N9/N10 KILCULLEN TO WATERFORD SCHEME, PHASE 4 – KNOCKTOPHER TO POWERSTOWN

Ministerial Direction Scheme Reference No.	A032
Registration No.	E3540
Site Name	AR078, Danesfort 2
Townland	Danesfort
County	Kilkenny
Excavation Director	Richard Jennings
NGR	251953 146745
Chainage	34925

FINAL REPORT

ON BEHALF OF KILKENNY COUNTY COUNCIL

FEBRUARY 2012

IAC Irish Archaeological Consultancy

PROJECT DETAILS

Project	N9/N10 Kilcullen to Waterford Scheme, Phase 4: Knocktopher to Powerstown
Ministerial Direction Reference No.	A032
Excavation Registration Number	E3540
Excavation Director	Richard Jennings
Senior Archaeologist	Tim Coughlan
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Kilkenny County Council
Site Name	AR078, Danesfort 2
Site Type	Burnt mound
Townland(s)	Danesfort
Parish	Danesfort
County	Kilkenny
NGR (easting)	251953
NGR (northing)	146745
Chainage	34925
Height OD (m)	54.431
RMP No.	N/A
Excavation Dates	25 June–23 July 2007
Project Duration	20 March 2007–18 April 2008
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Report By	Richard Jennings and Tim Coughlan
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This final report has been prepared by Irish Archaeological Consultancy Ltd in compliance with the directions issued to Kilkenny 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 Kilkenny County Council and Irish Archaeological Consultancy Ltd.

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ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by the National Roads Authority (NRA) through Kilkenny County Council, undertook an excavation at the site of AR078, Danesfort 2 along the proposed N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Figure 1). The following report describes the results of archaeological excavation at that site. The area was fully excavated by Richard Jennings under Ministerial Direction A032 and Excavation Registration Number E3540 issued by the DOEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between 25 June and 24 July 2007.

The site was identified as two phases of burnt mound activity, one in the early Bronze Age and a second in the early Iron Age. It is possible there were two separate phases of occupation in the Bronze Age.

The earliest dated feature on the site consisted of a sub-oval, bowl shaped trough (Trough 1) with an adjacent hearth, identified by a smaller cut with scorched sides and base. The trough was dated to the early Bronze Age. A shallow extension to the trough on the west side may have served as a step. A number of small pit features were identified in the general vicinity of the trough but it is not clear if these were directly related, and indeed their function remains unclear.

In the north of the site there was a very large and deep pit which may have functioned as a cistern or waterhole. The large pit was dated to the early Bronze Age but appears to be slightly later in date than Trough 1. It may therefore represent a second phase of Bronze Age activity on the site. The waterhole was not sealed by the main burnt mound spread however; there was evidence that some burnt mound material had been tipped into the feature, presumably after it was abandoned.

Located between the waterhole and Trough 1 were a series of features that represent the Iron Age phase of occupation of the site. These consisted of a large sub-oval trough (Trough 2) and adjacent large pit to the west. A number of irregular pits were identified to the east of the trough and may represent storage or perhaps evidence of land clearance in advance of the activity associated with the trough. Two structures were identified, the first of which (Structure A) consisted of a number of circular post-pits in a horseshoe shaped formation around the east of the trough. While the pits did not seem deep enough to support large (long) structural posts, the regular arrangement may have supported a platform erected on shorter posts around the trough. Some small stakeholes appear to have augmented the structure. At a distance of 5m to the east of Trough 2 was Structure B. This consisted of two parallel lines of four postholes. It is again interpreted that this may have been the location for a small platform (1.5m by 0.5m). Both Trough 2 and Structure B have been dated to the early Iron Age.

The overlying burnt mound deposits sealed almost all of the pits and troughs identified at the site, with the notable exception of the large waterhole. This probably indicates that the water in the waterhole was not heated, and it was a storage facility. It was not possible to identify which deposits were associated with the Bronze Age activity and which were associated with the Iron Age, as the mound deposits had been substantially levelled and disturbed over time. A number of modern drainage channels were also recorded, which truncated some of the features on the site.

Four samples were sent for AMS radiocarbon dating. A sample of ash and *Prunus* sp. charcoal from trough fill C54 was radiocarbon dated. The 2 sigma calibrated result was 2464–2214BC (UBA 12186). A sample of Pomoideae charcoal from

waterhole fill C111 had a 2 sigma calibrated result of 2116–1893BC (UBA 15553). A sample of cherry charcoal from posthole fill C122 was also radiocarbon dated. The 2 sigma calibrated result was 806–595BC (UBA 15554). A sample of *Prunus* sp. charcoal from pit fill C105 returned a 2 sigma calibrated result of 744–407BC (UBA 11000).

The Iron Age phase on the site contains features which conform in many ways with the features commonly found on burnt mound sites in terms of a trough, pits and burnt mound spread. The trough (Trough 2) however, does appear to be particularly deep and at 0.70m is approximately twice the depth of an average trough. Another deep, large pit is adjacent to the west end although not as large as the Bronze Age waterhole. The function of this pit, and indeed Trough 2 needs to be considered given their particular size and depth and it would seem unlikely that they were designed for cooking. The volume of water in such deep features would be more easily heated (for bathing) than boiled (for cooking). Trough 2 was also surrounded by a series of possible post-pits which may have supported a platform around the trough or indeed a small enclosed or roofed structure over the trough. A second possibly small structure or platform (B) 5m to the east consisted of parallel rows of four postholes. Structure A, Structure B and the trough were all on a similar east-west alignment, which is not likely to be coincidental.

The Iron Age phase at Danesfort 2 potentially represents a bathing place. This is significant in terms of our wider understanding of the function of *fulachta fiadh*/burnt mounds. It has been identified that this site type can have many functions and often the precise nature of the activity at excavated burnt mounds is unclear. The results of excavations at Danesfort 2 indicate that these varying functions can potentially occur in tandem when we consider the simpler trough and pits from the early Bronze Age; the subsequent unrelated very large early Bronze Age waterhole/cistern and the Iron Age possible bathing site.

Danesfort 2 is an important site locally as it represents the first evidence of early Iron Age activity in the immediate area and it adds to the considerable evidence from the Bronze Age that has been gathered through excavations as part of the N9/N10 Phase 4. It is, however, also of regional significance, based on the nature of the burnt mound activity identified at the site, in particular the Iron Age possible bathing site. A number of potential sweathouses and bathing sites have been confirmed from recent excavations of burnt mounds across the country and the results of the Danesfort 2 excavation will significantly add to the further study, analysis and understanding of the varied function and form of burnt mound sites.

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1 INTRODUCTION

1.1 General

This report presents the results of the archaeological excavation of Danesfort 2, AR078 (Figure 1), in the townland of Danesfort undertaken by Richard Jennings for IAC, on behalf of Kilkenny County Council and the NRA, in accordance with the Code of Practice between the NRA and the Minister for Arts, Heritage, Gaeltacht and the Islands. It was carried out as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4, which extends between Knocktopher in Co. Kilkenny to Powerstown in Co. Carlow. The excavation was undertaken to offset the adverse impact of road construction on known and potential subsoil archaeological remains in order to preserve the site by record.

The site measured 2834m^2 and was first identified during testing carried out in between 30 January and 3 March 2006 by Melanie McQuade (E3882) for Margaret Gowen & Co. Ltd. on behalf of the National Roads Authority. Danesfort 2 was excavated between June 25 and July 24 2007 with a team of one director, one supervisor and 14 assistant archaeologists.

1.2 The Development

For the purposes of construction, the N9/N10 Kilcullen to Waterford Road Scheme has been divided into separate sections, known as Phases 1–4. Phase 2 of the scheme extends from the tie-in to the Waterford City Bypass at Dunkitt, to Knocktopher in Co. Kilkenny (Ch. 2+000–Ch. 25+400). Phase 4 continues from Knocktopher to Powerstown in Co. Carlow (Ch. 25+400–Ch. 76+000) and includes the Kilkenny Link Road.

The roadway of the entire scheme includes approximately 64km of mainline high quality dual carriageway and 6.2km of the Kilkenny Link Road, which will connect the road development to the Kilkenny Ring Road Extension. The road development requires the realignment and modification of existing national, regional and local roads where the mainline intersects them. It requires the acquisition of 305 hectares of land for its construction. A further link road will connect the scheme to Paulstown in County Kilkenny, while six new grade separated junctions and three roundabouts are part of the road development.

1.3 Archaeological Requirements

The archaeological requirements for the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4: Knocktopher to Powerstown, are outlined in the Archaeological Directions issued to Kilkenny 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 Kilkenny County Council and Irish Archaeological Consultancy Ltd. These instructions form the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract are located between the townlands of Knocktopher, Co. Kilkenny, and Powerstown, Co. Carlow.

The proposed N9/N10 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Valerie J. Keeley Ltd and published in February 2005. The Record of Monuments and Places, the Site Monument Record, Topographical files, aerial photography, the Kilkenny and Carlow County Archaeological Urban Survey, and literary sources were all consulted. Two phases of geophysical survey were also conducted by Target (post-EIS geophysics carried out by ArchaeoPhysica) and an aerial survey was carried out by Margaret Gowen & Co. Ltd. As a result of the paper survey, field inspections and geophysical

survey, 35 sites were recorded in proximity to this section of the overall route alignment.

A previous archaeological assessment of Phase 2 of the scheme (test trenching conducted by Margaret Gowen & Co. Ltd. in 2006) extended into the lands acquired for Phase 4 to a point at Ch. 37+100 in the townland of Rathclogh, Co. Kilkenny. Thirty-four archaeological sites were identified within this area between Knocktopher and Rathclogh and subsequently excavated by Irish Archaeological Consultancy Ltd. as part of this archaeological contract.

Advance archaeological testing of the area between Rathclogh (Ch. 37+100) and Powerstown (Ch. 76+000) was completed by IAC during March–May 2007 and excavation of the sites identified during this process was also conducted by IAC between August 2007 and April 2008.

1.4 Methodology

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

All archaeological features were fully excavated by hand and recorded on *pro forma* record sheets using a single context recording system best suited to rural environment, with multi context plans and sections being recorded at a scale of 1:50, 1:20 or 1:10 as appropriate.

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

An environmental strategy was devised at the beginning of the excavation based on IAC in-house post-excavation and site methodologies and guidelines. Features exhibiting large amounts of carbonised material were the primary targets.

All artefacts uncovered on site were dealt with in accordance with the guidelines as issued by the NMI and where warranted in consultation with the relevant specialists. All archive is currently stored in IAC's facility in Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland.

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

All excavation and post excavation works were carried out in accordance with the relevant approvals and in consultation and agreement with the National Roads Authority (NRA) Project Archaeologist, the National Monuments Section of the DoEHLG and the National Museum of Ireland. Where necessary licences to alter and export archaeological objects were sought from the National Museum of Ireland.

References to other sites excavated as part of the N9/N10 Phase 4: Knocktopher to Powerstown are referenced throughout this report only by their site name e.g.

Paulstown 1. A list of these sites and details including director's name and National Monuments Excavation Reference Number can be referenced in Appendix 4.

Final Report Date Ranges

The following date ranges for Irish prehistory and medieval periods are used for all final reports for the N9/N10 Phase 4: Knocktopher to Powerstown excavations.

Mesolithic: 7000–4000BC
Neolithic: 4000–2500BC
Early Bronze Age: 2500–1700BC
Middle Bronze Age: 1700–1200BC
Late Bronze Age: 1200–800BC
Iron Age: 800BC–AD500
Early medieval period: AD500–1100
Medieval period: AD1100–1600
Post-medieval: AD1600–1800

Source:
Carlin, N., Clarke, L. & Walsh, F. 2008 *The M4 Kinnegad-Enfield-Kilcock Motorway: The Archaeology of Life and Death on the Boyne Floodplain*. NRA Monograph Series No. 2, Wordwell, Bray.

2 EXCAVATION RESULTS

Danesfort 2, a burnt mound, was located in a valley adjacent to a tributary that joins the King's River at the village of Ennisnag. The valley runs from west to east and is U-shaped. The burnt mound was located on the southern slope and base of the valley (Figure 4, Plate 1). It was not visible prior to excavation as it was obscured beneath a band of redeposited topsoil that lined the valley slopes. The valley sides were formed of boulder clay but its base was characterised by a loose concentration of medium- and large sized angular and sub-rounded stones. These probably related to a path which is depicted on the first edition Ordinance Survey Map (1839). At this time the valley was within Danesfort Demesne (the external stone wall perimeter of the Demesne is visible in Plate 1). It is very probable that at some point in the past this valley carried water into the Ennisnag tributary. Although dry and under pasture at the start of the excavation, when it rained the ground became saturated and the archaeological features rapidly filled with water, despite the presence of a modern drainage pipe running on the valley base. The location of the site in a gently winding valley only 54m OD meant that views from the site were quite restricted in all directions.

The burnt mound was situated within an archaeologically rich Bronze Age landscape (Ch. 33740-37100, Danesfort and Croan townlands). Evidence of funerary and domestic activity was discovered 0.4–0.6km to the south-west at sites Danesfort 12 and 13 where three ringditches, a pit circle and three cremations were found in low-lying land beside the Ennisnag tributary. Another ringditch was found 0.3km to the south-east at Danesfort 1 while Graves (1860–1) reported the discovery in 1838 of an intact Bronze Age urn in a sand pit next to a post-medieval turret (RMP KK023-080) which is visible 0.2km to the south of Danesfort 2. A prehistoric shelter on higher ground was recorded 0.7km to the north-east (Croan 1, AR081). Bronze Age sites were also excavated 1–1.8km to the north and north-east at Danesfort 5–7 including a settlement and cremation pits with late Bronze Age pottery. The next closest recorded burnt mound activity was recorded in a shallow basin at Danesfort 11, *c.* 2.3km to the north-west. In that instance, there was no mound and only features cut into the boulder clay survived.

2.1 PHASE 1 Natural Drift Geology

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A				Medium grey sandy gravel clay.	Natural

The subsoil comprised sandy, gravel clay.

2.2 PHASE 2 Early Bronze Age Activity

The primary features excavated at Danesfort 2 were dated to the early Bronze Age and were associated with burnt mound activity (Figure 5; Plate 2).

2.2.1 Trough 1 with adjoining Hearth

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C7	N/A	4.50	2.20	0.75	Irregular shaped cut of trough and hearth	Cut of trough
C7a	N/A	1.30	1.30	0.20	Roughly circular hearth cut	Cut of hearth
C8	C7/7a	4.50	1.30	0.30	Dark greyish black clayey silt	Upp. fill trough/hearth
C21	N/A	0.05	0.06	0.11	Circular shaped cut	Cut of stakehole
C22	C21	0.06	0.08	0.11	Mid greyish brown silty clay	Fill of stakehole
C33	C7	1.50	0.75	0.35	Light brownish grey silt	Upper fill of trough
C53	C7	2.50	1.80	25.4	Greyish black clayey silt	Middle fill of trough
C54	C7	1.80	1.60	0.25	Blackish grey silty clay	Basal fill of trough

Finds: None

The trough, C7, was located in the southern area of the site (Figure 5). It was bowl-shaped with an uneven stony base (Plate 3). The area to the west of the trough consisted of a shallower, sub-rectangular extension to the main bowl shaped trough cut that perhaps functioned as a small step. The trough was adjoined on its eastern (upslope) side by a small hearth C7a (Plate 4). It was impossible to distinguish between the fills of the two features as the fill of the hearth and the upper fill of the trough were identical. This fill contained a high ash component while the sides of the hearth were reddened due to the scorching of the earth. The lower fills of the trough also contained ash but in less substantial quantities. These fills, which had matrices of clay or silt, were dominated by charcoal and small angular fragments of heat-shattered sandstone. The evidence suggests that the hearth was used to heat sandstone blocks which were then placed into the water-filled trough to boil water. A solitary stakehole was identified adjacent to the hearth. The function of a single stakehole cannot be accurately assessed.

Charcoal analysis of fill C8 (fill of trough C7) indicated a predominance of hazel (*Corylus avellana),* ash (*Fraxinus excelsior*), pomaceous fruitwood (*Pomoideae*) wild/bird cherry (*Prunus avium/padus* sp.) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

A sample of plant remains (S14) from C54 was examined and no charred seeds were recovered from this sample (Johnston, Appendix 2.4).

Stone retrieved from C8, C33, C53 and C54 was analysed and was found to be coarse grained, quartz-rich, red sandstone. The sample examined from C54 also contained a burnt limestone piece. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.05g) of ash and prunus was chosen for AMS dating from C54 and returned a result of 3869±26 (UBA 12186). The 2 Sigma calibrated result for this was 2464–2214BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age period.

2.2.2 Features Adjacent to Trough 1

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C11	N/A	1.27	0.42	0.13	Elongated shallow pit	Cut of pit
C12	C11	1.27	0.42	0.13	Black silty sand with pebbles	Fill of pit
13	N/A	0.48	0.35	0.07	Sub-circular, gradual slope, concave base.	Cut of pit
14	C13	0.48	0.35	0.07	Black sandy silt with burnt stones, charcoal	Fill of pit
C15	N/A	0.90	0.68	0.12	Oval shaped shallow pit	Cut of pit
C16	C15	0.90	0.68	0.12	Black silty sand with stone and pebbles	Fill of pit
C17	N/A	2.80	0.49	0.22	Curvilinear shaped cut	Cut of channel
C18	C17	2.80	0.49	0.22	Dark brown silty sand	Fill of channel
C23	N/A	0.25	0.18	0.13	Oval shaped cut	Cut of pit
C24	C23	0.25	0.18	0.13	Dark greyish brown silty sand	Fill of pit
C25	N/A	0.45	0.25	0.18	Oval shaped cut	Cut of pit
C26	C25	0.45	0.25	0.18	Greyish brown silty sand	Fill of pit
C27	N/A	0.20	0.15	0.35	Circular cut	Cut of pit
C28	C27	0.20	0.15	0.35	Black silty sand	Fill of pit
C152	N/A	0.67	0.42	0.21	Oval shaped cut	Cut of pit
C153	C152	0.67	0.42	0.21	Black silty clay	Fill of pit

Finds: None

There were a number of features in the vicinity of the trough. These were generally shallow and probably not particularly significant. They were probably related to activity associated with the trough but form no particular pattern and contained nothing diagnostic in their fills to suggest a particular function. The most prominent feature was C17, a small curvilinear channel filled with burnt mound material. There was not enough evidence to suggest that it was structural and it may have formed naturally as a result of water erosion. Charcoal was identified from the fills but this was not sent for further analysis.

Stone retrieved from C153 (fill of pit C152) and C28 (fill of pit C27) was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.2.3 Large Waterhole C109 and adjacent Pit C5

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C5	N/A	1.60	1.50	0.11	Oval shallow pit with irregular base	Cut of pit
C6	C5	1.60	1.50	0.11	Grey-Black silt with no inclusions	Fill of pit
C52	C109	1.35	0.8	0.30	Tightly compacted light brown clay with small stones within.	Fill of pit
C106	C109	1.65	2.50	0.20	Dark brown silty clay	Fill of pit
C107	C109	2.10	3.50	0.30	Dark brown clay	Fill of pit
C108	C109	0.60	2.00	0.65	Medium brown silty clay	Fill of pit
C109	N/A	6.00	6.00	0.75	Oval shaped cut	Cut of pit
C110	C109	6.00	3.50	0.75	Dark grey thick marl	Fill of pit
C111	C109	1.70	1.70	0.25	Black clay with heat shattered stones	Fill of pit

Finds: None

At the north of the excavated area was a large pit which may have functioned as a waterhole/cistern. This may have utilised the location near the base of the valley to store water during periods of rain when there would be a surplus of surface water available. In drier conditions there was no obvious water source. The size of the waterhole appears to be slightly excessive given the small number of features identified on the site (Figure 4; Plate 8). Perhaps another site was located close by, although the proposed N9/N10 ran along the valley floor where it seems most likely that additional burnt mound activity would have been located if it had existed.

The waterhole was located away from the main cluster of burnt mound features and was not sealed by the dispersed burnt mound spread. Nevertheless, burnt mound material did find its way into the waterhole. It was found tipped into the waterhole (C111) on its southern side nearest Trough 2. The layer of burnt mound material was within thick, dark-grey marl (C110) which also contained occasional large sandstone rocks. These were probably the types of stones that were heated and then dumped into the troughs. Only one feature of archaeological potential was located in proximity of the waterhole. This consisted of a small shallow pit C5 which had no inclusions and as such its function is unclear.

While the waterhole was dated to the early Bronze Age (see below), the calibrated dates suggest that it was not contemporary with Trough 1, being slightly later in date. This may indicate a second phase of early Bronze Age activity on the site. The activity to the south of the waterhole has been dated to the Iron Age with the early

Bronze Age trough 1 being further south again. There is some indication that the Iron Age features have truncated some earlier features. Perhaps these were contemporary with the waterhole.

Charcoal analysis of fill C111 (fill of pit C109) indicated a predominance of pomaceous fruitwood (*Pomoideae*) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

Stone retrieved from C111 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of pomaceous fruitwood was chosen for AMS dating from C111 and returned a result of 3619±30 (UB 15553). The 2 Sigma calibrated result for this was 2153–1893BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age period.

2.3 PHASE 3 Iron Age Activity

2.3.1 Trough 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C128	N/A	2.25	1.60	0.75	Oval shaped cut	Cut of pit/Trough
C105	C128	2.25	1.60	0.75	Dark grey-black sandy silt, shattered stones	Fill of pit/Trough

Finds: None
Trough 2 consisted of a large, deep oval pit C128 with a U-shaped profile (Figure 4-6; Plate 5). No surviving timbers or stakeholes were found to suggest that it was wooden lined. Its fill of heat-shattered stones differed from that of the overlying burnt mound material in that it contained infrequent medium and large sized stones and was siltier and less clayey than the mound. It has been dated to the early Iron Age (see below). Associated with the trough were two separate phases of pits, predominantly to the east of the trough. The second phase of features appeared to be directly related to a structure erected over/around the trough. The earlier features were more irregular in plan and pattern and may be unrelated to the trough, perhaps being associated with the previously outlined early Bronze Age activity. These features were all located to the east of the trough.

Charcoal analysis of fill C105 (fill of trough C128) indicated a predominance of pomaceous fruitwood (*Pomoideae*) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3). A fragment of *Prunus* sp. was identified for radiocarbon analysis. This species was not identified in the wider analysis of the sample.

Stone retrieved from C105 was analysed and was found to be coarse grained, quartz rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of *Prunus* sp charcoal was chosen for AMS dating from C105 and returned a result of 2434±20 (UBA 11000). The 2 Sigma calibrated result for this was 744–407BC (QUB, Appendix 2.7) dating this feature to the early Iron Age period.

2.3.2 Large Pit C100

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C100	N/A	2.90	2.70	0.70	Irregular shaped cut	Cut of pit
C151	C100	2.90	2.70	0.70	Dark greyish black sandy silt	Fill of pit

Finds: None

A large sub-rectangular pit, C100, was located to the west of Trough 2 (Figure 5). The fill of this pit contained the same dark-greyish-black, sandy silt that was found in the adjoining trough. For this reason it is likely that the pit was contemporary with the trough and that the two were directly associated rather than one being a replacement for the other. No further analysis was carried out on the fill material C151.

2.3.3 Primary Phase of Pits to East of the Trough

A series of irregular shaped pits were identified in the area to the east of the trough.

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C44	C59	0.35	0.37	0.06	Mid greyish brown fine sand	Fill of pit
C57	N/A	2.40	2.20	0.32	Oval shaped cut	Cut of pit
C58	C57	1.10	0.88	0.17	Greyish black silty sand	Fill of pit
C59	N/A	0.76	0.74	0.20	Circular shaped cut	Cut of pit
C60	C59	0.70	0.66	0.15	Black fine sand	Fill of pit
C61	N/A	0.95	0.65	0.16	Circular shaped cut	Cut of pit
C62	C61	0.95	0.65	0.16	Black soil with stones	Fill of pit
C63	N/A	1.35	1.05	0.37	Irregular shaped cut	Cut of pit
C64	C63	1.35	1.05	0.37	Black silty sand	Fill of pit
C71	N/A	0.32	0.28	0.12	Circular shaped cut	Cut of pit
C72	C71	0.32	0.28	0.12	Black silty sand	Fill of pit
C75	N/A	0.33	0.33	0.07	Greyish black silty sand	Spread
C81	N/A	1.00	0.50	0.25	Irregular shaped cut	Cut of pit
C82	C81	1.00	0.40	0.25	Black sandy clay	Fill of pit
C91	N/A	0.80	0.40	0.13	Curved linear, gradual sides, linear base.	Cut of pit
C92	C91	0.80	0.40	0.13	Greyish black silty sand	Fill of pit
C93	N/A	1.25	0.60	0.32	L- shaped cut- upper part	Cut of pit
C94	C93	1.25	0.60	0.32	Black silty sand	Fill of pit
C112	C118	0.71	0.67	0.20	Dark brownish black silty sand	Fill of pit
C117	C57	2.40	2.20	0.21	Orange brown silty sand	Fill of pit
C118	N/A	0.71	0.67	0.20	V-shaped cut	Cut of pit
C129	N/A	1.00	1.00	0.30	Irregular shaped cut	Cut of pit
C130	C129	1.00	1.00	0.30	Black silty sand	Fill of pit

Finds: None

The pits were concentrated upslope on the eastern side of the trough over a 7m by 5m area. These comprised ten irregular-shaped shallow pits, the largest of which, C57, was 2.4m by 2.2m by 0.3m. All generally contained silty sand burnt mound material and must have performed some function that was related to the nearby trough. None of their bases were scorched to suggest that *in situ* burning took place in them. Perhaps their function was to store some form of organic material that has not survived in the archaeological record. They may also have been the result of some land clearance to facilitate the trough and associated structures. It seems unlikely that the purpose of the pits was to hold water given the adjacent presence of

a large trough and pit. Soil samples were processed from the pits to assess if any diagnostic material could be identified to suggest a function but predominantly only charcoal fragments were recovered. A few fragments of burnt bone were found in C64 (fill of pit C63) which may indicate domestic waste.

None of the pits were dated, however some of the pits were truncated by postholes and pits probably associated with a structure erected around or over Trough 2. It is possible therefore that these pits were associated with the early Bronze Age phase of activity on site, perhaps with the large waterhole C109 to the north. However their location, clustered immediately east of Trough 2 suggests a primary phase of activity associated with the trough.

Charcoal analysis of fill C94 (fill of pit C93) indicated a predominance of oak (*Quercus* sp.) although the level of charcoal from this context was low. This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

A sample of plant remains from C58 was examined and no charred seeds were recovered from this sample (Johnston, Appendix 2.4).

Burnt animal bone fragments were recovered from fill C64 of pit C63. A total of four calcined fragments of unidentifiable trabecular bone were recovered. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation (McCarthy, Appendix 2.5).

Stone retrieved from C60, C64, C72, C82, C93 and C112 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.3.4 Structure A at Trough 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C77	N/A	0.22	0.14	0.11	Circular shaped cut	Cut of stakehole
C78	C77	0.22	0.14	0.11	Black to dark brown soil	Fill of stakehole
C79	N/A	0.10	0.08	0.09	Circular shaped cut	Cut of stakehole
C80	C80	0.10	0.08	0.09	Black soil	Fill of stakehole
C87	N/A	0.13	0.11	0.22	Circular shaped cut	Cut of stakehole
C83	N/A	0.85	0.40	0.30	Circular shaped cut	Cut of pit
C84	C83	0.85	0.40	0.30	Black sandy clay	Fill of pit
C88	C87	0.13	0.11	0.22	Greyish black silty clay	Fill of stakehole
C89	N/A	0.14	0.13	0.16	Circular shaped cut	Cut of stakehole
C90	C89	0.14	0.13	0.16	Grey silty sand	Fill of stakehole
C95	N/A	0.40	0.38	0.40	Circular shaped cut	Cut of pit/posthole
C96	C95	0.40	0.38	0.40	Black silty sand	Fill of pit/ posthole
C97	N/A	0.60	0.50	0.21	Circular shaped cut	Cut of pit
C98	C97	0.24	0.20	0.09	Brownish black silty clay	Fill of pit
C123	C97	0.60	0.50	0.15	Mid brown sandy clay	Fill of [pit
C131	N/A	0.55	0.55	0.28	Rounded shaped cut	Cut of pit
C132	C131	0.55	0.55	0.15	Dark grey clayey silt	Fill of pit
137	N/A	0.12	0.10	0.09	Circular, steep sides and concave base.	Cut of stakehole
138	C137	0.12	0.10	0.09	Loosely compact black clay silt with grey hue.	Fill of stakehole
139	N/A	0.11	0.09	0.05	Circular, steep sides and concave base.	Cut of stakehole
140	C139	0.11	0.09	0.05	Loosely compact black clay silt with grey	Fill of stakehole

					hue.	
C141	C142	0.39	0.30	0.20	Greyish black silty sand	Fill of stakehole
C142	N/A	0.39	0.30	0.20	Circular within oval shaped pit	Cut of stakehole
C143	C144	0.50	0.40	0.47	Brownish black silty clay	Fill of pit/posthole
C144	N/A	0.50	0.40	0.47	Oval shaped cut	Cut of pit/posthole
C145	N/A	0.35	0.35	0.20	Rounded shaped cut	Cut of pit
C146	C145	0.35	0.35	0.20	Dark greyish black clayey silt	Fill of pit

Finds: None

Seven circular pits formed a horseshoe shaped structure around the trough. These pits contrasted with those of the earlier phase in that they were of consistent size and shape and tended to have steep sides and flat bases. The one characteristic that prevented all of them from being definitively categorised as postholes was their shallowness. Only three exceeded depths of 0.3m and the majority were over 0.4m in diameter. Also, none of them contained postpipes or packing material that might give an indication that they supported posts. However, the horseshoe-shaped distribution of the pits, effectively around the perimeter of the trough, suggests that they had a structural function, so perhaps they held short and thick posts which served as the foundation for a wooden platform that may have existed over or around the sides of the trough.

In four examples the circular pits truncated some of the irregular pits of the earlier phase. It was impossible to detect the cut of three examples due to their containing similar fills of charcoal and heat-shattered stones. If there was a difference, the matrices of the earlier pits tended to be silty sand while the circular pits had a greater silty clay component. This might indicate that the earlier pits had been deliberately backfilled while the later ones had naturally silted up. One cut was very clear: circular pit C95 truncated C118 (Figure 6; Plate 6).

Seven stakeholes were probably associated with the structure, being located predominantly along its east side. They may have provided some additional support to the post-pits. Some of them appeared to be cut into the earlier phase of pits including C89, C83 and C144.

Stone retrieved from C93/94 was analysed and was found to be coarse grained, quartz rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.3.5 Shallow Pit C147

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C147	N/A	0.90	0.40	0.25	Rectangular shaped cut	Cut of pit
C148	C147	0.90	0.40	0.25	Dark greyish black clayey silt	Fill of pit

Finds: None

A small rectangular pit C147, was cut into the northern side of the trough. It appeared to modify the existing oval trough creating a shallow step. Perhaps its function was related to the possible platform Structure A. Indeed, it appeared to respect one of the supporting post-pits C131. Its precise function is unclear.

2.3.6 Structure B

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C19	N/A	0.35	0.33	0.21	Circular shaped cut	Cut of posthole
C20	C19	0.35	0.33	0.21	Mid black, light grey hue, silty clay	Fill of posthole
C29	N/A	0.33	0.31	0.14	Circular shaped cut	Cut of posthole
C30	C29	0.33	0.31	0.14	Black soil with greyish hue	Fill of posthole
C48	N/A	0.35	0.30	0.39	Circular shaped cut	Cut of posthole
C49	C48	0.35	0.30	0.39	Black silt with greyish hue	Fill of posthole
C50	N/A	0.37	0.29	0.25	Circular shaped cut	Cut of posthole
C51	C50	0.24	0.20	0.11	Black, mid grey hue, silty clay	Fill of posthole
C55	N/A	0.36	0.32	0.36	Circular shaped cut	Cut of posthole
C56	C55	0.36	0.32	0.36	Black, light grey hue, silty clay	Fill of posthole
C101	N/A	0.34	0.30	0.42	Circular shaped cut	Cut of posthole
C102	C101	0.34	0.30	0.42	Black silt with greyish hue	Fill of posthole
C119	N/A	0.39	0.25	0.37	Oval shaped cut	Cut of posthole
C120	C120	0.39	0.25	0.37	Black , light grey hue silty clay	Fill of posthole
C121	N/A	0.28	0.26	0.39	Circular shaped cut	Cut of posthole
C122	C121	0.28	0.26	0.39	Black soil with greyish hue	Fill of posthole
C124	N/A	0.16	0.16	0.34	Circular shaped cut	Cut of stakehole
C125	C124	0.16	0.16	0.34	Greyish black silty sand	Fill of stakehole

Finds: None

Another possible structure - Structure B - was identified 5.5m east of and upslope of Trough 2. It comprised two parallel rows of four near-circular postholes, which were approximately 0.5m apart from each other (Plate 7). The postholes in each of the rows were also tightly spaced and in some instances were connected by a very shallow channel. The postholes were on average 0.35m in diameter and ranged in depth from 0.14m to 0.42m. There was no direct physical relationship between this structure and Trough 2. The postholes did however more closely resemble the post-pits of Structure A than the irregular pits of the earlier phase possibly suggesting the two structures were related. Both possible structures were also on the same alignment and contained similar fills of silty clays, charcoal and heat-shattered stones. The proximity of the postholes of Structure B suggests that their purpose was to support a small platform apparently measuring 1.5m long by 1m wide. Stakehole C124, located to the west of these postholes, may also have formed part of this structure.

Stone retrieved from C56, C102 and C122 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of cherry charcoal was chosen for AMS dating from C122 and returned a result of 2571±25 (UB 15554). The 2 Sigma calibrated result for this was 806–595BC (QUB, Appendix 2.7) dating this feature to the early Iron Age period.

2.4 PHASE 4 Burnt Mound Deposits

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	14.35	13.80	0.57	Black silty clay, burnt stones, charcoal	Spread
C46	N/A	25.00	9.00	0.30	Mid brown clay, burnt stones, charcoal	Spread
C37	N/A	4.00	2.00	0.15	Dark brown silty clay, burnt stones, charcoal	Spread
C38	N/A	4.20	1.50	0.35	Light brown silty clay, burnt stones	Spread
C39	N/A	2.30	1.20	0.25	Grey brown silty clay, burnt stones	Spread

Finds

Context	Find Number	Material	Period	Description
C3	E3540:003:001	Flint	Early Neolithic	Retouched artefact, probable scraper
C3	E3540:003:002	Quartz crystal	Early Neolithic	Natural chunk
C3	E3540:003:003	Quartz crystal	Early Neolithic	Retouched artefact, probable scraper
C3	E3540:003:004	Quartzite	Early Neolithic	Rubbing stone
C3	E3540:003:005	Quartzite	Early Neolithic	Rubbing stone
C3	E3540:003:006	Copper alloy	Medieval	Stick pin

The burnt mound (C3/C46) was not noticeable as a mound prior to excavation as its sides were covered by topsoil and ploughsoil deposits of up to 0.5m deep (Figure 4). The highest point of the mound was covered by only 0.25m of soil. The removal of the soil revealed an irregular shaped mound 13m by 14m that was up to 0.57m deep (Figure 4; Plate 1). The darkest and densest visible concentrations of charcoal and heat-shattered stone were located in the area between the two troughs and in the waterhole to the north of Trough 2. No tip lines or multiple phases could be distinguished within the burnt mound even though two phases of activity were recorded. The mound itself had a silty clay matrix with abundant charcoal and heat-shattered sandstones. The sandstone fragments were pinkish in colour, angular, easily scratched and typically 0.07m long. A few prehistoric finds were recovered from the mound including flint flakes and a possibly later copper-alloy pin.

C37, C38, C39 and C46 were deposits found on top of, or banked up against, the main burnt mound deposit C3 (Figure 6). They all contained heat-shattered stones which were lighter in colour than the mound as a result of contact with ploughsoil. Those in the valley base (C46) had probably come displaced from the mound due to water erosion, drainage, agricultural activity or the construction of the path that once ran on the valley base.

While the burnt mound deposits were clearly associated with two distinct phases of activity on the site - Bronze Age and Iron Age - it was not possible to identify which deposits were related to which phase as the mound material had been substantially levelled and disturbed presumably by post-medieval and modern agricultural practices.

Five lithics were retrieved from C3. These include one flint retouched artefact (Figure 7) and one quartz crystal retouched artefact both of which were probably used as scrapers, two quartzite rubbing stones and one natural chunk of quartz crystal. The assemblage is technologically and typologically diagnostic and dates to the first half of the Neolithic period (Sternke, Appendix 2.1). No Neolithic activity was identified on the site but the presence of these artefacts within the disturbed burnt mound material may indicate that Neolithic activity was located nearby.

A copper alloy stick pin (003:6) with an undifferentiated head was also recovered from C3. It has a circular, tapering shank that is decorated with transverse lines and is hipped in the upper part of the shank, which would have helped the pin to grip the garment. It dates to the medieval period, specifically to the early 12th/13th centuries (Scully, Appendix 2.2). While no medieval activity was recorded at Danesfort 2, there is activity recorded to this period in the locality. Excavations carried out along the N9/10 identified medieval activity at Danesfort 4 and 6 in particular. In the 13th century Danesfort was the centre of a thriving borough in a manor of the same name (Empey 1990, 80).

Burnt and unburnt animal bone fragments were recovered from burnt mound spread C3. A total of 15 bone fragments (90.6g) (including two teeth) representing 12 possible skeletal elements were identified. Species identified included cow (*Bos*), pig

(*Sus*) and sheep/goat (*Caprinae*). Small fragment size combined with a poor degree of preservation meant it was not possible to identify the species of 6 fragments (24.3g). One fragment of unidentified bone had evidence of butchering. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation (McCarthy, Appendix 2.5).

It is significant that sandstone is the predominant rock type in the mound material given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area (Mandal, Appendix 2.6).

2.5 PHASE 5 Modern activity

2.5.1 Drains

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C4	N/A	ran across site	0.37	0.34	Cut of linear feature	Modern drain
C36	C4	ran across site	0.37	0.34	Contained plastic water pipe	Fill over Pipe
C158	N/A	ran across site	1.26	0.50	Cut of linear feature	Modern drain
C159-161	C158	ran across site	1.26	0.50	Fills of linear feature	Fills of modern drain

Finds: None

These modern drainage features demonstrated the necessity of draining the land due to the low-lying location created by the valley (Figures 4–5).

2.6 PHASE 6 Topsoil and Plough soil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A	across site		0.25-0.50	Dark brown sandy silty clay	Topsoil

Finds: None

The topsoil comprised sandy, silty clay and contained no artefacts.

3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Danesfort 2. This includes the analysis of the physical and archaeological landscape, the compilation of information gathered during research into the site type, date, and function, and the results of the excavation and specialist analysis of samples taken during the course of on-site works.

3.1 Landscape Setting

3.1.1 The General Landscape – compiled by Michelle Brick

The topography of the region through which the route passes is generally flat with an average height of 70m O.D. The southern periphery of the route is bordered by Kilmacoliver (261m) and Carricktriss Gorse (314m), with Slievenamon (721m) further west. The Slieveardagh hills (340m) are visible on the western horizon in the south of the route and with the exception of Knockadrina Hill (140m), the enclosed landscape is made up of minor undulations. In the centre of the route Freestone Hill (130m) and Knocknagappoge (334m) further north are the significant uplands. A number of hills and mountains are visible in the distance to the east and west of this area of the landscape but the topography remains generally flat. To the north the Castlecomer Plateau influences a rise in the overall topography of the region. This expanse of terrain stretches along the north-east margins of Kilkenny, crosses the county border into Carlow and stretches northwards into Laois. This plateau consists of a variety of hills and peaks including Mountnugent Upper (334m), Baunreagh (310m), Knockbaun (296m), Brennan's Hill (326m) and Fossy Mountain (330m). These hills contain seams of anthracite coal as a result of millions of years of compression, and consequently Shales and Sandstones were formed which are evident throughout the plateau. Mining in the region began in the 17th century, continued for over 300 years and it is for what Castlecomer is best known. According to the Environmental Protection Agency soil maps of Ireland, the underlying bedrock of the entire region primarily consists of Carboniferous Limestone. However there is also a small amount of surface bedrock, sands, gravels, shales and sandstone Tills present along the route. The soil cover of the region is primarily composed of Grey Brown Podzolics, Renzinas and Lithosols. Additional soil types also present along the route include Brown Earths, surface Water Gleys and Ground Water Gleys.

The prevailing water courses within the landscape of the N9/N10 Phase 4 are the Rivers Nore and Barrow. The River Nore rises on the east slopes of the Devil's Bit in Co. Tipperary and flows eastwards through Borris-in-Ossory and then south through Co. Kilkenny, passing through the towns of Durrow (Laois), Ballyragget, Kilkenny, Bennettsbridge and Thomastown to join the River Barrow upstream of New Ross, Co. Wexford. It is 140 kilometres long and drains a total catchment of 1572 square kilometers and runs through the central and southern sections of the route. In the south of the route three main tributaries of the River Nore are evident. The Kings River flows east through Callan and Kells. It is joined by the River Glory which meanders on a north-south axis towards the western margins of the route landscape and the Little Arrigle River flows along the southern fringes. These rivers are flanked by low-lying valleys that are characterised by wet, marshy land. The condition of the soil improves further north beyond the King's River where the influence of these waterways declines. In the northern area of the route the River Dinin is a tributary of the River Nore flowing south-west from Brennan's Hill through the Castlecomer Plateau. The Plateau is the tableland that is the watershed between the Rivers Nore and Barrow (Lyng 1984). The River Barrow is the second longest river (193 kilometres) in Ireland after the River Shannon. It rises in the Slieve Bloom Mountains in Co Laois and flows east across bogs and lowlands and then turns south into the lowland immediately east of the Castlecomer Plateau. It passes through

Portarlington, Athy, Carlow, and Graiguenamanagh and runs through northern section of the route. It is joined by the River Nore at New Ross. The Maudlin River is the notable tributary of the River Barrow within the landscape of the route and flows east from Old Leighlin, with minor tributaries of it flowing through Bannagagole. There are also streams and minor watercourses present throughout the entire landscape and these waterways would have been a valuable resource to past communities and would also have had a major influence on settlement and the surrounding land use.

The physical landscape through which the N9/N10 Phase 4 passes can be divided into three principal areas defined by the main rivers and their catchments. The southern area is located in the undulating landscape on the western flanks of the Nore Valley. The central area is dominated by the fertile watershed between the Barrow and Nore systems in the hinterland of Kilkenny City. The northern area is located on the western flanks of the Barrow Valley overlooked by uplands to the north and west. Danesfort 2 is located in the central landscape area.

3.1.2 The Central Landscape

The central landscape of the route encompasses the environs of the Nore Valley and the hinterland of Kilkenny City. The underlying bedrock of the region is made up of Carboniferous Limestone sands and gravels, Carboniferous Limestone Tills, Shale's and Sandstone Tills. According to the EPA the natural soils of the region consist of Renzinas and Lithosols in areas dominated by underlying bedrock of Carboniferous Limestone sands and gravels. Soil cover consisting of Grey Brown Podzolics and Brown Earths is present in areas of underlying Carboniferous Limestone Tills and Surface Water Gleys and Ground Water Gleys are the soils present where the underlying bedrock is made up of Shale's and Sandstone Tills. This landscape is underlain not only by the Butlersgrove geological formation but also by the Ballyadams formation (thick-bedded calcarenitic wackestone on erosional surfaces). A large number of quarries in the area, some of which produced the distinctive blue 'Kilkenny limestone' that was used to construct the medieval and later city, occur around the city itself and extend southward into the dolomite formations along the Nore around Dunbell (Tietzsch-Tyler, 1994).

The glacial drift around the Kilkenny City hinterland, along the Kilkenny Link Road, comprises sandy (50–60%), gravely clay with a noticeably higher sand content than along the southern plain of the River Nore. As this section crosses existing watercourses, areas of granular deposits and several isolated sand and gravel lenses were noted. The floodplain of the Nore extends *c.* 80m on the western side and *c.* 50m on the eastern side, creating marsh and wet grassland within the immediate area. The nature of the glacial drift and geology, combined with the water sources and floodplains in the area, has resulted in the high quality of the local pastoral and arable agricultural landscape. The topography in this section remains between 50m and 80m OD creating open and expansive views over the confluence of the Nore and Kings Rivers. Mountains are visible on the horizon to the north, east and south-east. Freestone Hill (130m) is located directly to the North and Knocknaguppoge beyond this rises to 334m. Outside the parameters of this landscape lies Brandon Hill (513m) to the south-east and further to the east are the Blackstairs Mountains (735m) and Mount Leinster (795m). The River Nore is the prevailing water course of the region and the River Barrow flows along the margins to the east. The Kings River is located to the south and would have influenced activity in and around this area.

3.1.3 Site Specific Landscape

Danesfort 2, a burnt mound, was located in a valley adjacent to a tributary that joins the King's River at the village of Ennisnag. The valley runs from west to east and is U-shaped. The burnt mound was located on the southern slopes and base of the valley (Figure 4; Plate 1). It was not visible prior to excavation as it was obscured beneath a band of redeposited topsoil that lined the valley slopes. The valley sides were formed of boulder clay but its base was characterised by a loose concentration of medium- and large sized angular and sub-rounded stones. These probably related to a path which is depicted on the first edition Ordinance Survey Map (1839). At this time the valley was within Danesfort Demesne (the external stone wall perimeter of the Demesne is visible in Plate 1). It is very probable that at some point in the past this valley carried water into the Ennisnag tributary. Although dry and under pasture at the start of the excavation, when it rained the ground became saturated and the archaeological features rapidly filled with water, despite the presence of a modern drainage pipe running on the valley base. The location of the site in a gently winding valley only 54m OD meant that views from the site were fairly restricted in all directions.

The burnt mound was situated within an archaeologically rich Bronze Age landscape (Ch. 33740–37100, Danesfort and Croan townlands). Evidence of funerary and domestic activity was discovered 0.4–0.6km to the south-west at sites Danesfort 12 and 13 where three ringditches, a pit circle and three cremations were found in low-lying land beside the Ennisnag tributary. Another ringditch was found 0.3km to the south-east at Danesfort 1 while Graves (1860–1) reported the discovery in 1838 of an intact Bronze Age urn in a sand pit next to a post-medieval turret (RMP KK023-080) which is visible 0.2km to the south of Danesfort 2. A prehistoric shelter on higher ground was recorded 0.7km to the north-east (Croan 1). Bronze Age sites were also excavated 1–1.8km to the north and north-east at Danesfort 5–7 including a settlement and cremation pits with late Bronze Age pottery. The next closest recorded burnt mound activity occured in a shallow basin at Danesfort 11, *c.* 2.3km to the north-west. In that instance, there was no mound and only features cut into the boulder clay survived.

3.2 The Archaeological Landscape

As part of the general research relating to sites along the scheme and the specific research relating to Danesfort 2, the known archaeology within the surrounding landscape was assessed in order to establish the level and type of activity in the surrounding area in the past. This included a review of information from the Record of Monuments and Places, previous excavations and other relevant documentary sources including mapping and other sites excavated as part of the N9/N10 Phase 4 scheme. The excavated archaeology at Danesfort 2 has been identified as being Bronze Age and Iron Age in date.

3.2.1 General Bronze Age Landscape of the Scheme – compiled by Michelle Brick

The archaeological record implies that the Irish Bronze Age (2500–800BC) population dramatically increased from that of the Neolithic and the evidence for permanent settlements with considerable longevity becomes much more substantial. In addition, a wide range of ritual and funerary activity associated with this settlement is apparent. The overall environmental record for Ireland suggests that there was a general climatic deterioration in the Bronze Age, bringing wetter, colder conditions; during this period there was also accelerated forest clearance with more intensive habitation in the drier lowlands. As a result of extensive development-led projects across the country, understanding of settlement and burial patterns from the early Bronze Age has greatly developed. The distribution of the prehistoric evidence shows

that the Rivers Nore and Barrow provided a focus for settlement. In the central part of the current portion of the N9/N10 Phase 4 the fertile Kilkenny lowlands have produced some Bronze Age archaeology, particularly in Danesfort and Ennisnag townlands. In the northern part of the scheme intense settlement is indicated by both burnt mounds and barrows existing on the uplands of the Castlecomer Plateau and the flanking valleys of the Nore and Suir. Hillforts appear to be positioned to overlook the settlement activity, as well as the route of the Nore, the lower saddle to the north of the Slieveardagh Hills, and to the south of the spur surmounted by Clonmantagh. A considerable number of ringditches, cremation and inhumation burials (single and grouped), burnt mound sites, structures and domestic settlement evidence, have been recorded as part of the Bronze Age on of the N9/N10 Phase 4.

In the southern landscape the exposure of domestic Bronze Age settlement was less forthcoming than that of the northern landscape. There was little direct evidence for structures in the southern and central landscapes with the exception of a cluster of structures in the Danesfort area. Instead most of the settlement activity that fell within the roadtake was noted in the northern landscape, further to the north of Kilkenny and in Carlow. Ritual and burial is a dominant feature of the Bronze Age in Kilkenny and Carlow as indicated by the presence of flat cemeteries, burial cairns, ringditches, mounds, barrows and hillforts throughout these counties. Freestone Hill situated in Coolgrange, Co. Kilkenny, in the centre of the present landscape is just one example of these sites. Along the lower part of the Nore Valley, and concentrated in the Foulksrath and Jenkinstown areas, the landscape is dominated by barrows (in this case more specifically ringditches). The contrasting locations of these site types most probably relate to differential landscape exploitation by the same communities with some activities, possibly associated with the seasonal use of upland pasture, confined to higher terrain and settlement and funerary activity taking place in the more sheltered lowlands.

The significant number of burnt mound sites discovered due to the N9/N10 excavations, combined with the previously known examples in the RMP reinforces the concept that Bronze Age activity in Kilkenny and Carlow was considerable. A total of 36 sites with evidence for burnt mound activity were uncovered during the N9/N10 excavations, with an additional example discovered, and preserved outside, the roadtake. The burnt mounds are focussed in the upland area, especially along the river and stream valleys, such as at Clashduff, Coan West and Muckalee on the Dinin and Douglas Rivers, and in the upland hinterland of Freestone Hill.

The distribution of the prehistoric evidence shows that the Rivers Nore and Barrow provided a focus for Bronze Age settlement. The patterning of human activity in the region indicates that these were also the principal route-ways in prehistory; both were navigable by small craft but they, and the major tributaries of the Nore– the Dinin and King's Rivers – were also conspicuous landscape features that facilitated accurate navigation through this landscape. The Barrow and Nore also provided access to wider networks beyond the region.

The Central Landscape: Domestic Settlement

The characteristics of the prehistoric settlement landscape change from the peripheral activity located alongside the River Nore floodplains of the southern landscape to a slightly more permanent and defined settlement in the central landscape. The direct domestic settlement evidence, albeit limited, indicates the presence of a Bronze Age community in the locality. As the evidence for peripheral settlement activity including burnt mounds and funeral monuments was also limited, this area may have been dominated by small-scale settlement. The area contained soils amenable to farming and perhaps the area was cultivated, rather than settled.

The majority of the evidence was centred upon the Danesfort area which may consequently represent an important focus of activity, perhaps with considerable longevity.

Danesfort 5 was located upslope from a burnt mound site in Croan (unexcavated and not a Recorded Monument) and contained three post-built, circular houses with south-east-facing porches and internal hearths. Structure 1 overlay the remains of postholes, stakeholes and a possible fireplace, which may have represented an earlier structure or shelter. The morphology of these houses, with their regularly spaced postholes, would indicate a middle-late Bronze Age date, as also suggested by middle to late Bronze Age pottery. At Dunbell Big 2 there was a shallow, circular gully with internal postholes, an east-facing entrance (representing a possible structure) and a pit containing middle Bronze Age domestic pottery. A small lithic assemblage, including a convex end scraper, flake and debitage, came from Holdenstown 1. Holdenstown 3 also produced sherds from two fine middle Bronze Age domestic vessels.

A major prehistoric complex was identified at Templemartin 5 where settlement, industry and burial continued episodically until the late Bronze Age. The site was situated on the top of a northwest-southeast ridge and overlooked the surrounding countryside of rolling pasture land. At this site a series of six ringditches were recorded, two of which extended beyond the area of excavation and are therefore preserved *in situ*. One of the ringditches (5.2m external diameter) was penannular with a gap of 0.8m in the south-east and an almost-centrally located hearth. The presence of a hearth, with evidence for *in situ* burning, suggests that this 'ringditch' was the foundation trench for the wall of a structure, rather than a funerary monument. It was post-dated by another ringditch which cut through its western side. Other peripheral and possible settlement activity, in the form of pits, Bronze Age pottery and postholes, was noted at Danesfort 7, 8 and 9, as well as Ennisnag 1.

The Central Landscape; Funerary and Ritual activity

The previously known Bronze Age burial record of this landscape included two prehistoric burials excavated by Cassidy in 1991 at Dunbell Big (Cassidy 1991a and b). There at Ringfort No. 5, a pit containing a badly damaged Bronze Age food vessel was found and the second burial was discovered within a cist. The cist fill was mainly a reddish loam and on its side at its base was an intact food vessel containing and surrounded by burnt bone (*ibid*.). Other significant funerary activity includes the single grave sites of Garrincreen to the west and Grange Lower (Waddell 1990, 103) to the south-east. Bowl burials have also been discovered at Wells, Slyguff and Kilgraney, Co. Carlow, sites that border the eastern margins of this study area.

Ten sites produced evidence for funerary activity in this section of the N9/N10, primarily in the form of ringditches: Danesfort 1, 12 and 13, Kilree 4, Holdenstown 1 and Templemartin 5. However, the Danesfort 12 and 13 ringditches have produced Iron Age dates. The Danesfort 1 ringditch had cremated bone in the middle of its three fills, at opposite sides of the ditch. At Danesfort 6 a deep, flat-bottomed, straight-sided circular pit containing sherds of at least three vase urns and a cremation pit with a marker post were identified. At Danesfort 7 a middle-late Bronze Age flat cemetery was characterised by eight circular pits associated with token cremations. There are also some previously recorded finds from the Danesfort area, in particular a lidded vase that was found in the 19th century. Graves (1860) refers to the discovery of three 'sepulchral urns' found in Danesfort by Lady Elizabeth and Captain Wemyss, in the proceedings of the September meeting of the Kilkenny and South East of Ireland Archaeological Society in 1860; two of these are described as rare and highly ornamented. The exact location of these finds has been questioned

but excavated evidence of Bronze Age funerary activity in this townland, as a result of the N9/N10, supports the authenticity of the discovery.

An isolated cremation pit at Kilree 1 was capped with a saddle quern. At Kilree 4 a double ringditch was located on the edge of the Nore floodplain overlooking a potential crossing point. The fills of both the external and internal ringditch contained charcoal, animal bone and burnt bone. A possible cremation pit was identified and contained a single piece of copper in the middle fill; charcoal, burnt bone and burnt clay were also found in the fills. A funerary complex was identified at Holdenstown 1 and consisted of three ringditches, one of which was badly truncated. The primary phase of one of the small ringditches contained cremated material; this ringditch was later re-used to enclose a small inhumation cemetery. The activity at Holdenstown 1 fits into a wider landscape as the adjacent site of Dunbell Big 2 contained evidence for Bronze Age settlement and Holdenstown 2 also had evidence of prehistoric activity.

Two pits from the multi–phased site Templemartin 5 contained cremations in Grooved Ware vessels. In addition there were six ringditches, at least five of which were later in date than the two cremation pits. These ringditches formed the main concentration of activity probably during the Bronze Age and focused the funerary action on a rise to the north-east of the site, at the edge of a north-south gravel ridge overlooked by Freestone Hill. One was penannular, and its entrance faced the south-east, typical of the Bronze Age period and it pre-dated the other ringditches. It is possible that this represents the slot trench of a structure rather than a funerary monument. Fifteen cremation pits were identified on the site: two of these dated to the late Neolithic. The main focal point of the cemetery was also the highest point of the site and was on the edge of a ridge overlooking the surrounding countryside, and two of the ringditches and a concentration of Bronze Age cremation pits were located here. Five of the cremation pits had evidence for marker posts/stones and two others had been formally capped or sealed with sterile material. The amount of bone contained in any of the above cremations could only be considered as a token deposit of any individual. Two cremations, Cremations 9 and 11, display evidence of structured deposition and have larger chunks of bone than the others, suggesting these two might be slightly earlier, perhaps middle Bronze Age in date. The rest of the cremations had only very small pieces of bone which suggests that they were more intensely processed: perhaps more indicative of a late Bronze Age date. Possible pyre remains were represented by deposits located to the south of the main concentration of cremations

The Central Landscape; Burnt mounds

Only seven sites with evidence of burnt mound activity were uncovered within the central landscape. Two of the three Danesfort sites were located close together (Danesfort 10 and 11) and a further two sites were also located in proximity to each other (Rathgarvan or Clifden 1 and Maddockstown 1). Burnt mound activity discovered at Danesfort 2 was situated on the southern slopes of a small valley near the Ennisnag tributary of the King's River in the southern end of this landscape. Holdenstown 4 was not located close to any other burnt mounds however it was situated on flat terrain with good visibility southwards to Holdenstown 3. Rathgarvan or Clifden 1 and Maddockstown 1 were located on flat, wet grassland. Rathgarvan or Clifden 1 had evidence for natural springs and a waterhole which would have supplied water on-site. The River Nore meanders NNW–SSE to the south-east of both these sites. Burnt mound activity was also excavated at Leggetsrath East 1 which was located on the eastern edge of the floodplain of a small river/stream. This site was also on marginal land but was surrounded to the north and south by well-drained pastureland. Other burnt mound sites recorded in the vicinity include those at

Bishopslough West (KK024-037, 38), Maddockstown (KK020-052), Rathcash West (KK020-077, 78) and Cloghoge (KK020-039, 075, 76).

The Central Landscape; Route-ways and Communications
It is evident that the Nore, Dinin (and its tributary the Douglas) provided the landscape links within the extensive late Bronze Age settlement distribution to the north of Kilkenny extending from the lowlands up into the uplands of the Castlecomer Plateau. However, beyond this the Nore also leads to the lowland zone in mid-Laois with its core of prehistoric activity, as well as to the sources of the Suir and contact with other major settlement cores at, for example, Cahir and Cashel. To the south the King's River, rising in the Slieveardagh Hills, also provides access to the Suir Valley.
While it is clear that the rivers and streams are a major feature of the settlement networks, the distribution of prehistoric activity shows that other route–ways were functioning at both a local and regional scale. Some of these were already important in the early Neolithic while others became prominent only in the Bronze Age. Among the most significant of these are those on the eastern side of the Barrow in the Goresbridge area that formed the core of a settlement zone that in the Bronze Age extended westwards across the river into the Paulstown area of Co. Kilkenny. The immediate environs of Kilkenny City also appear in the Bronze Age as a settlement focus. Additionally the major focal site on Freestone Hill has been highlighted by the discovery of new sites on the lowlands immediately to the south around Rathcash.

The Central Landscape; Conclusions
While the central part of the N9/N10 Scheme through the fertile Kilkenny lowlands has produced some Bronze Age archaeology, particularly in the Danesfort and Ennisnag areas, this low level of activity reflects the known site distribution patterns. This picture provides an interesting contrast with the dense settlement in the early medieval and medieval periods but it is probably significant that the two nodes of Bronze Age settlement identified are in slightly more elevated terrain overlooking the Nore and King's Rivers. More significant in this study area is the rich array of Bronze Age funerary activity uncovered along this portion of the N9/N10 route.

3.2.2 The General Iron Age Landscape of the Scheme – compiled by Michelle Brick

As with wider settlement patterns in Ireland, direct evidence for Iron Age (800BC–AD500) domestic habitation was not identified, although several furnaces, kilns and ringditches date to this period and attest to an Iron Age presence in the area. It is possible that some smaller Iron Age ringditches were in fact structural, rather than funerary. Evidence for Iron Age domestic settlement activity remains indirect and peripheral in Kilkenny and Carlow, and in Ireland as a whole.

The Southern Landscape
Direct evidence of Iron Age activity in the southern landscape of the N9/N10 Phase 4 is limited. There is a marked absence of hillforts from south Kilkenny but this does not necessarily infer absence of settlement (Gibbons 1990, 20). A small number of features produced Iron Age dates in this landscape as a result of the N9/N10 Phase 4 excavations. A posthole dating to this period (165BC–AD16; UBA 10984) was excavated at Baysrath 2, and belongs to a possible structure indicating potential domestic settlement in the region. At Tinvaun 2 a possible hut structure was identified which consisted of four truncated slot-trench-like pits, a posthole and a shallow, roughly central pit in the interior of the area. Dates returned for this possible structure have indicated that it was in use during the Iron Age period (AD5–124; UBA 12169). There was also some metalworking activity on site and this structure may have been associated with it. Further to this, a posthole and a hearth excavated at Danganbeg 1 also dated to the Iron Age (762–416BC and 41BC–AD 55; UBA 14025

and UBA 14024 respectively). No funerary features belonging to the Iron Age were excavated as part of the present Phase 4 in the southern landscape. However, some metal working activity in the form of slag pits/furnaces and funerary activity in the form of a ringditch has been excavated at Baysrath directly to the south of the present excavations and have been dated to the Iron Age period (Channing 2007). Three circular structures excavated at this site have also been dated to this period (AD60–131, AD25–128 and 88BC–AD53; UBA 10684, UBA 10685 and UBA 10691 respectively) indicating a strong Iron Age presence in this area (*ibid.).* A ditch dating to the Iron Age (39BC–AD74; UBA 10993) was excavated at Tinvaun 1; burnt mound activity associated with the Bronze Age was also excavated at this site and this ditch relates to a later phase of activity at the site. At Knockadrina 2 (51BC–AD78; UBA 12178) an Iron Age furnace was excavated and at Stonecarthy West 1 a possible trough also yielded an Iron Age date (771–539BC; UBA 12174), however other features associated with a burnt mound on the site returned Bronze Age dates.

The Central Landscape

As with the southern landscape there is no direct evidence for Iron Age settlement although there are many early medieval RMP sites in this area, the majority of which are ringforts and enclosure sites, such as the ringforts recorded at Woolengrange (KK024-079 and KK024-082) and the enclosures at Carran (KK024-021001, 2) . Iron Age activity in the county is represented by the Hillfort at Freestone Hill where a defensive hillfort and inner enclosure (KK020-018002) was built encircling the hill-top (Gibbons 1990, 18), re-using the site of an earlier burial cairn (KK020-018001). The site was then re-occupied *c.* AD300 (Raftery 1969). Another possible Iron Age hillfort is located at Cotterallsrath located to the west of the southern end of this central landscape. Directly to the north-east of this site and located four miles south of Kilkenny City are the remains of a linear earthwork at Grevine West (Gibbons 1990, 20), also indicating an Iron Age presence in the region. Additionally, excavations were carried out at two ringforts in the townland of Dunbell; Dunbell 6 in 1972 and Dunbell 5 (KK024-010) in 1990 (Foley 1974; 2006; Cassidy 1991). The ringfort settlement at Dunbell 5 in particular produced dates from the Bronze Age to the eighth–10th centuries AD including evidence of Iron Age occupation.

Two clusters of Iron Age activity were noted from the N9/N10 excavations within the central landscape, at Danesfort and at Kilree and Holdenstown. These sites exhibited evidence for funerary activity and no evidence for domestic settlement was uncovered within this central landscape. At Danesfort 13 the primary fill of a ringditch returned a radiocarbon date of 503–384BC (UBA 10999) and was considered to be associated with two similar ringditches excavated at the neighbouring site of Danesfort 12. A fine glass bead found within a pit at Danesfort 13 also indicated that Iron Age activity continued in the Danesfort area, confirming the longevity of Danesfort as a focus for prehistoric funerary activity and although the area continued to be occupied in the early medieval period the focus then shifted towards settlement. Iron Age activity was excavated at Kilree 4, a site which contained a probable token cremation burial within a double ringditch (171BC–AD4), which was located on flat, gravely ground that overlooked the River Nore and its floodplain. At Holdenstown 1, three ringditches of possible Iron Age date were excavated. The largest was penannular in plan and had an undug, east-facing causeway. The two best preserved ringditches had evidence of re-cutting which may have been a symbolic act of redefining the burial monument. The primary phase has been interpreted as representing funerary feasting while the secondary phase consisted of burial possibly dating to the late Iron Age. Both ringditches were subsequently re-cut and were backfilled with material which included burnt bone, charcoal, seeds, and animal bone. The quantity of cremated bone is indicative of token cremation mixed with pyre debris. Although Ringditch 3 was heavily truncated, it also contained evidence of

token cremation. The evidence thus far is indicative of burial potentially in the Iron Age and the site was later re-used as an inhumation cemetery known as a ferta, during the early medieval period. A shallow, northeast-southwest linear ditch spanned the entire width of the site at Holdenstown 1. The precise function of this ditch is unknown; however, its length and the fact that no return was identified suggest that it may have been a boundary ditch. It is possible that it is broadly contemporary with the burials within Ringditch 2, as these burials followed the same alignment of this ditch and there was no truncation. The ditch has been dated to the Iron Age period (168–3BC; UBA 13108). It is then possible that the burials associated with Ringditch 2 and with this ditch were placed either inside or outside the boundary; both of which suggests a significant symbolism.

In Danesfort 12 a furnace had evidence of reddened sides and a burnt and blackened rim but the base was not scorched. The fills contained large quantities of charcoal and slag. It is possible that this activity was contemporary with the Iron Age funerary activity recorded on site. Metallurgical activity was also recorded at Danesfort 13 and included two smelting furnace pits, a metalled surface, three waste pits, and an occupation deposit. This activity may also have been contemporary with Iron Age funerary activity also recorded on site. At the multi-period site of Danesfort 5 a metalworking area was identified and included several pits and deposits. Of these pits one returned an Iron Age date of 786–543BC (UBA12192). A kiln excavated at Danesfort 5 also produced Iron Age dates ranging between 169BC and AD50, (UBA 12189–91). Other features at this site were dated to the late Bronze Age period and the Iron Age activity may indicate a continuity of settlement at the site. At Holdenstown 2 a total of five kilns were identified with one dating to AD21–203 (UBA 13111). Both Danesfort 2 and Holdenstown 4 returned Iron Age dates from features associated with burnt mound activity (744–407BC, UBA 11000; 765–420BC; UBA 13114).

The Northern Landscape

The northern landscape of the N9/N10 Phase 4 also contained Iron Age evidence. The aforementioned Freestone Hill (KK020-018) is located directly to the south of this landscape and two additional hillforts can also be located in the north of the county. Clomantagh (KK008-124002) overlooks Johnstown in north-west Kilkenny and similar to Freestone Hill, the site was originally used in the Bronze Age as a funerary complex (Gibbons 1990, 18). A linear earthwork has also been recorded at Woodsgift (Gibbons 1990, 20) and is located directly to the south of this site. The other possible hillfort in the region is recorded at Tooremore or Carndubh to the east (*ibid.*). This hillfort which is not shown on the Ordnance Survey maps, is situated on Corrandhu Hill, two miles east of Ballyragget, straddling the townland boundary between Toore More and Donaghmore (Condit and Gibbons 1988, 49). Further to these, located along the Kilkenny-Carlow border is a linear earthwork known as the Rathduff Trench (KK026-006). It ran for over three miles from the River Barrow at Duninga, in a north westerly direction to the foothills of the Castlecomer plateau above Shankill (Gibbons 1990, 20). A portion of this linear earthwork was excavated at Shankill 1 and consisted of a U shaped bank with a ditch.

Excavations in the northern landscape of the N9/N10 produced a small amount of domestic settlement evidence. The fill of a stakehole associated with a possible structure at Moanduff 1 produced an Iron Age date of AD215–376 (UBA 13124); the site also had evidence of occupation in the Bronze Age which implies that the site may have been used throughout both periods. Radiocarbon dating for Rathcash East 1 also indicates use of the site during the Iron Age period. The excavated features included a possible structure that may be inferred as a ringditch as a result of the middle Iron Age date retrieved from its fill (38BC–AD73; UBA 12221) and an

associated rubbish pit (37BC–AD123; UBA 12220). Excavations in the northern landscape of the N9/N10 did not produce any evidence for Iron Age funerary activity. However ephemeral Iron Age activity was discovered at a number of sites in the form of metal working and burnt mound activity. At Rathcash East 3 a large keyhole-shaped furnace that dated to the Iron Age (160BC–AD0; UBA 14032), aligned northeast–southwest was excavated along with six post-pits that may have supported a shelter around the west side of the furnace. The post - pits had a rectangular arrangement, being open on the east (furnace) side. The furnace had 18 fills, with the majority containing significant amounts of charcoal and frequent slag. Some of the post-pits contained charcoal, burnt clay and slag. One of the post-pits has been dated to 362–200BC (UBA 14033). A kiln and pit excavated at Cranavonane 3 have been dated to 104BC–AD50 (UBA 12251) and 341–54BC (UBA 12252) respectively. In addition to these features a pit excavated at Jordanstown 1 returned a date of 382–206BC (UBA 12233) and a pit at the multi-period site of Moanduff 2 retrieved a date of AD140–385 (UBA 12260). Features associated with burnt mound activity dating to this period were excavated at Rathcash 2 where the fill of a trough dated to 344–55BC (UBA 12219) and at Kellymount 2, where a waterhole has been dated to AD236–380 (UBA 14041). The fill of a trough at Kellymount 3 also returned a date of 751–409BC (UBA 14043).

Conclusion

The presence of the Iron Age ringditches along the N9/N10 Phase 4 and the number of sites displaying industrial activity dating to this period confirm the presence of an Iron Age community in the region. The possible structure at Rathcash East 1 may also be indicative of an Iron Age settlement site, further demonstrating Iron Age activity in the locality. The presence of three hillforts in north Kilkenny suggests that it was an area of considerable importance during this period (Condit and Gibbons 1988, 52). The lack of excavated domestic settlements along the route is not indicative of a sparse population at the time rather they were not located along the corridor of the N9/N10 route-way and have yet to be discovered.

3.2.3 The Site Specific Archaeological Landscape of Danesfort 2

There are no recorded monuments in the immediate vicinity of Danesfort 2. However a ringwork (KK023-080) and a designed landscape (KK023-080001) are located *c.* 250m to the south-east and a ringfort (KK023-079) is recorded *c.* 600m to the south. Three ringforts (KK023-076–78) are recorded to the south-west, 400m–750m away and further to the south-west, *c.* 900m away, a holy well (KK023-075) is recorded. A church and graveyard complex (KK023-081) is also recorded *c.* 700m to the north of Danesfort 2.

At Danesfort 2 burnt mound activity and associated features dating to the early Bronze Age and early/middle Iron Age periods was excavated. A number of sites were excavated in the vicinity of Danesfort 2, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. To the east, *c.* 300m away, at Danesfort 1, a ringditch containing cremated bone within its fills has been dated to the middle Iron Age. Also to the ENE, located *c.* 250m away, excavations were carried out at Danesfort 3, however no features of archaeological significance were uncovered here. To the north-east of Danesfort 2, *c.* 650m away, a hearth and possible structure were excavated at Croan 1, however dates returned from a fill of the hearth indicate a post medieval date.

There were a number of archaeological excavations to the immediate south of Danesfort 2, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. At Danesfort 13, located *c.* 350m to the south-west Bronze/Iron Age and early medieval activity was recorded. The Bronze Age archaeology primarily consisted of a ringditch

and a cremation pit. The early medieval phase consisted of a field boundary ditch and a metalworking area that included a charcoal-producing kiln, a furnace and a possible forging area. Further to the south-west, *c*. 550m away, multiple periods of activity were excavated at Danesfort 12, consisting of a possible late Neolithic temporary structure, an early Bronze Age pit circle, a middle Bronze Age industrial complex and two late Bronze/Iron Age ringditches and cremation pits. Also excavated was an iron working furnace probably dating to the early medieval period and a rectangular ditch enclosure.

3.3 Typological Background of 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 agricultural activity and are no longer visible on the field surface. Nevertheless even disturbed spreads of burnt mound material often preserves the underlying associated features, such as troughs, pits and gullies, intact.

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

Burnt mound sites are principally Bronze Age monuments and reach their pinnacle of use in the middle/late Bronze Age (Brindley *et al*. 1989–90; Corlett 1997). Earlier sites, such as Enniscoffey Co. Westmeath (Grogan *et al*. 2007, 96), have been dated to the Neolithic and later sites, such as Peter Street, Co. Waterford (Walsh 1990, 47), have been dated to the medieval period. Thus although burnt mound sites generally form a 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 mounds sites were used as cooking sites. O'Kelly (1954) and Lawless (1990) have demonstrated how joints of meat could be efficiently cooked in trough of boiling water. The use of burnt mound sites for bathing or as saunas has been suggested as an alternative function (Lucas 1965, Barfield and Hodder 1987, O' Drisceoil 1988). This proposal is largely influenced by references in the early Irish literature to sites of a similar character and is very difficult to prove, or disprove. Others, such as Jeffrey (1991), argue that they may have been centres of textile production for the fulling or

dyeing of cloth. More recent demonstrations by Quinn and Moore (2007) have shown that troughs could have been used for brewing, however, this theory has been criticised by leading Irish environmentalists due to the absence of cereal remains from most burnt mound sites (McClatchie *et al*. 2007).

3.4 Summary of the Excavation Results

The excavation has identified Burnt Mound activity at the site. This was represented by two main phases of occupation, one in the early Bronze Age and a second in the Early Iron Age, although there is an indication that there may be two separate phases of occupation in the Bronze Age.

The earliest dated feature on the site consisted of a sub-oval, bowl shaped trough (Trough 1) with an adjacent hearth identified by a smaller cut with scorched sides and base to the east of the trough. The trough was dated to the early Bronze Age. A shallow extension to the trough on the west side may have served as a step. A number of small pit features were identified in the general vicinity around the trough but it is not clear if these were directly related or indeed what their function was.

In the north of the site there was a very large and deep pit which may have functioned as a cistern or waterhole. The large pit was dated to the early Bronze Age but appears to be slightly later in date than Trough 1. It may therefore represent a second phase of Bronze Age activity on the site. The waterhole was not sealed by the main burnt mound spread however, there was evidence that some burnt mound material had been tipped into the feature, presumably after it was abandoned.

Located between the waterhole and Trough 1 were a series of features that represent the Iron Age phase of occupation of the site. These consisted of a large sub-oval trough (Trough 2) and adjacent large pit to the west. A number of irregular pits were identified to the east of the trough and may represent storage or perhaps evidence of land clearance in advance of the activity associated with the trough. Two structures were identified, the first of which (Structure A) consisted of a number of circular post-pits in a horseshoe shaped formation around the east of the trough. While the pits did not seem deep enough to support large (long) structural posts, the regular arrangement may have supported a platform erected on shorter posts around the trough. Some small stakeholes appear to have augmented the structure. At a distance of 5m to the east of Trough 2 was Structure B. This consisted of two parallel lines of 4 postholes. It is again interpreted that this may have been the location for a small platform (1.5m by 0.5m). Both Trough 2 and Structure B have been dated to the early Iron Age.

The overlying burnt mound deposits sealed almost all of the pits and troughs identified at the site with the notable exception of the large waterhole. This probably indicates that the water in the waterhole was not heated, and it was a storage facility. It was not possible to identify which deposits were associated with the Bronze Age activity and which were associated with the Iron Age as the mound deposits had been substantially levelled and disturbed over time. A number of modern drainage channels were also recorded, which truncated some of the features on the site.

3.5 Summary of the Specialist Analysis

A number of specialists provided analysis of samples and artefacts recovered from the site as part of the post-excavation works. This work in part formed the basis for the dating evidence for the site. The detailed reports on the results of all analysis are in Appendix 2

Lithics analysis
The lithic finds from the archaeological excavation at Danesfort 2, Co. Kilkenny are a flint convex end scraper, a quartz crystal scraper and two rubbing stones. The assemblage is morphologically and technologically diagnostic and dates to the first half of the Neolithic period. It represents a residual earlier phase at this site and is most likely waste which is possibly related to domestic activities. This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

Small finds analysis
A copper alloy stick pin (E3540:3:6) with an undifferentiated head was recovered from the burnt mount spread C3. According to O'Rahilly's typology of stick pins found in the Dublin area, stick pins with undifferentiated heads date from the start of the 12th century to the early decades of the 13th century (Scully, Appendix 2.2).

Charcoal and Wood Species identification
Charcoal was examined from four contexts at Danesfort 2, from two pits and two troughs. Five wood taxa were identified. The results are dominated by oak.

Analysis of Plant Remains
Two samples were examined from this site, C58 (S25) and C54 (S14). There were no charred seeds from these samples.

Animal Bone Analysis
A total of 51 animal bone and burnt bone fragments recovered from archaeological contexts C3 and C64 on Danesfort 2 were submitted for examination. The bone samples were assessed and identified to species where possible; a total of 9 bone fragments recovered were identified to the species of cow, pig, sheep and goat. Due to the size and fragmented nature of the individual bone pieces it was not possible to identify 42 fragments to species. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation. A series of early Neolithic lithic artefacts as well as a copper alloy medieval stick pin were also recovered within clay spread C3.

Petrographical analysis
A total of 19 samples were submitted for analysis from Danesfort 2. Coarse grained sandstone is typical of *fulacht fiadh* material. The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles is clear evidence of the use of secondary sources. Angular pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

Radiocarbon Dating
A total of four samples were sent for AMS radiocarbon dating.

A sample of Prunus sp. charcoal from fill C105 of Trough 2 (C128) was radiocarbon dated. The 2 sigma calibrated result was 744–407BC (UBA 11000).

A sample of Ash and Prunus sp. charcoal from Trough 1 fill C54 was radiocarbon dated. The 2 sigma calibrated result was 2464–2214BC (UBA 12186).

A sample of Pomoideae charcoal from waterhole (C109) fill C111 was radiocarbon dated. The 2 sigma calibrated result was 2116–1893BC (UBA 15553).

A sample of Cherry charcoal from posthole fill (Structure B) C122 was radiocarbon dated. The 2 sigma calibrated result was 806–595BC (UBA 15554).

4 DISCUSSION AND CONCLUSIONS

4.1 Discussion

The excavation at Danesfort 2 has identified burnt mound activity with two main phases of occupation dating to the early Bronze Age and the early Iron Age. The site was located in a shallow valley adjacent to a tributary of the King's River. The valley runs from west to east and is U-shaped and the site was located on the bottom of the south slope and on the valley floor (Figure 4; Plate 1). It is very probable that at some point in the past this valley was a conduit for water into the Ennisnag tributary, if only during period of flooding. The physical landscape of the site is one that is typically associated with burnt mound type sites. It is common that these sites are located in low-lying, often marginal areas, adjacent to water sources, rivers and streams. In this regard the identification of the activity at Danesfort 2 would not be unexpected as the land, while not wet all year round is prone to flooding in wet weather. During the course of the excavation the site became flooded following heavy rain. A modern drainage channel identified extending along the valley base provides further evidence of the seasonally wet nature of the immediate surrounding landscape.

There are no previously recorded monuments in the immediate vicinity that would date to the prehistoric period. The monuments in the vicinity consist of ringforts and enclosures which would all date to the early medieval period or later. In this regard the identification of the site, particularly one with two phases dating to the Bronze Age and Iron Age could be seen as unexpected. However, the excavations as part of the N9/N10 Phase 4 have identified many sites in the vicinity within Danesfort with dates ranging from the late Neolithic through to the medieval and post-medieval period. The excavations have identified a particular cluster of activity dating to the Bronze Age, with the nearby funerary site of Danesfort 12, to the southwest, producing contemporary early Bronze Age dates and the Bronze Age domestic settlement site at Danesfort 5 also containing a kiln which is contemporary with the Iron Age phase at Danesfort 2. What has become clear is that there has been intensive settlement of this landscape throughout prehistory and in this context it could have been anticipated that sites of similar type and date to Danesfort 2 would be identified.

The nature and form of burnt mound sites can be particularly varied, and there are many debates as to their function. At a basic level these sites are connected by the use of hot-stone technology - a process where stones are heated in a fire and then immersed into water, usually in the trough, so that the water is heated. More simple sites may have functioned as pot-boilers with the stones being placed directly into a pit rather than into a water-filled trough. It is generally accepted that this activity is more often than not associated with cooking, however other uses for the heated water and troughs are suggested based on evidence from recent excavations and research (see section 3.3).

The earliest phase of activity at Danesfort 2 was associated with early Bronze Age features that would be commonplace on most burnt mound sites – a trough, an adjacent hearth, outlying pits, occasional postholes and an overlying mound of heat shattered stones and blackened soil. Subsequent early Bronze Age activity however consisted of a very large waterhole or well, away from the earlier mound. It seems likely, both from the radiocarbon dates and their physical location, that the waterhole was not associated with the earliest burnt mound activity and may not have been related to any other features on the site.

In general terms, the presence of larger pits, such as the wells or cisterns identified on this site, would be less common, although a large number of burnt mound sites

from the N9/N10 Phase 4 exhibited similar features, from several stages in prehistory: - Kellymount 2 and 3, Stonecarthy West 1 and Maddockstown 1. These very large pits have been interpreted as water-holes that were potentially designed for bulk water storage, unlike the usual troughs which were the "vessel" in which water was heated rather than stored. On these other sites water storage pits were generally associated with a trough.

It is suggested that the waterholes may indicate a bathing site, where a large volume of water was required but which may not necessarily have had to be boiled (as for cooking), but merely heated for bathing. The function of the waterhole at Danesfort 2 is unclear as it was not contemporary with any of the other dated archaeology. The single shallow pit adjacent to it contained no burnt mound material which suggests that it was probably not a trough.

The Iron Age phase on the site was associated with features commonly found on burnt mound sites, in terms of a trough, pits and burnt mound spread. The trough (Trough 2) however, does appear to have been particularly deep and at 0.70m would have been approximately twice the depth of an average trough. Another deep, large pit adjacent to the west end of the trough was not as large as the Bronze Age waterhole. The function of this pit, and indeed Trough 2 is worthy of consideration; given their particular size and depth, and it would seem unlikely that they were designed for cooking. As outlined above, the volume of water in such deep features would be more easily heated (for bathing) than boiled (for cooking). Trough 2 was also surrounded by a series of possible post-pits (Structure A) which may have supported a platform around the trough or indeed a small enclosed or roofed structure over the trough. A second possibly small structure or platform (Structure B) 5m to the east consisted of parallel rows of four postholes. Structure A, Structure B and the trough were all on a similar east-west alignment which is not likely to be coincidental. The precise function of both structures or indeed the trough and pit is not known but collectively they represent a very formal arrangement that is not commonplace on burnt mound sites.

It has been a popular theory for some time that burnt mounds were used as bathing sites or saunas (Lucas 1965; Barfield and Hodder 1987; O'Drisceoil 1988) yet few sites had produced evidence of the necessary associated structures. Features interpreted as being associated with possible sweathouses or bathing have been identified at a number of burnt mound sites from different projects over the last number of years, largely as a result of the increase in the volume of development led excavations particularly from infrastructural projects similar to the N9/N10. A probable sweathouse was documented from the N25 Waterford Bypass at Rathpatrick (Eogan, 2007). Here the main feature was a 5m diameter sunken area with thirty six stake-holes identified around the periphery of the base representing a structure, as well as other features including a possible bath (trough) and an annexe to the main structure. It is interpreted that the stakeholes would have supported a hemispherical, tent-like structure. Eogan identified parallels in other cultures with particular similarities to the Rathpatrick structure in Native American sweatlodges. Clearly an enclosed structure is a key element to the functioning of a sweathouse or sauna, and it is interpreted that the slots and postholes at Blanchvillespark 3 on the N9/N10 Phase 4 could easily have been associated with such an enclosed area. Similarities between the two sites can also be seen by the sunken nature of the interior of the structure and the creation of an adjacent annex, although the shape and plan of the basic sweathouse structure is different in each site. Another similar site to Rathpatrick was identified at Ballykeoghan in south Kilkenny which was excavated as part of the N9/N10 Phase 2 (Laidlaw, 2008). Burrow or Glenanummer 3 Co Offaly, which was excavated as part of the N6 Kilbeggan to Athlone, also

consisted of a sunken circular area with stakeholes around the perimeter, with an elaborate system of additional troughs designed for water to flow from one to another (Coughlan, 2010). Two bone pendants recovered from the sweathouse area at this site represent personal ornaments that were probably lost while bathing.

The Ballykeoghan and Rathpatrick sites both date to the late Bronze Age/early Iron Age, while Burrow or Glenanummer was dated to the late Bronze Age, but all three are later in date than Blanchvillespark 3. Blanchvillespark is therefore quite an early example of possible sweathouse and bathing activity at a burnt mound site. A number of other possible sweathouses that date to the Iron Age have been identified as part of the N9/N10 Phase 4. At Stonecarthy West, an oval slot trench that could have supported structural walls enclosed a shallow hollow and may have acted as a sweathouse. The Kellymount sites showed evidence of structural activity both outside and inside the troughs with possible enclosing palisades and a variety troughs and pits, with some very large waterhole or well features. This slot trench from Stonecarthy West 1 and a trough from Kellymount 3 are contemporary with the Iron Age dates from Danesfort 2, which may be coincidental. It seems unlikely that water heated in the very large waterhole pits would have been boiled due to the volume of water that would have been involved so a bathing function is being considered. Kellymount 2 also produced a fragment of amber bead from the base of the waterhole, and similar to Burrow and Glenanummer this may represent a personal ornament lost while bathing. It is clear therefore that there is growing evidence that some burnt mound sites functioned as sweathouses or bathing places.

The Iron Age Phase at Danesfort 2 was as such potentially a bathing place. This is significant in terms of our wider understanding of the function of *fulachta fiadh*/burnt mounds. It has been identified that this site type can have many functions and often the precise nature of the activity at excavated burnt mounds is unclear. The results of excavations at Danesfort 2 indicate that these varying functions can potentially occur in tandem when we consider the simpler trough and pits from the early Bronze Age; the subsequent un related very large early Bronze Age waterhole/cistern and the Iron Age possible bathing site.

4.2 Conclusions

Danesfort 2 is an important site locally as it represents the first evidence of early Iron Age activity in the immediate area and it adds to the considerable evidence from the Bronze Age that has been gathered through excavations as part of the N9/N10 Phase 4. It is however also of regional significance based on the nature of the burnt mound activity identified at the site, in particular the Iron Age possible bathing site. A number of potential sweathouses and bathing sites have been confirmed from recent excavations of burnt mounds across the country and the results of the Danesfort 2 excavation will significantly add to the further study, analysis and understanding of the varied function and form of burnt mound sites.

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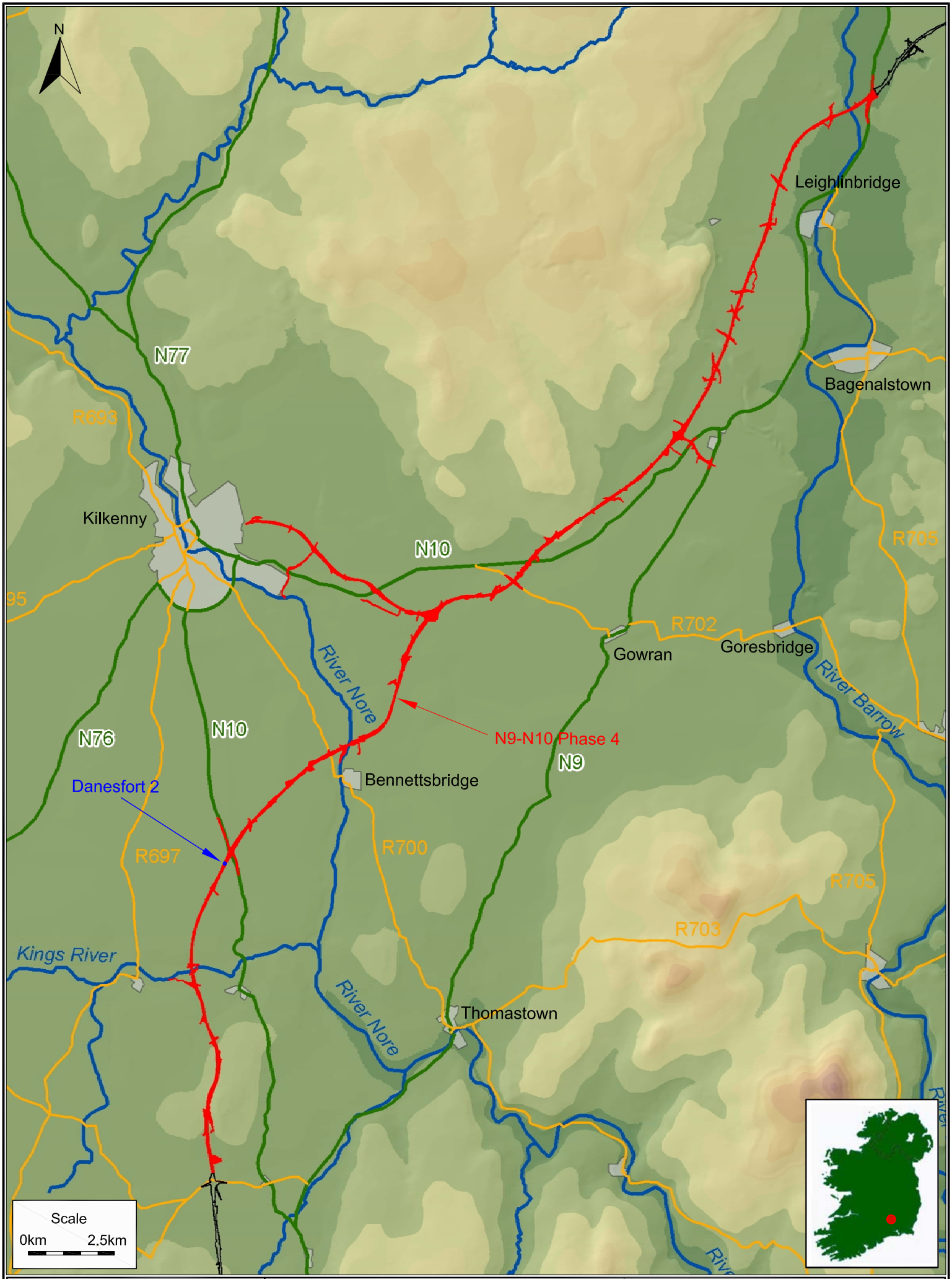

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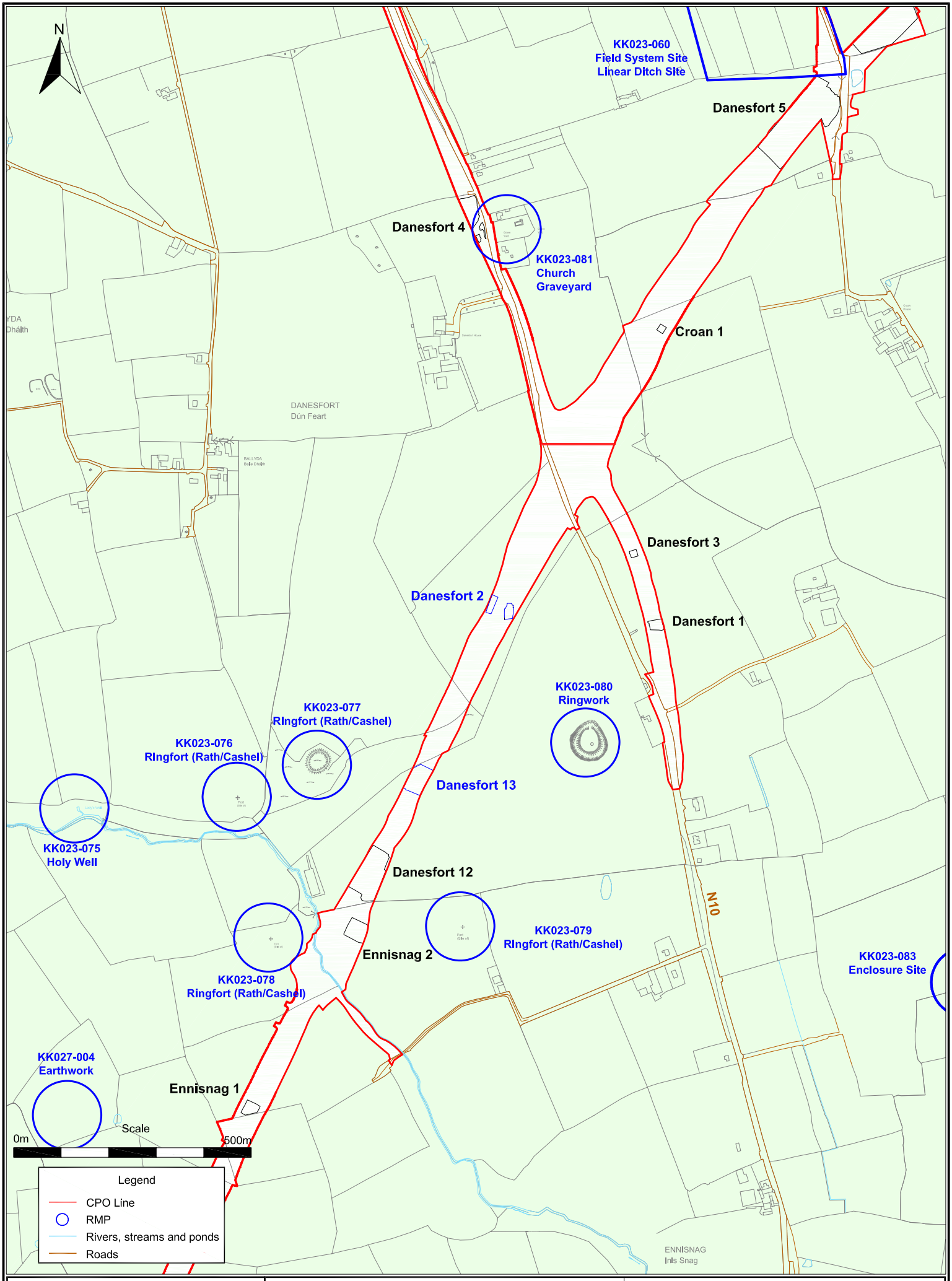

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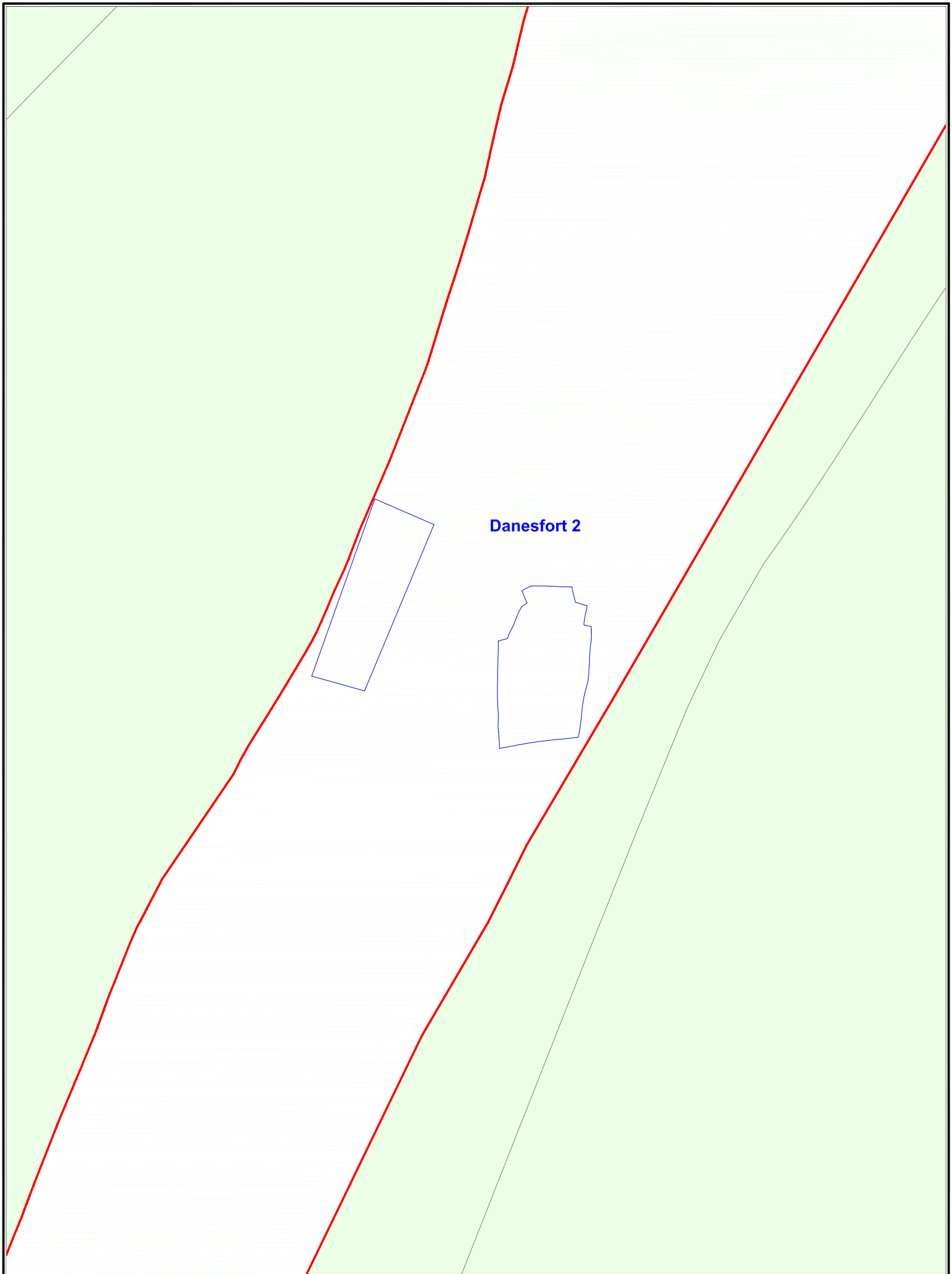

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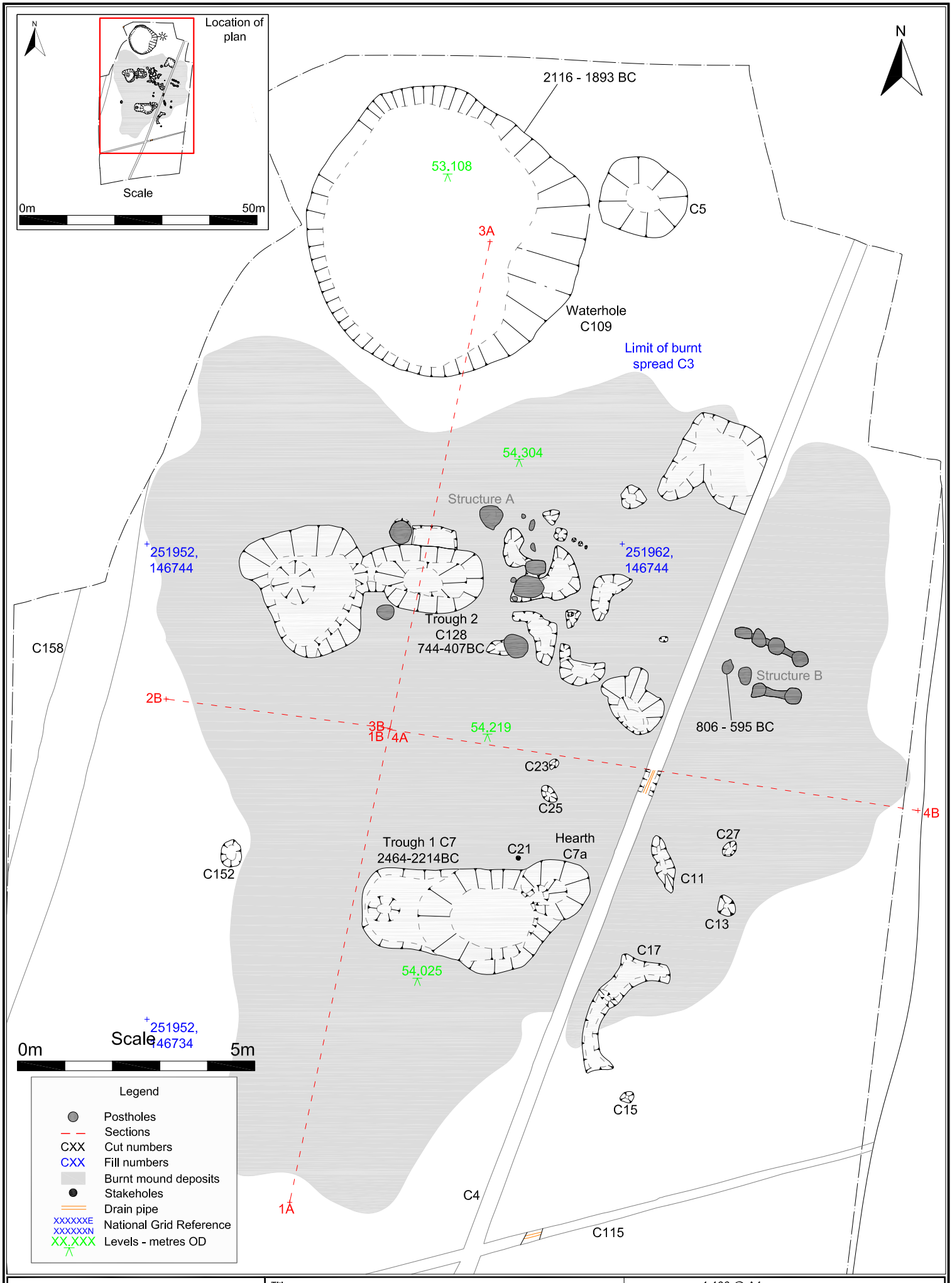

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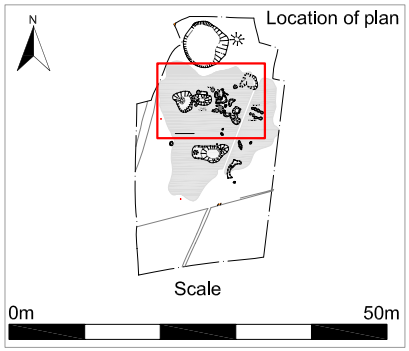

N

54.304

Structure A

54.954

Trough 2
744 - 407 BC

Structure B

806 - 595 BC

54.219

54.731

Scale
0m
2.5m

Legend

- First Phase of Activity
- Second Phase of Activity
- Drain Pipe
- Break of slope
- CXX — Cut numbers
- National Grid Reference
- XX.XXX — Levels - metres OD

IAC Irish Archaeological Consultancy

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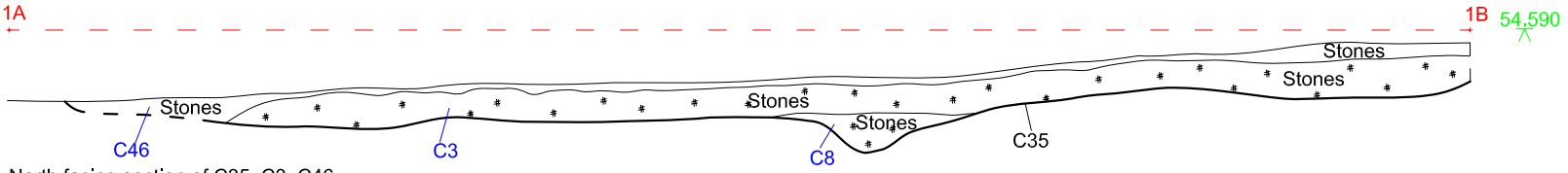
East facing section of C35, C3, C8, C46



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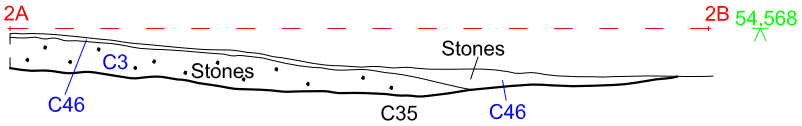

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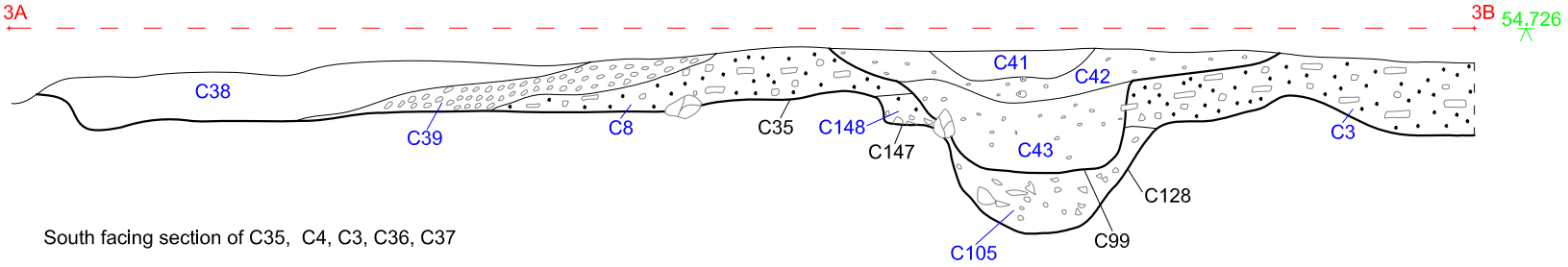

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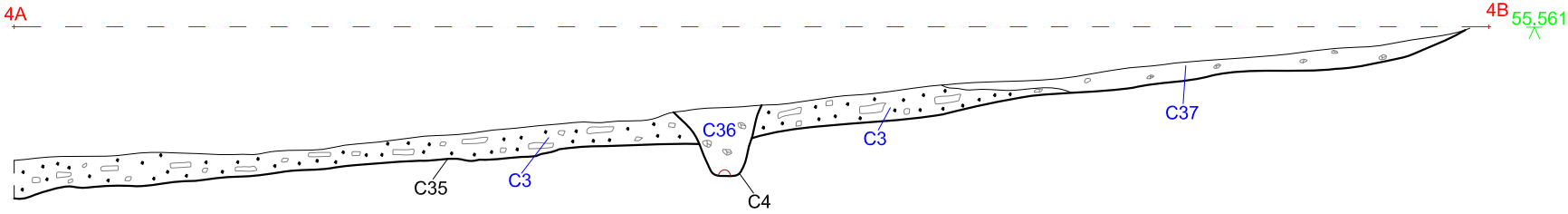

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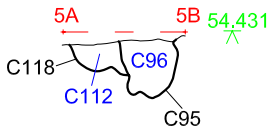


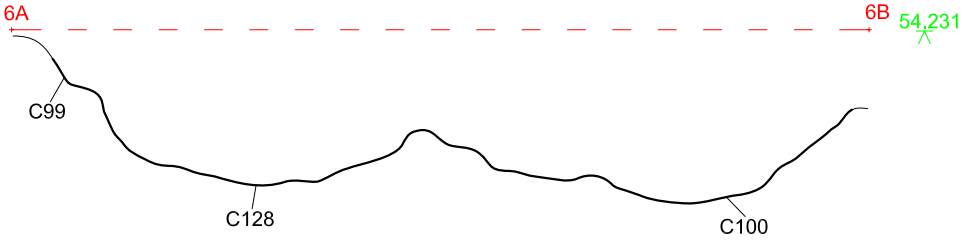
Scale

0m 2.5m

Legend

CXX	Cut Numbers
CXX	Fill Numbers
	Stone
	Charcoal
XX.XXX	Levels - metres OD

North facing profile of C99, C128, C100



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E3540:3:1

Scale

0mm 50mm

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PLATES

Plate 1: Burnt mound, pre-excavation, facing east

Plate 2: Waterhole C109, Trough 2 and Trough 1, mid-excavation, facing east

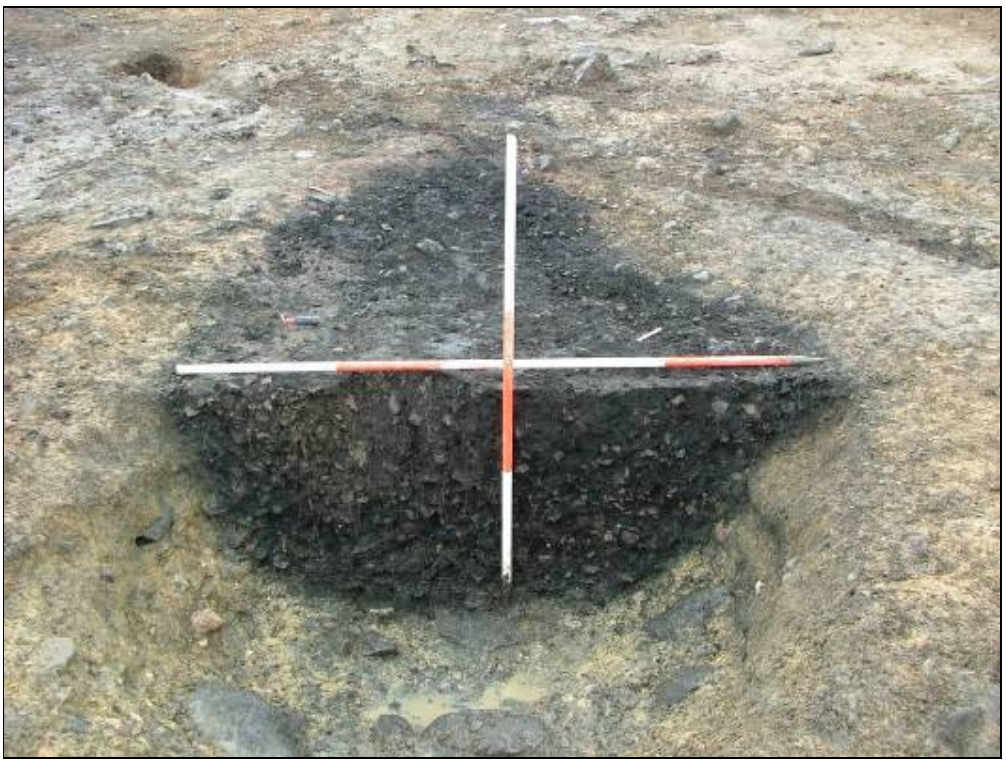

Plate 3: Trough 1, mid-excavation, facing east

Plate 4: Trough 1 and hearth C7a, mid-excavation, facing east

Plate 5: Trough 2, mid-excavation, facing east

Plate 6: Posthole C95 cutting pit C118, mid-excavation, facing north

Plate 7: Structure B, post-excavation, facing north west

Plate 8: Waterhole C109, mid-excavation, facing east

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
1	N/A				Topsoil	Dark brown sandy silty clay.		
2	N/A				Natural	Mid grey sandy gravely clay		
3	N/A	14.35	13.80	0.57	Spread	Mixed black and brown burnt clay with stones and charcoal, few finds including a bronze pin, hammer stone and flint.	C46	C2
4	Void							
5	N/A	1.60	1.50	0.11	Cut of pit	Oval in shape, W-E, imperceptible break of slope with concave sides leading to an irregular base.	C6	C2
6	C5	1.60	1.50	0.11	Fill of pit	Loosely compacted greyish black silt with no inclusions.	C1	C5
7	N/A	4.50	2.20	0.75	Cut of trough	Irregular in shape, W-E, gradual break of slope with irregular sides and a flat base.	C54	C2
7a	N/A	1.30	1.30	0.20	Hearth cut	Roughly circular hearth cut	C8	C2
8	C7/7a	4.50	1.30	0.30	Fill of trough	Loosely compact dark greyish black ashy silt with occasional stones and charcoal.	C3	C53
9	N/A	0.23	0.17	0.11	Natural depression		C10	C2
10	C9	0.23	0.17	0.11	Natural depression			
11	N/A	1.27	0.42	0.13	Cut of pit	NW-SE, elongate in shape, gradual break of slope with sloping sides leading to a concave base.	C12	C2
12	C11	1.27	0.42	0.13	Fill of pit	Loosely compact black silty sand with pebble inclusions.	C3	C11
13	N/A	0.48	0.35	0.07	Cut of pit	Sub-circular in shape, gradual break of slope with concave base.	C14	C2
14	C13	0.48	0.35	0.07	Fill of pit	Medium to loosely compacted, black sandy silt with burnt angular fulacht stones included and occ. charcoal	C3	C13
15	N/A	0.90	0.68	0.12	Cut of pit	Oval in shape, N-S, gradual break of slope with irregular sides and oval shape of base.	C16	C2
16	C15	0.90	0.68	0.12	Fill of pit	Loosely compact black sandy silt with stone and pebble inclusions.	C1	C15
17	N/A	2.80	0.49	0.22	Cut of channel like feature	Curvilinear roughly going SW-NE, gradual break of slope with concave base.	C18	C2
18	C17	2.80	0.49	0.22	Fill of channel like feature	Medium to tightly compacted dark brown silty sand with some small stones.	C3	C17
19	N/A	0.35	0.33	0.21	Cut of posthole	Circular in shape, sharp break of slope with vertical sides and flat shape	C20	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						of base.		
20	C19	0.35	0.33	0.21	Fill of posthole	Loosely compacted mid black silty clay with a light grey hue, stone and charcoal inclusions.	C3	C19
21	N/A	0.05	0.06	0.11	Cut of stakehole	Circular in shape, gradual break of slope with gradual sides and tapered round pointed base.	C22	C2
22	C21	0.06	0.08	0.11	Fill of stakehole	Mid greyish brown silty clay with small stones and some charcoal.	C3	C21
23	N/A	0.25	0.18	0.13	Cut of stakehole	Oval in shape, SW-NE, gradual break of slope with gradual sides and concave base.	C24	C2
24	C23	0.25	0.18	0.13	Fill of stakehole	Medium to loosely compacted, dark greyish brown silty sand with charcoal and small stones.	C1	C23
25	N/A	0.45	0.25	0.18	Cut of pit	Sub oval in shape, NW-SE, gradual break of slope with undercut edges leading to concave base.	C26	C2
26	C25	0.45	0.25	0.18	Fill of pit	Medium to loosely compacted mid greyish brown silty sand with big and small stones.	C1	C25
27	N/A	0.20	0.15	0.35	Cut of stakehole	Circular in shape, sharp break of slope with vertical sides and concave base.	C28	C2
28	C27	0.20	0.15	0.35	Fill of stakehole	Very loosely compacted black soil with small stones and roots.	C3	C27
29	N/A	0.33	0.31	0.14	Cut of posthole	Circular in shape, sharp break of slope- top and gradual break of slope-base with vertical sides leading to a concave base.	C30	C2
30	C29	0.33	0.31	0.14	Fill of posthole	Loosely compacted black soil with greyish hue, charcoal flecks and some pebble inclusions.	C3	C29
31	N/A	0.42	0.28	0.05	Non-archaeological			
32	C31	0.42	0.28	0.05	Non-archaeological			
33	C7	1.50	0.75	0.35	Fill of trough	Loosely compacted light brownish grey silt with lots of small irregular sharp edged stones.	C3	C53
34		1.60	1.20	0.10	Natural	Firmly compacted reddish orange clay with no inclusions.		
35-36	N/A					Irregular in shape		
37	N/A	4.00	2.00	0.15	Spread	Loosely compact dark brown silty clay with heat shattered stones	C1	C3
38	N/A	4.20	1.50	0.35	Spread	Loosely compact light brown silty clay with heat shattered stones	C1	C3
39	N/A	2.30	1.20	0.25	Spread	Loosely compact grey brown silty clay with heat shattered stones	C1	C3
40	Void							
41-43	C99	1.30	1.20	0.20	Fills of Test trench		C1	C42
44	C59	0.35	0.37	0.06	Fill of pit	Loosely compacted mid greyish brown fine sand with a small amount of charcoal.	C60	C59

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
45	N/A							
46	N/A	35	9	0.30	Spread	Mid brown clay with heat shattered stones and charcoal	C1	C3
47	N/A							
48	N/A	0.35	0.30	0.39	Cut of posthole	Circular in shape, sharp break of slope- top, gradual break of slope- base with vertical sides and concave shape of base.	C49	C2
49	C48	0.35	0.30	0.39	Fill of posthole	Very loosely compacted black silt with greyish hue, large pieces of charcoal and stones included.	C3	C48
50	N/A	0.37	0.29	0.25	Cut of posthole	Circular in shape, sharp break of slope- top and base with vertical sides and flat shape of base, no inclusions.	C51	C2
51	C50	0.24	0.20	0.11	Fill of posthole	Loosely compacted light black silty clay with grey hue, flecks of charcoal and some stones included.	C3	C50
52	C109	1.35	0.8	0.30	Fill of pit	Tightly compacted light brown clay with small stones within.	C2	C106
53	C7	2.50	1.80	25.4	Fill of trough	Loosely compacted greyish black clayish silt with a few stones and charcoal included.	C8	C53
54	C7	1.80	1.60	0.25	Fill of trough	Firmly compacted blackish grey silty clay with charcoal.	C53	C7
55	N/A	0.36	0.32	0.36	Cut of posthole	Circular in shape, sharp break of slope top and base with vertical sides and flat base.	C56	C2
56	C55	0.36	0.32	0.36	Fill of posthole	Loosely compacted black silty clay with a light grey hue with charcoal and stone inclusions.	C3	C55
57	N/A	2.40	2.20	0.32	Cut of pit	Oval in shape, NE-SW, gradual break of slope with sloping sides and concave base.	C117	C2
58	C57	1.10	0.88	0.17	Fill of pit	Loosely compacted greyish black silty sand with stone and charcoal inclusions.	C3	C57
59	N/A	0.76	0.74	0.20	Cut of pit	Circular in shape, gradual break of slope with a concave base.	C44	C2
60	C59	0.70	0.66	0.15	Fill of pit	Loosely compacted black fine sand with heat shattered stone and charcoal.	C3	C44
61	N/A	0.95	0.65	0.16	Cut of pit	Circular in shape, sharp break of slope with gradual sides leading to cone like base.	C62	C2
62	C61	0.95	0.65	0.16	Fill of pit	Loosely compacted black fill, burnt soil=50%, burnt stone =50%.	C3	C61
63	N/A	1.35	1.05	0.37	Cut of pit	Irregular in shape, NE-SW, with sharp break of slope and sloping sides leading to concave base, no inclusions.	C64	C2
64	C63	1.35	1.05	0.37	Fill of pit	Loosely compacted black silty sand with stone and burnt bone inclusions.	C3	C63
65	N/A	0.75	0.45	0.19	Natural depression	Irregular in shape, break of slope taken out by digger with flat shape of base, no inclusions.	C66	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
66	C65	0.75	0.45	0.19	Natural depression	Moderately compacted black soil with no inclusions.	C1	C65
67-70	N/A							
71	N/A	0.32	0.28	0.12	Cut of pit	Circular in shape with gradual break of slope, sloping sides with concave base.	C72	C2
72	C71	0.32	0.28	0.12	Fill of pit	Loosely compacted black silty sand with stone and charcoal inclusions.	C3	C71
73-74	Void							
75	N/A	0.33	0.33	0.07	Spread	Greyish black silty sand spread	C76	C2
76	Void							
77	N/A	0.22	0.14	0.11	Cut of stakehole	Circular in shape, sharp break of slope- top with sharp sides to gradual on NE; break of slope- base is sharp on W side and gradual on E;	C78	C2
78	C77	0.22	0.14	0.11	Fill of stakehole	Loosely compacted black to dark brown soil with small stones included.	C3	C77
79	N/A	0.10	0.08	0.09	Cut of stakehole	Circular in shape, sharp break of slope top and base with vertical sides and circular base, no inclusions.	C80	C2
80	C79	0.10	0.08	0.09	Fill of stakehole	Loosely compacted black soil with one small stone.	C3	C79
81	N/A	1.00	0.50	0.25	Cut of pit	Irregularly shaped, sharp break of slope with gradual sides and a concave base.	C82	C2
82	C81	1.00	0.40	0.25	Fill of pit	Moderately compacted black sandy clay with small stones and roots throughout.	C3	C81
83	N/A	0.85	0.40	0.30	Cut of posthole	Circular in shape, sharp break of slope with sharp sides and a sharp base.	C84	C2
84	C83	0.85	0.40	0.30	Fill of posthole	Moderately compacted dark brown black sandy clay with small stones and roots throughout.	C3	C83
85-86	N/A							
87	N/A	0.13	0.11	0.22	Cut of stakehole	Circular in shape, sharp break of slope with vertical sides and concave base, no inclusions.	C88	C2
88	C87	0.13	0.11	0.22	Fill of stakehole	Loosely compacted greyish black silty clay with charcoal and stones within.	C3	C87
89	N/A	0.14	0.13	0.16	Cut of stakehole	Circular in shape with gradual break of slope, vertical sides and a concave base, no inclusions.	C90	C2
90	C89	0.14	0.13	0.16	Fill of stakehole	Loosely compacted grey silty sand with charcoal and stones.	C3	C89
91	N/A	0.80	0.40	0.13	Cut of pit	Curved linear, NW-SE, sharp break of slope with sharp and gradual (west part) sides leading to linear base.	C92	C2
92	C91	0.80	0.40	0.13	Fill of pit	Greyish black silty sand		
93	N/A	1.25	0.60	0.32	Cut of pit	L shaped feature, S-N, sharp break of slope- top with sloping to vertical	C94	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						sides, gradual break of slope-base and concave base.		
94	C93	1.25	0.60	0.32	Fill of pit	Loosely compacted black silty sand with occasional charcoal and pebbles.	C3	C93
95	N/A	0.40	0.38	0.40	Cut of posthole	Circular in shape, sharp break of slope- top and gradual break of slope-base with vertical sides and concave base, no inclusions.	C96	C2
96	C95	0.40	0.38	0.40	Fill of posthole	Loosely compacted black silty sand with pebbles and charcoal within.	C3	C95
97	N/A	0.60	0.50	0.21	Cut of pit	Circular in shape, sloping break of slope- top and gradual break of slope-base with sloping sides and an oval shape of base.	C123	C2
98	C97	0.24	0.20	0.09	Fill of pit	Loosely compacted brownish black silty clay with occasional stone and charcoal.	C1	C123
99	N/A	3.00	1.20	0.60	Cut of Test Trench	Rectangular in shape, E-W, gradual break of slope on north side with a sharp break of slope from south side, steep mid slightly convex sides, gradual break of slope- base leading to flat base.	C43	C3
100	N/A	2.90	2.70	0.70	Cut of pit	Irregular in shape (almost triangular), E-W, gradual northern break of slope- top, sharp south and western break of slope- top with sloped- N,S to steep- W, E sides, gradual break of slope- base leading to a flat base.	C151	C2
101	N/A	0.34	0.30	0.42	Cut of posthole	Circular, sharp break of slope- top, gradual break of slope- base with vertical sides and concave base.	C102	C2
102	C101	0.34	0.30	0.42	Fill of posthole	Loosely compacted black silt with a greyish hue, some charcoal flecks and angular stones.	C3	C101
103	N/A	0.17		0.06	Non-archaeological			
104	C103	0.17		0.06	Non-archaeological			
105	C128	2.25	1.50	0.74	Fill of pit	Loosely compacted dark greyish black sandy silt, small and large irregular stones and charcoal included.	C99	C128
106	C109	1.65	2.50	0.20	Fill of waterhole	Moderately compacted dark brown silty clay with a few small stones.	C3	C110
107	C109	2.10	3.50	0.30	Fill of waterhole	Loosely compacted dark brown wet clay with lots of small stones.	C106	C2
108	C109	0.60	2.00	0.65	Fill of waterhole	Loosely compacted medium brown silty clay with small stones.	C3	C109
109	N/A	6.00	6.00	0.75	Cut of waterhole	Circular in shape, sharp break of slope with sharp sides and sharp base, no inclusions.	C108	C2
110	C109	6.00	3.50	0.75	Fill of waterhole	Tightly compacted dark grey thick marl with lots of small stones.	C106	C2
111	C109	1.70	1.70	0.25	Fill of waterhole	Loosely compacted black clay soil with small stones and charcoal.	C3	C110
112	C118	0.71	0.67	0.20	Fill of pit	Loosely compacted dark brownish black silty sand with pebbles and occasional charcoal.	C3	C118
113-116	N/A							

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
117	C57	2.40	2.20	0.21	Fill of pit	Firmly compacted orange brown silty sand with stone and charcoal inclusions.	C58	C57
118	N/A	0.71	0.67	0.20	Cut of pit	V shaped feature, W-E, sharp break of slope top and gradual break of slope- base with vertical to sloping sides and concave base.	C112	C2
119	N/A	0.39	0.25	0.37	Cut of posthole	Oval in shape, W-E, with sharp break of slope top and base; sides- vertical from E and sloping inwards to W; flat shape of base.	C120	C2
120	C119	0.39	0.25	0.37	Fill of posthole	Loosely compacted black silty clay with light grey hue, charcoal flecks and stones included.	C3	C119
121	N/A	0.28	0.26	0.39	Cut of posthole	Circular in shape, gradual break of slope- base with vertical sides and concave base.	C122	C2
122	C121	0.28	0.26	0.39	Fill of posthole	Very loosely compacted black soil with greyish hue, large flecks of charcoal and angular stones included.	C3	C121
123	C97	0.60	0.50	0.15	Fill of pit	Loosely compacted mid brown sandy clay with large stone included.	C98	C97
124	N/A	0.16	0.16	0.34	Cut of stakehole	Circular in shape, gradual break of slope top and base with vertical sides and concave base.	C125	C2
125	C124	0.16	0.16	0.34	Fill of stakehole	Loosely compacted greyish black silty sand, no inclusions.	C3	C124
126	Void							
127	Void							
128	N/A	2.25	1.60	0.75	Cut of pit	Oval in shape, E-W, gradual break of slope top and base with slightly concave sides and concave base.	C105	C2
129	N/A	1.00	1.00	0.30	Cut of pit	Irregular in shape, E-W, gradual break of slope with sloping sides and flat base.	C64	C2
130	C129	1.00	1.00	0.30	Fill of pit	Loosely compacted black silty sand with a few stones.	C3	C129
131	N/A	0.55	0.55	0.28	Cut of pit	Rounded in shape, sharp break of slope- top and gradual break of slope- base with concave sides and flat shape of base.	C132	C2
132	C131	0.55	0.55	0.15	Fill of pit	Loosely compacted dark grey clayey silt with small irregular stone inclusions.	C3	C131
133-134	N/A							
135	N/A	1.25	0.72	0.40		Loose to moderately compacted grey brown gravely sandy soil with a few stones.		
136	N/A	1.25	0.72	0.40		Moderate compaction, mottled orange brown and black silty soil with no inclusions.		
137	N/A	0.12	0.10	0.09	Cut of stakehole	Circular in shape, sharp break of slope- top, gradual break of slope- base with steep sides and concave base.	C138	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
138	C137	0.12	0.10	0.09	Fill of stakehole	Loosely compacted black clayey silt with greyish hue, stones and charcoal included.	C3	C137
139	N/A	0.11	0.09	0.05	Cut of stakehole	Circular in shape, sharp break of slope- top, gradual break of slope- base with steep sides and concave base.	C3	C140
140	C139	0.11	0.09	0.05	Fill of stakehole	Loosely compacted black clayey silt with greyish hue, stones and charcoal included.	C3	C139
141	C142	0.39	0.30	0.20	Fill of stakehole	Loosely compacted greyish black silty sand with charcoal and stones included.	C3	C142
142	N/A	0.39	0.30	0.20	Cut of stakehole	Oval in shape, N-S, gradual break of slope top and base with a concave base and sloping sides	C141	C2
143	C144	0.50	0.40	0.47	Fill of posthole	Loosely compacted brownish black silty clay with occasional stone and charcoal.	C3	C144
144	N/A	0.50	0.40	0.47	Cut of posthole	Oval in shape, W-E, gradual break of slope top and base with vertical sides and concave base.	C143	C2
145	N/A	0.35	0.35	0.20	Cut of pit	Rounded in shape, gradual break of slope with concave sides and concave base.	C146	C2
146	C145	0.35	0.35	0.20	Fill of pit	Loosely compacted dark greyish black clayey silt with small irregular stones and charcoal.	C3	C145
147	N/A	0.90	0.40	0.25	Cut of pit	Rectangular E-W, sharp break of slope- top and base with vertical sides and a flat base.	C148	C2
148	C147	0.90	0.40	0.25	Fill of pit	Loosely compacted dark greyish black clayey silt with small irregular stones and charcoal.	C99	C147
149	=106							
150	=109							
151	C100	2.90	2.70	0.70	Fill of pit	Loosely compacted dark greyish black sandy silt, small and large irregular stones and charcoal included.	C3	C100
152	N/A	0.67	0.42	0.21	Cut of pit	Oval in shape, N-S, sharp break of slope top and base with almost vertical sides and flat base.	C153	C2
153	C152	0.67	0.42	0.21	Fill of pit	Lightly compacted black silty clay with stones and charcoal.	C3	C152
154	Void							
155	Void							
156	Void							
157	Void							
158	N/A		1.26	0.51	Cut of ditch	Linear in shape, N-S, sharp break of slope- top and gradual break of slope- base, sloped sides and flat base	C161	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
159	C158		0.91	0.26	Fill of ditch	Loosely compacted greyish brown silty clay with occ. stones.	C3	C161
160	C158		0.39	0.27	Fill of ditch	Loosely compacted greyish black silty sand with charcoal.	C3	C161
161	C158		0.65	0.38	Fill of ditch	Loosely compacted light grey silty clay with snail shells.	C160	C158
162	=111						C149	C163
163	=111						C162	C109
164	N/A	5.50	4.30	0.30	Non-archaeological			
165	N/A	2.40	1.50	0.34	Non-archaeological			
166	C165	2.40	1.50	0.34	Non-archaeological			

Appendix 1.2 Finds Register

Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3540:003:001	3	1	Scraper	Flint convex end scraper	Flint	A flint convex end scraper produced on a single-platform flake using a soft stone hammer	N/A
E3540:003:002	3	2	Chunk	Natural chunk of quartz crystal	Quartz crystal	Natural chunk of quartz crystal	N/A
E3540:003:003	3	3	Scraper	Quartz crystal scraper	Quartz crystal	A possible quartz crystal scraper	N/A
E3540:003:004	3	4	Stone	Quartzite rubbing stone	Quartzite	A quartzite rubbing stone which is flattened and smoothened on one surface	N/A
E3540:003:005	3	5	Stone	Quartzite rubbing stone	Quartzite	A quartzite rubbing stone which is flattened and smoothened on one surface and was probably used as a mano	N/A
E3540:003:006	3	6	Pin	Copper alloy stick pin	Copper alloy	Copper alloy stick pin. Undifferentiated head (O'Rahilly Class 7). Circular shank, widens below the head and decorated with transverse lines. Dates to 12th Century – early 13th Century.	N/A

Appendix 1.3 Sample Register

During post excavation works specific samples were processed with a view to further analysis. A total of 30 soil samples were taken from features at Danesfort 2 and all 32 samples were processed by flotation and sieving through a 250µm mesh. The following are the ecofacts recovered from these samples:

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	Seeds and hazelnut	Burnt animal bone	animal bone	human bone	metallurgical waste	Other
C3	11	Mound				90.8g			
C8	2	Possible trough	3.1g						
C14	5	Pit	4.7g						
C15	8	Pit	5.5g						
C18	9	Curvilinear	0.3g						
C24	7	Pit	0.8g						

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	Seeds and hazelnut	Burnt animal bone	animal bone	human bone	metallurgical waste	Other
C26	6	Pit	0.3g						
C28	4	Pit	1.3g						
C33	3	Possible trough	1.6g						
C43	16	Pit	19.5g						
C44	18	Pit	0.6g						
C51	28	Posthole	3.0g						
C53	13	Pit	0.9g						
C54	14	Pit	0.3g	<0.1g					
C56	27	Posthole	1.0g						
C58	25	Pit	4.7g	0.2g					
C60	15	Pit	3.4g						
C64	26	Pit	0.4g		0.1g				
C64	35	Pit			1.2g				
C72	36	Pit	0.3g						
C76	17	Fill of [075]	0.4g						
C82	43	Pit	0.8g						
C94	34	Pit	4.3g						
C98	24	Pit	5.1g						
C102	29	Posthole	0.7g						
C105	39	Fill of pit	0.5g						
C111	32	Posthole	3.1g						
C112	23	Posthole	0.3g						
C122	31	Posthole	35.2g						
C153	41	Fill of pit	0.2g						

Appendix 1.4 Archive Index

Project: N9/N10 Phase 4 Knocktopher to Powerstown		
Site Name: AR078 Danesfort 2		
Excavation Registration Number: E3540		
Site director: Richard Jennings		
Date: November 2010		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	14	5 pre-ex, 17 section sheets, 4 mid-ex and 5 post-ex plans
Site sections, profiles, elevations	17	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1	
Site registers (folders)	2	
Survey/levels data (origin information)	514	
Context sheets	166	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	141	
Photographs (print)	0	
Photographs (slide)	0	

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Lithics Report – Farina Sternke MA, PHD

Appendix 2.2 Small Finds Report – Siobhán Scully

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Appendix 2.4 Plant Remains Analysis Report – Penny Johnson

Appendix 2.5 Animal Bone and Burnt Bone Report – Aoife McCarthy

Appendix 2.6 Petrographical Report – Stephen Mandal MIAI PGEO

Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

Appendix 2.1 Lithics Report – Farina Sternke MA, PHD

Lithics Finds Report for E3540 Danesfort 2 (A032/065), Co. Kilkenny
N9/N10 Road Scheme – Phase 4
Farina Sternke MA, PhD

Contents

List of Tables

Introduction
A total of five lithic finds from the archaeological investigations of a prehistoric site at Danesfort 2, Co. Kilkenny were presented for analysis (Table 1). The finds are associated with a *fulacht fiadh* with an associated trough, and pits and postholes.

Find Number	Context	Material	Type	Condition	Cortex	Length (mm)	Width (mm)	Thickness (mm)	Complete	Retouch
E3540:003:1	3	Flint	Retouched artefact	Reasonably fresh	No	29	15	4	Yes	Left edge direct semi-abrupt
E3540:003:2	3	Quartz crystal	Natural chunk							
E3540:003:3	3	Quartz crystal	Retouched artefact	Reasonably fresh	No	22	9	4	Yes	Distal left edge direct abrupt
E3540:003:4	3	Quartzite	Rubbing stone	Slightly weathered		64	49	30	No	No
E3540:003:5	3	Quartzite	Rubbing stone	Slightly weathered		104	99	41	No	No

Table 1 Composition of the Lithic Assemblage from Danesfort 2 (E3540)

Methodology
All lithic artefacts are examined visually and catalogued using Microsoft Excel. The following details are recorded for each artefact which measures at least 20mm in length or width: context information, raw material type, artefact type, the presence of cortex, artefact condition, length, with and thickness measurements, fragmentation and the type of retouch (where applicable). The technological criteria recorded are based on the terminology and technology presented in Inizan *et al.* 1999. The general typological and morphological classifications are based on Woodman *et al.* 2006. Struck lithics smaller than 20mm are classed as debitage and not analysed further, unless they represent pieces of technological or typological significance, e.g. cores etc. The same is done with natural chunks.

Quantification
The lithics are one flaked piece of flint, one flaked piece of quartz crystal and two utilised pieces of quartzite (Table 1). In addition, one natural piece of quartz crystal. Four artefacts are larger than 20mm in length and width and were therefore recorded in detail.

Provenance
The lithic artefacts were recovered from context *c.* 3.

Condition:
The lithics survive in reasonably fresh (E3540:003:1 and E3540:003:3) and weathered (E3540:003:4 and E3540:003:5) condition. Two artefacts are incomplete (E3540:003:4 and E3540:003:5)

Technology/Morphology:
The artefacts are two retouched tools and two macro tools.

Retouched Artefacts:
The retouched artefacts are two miscellaneous retouched artefacts which were probably used as scrapers. Artefact E3540:003:1 is made of flint and was produced on a single-platform flake using a soft stone hammer. This artefact appears to have been used as a convex end scraper. The other retouched artefact (E3540:003:3) is made of quartz crystal. The artefacts measure 29mm and 22mm long, 15mm and

9mm wide and 4mm and 4mm thick, respectively. They most likely date to the first half of the Neolithic period.

Macro Tools:
The macro tools are two quartzite rubbing stones (E3540:003:4 and E3540:003:5) which are flattened and smoothened on one surface. Artefact E3540:003:5 was probably used as a mano. The rubbing stones measure 64mm and 104mm in length, 49mm and 99mm in width and 30mm and 41mm in thickness, respectively. They probably date to the Neolithic period.

Dating:
The assemblage is technologically and typologically diagnostic and dates to the first half of the Neolithic period.

Conservation
Lithics do not require specific conservation, but should be stored in a dry, stable environment. Preferably, each lithic should be bagged separately and contact with other lithics should be avoided, so as to prevent damage and breakage, in particular edge damage which could later be misinterpreted as retouch. Larger and heavier items are best kept in individual boxes to avoid crushing of smaller assemblage pieces.

Discussion
Flint is available in smaller nodules along the Wicklow, Wexford and Waterford coast or in the glacial tills in Co. Kilkenny in the form of remanié pebbles. The use of a limited single platform and dominant bipolar technology on small to medium sized pebbles is in parts the result of this availability. The flint used at Danesfort 2 is beach pebble flint which almost certainly derives from the Wicklow, Wexford or Waterford coast. The majority of these flint nodules are rather small pebbles with an average dimension of 30–50mm and often only permit the use of a bipolar technology to efficiently reduce the nodule achieving a maximum outcome, i.e. the largest possible amount of suitable and usable blanks. The result is the regionally dominant split pebble bipolar (Neolithic and Bronze Age) character of the south-eastern flint assemblages (O'Hare 2005).

Summary
The lithic finds from the archaeological excavation at Danesfort 2, Co. Kilkenny are a flint convex end scraper, a quartz crystal scraper and two rubbing stones. The assemblage is morphologically and technologically diagnostic and dates to the first half of the Neolithic period. It represents a residual earlier phase at this site and is most likely waste which is possibly related to domestic activities. This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

Recommendations for Illustration
- Convex End Scraper (E3540:003:1)

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Appendix 2.2 Small Finds Report – Siobhán Scully

N9/N10 Knocktopher to Powerstown
Phase 4
Danesfort 2 Small Finds Report
E3540 A032/065 AR078
Siobhán Scully, Margaret Gowen & Co. Ltd
December 2009

Introduction
This report details a single piece of metal retrieved from the excavations at Danesfort 2 (E3540) as part of the N9/N10 Knocktopher to Powerstown road scheme.

Metal
A copper alloy stick pin (003:6) with an undifferentiated head was recovered from the burnt mount spread C3. The circular, tapering shank is decorated with transverse lines and is hipped in the upper part of the shank, which would have helped the pin to grip the garment. According to O'Rahilly's typology of stick pins found in the Dublin, stick pins with undifferentiated heads date from the start of the twelfth century to the early decades of the thirteenth century (1998, 33).

Catalogue
E3540:003:6 Copper alloy stick pin. Undifferentiated head (O'Rahilly Class 7). Circular shank, widens below the head and decorated with transverse lines. L 69.5mm Diam. 1.2–2.8mm. 12th Century – early 13th Century.

Reference
O'Rahilly, C. 1998 'A Classification of Bronze Stick-Pins from the Dublin Excavations 1962-1972' in C. Manning (ed.), *Dublin and Beyond the Pale: Studies in Honour of Patrick Healy*, 23–33. Wordwell, Bray.

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Site Name – Danesfort 2
Excavation Number – E3540 AR078
Co. Kilkenny
Author – Lorna O'Donnell
Date –17/7/09

Illustrations

Figures

Tables

Introduction

This report describes the charcoal analysis of samples from a burnt mound, excavated by Richard Jennings at Danesfort 2, Co. Kilkenny. The site was excavated as part of along the N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Jennings 2009). Charcoal was examined from four contexts, including pit and trough fills. The aim of the work is to identify enough suitable material for radiocarbon dating, and to provide a floristic background to the site, as well as wood selection patterns for the burnt mound. This report is summary in nature only, further analysis, discussions and comparisons of results will be incorporated into a final integrated charcoal and wood report for all sites along the N9/N10 (Lyons *et al* forthcoming).

Methodology (After IAC Ltd)

Processing

- A mechanical flotation tank using a pump and water recycling system is used for soil flotation.
- The soil is washed using a 1mm mesh in the flotation tank and a 300 micron and 1mm sieve is used to catch floated material.
- The volume of all soil samples are recorded in litres using a measuring jug.
- The sample is then placed into the 1mm mesh in the flotation tank, the tank is then filled with water and the sample washed. Any large lumps of soil can be carefully broken down by hand, but the jets of water in the flotation tank gently clean the rest of the sample.
- Once the sample is clean (just stones, charcoal, artefacts remaining in the mesh) the tank is fill up with water and at this stage any floating material (charcoal, seeds etc) should flow over the spout and into the sieves.
- The retent is then gently poured into a labelled tray (containing site code, site name, sample number and context number) and place on a shelf to dry.
- The flots are securely packaged in tissue, labelled and hung up to dry. This prevents any loss of light material (seeds) which could result once the flots are dry and being moved (if they are dried on trays).
- Before washing a new sample all equipment used (measuring jugs, 1mm mesh, sieves etc) are thoroughly washed using clean water.
- The large black settling tanks (and water) are cleaned between every site, or if a large site is being processed, every 1–2 weeks.
- Any samples containing high clay content will be soaked in water for 1–2 days to aid the sieving process.

Charcoal identification

Each piece of charcoal was examined and orientated first under low magnification (10x-40x). They were then broken to reveal their transverse, tangential and longitudinal surfaces. Pieces were mounted in plasticine, and examined under a binocular microscope with dark ground light and magnifications generally of 200x and 400x. Each taxon or species will have anatomical characteristics that are particular to them, and these are identified by comparing their relevant characteristics to keys (Schweingruber 1978; Hather 2000 and Wheeler *et al* 1989) and a reference collection supplied by the National Botanical Gardens of Ireland, Glasnevin. Fifty fragments were identified from each sample, where possible.

2.3 Details of charcoal recording

The general age group of each taxa per sample was recorded, and the growth rates were classified as slow, medium, fast or mixed. It was not within the scope of this project to measure all the ring widths from the charcoal, however, some measurements were taken with a graticule in the microscope in order to make the

scale of slow, medium and fast growth less subjective. Slow growth within the charcoal from this site was considered to be approximately 0.4mm per annum, medium approximately 1mm per annum and fast approximately 2.2mm per annum.

The ring curvature of the pieces was also noted – for example weakly curved annual rings suggest the use of trunks or larger branches, while strongly curved annual rings indicate the burning of smaller branches or trees (Fig. 1). Tyloses in vessels in species such as oak can denote the presence of heartwood. These occur when adjacent parenchyma cells penetrate the vessel walls (via the pitting) effectively blocking the vessels (Gale 2003, 37). Insect infestation is usually recognised by round holes, and is considered to be caused by burrowing insects. Their presence normally suggests the use of decayed degraded wood, which may have been gathered from the woodland floor or may have been stockpiled.

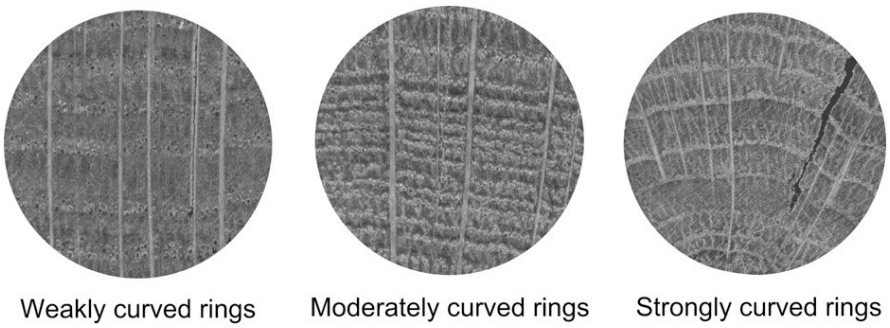

Fig. 1 Ring curvature. Weakly curved rings indicate the use of trunks or large branches.
(After Marguerie and Hunot 2007 1421, Fig. 3).

Results

Five wood taxa or trees were identified from the Danesfort 2 samples, hazel (*Corylus avellana*), ash (*Fraxinus* sp.), pomaceous fruitwood (Pomoideae), wild/bird cherry (*Prunus avium/padus*) and oak (*Quercus* sp.). The results are dominated by oak (Fig. 2).

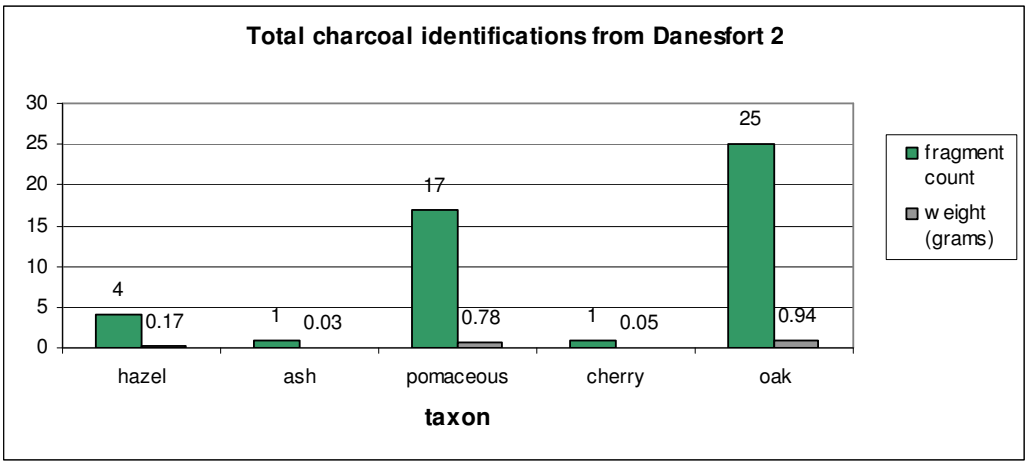

Fig. 2

Charcoal was examined from two pit fills at Danesfort 2 (Cut 93 and 109; Fill 94 and 111). The level of charcoal is low from C94, only one fragment of oak was identified. Pomaceous fruitwood and oak were identified from C111. Charcoal was also

examined from trough fills (Trough 1 Cut 7 and Trough 2 Cut 128; Fill 8 and 105). A variety of trees was identified from C8 (hazel, ash, pomaceous fruitwood and oak), while pomaceous fruitwood and oak only were identified from C105 (Table 1).

Discussion

The oak present could be either our native pedunculate (*Quercus robur*) which prefers more wet, heavier clays than the sessile oak (*Quercus petraea*) (Beckett 1979, 40–41).The Pomoideae group (pomaceous fruitwood), a sub family of the Rosaceae includes crab apple, wild pear, rowan/whitebeam and hawthorn. Crab apple (*Malus sylvestris*) is a tree of hedges, copses and oak woodland, thriving in fertile and heavy soils. It often grows singly, with large distances between individual trees (Lipscombe and Stokes 200, 78). Wild pear (*Pyrus pyraster*) can grow on woodland edges and also can be found growing in a solitary situation (Lipscombe and Stokes 2008, 114 ; Stuijts 2005, 142). Rowan (*Sorbus aucuparia*) is a tough colonizer which can tolerate peaty soils and exposed conditions. It needs plenty of light to thrive (Hickie 2002, 65). It is a tree of mountains, woodlands and valleys, growing on a wide range of soils, including chalks, acid soils and even peat (Lipscombe and Stokes 2008, 120). Whitebeam (*Sorbus aria*) grows up to 20m high and has a preference for limestone soils (Orme and Coles 1985, 11). Hawthorn (*Crataegus monogyna)* can thrive in all but the most acid of soils (Gale and Cutler 2000). As wild pear is not a native Irish species, it is likely that the charcoal represents other types encompassed in the Pomoideae group.

Hazel is a very tolerant tree, it can grow from wet to dry conditions (but not waterlogged ones (Orme and Coles 1985, 9). It was once very common in Ireland, Mc Cracken writes that it was once widespread to an extent that is hard to imagine today (1971, 19). It can grow as a tree or can form hazel scrub. Wild/bird cherry can grow well in light conditions such as near woodland margins (Orme and Coles 1985, 11).

Ash trees prefer moist, well drained and fertile soils. It is very intolerant of shade (Lipscombe and Stokes 2008, 188)

Summary

Charcoal was examined from four contexts at Danesfort 2, from two pits and two troughs. Five wood taxa were identified, the results are dominated by oak.

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Table 1 Charcoal identification details from Danesfort 2

Context number	Cut number	Sample number	Flot weight (g)	Context description	Wood taxon	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Growth	Weakly or strongly curved rings	Comment
8	7	2	3.1	Trough fill - Trough 1	*Corylus avellana* (hazel)	4	0.17	4-5	2-6	medium		radial cracks
					Fraxinus sp. (ash)	1	0.03	5-6	3-4	medium		
					Pomoideae spp. (pomaceous)	7	0.39	5-6	3-4	medium		
					Prunus avium/padus sp. (wild/bird cherry)	1	0.05	5-6	3-4	medium		
					Quercus sp. (oak)	3	0.22	5-6	3-4	medium		
94	93	14	0.3	Pit fill	*Quercus* sp. (oak)	1	0.01					
105	128	39	3.5	Trough fill - Trough 2	Pomoideae spp. (pomaceous)	5	0.08	4-5	2-3	medium	strongly curved	
					Quercus sp. (oak)	15	0.21	4-5	2-3	slow		
111	109	32	3.1	Pit fill	Pomoideae spp. (pomaceous)	5	0.31	4-5	2-4	medium		
					Quercus sp. (oak)	6	0.5	4-5	2-4	medium		

Appendix 2.4 Plant Remains Analysis Report – Penny Johnston

Plant Remains Analysis Report for
E3540 Danesfort 2 (A032/065), Co. Kilkenny
N9/N10 Road Scheme – Phase 4

Penny Johnston, Eachtra

Introduction
This report details the analysis of plant remains recovered from excavations in advance of the construction of the N9/N10 Knocktopher to Powerstown Road (Phase 4). The excavation was directed by Richard Jennings on behalf of Irish Archaeological Consultancy Ltd. The archaeological site was located in the townland of Danesfort (E3540).

The excavated remains included evidence for Bronze Age occupation and burnt mound/*fulachta fiadh* activity.

Methodology
The samples were processed by the client, who also carried out a preliminary sorting of the samples. This pre-selection of the plant remains may bias the final plant records from these sites, as it is possible that many small items, such as weed seeds and chaff, were not picked out.

The selected material was sent to Eachtra Archaeological Projects where it was examined under a low-powered binocular microscope (X6 –X45). Suitable plant material was identified and the results of analysis are presented.

Danesfort 2 E3540 AR078
This was a burnt mound/*fulacht fiadh* site with deposits of charcoal and heat affected stones, a trough, several pits and a well. A total of 2 samples were examined from this site, C.58 (S.25) and C.54 (S.14). There were no charred seeds from these samples.

Appendix 2.5 Animal Bone Report – Aoife McCarthy

Osteoarchaeological Report of Faunal Remains and Burnt Bone from
E3540 A032/: Danesfort 2 AR078
Co. Kilkenny
N9/N10 Kilcullen to Waterford Scheme
Phase 4: Knocktopher to Powerstown

Author: Aoife McCarthy MA BA
Date: March 2010

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1. Introduction

1.1 Introduction

This report details the osteological analysis of faunal remains and burnt bone samples recovered during excavations at Site E3540 AR078 Danesfort 2 in the townland of Danesfort, Co. Kilkenny as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme. Aoife McCarthy MA (Osteoarchaeology University of Southampton 2006) undertook the analysis on behalf of Irish Archaeological Consultancy Ltd in February 2010. At the time of writing this report, background archaeological information was obtained from a draft interim excavation report (Jennings, R. 2009) and from consulting the original site register documents.

1.2 General Osteological Information

The osteological analysis of both hand retrieved faunal remains and burnt bone fragments recovered during sieving of bulk soil samples was undertaken to provide an overview of the osteoarchaeological aspect of the site and determine if the material could provide further interpretation of site activity.

A total of 51 fragments from 45 possible skeletal elements and weighing 91.93g were recorded within the assemblage. The degree of preservation of the bone assemblage recovered varied from well preserved to moderate preservation for retrieved faunal remains and to poor for burnt bone fragments. A modest rate of fragmentation was also noted within the combined assemblage.

A large portion of the faunal remains assemblage recovered at Danesfort 2 originated from C64 the black silty-sand fill of pit feature C63 which accounted for 36 bone fragments or 70.6% of the total. A series of two charcoal samples retrieved from archaeological contexts C105 and C54 were classified to species and issued for AMS dating. A sample of *prunus spp* charcoal identified within pit fill C105 was sent for radiocarbon dating and returned a two sigma calibrated date of Cal. 744–407BC; whilst ash and *prunus spp* charcoal retrieved within pit fill C54 returned a two sigma calibrated date of Cal. 2464–2214BC. The AMS dates returned place activity within the Bronze Age, stretching into the early Iron Age period.

A total of 9 bone fragments (17.6%) of the combined assemblage were classified to species. Due to fragmentation combined with poor preservation and small size of the individual bone fragments it was not possible to identify 42 fragments (82.4%) these were classed as indeterminate vertebrate. Bone elements were identified where possible.

The faunal remains assemblage recovered from Danesfort 2 contained bones from a possible 4 different species including; cow, pig, sheep and goat. The domestic species of pig and cow accounted for 5 fragments (55.6%) and 2 fragments (22.2%) respectively of identified material.

2. Methodology

SPECIES IDENTIFICATION: Identification of the bones involved reference to Schmid (1972) and Hillson (1992) as well as comparison with the author's own reference material. The closely related taxa of sheep and goat are difficult to distinguish and where grouped under the term '*caprinae*'

- NISP: Number of Identified Specimens Indicates the total number of fragments found.

- MNI: Minimum Number of Individuals. Indicates the minimum number of individuals from every species that were present in the material. Estimating MNI is calculated on the specimen of the most abundant skeletal element present; whilst taking age, sex, size and archaeological context into account.

- In order to calculate accurate MNI and MNE figures for each species, bird as well as mammal, a method of zoning was implemented when recording (Serjeantson, 2000). This method was used so as to compensate for any possible biases due to fragmentation; siding was also taken into account at this point.

- MNE: Minimum Number of Elements. Indicates the minimum number of anatomical units that are present and what side they are from. To avoid getting a higher MNE all loose epiphyses have to be paired with all un-fused diaphysis.

AGEING: Two main methods are used to determine the age of faunal remains; tooth eruption and degree of Epiphysial fusion (a less reliable method). Tooth eruption and wear stages were recorded for the following teeth where possible; dP4 (deciduous fourth premolar), P4 (fourth premolar), M1 (first molar), M2 (second molar) and M3 (third molar) of cattle, sheep/goat and pig (Grant 1982). The analysis of tooth wear patterns refers to the alteration of the enamel surface and exposure of inner dentine through use.

BIOMETRICAL DATA: Due to fragmentation, small size and the nature of the remains recovered measurements and biometrical analysis was not possible.

SEX DETERMINATION: Sex determination of animal remains is possible by analysis of certain sexually dimorphic elements. For example goat horncores may be classified as male or female based on their morphology and cattle metacarpals can be defined as male or female through calculation of the slenderness index (McCormick 1992). Sexual determination of species was not possible due fragmentation and the nature of the bone material recovered from Danesfort 2.

BUTCHERY/GNAWING/BURNING: Evidence for butchery was recorded under the categories of cut, chopped, chopped and cut. All specimens were analysed for evidence of rodent or carnivorous gnawing as well as evidence of burning. Burnt bones were recorded in accordance with colour changes resulting from differing heat levels e.g. calcined bones acquire a bluish-whitish hue through exposure to high temperatures.

PATHOLOGY: The discovery of any injury and/or pathology was recorded for all specimens, where present.

3. Results

Context 3 Sample 11
A total of 15 bone fragments (90.6g) representing 12 possible skeletal elements were identified within burnt clay spread C3. Species identified within spread material C3 included cow, pig and sheep/goat (*caprinae*). Small fragment size combined with a poor degree of preservation meant it was not possible to identify the species of 6 fragments (24.3g).

***Bos*/Cow**
A moderately preserved fragment of tibia diaphysis and a complete naviculo-cuboid (51.7g) were recovered. The single tibia diaphysis fragment displayed evidence of minor singeing in the form of blackening of the bone surface. As Devlin J.P. & Herrmann N. P (2008, 109) state "increasing exposure to heat bone progresses through a sequence of colours from unburned tan, to shades of dark brown to black, progressing to blue and grey and finally to white." A low degree of surface eburnation was recorded on the auricular surfaces of the complete naviculo-cuboid bone; indicating possible osteoarthritis.

***Sus*/Pig**
A series of 5 poorly preserved fragments of rib corpus (5.9g) were recovered from spread material C3. Measurements of the largest rib corpus fragment were recorded at 49mm long, 22mm wide and 7mm thick. Frequent chatter marks and surface striations consistent with rodent gnawing were noted on all 5 rib corpus fragments.

Sheep/Goat (*Caprinae*)
Loose permanent caprinae Molar 1 & Molar 2 teeth were recovered within clay spread C3. Dental wear patterns were recorded for both retrieved mandibular teeth. The single age category of 2–3 Years was represented (Appendix 1).

Indeterminate Vertebrate
Due to fragmentation, poor preservation and small fragment size 6 bone fragments recovered from spread material C3 were not identified to species. A single tibia diaphysis fragment from a large size vertebrate showed evidence of exposure to a high level of heat; resulting in calcination of the bone surface and colour change to grey. Evidence of butchery in the form cut and chop marks were also catalogued on the tibia diaphysis fragment. Frequent surface striations combined with chatter marks consistent with rodent gnawing were noted on 2 diaphysis fragments. A quantity of 4 of the unidentifiable bone fragments recovered comprised small–tiny fragments of trabecular bone.

Context 64 Sample 35
A series of 32 calcined rib corpus, long bone and unidentifiable burnt bone fragments (1.23g) of a small size mammal were retrieved within C64 the silty-sand fill of pit feature C63.

Indeterminate Vertebrate
A high degree of fragmentation combined with small fragment size and poor preservation meant that the long bone diaphysis, rib corpus and unidentifiable burnt bone fragments recovered from pit fill C64 were not identifiable to species. The long bone diaphysis fragment retrieved measured 9mm long, 6mm wide and 4mm thick. All 32 bone fragments displayed evidence of exposure to a high level of heat and resulting calcination of the bone. This was manifested as bone surface colour change to grey-white, combined with bone surface cracking. Contact of bone with heat diminishes its moisture content and results in the combustion of the organic or collagen component; the remaining structure of the bone after this process is mineral. A white or pale grey colour indicates exposure of bone to temperatures in excess of *c.* 600°C combined with a ready oxygen supply (McKinley, 2004). Such distortion to the bone structure reduces its size and as detailed above alters bone colour (Luff R. & Pearce J. 1994). A quantity of 20 unidentifiable bone fragments recovered consisted of small–tiny fragments of trabecular bone.

Context 64 Sample 26
A total of 4 calcined fragments of unidentifiable trabecular bone were recovered within sample 26 of pit fill C64.

4. Summary
Fifty one animal bone & burnt bone fragments recovered from archaeological contexts C3 and C64 on Danesfort 2 were submitted for examination. The bone samples were assessed and identified to species where possible; a total of 9 bone fragments recovered were identified to the species of cow, pig, sheep and goat. Due to the size and fragmented nature of the individual bone pieces it was not possible to identify 42 fragments to species. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Site AR078 Danesfort 2 due to its limited size and poor degree of bone preservation. A series of early Neolithic lithic aretfacts as well as a copper alloy medieval stick pin were also recovered within clay spread C3.

Bone Database:

Spec	C	S	Taxa	Anat	Side	Prox	Dist	1	2	3	4	5	6	7	8	But	Bu	G	Q	W (g)	Comments
1	C3	11	Shp/Gt	M1	R														1	3.30	Single loose M1 tooth in wear. Dental notes taken.
2	C3	11	Shp/Gt	M2	R														1	5.40	Single loose M2 tooth in wear. Dental notes taken.
3	C3	11	Pig Sz	Rib	R													R	4	5.00	Series of moderately preserved fragments of corpus, degree of trabecular bone exposed. Length 49mm, Width 22mm, Thickness 7mm
4	C3	11	Cow	Tibia			fsd							1			B		1	37.70	Moderately preserved, distal tibia fragment. Minor singeing of surface, degree of trabecular bone exposed.
5	C3	11	Unid	Tibia						1						7a, 12a	G	R	1	23.40	Well preserved fragment. Large sz mammal. Minor exposure to heat, surface greyed
6	C3	11	Unid	Unid															4	0.30	Small poorly preserved fragments of trabecular bone
7	C3	11	Pig Sz	Rib														R	1	0.90	Trabecular bone exposed poor preservation.
8	C3	11	Unid	Unid													Br, B	R	1	0.60	Trabecular bone exposed poor preservation.
9	C3	11	Cow	Naviculo-Cuboid	R			1	1	1	1	1	1	1	1				1	14.00	Well preserved & complete. Low degree of eburnation on auricular surfaces
10	C64	26	Unid	Unid													W, G		4	0.10	Series of small-tiny calcined fragments of trabecular bone
11	C64	35	Unid	Long Bone													W, G		8	0.58	Series of calcined fragments of long bone diaphysis. Small sz mammal Largest fragment 9mm long, 6mm wide & 4mm thick
12	C64	35	Unid	Rib													W, G		4	0.33	Poorly preserved, calcined fragments of rib corpus, trabecular bone.
13	C64	35	Unid	Unid													W, G		20	0.32	Series of small-tiny calcined fragments of trabecular bone

Key:

C= Context
S=Sample
Anat=Anatomical Element
Prox=Proximal
Dist=Distal

But=Butchery
Bu=Burnt
G=Gnaw
Q=Quantity of Pieces
G=Grey

N=No
Unid=Unidentifiable
Taxa=Taxon
B=Black

W=White
R=Rodent
Cn=Carnivore

Table 1: Dental Ageing Database

SPEC No	C	S	TAXA	(DP4) P4	M1	M2	M3	COMMENTS/AGE CATEGORY
1	C3	11	Shp/Gt		H			2-3 Years
2	C3	11	Shp/Gt			G-H		2-3 Years

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GLOSSARY OF TERMS:
BOS: Latin term for Cow
SUS: Latin term for Pig
CERVUS: Latin term for Deer
EQUUS: Latin term for Horse
OVIS: Latin term for Sheep
CAPRINAE: Latin term for Sheep/Goat
CANIS: Latin term for Dog
LEPUS: Latin term for Hare
AVES: Latin term for Bird
TAPHONOMY: The study of the processes affecting an organism after death from the time of burial until collection.
TRABECULAR BONE: Osseous tissues that fill the interior cavity of bones and resemble a sponge or honeycomb.
DIAPHYSIS: Bone shaft
CORPUS COSTAE: Body of Rib Bone

Appendix 2.6 Petrographical Report – Stephen Mandal MIAI PGEO

Petrographical Report on Site Samples Taken During Archaeological Excavations at Danesfort 2 (E3540), Co. Kilkenny

Eurgeol Dr Stephen Mandal MIAI PGEO

Introduction
This report is based on the macroscopic (hand specimen) examination of stone samples taken during archaeological excavations in advance of the N9/N10 Phase 4 Knocktopher to Powerstown Road Scheme. The purpose of the study was to identify the rock types from which the stone objects were made, to highlight potential sources for them, and to comment on their possible function. It is important to note that macroscopic petrographical studies have been considered of limited value in comparison to microscopic (thin section and geochemical analysis) studies. On the other hand, macroscopic studies provide an excellent preliminary assessment tool and have proven to be of considerable value in petrographical studies (e.g. see Mandal 1997; Cooney and Mandal 1998).

Solid Geology and Soils of the Site (see Figure 1; McConnell 1994)
The bedrock under the site consists of fossiliferous dark-grey muddy limestone belonging to the Ballysteen Formation (shown on Figure 1 as BA).

The stratigraphical sequence in the area consists of the following. Gaps in the stratigraphically sequence are represented by line breaks.

Carboniferous (Silesian)
Killeshin Silstone Formation (KN) – Muddy siltstone and silty mudstone
Luggacurren Shale Formation (LS) – Mudstone and shale with chert and limestone

Carboniferous (Dinantian)
Clogrenan Formation (CL) – Cherty, muddy calcarenite limestone
Ballyadams Formation (BM) – Crinoidal wackestone/ packstone limestone
Butlersgrove Formation (BU) – Very dark grey argillaceous limestones
Ballysteen Formation (BA) – Fossiliferous dark-grey muddy limestone
Ballymartin Formation (BT) – Limestone and dark grey calcareous shales
Porter's Gate Formation (PG) – Sandstones, shales and thin limestones

Devonian
Kiltorean Formation (KT) – Yellow and red sandstones, green mudstones
Carrigmaclea Formation (CI) – Red, brown conglomerates and sandstones

Ordovician
Oaklands Formation (OA) – Green, red-purple, buff shale, siltstone
Maulin Formation (MN) – Dark blue-grey slate, phyllite, schist

Igneous Intrusions (undated)
Granite (Gr) – Undifferntiated
Dolerite (D)

The geology of the area is generally dominated by Lower Carboniferous Age rocks, principally limestones. These rocks, which also make up much of the Midlands of Ireland, represent the northward return of the sea at the end of the Devonian, *c.* 360 million years ago, owing to the opening of a new ocean to the south called the Palaeo-Tethys in what is now central Europe.

To the south of the study area occur Ordovician-Devonian Age rocks. The Devonian Age rocks consist of coarse sandstone and conglomerates representing terrestrial sediments resulting from a period of tectonic uplift.

The older, Ordovician Age rocks represent tectonic activity, relating to the closure of the Iaepetus Ocean, a major ocean which at its widest was probably greater than

3000km across. These rocks have been metamorphosed to slates, phyllites and schists by the intrusion of the Tullow granite pluton *c.* 405 million years ago.

Bedrock is not exposed at surface at the site; instead the overburden consists of boulder clay; surface drift from early glaciations. The area is part of a physical region known as the Caledonian province of the south-east. The soils of the area consist of acid brown earths (Aalen et al. 1997).

Results

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
Danesfort 2	A032/065	AR078	E3540	2	8	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	3	33	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	4	28	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	13	53	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	14	54	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red, contains burnt limestone piece
Danesfort 2	A032/065	AR078	E3540	15	60	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	16	43	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	17	76	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	23	112	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	26	64	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	27	56	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	29	102	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	31	122	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	32	111	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	34	93/94	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	36	72	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	39	105	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	41	153	Burnt;	Angular to Sub-rounded; broken	Sandstone, coarse grained, quartz rich, red

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
							cobbles	
Danesfort 2	A032/065	AR078	E3540	43	82	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red

Table 1. Results of petrographical analysis of stone samples from the site

Potential Sources
Coarse grained sandstone does not occur in bedrock in the immediate vicinity of the site. The dominant rock type in the area is limestone. Whilst there are minor sandstones within some of the limestone formations, the closest bedrock source for coarse grained yellow / red sandstone is within the Devonian Age Kiltorean Formation (yellow and red sandstones, green mudstones) and Carrigmaclea Formation (red, brown conglomerates and sandstones) (see Figure 1, shown as KT and CI respectively). It is important to note that these rock types were not necessarily sourced from bedrock. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles. It is therefore possible that these rocks were sourced locally.

Discussion
Whilst it is not possible to determine a definitive source for these stone samples based on macroscopic examination alone, it can be stated that these rock types are available locally in outcrop and within the glacial tills / sub-soils. It is therefore probable that the material in these samples were sourced in the vicinity of the site.

A total of 52 samples were also examined from the scheme across 6 sites during the course of the main excavations (A032 – phase 4; see Table 2). The samples showed a remarkable consistency across the scheme in terms of the principal rock type utilised; coarse grained sandstone, typically red in colour. All samples contain a variation of this type of rock as their principal component. All but one of the samples from UA2 (sample 3) are clearly burnt / altered. All contain angular pieces of stone. A total of 37 (70%) also contain sub-rounded to rounded pieces; in all cases these samples contain pebbles and / or cobbles, in most cases broken. Three of the samples contain minor amounts of limestone as a secondary rock type to sandstone.

Site	Licence			No.	Burnt	Angular	Rounded	Limestone
UA2				3	2	3	0	0
Baysrath 4	A032/089	AR057	E3629	2	2	2	2	2
Danganbeg 1	A032/075	AR058	E3606	15	15	15	15	0
Stonecarthy West 1	A032/079	AR067	E3610	8	8	8	0	0
Danesfort 2	A032/065	AR078	E3540	19	19	19	19	1
Danesfort 5	A032/058	AR082	E3456	5	5	5	0	0
Grand Total				**53**	**52**	**53**	**37**	**3**

Table 2. Results of petrographical analysis of stone samples from the N9/N10 Phase 4 Road Scheme

These samples are also very consistent with the samples examined from the N9/N10 Phase 4b road scheme to the north.

Coarse grained sandstone is typical of *fulacht fiadh* material (e.g. see Mandal 2004). The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles is clear evidence of the use of secondary sources. Angular

pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

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Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

The "Measured radiocarbon age" is quoted in conventional years BP (before AD 1950). The error is expressed at the one-sigma level of confidence.

The "Calibrated date range" is equivalent to the probable calendrical age of the sample material and is expressed at the two-sigma (95.4% probability) level of confidence.

Calibration data set: intcal04.14c (UBA 11000, 12186)

Calibration data set: intcal09.14c (UBA 15553, 15554)

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C105, Fill of C128	39	Charcoal	*Prunus spp.* / 0.1g	QUB	UBA 11000	AMS (Std)	703–414 BC (1 sigma), 744–407 BC (2 sigma)	2434±20	-22.6
C54, Fill of a pit	14	Charcoal	*Fraxinus excelsior &Prunus spp.* / 0.5g	QUB	UBA 12186	AMS (Std)	2453–2293BC(1 sigma), 2464–2214BC (2 sigma)	3869±26	-21.8
C111, Fill of waterhole	32	Charcoal	Pomoideae / 0.1g	QUB	UBA 15553	AMS (Std)	2024–1943BC (1 Sigma) 2116–1893BC (2 Sigma)	3619±30	-28.8
C122, Fill of a posthole	31	Charcoal	*Cherry*	QUB	UBA 15554	AMS (Std)	797–769BC (1 Sigma) 806–595BC (2 Sigma)	2571±25	-26.9

References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, PG Blackwell, C Bronk Ramsey, CE Buck, GS Burr, RL Edwards, M Friedrich, PM Grootes, TP Guilderson, I Hajdas, TJ Heaton, AG Hogg, KA Hughen, KF Kaiser, B Kromer, FG McCormac, SW Manning, RW Reimer, DA Richards, JR Southon, S Talamo, CSM Turney, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111–1150.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14
NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

APPENDIX 3 LIST OF RMP IN AREA

RMP No	Description
KK023-005	Enclosure
KK023-007	Moated site
KK023-081001	Church
KK023-081002	Graveyard
KK023-081003	Grave slab
KK023-077	Ringfort (Unclassified)
KK023-076	Ringfort (Unclassified)
KK023-080	Castle Ringwork
KK023-080001	Designed Landscape (Folly)
KK023-083	Not in RMP
KK023-078	Ringfort (Unclassified)
KK023-079	Ringfort (Unclassified)

See Figure 2 for location.

APPENDIX 4 LIST OF SITE NAMES

Site Name	Site Code	E Number	Director	NGR
Baysrath 2	AR055	E3627	Fintan Walsh	251593/137855
Baysrath 3	AR056	E3628	Fintan Walsh	251672/138000
Baysrath 4	AR057	E3629	Fintan Walsh	251515/138280
Danganbeg 1	AR058	E3606	Emma Devine	251462/138754
Danganbeg 2	AR059	E3607	Emma Devine	251397/138939
Danganbeg 3	AR060	E3671	Emma Devine	251430/139245
Danganbeg 4	AR061	E3676	Emma Devine	251401/139372
Knockadrina 1	AR062	E3677	Ed Lyne	251422/139420
Tinvaun 1	AR063	E3678	Ed Lyne	251482/139625
Tinvaun 2	AR064	E3680	James Kyle	251445/139736
Tinvaun 3	AR065	E3608	James Kyle	251501/139832
Tinvaun 4	AR066	E3609	James Kyle	251508/139917
Stonecarthy West 1	AR067	E3610	James Kyle	251538/140023
Knockadrina 2	AR068	E3611	James Kyle	251647/140237
Rathduff 1	AR069	E3612	Ed Lyne	251286/142167
Rathduff Upper 1	AR070	E3613	Ed Lyne	251280/142559
Kellsgrange 1	AR071	E3575	James Kyle	250911/143732
Kellsgrange 2	AR072	E3577	James Kyle	250967/143861
Kellsgrange 3	AR073	E3576	James Kyle	250948/144003
Ennisnag 1	AR074	E3614	Richard Jennings	251416/145690
Ennisnag 2	AR075	E3615	Richard Jennings	251638/146068
Danesfort 12	AR076	E3616	Richard Jennings	251669/146186
Danesfort 13	AR077	E3617	Richard Jennings	251765/146384
Danesfort 2	AR078	E3540	Richard Jennings	251953/146745
Danesfort 4	AR079	E3539	Richard Jennings	251880/147579
Danesfort 3	AR080A	E3542	Richard Jennings	252221/146845
Danesfort 1	AR080B	E3541	Richard Jennings	252267/146707
Croan 1	AR081	E3543	Emma Devine	252280/147332
Danesfort 5	AR082	E3456	Emma Devine	252567/147767
Danesfort 6	AR083	E3538	Emma Devine	252764/147995
Danesfort 7	AR084	E3537	Emma Devine	252878/148099
Danesfort 8	AR085	E3461	Richard Jennings	253020/148246
Danesfort 9	AR086	E3458	Richard Jennings	253089/148345
Danesfort 10	AR087	E3459	Richard Jennings	253229/148414
Danesfort 11	AR088	E3460	Richard Jennings	253245/148462
Rathclogh 1	AR089	E3726	Patricia Lynch	253365/145515
Rathclogh 2	AR090	E3727	Patricia Lynch	253650/148848
Kilree 1	AR091	E3728	Patricia Lynch	254088/149310
Kilree 2	AR092	E3729	Patricia Lynch	254320/149500
Kilree 3	AR093	E3643	Patricia Lynch	254449, 149639
Kilree 4	AR094	E3730	Patricia Lynch	255330/150084
Dunbell Big 2	AR095	E3853	Yvonne Whitty	256684/151066
Holdenstown 1	AR096	E3681	Yvonne Whitty	256737/151253
Holdenstown 2	AR097/98	E3630	Yvonne Whitty	256891/151781
Holdenstown 3	AR099	E3854	Yvonne Whitty	256990/152085
Holdenstown 4	AR100	E3682	Yvonne Whitty	256828/152048
Dunbell Big 1	AR101	E3855	Yvonne Whitty	257034/152315
Rathcash 1	AR102	E3859	Tim Coughlan	258178/154199
Rathcash 2	AR103	E3860	Tim Coughlan	258294/154293
Rathcash East 1	AR104	E3892	Tim Coughlan	259419/154546
Rathcash East 2	AR105	E3893	Tim Coughlan	259555/154566
Rathcash East 3	AR106	E3861	Tim Coughlan	259821/154653
Blanchvillespark 1	AR107	E3894	Richard Jennings	260535/155212
Blanchvillespark 2	AR108	E3895	Tim Coughlan	260637/155449
Blanchvillespark 3	AR109	E3913	Tim Coughlan	260785/155653

Site Name	Site Code	E Number	Director	NGR
Blanchvillespark 4	AR110	E3914	Tim Coughlan	261442/156269
Blanchvillespark / Ballyquirk 1	AR111	E3862	Ruth Elliott	261531/156323
Ballyquirk 1	AR112	E3863	Ruth Elliott	261531/156323
Ballyquirk 2	AR113	E3864	Ruth Elliott	261811/156508
Ballyquirk 3	AR114	E3865	Ruth Elliott	261875/156559
Ballinvally 1	AR115	E3836	Emma Devine	263258/157521
Garryduff 1	AR116	E3852	Emma Devine	263933/157991
Kilmacahill 1	AR117	E3915	Tim Coughlan	264267/158369
Kilmacahill 2	AR118	E3833	Tim Coughlan	264380/158453
Jordanstown 1	AR119	E3834	James Kyle	264546/158643
Jordanstown 2	AR120	E3851	James Kyle	264893/159038
Kellymount 6	AR121	E3758	Przemaslaw Wierbicki	265130,159277
Jordanstown 3	AR122	E3916	Przemaslaw Wierbicki	265103/159227
Kellymount 1	AR123	E3756	Przemaslaw Wierbicki	265250/159397
Kellymount 2	AR124	E3757	Przemaslaw Wierbicki	265164/159463
Kellymount 3	AR125	E3856	Przemaslaw Wierbicki	265338/159597
Kellymount 4	AR126	E3857	Przemaslaw Wierbicki	265412/159803
Kellymount 5	AR127	E3858	Przemaslaw Wierbicki	265530,159977
Shankill 2	AR128	E3738	Richard Jennings	265924/160651.
Shankill 3	AR129	E3737	Richard Jennings	266052/161141
Shankill 4	AR130	E3838	Richard Jennings	266286/161526
Shankill 5	AR131	E3850	Richard Jennings	266374/161730
Shankill 6	AR132	E3840	Richard Jennings	266403/161836
Moanmore 1	AR133	E3835	Richard Jennings	266476/162016
Moanmore 2	AR134	E3843	Sinead Phelan	266756/162866
Moanmore 3	AR135	E3837	Sinead Phelan	266856/163259
Bannagagole 1	AR136	E3844	Sinead Phelan	266942/163569
Moanduff 1	AR137	E3839	Robert Lynch	267261/164397
Coneykeare 1	AR138	E3683	Sinead Phelan	267836/166209
Coolnakisha 1	AR139	E3768	Ellen O'Carroll	268175/167274
Coolnakisha 2	AR140	E3767	Ellen O'Carroll	268306/167559
Cranavonane 1	AR141	E3842	Tim Coughlan	268554/167895
Cranavonane 2	AR142	E3732	Ellen O'Carroll	268830/168154
Cranavonane 3	AR143	E3731	Ellen O'Carroll	269123/168362
Tomard Lower 1	AR144	E3733	Ellen O'Carroll	269349/168496
Paulstown 1	AR145	E3642	Ruth Elliot	265889/158499
Paulstown 2	AR146	E3632	Ruth Elliot	265664/158651
Rathgarvan or Clifden 1	AR147	E3760	Przemaslaw Wierbicki	257026/154123
Maddockstown 1	AR148	E3759	Przemaslaw Wierbicki	256886/154199
Templemartin 3	AR149	E3845	Emma Devine	255095/155200
Templemartin 4	AR150	E3841	Emma Devine	254920/155427
Templemartin 5	AR151	E3846	Emma Devine	254706/155636
Templemartin 1	AR152	E3849	Emma Devine	254504/155826
Templemartin 2	AR153	E3847	Emma Devine	254173/156236
Leggetsrath East 1	AR154	E3734	Emma Devine	253793/156484
Moanduff 2	AR155	E3735	Sinead Phelan	267470/164887
Moanduff 3	AR156	E3736	Sinead Phelan	267515/164979
Ballyquirk 4	AR157	E3848	Richard Jennings	262596/157025
Shankill 1	AR158	E3766	Przemaslaw Wierbicki	265707/160269
Rathgarvan or Clifden 2	AR159	E3921	Tim Coughlan	257095/154119
Ballynolan 1	AR160	E3755	Sinead Phelan	267714/165597
Rathduff Upper 3	UA2	E3974	Tim Coughlan	250991/143565
Rathduff Bayley	UA4	E4011	Tim Coughlan	251005/143564

N9/N10 KILCULLEN TO WATERFORD SCHEME, PHASE 4 – KNOCKTOPHER TO POWERSTOWN

Ministerial Direction Scheme Reference No.	A032
Registration No.	E3540
Site Name	AR078, Danesfort 2
Townland	Danesfort
County	Kilkenny
Excavation Director	Richard Jennings
NGR	251953 146745
Chainage	34925

FINAL REPORT

ON BEHALF OF KILKENNY COUNTY COUNCIL

FEBRUARY 2012

IAC Irish Archaeological Consultancy

PROJECT DETAILS

Project	N9/N10 Kilcullen to Waterford Scheme, Phase 4: Knocktopher to Powerstown
Ministerial Direction Reference No.	A032
Excavation Registration Number	E3540
Excavation Director	Richard Jennings
Senior Archaeologist	Tim Coughlan
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Kilkenny County Council
Site Name	AR078, Danesfort 2
Site Type	Burnt mound
Townland(s)	Danesfort
Parish	Danesfort
County	Kilkenny
NGR (easting)	251953
NGR (northing)	146745
Chainage	34925
Height OD (m)	54.431
RMP No.	N/A
Excavation Dates	25 June–23 July 2007
Project Duration	20 March 2007–18 April 2008
Report Type	Final
Report Date	February 2012
Report By	Richard Jennings and Tim Coughlan
Report Reference	Jennings, J. and Coughlan, T. 2012 E3540 Danesfort 2 Final Report. Unpublished Final Report. National Monument Service. Department of the Environment, Heritage and Local Government, Dublin.

ACKNOWLEDGEMENTS

This final report has been prepared by Irish Archaeological Consultancy Ltd in compliance with the directions issued to Kilkenny 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 Kilkenny County Council and Irish Archaeological Consultancy Ltd.

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James Eogan (NRA Senior Archaeologist), Ed Danaher (NRA Archaeologist) and Bernice Kelly (NRA Assistant Archaeologist)

Project Liaison Officer, Kilkenny Co. Council – Joe Gannon and Lisa Mulcahy

NATIONAL MONUMENTS, DOEHLG

Archaeologist – Martin Reid

IRISH ANTIQUITIES DIVISION, NATIONAL MUSEUM OF IRELAND

Assistant Keeper – Nessa O'Connor

ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by the National Roads Authority (NRA) through Kilkenny County Council, undertook an excavation at the site of AR078, Danesfort 2 along the proposed N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Figure 1). The following report describes the results of archaeological excavation at that site. The area was fully excavated by Richard Jennings under Ministerial Direction A032 and Excavation Registration Number E3540 issued by the DOEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between 25 June and 24 July 2007.

The site was identified as two phases of burnt mound activity, one in the early Bronze Age and a second in the early Iron Age. It is possible there were two separate phases of occupation in the Bronze Age.

The earliest dated feature on the site consisted of a sub-oval, bowl shaped trough (Trough 1) with an adjacent hearth, identified by a smaller cut with scorched sides and base. The trough was dated to the early Bronze Age. A shallow extension to the trough on the west side may have served as a step. A number of small pit features were identified in the general vicinity of the trough but it is not clear if these were directly related, and indeed their function remains unclear.

In the north of the site there was a very large and deep pit which may have functioned as a cistern or waterhole. The large pit was dated to the early Bronze Age but appears to be slightly later in date than Trough 1. It may therefore represent a second phase of Bronze Age activity on the site. The waterhole was not sealed by the main burnt mound spread however; there was evidence that some burnt mound material had been tipped into the feature, presumably after it was abandoned.

Located between the waterhole and Trough 1 were a series of features that represent the Iron Age phase of occupation of the site. These consisted of a large sub-oval trough (Trough 2) and adjacent large pit to the west. A number of irregular pits were identified to the east of the trough and may represent storage or perhaps evidence of land clearance in advance of the activity associated with the trough. Two structures were identified, the first of which (Structure A) consisted of a number of circular post-pits in a horseshoe shaped formation around the east of the trough. While the pits did not seem deep enough to support large (long) structural posts, the regular arrangement may have supported a platform erected on shorter posts around the trough. Some small stakeholes appear to have augmented the structure. At a distance of 5m to the east of Trough 2 was Structure B. This consisted of two parallel lines of four postholes. It is again interpreted that this may have been the location for a small platform (1.5m by 0.5m). Both Trough 2 and Structure B have been dated to the early Iron Age.

The overlying burnt mound deposits sealed almost all of the pits and troughs identified at the site, with the notable exception of the large waterhole. This probably indicates that the water in the waterhole was not heated, and it was a storage facility. It was not possible to identify which deposits were associated with the Bronze Age activity and which were associated with the Iron Age, as the mound deposits had been substantially levelled and disturbed over time. A number of modern drainage channels were also recorded, which truncated some of the features on the site.

Four samples were sent for AMS radiocarbon dating. A sample of ash and *Prunus* sp. charcoal from trough fill C54 was radiocarbon dated. The 2 sigma calibrated result was 2464–2214BC (UBA 12186). A sample of Pomoideae charcoal from

waterhole fill C111 had a 2 sigma calibrated result of 2116–1893BC (UBA 15553). A sample of cherry charcoal from posthole fill C122 was also radiocarbon dated. The 2 sigma calibrated result was 806–595BC (UBA 15554). A sample of *Prunus* sp. charcoal from pit fill C105 returned a 2 sigma calibrated result of 744–407BC (UBA 11000).

The Iron Age phase on the site contains features which conform in many ways with the features commonly found on burnt mound sites in terms of a trough, pits and burnt mound spread. The trough (Trough 2) however, does appear to be particularly deep and at 0.70m is approximately twice the depth of an average trough. Another deep, large pit is adjacent to the west end although not as large as the Bronze Age waterhole. The function of this pit, and indeed Trough 2 needs to be considered given their particular size and depth and it would seem unlikely that they were designed for cooking. The volume of water in such deep features would be more easily heated (for bathing) than boiled (for cooking). Trough 2 was also surrounded by a series of possible post-pits which may have supported a platform around the trough or indeed a small enclosed or roofed structure over the trough. A second possibly small structure or platform (B) 5m to the east consisted of parallel rows of four postholes. Structure A, Structure B and the trough were all on a similar east-west alignment, which is not likely to be coincidental.

The Iron Age phase at Danesfort 2 potentially represents a bathing place. This is significant in terms of our wider understanding of the function of *fulachta fiadh*/burnt mounds. It has been identified that this site type can have many functions and often the precise nature of the activity at excavated burnt mounds is unclear. The results of excavations at Danesfort 2 indicate that these varying functions can potentially occur in tandem when we consider the simpler trough and pits from the early Bronze Age; the subsequent unrelated very large early Bronze Age waterhole/cistern and the Iron Age possible bathing site.

Danesfort 2 is an important site locally as it represents the first evidence of early Iron Age activity in the immediate area and it adds to the considerable evidence from the Bronze Age that has been gathered through excavations as part of the N9/N10 Phase 4. It is, however, also of regional significance, based on the nature of the burnt mound activity identified at the site, in particular the Iron Age possible bathing site. A number of potential sweathouses and bathing sites have been confirmed from recent excavations of burnt mounds across the country and the results of the Danesfort 2 excavation will significantly add to the further study, analysis and understanding of the varied function and form of burnt mound sites.

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1 INTRODUCTION

1.1 General

This report presents the results of the archaeological excavation of Danesfort 2, AR078 (Figure 1), in the townland of Danesfort undertaken by Richard Jennings for IAC, on behalf of Kilkenny County Council and the NRA, in accordance with the Code of Practice between the NRA and the Minister for Arts, Heritage, Gaeltacht and the Islands. It was carried out as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4, which extends between Knocktopher in Co. Kilkenny to Powerstown in Co. Carlow. The excavation was undertaken to offset the adverse impact of road construction on known and potential subsoil archaeological remains in order to preserve the site by record.

The site measured 2834m^2 and was first identified during testing carried out in between 30 January and 3 March 2006 by Melanie McQuade (E3882) for Margaret Gowen & Co. Ltd. on behalf of the National Roads Authority. Danesfort 2 was excavated between June 25 and July 24 2007 with a team of one director, one supervisor and 14 assistant archaeologists.

1.2 The Development

For the purposes of construction, the N9/N10 Kilcullen to Waterford Road Scheme has been divided into separate sections, known as Phases 1–4. Phase 2 of the scheme extends from the tie-in to the Waterford City Bypass at Dunkitt, to Knocktopher in Co. Kilkenny (Ch. 2+000–Ch. 25+400). Phase 4 continues from Knocktopher to Powerstown in Co. Carlow (Ch. 25+400–Ch. 76+000) and includes the Kilkenny Link Road.

The roadway of the entire scheme includes approximately 64km of mainline high quality dual carriageway and 6.2km of the Kilkenny Link Road, which will connect the road development to the Kilkenny Ring Road Extension. The road development requires the realignment and modification of existing national, regional and local roads where the mainline intersects them. It requires the acquisition of 305 hectares of land for its construction. A further link road will connect the scheme to Paulstown in County Kilkenny, while six new grade separated junctions and three roundabouts are part of the road development.

1.3 Archaeological Requirements

The archaeological requirements for the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4: Knocktopher to Powerstown, are outlined in the Archaeological Directions issued to Kilkenny 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 Kilkenny County Council and Irish Archaeological Consultancy Ltd. These instructions form the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract are located between the townlands of Knocktopher, Co. Kilkenny, and Powerstown, Co. Carlow.

The proposed N9/N10 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Valerie J. Keeley Ltd and published in February 2005. The Record of Monuments and Places, the Site Monument Record, Topographical files, aerial photography, the Kilkenny and Carlow County Archaeological Urban Survey, and literary sources were all consulted. Two phases of geophysical survey were also conducted by Target (post-EIS geophysics carried out by ArchaeoPhysica) and an aerial survey was carried out by Margaret Gowen & Co. Ltd. As a result of the paper survey, field inspections and geophysical

survey, 35 sites were recorded in proximity to this section of the overall route alignment.

A previous archaeological assessment of Phase 2 of the scheme (test trenching conducted by Margaret Gowen & Co. Ltd. in 2006) extended into the lands acquired for Phase 4 to a point at Ch. 37+100 in the townland of Rathclogh, Co. Kilkenny. Thirty-four archaeological sites were identified within this area between Knocktopher and Rathclogh and subsequently excavated by Irish Archaeological Consultancy Ltd. as part of this archaeological contract.

Advance archaeological testing of the area between Rathclogh (Ch. 37+100) and Powerstown (Ch. 76+000) was completed by IAC during March–May 2007 and excavation of the sites identified during this process was also conducted by IAC between August 2007 and April 2008.

1.4 Methodology

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

All archaeological features were fully excavated by hand and recorded on *pro forma* record sheets using a single context recording system best suited to rural environment, with multi context plans and sections being recorded at a scale of 1:50, 1:20 or 1:10 as appropriate.

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

An environmental strategy was devised at the beginning of the excavation based on IAC in-house post-excavation and site methodologies and guidelines. Features exhibiting large amounts of carbonised material were the primary targets.

All artefacts uncovered on site were dealt with in accordance with the guidelines as issued by the NMI and where warranted in consultation with the relevant specialists. All archive is currently stored in IAC's facility in Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland.

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

All excavation and post excavation works were carried out in accordance with the relevant approvals and in consultation and agreement with the National Roads Authority (NRA) Project Archaeologist, the National Monuments Section of the DoEHLG and the National Museum of Ireland. Where necessary licences to alter and export archaeological objects were sought from the National Museum of Ireland.

References to other sites excavated as part of the N9/N10 Phase 4: Knocktopher to Powerstown are referenced throughout this report only by their site name e.g.

Paulstown 1. A list of these sites and details including director's name and National Monuments Excavation Reference Number can be referenced in Appendix 4.

Final Report Date Ranges

The following date ranges for Irish prehistory and medieval periods are used for all final reports for the N9/N10 Phase 4: Knocktopher to Powerstown excavations.

Mesolithic: 7000–4000BC
Neolithic: 4000–2500BC
Early Bronze Age: 2500–1700BC
Middle Bronze Age: 1700–1200BC
Late Bronze Age: 1200–800BC
Iron Age: 800BC–AD500
Early medieval period: AD500–1100
Medieval period: AD1100–1600
Post-medieval: AD1600–1800

Source:
Carlin, N., Clarke, L. & Walsh, F. 2008 *The M4 Kinnegad-Enfield-Kilcock Motorway: The Archaeology of Life and Death on the Boyne Floodplain*. NRA Monograph Series No. 2, Wordwell, Bray.

2 EXCAVATION RESULTS

Danesfort 2, a burnt mound, was located in a valley adjacent to a tributary that joins the King's River at the village of Ennisnag. The valley runs from west to east and is U-shaped. The burnt mound was located on the southern slope and base of the valley (Figure 4, Plate 1). It was not visible prior to excavation as it was obscured beneath a band of redeposited topsoil that lined the valley slopes. The valley sides were formed of boulder clay but its base was characterised by a loose concentration of medium- and large sized angular and sub-rounded stones. These probably related to a path which is depicted on the first edition Ordinance Survey Map (1839). At this time the valley was within Danesfort Demesne (the external stone wall perimeter of the Demesne is visible in Plate 1). It is very probable that at some point in the past this valley carried water into the Ennisnag tributary. Although dry and under pasture at the start of the excavation, when it rained the ground became saturated and the archaeological features rapidly filled with water, despite the presence of a modern drainage pipe running on the valley base. The location of the site in a gently winding valley only 54m OD meant that views from the site were quite restricted in all directions.

The burnt mound was situated within an archaeologically rich Bronze Age landscape (Ch. 33740-37100, Danesfort and Croan townlands). Evidence of funerary and domestic activity was discovered 0.4–0.6km to the south-west at sites Danesfort 12 and 13 where three ringditches, a pit circle and three cremations were found in low-lying land beside the Ennisnag tributary. Another ringditch was found 0.3km to the south-east at Danesfort 1 while Graves (1860–1) reported the discovery in 1838 of an intact Bronze Age urn in a sand pit next to a post-medieval turret (RMP KK023-080) which is visible 0.2km to the south of Danesfort 2. A prehistoric shelter on higher ground was recorded 0.7km to the north-east (Croan 1, AR081). Bronze Age sites were also excavated 1–1.8km to the north and north-east at Danesfort 5–7 including a settlement and cremation pits with late Bronze Age pottery. The next closest recorded burnt mound activity was recorded in a shallow basin at Danesfort 11, *c.* 2.3km to the north-west. In that instance, there was no mound and only features cut into the boulder clay survived.

2.1 PHASE 1 Natural Drift Geology

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A				Medium grey sandy gravel clay.	Natural

The subsoil comprised sandy, gravel clay.

2.2 PHASE 2 Early Bronze Age Activity

The primary features excavated at Danesfort 2 were dated to the early Bronze Age and were associated with burnt mound activity (Figure 5; Plate 2).

2.2.1 Trough 1 with adjoining Hearth

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C7	N/A	4.50	2.20	0.75	Irregular shaped cut of trough and hearth	Cut of trough
C7a	N/A	1.30	1.30	0.20	Roughly circular hearth cut	Cut of hearth
C8	C7/7a	4.50	1.30	0.30	Dark greyish black clayey silt	Upp. fill trough/hearth
C21	N/A	0.05	0.06	0.11	Circular shaped cut	Cut of stakehole
C22	C21	0.06	0.08	0.11	Mid greyish brown silty clay	Fill of stakehole
C33	C7	1.50	0.75	0.35	Light brownish grey silt	Upper fill of trough
C53	C7	2.50	1.80	25.4	Greyish black clayey silt	Middle fill of trough
C54	C7	1.80	1.60	0.25	Blackish grey silty clay	Basal fill of trough

Finds: None

The trough, C7, was located in the southern area of the site (Figure 5). It was bowl-shaped with an uneven stony base (Plate 3). The area to the west of the trough consisted of a shallower, sub-rectangular extension to the main bowl shaped trough cut that perhaps functioned as a small step. The trough was adjoined on its eastern (upslope) side by a small hearth C7a (Plate 4). It was impossible to distinguish between the fills of the two features as the fill of the hearth and the upper fill of the trough were identical. This fill contained a high ash component while the sides of the hearth were reddened due to the scorching of the earth. The lower fills of the trough also contained ash but in less substantial quantities. These fills, which had matrices of clay or silt, were dominated by charcoal and small angular fragments of heat-shattered sandstone. The evidence suggests that the hearth was used to heat sandstone blocks which were then placed into the water-filled trough to boil water. A solitary stakehole was identified adjacent to the hearth. The function of a single stakehole cannot be accurately assessed.

Charcoal analysis of fill C8 (fill of trough C7) indicated a predominance of hazel (*Corylus avellana),* ash (*Fraxinus excelsior*), pomaceous fruitwood (*Pomoideae*) wild/bird cherry (*Prunus avium/padus* sp.) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

A sample of plant remains (S14) from C54 was examined and no charred seeds were recovered from this sample (Johnston, Appendix 2.4).

Stone retrieved from C8, C33, C53 and C54 was analysed and was found to be coarse grained, quartz-rich, red sandstone. The sample examined from C54 also contained a burnt limestone piece. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.05g) of ash and prunus was chosen for AMS dating from C54 and returned a result of 3869±26 (UBA 12186). The 2 Sigma calibrated result for this was 2464–2214BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age period.

2.2.2 Features Adjacent to Trough 1

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C11	N/A	1.27	0.42	0.13	Elongated shallow pit	Cut of pit
C12	C11	1.27	0.42	0.13	Black silty sand with pebbles	Fill of pit
13	N/A	0.48	0.35	0.07	Sub-circular, gradual slope, concave base.	Cut of pit
14	C13	0.48	0.35	0.07	Black sandy silt with burnt stones, charcoal	Fill of pit
C15	N/A	0.90	0.68	0.12	Oval shaped shallow pit	Cut of pit
C16	C15	0.90	0.68	0.12	Black silty sand with stone and pebbles	Fill of pit
C17	N/A	2.80	0.49	0.22	Curvilinear shaped cut	Cut of channel
C18	C17	2.80	0.49	0.22	Dark brown silty sand	Fill of channel
C23	N/A	0.25	0.18	0.13	Oval shaped cut	Cut of pit
C24	C23	0.25	0.18	0.13	Dark greyish brown silty sand	Fill of pit
C25	N/A	0.45	0.25	0.18	Oval shaped cut	Cut of pit
C26	C25	0.45	0.25	0.18	Greyish brown silty sand	Fill of pit
C27	N/A	0.20	0.15	0.35	Circular cut	Cut of pit
C28	C27	0.20	0.15	0.35	Black silty sand	Fill of pit
C152	N/A	0.67	0.42	0.21	Oval shaped cut	Cut of pit
C153	C152	0.67	0.42	0.21	Black silty clay	Fill of pit

Finds: None

There were a number of features in the vicinity of the trough. These were generally shallow and probably not particularly significant. They were probably related to activity associated with the trough but form no particular pattern and contained nothing diagnostic in their fills to suggest a particular function. The most prominent feature was C17, a small curvilinear channel filled with burnt mound material. There was not enough evidence to suggest that it was structural and it may have formed naturally as a result of water erosion. Charcoal was identified from the fills but this was not sent for further analysis.

Stone retrieved from C153 (fill of pit C152) and C28 (fill of pit C27) was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.2.3 Large Waterhole C109 and adjacent Pit C5

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C5	N/A	1.60	1.50	0.11	Oval shallow pit with irregular base	Cut of pit
C6	C5	1.60	1.50	0.11	Grey-Black silt with no inclusions	Fill of pit
C52	C109	1.35	0.8	0.30	Tightly compacted light brown clay with small stones within.	Fill of pit
C106	C109	1.65	2.50	0.20	Dark brown silty clay	Fill of pit
C107	C109	2.10	3.50	0.30	Dark brown clay	Fill of pit
C108	C109	0.60	2.00	0.65	Medium brown silty clay	Fill of pit
C109	N/A	6.00	6.00	0.75	Oval shaped cut	Cut of pit
C110	C109	6.00	3.50	0.75	Dark grey thick marl	Fill of pit
C111	C109	1.70	1.70	0.25	Black clay with heat shattered stones	Fill of pit

Finds: None

At the north of the excavated area was a large pit which may have functioned as a waterhole/cistern. This may have utilised the location near the base of the valley to store water during periods of rain when there would be a surplus of surface water available. In drier conditions there was no obvious water source. The size of the waterhole appears to be slightly excessive given the small number of features identified on the site (Figure 4; Plate 8). Perhaps another site was located close by, although the proposed N9/N10 ran along the valley floor where it seems most likely that additional burnt mound activity would have been located if it had existed.

The waterhole was located away from the main cluster of burnt mound features and was not sealed by the dispersed burnt mound spread. Nevertheless, burnt mound material did find its way into the waterhole. It was found tipped into the waterhole (C111) on its southern side nearest Trough 2. The layer of burnt mound material was within thick, dark-grey marl (C110) which also contained occasional large sandstone rocks. These were probably the types of stones that were heated and then dumped into the troughs. Only one feature of archaeological potential was located in proximity of the waterhole. This consisted of a small shallow pit C5 which had no inclusions and as such its function is unclear.

While the waterhole was dated to the early Bronze Age (see below), the calibrated dates suggest that it was not contemporary with Trough 1, being slightly later in date. This may indicate a second phase of early Bronze Age activity on the site. The activity to the south of the waterhole has been dated to the Iron Age with the early

Bronze Age trough 1 being further south again. There is some indication that the Iron Age features have truncated some earlier features. Perhaps these were contemporary with the waterhole.

Charcoal analysis of fill C111 (fill of pit C109) indicated a predominance of pomaceous fruitwood (*Pomoideae*) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

Stone retrieved from C111 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of pomaceous fruitwood was chosen for AMS dating from C111 and returned a result of 3619±30 (UB 15553). The 2 Sigma calibrated result for this was 2153–1893BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age period.

2.3 PHASE 3 Iron Age Activity

2.3.1 Trough 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C128	N/A	2.25	1.60	0.75	Oval shaped cut	Cut of pit/Trough
C105	C128	2.25	1.60	0.75	Dark grey-black sandy silt, shattered stones	Fill of pit/Trough

Finds: None
Trough 2 consisted of a large, deep oval pit C128 with a U-shaped profile (Figure 4-6; Plate 5). No surviving timbers or stakeholes were found to suggest that it was wooden lined. Its fill of heat-shattered stones differed from that of the overlying burnt mound material in that it contained infrequent medium and large sized stones and was siltier and less clayey than the mound. It has been dated to the early Iron Age (see below). Associated with the trough were two separate phases of pits, predominantly to the east of the trough. The second phase of features appeared to be directly related to a structure erected over/around the trough. The earlier features were more irregular in plan and pattern and may be unrelated to the trough, perhaps being associated with the previously outlined early Bronze Age activity. These features were all located to the east of the trough.

Charcoal analysis of fill C105 (fill of trough C128) indicated a predominance of pomaceous fruitwood (*Pomoideae*) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3). A fragment of *Prunus* sp. was identified for radiocarbon analysis. This species was not identified in the wider analysis of the sample.

Stone retrieved from C105 was analysed and was found to be coarse grained, quartz rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of *Prunus* sp charcoal was chosen for AMS dating from C105 and returned a result of 2434±20 (UBA 11000). The 2 Sigma calibrated result for this was 744–407BC (QUB, Appendix 2.7) dating this feature to the early Iron Age period.

2.3.2 Large Pit C100

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C100	N/A	2.90	2.70	0.70	Irregular shaped cut	Cut of pit
C151	C100	2.90	2.70	0.70	Dark greyish black sandy silt	Fill of pit

Finds: None

A large sub-rectangular pit, C100, was located to the west of Trough 2 (Figure 5). The fill of this pit contained the same dark-greyish-black, sandy silt that was found in the adjoining trough. For this reason it is likely that the pit was contemporary with the trough and that the two were directly associated rather than one being a replacement for the other. No further analysis was carried out on the fill material C151.

2.3.3 Primary Phase of Pits to East of the Trough

A series of irregular shaped pits were identified in the area to the east of the trough.

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C44	C59	0.35	0.37	0.06	Mid greyish brown fine sand	Fill of pit
C57	N/A	2.40	2.20	0.32	Oval shaped cut	Cut of pit
C58	C57	1.10	0.88	0.17	Greyish black silty sand	Fill of pit
C59	N/A	0.76	0.74	0.20	Circular shaped cut	Cut of pit
C60	C59	0.70	0.66	0.15	Black fine sand	Fill of pit
C61	N/A	0.95	0.65	0.16	Circular shaped cut	Cut of pit
C62	C61	0.95	0.65	0.16	Black soil with stones	Fill of pit
C63	N/A	1.35	1.05	0.37	Irregular shaped cut	Cut of pit
C64	C63	1.35	1.05	0.37	Black silty sand	Fill of pit
C71	N/A	0.32	0.28	0.12	Circular shaped cut	Cut of pit
C72	C71	0.32	0.28	0.12	Black silty sand	Fill of pit
C75	N/A	0.33	0.33	0.07	Greyish black silty sand	Spread
C81	N/A	1.00	0.50	0.25	Irregular shaped cut	Cut of pit
C82	C81	1.00	0.40	0.25	Black sandy clay	Fill of pit
C91	N/A	0.80	0.40	0.13	Curved linear, gradual sides, linear base.	Cut of pit
C92	C91	0.80	0.40	0.13	Greyish black silty sand	Fill of pit
C93	N/A	1.25	0.60	0.32	L- shaped cut- upper part	Cut of pit
C94	C93	1.25	0.60	0.32	Black silty sand	Fill of pit
C112	C118	0.71	0.67	0.20	Dark brownish black silty sand	Fill of pit
C117	C57	2.40	2.20	0.21	Orange brown silty sand	Fill of pit
C118	N/A	0.71	0.67	0.20	V-shaped cut	Cut of pit
C129	N/A	1.00	1.00	0.30	Irregular shaped cut	Cut of pit
C130	C129	1.00	1.00	0.30	Black silty sand	Fill of pit

Finds: None

The pits were concentrated upslope on the eastern side of the trough over a 7m by 5m area. These comprised ten irregular-shaped shallow pits, the largest of which, C57, was 2.4m by 2.2m by 0.3m. All generally contained silty sand burnt mound material and must have performed some function that was related to the nearby trough. None of their bases were scorched to suggest that *in situ* burning took place in them. Perhaps their function was to store some form of organic material that has not survived in the archaeological record. They may also have been the result of some land clearance to facilitate the trough and associated structures. It seems unlikely that the purpose of the pits was to hold water given the adjacent presence of

a large trough and pit. Soil samples were processed from the pits to assess if any diagnostic material could be identified to suggest a function but predominantly only charcoal fragments were recovered. A few fragments of burnt bone were found in C64 (fill of pit C63) which may indicate domestic waste.

None of the pits were dated, however some of the pits were truncated by postholes and pits probably associated with a structure erected around or over Trough 2. It is possible therefore that these pits were associated with the early Bronze Age phase of activity on site, perhaps with the large waterhole C109 to the north. However their location, clustered immediately east of Trough 2 suggests a primary phase of activity associated with the trough.

Charcoal analysis of fill C94 (fill of pit C93) indicated a predominance of oak (*Quercus* sp.) although the level of charcoal from this context was low. This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

A sample of plant remains from C58 was examined and no charred seeds were recovered from this sample (Johnston, Appendix 2.4).

Burnt animal bone fragments were recovered from fill C64 of pit C63. A total of four calcined fragments of unidentifiable trabecular bone were recovered. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation (McCarthy, Appendix 2.5).

Stone retrieved from C60, C64, C72, C82, C93 and C112 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.3.4 Structure A at Trough 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C77	N/A	0.22	0.14	0.11	Circular shaped cut	Cut of stakehole
C78	C77	0.22	0.14	0.11	Black to dark brown soil	Fill of stakehole
C79	N/A	0.10	0.08	0.09	Circular shaped cut	Cut of stakehole
C80	C80	0.10	0.08	0.09	Black soil	Fill of stakehole
C87	N/A	0.13	0.11	0.22	Circular shaped cut	Cut of stakehole
C83	N/A	0.85	0.40	0.30	Circular shaped cut	Cut of pit
C84	C83	0.85	0.40	0.30	Black sandy clay	Fill of pit
C88	C87	0.13	0.11	0.22	Greyish black silty clay	Fill of stakehole
C89	N/A	0.14	0.13	0.16	Circular shaped cut	Cut of stakehole
C90	C89	0.14	0.13	0.16	Grey silty sand	Fill of stakehole
C95	N/A	0.40	0.38	0.40	Circular shaped cut	Cut of pit/posthole
C96	C95	0.40	0.38	0.40	Black silty sand	Fill of pit/ posthole
C97	N/A	0.60	0.50	0.21	Circular shaped cut	Cut of pit
C98	C97	0.24	0.20	0.09	Brownish black silty clay	Fill of pit
C123	C97	0.60	0.50	0.15	Mid brown sandy clay	Fill of [pit
C131	N/A	0.55	0.55	0.28	Rounded shaped cut	Cut of pit
C132	C131	0.55	0.55	0.15	Dark grey clayey silt	Fill of pit
137	N/A	0.12	0.10	0.09	Circular, steep sides and concave base.	Cut of stakehole
138	C137	0.12	0.10	0.09	Loosely compact black clay silt with grey hue.	Fill of stakehole
139	N/A	0.11	0.09	0.05	Circular, steep sides and concave base.	Cut of stakehole
140	C139	0.11	0.09	0.05	Loosely compact black clay silt with grey	Fill of stakehole

					hue.	
C141	C142	0.39	0.30	0.20	Greyish black silty sand	Fill of stakehole
C142	N/A	0.39	0.30	0.20	Circular within oval shaped pit	Cut of stakehole
C143	C144	0.50	0.40	0.47	Brownish black silty clay	Fill of pit/posthole
C144	N/A	0.50	0.40	0.47	Oval shaped cut	Cut of pit/posthole
C145	N/A	0.35	0.35	0.20	Rounded shaped cut	Cut of pit
C146	C145	0.35	0.35	0.20	Dark greyish black clayey silt	Fill of pit

Finds: None

Seven circular pits formed a horseshoe shaped structure around the trough. These pits contrasted with those of the earlier phase in that they were of consistent size and shape and tended to have steep sides and flat bases. The one characteristic that prevented all of them from being definitively categorised as postholes was their shallowness. Only three exceeded depths of 0.3m and the majority were over 0.4m in diameter. Also, none of them contained postpipes or packing material that might give an indication that they supported posts. However, the horseshoe-shaped distribution of the pits, effectively around the perimeter of the trough, suggests that they had a structural function, so perhaps they held short and thick posts which served as the foundation for a wooden platform that may have existed over or around the sides of the trough.

In four examples the circular pits truncated some of the irregular pits of the earlier phase. It was impossible to detect the cut of three examples due to their containing similar fills of charcoal and heat-shattered stones. If there was a difference, the matrices of the earlier pits tended to be silty sand while the circular pits had a greater silty clay component. This might indicate that the earlier pits had been deliberately backfilled while the later ones had naturally silted up. One cut was very clear: circular pit C95 truncated C118 (Figure 6; Plate 6).

Seven stakeholes were probably associated with the structure, being located predominantly along its east side. They may have provided some additional support to the post-pits. Some of them appeared to be cut into the earlier phase of pits including C89, C83 and C144.

Stone retrieved from C93/94 was analysed and was found to be coarse grained, quartz rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.3.5 Shallow Pit C147

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C147	N/A	0.90	0.40	0.25	Rectangular shaped cut	Cut of pit
C148	C147	0.90	0.40	0.25	Dark greyish black clayey silt	Fill of pit

Finds: None

A small rectangular pit C147, was cut into the northern side of the trough. It appeared to modify the existing oval trough creating a shallow step. Perhaps its function was related to the possible platform Structure A. Indeed, it appeared to respect one of the supporting post-pits C131. Its precise function is unclear.

2.3.6 Structure B

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C19	N/A	0.35	0.33	0.21	Circular shaped cut	Cut of posthole
C20	C19	0.35	0.33	0.21	Mid black, light grey hue, silty clay	Fill of posthole
C29	N/A	0.33	0.31	0.14	Circular shaped cut	Cut of posthole
C30	C29	0.33	0.31	0.14	Black soil with greyish hue	Fill of posthole
C48	N/A	0.35	0.30	0.39	Circular shaped cut	Cut of posthole
C49	C48	0.35	0.30	0.39	Black silt with greyish hue	Fill of posthole
C50	N/A	0.37	0.29	0.25	Circular shaped cut	Cut of posthole
C51	C50	0.24	0.20	0.11	Black, mid grey hue, silty clay	Fill of posthole
C55	N/A	0.36	0.32	0.36	Circular shaped cut	Cut of posthole
C56	C55	0.36	0.32	0.36	Black, light grey hue, silty clay	Fill of posthole
C101	N/A	0.34	0.30	0.42	Circular shaped cut	Cut of posthole
C102	C101	0.34	0.30	0.42	Black silt with greyish hue	Fill of posthole
C119	N/A	0.39	0.25	0.37	Oval shaped cut	Cut of posthole
C120	C120	0.39	0.25	0.37	Black , light grey hue silty clay	Fill of posthole
C121	N/A	0.28	0.26	0.39	Circular shaped cut	Cut of posthole
C122	C121	0.28	0.26	0.39	Black soil with greyish hue	Fill of posthole
C124	N/A	0.16	0.16	0.34	Circular shaped cut	Cut of stakehole
C125	C124	0.16	0.16	0.34	Greyish black silty sand	Fill of stakehole

Finds: None

Another possible structure - Structure B - was identified 5.5m east of and upslope of Trough 2. It comprised two parallel rows of four near-circular postholes, which were approximately 0.5m apart from each other (Plate 7). The postholes in each of the rows were also tightly spaced and in some instances were connected by a very shallow channel. The postholes were on average 0.35m in diameter and ranged in depth from 0.14m to 0.42m. There was no direct physical relationship between this structure and Trough 2. The postholes did however more closely resemble the post-pits of Structure A than the irregular pits of the earlier phase possibly suggesting the two structures were related. Both possible structures were also on the same alignment and contained similar fills of silty clays, charcoal and heat-shattered stones. The proximity of the postholes of Structure B suggests that their purpose was to support a small platform apparently measuring 1.5m long by 1m wide. Stakehole C124, located to the west of these postholes, may also have formed part of this structure.

Stone retrieved from C56, C102 and C122 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of cherry charcoal was chosen for AMS dating from C122 and returned a result of 2571±25 (UB 15554). The 2 Sigma calibrated result for this was 806–595BC (QUB, Appendix 2.7) dating this feature to the early Iron Age period.

2.4 PHASE 4 Burnt Mound Deposits

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	14.35	13.80	0.57	Black silty clay, burnt stones, charcoal	Spread
C46	N/A	25.00	9.00	0.30	Mid brown clay, burnt stones, charcoal	Spread
C37	N/A	4.00	2.00	0.15	Dark brown silty clay, burnt stones, charcoal	Spread
C38	N/A	4.20	1.50	0.35	Light brown silty clay, burnt stones	Spread
C39	N/A	2.30	1.20	0.25	Grey brown silty clay, burnt stones	Spread

Finds

Context	Find Number	Material	Period	Description
C3	E3540:003:001	Flint	Early Neolithic	Retouched artefact, probable scraper
C3	E3540:003:002	Quartz crystal	Early Neolithic	Natural chunk
C3	E3540:003:003	Quartz crystal	Early Neolithic	Retouched artefact, probable scraper
C3	E3540:003:004	Quartzite	Early Neolithic	Rubbing stone
C3	E3540:003:005	Quartzite	Early Neolithic	Rubbing stone
C3	E3540:003:006	Copper alloy	Medieval	Stick pin

The burnt mound (C3/C46) was not noticeable as a mound prior to excavation as its sides were covered by topsoil and ploughsoil deposits of up to 0.5m deep (Figure 4). The highest point of the mound was covered by only 0.25m of soil. The removal of the soil revealed an irregular shaped mound 13m by 14m that was up to 0.57m deep (Figure 4; Plate 1). The darkest and densest visible concentrations of charcoal and heat-shattered stone were located in the area between the two troughs and in the waterhole to the north of Trough 2. No tip lines or multiple phases could be distinguished within the burnt mound even though two phases of activity were recorded. The mound itself had a silty clay matrix with abundant charcoal and heat-shattered sandstones. The sandstone fragments were pinkish in colour, angular, easily scratched and typically 0.07m long. A few prehistoric finds were recovered from the mound including flint flakes and a possibly later copper-alloy pin.

C37, C38, C39 and C46 were deposits found on top of, or banked up against, the main burnt mound deposit C3 (Figure 6). They all contained heat-shattered stones which were lighter in colour than the mound as a result of contact with ploughsoil. Those in the valley base (C46) had probably come displaced from the mound due to water erosion, drainage, agricultural activity or the construction of the path that once ran on the valley base.

While the burnt mound deposits were clearly associated with two distinct phases of activity on the site - Bronze Age and Iron Age - it was not possible to identify which deposits were related to which phase as the mound material had been substantially levelled and disturbed presumably by post-medieval and modern agricultural practices.

Five lithics were retrieved from C3. These include one flint retouched artefact (Figure 7) and one quartz crystal retouched artefact both of which were probably used as scrapers, two quartzite rubbing stones and one natural chunk of quartz crystal. The assemblage is technologically and typologically diagnostic and dates to the first half of the Neolithic period (Sternke, Appendix 2.1). No Neolithic activity was identified on the site but the presence of these artefacts within the disturbed burnt mound material may indicate that Neolithic activity was located nearby.

A copper alloy stick pin (003:6) with an undifferentiated head was also recovered from C3. It has a circular, tapering shank that is decorated with transverse lines and is hipped in the upper part of the shank, which would have helped the pin to grip the garment. It dates to the medieval period, specifically to the early 12th/13th centuries (Scully, Appendix 2.2). While no medieval activity was recorded at Danesfort 2, there is activity recorded to this period in the locality. Excavations carried out along the N9/10 identified medieval activity at Danesfort 4 and 6 in particular. In the 13th century Danesfort was the centre of a thriving borough in a manor of the same name (Empey 1990, 80).

Burnt and unburnt animal bone fragments were recovered from burnt mound spread C3. A total of 15 bone fragments (90.6g) (including two teeth) representing 12 possible skeletal elements were identified. Species identified included cow (*Bos*), pig

(*Sus*) and sheep/goat (*Caprinae*). Small fragment size combined with a poor degree of preservation meant it was not possible to identify the species of 6 fragments (24.3g). One fragment of unidentified bone had evidence of butchering. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation (McCarthy, Appendix 2.5).

It is significant that sandstone is the predominant rock type in the mound material given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area (Mandal, Appendix 2.6).

2.5 PHASE 5 Modern activity

2.5.1 Drains

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C4	N/A	ran across site	0.37	0.34	Cut of linear feature	Modern drain
C36	C4	ran across site	0.37	0.34	Contained plastic water pipe	Fill over Pipe
C158	N/A	ran across site	1.26	0.50	Cut of linear feature	Modern drain
C159-161	C158	ran across site	1.26	0.50	Fills of linear feature	Fills of modern drain

Finds: None

These modern drainage features demonstrated the necessity of draining the land due to the low-lying location created by the valley (Figures 4–5).

2.6 PHASE 6 Topsoil and Plough soil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A	across site		0.25-0.50	Dark brown sandy silty clay	Topsoil

Finds: None

The topsoil comprised sandy, silty clay and contained no artefacts.

3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Danesfort 2. This includes the analysis of the physical and archaeological landscape, the compilation of information gathered during research into the site type, date, and function, and the results of the excavation and specialist analysis of samples taken during the course of on-site works.

3.1 Landscape Setting

3.1.1 The General Landscape – compiled by Michelle Brick

The topography of the region through which the route passes is generally flat with an average height of 70m O.D. The southern periphery of the route is bordered by Kilmacoliver (261m) and Carricktriss Gorse (314m), with Slievenamon (721m) further west. The Slieveardagh hills (340m) are visible on the western horizon in the south of the route and with the exception of Knockadrina Hill (140m), the enclosed landscape is made up of minor undulations. In the centre of the route Freestone Hill (130m) and Knocknagappoge (334m) further north are the significant uplands. A number of hills and mountains are visible in the distance to the east and west of this area of the landscape but the topography remains generally flat. To the north the Castlecomer Plateau influences a rise in the overall topography of the region. This expanse of terrain stretches along the north-east margins of Kilkenny, crosses the county border into Carlow and stretches northwards into Laois. This plateau consists of a variety of hills and peaks including Mountnugent Upper (334m), Baunreagh (310m), Knockbaun (296m), Brennan's Hill (326m) and Fossy Mountain (330m). These hills contain seams of anthracite coal as a result of millions of years of compression, and consequently Shales and Sandstones were formed which are evident throughout the plateau. Mining in the region began in the 17th century, continued for over 300 years and it is for what Castlecomer is best known. According to the Environmental Protection Agency soil maps of Ireland, the underlying bedrock of the entire region primarily consists of Carboniferous Limestone. However there is also a small amount of surface bedrock, sands, gravels, shales and sandstone Tills present along the route. The soil cover of the region is primarily composed of Grey Brown Podzolics, Renzinas and Lithosols. Additional soil types also present along the route include Brown Earths, surface Water Gleys and Ground Water Gleys.

The prevailing water courses within the landscape of the N9/N10 Phase 4 are the Rivers Nore and Barrow. The River Nore rises on the east slopes of the Devil's Bit in Co. Tipperary and flows eastwards through Borris-in-Ossory and then south through Co. Kilkenny, passing through the towns of Durrow (Laois), Ballyragget, Kilkenny, Bennettsbridge and Thomastown to join the River Barrow upstream of New Ross, Co. Wexford. It is 140 kilometres long and drains a total catchment of 1572 square kilometers and runs through the central and southern sections of the route. In the south of the route three main tributaries of the River Nore are evident. The Kings River flows east through Callan and Kells. It is joined by the River Glory which meanders on a north-south axis towards the western margins of the route landscape and the Little Arrigle River flows along the southern fringes. These rivers are flanked by low-lying valleys that are characterised by wet, marshy land. The condition of the soil improves further north beyond the King's River where the influence of these waterways declines. In the northern area of the route the River Dinin is a tributary of the River Nore flowing south-west from Brennan's Hill through the Castlecomer Plateau. The Plateau is the tableland that is the watershed between the Rivers Nore and Barrow (Lyng 1984). The River Barrow is the second longest river (193 kilometres) in Ireland after the River Shannon. It rises in the Slieve Bloom Mountains in Co Laois and flows east across bogs and lowlands and then turns south into the lowland immediately east of the Castlecomer Plateau. It passes through

Portarlington, Athy, Carlow, and Graiguenamanagh and runs through northern section of the route. It is joined by the River Nore at New Ross. The Maudlin River is the notable tributary of the River Barrow within the landscape of the route and flows east from Old Leighlin, with minor tributaries of it flowing through Bannagagole. There are also streams and minor watercourses present throughout the entire landscape and these waterways would have been a valuable resource to past communities and would also have had a major influence on settlement and the surrounding land use.

The physical landscape through which the N9/N10 Phase 4 passes can be divided into three principal areas defined by the main rivers and their catchments. The southern area is located in the undulating landscape on the western flanks of the Nore Valley. The central area is dominated by the fertile watershed between the Barrow and Nore systems in the hinterland of Kilkenny City. The northern area is located on the western flanks of the Barrow Valley overlooked by uplands to the north and west. Danesfort 2 is located in the central landscape area.

3.1.2 The Central Landscape

The central landscape of the route encompasses the environs of the Nore Valley and the hinterland of Kilkenny City. The underlying bedrock of the region is made up of Carboniferous Limestone sands and gravels, Carboniferous Limestone Tills, Shale's and Sandstone Tills. According to the EPA the natural soils of the region consist of Renzinas and Lithosols in areas dominated by underlying bedrock of Carboniferous Limestone sands and gravels. Soil cover consisting of Grey Brown Podzolics and Brown Earths is present in areas of underlying Carboniferous Limestone Tills and Surface Water Gleys and Ground Water Gleys are the soils present where the underlying bedrock is made up of Shale's and Sandstone Tills. This landscape is underlain not only by the Butlersgrove geological formation but also by the Ballyadams formation (thick-bedded calcarenitic wackestone on erosional surfaces). A large number of quarries in the area, some of which produced the distinctive blue 'Kilkenny limestone' that was used to construct the medieval and later city, occur around the city itself and extend southward into the dolomite formations along the Nore around Dunbell (Tietzsch-Tyler, 1994).

The glacial drift around the Kilkenny City hinterland, along the Kilkenny Link Road, comprises sandy (50–60%), gravely clay with a noticeably higher sand content than along the southern plain of the River Nore. As this section crosses existing watercourses, areas of granular deposits and several isolated sand and gravel lenses were noted. The floodplain of the Nore extends *c.* 80m on the western side and *c.* 50m on the eastern side, creating marsh and wet grassland within the immediate area. The nature of the glacial drift and geology, combined with the water sources and floodplains in the area, has resulted in the high quality of the local pastoral and arable agricultural landscape. The topography in this section remains between 50m and 80m OD creating open and expansive views over the confluence of the Nore and Kings Rivers. Mountains are visible on the horizon to the north, east and south-east. Freestone Hill (130m) is located directly to the North and Knocknaguppoge beyond this rises to 334m. Outside the parameters of this landscape lies Brandon Hill (513m) to the south-east and further to the east are the Blackstairs Mountains (735m) and Mount Leinster (795m). The River Nore is the prevailing water course of the region and the River Barrow flows along the margins to the east. The Kings River is located to the south and would have influenced activity in and around this area.

3.1.3 Site Specific Landscape

Danesfort 2, a burnt mound, was located in a valley adjacent to a tributary that joins the King's River at the village of Ennisnag. The valley runs from west to east and is U-shaped. The burnt mound was located on the southern slopes and base of the valley (Figure 4; Plate 1). It was not visible prior to excavation as it was obscured beneath a band of redeposited topsoil that lined the valley slopes. The valley sides were formed of boulder clay but its base was characterised by a loose concentration of medium- and large sized angular and sub-rounded stones. These probably related to a path which is depicted on the first edition Ordinance Survey Map (1839). At this time the valley was within Danesfort Demesne (the external stone wall perimeter of the Demesne is visible in Plate 1). It is very probable that at some point in the past this valley carried water into the Ennisnag tributary. Although dry and under pasture at the start of the excavation, when it rained the ground became saturated and the archaeological features rapidly filled with water, despite the presence of a modern drainage pipe running on the valley base. The location of the site in a gently winding valley only 54m OD meant that views from the site were fairly restricted in all directions.

The burnt mound was situated within an archaeologically rich Bronze Age landscape (Ch. 33740–37100, Danesfort and Croan townlands). Evidence of funerary and domestic activity was discovered 0.4–0.6km to the south-west at sites Danesfort 12 and 13 where three ringditches, a pit circle and three cremations were found in low-lying land beside the Ennisnag tributary. Another ringditch was found 0.3km to the south-east at Danesfort 1 while Graves (1860–1) reported the discovery in 1838 of an intact Bronze Age urn in a sand pit next to a post-medieval turret (RMP KK023-080) which is visible 0.2km to the south of Danesfort 2. A prehistoric shelter on higher ground was recorded 0.7km to the north-east (Croan 1). Bronze Age sites were also excavated 1–1.8km to the north and north-east at Danesfort 5–7 including a settlement and cremation pits with late Bronze Age pottery. The next closest recorded burnt mound activity occured in a shallow basin at Danesfort 11, *c.* 2.3km to the north-west. In that instance, there was no mound and only features cut into the boulder clay survived.

3.2 The Archaeological Landscape

As part of the general research relating to sites along the scheme and the specific research relating to Danesfort 2, the known archaeology within the surrounding landscape was assessed in order to establish the level and type of activity in the surrounding area in the past. This included a review of information from the Record of Monuments and Places, previous excavations and other relevant documentary sources including mapping and other sites excavated as part of the N9/N10 Phase 4 scheme. The excavated archaeology at Danesfort 2 has been identified as being Bronze Age and Iron Age in date.

3.2.1 General Bronze Age Landscape of the Scheme – compiled by Michelle Brick

The archaeological record implies that the Irish Bronze Age (2500–800BC) population dramatically increased from that of the Neolithic and the evidence for permanent settlements with considerable longevity becomes much more substantial. In addition, a wide range of ritual and funerary activity associated with this settlement is apparent. The overall environmental record for Ireland suggests that there was a general climatic deterioration in the Bronze Age, bringing wetter, colder conditions; during this period there was also accelerated forest clearance with more intensive habitation in the drier lowlands. As a result of extensive development-led projects across the country, understanding of settlement and burial patterns from the early Bronze Age has greatly developed. The distribution of the prehistoric evidence shows

that the Rivers Nore and Barrow provided a focus for settlement. In the central part of the current portion of the N9/N10 Phase 4 the fertile Kilkenny lowlands have produced some Bronze Age archaeology, particularly in Danesfort and Ennisnag townlands. In the northern part of the scheme intense settlement is indicated by both burnt mounds and barrows existing on the uplands of the Castlecomer Plateau and the flanking valleys of the Nore and Suir. Hillforts appear to be positioned to overlook the settlement activity, as well as the route of the Nore, the lower saddle to the north of the Slieveardagh Hills, and to the south of the spur surmounted by Clonmantagh. A considerable number of ringditches, cremation and inhumation burials (single and grouped), burnt mound sites, structures and domestic settlement evidence, have been recorded as part of the Bronze Age on of the N9/N10 Phase 4.

In the southern landscape the exposure of domestic Bronze Age settlement was less forthcoming than that of the northern landscape. There was little direct evidence for structures in the southern and central landscapes with the exception of a cluster of structures in the Danesfort area. Instead most of the settlement activity that fell within the roadtake was noted in the northern landscape, further to the north of Kilkenny and in Carlow. Ritual and burial is a dominant feature of the Bronze Age in Kilkenny and Carlow as indicated by the presence of flat cemeteries, burial cairns, ringditches, mounds, barrows and hillforts throughout these counties. Freestone Hill situated in Coolgrange, Co. Kilkenny, in the centre of the present landscape is just one example of these sites. Along the lower part of the Nore Valley, and concentrated in the Foulksrath and Jenkinstown areas, the landscape is dominated by barrows (in this case more specifically ringditches). The contrasting locations of these site types most probably relate to differential landscape exploitation by the same communities with some activities, possibly associated with the seasonal use of upland pasture, confined to higher terrain and settlement and funerary activity taking place in the more sheltered lowlands.

The significant number of burnt mound sites discovered due to the N9/N10 excavations, combined with the previously known examples in the RMP reinforces the concept that Bronze Age activity in Kilkenny and Carlow was considerable. A total of 36 sites with evidence for burnt mound activity were uncovered during the N9/N10 excavations, with an additional example discovered, and preserved outside, the roadtake. The burnt mounds are focussed in the upland area, especially along the river and stream valleys, such as at Clashduff, Coan West and Muckalee on the Dinin and Douglas Rivers, and in the upland hinterland of Freestone Hill.

The distribution of the prehistoric evidence shows that the Rivers Nore and Barrow provided a focus for Bronze Age settlement. The patterning of human activity in the region indicates that these were also the principal route-ways in prehistory; both were navigable by small craft but they, and the major tributaries of the Nore– the Dinin and King's Rivers – were also conspicuous landscape features that facilitated accurate navigation through this landscape. The Barrow and Nore also provided access to wider networks beyond the region.

The Central Landscape: Domestic Settlement

The characteristics of the prehistoric settlement landscape change from the peripheral activity located alongside the River Nore floodplains of the southern landscape to a slightly more permanent and defined settlement in the central landscape. The direct domestic settlement evidence, albeit limited, indicates the presence of a Bronze Age community in the locality. As the evidence for peripheral settlement activity including burnt mounds and funeral monuments was also limited, this area may have been dominated by small-scale settlement. The area contained soils amenable to farming and perhaps the area was cultivated, rather than settled.

The majority of the evidence was centred upon the Danesfort area which may consequently represent an important focus of activity, perhaps with considerable longevity.

Danesfort 5 was located upslope from a burnt mound site in Croan (unexcavated and not a Recorded Monument) and contained three post-built, circular houses with south-east-facing porches and internal hearths. Structure 1 overlay the remains of postholes, stakeholes and a possible fireplace, which may have represented an earlier structure or shelter. The morphology of these houses, with their regularly spaced postholes, would indicate a middle-late Bronze Age date, as also suggested by middle to late Bronze Age pottery. At Dunbell Big 2 there was a shallow, circular gully with internal postholes, an east-facing entrance (representing a possible structure) and a pit containing middle Bronze Age domestic pottery. A small lithic assemblage, including a convex end scraper, flake and debitage, came from Holdenstown 1. Holdenstown 3 also produced sherds from two fine middle Bronze Age domestic vessels.

A major prehistoric complex was identified at Templemartin 5 where settlement, industry and burial continued episodically until the late Bronze Age. The site was situated on the top of a northwest-southeast ridge and overlooked the surrounding countryside of rolling pasture land. At this site a series of six ringditches were recorded, two of which extended beyond the area of excavation and are therefore preserved *in situ*. One of the ringditches (5.2m external diameter) was penannular with a gap of 0.8m in the south-east and an almost-centrally located hearth. The presence of a hearth, with evidence for *in situ* burning, suggests that this 'ringditch' was the foundation trench for the wall of a structure, rather than a funerary monument. It was post-dated by another ringditch which cut through its western side. Other peripheral and possible settlement activity, in the form of pits, Bronze Age pottery and postholes, was noted at Danesfort 7, 8 and 9, as well as Ennisnag 1.

The Central Landscape; Funerary and Ritual activity

The previously known Bronze Age burial record of this landscape included two prehistoric burials excavated by Cassidy in 1991 at Dunbell Big (Cassidy 1991a and b). There at Ringfort No. 5, a pit containing a badly damaged Bronze Age food vessel was found and the second burial was discovered within a cist. The cist fill was mainly a reddish loam and on its side at its base was an intact food vessel containing and surrounded by burnt bone (*ibid*.). Other significant funerary activity includes the single grave sites of Garrincreen to the west and Grange Lower (Waddell 1990, 103) to the south-east. Bowl burials have also been discovered at Wells, Slyguff and Kilgraney, Co. Carlow, sites that border the eastern margins of this study area.

Ten sites produced evidence for funerary activity in this section of the N9/N10, primarily in the form of ringditches: Danesfort 1, 12 and 13, Kilree 4, Holdenstown 1 and Templemartin 5. However, the Danesfort 12 and 13 ringditches have produced Iron Age dates. The Danesfort 1 ringditch had cremated bone in the middle of its three fills, at opposite sides of the ditch. At Danesfort 6 a deep, flat-bottomed, straight-sided circular pit containing sherds of at least three vase urns and a cremation pit with a marker post were identified. At Danesfort 7 a middle-late Bronze Age flat cemetery was characterised by eight circular pits associated with token cremations. There are also some previously recorded finds from the Danesfort area, in particular a lidded vase that was found in the 19th century. Graves (1860) refers to the discovery of three 'sepulchral urns' found in Danesfort by Lady Elizabeth and Captain Wemyss, in the proceedings of the September meeting of the Kilkenny and South East of Ireland Archaeological Society in 1860; two of these are described as rare and highly ornamented. The exact location of these finds has been questioned

but excavated evidence of Bronze Age funerary activity in this townland, as a result of the N9/N10, supports the authenticity of the discovery.

An isolated cremation pit at Kilree 1 was capped with a saddle quern. At Kilree 4 a double ringditch was located on the edge of the Nore floodplain overlooking a potential crossing point. The fills of both the external and internal ringditch contained charcoal, animal bone and burnt bone. A possible cremation pit was identified and contained a single piece of copper in the middle fill; charcoal, burnt bone and burnt clay were also found in the fills. A funerary complex was identified at Holdenstown 1 and consisted of three ringditches, one of which was badly truncated. The primary phase of one of the small ringditches contained cremated material; this ringditch was later re-used to enclose a small inhumation cemetery. The activity at Holdenstown 1 fits into a wider landscape as the adjacent site of Dunbell Big 2 contained evidence for Bronze Age settlement and Holdenstown 2 also had evidence of prehistoric activity.

Two pits from the multi–phased site Templemartin 5 contained cremations in Grooved Ware vessels. In addition there were six ringditches, at least five of which were later in date than the two cremation pits. These ringditches formed the main concentration of activity probably during the Bronze Age and focused the funerary action on a rise to the north-east of the site, at the edge of a north-south gravel ridge overlooked by Freestone Hill. One was penannular, and its entrance faced the south-east, typical of the Bronze Age period and it pre-dated the other ringditches. It is possible that this represents the slot trench of a structure rather than a funerary monument. Fifteen cremation pits were identified on the site: two of these dated to the late Neolithic. The main focal point of the cemetery was also the highest point of the site and was on the edge of a ridge overlooking the surrounding countryside, and two of the ringditches and a concentration of Bronze Age cremation pits were located here. Five of the cremation pits had evidence for marker posts/stones and two others had been formally capped or sealed with sterile material. The amount of bone contained in any of the above cremations could only be considered as a token deposit of any individual. Two cremations, Cremations 9 and 11, display evidence of structured deposition and have larger chunks of bone than the others, suggesting these two might be slightly earlier, perhaps middle Bronze Age in date. The rest of the cremations had only very small pieces of bone which suggests that they were more intensely processed: perhaps more indicative of a late Bronze Age date. Possible pyre remains were represented by deposits located to the south of the main concentration of cremations

The Central Landscape; Burnt mounds

Only seven sites with evidence of burnt mound activity were uncovered within the central landscape. Two of the three Danesfort sites were located close together (Danesfort 10 and 11) and a further two sites were also located in proximity to each other (Rathgarvan or Clifden 1 and Maddockstown 1). Burnt mound activity discovered at Danesfort 2 was situated on the southern slopes of a small valley near the Ennisnag tributary of the King's River in the southern end of this landscape. Holdenstown 4 was not located close to any other burnt mounds however it was situated on flat terrain with good visibility southwards to Holdenstown 3. Rathgarvan or Clifden 1 and Maddockstown 1 were located on flat, wet grassland. Rathgarvan or Clifden 1 had evidence for natural springs and a waterhole which would have supplied water on-site. The River Nore meanders NNW–SSE to the south-east of both these sites. Burnt mound activity was also excavated at Leggetsrath East 1 which was located on the eastern edge of the floodplain of a small river/stream. This site was also on marginal land but was surrounded to the north and south by well-drained pastureland. Other burnt mound sites recorded in the vicinity include those at

Bishopslough West (KK024-037, 38), Maddockstown (KK020-052), Rathcash West (KK020-077, 78) and Cloghoge (KK020-039, 075, 76).

The Central Landscape; Route-ways and Communications

It is evident that the Nore, Dinin (and its tributary the Douglas) provided the landscape links within the extensive late Bronze Age settlement distribution to the north of Kilkenny extending from the lowlands up into the uplands of the Castlecomer Plateau. However, beyond this the Nore also leads to the lowland zone in mid-Laois with its core of prehistoric activity, as well as to the sources of the Suir and contact with other major settlement cores at, for example, Cahir and Cashel. To the south the King's River, rising in the Slieveardagh Hills, also provides access to the Suir Valley.

While it is clear that the rivers and streams are a major feature of the settlement networks, the distribution of prehistoric activity shows that other route–ways were functioning at both a local and regional scale. Some of these were already important in the early Neolithic while others became prominent only in the Bronze Age. Among the most significant of these are those on the eastern side of the Barrow in the Goresbridge area that formed the core of a settlement zone that in the Bronze Age extended westwards across the river into the Paulstown area of Co. Kilkenny. The immediate environs of Kilkenny City also appear in the Bronze Age as a settlement focus. Additionally the major focal site on Freestone Hill has been highlighted by the discovery of new sites on the lowlands immediately to the south around Rathcash.

The Central Landscape; Conclusions

While the central part of the N9/N10 Scheme through the fertile Kilkenny lowlands has produced some Bronze Age archaeology, particularly in the Danesfort and Ennisnag areas, this low level of activity reflects the known site distribution patterns. This picture provides an interesting contrast with the dense settlement in the early medieval and medieval periods but it is probably significant that the two nodes of Bronze Age settlement identified are in slightly more elevated terrain overlooking the Nore and King's Rivers. More significant in this study area is the rich array of Bronze Age funerary activity uncovered along this portion of the N9/N10 route.

3.2.2 The General Iron Age Landscape of the Scheme – compiled by Michelle Brick

As with wider settlement patterns in Ireland, direct evidence for Iron Age (800BC–AD500) domestic habitation was not identified, although several furnaces, kilns and ringditches date to this period and attest to an Iron Age presence in the area. It is possible that some smaller Iron Age ringditches were in fact structural, rather than funerary. Evidence for Iron Age domestic settlement activity remains indirect and peripheral in Kilkenny and Carlow, and in Ireland as a whole.

The Southern Landscape

Direct evidence of Iron Age activity in the southern landscape of the N9/N10 Phase 4 is limited. There is a marked absence of hillforts from south Kilkenny but this does not necessarily infer absence of settlement (Gibbons 1990, 20). A small number of features produced Iron Age dates in this landscape as a result of the N9/N10 Phase 4 excavations. A posthole dating to this period (165BC–AD16; UBA 10984) was excavated at Baysrath 2, and belongs to a possible structure indicating potential domestic settlement in the region. At Tinvaun 2 a possible hut structure was identified which consisted of four truncated slot-trench-like pits, a posthole and a shallow, roughly central pit in the interior of the area. Dates returned for this possible structure have indicated that it was in use during the Iron Age period (AD5–124; UBA 12169). There was also some metalworking activity on site and this structure may have been associated with it. Further to this, a posthole and a hearth excavated at Danganbeg 1 also dated to the Iron Age (762–416BC and 41BC–AD 55; UBA 14025

and UBA 14024 respectively). No funerary features belonging to the Iron Age were excavated as part of the present Phase 4 in the southern landscape. However, some metal working activity in the form of slag pits/furnaces and funerary activity in the form of a ringditch has been excavated at Baysrath directly to the south of the present excavations and have been dated to the Iron Age period (Channing 2007). Three circular structures excavated at this site have also been dated to this period (AD60–131, AD25–128 and 88BC–AD53; UBA 10684, UBA 10685 and UBA 10691 respectively) indicating a strong Iron Age presence in this area (*ibid.).* A ditch dating to the Iron Age (39BC–AD74; UBA 10993) was excavated at Tinvaun 1; burnt mound activity associated with the Bronze Age was also excavated at this site and this ditch relates to a later phase of activity at the site. At Knockadrina 2 (51BC–AD78; UBA 12178) an Iron Age furnace was excavated and at Stonecarthy West 1 a possible trough also yielded an Iron Age date (771–539BC; UBA 12174), however other features associated with a burnt mound on the site returned Bronze Age dates.

The Central Landscape

As with the southern landscape there is no direct evidence for Iron Age settlement although there are many early medieval RMP sites in this area, the majority of which are ringforts and enclosure sites, such as the ringforts recorded at Woolengrange (KK024-079 and KK024-082) and the enclosures at Carran (KK024-021001, 2) . Iron Age activity in the county is represented by the Hillfort at Freestone Hill where a defensive hillfort and inner enclosure (KK020-018002) was built encircling the hill-top (Gibbons 1990, 18), re-using the site of an earlier burial cairn (KK020-018001). The site was then re-occupied *c.* AD300 (Raftery 1969). Another possible Iron Age hillfort is located at Cotterallsrath located to the west of the southern end of this central landscape. Directly to the north-east of this site and located four miles south of Kilkenny City are the remains of a linear earthwork at Grevine West (Gibbons 1990, 20), also indicating an Iron Age presence in the region. Additionally, excavations were carried out at two ringforts in the townland of Dunbell; Dunbell 6 in 1972 and Dunbell 5 (KK024-010) in 1990 (Foley 1974; 2006; Cassidy 1991). The ringfort settlement at Dunbell 5 in particular produced dates from the Bronze Age to the eighth–10th centuries AD including evidence of Iron Age occupation.

Two clusters of Iron Age activity were noted from the N9/N10 excavations within the central landscape, at Danesfort and at Kilree and Holdenstown. These sites exhibited evidence for funerary activity and no evidence for domestic settlement was uncovered within this central landscape. At Danesfort 13 the primary fill of a ringditch returned a radiocarbon date of 503–384BC (UBA 10999) and was considered to be associated with two similar ringditches excavated at the neighbouring site of Danesfort 12. A fine glass bead found within a pit at Danesfort 13 also indicated that Iron Age activity continued in the Danesfort area, confirming the longevity of Danesfort as a focus for prehistoric funerary activity and although the area continued to be occupied in the early medieval period the focus then shifted towards settlement. Iron Age activity was excavated at Kilree 4, a site which contained a probable token cremation burial within a double ringditch (171BC–AD4), which was located on flat, gravely ground that overlooked the River Nore and its floodplain. At Holdenstown 1, three ringditches of possible Iron Age date were excavated. The largest was penannular in plan and had an undug, east-facing causeway. The two best preserved ringditches had evidence of re-cutting which may have been a symbolic act of redefining the burial monument. The primary phase has been interpreted as representing funerary feasting while the secondary phase consisted of burial possibly dating to the late Iron Age. Both ringditches were subsequently re-cut and were backfilled with material which included burnt bone, charcoal, seeds, and animal bone. The quantity of cremated bone is indicative of token cremation mixed with pyre debris. Although Ringditch 3 was heavily truncated, it also contained evidence of

token cremation. The evidence thus far is indicative of burial potentially in the Iron Age and the site was later re-used as an inhumation cemetery known as a ferta, during the early medieval period. A shallow, northeast-southwest linear ditch spanned the entire width of the site at Holdenstown 1. The precise function of this ditch is unknown; however, its length and the fact that no return was identified suggest that it may have been a boundary ditch. It is possible that it is broadly contemporary with the burials within Ringditch 2, as these burials followed the same alignment of this ditch and there was no truncation. The ditch has been dated to the Iron Age period (168–3BC; UBA 13108). It is then possible that the burials associated with Ringditch 2 and with this ditch were placed either inside or outside the boundary; both of which suggests a significant symbolism.

In Danesfort 12 a furnace had evidence of reddened sides and a burnt and blackened rim but the base was not scorched. The fills contained large quantities of charcoal and slag. It is possible that this activity was contemporary with the Iron Age funerary activity recorded on site. Metallurgical activity was also recorded at Danesfort 13 and included two smelting furnace pits, a metalled surface, three waste pits, and an occupation deposit. This activity may also have been contemporary with Iron Age funerary activity also recorded on site. At the multi-period site of Danesfort 5 a metalworking area was identified and included several pits and deposits. Of these pits one returned an Iron Age date of 786–543BC (UBA12192). A kiln excavated at Danesfort 5 also produced Iron Age dates ranging between 169BC and AD50, (UBA 12189–91). Other features at this site were dated to the late Bronze Age period and the Iron Age activity may indicate a continuity of settlement at the site. At Holdenstown 2 a total of five kilns were identified with one dating to AD21–203 (UBA 13111). Both Danesfort 2 and Holdenstown 4 returned Iron Age dates from features associated with burnt mound activity (744–407BC, UBA 11000; 765–420BC; UBA 13114).

The Northern Landscape

The northern landscape of the N9/N10 Phase 4 also contained Iron Age evidence. The aforementioned Freestone Hill (KK020-018) is located directly to the south of this landscape and two additional hillforts can also be located in the north of the county. Clomantagh (KK008-124002) overlooks Johnstown in north-west Kilkenny and similar to Freestone Hill, the site was originally used in the Bronze Age as a funerary complex (Gibbons 1990, 18). A linear earthwork has also been recorded at Woodsgift (Gibbons 1990, 20) and is located directly to the south of this site. The other possible hillfort in the region is recorded at Tooremore or Carndubh to the east (*ibid.*). This hillfort which is not shown on the Ordnance Survey maps, is situated on Corrandhu Hill, two miles east of Ballyragget, straddling the townland boundary between Toore More and Donaghmore (Condit and Gibbons 1988, 49). Further to these, located along the Kilkenny-Carlow border is a linear earthwork known as the Rathduff Trench (KK026-006). It ran for over three miles from the River Barrow at Duninga, in a north westerly direction to the foothills of the Castlecomer plateau above Shankill (Gibbons 1990, 20). A portion of this linear earthwork was excavated at Shankill 1 and consisted of a U shaped bank with a ditch.

Excavations in the northern landscape of the N9/N10 produced a small amount of domestic settlement evidence. The fill of a stakehole associated with a possible structure at Moanduff 1 produced an Iron Age date of AD215–376 (UBA 13124); the site also had evidence of occupation in the Bronze Age which implies that the site may have been used throughout both periods. Radiocarbon dating for Rathcash East 1 also indicates use of the site during the Iron Age period. The excavated features included a possible structure that may be inferred as a ringditch as a result of the middle Iron Age date retrieved from its fill (38BC–AD73; UBA 12221) and an

associated rubbish pit (37BC–AD123; UBA 12220). Excavations in the northern landscape of the N9/N10 did not produce any evidence for Iron Age funerary activity. However ephemeral Iron Age activity was discovered at a number of sites in the form of metal working and burnt mound activity. At Rathcash East 3 a large keyhole-shaped furnace that dated to the Iron Age (160BC–AD0; UBA 14032), aligned northeast–southwest was excavated along with six post-pits that may have supported a shelter around the west side of the furnace. The post - pits had a rectangular arrangement, being open on the east (furnace) side. The furnace had 18 fills, with the majority containing significant amounts of charcoal and frequent slag. Some of the post-pits contained charcoal, burnt clay and slag. One of the post-pits has been dated to 362–200BC (UBA 14033). A kiln and pit excavated at Cranavonane 3 have been dated to 104BC–AD50 (UBA 12251) and 341–54BC (UBA 12252) respectively. In addition to these features a pit excavated at Jordanstown 1 returned a date of 382–206BC (UBA 12233) and a pit at the multi-period site of Moanduff 2 retrieved a date of AD140–385 (UBA 12260). Features associated with burnt mound activity dating to this period were excavated at Rathcash 2 where the fill of a trough dated to 344–55BC (UBA 12219) and at Kellymount 2, where a waterhole has been dated to AD236–380 (UBA 14041). The fill of a trough at Kellymount 3 also returned a date of 751–409BC (UBA 14043).

Conclusion

The presence of the Iron Age ringditches along the N9/N10 Phase 4 and the number of sites displaying industrial activity dating to this period confirm the presence of an Iron Age community in the region. The possible structure at Rathcash East 1 may also be indicative of an Iron Age settlement site, further demonstrating Iron Age activity in the locality. The presence of three hillforts in north Kilkenny suggests that it was an area of considerable importance during this period (Condit and Gibbons 1988, 52). The lack of excavated domestic settlements along the route is not indicative of a sparse population at the time rather they were not located along the corridor of the N9/N10 route-way and have yet to be discovered.

3.2.3 The Site Specific Archaeological Landscape of Danesfort 2

There are no recorded monuments in the immediate vicinity of Danesfort 2. However a ringwork (KK023-080) and a designed landscape (KK023-080001) are located *c.* 250m to the south-east and a ringfort (KK023-079) is recorded *c.* 600m to the south. Three ringforts (KK023-076–78) are recorded to the south-west, 400m–750m away and further to the south-west, *c.* 900m away, a holy well (KK023-075) is recorded. A church and graveyard complex (KK023-081) is also recorded *c.* 700m to the north of Danesfort 2.

At Danesfort 2 burnt mound activity and associated features dating to the early Bronze Age and early/middle Iron Age periods was excavated. A number of sites were excavated in the vicinity of Danesfort 2, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. To the east, *c.* 300m away, at Danesfort 1, a ringditch containing cremated bone within its fills has been dated to the middle Iron Age. Also to the ENE, located *c.* 250m away, excavations were carried out at Danesfort 3, however no features of archaeological significance were uncovered here. To the north-east of Danesfort 2, *c.* 650m away, a hearth and possible structure were excavated at Croan 1, however dates returned from a fill of the hearth indicate a post medieval date.

There were a number of archaeological excavations to the immediate south of Danesfort 2, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. At Danesfort 13, located *c.* 350m to the south-west Bronze/Iron Age and early medieval activity was recorded. The Bronze Age archaeology primarily consisted of a ringditch

and a cremation pit. The early medieval phase consisted of a field boundary ditch and a metalworking area that included a charcoal-producing kiln, a furnace and a possible forging area. Further to the south-west, *c*. 550m away, multiple periods of activity were excavated at Danesfort 12, consisting of a possible late Neolithic temporary structure, an early Bronze Age pit circle, a middle Bronze Age industrial complex and two late Bronze/Iron Age ringditches and cremation pits. Also excavated was an iron working furnace probably dating to the early medieval period and a rectangular ditch enclosure.

3.3 Typological Background of 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 agricultural activity and are no longer visible on the field surface. Nevertheless even disturbed spreads of burnt mound material often preserves the underlying associated features, such as troughs, pits and gullies, intact.

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

Burnt mound sites are principally Bronze Age monuments and reach their pinnacle of use in the middle/late Bronze Age (Brindley *et al*. 1989–90; Corlett 1997). Earlier sites, such as Enniscoffey Co. Westmeath (Grogan *et al*. 2007, 96), have been dated to the Neolithic and later sites, such as Peter Street, Co. Waterford (Walsh 1990, 47), have been dated to the medieval period. Thus although burnt mound sites generally form a 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 mounds sites were used as cooking sites. O'Kelly (1954) and Lawless (1990) have demonstrated how joints of meat could be efficiently cooked in trough of boiling water. The use of burnt mound sites for bathing or as saunas has been suggested as an alternative function (Lucas 1965, Barfield and Hodder 1987, O' Drisceoil 1988). This proposal is largely influenced by references in the early Irish literature to sites of a similar character and is very difficult to prove, or disprove. Others, such as Jeffrey (1991), argue that they may have been centres of textile production for the fulling or

dyeing of cloth. More recent demonstrations by Quinn and Moore (2007) have shown that troughs could have been used for brewing, however, this theory has been criticised by leading Irish environmentalists due to the absence of cereal remains from most burnt mound sites (McClatchie *et al*. 2007).

3.4 Summary of the Excavation Results

The excavation has identified Burnt Mound activity at the site. This was represented by two main phases of occupation, one in the early Bronze Age and a second in the Early Iron Age, although there is an indication that there may be two separate phases of occupation in the Bronze Age.

The earliest dated feature on the site consisted of a sub-oval, bowl shaped trough (Trough 1) with an adjacent hearth identified by a smaller cut with scorched sides and base to the east of the trough. The trough was dated to the early Bronze Age. A shallow extension to the trough on the west side may have served as a step. A number of small pit features were identified in the general vicinity around the trough but it is not clear if these were directly related or indeed what their function was.

In the north of the site there was a very large and deep pit which may have functioned as a cistern or waterhole. The large pit was dated to the early Bronze Age but appears to be slightly later in date than Trough 1. It may therefore represent a second phase of Bronze Age activity on the site. The waterhole was not sealed by the main burnt mound spread however, there was evidence that some burnt mound material had been tipped into the feature, presumably after it was abandoned.

Located between the waterhole and Trough 1 were a series of features that represent the Iron Age phase of occupation of the site. These consisted of a large sub-oval trough (Trough 2) and adjacent large pit to the west. A number of irregular pits were identified to the east of the trough and may represent storage or perhaps evidence of land clearance in advance of the activity associated with the trough. Two structures were identified, the first of which (Structure A) consisted of a number of circular post-pits in a horseshoe shaped formation around the east of the trough. While the pits did not seem deep enough to support large (long) structural posts, the regular arrangement may have supported a platform erected on shorter posts around the trough. Some small stakeholes appear to have augmented the structure. At a distance of 5m to the east of Trough 2 was Structure B. This consisted of two parallel lines of 4 postholes. It is again interpreted that this may have been the location for a small platform (1.5m by 0.5m). Both Trough 2 and Structure B have been dated to the early Iron Age.

The overlying burnt mound deposits sealed almost all of the pits and troughs identified at the site with the notable exception of the large waterhole. This probably indicates that the water in the waterhole was not heated, and it was a storage facility. It was not possible to identify which deposits were associated with the Bronze Age activity and which were associated with the Iron Age as the mound deposits had been substantially levelled and disturbed over time. A number of modern drainage channels were also recorded, which truncated some of the features on the site.

3.5 Summary of the Specialist Analysis

A number of specialists provided analysis of samples and artefacts recovered from the site as part of the post-excavation works. This work in part formed the basis for the dating evidence for the site. The detailed reports on the results of all analysis are in Appendix 2

Lithics analysis
The lithic finds from the archaeological excavation at Danesfort 2, Co. Kilkenny are a flint convex end scraper, a quartz crystal scraper and two rubbing stones. The assemblage is morphologically and technologically diagnostic and dates to the first half of the Neolithic period. It represents a residual earlier phase at this site and is most likely waste which is possibly related to domestic activities. This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

Small finds analysis
A copper alloy stick pin (E3540:3:6) with an undifferentiated head was recovered from the burnt mount spread C3. According to O'Rahilly's typology of stick pins found in the Dublin area, stick pins with undifferentiated heads date from the start of the 12th century to the early decades of the 13th century (Scully, Appendix 2.2).

Charcoal and Wood Species identification
Charcoal was examined from four contexts at Danesfort 2, from two pits and two troughs. Five wood taxa were identified. The results are dominated by oak.

Analysis of Plant Remains
Two samples were examined from this site, C58 (S25) and C54 (S14). There were no charred seeds from these samples.

Animal Bone Analysis
A total of 51 animal bone and burnt bone fragments recovered from archaeological contexts C3 and C64 on Danesfort 2 were submitted for examination. The bone samples were assessed and identified to species where possible; a total of 9 bone fragments recovered were identified to the species of cow, pig, sheep and goat. Due to the size and fragmented nature of the individual bone pieces it was not possible to identify 42 fragments to species. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation. A series of early Neolithic lithic artefacts as well as a copper alloy medieval stick pin were also recovered within clay spread C3.

Petrographical analysis
A total of 19 samples were submitted for analysis from Danesfort 2. Coarse grained sandstone is typical of *fulacht fiadh* material. The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles is clear evidence of the use of secondary sources. Angular pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

Radiocarbon Dating
A total of four samples were sent for AMS radiocarbon dating.

A sample of Prunus sp. charcoal from fill C105 of Trough 2 (C128) was radiocarbon dated. The 2 sigma calibrated result was 744–407BC (UBA 11000).

A sample of Ash and Prunus sp. charcoal from Trough 1 fill C54 was radiocarbon dated. The 2 sigma calibrated result was 2464–2214BC (UBA 12186).

A sample of Pomoideae charcoal from waterhole (C109) fill C111 was radiocarbon dated. The 2 sigma calibrated result was 2116–1893BC (UBA 15553).

A sample of Cherry charcoal from posthole fill (Structure B) C122 was radiocarbon dated. The 2 sigma calibrated result was 806–595BC (UBA 15554).

4 DISCUSSION AND CONCLUSIONS

4.1 Discussion

The excavation at Danesfort 2 has identified burnt mound activity with two main phases of occupation dating to the early Bronze Age and the early Iron Age. The site was located in a shallow valley adjacent to a tributary of the King's River. The valley runs from west to east and is U-shaped and the site was located on the bottom of the south slope and on the valley floor (Figure 4; Plate 1). It is very probable that at some point in the past this valley was a conduit for water into the Ennisnag tributary, if only during period of flooding. The physical landscape of the site is one that is typically associated with burnt mound type sites. It is common that these sites are located in low-lying, often marginal areas, adjacent to water sources, rivers and streams. In this regard the identification of the activity at Danesfort 2 would not be unexpected as the land, while not wet all year round is prone to flooding in wet weather. During the course of the excavation the site became flooded following heavy rain. A modern drainage channel identified extending along the valley base provides further evidence of the seasonally wet nature of the immediate surrounding landscape.

There are no previously recorded monuments in the immediate vicinity that would date to the prehistoric period. The monuments in the vicinity consist of ringforts and enclosures which would all date to the early medieval period or later. In this regard the identification of the site, particularly one with two phases dating to the Bronze Age and Iron Age could be seen as unexpected. However, the excavations as part of the N9/N10 Phase 4 have identified many sites in the vicinity within Danesfort with dates ranging from the late Neolithic through to the medieval and post-medieval period. The excavations have identified a particular cluster of activity dating to the Bronze Age, with the nearby funerary site of Danesfort 12, to the southwest, producing contemporary early Bronze Age dates and the Bronze Age domestic settlement site at Danesfort 5 also containing a kiln which is contemporary with the Iron Age phase at Danesfort 2. What has become clear is that there has been intensive settlement of this landscape throughout prehistory and in this context it could have been anticipated that sites of similar type and date to Danesfort 2 would be identified.

The nature and form of burnt mound sites can be particularly varied, and there are many debates as to their function. At a basic level these sites are connected by the use of hot-stone technology - a process where stones are heated in a fire and then immersed into water, usually in the trough, so that the water is heated. More simple sites may have functioned as pot-boilers with the stones being placed directly into a pit rather than into a water-filled trough. It is generally accepted that this activity is more often than not associated with cooking, however other uses for the heated water and troughs are suggested based on evidence from recent excavations and research (see section 3.3).

The earliest phase of activity at Danesfort 2 was associated with early Bronze Age features that would be commonplace on most burnt mound sites – a trough, an adjacent hearth, outlying pits, occasional postholes and an overlying mound of heat shattered stones and blackened soil. Subsequent early Bronze Age activity however consisted of a very large waterhole or well, away from the earlier mound. It seems likely, both from the radiocarbon dates and their physical location, that the waterhole was not associated with the earliest burnt mound activity and may not have been related to any other features on the site.

In general terms, the presence of larger pits, such as the wells or cisterns identified on this site, would be less common, although a large number of burnt mound sites

from the N9/N10 Phase 4 exhibited similar features, from several stages in prehistory: - Kellymount 2 and 3, Stonecarthy West 1 and Maddockstown 1. These very large pits have been interpreted as water-holes that were potentially designed for bulk water storage, unlike the usual troughs which were the "vessel" in which water was heated rather than stored. On these other sites water storage pits were generally associated with a trough.

It is suggested that the waterholes may indicate a bathing site, where a large volume of water was required but which may not necessarily have had to be boiled (as for cooking), but merely heated for bathing. The function of the waterhole at Danesfort 2 is unclear as it was not contemporary with any of the other dated archaeology. The single shallow pit adjacent to it contained no burnt mound material which suggests that it was probably not a trough.

The Iron Age phase on the site was associated with features commonly found on burnt mound sites, in terms of a trough, pits and burnt mound spread. The trough (Trough 2) however, does appear to have been particularly deep and at 0.70m would have been approximately twice the depth of an average trough. Another deep, large pit adjacent to the west end of the trough was not as large as the Bronze Age waterhole. The function of this pit, and indeed Trough 2 is worthy of consideration; given their particular size and depth, and it would seem unlikely that they were designed for cooking. As outlined above, the volume of water in such deep features would be more easily heated (for bathing) than boiled (for cooking). Trough 2 was also surrounded by a series of possible post-pits (Structure A) which may have supported a platform around the trough or indeed a small enclosed or roofed structure over the trough. A second possibly small structure or platform (Structure B) 5m to the east consisted of parallel rows of four postholes. Structure A, Structure B and the trough were all on a similar east-west alignment which is not likely to be coincidental. The precise function of both structures or indeed the trough and pit is not known but collectively they represent a very formal arrangement that is not commonplace on burnt mound sites.

It has been a popular theory for some time that burnt mounds were used as bathing sites or saunas (Lucas 1965; Barfield and Hodder 1987; O'Drisceoil 1988) yet few sites had produced evidence of the necessary associated structures. Features interpreted as being associated with possible sweathouses or bathing have been identified at a number of burnt mound sites from different projects over the last number of years, largely as a result of the increase in the volume of development led excavations particularly from infrastructural projects similar to the N9/N10. A probable sweathouse was documented from the N25 Waterford Bypass at Rathpatrick (Eogan, 2007). Here the main feature was a 5m diameter sunken area with thirty six stake-holes identified around the periphery of the base representing a structure, as well as other features including a possible bath (trough) and an annexe to the main structure. It is interpreted that the stakeholes would have supported a hemispherical, tent-like structure. Eogan identified parallels in other cultures with particular similarities to the Rathpatrick structure in Native American sweatlodges. Clearly an enclosed structure is a key element to the functioning of a sweathouse or sauna, and it is interpreted that the slots and postholes at Blanchvillespark 3 on the N9/N10 Phase 4 could easily have been associated with such an enclosed area. Similarities between the two sites can also be seen by the sunken nature of the interior of the structure and the creation of an adjacent annex, although the shape and plan of the basic sweathouse structure is different in each site. Another similar site to Rathpatrick was identified at Ballykeoghan in south Kilkenny which was excavated as part of the N9/N10 Phase 2 (Laidlaw, 2008). Burrow or Glenanummer 3 Co Offaly, which was excavated as part of the N6 Kilbeggan to Athlone, also

consisted of a sunken circular area with stakeholes around the perimeter, with an elaborate system of additional troughs designed for water to flow from one to another (Coughlan, 2010). Two bone pendants recovered from the sweathouse area at this site represent personal ornaments that were probably lost while bathing.

The Ballykeoghan and Rathpatrick sites both date to the late Bronze Age/early Iron Age, while Burrow or Glenanummer was dated to the late Bronze Age, but all three are later in date than Blanchvillespark 3. Blanchvillespark is therefore quite an early example of possible sweathouse and bathing activity at a burnt mound site. A number of other possible sweathouses that date to the Iron Age have been identified as part of the N9/N10 Phase 4. At Stonecarthy West, an oval slot trench that could have supported structural walls enclosed a shallow hollow and may have acted as a sweathouse. The Kellymount sites showed evidence of structural activity both outside and inside the troughs with possible enclosing palisades and a variety troughs and pits, with some very large waterhole or well features. This slot trench from Stonecarthy West 1 and a trough from Kellymount 3 are contemporary with the Iron Age dates from Danesfort 2, which may be coincidental. It seems unlikely that water heated in the very large waterhole pits would have been boiled due to the volume of water that would have been involved so a bathing function is being considered. Kellymount 2 also produced a fragment of amber bead from the base of the waterhole, and similar to Burrow and Glenanummer this may represent a personal ornament lost while bathing. It is clear therefore that there is growing evidence that some burnt mound sites functioned as sweathouses or bathing places.

The Iron Age Phase at Danesfort 2 was as such potentially a bathing place. This is significant in terms of our wider understanding of the function of *fulachta fiadh*/burnt mounds. It has been identified that this site type can have many functions and often the precise nature of the activity at excavated burnt mounds is unclear. The results of excavations at Danesfort 2 indicate that these varying functions can potentially occur in tandem when we consider the simpler trough and pits from the early Bronze Age; the subsequent un related very large early Bronze Age waterhole/cistern and the Iron Age possible bathing site.

4.2 Conclusions

Danesfort 2 is an important site locally as it represents the first evidence of early Iron Age activity in the immediate area and it adds to the considerable evidence from the Bronze Age that has been gathered through excavations as part of the N9/N10 Phase 4. It is however also of regional significance based on the nature of the burnt mound activity identified at the site, in particular the Iron Age possible bathing site. A number of potential sweathouses and bathing sites have been confirmed from recent excavations of burnt mounds across the country and the results of the Danesfort 2 excavation will significantly add to the further study, analysis and understanding of the varied function and form of burnt mound sites.

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PLATES

Plate 1: Burnt mound, pre-excavation, facing east

Plate 2: Waterhole C109, Trough 2 and Trough 1, mid-excavation, facing east

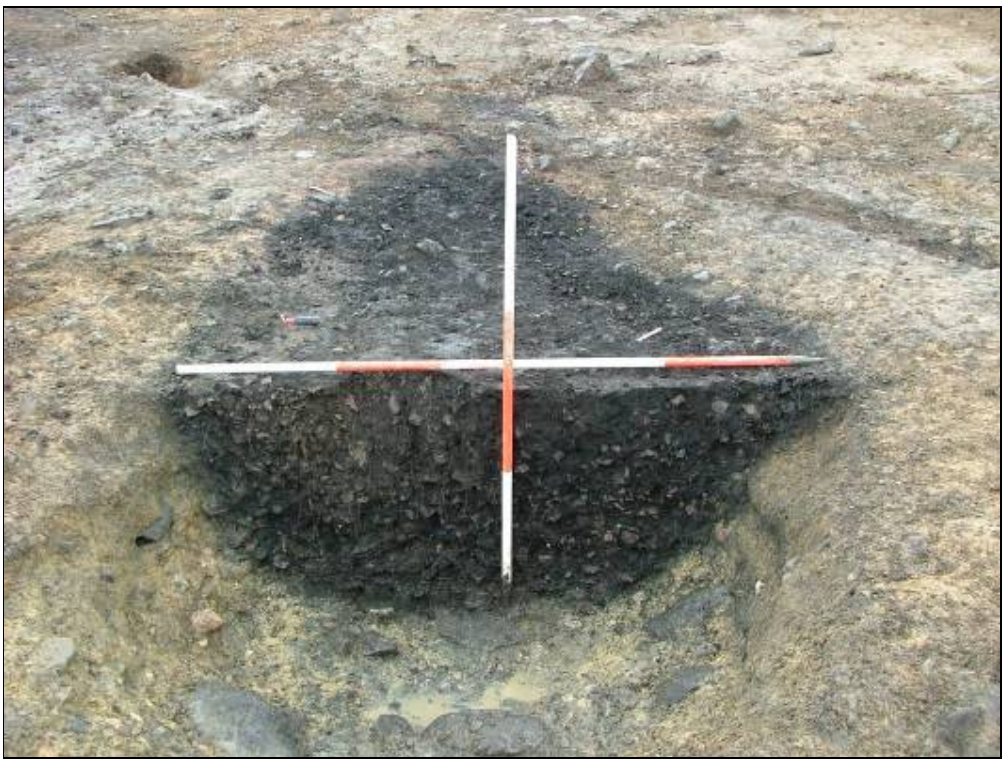

Plate 3: Trough 1, mid-excavation, facing east

Plate 4: Trough 1 and hearth C7a, mid-excavation, facing east

Plate 5: Trough 2, mid-excavation, facing east

Plate 6: Posthole C95 cutting pit C118, mid-excavation, facing north

Plate 7: Structure B, post-excavation, facing north west

Plate 8: Waterhole C109, mid-excavation, facing east

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
1	N/A				Topsoil	Dark brown sandy silty clay.		
2	N/A				Natural	Mid grey sandy gravely clay		
3	N/A	14.35	13.80	0.57	Spread	Mixed black and brown burnt clay with stones and charcoal, few finds including a bronze pin, hammer stone and flint.	C46	C2
4	Void							
5	N/A	1.60	1.50	0.11	Cut of pit	Oval in shape, W-E, imperceptible break of slope with concave sides leading to an irregular base.	C6	C2
6	C5	1.60	1.50	0.11	Fill of pit	Loosely compacted greyish black silt with no inclusions.	C1	C5
7	N/A	4.50	2.20	0.75	Cut of trough	Irregular in shape, W-E, gradual break of slope with irregular sides and a flat base.	C54	C2
7a	N/A	1.30	1.30	0.20	Hearth cut	Roughly circular hearth cut	C8	C2
8	C7/7a	4.50	1.30	0.30	Fill of trough	Loosely compact dark greyish black ashy silt with occasional stones and charcoal.	C3	C53
9	N/A	0.23	0.17	0.11	Natural depression		C10	C2
10	C9	0.23	0.17	0.11	Natural depression			
11	N/A	1.27	0.42	0.13	Cut of pit	NW-SE, elongate in shape, gradual break of slope with sloping sides leading to a concave base.	C12	C2
12	C11	1.27	0.42	0.13	Fill of pit	Loosely compact black silty sand with pebble inclusions.	C3	C11
13	N/A	0.48	0.35	0.07	Cut of pit	Sub-circular in shape, gradual break of slope with concave base.	C14	C2
14	C13	0.48	0.35	0.07	Fill of pit	Medium to loosely compacted, black sandy silt with burnt angular fulacht stones included and occ. charcoal	C3	C13
15	N/A	0.90	0.68	0.12	Cut of pit	Oval in shape, N-S, gradual break of slope with irregular sides and oval shape of base.	C16	C2
16	C15	0.90	0.68	0.12	Fill of pit	Loosely compact black sandy silt with stone and pebble inclusions.	C1	C15
17	N/A	2.80	0.49	0.22	Cut of channel like feature	Curvilinear roughly going SW-NE, gradual break of slope with concave base.	C18	C2
18	C17	2.80	0.49	0.22	Fill of channel like feature	Medium to tightly compacted dark brown silty sand with some small stones.	C3	C17
19	N/A	0.35	0.33	0.21	Cut of posthole	Circular in shape, sharp break of slope with vertical sides and flat shape	C20	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						of base.		
20	C19	0.35	0.33	0.21	Fill of posthole	Loosely compacted mid black silty clay with a light grey hue, stone and charcoal inclusions.	C3	C19
21	N/A	0.05	0.06	0.11	Cut of stakehole	Circular in shape, gradual break of slope with gradual sides and tapered round pointed base.	C22	C2
22	C21	0.06	0.08	0.11	Fill of stakehole	Mid greyish brown silty clay with small stones and some charcoal.	C3	C21
23	N/A	0.25	0.18	0.13	Cut of stakehole	Oval in shape, SW-NE, gradual break of slope with gradual sides and concave base.	C24	C2
24	C23	0.25	0.18	0.13	Fill of stakehole	Medium to loosely compacted, dark greyish brown silty sand with charcoal and small stones.	C1	C23
25	N/A	0.45	0.25	0.18	Cut of pit	Sub oval in shape, NW-SE, gradual break of slope with undercut edges leading to concave base.	C26	C2
26	C25	0.45	0.25	0.18	Fill of pit	Medium to loosely compacted mid greyish brown silty sand with big and small stones.	C1	C25
27	N/A	0.20	0.15	0.35	Cut of stakehole	Circular in shape, sharp break of slope with vertical sides and concave base.	C28	C2
28	C27	0.20	0.15	0.35	Fill of stakehole	Very loosely compacted black soil with small stones and roots.	C3	C27
29	N/A	0.33	0.31	0.14	Cut of posthole	Circular in shape, sharp break of slope- top and gradual break of slope-base with vertical sides leading to a concave base.	C30	C2
30	C29	0.33	0.31	0.14	Fill of posthole	Loosely compacted black soil with greyish hue, charcoal flecks and some pebble inclusions.	C3	C29
31	N/A	0.42	0.28	0.05	Non-archaeological			
32	C31	0.42	0.28	0.05	Non-archaeological			
33	C7	1.50	0.75	0.35	Fill of trough	Loosely compacted light brownish grey silt with lots of small irregular sharp edged stones.	C3	C53
34		1.60	1.20	0.10	Natural	Firmly compacted reddish orange clay with no inclusions.		
35-36	N/A					Irregular in shape		
37	N/A	4.00	2.00	0.15	Spread	Loosely compact dark brown silty clay with heat shattered stones	C1	C3
38	N/A	4.20	1.50	0.35	Spread	Loosely compact light brown silty clay with heat shattered stones	C1	C3
39	N/A	2.30	1.20	0.25	Spread	Loosely compact grey brown silty clay with heat shattered stones	C1	C3
40	Void							
41-43	C99	1.30	1.20	0.20	Fills of Test trench		C1	C42
44	C59	0.35	0.37	0.06	Fill of pit	Loosely compacted mid greyish brown fine sand with a small amount of charcoal.	C60	C59

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
45	N/A							
46	N/A	35	9	0.30	Spread	Mid brown clay with heat shattered stones and charcoal	C1	C3
47	N/A							
48	N/A	0.35	0.30	0.39	Cut of posthole	Circular in shape, sharp break of slope- top, gradual break of slope- base with vertical sides and concave shape of base.	C49	C2
49	C48	0.35	0.30	0.39	Fill of posthole	Very loosely compacted black silt with greyish hue, large pieces of charcoal and stones included.	C3	C48
50	N/A	0.37	0.29	0.25	Cut of posthole	Circular in shape, sharp break of slope- top and base with vertical sides and flat shape of base, no inclusions.	C51	C2
51	C50	0.24	0.20	0.11	Fill of posthole	Loosely compacted light black silty clay with grey hue, flecks of charcoal and some stones included.	C3	C50
52	C109	1.35	0.8	0.30	Fill of pit	Tightly compacted light brown clay with small stones within.	C2	C106
53	C7	2.50	1.80	25.4	Fill of trough	Loosely compacted greyish black clayish silt with a few stones and charcoal included.	C8	C53
54	C7	1.80	1.60	0.25	Fill of trough	Firmly compacted blackish grey silty clay with charcoal.	C53	C7
55	N/A	0.36	0.32	0.36	Cut of posthole	Circular in shape, sharp break of slope top and base with vertical sides and flat base.	C56	C2
56	C55	0.36	0.32	0.36	Fill of posthole	Loosely compacted black silty clay with a light grey hue with charcoal and stone inclusions.	C3	C55
57	N/A	2.40	2.20	0.32	Cut of pit	Oval in shape, NE-SW, gradual break of slope with sloping sides and concave base.	C117	C2
58	C57	1.10	0.88	0.17	Fill of pit	Loosely compacted greyish black silty sand with stone and charcoal inclusions.	C3	C57
59	N/A	0.76	0.74	0.20	Cut of pit	Circular in shape, gradual break of slope with a concave base.	C44	C2
60	C59	0.70	0.66	0.15	Fill of pit	Loosely compacted black fine sand with heat shattered stone and charcoal.	C3	C44
61	N/A	0.95	0.65	0.16	Cut of pit	Circular in shape, sharp break of slope with gradual sides leading to cone like base.	C62	C2
62	C61	0.95	0.65	0.16	Fill of pit	Loosely compacted black fill, burnt soil=50%, burnt stone =50%.	C3	C61
63	N/A	1.35	1.05	0.37	Cut of pit	Irregular in shape, NE-SW, with sharp break of slope and sloping sides leading to concave base, no inclusions.	C64	C2
64	C63	1.35	1.05	0.37	Fill of pit	Loosely compacted black silty sand with stone and burnt bone inclusions.	C3	C63
65	N/A	0.75	0.45	0.19	Natural depression	Irregular in shape, break of slope taken out by digger with flat shape of base, no inclusions.	C66	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
66	C65	0.75	0.45	0.19	Natural depression	Moderately compacted black soil with no inclusions.	C1	C65
67-70	N/A							
71	N/A	0.32	0.28	0.12	Cut of pit	Circular in shape with gradual break of slope, sloping sides with concave base.	C72	C2
72	C71	0.32	0.28	0.12	Fill of pit	Loosely compacted black silty sand with stone and charcoal inclusions.	C3	C71
73-74	Void							
75	N/A	0.33	0.33	0.07	Spread	Greyish black silty sand spread	C76	C2
76	Void							
77	N/A	0.22	0.14	0.11	Cut of stakehole	Circular in shape, sharp break of slope- top with sharp sides to gradual on NE; break of slope- base is sharp on W side and gradual on E;	C78	C2
78	C77	0.22	0.14	0.11	Fill of stakehole	Loosely compacted black to dark brown soil with small stones included.	C3	C77
79	N/A	0.10	0.08	0.09	Cut of stakehole	Circular in shape, sharp break of slope top and base with vertical sides and circular base, no inclusions.	C80	C2
80	C79	0.10	0.08	0.09	Fill of stakehole	Loosely compacted black soil with one small stone.	C3	C79
81	N/A	1.00	0.50	0.25	Cut of pit	Irregularly shaped, sharp break of slope with gradual sides and a concave base.	C82	C2
82	C81	1.00	0.40	0.25	Fill of pit	Moderately compacted black sandy clay with small stones and roots throughout.	C3	C81
83	N/A	0.85	0.40	0.30	Cut of posthole	Circular in shape, sharp break of slope with sharp sides and a sharp base.	C84	C2
84	C83	0.85	0.40	0.30	Fill of posthole	Moderately compacted dark brown black sandy clay with small stones and roots throughout.	C3	C83
85-86	N/A							
87	N/A	0.13	0.11	0.22	Cut of stakehole	Circular in shape, sharp break of slope with vertical sides and concave base, no inclusions.	C88	C2
88	C87	0.13	0.11	0.22	Fill of stakehole	Loosely compacted greyish black silty clay with charcoal and stones within.	C3	C87
89	N/A	0.14	0.13	0.16	Cut of stakehole	Circular in shape with gradual break of slope, vertical sides and a concave base, no inclusions.	C90	C2
90	C89	0.14	0.13	0.16	Fill of stakehole	Loosely compacted grey silty sand with charcoal and stones.	C3	C89
91	N/A	0.80	0.40	0.13	Cut of pit	Curved linear, NW-SE, sharp break of slope with sharp and gradual (west part) sides leading to linear base.	C92	C2
92	C91	0.80	0.40	0.13	Fill of pit	Greyish black silty sand		
93	N/A	1.25	0.60	0.32	Cut of pit	L shaped feature, S-N, sharp break of slope- top with sloping to vertical	C94	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						sides, gradual break of slope-base and concave base.		
94	C93	1.25	0.60	0.32	Fill of pit	Loosely compacted black silty sand with occasional charcoal and pebbles.	C3	C93
95	N/A	0.40	0.38	0.40	Cut of posthole	Circular in shape, sharp break of slope- top and gradual break of slope-base with vertical sides and concave base, no inclusions.	C96	C2
96	C95	0.40	0.38	0.40	Fill of posthole	Loosely compacted black silty sand with pebbles and charcoal within.	C3	C95
97	N/A	0.60	0.50	0.21	Cut of pit	Circular in shape, sloping break of slope- top and gradual break of slope-base with sloping sides and an oval shape of base.	C123	C2
98	C97	0.24	0.20	0.09	Fill of pit	Loosely compacted brownish black silty clay with occasional stone and charcoal.	C1	C123
99	N/A	3.00	1.20	0.60	Cut of Test Trench	Rectangular in shape, E-W, gradual break of slope on north side with a sharp break of slope from south side, steep mid slightly convex sides, gradual break of slope- base leading to flat base.	C43	C3
100	N/A	2.90	2.70	0.70	Cut of pit	Irregular in shape (almost triangular), E-W, gradual northern break of slope- top, sharp south and western break of slope- top with sloped- N,S to steep- W, E sides, gradual break of slope- base leading to a flat base.	C151	C2
101	N/A	0.34	0.30	0.42	Cut of posthole	Circular, sharp break of slope- top, gradual break of slope- base with vertical sides and concave base.	C102	C2
102	C101	0.34	0.30	0.42	Fill of posthole	Loosely compacted black silt with a greyish hue, some charcoal flecks and angular stones.	C3	C101
103	N/A	0.17		0.06	Non-archaeological			
104	C103	0.17		0.06	Non-archaeological			
105	C128	2.25	1.50	0.74	Fill of pit	Loosely compacted dark greyish black sandy silt, small and large irregular stones and charcoal included.	C99	C128
106	C109	1.65	2.50	0.20	Fill of waterhole	Moderately compacted dark brown silty clay with a few small stones.	C3	C110
107	C109	2.10	3.50	0.30	Fill of waterhole	Loosely compacted dark brown wet clay with lots of small stones.	C106	C2
108	C109	0.60	2.00	0.65	Fill of waterhole	Loosely compacted medium brown silty clay with small stones.	C3	C109
109	N/A	6.00	6.00	0.75	Cut of waterhole	Circular in shape, sharp break of slope with sharp sides and sharp base, no inclusions.	C108	C2
110	C109	6.00	3.50	0.75	Fill of waterhole	Tightly compacted dark grey thick marl with lots of small stones.	C106	C2
111	C109	1.70	1.70	0.25	Fill of waterhole	Loosely compacted black clay soil with small stones and charcoal.	C3	C110
112	C118	0.71	0.67	0.20	Fill of pit	Loosely compacted dark brownish black silty sand with pebbles and occasional charcoal.	C3	C118
113-116	N/A							

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
117	C57	2.40	2.20	0.21	Fill of pit	Firmly compacted orange brown silty sand with stone and charcoal inclusions.	C58	C57
118	N/A	0.71	0.67	0.20	Cut of pit	V shaped feature, W-E, sharp break of slope top and gradual break of slope- base with vertical to sloping sides and concave base.	C112	C2
119	N/A	0.39	0.25	0.37	Cut of posthole	Oval in shape, W-E, with sharp break of slope top and base; sides- vertical from E and sloping inwards to W; flat shape of base.	C120	C2
120	C119	0.39	0.25	0.37	Fill of posthole	Loosely compacted black silty clay with light grey hue, charcoal flecks and stones included.	C3	C119
121	N/A	0.28	0.26	0.39	Cut of posthole	Circular in shape, gradual break of slope- base with vertical sides and concave base.	C122	C2
122	C121	0.28	0.26	0.39	Fill of posthole	Very loosely compacted black soil with greyish hue, large flecks of charcoal and angular stones included.	C3	C121
123	C97	0.60	0.50	0.15	Fill of pit	Loosely compacted mid brown sandy clay with large stone included.	C98	C97
124	N/A	0.16	0.16	0.34	Cut of stakehole	Circular in shape, gradual break of slope top and base with vertical sides and concave base.	C125	C2
125	C124	0.16	0.16	0.34	Fill of stakehole	Loosely compacted greyish black silty sand, no inclusions.	C3	C124
126	Void							
127	Void							
128	N/A	2.25	1.60	0.75	Cut of pit	Oval in shape, E-W, gradual break of slope top and base with slightly concave sides and concave base.	C105	C2
129	N/A	1.00	1.00	0.30	Cut of pit	Irregular in shape, E-W, gradual break of slope with sloping sides and flat base.	C64	C2
130	C129	1.00	1.00	0.30	Fill of pit	Loosely compacted black silty sand with a few stones.	C3	C129
131	N/A	0.55	0.55	0.28	Cut of pit	Rounded in shape, sharp break of slope- top and gradual break of slope- base with concave sides and flat shape of base.	C132	C2
132	C131	0.55	0.55	0.15	Fill of pit	Loosely compacted dark grey clayey silt with small irregular stone inclusions.	C3	C131
133-134	N/A							
135	N/A	1.25	0.72	0.40		Loose to moderately compacted grey brown gravely sandy soil with a few stones.		
136	N/A	1.25	0.72	0.40		Moderate compaction, mottled orange brown and black silty soil with no inclusions.		
137	N/A	0.12	0.10	0.09	Cut of stakehole	Circular in shape, sharp break of slope- top, gradual break of slope- base with steep sides and concave base.	C138	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
138	C137	0.12	0.10	0.09	Fill of stakehole	Loosely compacted black clayey silt with greyish hue, stones and charcoal included.	C3	C137
139	N/A	0.11	0.09	0.05	Cut of stakehole	Circular in shape, sharp break of slope- top, gradual break of slope- base with steep sides and concave base.	C3	C140
140	C139	0.11	0.09	0.05	Fill of stakehole	Loosely compacted black clayey silt with greyish hue, stones and charcoal included.	C3	C139
141	C142	0.39	0.30	0.20	Fill of stakehole	Loosely compacted greyish black silty sand with charcoal and stones included.	C3	C142
142	N/A	0.39	0.30	0.20	Cut of stakehole	Oval in shape, N-S, gradual break of slope top and base with a concave base and sloping sides	C141	C2
143	C144	0.50	0.40	0.47	Fill of posthole	Loosely compacted brownish black silty clay with occasional stone and charcoal.	C3	C144
144	N/A	0.50	0.40	0.47	Cut of posthole	Oval in shape, W-E, gradual break of slope top and base with vertical sides and concave base.	C143	C2
145	N/A	0.35	0.35	0.20	Cut of pit	Rounded in shape, gradual break of slope with concave sides and concave base.	C146	C2
146	C145	0.35	0.35	0.20	Fill of pit	Loosely compacted dark greyish black clayey silt with small irregular stones and charcoal.	C3	C145
147	N/A	0.90	0.40	0.25	Cut of pit	Rectangular E-W, sharp break of slope- top and base with vertical sides and a flat base.	C148	C2
148	C147	0.90	0.40	0.25	Fill of pit	Loosely compacted dark greyish black clayey silt with small irregular stones and charcoal.	C99	C147
149	=106							
150	=109							
151	C100	2.90	2.70	0.70	Fill of pit	Loosely compacted dark greyish black sandy silt, small and large irregular stones and charcoal included.	C3	C100
152	N/A	0.67	0.42	0.21	Cut of pit	Oval in shape, N-S, sharp break of slope top and base with almost vertical sides and flat base.	C153	C2
153	C152	0.67	0.42	0.21	Fill of pit	Lightly compacted black silty clay with stones and charcoal.	C3	C152
154	Void							
155	Void							
156	Void							
157	Void							
158	N/A		1.26	0.51	Cut of ditch	Linear in shape, N-S, sharp break of slope- top and gradual break of slope- base, sloped sides and flat base	C161	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
159	C158		0.91	0.26	Fill of ditch	Loosely compacted greyish brown silty clay with occ. stones.	C3	C161
160	C158		0.39	0.27	Fill of ditch	Loosely compacted greyish black silty sand with charcoal.	C3	C161
161	C158		0.65	0.38	Fill of ditch	Loosely compacted light grey silty clay with snail shells.	C160	C158
162	=111						C149	C163
163	=111						C162	C109
164	N/A	5.50	4.30	0.30	Non-archaeological			
165	N/A	2.40	1.50	0.34	Non-archaeological			
166	C165	2.40	1.50	0.34	Non-archaeological			

Appendix 1.2 Finds Register

Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3540:003:001	3	1	Scraper	Flint convex end scraper	Flint	A flint convex end scraper produced on a single-platform flake using a soft stone hammer	N/A
E3540:003:002	3	2	Chunk	Natural chunk of quartz crystal	Quartz crystal	Natural chunk of quartz crystal	N/A
E3540:003:003	3	3	Scraper	Quartz crystal scraper	Quartz crystal	A possible quartz crystal scraper	N/A
E3540:003:004	3	4	Stone	Quartzite rubbing stone	Quartzite	A quartzite rubbing stone which is flattened and smoothened on one surface	N/A
E3540:003:005	3	5	Stone	Quartzite rubbing stone	Quartzite	A quartzite rubbing stone which is flattened and smoothened on one surface and was probably used as a mano	N/A
E3540:003:006	3	6	Pin	Copper alloy stick pin	Copper alloy	Copper alloy stick pin. Undifferentiated head (O'Rahilly Class 7). Circular shank, widens below the head and decorated with transverse lines. Dates to 12th Century – early 13th Century.	N/A

Appendix 1.3 Sample Register

During post excavation works specific samples were processed with a view to further analysis. A total of 30 soil samples were taken from features at Danesfort 2 and all 32 samples were processed by flotation and sieving through a 250µm mesh. The following are the ecofacts recovered from these samples:

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	Seeds and hazelnut	Burnt animal bone	animal bone	human bone	metallurgical waste	Other
C3	11	Mound				90.8g			
C8	2	Possible trough	3.1g						
C14	5	Pit	4.7g						
C15	8	Pit	5.5g						
C18	9	Curvilinear	0.3g						
C24	7	Pit	0.8g						

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	Seeds and hazelnut	Burnt animal bone	animal bone	human bone	metallurgical waste	Other
C26	6	Pit	0.3g						
C28	4	Pit	1.3g						
C33	3	Possible trough	1.6g						
C43	16	Pit	19.5g						
C44	18	Pit	0.6g						
C51	28	Posthole	3.0g						
C53	13	Pit	0.9g						
C54	14	Pit	0.3g	<0.1g					
C56	27	Posthole	1.0g						
C58	25	Pit	4.7g	0.2g					
C60	15	Pit	3.4g						
C64	26	Pit	0.4g		0.1g				
C64	35	Pit			1.2g				
C72	36	Pit	0.3g						
C76	17	Fill of [075]	0.4g						
C82	43	Pit	0.8g						
C94	34	Pit	4.3g						
C98	24	Pit	5.1g						
C102	29	Posthole	0.7g						
C105	39	Fill of pit	0.5g						
C111	32	Posthole	3.1g						
C112	23	Posthole	0.3g						
C122	31	Posthole	35.2g						
C153	41	Fill of pit	0.2g						

Appendix 1.4 Archive Index

Project: N9/N10 Phase 4 Knocktopher to Powerstown		
Site Name: AR078 Danesfort 2		
Excavation Registration Number: E3540		
Site director: Richard Jennings		
Date: November 2010		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	14	5 pre-ex, 17 section sheets, 4 mid-ex and 5 post-ex plans
Site sections, profiles, elevations	17	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1	
Site registers (folders)	2	
Survey/levels data (origin information)	514	
Context sheets	166	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	141	
Photographs (print)	0	
Photographs (slide)	0	

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Lithics Report – Farina Sternke MA, PHD

Appendix 2.2 Small Finds Report – Siobhán Scully

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Appendix 2.4 Plant Remains Analysis Report – Penny Johnson

Appendix 2.5 Animal Bone and Burnt Bone Report – Aoife McCarthy

Appendix 2.6 Petrographical Report – Stephen Mandal MIAI PGEO

Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

Appendix 2.1 Lithics Report – Farina Sternke MA, PHD

Lithics Finds Report for E3540 Danesfort 2 (A032/065), Co. Kilkenny
N9/N10 Road Scheme – Phase 4
Farina Sternke MA, PhD

Contents

List of Tables

Introduction
A total of five lithic finds from the archaeological investigations of a prehistoric site at Danesfort 2, Co. Kilkenny were presented for analysis (Table 1). The finds are associated with a *fulacht fiadh* with an associated trough, and pits and postholes.

Find Number	Context	Material	Type	Condition	Cortex	Length (mm)	Width (mm)	Thickness (mm)	Complete	Retouch
E3540:003:1	3	Flint	Retouched artefact	Reasonably fresh	No	29	15	4	Yes	Left edge direct semi-abrupt
E3540:003:2	3	Quartz crystal	Natural chunk							
E3540:003:3	3	Quartz crystal	Retouched artefact	Reasonably fresh	No	22	9	4	Yes	Distal left edge direct abrupt
E3540:003:4	3	Quartzite	Rubbing stone	Slightly weathered		64	49	30	No	No
E3540:003:5	3	Quartzite	Rubbing stone	Slightly weathered		104	99	41	No	No

Table 1 Composition of the Lithic Assemblage from Danesfort 2 (E3540)

Methodology
All lithic artefacts are examined visually and catalogued using Microsoft Excel. The following details are recorded for each artefact which measures at least 20mm in length or width: context information, raw material type, artefact type, the presence of cortex, artefact condition, length, with and thickness measurements, fragmentation and the type of retouch (where applicable). The technological criteria recorded are based on the terminology and technology presented in Inizan *et al.* 1999. The general typological and morphological classifications are based on Woodman *et al.* 2006. Struck lithics smaller than 20mm are classed as debitage and not analysed further, unless they represent pieces of technological or typological significance, e.g. cores etc. The same is done with natural chunks.

Quantification
The lithics are one flaked piece of flint, one flaked piece of quartz crystal and two utilised pieces of quartzite (Table 1). In addition, one natural piece of quartz crystal. Four artefacts are larger than 20mm in length and width and were therefore recorded in detail.

Provenance
The lithic artefacts were recovered from context *c.* 3.

Condition:
The lithics survive in reasonably fresh (E3540:003:1 and E3540:003:3) and weathered (E3540:003:4 and E3540:003:5) condition. Two artefacts are incomplete (E3540:003:4 and E3540:003:5)

Technology/Morphology:
The artefacts are two retouched tools and two macro tools.

Retouched Artefacts:
The retouched artefacts are two miscellaneous retouched artefacts which were probably used as scrapers. Artefact E3540:003:1 is made of flint and was produced on a single-platform flake using a soft stone hammer. This artefact appears to have been used as a convex end scraper. The other retouched artefact (E3540:003:3) is made of quartz crystal. The artefacts measure 29mm and 22mm long, 15mm and

9mm wide and 4mm and 4mm thick, respectively. They most likely date to the first half of the Neolithic period.

Macro Tools:
The macro tools are two quartzite rubbing stones (E3540:003:4 and E3540:003:5) which are flattened and smoothened on one surface. Artefact E3540:003:5 was probably used as a mano. The rubbing stones measure 64mm and 104mm in length, 49mm and 99mm in width and 30mm and 41mm in thickness, respectively. They probably date to the Neolithic period.

Dating:
The assemblage is technologically and typologically diagnostic and dates to the first half of the Neolithic period.

Conservation
Lithics do not require specific conservation, but should be stored in a dry, stable environment. Preferably, each lithic should be bagged separately and contact with other lithics should be avoided, so as to prevent damage and breakage, in particular edge damage which could later be misinterpreted as retouch. Larger and heavier items are best kept in individual boxes to avoid crushing of smaller assemblage pieces.

Discussion
Flint is available in smaller nodules along the Wicklow, Wexford and Waterford coast or in the glacial tills in Co. Kilkenny in the form of remanié pebbles. The use of a limited single platform and dominant bipolar technology on small to medium sized pebbles is in parts the result of this availability. The flint used at Danesfort 2 is beach pebble flint which almost certainly derives from the Wicklow, Wexford or Waterford coast. The majority of these flint nodules are rather small pebbles with an average dimension of 30–50mm and often only permit the use of a bipolar technology to efficiently reduce the nodule achieving a maximum outcome, i.e. the largest possible amount of suitable and usable blanks. The result is the regionally dominant split pebble bipolar (Neolithic and Bronze Age) character of the south-eastern flint assemblages (O'Hare 2005).

Summary
The lithic finds from the archaeological excavation at Danesfort 2, Co. Kilkenny are a flint convex end scraper, a quartz crystal scraper and two rubbing stones. The assemblage is morphologically and technologically diagnostic and dates to the first half of the Neolithic period. It represents a residual earlier phase at this site and is most likely waste which is possibly related to domestic activities. This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

Recommendations for Illustration
- Convex End Scraper (E3540:003:1)

References
Inizan, M-L, Reduron-Ballinger, M., Roche, H. and Tixier, J. 1999 *Technology and Terminology of Knapped Stone* 5. CREP, Nanterre.
O'Hare, M. B 2005 The Bronze Age Lithics of Ireland. Unpublished PhD Thesis. Queen's University of Belfast.
Woodman, P. C., Finlay, N. and Anderson, E. 2006 *The Archaeology of a Collection: The Keiller-Knowles Collection of the National Museum of Ireland*. National Museum of Ireland Monograph Series 2. Wordwell, Bray.

Appendix 2.2 Small Finds Report – Siobhán Scully

N9/N10 Knocktopher to Powerstown
Phase 4
Danesfort 2 Small Finds Report
E3540 A032/065 AR078
Siobhán Scully, Margaret Gowen & Co. Ltd
December 2009

Introduction
This report details a single piece of metal retrieved from the excavations at Danesfort 2 (E3540) as part of the N9/N10 Knocktopher to Powerstown road scheme.

Metal
A copper alloy stick pin (003:6) with an undifferentiated head was recovered from the burnt mount spread C3. The circular, tapering shank is decorated with transverse lines and is hipped in the upper part of the shank, which would have helped the pin to grip the garment. According to O'Rahilly's typology of stick pins found in the Dublin, stick pins with undifferentiated heads date from the start of the twelfth century to the early decades of the thirteenth century (1998, 33).

Catalogue
E3540:003:6 Copper alloy stick pin. Undifferentiated head (O'Rahilly Class 7). Circular shank, widens below the head and decorated with transverse lines. L 69.5mm Diam. 1.2–2.8mm. 12th Century – early 13th Century.

Reference
O'Rahilly, C. 1998 'A Classification of Bronze Stick-Pins from the Dublin Excavations 1962-1972' in C. Manning (ed.), *Dublin and Beyond the Pale: Studies in Honour of Patrick Healy*, 23–33. Wordwell, Bray.

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Site Name – Danesfort 2
Excavation Number – E3540 AR078
Co. Kilkenny
Author – Lorna O'Donnell
Date –17/7/09

Illustrations

Figures

Tables

Introduction

This report describes the charcoal analysis of samples from a burnt mound, excavated by Richard Jennings at Danesfort 2, Co. Kilkenny. The site was excavated as part of along the N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Jennings 2009). Charcoal was examined from four contexts, including pit and trough fills. The aim of the work is to identify enough suitable material for radiocarbon dating, and to provide a floristic background to the site, as well as wood selection patterns for the burnt mound. This report is summary in nature only, further analysis, discussions and comparisons of results will be incorporated into a final integrated charcoal and wood report for all sites along the N9/N10 (Lyons *et al* forthcoming).

Methodology (After IAC Ltd)

Processing

- A mechanical flotation tank using a pump and water recycling system is used for soil flotation.
- The soil is washed using a 1mm mesh in the flotation tank and a 300 micron and 1mm sieve is used to catch floated material.
- The volume of all soil samples are recorded in litres using a measuring jug.
- The sample is then placed into the 1mm mesh in the flotation tank, the tank is then filled with water and the sample washed. Any large lumps of soil can be carefully broken down by hand, but the jets of water in the flotation tank gently clean the rest of the sample.
- Once the sample is clean (just stones, charcoal, artefacts remaining in the mesh) the tank is fill up with water and at this stage any floating material (charcoal, seeds etc) should flow over the spout and into the sieves.
- The retent is then gently poured into a labelled tray (containing site code, site name, sample number and context number) and place on a shelf to dry.
- The flots are securely packaged in tissue, labelled and hung up to dry. This prevents any loss of light material (seeds) which could result once the flots are dry and being moved (if they are dried on trays).
- Before washing a new sample all equipment used (measuring jugs, 1mm mesh, sieves etc) are thoroughly washed using clean water.
- The large black settling tanks (and water) are cleaned between every site, or if a large site is being processed, every 1–2 weeks.
- Any samples containing high clay content will be soaked in water for 1–2 days to aid the sieving process.

Charcoal identification

Each piece of charcoal was examined and orientated first under low magnification (10x-40x). They were then broken to reveal their transverse, tangential and longitudinal surfaces. Pieces were mounted in plasticine, and examined under a binocular microscope with dark ground light and magnifications generally of 200x and 400x. Each taxon or species will have anatomical characteristics that are particular to them, and these are identified by comparing their relevant characteristics to keys (Schweingruber 1978; Hather 2000 and Wheeler *et al* 1989) and a reference collection supplied by the National Botanical Gardens of Ireland, Glasnevin. Fifty fragments were identified from each sample, where possible.

2.3 Details of charcoal recording

The general age group of each taxa per sample was recorded, and the growth rates were classified as slow, medium, fast or mixed. It was not within the scope of this project to measure all the ring widths from the charcoal, however, some measurements were taken with a graticule in the microscope in order to make the

scale of slow, medium and fast growth less subjective. Slow growth within the charcoal from this site was considered to be approximately 0.4mm per annum, medium approximately 1mm per annum and fast approximately 2.2mm per annum.

The ring curvature of the pieces was also noted – for example weakly curved annual rings suggest the use of trunks or larger branches, while strongly curved annual rings indicate the burning of smaller branches or trees (Fig. 1). Tyloses in vessels in species such as oak can denote the presence of heartwood. These occur when adjacent parenchyma cells penetrate the vessel walls (via the pitting) effectively blocking the vessels (Gale 2003, 37). Insect infestation is usually recognised by round holes, and is considered to be caused by burrowing insects. Their presence normally suggests the use of decayed degraded wood, which may have been gathered from the woodland floor or may have been stockpiled.

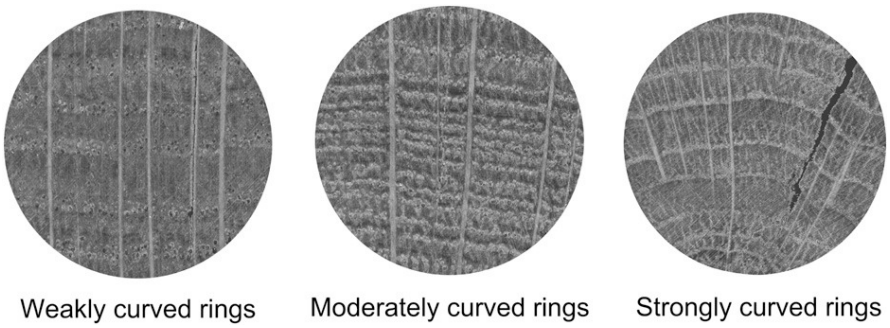

Fig. 1 Ring curvature. Weakly curved rings indicate the use of trunks or large branches.
(After Marguerie and Hunot 2007 1421, Fig. 3).

Results

Five wood taxa or trees were identified from the Danesfort 2 samples, hazel (*Corylus avellana*), ash (*Fraxinus* sp.), pomaceous fruitwood (Pomoideae), wild/bird cherry (*Prunus avium/padus*) and oak (*Quercus* sp.). The results are dominated by oak (Fig. 2).

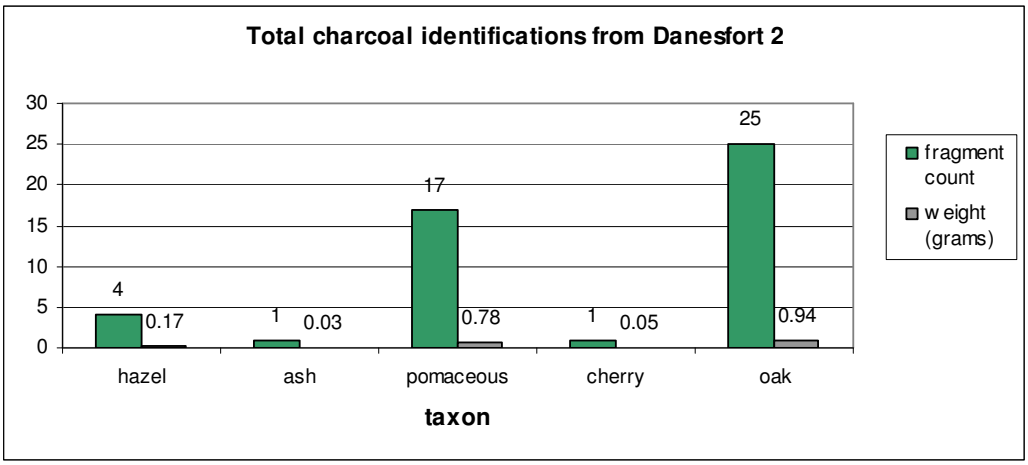

Fig. 2

Charcoal was examined from two pit fills at Danesfort 2 (Cut 93 and 109; Fill 94 and 111). The level of charcoal is low from C94, only one fragment of oak was identified. Pomaceous fruitwood and oak were identified from C111. Charcoal was also

examined from trough fills (Trough 1 Cut 7 and Trough 2 Cut 128; Fill 8 and 105). A variety of trees was identified from C8 (hazel, ash, pomaceous fruitwood and oak), while pomaceous fruitwood and oak only were identified from C105 (Table 1).

Discussion

The oak present could be either our native pedunculate (*Quercus robur*) which prefers more wet, heavier clays than the sessile oak (*Quercus petraea*) (Beckett 1979, 40–41).The Pomoideae group (pomaceous fruitwood), a sub family of the Rosaceae includes crab apple, wild pear, rowan/whitebeam and hawthorn. Crab apple (*Malus sylvestris*) is a tree of hedges, copses and oak woodland, thriving in fertile and heavy soils. It often grows singly, with large distances between individual trees (Lipscombe and Stokes 200, 78). Wild pear (*Pyrus pyraster*) can grow on woodland edges and also can be found growing in a solitary situation (Lipscombe and Stokes 2008, 114 ; Stuijts 2005, 142). Rowan (*Sorbus aucuparia*) is a tough colonizer which can tolerate peaty soils and exposed conditions. It needs plenty of light to thrive (Hickie 2002, 65). It is a tree of mountains, woodlands and valleys, growing on a wide range of soils, including chalks, acid soils and even peat (Lipscombe and Stokes 2008, 120). Whitebeam (*Sorbus aria*) grows up to 20m high and has a preference for limestone soils (Orme and Coles 1985, 11). Hawthorn (*Crataegus monogyna)* can thrive in all but the most acid of soils (Gale and Cutler 2000). As wild pear is not a native Irish species, it is likely that the charcoal represents other types encompassed in the Pomoideae group.

Hazel is a very tolerant tree, it can grow from wet to dry conditions (but not waterlogged ones (Orme and Coles 1985, 9). It was once very common in Ireland, Mc Cracken writes that it was once widespread to an extent that is hard to imagine today (1971, 19). It can grow as a tree or can form hazel scrub. Wild/bird cherry can grow well in light conditions such as near woodland margins (Orme and Coles 1985, 11).

Ash trees prefer moist, well drained and fertile soils. It is very intolerant of shade (Lipscombe and Stokes 2008, 188)

Summary

Charcoal was examined from four contexts at Danesfort 2, from two pits and two troughs. Five wood taxa were identified, the results are dominated by oak.

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Table 1 Charcoal identification details from Danesfort 2

Context number	Cut number	Sample number	Flot weight (g)	Context description	Wood taxon	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Growth	Weakly or strongly curved rings	Comment
8	7	2	3.1	Trough fill - Trough 1	*Corylus avellana* (hazel)	4	0.17	4-5	2-6	medium		radial cracks
					Fraxinus sp. (ash)	1	0.03	5-6	3-4	medium		
					Pomoideae spp. (pomaceous)	7	0.39	5-6	3-4	medium		
					Prunus avium/padus sp. (wild/bird cherry)	1	0.05	5-6	3-4	medium		
					Quercus sp. (oak)	3	0.22	5-6	3-4	medium		
94	93	14	0.3	Pit fill	*Quercus* sp. (oak)	1	0.01					
105	128	39	3.5	Trough fill - Trough 2	Pomoideae spp. (pomaceous)	5	0.08	4-5	2-3	medium	strongly curved	
					Quercus sp. (oak)	15	0.21	4-5	2-3	slow		
111	109	32	3.1	Pit fill	Pomoideae spp. (pomaceous)	5	0.31	4-5	2-4	medium		
					Quercus sp. (oak)	6	0.5	4-5	2-4	medium		

Appendix 2.4 Plant Remains Analysis Report – Penny Johnston

Plant Remains Analysis Report for
E3540 Danesfort 2 (A032/065), Co. Kilkenny
N9/N10 Road Scheme – Phase 4

Penny Johnston, Eachtra

Introduction
This report details the analysis of plant remains recovered from excavations in advance of the construction of the N9/N10 Knocktopher to Powerstown Road (Phase 4). The excavation was directed by Richard Jennings on behalf of Irish Archaeological Consultancy Ltd. The archaeological site was located in the townland of Danesfort (E3540).

The excavated remains included evidence for Bronze Age occupation and burnt mound/*fulachta fiadh* activity.

Methodology
The samples were processed by the client, who also carried out a preliminary sorting of the samples. This pre-selection of the plant remains may bias the final plant records from these sites, as it is possible that many small items, such as weed seeds and chaff, were not picked out.

The selected material was sent to Eachtra Archaeological Projects where it was examined under a low-powered binocular microscope (X6 –X45). Suitable plant material was identified and the results of analysis are presented.

Danesfort 2 E3540 AR078
This was a burnt mound/*fulacht fiadh* site with deposits of charcoal and heat affected stones, a trough, several pits and a well. A total of 2 samples were examined from this site, C.58 (S.25) and C.54 (S.14). There were no charred seeds from these samples.

Appendix 2.5 Animal Bone Report – Aoife McCarthy

Osteoarchaeological Report of Faunal Remains and Burnt Bone from
E3540 A032/: Danesfort 2 AR078
Co. Kilkenny
N9/N10 Kilcullen to Waterford Scheme
Phase 4: Knocktopher to Powerstown

Author: Aoife McCarthy MA BA
Date: March 2010

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1. Introduction

1.1 Introduction

This report details the osteological analysis of faunal remains and burnt bone samples recovered during excavations at Site E3540 AR078 Danesfort 2 in the townland of Danesfort, Co. Kilkenny as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme. Aoife McCarthy MA (Osteoarchaeology University of Southampton 2006) undertook the analysis on behalf of Irish Archaeological Consultancy Ltd in February 2010. At the time of writing this report, background archaeological information was obtained from a draft interim excavation report (Jennings, R. 2009) and from consulting the original site register documents.

1.2 General Osteological Information

The osteological analysis of both hand retrieved faunal remains and burnt bone fragments recovered during sieving of bulk soil samples was undertaken to provide an overview of the osteoarchaeological aspect of the site and determine if the material could provide further interpretation of site activity.

A total of 51 fragments from 45 possible skeletal elements and weighing 91.93g were recorded within the assemblage. The degree of preservation of the bone assemblage recovered varied from well preserved to moderate preservation for retrieved faunal remains and to poor for burnt bone fragments. A modest rate of fragmentation was also noted within the combined assemblage.

A large portion of the faunal remains assemblage recovered at Danesfort 2 originated from C64 the black silty-sand fill of pit feature C63 which accounted for 36 bone fragments or 70.6% of the total. A series of two charcoal samples retrieved from archaeological contexts C105 and C54 were classified to species and issued for AMS dating. A sample of *prunus spp* charcoal identified within pit fill C105 was sent for radiocarbon dating and returned a two sigma calibrated date of Cal. 744–407BC; whilst ash and *prunus spp* charcoal retrieved within pit fill C54 returned a two sigma calibrated date of Cal. 2464–2214BC. The AMS dates returned place activity within the Bronze Age, stretching into the early Iron Age period.

A total of 9 bone fragments (17.6%) of the combined assemblage were classified to species. Due to fragmentation combined with poor preservation and small size of the individual bone fragments it was not possible to identify 42 fragments (82.4%) these were classed as indeterminate vertebrate. Bone elements were identified where possible.

The faunal remains assemblage recovered from Danesfort 2 contained bones from a possible 4 different species including; cow, pig, sheep and goat. The domestic species of pig and cow accounted for 5 fragments (55.6%) and 2 fragments (22.2%) respectively of identified material.

2. Methodology

SPECIES IDENTIFICATION: Identification of the bones involved reference to Schmid (1972) and Hillson (1992) as well as comparison with the author's own reference material. The closely related taxa of sheep and goat are difficult to distinguish and where grouped under the term '*caprinae*'

- NISP: Number of Identified Specimens Indicates the total number of fragments found.

- MNI: Minimum Number of Individuals. Indicates the minimum number of individuals from every species that were present in the material. Estimating MNI is calculated on the specimen of the most abundant skeletal element present; whilst taking age, sex, size and archaeological context into account.

- In order to calculate accurate MNI and MNE figures for each species, bird as well as mammal, a method of zoning was implemented when recording (Serjeantson, 2000). This method was used so as to compensate for any possible biases due to fragmentation; siding was also taken into account at this point.

- MNE: Minimum Number of Elements. Indicates the minimum number of anatomical units that are present and what side they are from. To avoid getting a higher MNE all loose epiphyses have to be paired with all un-fused diaphysis.

AGEING: Two main methods are used to determine the age of faunal remains; tooth eruption and degree of Epiphysial fusion (a less reliable method). Tooth eruption and wear stages were recorded for the following teeth where possible; dP4 (deciduous fourth premolar), P4 (fourth premolar), M1 (first molar), M2 (second molar) and M3 (third molar) of cattle, sheep/goat and pig (Grant 1982). The analysis of tooth wear patterns refers to the alteration of the enamel surface and exposure of inner dentine through use.

BIOMETRICAL DATA: Due to fragmentation, small size and the nature of the remains recovered measurements and biometrical analysis was not possible.

SEX DETERMINATION: Sex determination of animal remains is possible by analysis of certain sexually dimorphic elements. For example goat horncores may be classified as male or female based on their morphology and cattle metacarpals can be defined as male or female through calculation of the slenderness index (McCormick 1992). Sexual determination of species was not possible due fragmentation and the nature of the bone material recovered from Danesfort 2.

BUTCHERY/GNAWING/BURNING: Evidence for butchery was recorded under the categories of cut, chopped, chopped and cut. All specimens were analysed for evidence of rodent or carnivorous gnawing as well as evidence of burning. Burnt bones were recorded in accordance with colour changes resulting from differing heat levels e.g. calcined bones acquire a bluish-whitish hue through exposure to high temperatures.

PATHOLOGY: The discovery of any injury and/or pathology was recorded for all specimens, where present.

3. Results

Context 3 Sample 11
A total of 15 bone fragments (90.6g) representing 12 possible skeletal elements were identified within burnt clay spread C3. Species identified within spread material C3 included cow, pig and sheep/goat (*caprinae*). Small fragment size combined with a poor degree of preservation meant it was not possible to identify the species of 6 fragments (24.3g).

***Bos*/Cow**
A moderately preserved fragment of tibia diaphysis and a complete naviculo-cuboid (51.7g) were recovered. The single tibia diaphysis fragment displayed evidence of minor singeing in the form of blackening of the bone surface. As Devlin J.P. & Herrmann N. P (2008, 109) state "increasing exposure to heat bone progresses through a sequence of colours from unburned tan, to shades of dark brown to black, progressing to blue and grey and finally to white." A low degree of surface eburnation was recorded on the auricular surfaces of the complete naviculo-cuboid bone; indicating possible osteoarthritis.

***Sus*/Pig**
A series of 5 poorly preserved fragments of rib corpus (5.9g) were recovered from spread material C3. Measurements of the largest rib corpus fragment were recorded at 49mm long, 22mm wide and 7mm thick. Frequent chatter marks and surface striations consistent with rodent gnawing were noted on all 5 rib corpus fragments.

Sheep/Goat (*Caprinae*)
Loose permanent caprinae Molar 1 & Molar 2 teeth were recovered within clay spread C3. Dental wear patterns were recorded for both retrieved mandibular teeth. The single age category of 2–3 Years was represented (Appendix 1).

Indeterminate Vertebrate
Due to fragmentation, poor preservation and small fragment size 6 bone fragments recovered from spread material C3 were not identified to species. A single tibia diaphysis fragment from a large size vertebrate showed evidence of exposure to a high level of heat; resulting in calcination of the bone surface and colour change to grey. Evidence of butchery in the form cut and chop marks were also catalogued on the tibia diaphysis fragment. Frequent surface striations combined with chatter marks consistent with rodent gnawing were noted on 2 diaphysis fragments. A quantity of 4 of the unidentifiable bone fragments recovered comprised small–tiny fragments of trabecular bone.

Context 64 Sample 35
A series of 32 calcined rib corpus, long bone and unidentifiable burnt bone fragments (1.23g) of a small size mammal were retrieved within C64 the silty-sand fill of pit feature C63.

Indeterminate Vertebrate
A high degree of fragmentation combined with small fragment size and poor preservation meant that the long bone diaphysis, rib corpus and unidentifiable burnt bone fragments recovered from pit fill C64 were not identifiable to species. The long bone diaphysis fragment retrieved measured 9mm long, 6mm wide and 4mm thick. All 32 bone fragments displayed evidence of exposure to a high level of heat and resulting calcination of the bone. This was manifested as bone surface colour change to grey-white, combined with bone surface cracking. Contact of bone with heat diminishes its moisture content and results in the combustion of the organic or collagen component; the remaining structure of the bone after this process is mineral. A white or pale grey colour indicates exposure of bone to temperatures in excess of *c.* 600°C combined with a ready oxygen supply (McKinley, 2004). Such distortion to the bone structure reduces its size and as detailed above alters bone colour (Luff R. & Pearce J. 1994). A quantity of 20 unidentifiable bone fragments recovered consisted of small–tiny fragments of trabecular bone.

Context 64 Sample 26
A total of 4 calcined fragments of unidentifiable trabecular bone were recovered within sample 26 of pit fill C64.

4. Summary
Fifty one animal bone & burnt bone fragments recovered from archaeological contexts C3 and C64 on Danesfort 2 were submitted for examination. The bone samples were assessed and identified to species where possible; a total of 9 bone fragments recovered were identified to the species of cow, pig, sheep and goat. Due to the size and fragmented nature of the individual bone pieces it was not possible to identify 42 fragments to species. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Site AR078 Danesfort 2 due to its limited size and poor degree of bone preservation. A series of early Neolithic lithic aretfacts as well as a copper alloy medieval stick pin were also recovered within clay spread C3.

Bone Database:

Spec	C	S	Taxa	Anat	Side	Prox	Dist	1	2	3	4	5	6	7	8	But	Bu	G	Q	W (g)	Comments
1	C3	11	Shp/Gt	M1	R														1	3.30	Single loose M1 tooth in wear. Dental notes taken.
2	C3	11	Shp/Gt	M2	R														1	5.40	Single loose M2 tooth in wear. Dental notes taken.
3	C3	11	Pig Sz	Rib	R													R	4	5.00	Series of moderately preserved fragments of corpus, degree of trabecular bone exposed. Length 49mm, Width 22mm, Thickness 7mm
4	C3	11	Cow	Tibia			fsd							1			B		1	37.70	Moderately preserved, distal tibia fragment. Minor singeing of surface, degree of trabecular bone exposed.
5	C3	11	Unid	Tibia						1						7a, 12a	G	R	1	23.40	Well preserved fragment. Large sz mammal. Minor exposure to heat, surface greyed
6	C3	11	Unid	Unid															4	0.30	Small poorly preserved fragments of trabecular bone
7	C3	11	Pig Sz	Rib														R	1	0.90	Trabecular bone exposed poor preservation.
8	C3	11	Unid	Unid													Br, B	R	1	0.60	Trabecular bone exposed poor preservation.
9	C3	11	Cow	Naviculo-Cuboid	R			1	1	1	1	1	1	1	1				1	14.00	Well preserved & complete. Low degree of eburnation on auricular surfaces
10	C64	26	Unid	Unid													W, G		4	0.10	Series of small-tiny calcined fragments of trabecular bone
11	C64	35	Unid	Long Bone													W, G		8	0.58	Series of calcined fragments of long bone diaphysis. Small sz mammal Largest fragment 9mm long, 6mm wide & 4mm thick
12	C64	35	Unid	Rib													W, G		4	0.33	Poorly preserved, calcined fragments of rib corpus, trabecular bone.
13	C64	35	Unid	Unid													W, G		20	0.32	Series of small-tiny calcined fragments of trabecular bone

Key:

C= Context
S=Sample
Anat=Anatomical Element
Prox=Proximal
Dist=Distal

But=Butchery
Bu=Burnt
G=Gnaw
Q=Quantity of Pieces
G=Grey

N=No
Unid=Unidentifiable
Taxa=Taxon
B=Black

W=White
R=Rodent
Cn=Carnivore

Table 1: Dental Ageing Database

SPEC No	C	S	TAXA	(DP4) P4	M1	M2	M3	COMMENTS/AGE CATEGORY
1	C3	11	Shp/Gt		H			2-3 Years
2	C3	11	Shp/Gt			G-H		2-3 Years

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GLOSSARY OF TERMS:
BOS: Latin term for Cow
SUS: Latin term for Pig
CERVUS: Latin term for Deer
EQUUS: Latin term for Horse
OVIS: Latin term for Sheep
CAPRINAE: Latin term for Sheep/Goat
CANIS: Latin term for Dog
LEPUS: Latin term for Hare
AVES: Latin term for Bird
TAPHONOMY: The study of the processes affecting an organism after death from the time of burial until collection.
TRABECULAR BONE: Osseous tissues that fill the interior cavity of bones and resemble a sponge or honeycomb.
DIAPHYSIS: Bone shaft
CORPUS COSTAE: Body of Rib Bone

Appendix 2.6 Petrographical Report – Stephen Mandal MIAI PGEO

Petrographical Report on Site Samples Taken During Archaeological Excavations at Danesfort 2 (E3540), Co. Kilkenny

Eurgeol Dr Stephen Mandal MIAI PGEO

Introduction
This report is based on the macroscopic (hand specimen) examination of stone samples taken during archaeological excavations in advance of the N9/N10 Phase 4 Knocktopher to Powerstown Road Scheme. The purpose of the study was to identify the rock types from which the stone objects were made, to highlight potential sources for them, and to comment on their possible function. It is important to note that macroscopic petrographical studies have been considered of limited value in comparison to microscopic (thin section and geochemical analysis) studies. On the other hand, macroscopic studies provide an excellent preliminary assessment tool and have proven to be of considerable value in petrographical studies (e.g. see Mandal 1997; Cooney and Mandal 1998).

Solid Geology and Soils of the Site (see Figure 1; McConnell 1994)
The bedrock under the site consists of fossiliferous dark-grey muddy limestone belonging to the Ballysteen Formation (shown on Figure 1 as BA).

The stratigraphical sequence in the area consists of the following. Gaps in the stratigraphically sequence are represented by line breaks.

Carboniferous (Silesian)
Killeshin Silstone Formation (KN) – Muddy siltstone and silty mudstone
Luggacurren Shale Formation (LS) – Mudstone and shale with chert and limestone

Carboniferous (Dinantian)
Clogrenan Formation (CL) – Cherty, muddy calcarenite limestone
Ballyadams Formation (BM) – Crinoidal wackestone/ packstone limestone
Butlersgrove Formation (BU) – Very dark grey argillaceous limestones
Ballysteen Formation (BA) – Fossiliferous dark-grey muddy limestone
Ballymartin Formation (BT) – Limestone and dark grey calcareous shales
Porter's Gate Formation (PG) – Sandstones, shales and thin limestones

Devonian
Kiltorean Formation (KT) – Yellow and red sandstones, green mudstones
Carrigmaclea Formation (CI) – Red, brown conglomerates and sandstones

Ordovician
Oaklands Formation (OA) – Green, red-purple, buff shale, siltstone
Maulin Formation (MN) – Dark blue-grey slate, phyllite, schist

Igneous Intrusions (undated)
Granite (Gr) – Undifferntiated
Dolerite (D)

The geology of the area is generally dominated by Lower Carboniferous Age rocks, principally limestones. These rocks, which also make up much of the Midlands of Ireland, represent the northward return of the sea at the end of the Devonian, *c.* 360 million years ago, owing to the opening of a new ocean to the south called the Palaeo-Tethys in what is now central Europe.

To the south of the study area occur Ordovician-Devonian Age rocks. The Devonian Age rocks consist of coarse sandstone and conglomerates representing terrestrial sediments resulting from a period of tectonic uplift.

The older, Ordovician Age rocks represent tectonic activity, relating to the closure of the Iaepetus Ocean, a major ocean which at its widest was probably greater than

3000km across. These rocks have been metamorphosed to slates, phyllites and schists by the intrusion of the Tullow granite pluton *c.* 405 million years ago.

Bedrock is not exposed at surface at the site; instead the overburden consists of boulder clay; surface drift from early glaciations. The area is part of a physical region known as the Caledonian province of the south-east. The soils of the area consist of acid brown earths (Aalen et al. 1997).

Results

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
Danesfort 2	A032/065	AR078	E3540	2	8	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	3	33	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	4	28	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	13	53	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	14	54	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red, contains burnt limestone piece
Danesfort 2	A032/065	AR078	E3540	15	60	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	16	43	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	17	76	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	23	112	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	26	64	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	27	56	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	29	102	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	31	122	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	32	111	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	34	93/94	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	36	72	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	39	105	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	41	153	Burnt;	Angular to Sub-rounded; broken	Sandstone, coarse grained, quartz rich, red

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
							cobbles	
Danesfort 2	A032/065	AR078	E3540	43	82	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red

Table 1. Results of petrographical analysis of stone samples from the site

Potential Sources
Coarse grained sandstone does not occur in bedrock in the immediate vicinity of the site. The dominant rock type in the area is limestone. Whilst there are minor sandstones within some of the limestone formations, the closest bedrock source for coarse grained yellow / red sandstone is within the Devonian Age Kiltorean Formation (yellow and red sandstones, green mudstones) and Carrigmaclea Formation (red, brown conglomerates and sandstones) (see Figure 1, shown as KT and CI respectively). It is important to note that these rock types were not necessarily sourced from bedrock. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles. It is therefore possible that these rocks were sourced locally.

Discussion
Whilst it is not possible to determine a definitive source for these stone samples based on macroscopic examination alone, it can be stated that these rock types are available locally in outcrop and within the glacial tills / sub-soils. It is therefore probable that the material in these samples were sourced in the vicinity of the site.

A total of 52 samples were also examined from the scheme across 6 sites during the course of the main excavations (A032 – phase 4; see Table 2). The samples showed a remarkable consistency across the scheme in terms of the principal rock type utilised; coarse grained sandstone, typically red in colour. All samples contain a variation of this type of rock as their principal component. All but one of the samples from UA2 (sample 3) are clearly burnt / altered. All contain angular pieces of stone. A total of 37 (70%) also contain sub-rounded to rounded pieces; in all cases these samples contain pebbles and / or cobbles, in most cases broken. Three of the samples contain minor amounts of limestone as a secondary rock type to sandstone.

Site	Licence			No.	Burnt	Angular	Rounded	Limestone
UA2				3	2	3	0	0
Baysrath 4	A032/089	AR057	E3629	2	2	2	2	2
Danganbeg 1	A032/075	AR058	E3606	15	15	15	15	0
Stonecarthy West 1	A032/079	AR067	E3610	8	8	8	0	0
Danesfort 2	A032/065	AR078	E3540	19	19	19	19	1
Danesfort 5	A032/058	AR082	E3456	5	5	5	0	0
Grand Total				**53**	**52**	**53**	**37**	**3**

Table 2. Results of petrographical analysis of stone samples from the N9/N10 Phase 4 Road Scheme

These samples are also very consistent with the samples examined from the N9/N10 Phase 4b road scheme to the north.

Coarse grained sandstone is typical of *fulacht fiadh* material (e.g. see Mandal 2004). The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles is clear evidence of the use of secondary sources. Angular

pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

References

Aalen, F. H. A., Whelan, K. and Stout, M. 1997 *Atlas of the Irish Rural Landscape*. Cork University Press: Cork.

Cooney, G. and Mandal, S. 1998 *The Irish Stone Axe Project: Monograph I*. Wordwell: Wicklow.

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Mandal, S. 2004 Petrographical Report on Stone Samples found during Archaeological Investigations relating to the Sligo Inner Relief Road (Licence No. 03E0535). Unpublished report commissioned by ACS Ltd for the NRA.

McConnell, B. (ed.) 1994 *Geology of Carlow-Wexford: A Geological Description to Accompany the Bedrock Geology 1:100,000 Map Series, Sheet 19, Carlow-Wexford*. Geological Survey of Ireland Publications. Westprint: Sligo.

Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

The "Measured radiocarbon age" is quoted in conventional years BP (before AD 1950). The error is expressed at the one-sigma level of confidence.

The "Calibrated date range" is equivalent to the probable calendrical age of the sample material and is expressed at the two-sigma (95.4% probability) level of confidence.

Calibration data set: intcal04.14c (UBA 11000, 12186)

Calibration data set: intcal09.14c (UBA 15553, 15554)

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C105, Fill of C128	39	Charcoal	*Prunus spp.* / 0.1g	QUB	UBA 11000	AMS (Std)	703–414 BC (1 sigma), 744–407 BC (2 sigma)	2434±20	-22.6
C54, Fill of a pit	14	Charcoal	*Fraxinus excelsior &Prunus spp.* / 0.5g	QUB	UBA 12186	AMS (Std)	2453–2293BC(1 sigma), 2464–2214BC (2 sigma)	3869±26	-21.8
C111, Fill of waterhole	32	Charcoal	Pomoideae / 0.1g	QUB	UBA 15553	AMS (Std)	2024–1943BC (1 Sigma) 2116–1893BC (2 Sigma)	3619±30	-28.8
C122, Fill of a posthole	31	Charcoal	*Cherry*	QUB	UBA 15554	AMS (Std)	797–769BC (1 Sigma) 806–595BC (2 Sigma)	2571±25	-26.9

References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, PG Blackwell, C Bronk Ramsey, CE Buck, GS Burr, RL Edwards, M Friedrich, PM Grootes, TP Guilderson, I Hajdas, TJ Heaton, AG Hogg, KA Hughen, KF Kaiser, B Kromer, FG McCormac, SW Manning, RW Reimer, DA Richards, JR Southon, S Talamo, CSM Turney, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111–1150.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14
NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

APPENDIX 3 LIST OF RMP IN AREA

RMP No	Description
KK023-005	Enclosure
KK023-007	Moated site
KK023-081001	Church
KK023-081002	Graveyard
KK023-081003	Grave slab
KK023-077	Ringfort (Unclassified)
KK023-076	Ringfort (Unclassified)
KK023-080	Castle Ringwork
KK023-080001	Designed Landscape (Folly)
KK023-083	Not in RMP
KK023-078	Ringfort (Unclassified)
KK023-079	Ringfort (Unclassified)

See Figure 2 for location.

APPENDIX 4 LIST OF SITE NAMES

Site Name	Site Code	E Number	Director	NGR
Baysrath 2	AR055	E3627	Fintan Walsh	251593/137855
Baysrath 3	AR056	E3628	Fintan Walsh	251672/138000
Baysrath 4	AR057	E3629	Fintan Walsh	251515/138280
Danganbeg 1	AR058	E3606	Emma Devine	251462/138754
Danganbeg 2	AR059	E3607	Emma Devine	251397/138939
Danganbeg 3	AR060	E3671	Emma Devine	251430/139245
Danganbeg 4	AR061	E3676	Emma Devine	251401/139372
Knockadrina 1	AR062	E3677	Ed Lyne	251422/139420
Tinvaun 1	AR063	E3678	Ed Lyne	251482/139625
Tinvaun 2	AR064	E3680	James Kyle	251445/139736
Tinvaun 3	AR065	E3608	James Kyle	251501/139832
Tinvaun 4	AR066	E3609	James Kyle	251508/139917
Stonecarthy West 1	AR067	E3610	James Kyle	251538/140023
Knockadrina 2	AR068	E3611	James Kyle	251647/140237
Rathduff 1	AR069	E3612	Ed Lyne	251286/142167
Rathduff Upper 1	AR070	E3613	Ed Lyne	251280/142559
Kellsgrange 1	AR071	E3575	James Kyle	250911/143732
Kellsgrange 2	AR072	E3577	James Kyle	250967/143861
Kellsgrange 3	AR073	E3576	James Kyle	250948/144003
Ennisnag 1	AR074	E3614	Richard Jennings	251416/145690
Ennisnag 2	AR075	E3615	Richard Jennings	251638/146068
Danesfort 12	AR076	E3616	Richard Jennings	251669/146186
Danesfort 13	AR077	E3617	Richard Jennings	251765/146384
Danesfort 2	AR078	E3540	Richard Jennings	251953/146745
Danesfort 4	AR079	E3539	Richard Jennings	251880/147579
Danesfort 3	AR080A	E3542	Richard Jennings	252221/146845
Danesfort 1	AR080B	E3541	Richard Jennings	252267/146707
Croan 1	AR081	E3543	Emma Devine	252280/147332
Danesfort 5	AR082	E3456	Emma Devine	252567/147767
Danesfort 6	AR083	E3538	Emma Devine	252764/147995
Danesfort 7	AR084	E3537	Emma Devine	252878/148099
Danesfort 8	AR085	E3461	Richard Jennings	253020/148246
Danesfort 9	AR086	E3458	Richard Jennings	253089/148345
Danesfort 10	AR087	E3459	Richard Jennings	253229/148414
Danesfort 11	AR088	E3460	Richard Jennings	253245/148462
Rathclogh 1	AR089	E3726	Patricia Lynch	253365/145515
Rathclogh 2	AR090	E3727	Patricia Lynch	253650/148848
Kilree 1	AR091	E3728	Patricia Lynch	254088/149310
Kilree 2	AR092	E3729	Patricia Lynch	254320/149500
Kilree 3	AR093	E3643	Patricia Lynch	254449, 149639
Kilree 4	AR094	E3730	Patricia Lynch	255330/150084
Dunbell Big 2	AR095	E3853	Yvonne Whitty	256684/151066
Holdenstown 1	AR096	E3681	Yvonne Whitty	256737/151253
Holdenstown 2	AR097/98	E3630	Yvonne Whitty	256891/151781
Holdenstown 3	AR099	E3854	Yvonne Whitty	256990/152085
Holdenstown 4	AR100	E3682	Yvonne Whitty	256828/152048
Dunbell Big 1	AR101	E3855	Yvonne Whitty	257034/152315
Rathcash 1	AR102	E3859	Tim Coughlan	258178/154199
Rathcash 2	AR103	E3860	Tim Coughlan	258294/154293
Rathcash East 1	AR104	E3892	Tim Coughlan	259419/154546
Rathcash East 2	AR105	E3893	Tim Coughlan	259555/154566
Rathcash East 3	AR106	E3861	Tim Coughlan	259821/154653
Blanchvillespark 1	AR107	E3894	Richard Jennings	260535/155212
Blanchvillespark 2	AR108	E3895	Tim Coughlan	260637/155449
Blanchvillespark 3	AR109	E3913	Tim Coughlan	260785/155653

Site Name	Site Code	E Number	Director	NGR
Blanchvillespark 4	AR110	E3914	Tim Coughlan	261442/156269
Blanchvillespark / Ballyquirk 1	AR111	E3862	Ruth Elliott	261531/156323
Ballyquirk 1	AR112	E3863	Ruth Elliott	261531/156323
Ballyquirk 2	AR113	E3864	Ruth Elliott	261811/156508
Ballyquirk 3	AR114	E3865	Ruth Elliott	261875/156559
Ballinvally 1	AR115	E3836	Emma Devine	263258/157521
Garryduff 1	AR116	E3852	Emma Devine	263933/157991
Kilmacahill 1	AR117	E3915	Tim Coughlan	264267/158369
Kilmacahill 2	AR118	E3833	Tim Coughlan	264380/158453
Jordanstown 1	AR119	E3834	James Kyle	264546/158643
Jordanstown 2	AR120	E3851	James Kyle	264893/159038
Kellymount 6	AR121	E3758	Przemaslaw Wierbicki	265130,159277
Jordanstown 3	AR122	E3916	Przemaslaw Wierbicki	265103/159227
Kellymount 1	AR123	E3756	Przemaslaw Wierbicki	265250/159397
Kellymount 2	AR124	E3757	Przemaslaw Wierbicki	265164/159463
Kellymount 3	AR125	E3856	Przemaslaw Wierbicki	265338/159597
Kellymount 4	AR126	E3857	Przemaslaw Wierbicki	265412/159803
Kellymount 5	AR127	E3858	Przemaslaw Wierbicki	265530,159977
Shankill 2	AR128	E3738	Richard Jennings	265924/160651.
Shankill 3	AR129	E3737	Richard Jennings	266052/161141
Shankill 4	AR130	E3838	Richard Jennings	266286/161526
Shankill 5	AR131	E3850	Richard Jennings	266374/161730
Shankill 6	AR132	E3840	Richard Jennings	266403/161836
Moanmore 1	AR133	E3835	Richard Jennings	266476/162016
Moanmore 2	AR134	E3843	Sinead Phelan	266756/162866
Moanmore 3	AR135	E3837	Sinead Phelan	266856/163259
Bannagagole 1	AR136	E3844	Sinead Phelan	266942/163569
Moanduff 1	AR137	E3839	Robert Lynch	267261/164397
Coneykeare 1	AR138	E3683	Sinead Phelan	267836/166209
Coolnakisha 1	AR139	E3768	Ellen O'Carroll	268175/167274
Coolnakisha 2	AR140	E3767	Ellen O'Carroll	268306/167559
Cranavonane 1	AR141	E3842	Tim Coughlan	268554/167895
Cranavonane 2	AR142	E3732	Ellen O'Carroll	268830/168154
Cranavonane 3	AR143	E3731	Ellen O'Carroll	269123/168362
Tomard Lower 1	AR144	E3733	Ellen O'Carroll	269349/168496
Paulstown 1	AR145	E3642	Ruth Elliot	265889/158499
Paulstown 2	AR146	E3632	Ruth Elliot	265664/158651
Rathgarvan or Clifden 1	AR147	E3760	Przemaslaw Wierbicki	257026/154123
Maddockstown 1	AR148	E3759	Przemaslaw Wierbicki	256886/154199
Templemartin 3	AR149	E3845	Emma Devine	255095/155200
Templemartin 4	AR150	E3841	Emma Devine	254920/155427
Templemartin 5	AR151	E3846	Emma Devine	254706/155636
Templemartin 1	AR152	E3849	Emma Devine	254504/155826
Templemartin 2	AR153	E3847	Emma Devine	254173/156236
Leggetsrath East 1	AR154	E3734	Emma Devine	253793/156484
Moanduff 2	AR155	E3735	Sinead Phelan	267470/164887
Moanduff 3	AR156	E3736	Sinead Phelan	267515/164979
Ballyquirk 4	AR157	E3848	Richard Jennings	262596/157025
Shankill 1	AR158	E3766	Przemaslaw Wierbicki	265707/160269
Rathgarvan or Clifden 2	AR159	E3921	Tim Coughlan	257095/154119
Ballynolan 1	AR160	E3755	Sinead Phelan	267714/165597
Rathduff Upper 3	UA2	E3974	Tim Coughlan	250991/143565
Rathduff Bayley	UA4	E4011	Tim Coughlan	251005/143564

N9/N10 KILCULLEN TO WATERFORD SCHEME, PHASE 4 – KNOCKTOPHER TO POWERSTOWN

Ministerial Direction Scheme Reference No.	A032
Registration No.	E3540
Site Name	AR078, Danesfort 2
Townland	Danesfort
County	Kilkenny
Excavation Director	Richard Jennings
NGR	251953 146745
Chainage	34925

FINAL REPORT

ON BEHALF OF KILKENNY COUNTY COUNCIL

FEBRUARY 2012

IAC Irish Archaeological Consultancy

PROJECT DETAILS

Project	N9/N10 Kilcullen to Waterford Scheme, Phase 4: Knocktopher to Powerstown
Ministerial Direction Reference No.	A032
Excavation Registration Number	E3540
Excavation Director	Richard Jennings
Senior Archaeologist	Tim Coughlan
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Kilkenny County Council
Site Name	AR078, Danesfort 2
Site Type	Burnt mound
Townland(s)	Danesfort
Parish	Danesfort
County	Kilkenny
NGR (easting)	251953
NGR (northing)	146745
Chainage	34925
Height OD (m)	54.431
RMP No.	N/A
Excavation Dates	25 June–23 July 2007
Project Duration	20 March 2007–18 April 2008
Report Type	Final
Report Date	February 2012
Report By	Richard Jennings and Tim Coughlan
Report Reference	Jennings, J. and Coughlan, T. 2012 E3540 Danesfort 2 Final Report. Unpublished Final Report. National Monument Service. Department of the Environment, Heritage and Local Government, Dublin.

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Project Liaison Officer, Kilkenny Co. Council – Joe Gannon and Lisa Mulcahy

NATIONAL MONUMENTS, DOEHLG

Archaeologist – Martin Reid

IRISH ANTIQUITIES DIVISION, NATIONAL MUSEUM OF IRELAND

Assistant Keeper – Nessa O'Connor

ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by the National Roads Authority (NRA) through Kilkenny County Council, undertook an excavation at the site of AR078, Danesfort 2 along the proposed N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Figure 1). The following report describes the results of archaeological excavation at that site. The area was fully excavated by Richard Jennings under Ministerial Direction A032 and Excavation Registration Number E3540 issued by the DOEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between 25 June and 24 July 2007.

The site was identified as two phases of burnt mound activity, one in the early Bronze Age and a second in the early Iron Age. It is possible there were two separate phases of occupation in the Bronze Age.

The earliest dated feature on the site consisted of a sub-oval, bowl shaped trough (Trough 1) with an adjacent hearth, identified by a smaller cut with scorched sides and base. The trough was dated to the early Bronze Age. A shallow extension to the trough on the west side may have served as a step. A number of small pit features were identified in the general vicinity of the trough but it is not clear if these were directly related, and indeed their function remains unclear.

In the north of the site there was a very large and deep pit which may have functioned as a cistern or waterhole. The large pit was dated to the early Bronze Age but appears to be slightly later in date than Trough 1. It may therefore represent a second phase of Bronze Age activity on the site. The waterhole was not sealed by the main burnt mound spread however; there was evidence that some burnt mound material had been tipped into the feature, presumably after it was abandoned.

Located between the waterhole and Trough 1 were a series of features that represent the Iron Age phase of occupation of the site. These consisted of a large sub-oval trough (Trough 2) and adjacent large pit to the west. A number of irregular pits were identified to the east of the trough and may represent storage or perhaps evidence of land clearance in advance of the activity associated with the trough. Two structures were identified, the first of which (Structure A) consisted of a number of circular post-pits in a horseshoe shaped formation around the east of the trough. While the pits did not seem deep enough to support large (long) structural posts, the regular arrangement may have supported a platform erected on shorter posts around the trough. Some small stakeholes appear to have augmented the structure. At a distance of 5m to the east of Trough 2 was Structure B. This consisted of two parallel lines of four postholes. It is again interpreted that this may have been the location for a small platform (1.5m by 0.5m). Both Trough 2 and Structure B have been dated to the early Iron Age.

The overlying burnt mound deposits sealed almost all of the pits and troughs identified at the site, with the notable exception of the large waterhole. This probably indicates that the water in the waterhole was not heated, and it was a storage facility. It was not possible to identify which deposits were associated with the Bronze Age activity and which were associated with the Iron Age, as the mound deposits had been substantially levelled and disturbed over time. A number of modern drainage channels were also recorded, which truncated some of the features on the site.

Four samples were sent for AMS radiocarbon dating. A sample of ash and *Prunus* sp. charcoal from trough fill C54 was radiocarbon dated. The 2 sigma calibrated result was 2464–2214BC (UBA 12186). A sample of Pomoideae charcoal from

waterhole fill C111 had a 2 sigma calibrated result of 2116–1893BC (UBA 15553). A sample of cherry charcoal from posthole fill C122 was also radiocarbon dated. The 2 sigma calibrated result was 806–595BC (UBA 15554). A sample of *Prunus* sp. charcoal from pit fill C105 returned a 2 sigma calibrated result of 744–407BC (UBA 11000).

The Iron Age phase on the site contains features which conform in many ways with the features commonly found on burnt mound sites in terms of a trough, pits and burnt mound spread. The trough (Trough 2) however, does appear to be particularly deep and at 0.70m is approximately twice the depth of an average trough. Another deep, large pit is adjacent to the west end although not as large as the Bronze Age waterhole. The function of this pit, and indeed Trough 2 needs to be considered given their particular size and depth and it would seem unlikely that they were designed for cooking. The volume of water in such deep features would be more easily heated (for bathing) than boiled (for cooking). Trough 2 was also surrounded by a series of possible post-pits which may have supported a platform around the trough or indeed a small enclosed or roofed structure over the trough. A second possibly small structure or platform (B) 5m to the east consisted of parallel rows of four postholes. Structure A, Structure B and the trough were all on a similar east-west alignment, which is not likely to be coincidental.

The Iron Age phase at Danesfort 2 potentially represents a bathing place. This is significant in terms of our wider understanding of the function of *fulachta fiadh*/burnt mounds. It has been identified that this site type can have many functions and often the precise nature of the activity at excavated burnt mounds is unclear. The results of excavations at Danesfort 2 indicate that these varying functions can potentially occur in tandem when we consider the simpler trough and pits from the early Bronze Age; the subsequent unrelated very large early Bronze Age waterhole/cistern and the Iron Age possible bathing site.

Danesfort 2 is an important site locally as it represents the first evidence of early Iron Age activity in the immediate area and it adds to the considerable evidence from the Bronze Age that has been gathered through excavations as part of the N9/N10 Phase 4. It is, however, also of regional significance, based on the nature of the burnt mound activity identified at the site, in particular the Iron Age possible bathing site. A number of potential sweathouses and bathing sites have been confirmed from recent excavations of burnt mounds across the country and the results of the Danesfort 2 excavation will significantly add to the further study, analysis and understanding of the varied function and form of burnt mound sites.

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1 INTRODUCTION

1.1 General

This report presents the results of the archaeological excavation of Danesfort 2, AR078 (Figure 1), in the townland of Danesfort undertaken by Richard Jennings for IAC, on behalf of Kilkenny County Council and the NRA, in accordance with the Code of Practice between the NRA and the Minister for Arts, Heritage, Gaeltacht and the Islands. It was carried out as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4, which extends between Knocktopher in Co. Kilkenny to Powerstown in Co. Carlow. The excavation was undertaken to offset the adverse impact of road construction on known and potential subsoil archaeological remains in order to preserve the site by record.

The site measured 2834m^2 and was first identified during testing carried out in between 30 January and 3 March 2006 by Melanie McQuade (E3882) for Margaret Gowen & Co. Ltd. on behalf of the National Roads Authority. Danesfort 2 was excavated between June 25 and July 24 2007 with a team of one director, one supervisor and 14 assistant archaeologists.

1.2 The Development

For the purposes of construction, the N9/N10 Kilcullen to Waterford Road Scheme has been divided into separate sections, known as Phases 1–4. Phase 2 of the scheme extends from the tie-in to the Waterford City Bypass at Dunkitt, to Knocktopher in Co. Kilkenny (Ch. 2+000–Ch. 25+400). Phase 4 continues from Knocktopher to Powerstown in Co. Carlow (Ch. 25+400–Ch. 76+000) and includes the Kilkenny Link Road.

The roadway of the entire scheme includes approximately 64km of mainline high quality dual carriageway and 6.2km of the Kilkenny Link Road, which will connect the road development to the Kilkenny Ring Road Extension. The road development requires the realignment and modification of existing national, regional and local roads where the mainline intersects them. It requires the acquisition of 305 hectares of land for its construction. A further link road will connect the scheme to Paulstown in County Kilkenny, while six new grade separated junctions and three roundabouts are part of the road development.

1.3 Archaeological Requirements

The archaeological requirements for the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4: Knocktopher to Powerstown, are outlined in the Archaeological Directions issued to Kilkenny 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 Kilkenny County Council and Irish Archaeological Consultancy Ltd. These instructions form the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract are located between the townlands of Knocktopher, Co. Kilkenny, and Powerstown, Co. Carlow.

The proposed N9/N10 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Valerie J. Keeley Ltd and published in February 2005. The Record of Monuments and Places, the Site Monument Record, Topographical files, aerial photography, the Kilkenny and Carlow County Archaeological Urban Survey, and literary sources were all consulted. Two phases of geophysical survey were also conducted by Target (post-EIS geophysics carried out by ArchaeoPhysica) and an aerial survey was carried out by Margaret Gowen & Co. Ltd. As a result of the paper survey, field inspections and geophysical

survey, 35 sites were recorded in proximity to this section of the overall route alignment.

A previous archaeological assessment of Phase 2 of the scheme (test trenching conducted by Margaret Gowen & Co. Ltd. in 2006) extended into the lands acquired for Phase 4 to a point at Ch. 37+100 in the townland of Rathclogh, Co. Kilkenny. Thirty-four archaeological sites were identified within this area between Knocktopher and Rathclogh and subsequently excavated by Irish Archaeological Consultancy Ltd. as part of this archaeological contract.

Advance archaeological testing of the area between Rathclogh (Ch. 37+100) and Powerstown (Ch. 76+000) was completed by IAC during March–May 2007 and excavation of the sites identified during this process was also conducted by IAC between August 2007 and April 2008.

1.4 Methodology

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

All archaeological features were fully excavated by hand and recorded on *pro forma* record sheets using a single context recording system best suited to rural environment, with multi context plans and sections being recorded at a scale of 1:50, 1:20 or 1:10 as appropriate.

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

An environmental strategy was devised at the beginning of the excavation based on IAC in-house post-excavation and site methodologies and guidelines. Features exhibiting large amounts of carbonised material were the primary targets.

All artefacts uncovered on site were dealt with in accordance with the guidelines as issued by the NMI and where warranted in consultation with the relevant specialists. All archive is currently stored in IAC's facility in Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland.

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

All excavation and post excavation works were carried out in accordance with the relevant approvals and in consultation and agreement with the National Roads Authority (NRA) Project Archaeologist, the National Monuments Section of the DoEHLG and the National Museum of Ireland. Where necessary licences to alter and export archaeological objects were sought from the National Museum of Ireland.

References to other sites excavated as part of the N9/N10 Phase 4: Knocktopher to Powerstown are referenced throughout this report only by their site name e.g.

Paulstown 1. A list of these sites and details including director's name and National Monuments Excavation Reference Number can be referenced in Appendix 4.

Final Report Date Ranges

The following date ranges for Irish prehistory and medieval periods are used for all final reports for the N9/N10 Phase 4: Knocktopher to Powerstown excavations.

Mesolithic: 7000–4000BC
Neolithic: 4000–2500BC
Early Bronze Age: 2500–1700BC
Middle Bronze Age: 1700–1200BC
Late Bronze Age: 1200–800BC
Iron Age: 800BC–AD500
Early medieval period: AD500–1100
Medieval period: AD1100–1600
Post-medieval: AD1600–1800

Source:
Carlin, N., Clarke, L. & Walsh, F. 2008 *The M4 Kinnegad-Enfield-Kilcock Motorway: The Archaeology of Life and Death on the Boyne Floodplain*. NRA Monograph Series No. 2, Wordwell, Bray.

2 EXCAVATION RESULTS

Danesfort 2, a burnt mound, was located in a valley adjacent to a tributary that joins the King's River at the village of Ennisnag. The valley runs from west to east and is U-shaped. The burnt mound was located on the southern slope and base of the valley (Figure 4, Plate 1). It was not visible prior to excavation as it was obscured beneath a band of redeposited topsoil that lined the valley slopes. The valley sides were formed of boulder clay but its base was characterised by a loose concentration of medium- and large sized angular and sub-rounded stones. These probably related to a path which is depicted on the first edition Ordinance Survey Map (1839). At this time the valley was within Danesfort Demesne (the external stone wall perimeter of the Demesne is visible in Plate 1). It is very probable that at some point in the past this valley carried water into the Ennisnag tributary. Although dry and under pasture at the start of the excavation, when it rained the ground became saturated and the archaeological features rapidly filled with water, despite the presence of a modern drainage pipe running on the valley base. The location of the site in a gently winding valley only 54m OD meant that views from the site were quite restricted in all directions.

The burnt mound was situated within an archaeologically rich Bronze Age landscape (Ch. 33740-37100, Danesfort and Croan townlands). Evidence of funerary and domestic activity was discovered 0.4–0.6km to the south-west at sites Danesfort 12 and 13 where three ringditches, a pit circle and three cremations were found in low-lying land beside the Ennisnag tributary. Another ringditch was found 0.3km to the south-east at Danesfort 1 while Graves (1860–1) reported the discovery in 1838 of an intact Bronze Age urn in a sand pit next to a post-medieval turret (RMP KK023-080) which is visible 0.2km to the south of Danesfort 2. A prehistoric shelter on higher ground was recorded 0.7km to the north-east (Croan 1, AR081). Bronze Age sites were also excavated 1–1.8km to the north and north-east at Danesfort 5–7 including a settlement and cremation pits with late Bronze Age pottery. The next closest recorded burnt mound activity was recorded in a shallow basin at Danesfort 11, *c.* 2.3km to the north-west. In that instance, there was no mound and only features cut into the boulder clay survived.

2.1 PHASE 1 Natural Drift Geology

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A				Medium grey sandy gravel clay.	Natural

The subsoil comprised sandy, gravel clay.

2.2 PHASE 2 Early Bronze Age Activity

The primary features excavated at Danesfort 2 were dated to the early Bronze Age and were associated with burnt mound activity (Figure 5; Plate 2).

2.2.1 Trough 1 with adjoining Hearth

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C7	N/A	4.50	2.20	0.75	Irregular shaped cut of trough and hearth	Cut of trough
C7a	N/A	1.30	1.30	0.20	Roughly circular hearth cut	Cut of hearth
C8	C7/7a	4.50	1.30	0.30	Dark greyish black clayey silt	Upp. fill trough/hearth
C21	N/A	0.05	0.06	0.11	Circular shaped cut	Cut of stakehole
C22	C21	0.06	0.08	0.11	Mid greyish brown silty clay	Fill of stakehole
C33	C7	1.50	0.75	0.35	Light brownish grey silt	Upper fill of trough
C53	C7	2.50	1.80	25.4	Greyish black clayey silt	Middle fill of trough
C54	C7	1.80	1.60	0.25	Blackish grey silty clay	Basal fill of trough

Finds: None

The trough, C7, was located in the southern area of the site (Figure 5). It was bowl-shaped with an uneven stony base (Plate 3). The area to the west of the trough consisted of a shallower, sub-rectangular extension to the main bowl shaped trough cut that perhaps functioned as a small step. The trough was adjoined on its eastern (upslope) side by a small hearth C7a (Plate 4). It was impossible to distinguish between the fills of the two features as the fill of the hearth and the upper fill of the trough were identical. This fill contained a high ash component while the sides of the hearth were reddened due to the scorching of the earth. The lower fills of the trough also contained ash but in less substantial quantities. These fills, which had matrices of clay or silt, were dominated by charcoal and small angular fragments of heat-shattered sandstone. The evidence suggests that the hearth was used to heat sandstone blocks which were then placed into the water-filled trough to boil water. A solitary stakehole was identified adjacent to the hearth. The function of a single stakehole cannot be accurately assessed.

Charcoal analysis of fill C8 (fill of trough C7) indicated a predominance of hazel (*Corylus avellana),* ash (*Fraxinus excelsior*), pomaceous fruitwood (*Pomoideae*) wild/bird cherry (*Prunus avium/padus* sp.) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

A sample of plant remains (S14) from C54 was examined and no charred seeds were recovered from this sample (Johnston, Appendix 2.4).

Stone retrieved from C8, C33, C53 and C54 was analysed and was found to be coarse grained, quartz-rich, red sandstone. The sample examined from C54 also contained a burnt limestone piece. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.05g) of ash and prunus was chosen for AMS dating from C54 and returned a result of 3869±26 (UBA 12186). The 2 Sigma calibrated result for this was 2464–2214BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age period.

2.2.2 Features Adjacent to Trough 1

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C11	N/A	1.27	0.42	0.13	Elongated shallow pit	Cut of pit
C12	C11	1.27	0.42	0.13	Black silty sand with pebbles	Fill of pit
13	N/A	0.48	0.35	0.07	Sub-circular, gradual slope, concave base.	Cut of pit
14	C13	0.48	0.35	0.07	Black sandy silt with burnt stones, charcoal	Fill of pit
C15	N/A	0.90	0.68	0.12	Oval shaped shallow pit	Cut of pit
C16	C15	0.90	0.68	0.12	Black silty sand with stone and pebbles	Fill of pit
C17	N/A	2.80	0.49	0.22	Curvilinear shaped cut	Cut of channel
C18	C17	2.80	0.49	0.22	Dark brown silty sand	Fill of channel
C23	N/A	0.25	0.18	0.13	Oval shaped cut	Cut of pit
C24	C23	0.25	0.18	0.13	Dark greyish brown silty sand	Fill of pit
C25	N/A	0.45	0.25	0.18	Oval shaped cut	Cut of pit
C26	C25	0.45	0.25	0.18	Greyish brown silty sand	Fill of pit
C27	N/A	0.20	0.15	0.35	Circular cut	Cut of pit
C28	C27	0.20	0.15	0.35	Black silty sand	Fill of pit
C152	N/A	0.67	0.42	0.21	Oval shaped cut	Cut of pit
C153	C152	0.67	0.42	0.21	Black silty clay	Fill of pit

Finds: None

There were a number of features in the vicinity of the trough. These were generally shallow and probably not particularly significant. They were probably related to activity associated with the trough but form no particular pattern and contained nothing diagnostic in their fills to suggest a particular function. The most prominent feature was C17, a small curvilinear channel filled with burnt mound material. There was not enough evidence to suggest that it was structural and it may have formed naturally as a result of water erosion. Charcoal was identified from the fills but this was not sent for further analysis.

Stone retrieved from C153 (fill of pit C152) and C28 (fill of pit C27) was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.2.3 Large Waterhole C109 and adjacent Pit C5

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C5	N/A	1.60	1.50	0.11	Oval shallow pit with irregular base	Cut of pit
C6	C5	1.60	1.50	0.11	Grey-Black silt with no inclusions	Fill of pit
C52	C109	1.35	0.8	0.30	Tightly compacted light brown clay with small stones within.	Fill of pit
C106	C109	1.65	2.50	0.20	Dark brown silty clay	Fill of pit
C107	C109	2.10	3.50	0.30	Dark brown clay	Fill of pit
C108	C109	0.60	2.00	0.65	Medium brown silty clay	Fill of pit
C109	N/A	6.00	6.00	0.75	Oval shaped cut	Cut of pit
C110	C109	6.00	3.50	0.75	Dark grey thick marl	Fill of pit
C111	C109	1.70	1.70	0.25	Black clay with heat shattered stones	Fill of pit

Finds: None

At the north of the excavated area was a large pit which may have functioned as a waterhole/cistern. This may have utilised the location near the base of the valley to store water during periods of rain when there would be a surplus of surface water available. In drier conditions there was no obvious water source. The size of the waterhole appears to be slightly excessive given the small number of features identified on the site (Figure 4; Plate 8). Perhaps another site was located close by, although the proposed N9/N10 ran along the valley floor where it seems most likely that additional burnt mound activity would have been located if it had existed.

The waterhole was located away from the main cluster of burnt mound features and was not sealed by the dispersed burnt mound spread. Nevertheless, burnt mound material did find its way into the waterhole. It was found tipped into the waterhole (C111) on its southern side nearest Trough 2. The layer of burnt mound material was within thick, dark-grey marl (C110) which also contained occasional large sandstone rocks. These were probably the types of stones that were heated and then dumped into the troughs. Only one feature of archaeological potential was located in proximity of the waterhole. This consisted of a small shallow pit C5 which had no inclusions and as such its function is unclear.

While the waterhole was dated to the early Bronze Age (see below), the calibrated dates suggest that it was not contemporary with Trough 1, being slightly later in date. This may indicate a second phase of early Bronze Age activity on the site. The activity to the south of the waterhole has been dated to the Iron Age with the early

Bronze Age trough 1 being further south again. There is some indication that the Iron Age features have truncated some earlier features. Perhaps these were contemporary with the waterhole.

Charcoal analysis of fill C111 (fill of pit C109) indicated a predominance of pomaceous fruitwood (*Pomoideae*) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

Stone retrieved from C111 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of pomaceous fruitwood was chosen for AMS dating from C111 and returned a result of 3619±30 (UB 15553). The 2 Sigma calibrated result for this was 2153–1893BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age period.

2.3 PHASE 3 Iron Age Activity

2.3.1 Trough 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C128	N/A	2.25	1.60	0.75	Oval shaped cut	Cut of pit/Trough
C105	C128	2.25	1.60	0.75	Dark grey-black sandy silt, shattered stones	Fill of pit/Trough

Finds: None
Trough 2 consisted of a large, deep oval pit C128 with a U-shaped profile (Figure 4-6; Plate 5). No surviving timbers or stakeholes were found to suggest that it was wooden lined. Its fill of heat-shattered stones differed from that of the overlying burnt mound material in that it contained infrequent medium and large sized stones and was siltier and less clayey than the mound. It has been dated to the early Iron Age (see below). Associated with the trough were two separate phases of pits, predominantly to the east of the trough. The second phase of features appeared to be directly related to a structure erected over/around the trough. The earlier features were more irregular in plan and pattern and may be unrelated to the trough, perhaps being associated with the previously outlined early Bronze Age activity. These features were all located to the east of the trough.

Charcoal analysis of fill C105 (fill of trough C128) indicated a predominance of pomaceous fruitwood (*Pomoideae*) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3). A fragment of *Prunus* sp. was identified for radiocarbon analysis. This species was not identified in the wider analysis of the sample.

Stone retrieved from C105 was analysed and was found to be coarse grained, quartz rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of *Prunus* sp charcoal was chosen for AMS dating from C105 and returned a result of 2434±20 (UBA 11000). The 2 Sigma calibrated result for this was 744–407BC (QUB, Appendix 2.7) dating this feature to the early Iron Age period.

2.3.2 Large Pit C100

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C100	N/A	2.90	2.70	0.70	Irregular shaped cut	Cut of pit
C151	C100	2.90	2.70	0.70	Dark greyish black sandy silt	Fill of pit

Finds: None

A large sub-rectangular pit, C100, was located to the west of Trough 2 (Figure 5). The fill of this pit contained the same dark-greyish-black, sandy silt that was found in the adjoining trough. For this reason it is likely that the pit was contemporary with the trough and that the two were directly associated rather than one being a replacement for the other. No further analysis was carried out on the fill material C151.

2.3.3 Primary Phase of Pits to East of the Trough

A series of irregular shaped pits were identified in the area to the east of the trough.

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C44	C59	0.35	0.37	0.06	Mid greyish brown fine sand	Fill of pit
C57	N/A	2.40	2.20	0.32	Oval shaped cut	Cut of pit
C58	C57	1.10	0.88	0.17	Greyish black silty sand	Fill of pit
C59	N/A	0.76	0.74	0.20	Circular shaped cut	Cut of pit
C60	C59	0.70	0.66	0.15	Black fine sand	Fill of pit
C61	N/A	0.95	0.65	0.16	Circular shaped cut	Cut of pit
C62	C61	0.95	0.65	0.16	Black soil with stones	Fill of pit
C63	N/A	1.35	1.05	0.37	Irregular shaped cut	Cut of pit
C64	C63	1.35	1.05	0.37	Black silty sand	Fill of pit
C71	N/A	0.32	0.28	0.12	Circular shaped cut	Cut of pit
C72	C71	0.32	0.28	0.12	Black silty sand	Fill of pit
C75	N/A	0.33	0.33	0.07	Greyish black silty sand	Spread
C81	N/A	1.00	0.50	0.25	Irregular shaped cut	Cut of pit
C82	C81	1.00	0.40	0.25	Black sandy clay	Fill of pit
C91	N/A	0.80	0.40	0.13	Curved linear, gradual sides, linear base.	Cut of pit
C92	C91	0.80	0.40	0.13	Greyish black silty sand	Fill of pit
C93	N/A	1.25	0.60	0.32	L- shaped cut- upper part	Cut of pit
C94	C93	1.25	0.60	0.32	Black silty sand	Fill of pit
C112	C118	0.71	0.67	0.20	Dark brownish black silty sand	Fill of pit
C117	C57	2.40	2.20	0.21	Orange brown silty sand	Fill of pit
C118	N/A	0.71	0.67	0.20	V-shaped cut	Cut of pit
C129	N/A	1.00	1.00	0.30	Irregular shaped cut	Cut of pit
C130	C129	1.00	1.00	0.30	Black silty sand	Fill of pit

Finds: None

The pits were concentrated upslope on the eastern side of the trough over a 7m by 5m area. These comprised ten irregular-shaped shallow pits, the largest of which, C57, was 2.4m by 2.2m by 0.3m. All generally contained silty sand burnt mound material and must have performed some function that was related to the nearby trough. None of their bases were scorched to suggest that *in situ* burning took place in them. Perhaps their function was to store some form of organic material that has not survived in the archaeological record. They may also have been the result of some land clearance to facilitate the trough and associated structures. It seems unlikely that the purpose of the pits was to hold water given the adjacent presence of

a large trough and pit. Soil samples were processed from the pits to assess if any diagnostic material could be identified to suggest a function but predominantly only charcoal fragments were recovered. A few fragments of burnt bone were found in C64 (fill of pit C63) which may indicate domestic waste.

None of the pits were dated, however some of the pits were truncated by postholes and pits probably associated with a structure erected around or over Trough 2. It is possible therefore that these pits were associated with the early Bronze Age phase of activity on site, perhaps with the large waterhole C109 to the north. However their location, clustered immediately east of Trough 2 suggests a primary phase of activity associated with the trough.

Charcoal analysis of fill C94 (fill of pit C93) indicated a predominance of oak (*Quercus* sp.) although the level of charcoal from this context was low. This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

A sample of plant remains from C58 was examined and no charred seeds were recovered from this sample (Johnston, Appendix 2.4).

Burnt animal bone fragments were recovered from fill C64 of pit C63. A total of four calcined fragments of unidentifiable trabecular bone were recovered. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation (McCarthy, Appendix 2.5).

Stone retrieved from C60, C64, C72, C82, C93 and C112 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.3.4 Structure A at Trough 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C77	N/A	0.22	0.14	0.11	Circular shaped cut	Cut of stakehole
C78	C77	0.22	0.14	0.11	Black to dark brown soil	Fill of stakehole
C79	N/A	0.10	0.08	0.09	Circular shaped cut	Cut of stakehole
C80	C80	0.10	0.08	0.09	Black soil	Fill of stakehole
C87	N/A	0.13	0.11	0.22	Circular shaped cut	Cut of stakehole
C83	N/A	0.85	0.40	0.30	Circular shaped cut	Cut of pit
C84	C83	0.85	0.40	0.30	Black sandy clay	Fill of pit
C88	C87	0.13	0.11	0.22	Greyish black silty clay	Fill of stakehole
C89	N/A	0.14	0.13	0.16	Circular shaped cut	Cut of stakehole
C90	C89	0.14	0.13	0.16	Grey silty sand	Fill of stakehole
C95	N/A	0.40	0.38	0.40	Circular shaped cut	Cut of pit/posthole
C96	C95	0.40	0.38	0.40	Black silty sand	Fill of pit/ posthole
C97	N/A	0.60	0.50	0.21	Circular shaped cut	Cut of pit
C98	C97	0.24	0.20	0.09	Brownish black silty clay	Fill of pit
C123	C97	0.60	0.50	0.15	Mid brown sandy clay	Fill of [pit
C131	N/A	0.55	0.55	0.28	Rounded shaped cut	Cut of pit
C132	C131	0.55	0.55	0.15	Dark grey clayey silt	Fill of pit
137	N/A	0.12	0.10	0.09	Circular, steep sides and concave base.	Cut of stakehole
138	C137	0.12	0.10	0.09	Loosely compact black clay silt with grey hue.	Fill of stakehole
139	N/A	0.11	0.09	0.05	Circular, steep sides and concave base.	Cut of stakehole
140	C139	0.11	0.09	0.05	Loosely compact black clay silt with grey	Fill of stakehole

					hue.	
C141	C142	0.39	0.30	0.20	Greyish black silty sand	Fill of stakehole
C142	N/A	0.39	0.30	0.20	Circular within oval shaped pit	Cut of stakehole
C143	C144	0.50	0.40	0.47	Brownish black silty clay	Fill of pit/posthole
C144	N/A	0.50	0.40	0.47	Oval shaped cut	Cut of pit/posthole
C145	N/A	0.35	0.35	0.20	Rounded shaped cut	Cut of pit
C146	C145	0.35	0.35	0.20	Dark greyish black clayey silt	Fill of pit

Finds: None

Seven circular pits formed a horseshoe shaped structure around the trough. These pits contrasted with those of the earlier phase in that they were of consistent size and shape and tended to have steep sides and flat bases. The one characteristic that prevented all of them from being definitively categorised as postholes was their shallowness. Only three exceeded depths of 0.3m and the majority were over 0.4m in diameter. Also, none of them contained postpipes or packing material that might give an indication that they supported posts. However, the horseshoe-shaped distribution of the pits, effectively around the perimeter of the trough, suggests that they had a structural function, so perhaps they held short and thick posts which served as the foundation for a wooden platform that may have existed over or around the sides of the trough.

In four examples the circular pits truncated some of the irregular pits of the earlier phase. It was impossible to detect the cut of three examples due to their containing similar fills of charcoal and heat-shattered stones. If there was a difference, the matrices of the earlier pits tended to be silty sand while the circular pits had a greater silty clay component. This might indicate that the earlier pits had been deliberately backfilled while the later ones had naturally silted up. One cut was very clear: circular pit C95 truncated C118 (Figure 6; Plate 6).

Seven stakeholes were probably associated with the structure, being located predominantly along its east side. They may have provided some additional support to the post-pits. Some of them appeared to be cut into the earlier phase of pits including C89, C83 and C144.

Stone retrieved from C93/94 was analysed and was found to be coarse grained, quartz rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.3.5 Shallow Pit C147

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C147	N/A	0.90	0.40	0.25	Rectangular shaped cut	Cut of pit
C148	C147	0.90	0.40	0.25	Dark greyish black clayey silt	Fill of pit

Finds: None

A small rectangular pit C147, was cut into the northern side of the trough. It appeared to modify the existing oval trough creating a shallow step. Perhaps its function was related to the possible platform Structure A. Indeed, it appeared to respect one of the supporting post-pits C131. Its precise function is unclear.

2.3.6 Structure B

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C19	N/A	0.35	0.33	0.21	Circular shaped cut	Cut of posthole
C20	C19	0.35	0.33	0.21	Mid black, light grey hue, silty clay	Fill of posthole
C29	N/A	0.33	0.31	0.14	Circular shaped cut	Cut of posthole
C30	C29	0.33	0.31	0.14	Black soil with greyish hue	Fill of posthole
C48	N/A	0.35	0.30	0.39	Circular shaped cut	Cut of posthole
C49	C48	0.35	0.30	0.39	Black silt with greyish hue	Fill of posthole
C50	N/A	0.37	0.29	0.25	Circular shaped cut	Cut of posthole
C51	C50	0.24	0.20	0.11	Black, mid grey hue, silty clay	Fill of posthole
C55	N/A	0.36	0.32	0.36	Circular shaped cut	Cut of posthole
C56	C55	0.36	0.32	0.36	Black, light grey hue, silty clay	Fill of posthole
C101	N/A	0.34	0.30	0.42	Circular shaped cut	Cut of posthole
C102	C101	0.34	0.30	0.42	Black silt with greyish hue	Fill of posthole
C119	N/A	0.39	0.25	0.37	Oval shaped cut	Cut of posthole
C120	C120	0.39	0.25	0.37	Black , light grey hue silty clay	Fill of posthole
C121	N/A	0.28	0.26	0.39	Circular shaped cut	Cut of posthole
C122	C121	0.28	0.26	0.39	Black soil with greyish hue	Fill of posthole
C124	N/A	0.16	0.16	0.34	Circular shaped cut	Cut of stakehole
C125	C124	0.16	0.16	0.34	Greyish black silty sand	Fill of stakehole

Finds: None

Another possible structure - Structure B - was identified 5.5m east of and upslope of Trough 2. It comprised two parallel rows of four near-circular postholes, which were approximately 0.5m apart from each other (Plate 7). The postholes in each of the rows were also tightly spaced and in some instances were connected by a very shallow channel. The postholes were on average 0.35m in diameter and ranged in depth from 0.14m to 0.42m. There was no direct physical relationship between this structure and Trough 2. The postholes did however more closely resemble the post-pits of Structure A than the irregular pits of the earlier phase possibly suggesting the two structures were related. Both possible structures were also on the same alignment and contained similar fills of silty clays, charcoal and heat-shattered stones. The proximity of the postholes of Structure B suggests that their purpose was to support a small platform apparently measuring 1.5m long by 1m wide. Stakehole C124, located to the west of these postholes, may also have formed part of this structure.

Stone retrieved from C56, C102 and C122 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of cherry charcoal was chosen for AMS dating from C122 and returned a result of 2571±25 (UB 15554). The 2 Sigma calibrated result for this was 806–595BC (QUB, Appendix 2.7) dating this feature to the early Iron Age period.

2.4 PHASE 4 Burnt Mound Deposits

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	14.35	13.80	0.57	Black silty clay, burnt stones, charcoal	Spread
C46	N/A	25.00	9.00	0.30	Mid brown clay, burnt stones, charcoal	Spread
C37	N/A	4.00	2.00	0.15	Dark brown silty clay, burnt stones, charcoal	Spread
C38	N/A	4.20	1.50	0.35	Light brown silty clay, burnt stones	Spread
C39	N/A	2.30	1.20	0.25	Grey brown silty clay, burnt stones	Spread

Finds

Context	Find Number	Material	Period	Description
C3	E3540:003:001	Flint	Early Neolithic	Retouched artefact, probable scraper
C3	E3540:003:002	Quartz crystal	Early Neolithic	Natural chunk
C3	E3540:003:003	Quartz crystal	Early Neolithic	Retouched artefact, probable scraper
C3	E3540:003:004	Quartzite	Early Neolithic	Rubbing stone
C3	E3540:003:005	Quartzite	Early Neolithic	Rubbing stone
C3	E3540:003:006	Copper alloy	Medieval	Stick pin

The burnt mound (C3/C46) was not noticeable as a mound prior to excavation as its sides were covered by topsoil and ploughsoil deposits of up to 0.5m deep (Figure 4). The highest point of the mound was covered by only 0.25m of soil. The removal of the soil revealed an irregular shaped mound 13m by 14m that was up to 0.57m deep (Figure 4; Plate 1). The darkest and densest visible concentrations of charcoal and heat-shattered stone were located in the area between the two troughs and in the waterhole to the north of Trough 2. No tip lines or multiple phases could be distinguished within the burnt mound even though two phases of activity were recorded. The mound itself had a silty clay matrix with abundant charcoal and heat-shattered sandstones. The sandstone fragments were pinkish in colour, angular, easily scratched and typically 0.07m long. A few prehistoric finds were recovered from the mound including flint flakes and a possibly later copper-alloy pin.

C37, C38, C39 and C46 were deposits found on top of, or banked up against, the main burnt mound deposit C3 (Figure 6). They all contained heat-shattered stones which were lighter in colour than the mound as a result of contact with ploughsoil. Those in the valley base (C46) had probably come displaced from the mound due to water erosion, drainage, agricultural activity or the construction of the path that once ran on the valley base.

While the burnt mound deposits were clearly associated with two distinct phases of activity on the site - Bronze Age and Iron Age - it was not possible to identify which deposits were related to which phase as the mound material had been substantially levelled and disturbed presumably by post-medieval and modern agricultural practices.

Five lithics were retrieved from C3. These include one flint retouched artefact (Figure 7) and one quartz crystal retouched artefact both of which were probably used as scrapers, two quartzite rubbing stones and one natural chunk of quartz crystal. The assemblage is technologically and typologically diagnostic and dates to the first half of the Neolithic period (Sternke, Appendix 2.1). No Neolithic activity was identified on the site but the presence of these artefacts within the disturbed burnt mound material may indicate that Neolithic activity was located nearby.

A copper alloy stick pin (003:6) with an undifferentiated head was also recovered from C3. It has a circular, tapering shank that is decorated with transverse lines and is hipped in the upper part of the shank, which would have helped the pin to grip the garment. It dates to the medieval period, specifically to the early 12th/13th centuries (Scully, Appendix 2.2). While no medieval activity was recorded at Danesfort 2, there is activity recorded to this period in the locality. Excavations carried out along the N9/10 identified medieval activity at Danesfort 4 and 6 in particular. In the 13th century Danesfort was the centre of a thriving borough in a manor of the same name (Empey 1990, 80).

Burnt and unburnt animal bone fragments were recovered from burnt mound spread C3. A total of 15 bone fragments (90.6g) (including two teeth) representing 12 possible skeletal elements were identified. Species identified included cow (*Bos*), pig

(*Sus*) and sheep/goat (*Caprinae*). Small fragment size combined with a poor degree of preservation meant it was not possible to identify the species of 6 fragments (24.3g). One fragment of unidentified bone had evidence of butchering. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation (McCarthy, Appendix 2.5).

It is significant that sandstone is the predominant rock type in the mound material given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area (Mandal, Appendix 2.6).

2.5 PHASE 5 Modern activity

2.5.1 Drains

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C4	N/A	ran across site	0.37	0.34	Cut of linear feature	Modern drain
C36	C4	ran across site	0.37	0.34	Contained plastic water pipe	Fill over Pipe
C158	N/A	ran across site	1.26	0.50	Cut of linear feature	Modern drain
C159-161	C158	ran across site	1.26	0.50	Fills of linear feature	Fills of modern drain

Finds: None

These modern drainage features demonstrated the necessity of draining the land due to the low-lying location created by the valley (Figures 4–5).

2.6 PHASE 6 Topsoil and Plough soil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A	across site		0.25-0.50	Dark brown sandy silty clay	Topsoil

Finds: None

The topsoil comprised sandy, silty clay and contained no artefacts.

3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Danesfort 2. This includes the analysis of the physical and archaeological landscape, the compilation of information gathered during research into the site type, date, and function, and the results of the excavation and specialist analysis of samples taken during the course of on-site works.

3.1 Landscape Setting

3.1.1 The General Landscape – compiled by Michelle Brick

The topography of the region through which the route passes is generally flat with an average height of 70m O.D. The southern periphery of the route is bordered by Kilmacoliver (261m) and Carricktriss Gorse (314m), with Slievenamon (721m) further west. The Slieveardagh hills (340m) are visible on the western horizon in the south of the route and with the exception of Knockadrina Hill (140m), the enclosed landscape is made up of minor undulations. In the centre of the route Freestone Hill (130m) and Knocknagappoge (334m) further north are the significant uplands. A number of hills and mountains are visible in the distance to the east and west of this area of the landscape but the topography remains generally flat. To the north the Castlecomer Plateau influences a rise in the overall topography of the region. This expanse of terrain stretches along the north-east margins of Kilkenny, crosses the county border into Carlow and stretches northwards into Laois. This plateau consists of a variety of hills and peaks including Mountnugent Upper (334m), Baunreagh (310m), Knockbaun (296m), Brennan's Hill (326m) and Fossy Mountain (330m). These hills contain seams of anthracite coal as a result of millions of years of compression, and consequently Shales and Sandstones were formed which are evident throughout the plateau. Mining in the region began in the 17th century, continued for over 300 years and it is for what Castlecomer is best known. According to the Environmental Protection Agency soil maps of Ireland, the underlying bedrock of the entire region primarily consists of Carboniferous Limestone. However there is also a small amount of surface bedrock, sands, gravels, shales and sandstone Tills present along the route. The soil cover of the region is primarily composed of Grey Brown Podzolics, Renzinas and Lithosols. Additional soil types also present along the route include Brown Earths, surface Water Gleys and Ground Water Gleys.

The prevailing water courses within the landscape of the N9/N10 Phase 4 are the Rivers Nore and Barrow. The River Nore rises on the east slopes of the Devil's Bit in Co. Tipperary and flows eastwards through Borris-in-Ossory and then south through Co. Kilkenny, passing through the towns of Durrow (Laois), Ballyragget, Kilkenny, Bennettsbridge and Thomastown to join the River Barrow upstream of New Ross, Co. Wexford. It is 140 kilometres long and drains a total catchment of 1572 square kilometers and runs through the central and southern sections of the route. In the south of the route three main tributaries of the River Nore are evident. The Kings River flows east through Callan and Kells. It is joined by the River Glory which meanders on a north-south axis towards the western margins of the route landscape and the Little Arrigle River flows along the southern fringes. These rivers are flanked by low-lying valleys that are characterised by wet, marshy land. The condition of the soil improves further north beyond the King's River where the influence of these waterways declines. In the northern area of the route the River Dinin is a tributary of the River Nore flowing south-west from Brennan's Hill through the Castlecomer Plateau. The Plateau is the tableland that is the watershed between the Rivers Nore and Barrow (Lyng 1984). The River Barrow is the second longest river (193 kilometres) in Ireland after the River Shannon. It rises in the Slieve Bloom Mountains in Co Laois and flows east across bogs and lowlands and then turns south into the lowland immediately east of the Castlecomer Plateau. It passes through

Portarlington, Athy, Carlow, and Graiguenamanagh and runs through northern section of the route. It is joined by the River Nore at New Ross. The Maudlin River is the notable tributary of the River Barrow within the landscape of the route and flows east from Old Leighlin, with minor tributaries of it flowing through Bannagagole. There are also streams and minor watercourses present throughout the entire landscape and these waterways would have been a valuable resource to past communities and would also have had a major influence on settlement and the surrounding land use.

The physical landscape through which the N9/N10 Phase 4 passes can be divided into three principal areas defined by the main rivers and their catchments. The southern area is located in the undulating landscape on the western flanks of the Nore Valley. The central area is dominated by the fertile watershed between the Barrow and Nore systems in the hinterland of Kilkenny City. The northern area is located on the western flanks of the Barrow Valley overlooked by uplands to the north and west. Danesfort 2 is located in the central landscape area.

3.1.2 The Central Landscape

The central landscape of the route encompasses the environs of the Nore Valley and the hinterland of Kilkenny City. The underlying bedrock of the region is made up of Carboniferous Limestone sands and gravels, Carboniferous Limestone Tills, Shale's and Sandstone Tills. According to the EPA the natural soils of the region consist of Renzinas and Lithosols in areas dominated by underlying bedrock of Carboniferous Limestone sands and gravels. Soil cover consisting of Grey Brown Podzolics and Brown Earths is present in areas of underlying Carboniferous Limestone Tills and Surface Water Gleys and Ground Water Gleys are the soils present where the underlying bedrock is made up of Shale's and Sandstone Tills. This landscape is underlain not only by the Butlersgrove geological formation but also by the Ballyadams formation (thick-bedded calcarenitic wackestone on erosional surfaces). A large number of quarries in the area, some of which produced the distinctive blue 'Kilkenny limestone' that was used to construct the medieval and later city, occur around the city itself and extend southward into the dolomite formations along the Nore around Dunbell (Tietzsch-Tyler, 1994).

The glacial drift around the Kilkenny City hinterland, along the Kilkenny Link Road, comprises sandy (50–60%), gravely clay with a noticeably higher sand content than along the southern plain of the River Nore. As this section crosses existing watercourses, areas of granular deposits and several isolated sand and gravel lenses were noted. The floodplain of the Nore extends *c.* 80m on the western side and *c.* 50m on the eastern side, creating marsh and wet grassland within the immediate area. The nature of the glacial drift and geology, combined with the water sources and floodplains in the area, has resulted in the high quality of the local pastoral and arable agricultural landscape. The topography in this section remains between 50m and 80m OD creating open and expansive views over the confluence of the Nore and Kings Rivers. Mountains are visible on the horizon to the north, east and south-east. Freestone Hill (130m) is located directly to the North and Knocknaguppoge beyond this rises to 334m. Outside the parameters of this landscape lies Brandon Hill (513m) to the south-east and further to the east are the Blackstairs Mountains (735m) and Mount Leinster (795m). The River Nore is the prevailing water course of the region and the River Barrow flows along the margins to the east. The Kings River is located to the south and would have influenced activity in and around this area.

3.1.3 Site Specific Landscape

Danesfort 2, a burnt mound, was located in a valley adjacent to a tributary that joins the King's River at the village of Ennisnag. The valley runs from west to east and is U-shaped. The burnt mound was located on the southern slopes and base of the valley (Figure 4; Plate 1). It was not visible prior to excavation as it was obscured beneath a band of redeposited topsoil that lined the valley slopes. The valley sides were formed of boulder clay but its base was characterised by a loose concentration of medium- and large sized angular and sub-rounded stones. These probably related to a path which is depicted on the first edition Ordinance Survey Map (1839). At this time the valley was within Danesfort Demesne (the external stone wall perimeter of the Demesne is visible in Plate 1). It is very probable that at some point in the past this valley carried water into the Ennisnag tributary. Although dry and under pasture at the start of the excavation, when it rained the ground became saturated and the archaeological features rapidly filled with water, despite the presence of a modern drainage pipe running on the valley base. The location of the site in a gently winding valley only 54m OD meant that views from the site were fairly restricted in all directions.

The burnt mound was situated within an archaeologically rich Bronze Age landscape (Ch. 33740–37100, Danesfort and Croan townlands). Evidence of funerary and domestic activity was discovered 0.4–0.6km to the south-west at sites Danesfort 12 and 13 where three ringditches, a pit circle and three cremations were found in low-lying land beside the Ennisnag tributary. Another ringditch was found 0.3km to the south-east at Danesfort 1 while Graves (1860–1) reported the discovery in 1838 of an intact Bronze Age urn in a sand pit next to a post-medieval turret (RMP KK023-080) which is visible 0.2km to the south of Danesfort 2. A prehistoric shelter on higher ground was recorded 0.7km to the north-east (Croan 1). Bronze Age sites were also excavated 1–1.8km to the north and north-east at Danesfort 5–7 including a settlement and cremation pits with late Bronze Age pottery. The next closest recorded burnt mound activity occured in a shallow basin at Danesfort 11, *c.* 2.3km to the north-west. In that instance, there was no mound and only features cut into the boulder clay survived.

3.2 The Archaeological Landscape

As part of the general research relating to sites along the scheme and the specific research relating to Danesfort 2, the known archaeology within the surrounding landscape was assessed in order to establish the level and type of activity in the surrounding area in the past. This included a review of information from the Record of Monuments and Places, previous excavations and other relevant documentary sources including mapping and other sites excavated as part of the N9/N10 Phase 4 scheme. The excavated archaeology at Danesfort 2 has been identified as being Bronze Age and Iron Age in date.

3.2.1 General Bronze Age Landscape of the Scheme – compiled by Michelle Brick

The archaeological record implies that the Irish Bronze Age (2500–800BC) population dramatically increased from that of the Neolithic and the evidence for permanent settlements with considerable longevity becomes much more substantial. In addition, a wide range of ritual and funerary activity associated with this settlement is apparent. The overall environmental record for Ireland suggests that there was a general climatic deterioration in the Bronze Age, bringing wetter, colder conditions; during this period there was also accelerated forest clearance with more intensive habitation in the drier lowlands. As a result of extensive development-led projects across the country, understanding of settlement and burial patterns from the early Bronze Age has greatly developed. The distribution of the prehistoric evidence shows

that the Rivers Nore and Barrow provided a focus for settlement. In the central part of the current portion of the N9/N10 Phase 4 the fertile Kilkenny lowlands have produced some Bronze Age archaeology, particularly in Danesfort and Ennisnag townlands. In the northern part of the scheme intense settlement is indicated by both burnt mounds and barrows existing on the uplands of the Castlecomer Plateau and the flanking valleys of the Nore and Suir. Hillforts appear to be positioned to overlook the settlement activity, as well as the route of the Nore, the lower saddle to the north of the Slieveardagh Hills, and to the south of the spur surmounted by Clonmantagh. A considerable number of ringditches, cremation and inhumation burials (single and grouped), burnt mound sites, structures and domestic settlement evidence, have been recorded as part of the Bronze Age on of the N9/N10 Phase 4.

In the southern landscape the exposure of domestic Bronze Age settlement was less forthcoming than that of the northern landscape. There was little direct evidence for structures in the southern and central landscapes with the exception of a cluster of structures in the Danesfort area. Instead most of the settlement activity that fell within the roadtake was noted in the northern landscape, further to the north of Kilkenny and in Carlow. Ritual and burial is a dominant feature of the Bronze Age in Kilkenny and Carlow as indicated by the presence of flat cemeteries, burial cairns, ringditches, mounds, barrows and hillforts throughout these counties. Freestone Hill situated in Coolgrange, Co. Kilkenny, in the centre of the present landscape is just one example of these sites. Along the lower part of the Nore Valley, and concentrated in the Foulksrath and Jenkinstown areas, the landscape is dominated by barrows (in this case more specifically ringditches). The contrasting locations of these site types most probably relate to differential landscape exploitation by the same communities with some activities, possibly associated with the seasonal use of upland pasture, confined to higher terrain and settlement and funerary activity taking place in the more sheltered lowlands.

The significant number of burnt mound sites discovered due to the N9/N10 excavations, combined with the previously known examples in the RMP reinforces the concept that Bronze Age activity in Kilkenny and Carlow was considerable. A total of 36 sites with evidence for burnt mound activity were uncovered during the N9/N10 excavations, with an additional example discovered, and preserved outside, the roadtake. The burnt mounds are focussed in the upland area, especially along the river and stream valleys, such as at Clashduff, Coan West and Muckalee on the Dinin and Douglas Rivers, and in the upland hinterland of Freestone Hill.

The distribution of the prehistoric evidence shows that the Rivers Nore and Barrow provided a focus for Bronze Age settlement. The patterning of human activity in the region indicates that these were also the principal route-ways in prehistory; both were navigable by small craft but they, and the major tributaries of the Nore– the Dinin and King's Rivers – were also conspicuous landscape features that facilitated accurate navigation through this landscape. The Barrow and Nore also provided access to wider networks beyond the region.

The Central Landscape: Domestic Settlement

The characteristics of the prehistoric settlement landscape change from the peripheral activity located alongside the River Nore floodplains of the southern landscape to a slightly more permanent and defined settlement in the central landscape. The direct domestic settlement evidence, albeit limited, indicates the presence of a Bronze Age community in the locality. As the evidence for peripheral settlement activity including burnt mounds and funeral monuments was also limited, this area may have been dominated by small-scale settlement. The area contained soils amenable to farming and perhaps the area was cultivated, rather than settled.

The majority of the evidence was centred upon the Danesfort area which may consequently represent an important focus of activity, perhaps with considerable longevity.

Danesfort 5 was located upslope from a burnt mound site in Croan (unexcavated and not a Recorded Monument) and contained three post-built, circular houses with south-east-facing porches and internal hearths. Structure 1 overlay the remains of postholes, stakeholes and a possible fireplace, which may have represented an earlier structure or shelter. The morphology of these houses, with their regularly spaced postholes, would indicate a middle-late Bronze Age date, as also suggested by middle to late Bronze Age pottery. At Dunbell Big 2 there was a shallow, circular gully with internal postholes, an east-facing entrance (representing a possible structure) and a pit containing middle Bronze Age domestic pottery. A small lithic assemblage, including a convex end scraper, flake and debitage, came from Holdenstown 1. Holdenstown 3 also produced sherds from two fine middle Bronze Age domestic vessels.

A major prehistoric complex was identified at Templemartin 5 where settlement, industry and burial continued episodically until the late Bronze Age. The site was situated on the top of a northwest-southeast ridge and overlooked the surrounding countryside of rolling pasture land. At this site a series of six ringditches were recorded, two of which extended beyond the area of excavation and are therefore preserved *in situ*. One of the ringditches (5.2m external diameter) was penannular with a gap of 0.8m in the south-east and an almost-centrally located hearth. The presence of a hearth, with evidence for *in situ* burning, suggests that this 'ringditch' was the foundation trench for the wall of a structure, rather than a funerary monument. It was post-dated by another ringditch which cut through its western side. Other peripheral and possible settlement activity, in the form of pits, Bronze Age pottery and postholes, was noted at Danesfort 7, 8 and 9, as well as Ennisnag 1.

The Central Landscape; Funerary and Ritual activity

The previously known Bronze Age burial record of this landscape included two prehistoric burials excavated by Cassidy in 1991 at Dunbell Big (Cassidy 1991a and b). There at Ringfort No. 5, a pit containing a badly damaged Bronze Age food vessel was found and the second burial was discovered within a cist. The cist fill was mainly a reddish loam and on its side at its base was an intact food vessel containing and surrounded by burnt bone (*ibid*.). Other significant funerary activity includes the single grave sites of Garrincreen to the west and Grange Lower (Waddell 1990, 103) to the south-east. Bowl burials have also been discovered at Wells, Slyguff and Kilgraney, Co. Carlow, sites that border the eastern margins of this study area.

Ten sites produced evidence for funerary activity in this section of the N9/N10, primarily in the form of ringditches: Danesfort 1, 12 and 13, Kilree 4, Holdenstown 1 and Templemartin 5. However, the Danesfort 12 and 13 ringditches have produced Iron Age dates. The Danesfort 1 ringditch had cremated bone in the middle of its three fills, at opposite sides of the ditch. At Danesfort 6 a deep, flat-bottomed, straight-sided circular pit containing sherds of at least three vase urns and a cremation pit with a marker post were identified. At Danesfort 7 a middle-late Bronze Age flat cemetery was characterised by eight circular pits associated with token cremations. There are also some previously recorded finds from the Danesfort area, in particular a lidded vase that was found in the 19th century. Graves (1860) refers to the discovery of three 'sepulchral urns' found in Danesfort by Lady Elizabeth and Captain Wemyss, in the proceedings of the September meeting of the Kilkenny and South East of Ireland Archaeological Society in 1860; two of these are described as rare and highly ornamented. The exact location of these finds has been questioned

but excavated evidence of Bronze Age funerary activity in this townland, as a result of the N9/N10, supports the authenticity of the discovery.

An isolated cremation pit at Kilree 1 was capped with a saddle quern. At Kilree 4 a double ringditch was located on the edge of the Nore floodplain overlooking a potential crossing point. The fills of both the external and internal ringditch contained charcoal, animal bone and burnt bone. A possible cremation pit was identified and contained a single piece of copper in the middle fill; charcoal, burnt bone and burnt clay were also found in the fills. A funerary complex was identified at Holdenstown 1 and consisted of three ringditches, one of which was badly truncated. The primary phase of one of the small ringditches contained cremated material; this ringditch was later re-used to enclose a small inhumation cemetery. The activity at Holdenstown 1 fits into a wider landscape as the adjacent site of Dunbell Big 2 contained evidence for Bronze Age settlement and Holdenstown 2 also had evidence of prehistoric activity.

Two pits from the multi–phased site Templemartin 5 contained cremations in Grooved Ware vessels. In addition there were six ringditches, at least five of which were later in date than the two cremation pits. These ringditches formed the main concentration of activity probably during the Bronze Age and focused the funerary action on a rise to the north-east of the site, at the edge of a north-south gravel ridge overlooked by Freestone Hill. One was penannular, and its entrance faced the south-east, typical of the Bronze Age period and it pre-dated the other ringditches. It is possible that this represents the slot trench of a structure rather than a funerary monument. Fifteen cremation pits were identified on the site: two of these dated to the late Neolithic. The main focal point of the cemetery was also the highest point of the site and was on the edge of a ridge overlooking the surrounding countryside, and two of the ringditches and a concentration of Bronze Age cremation pits were located here. Five of the cremation pits had evidence for marker posts/stones and two others had been formally capped or sealed with sterile material. The amount of bone contained in any of the above cremations could only be considered as a token deposit of any individual. Two cremations, Cremations 9 and 11, display evidence of structured deposition and have larger chunks of bone than the others, suggesting these two might be slightly earlier, perhaps middle Bronze Age in date. The rest of the cremations had only very small pieces of bone which suggests that they were more intensely processed: perhaps more indicative of a late Bronze Age date. Possible pyre remains were represented by deposits located to the south of the main concentration of cremations

The Central Landscape; Burnt mounds

Only seven sites with evidence of burnt mound activity were uncovered within the central landscape. Two of the three Danesfort sites were located close together (Danesfort 10 and 11) and a further two sites were also located in proximity to each other (Rathgarvan or Clifden 1 and Maddockstown 1). Burnt mound activity discovered at Danesfort 2 was situated on the southern slopes of a small valley near the Ennisnag tributary of the King's River in the southern end of this landscape. Holdenstown 4 was not located close to any other burnt mounds however it was situated on flat terrain with good visibility southwards to Holdenstown 3. Rathgarvan or Clifden 1 and Maddockstown 1 were located on flat, wet grassland. Rathgarvan or Clifden 1 had evidence for natural springs and a waterhole which would have supplied water on-site. The River Nore meanders NNW–SSE to the south-east of both these sites. Burnt mound activity was also excavated at Leggetsrath East 1 which was located on the eastern edge of the floodplain of a small river/stream. This site was also on marginal land but was surrounded to the north and south by well-drained pastureland. Other burnt mound sites recorded in the vicinity include those at

Bishopslough West (KK024-037, 38), Maddockstown (KK020-052), Rathcash West (KK020-077, 78) and Cloghoge (KK020-039, 075, 76).

The Central Landscape; Route-ways and Communications

It is evident that the Nore, Dinin (and its tributary the Douglas) provided the landscape links within the extensive late Bronze Age settlement distribution to the north of Kilkenny extending from the lowlands up into the uplands of the Castlecomer Plateau. However, beyond this the Nore also leads to the lowland zone in mid-Laois with its core of prehistoric activity, as well as to the sources of the Suir and contact with other major settlement cores at, for example, Cahir and Cashel. To the south the King's River, rising in the Slieveardagh Hills, also provides access to the Suir Valley.

While it is clear that the rivers and streams are a major feature of the settlement networks, the distribution of prehistoric activity shows that other route–ways were functioning at both a local and regional scale. Some of these were already important in the early Neolithic while others became prominent only in the Bronze Age. Among the most significant of these are those on the eastern side of the Barrow in the Goresbridge area that formed the core of a settlement zone that in the Bronze Age extended westwards across the river into the Paulstown area of Co. Kilkenny. The immediate environs of Kilkenny City also appear in the Bronze Age as a settlement focus. Additionally the major focal site on Freestone Hill has been highlighted by the discovery of new sites on the lowlands immediately to the south around Rathcash.

The Central Landscape; Conclusions

While the central part of the N9/N10 Scheme through the fertile Kilkenny lowlands has produced some Bronze Age archaeology, particularly in the Danesfort and Ennisnag areas, this low level of activity reflects the known site distribution patterns. This picture provides an interesting contrast with the dense settlement in the early medieval and medieval periods but it is probably significant that the two nodes of Bronze Age settlement identified are in slightly more elevated terrain overlooking the Nore and King's Rivers. More significant in this study area is the rich array of Bronze Age funerary activity uncovered along this portion of the N9/N10 route.

3.2.2 The General Iron Age Landscape of the Scheme – compiled by Michelle Brick

As with wider settlement patterns in Ireland, direct evidence for Iron Age (800BC–AD500) domestic habitation was not identified, although several furnaces, kilns and ringditches date to this period and attest to an Iron Age presence in the area. It is possible that some smaller Iron Age ringditches were in fact structural, rather than funerary. Evidence for Iron Age domestic settlement activity remains indirect and peripheral in Kilkenny and Carlow, and in Ireland as a whole.

The Southern Landscape

Direct evidence of Iron Age activity in the southern landscape of the N9/N10 Phase 4 is limited. There is a marked absence of hillforts from south Kilkenny but this does not necessarily infer absence of settlement (Gibbons 1990, 20). A small number of features produced Iron Age dates in this landscape as a result of the N9/N10 Phase 4 excavations. A posthole dating to this period (165BC–AD16; UBA 10984) was excavated at Baysrath 2, and belongs to a possible structure indicating potential domestic settlement in the region. At Tinvaun 2 a possible hut structure was identified which consisted of four truncated slot-trench-like pits, a posthole and a shallow, roughly central pit in the interior of the area. Dates returned for this possible structure have indicated that it was in use during the Iron Age period (AD5–124; UBA 12169). There was also some metalworking activity on site and this structure may have been associated with it. Further to this, a posthole and a hearth excavated at Danganbeg 1 also dated to the Iron Age (762–416BC and 41BC–AD 55; UBA 14025

and UBA 14024 respectively). No funerary features belonging to the Iron Age were excavated as part of the present Phase 4 in the southern landscape. However, some metal working activity in the form of slag pits/furnaces and funerary activity in the form of a ringditch has been excavated at Baysrath directly to the south of the present excavations and have been dated to the Iron Age period (Channing 2007). Three circular structures excavated at this site have also been dated to this period (AD60–131, AD25–128 and 88BC–AD53; UBA 10684, UBA 10685 and UBA 10691 respectively) indicating a strong Iron Age presence in this area (*ibid.).* A ditch dating to the Iron Age (39BC–AD74; UBA 10993) was excavated at Tinvaun 1; burnt mound activity associated with the Bronze Age was also excavated at this site and this ditch relates to a later phase of activity at the site. At Knockadrina 2 (51BC–AD78; UBA 12178) an Iron Age furnace was excavated and at Stonecarthy West 1 a possible trough also yielded an Iron Age date (771–539BC; UBA 12174), however other features associated with a burnt mound on the site returned Bronze Age dates.

The Central Landscape

As with the southern landscape there is no direct evidence for Iron Age settlement although there are many early medieval RMP sites in this area, the majority of which are ringforts and enclosure sites, such as the ringforts recorded at Woolengrange (KK024-079 and KK024-082) and the enclosures at Carran (KK024-021001, 2) . Iron Age activity in the county is represented by the Hillfort at Freestone Hill where a defensive hillfort and inner enclosure (KK020-018002) was built encircling the hill-top (Gibbons 1990, 18), re-using the site of an earlier burial cairn (KK020-018001). The site was then re-occupied *c.* AD300 (Raftery 1969). Another possible Iron Age hillfort is located at Cotterallsrath located to the west of the southern end of this central landscape. Directly to the north-east of this site and located four miles south of Kilkenny City are the remains of a linear earthwork at Grevine West (Gibbons 1990, 20), also indicating an Iron Age presence in the region. Additionally, excavations were carried out at two ringforts in the townland of Dunbell; Dunbell 6 in 1972 and Dunbell 5 (KK024-010) in 1990 (Foley 1974; 2006; Cassidy 1991). The ringfort settlement at Dunbell 5 in particular produced dates from the Bronze Age to the eighth–10th centuries AD including evidence of Iron Age occupation.

Two clusters of Iron Age activity were noted from the N9/N10 excavations within the central landscape, at Danesfort and at Kilree and Holdenstown. These sites exhibited evidence for funerary activity and no evidence for domestic settlement was uncovered within this central landscape. At Danesfort 13 the primary fill of a ringditch returned a radiocarbon date of 503–384BC (UBA 10999) and was considered to be associated with two similar ringditches excavated at the neighbouring site of Danesfort 12. A fine glass bead found within a pit at Danesfort 13 also indicated that Iron Age activity continued in the Danesfort area, confirming the longevity of Danesfort as a focus for prehistoric funerary activity and although the area continued to be occupied in the early medieval period the focus then shifted towards settlement. Iron Age activity was excavated at Kilree 4, a site which contained a probable token cremation burial within a double ringditch (171BC–AD4), which was located on flat, gravely ground that overlooked the River Nore and its floodplain. At Holdenstown 1, three ringditches of possible Iron Age date were excavated. The largest was penannular in plan and had an undug, east-facing causeway. The two best preserved ringditches had evidence of re-cutting which may have been a symbolic act of redefining the burial monument. The primary phase has been interpreted as representing funerary feasting while the secondary phase consisted of burial possibly dating to the late Iron Age. Both ringditches were subsequently re-cut and were backfilled with material which included burnt bone, charcoal, seeds, and animal bone. The quantity of cremated bone is indicative of token cremation mixed with pyre debris. Although Ringditch 3 was heavily truncated, it also contained evidence of

token cremation. The evidence thus far is indicative of burial potentially in the Iron Age and the site was later re-used as an inhumation cemetery known as a ferta, during the early medieval period. A shallow, northeast-southwest linear ditch spanned the entire width of the site at Holdenstown 1. The precise function of this ditch is unknown; however, its length and the fact that no return was identified suggest that it may have been a boundary ditch. It is possible that it is broadly contemporary with the burials within Ringditch 2, as these burials followed the same alignment of this ditch and there was no truncation. The ditch has been dated to the Iron Age period (168–3BC; UBA 13108). It is then possible that the burials associated with Ringditch 2 and with this ditch were placed either inside or outside the boundary; both of which suggests a significant symbolism.

In Danesfort 12 a furnace had evidence of reddened sides and a burnt and blackened rim but the base was not scorched. The fills contained large quantities of charcoal and slag. It is possible that this activity was contemporary with the Iron Age funerary activity recorded on site. Metallurgical activity was also recorded at Danesfort 13 and included two smelting furnace pits, a metalled surface, three waste pits, and an occupation deposit. This activity may also have been contemporary with Iron Age funerary activity also recorded on site. At the multi-period site of Danesfort 5 a metalworking area was identified and included several pits and deposits. Of these pits one returned an Iron Age date of 786–543BC (UBA12192). A kiln excavated at Danesfort 5 also produced Iron Age dates ranging between 169BC and AD50, (UBA 12189–91). Other features at this site were dated to the late Bronze Age period and the Iron Age activity may indicate a continuity of settlement at the site. At Holdenstown 2 a total of five kilns were identified with one dating to AD21–203 (UBA 13111). Both Danesfort 2 and Holdenstown 4 returned Iron Age dates from features associated with burnt mound activity (744–407BC, UBA 11000; 765–420BC; UBA 13114).

The Northern Landscape

The northern landscape of the N9/N10 Phase 4 also contained Iron Age evidence. The aforementioned Freestone Hill (KK020-018) is located directly to the south of this landscape and two additional hillforts can also be located in the north of the county. Clomantagh (KK008-124002) overlooks Johnstown in north-west Kilkenny and similar to Freestone Hill, the site was originally used in the Bronze Age as a funerary complex (Gibbons 1990, 18). A linear earthwork has also been recorded at Woodsgift (Gibbons 1990, 20) and is located directly to the south of this site. The other possible hillfort in the region is recorded at Tooremore or Carndubh to the east (*ibid.*). This hillfort which is not shown on the Ordnance Survey maps, is situated on Corrandhu Hill, two miles east of Ballyragget, straddling the townland boundary between Toore More and Donaghmore (Condit and Gibbons 1988, 49). Further to these, located along the Kilkenny-Carlow border is a linear earthwork known as the Rathduff Trench (KK026-006). It ran for over three miles from the River Barrow at Duninga, in a north westerly direction to the foothills of the Castlecomer plateau above Shankill (Gibbons 1990, 20). A portion of this linear earthwork was excavated at Shankill 1 and consisted of a U shaped bank with a ditch.

Excavations in the northern landscape of the N9/N10 produced a small amount of domestic settlement evidence. The fill of a stakehole associated with a possible structure at Moanduff 1 produced an Iron Age date of AD215–376 (UBA 13124); the site also had evidence of occupation in the Bronze Age which implies that the site may have been used throughout both periods. Radiocarbon dating for Rathcash East 1 also indicates use of the site during the Iron Age period. The excavated features included a possible structure that may be inferred as a ringditch as a result of the middle Iron Age date retrieved from its fill (38BC–AD73; UBA 12221) and an

associated rubbish pit (37BC–AD123; UBA 12220). Excavations in the northern landscape of the N9/N10 did not produce any evidence for Iron Age funerary activity. However ephemeral Iron Age activity was discovered at a number of sites in the form of metal working and burnt mound activity. At Rathcash East 3 a large keyhole-shaped furnace that dated to the Iron Age (160BC–AD0; UBA 14032), aligned northeast–southwest was excavated along with six post-pits that may have supported a shelter around the west side of the furnace. The post - pits had a rectangular arrangement, being open on the east (furnace) side. The furnace had 18 fills, with the majority containing significant amounts of charcoal and frequent slag. Some of the post-pits contained charcoal, burnt clay and slag. One of the post-pits has been dated to 362–200BC (UBA 14033). A kiln and pit excavated at Cranavonane 3 have been dated to 104BC–AD50 (UBA 12251) and 341–54BC (UBA 12252) respectively. In addition to these features a pit excavated at Jordanstown 1 returned a date of 382–206BC (UBA 12233) and a pit at the multi-period site of Moanduff 2 retrieved a date of AD140–385 (UBA 12260). Features associated with burnt mound activity dating to this period were excavated at Rathcash 2 where the fill of a trough dated to 344–55BC (UBA 12219) and at Kellymount 2, where a waterhole has been dated to AD236–380 (UBA 14041). The fill of a trough at Kellymount 3 also returned a date of 751–409BC (UBA 14043).

Conclusion

The presence of the Iron Age ringditches along the N9/N10 Phase 4 and the number of sites displaying industrial activity dating to this period confirm the presence of an Iron Age community in the region. The possible structure at Rathcash East 1 may also be indicative of an Iron Age settlement site, further demonstrating Iron Age activity in the locality. The presence of three hillforts in north Kilkenny suggests that it was an area of considerable importance during this period (Condit and Gibbons 1988, 52). The lack of excavated domestic settlements along the route is not indicative of a sparse population at the time rather they were not located along the corridor of the N9/N10 route-way and have yet to be discovered.

3.2.3 The Site Specific Archaeological Landscape of Danesfort 2

There are no recorded monuments in the immediate vicinity of Danesfort 2. However a ringwork (KK023-080) and a designed landscape (KK023-080001) are located *c.* 250m to the south-east and a ringfort (KK023-079) is recorded *c.* 600m to the south. Three ringforts (KK023-076–78) are recorded to the south-west, 400m–750m away and further to the south-west, *c.* 900m away, a holy well (KK023-075) is recorded. A church and graveyard complex (KK023-081) is also recorded *c.* 700m to the north of Danesfort 2.

At Danesfort 2 burnt mound activity and associated features dating to the early Bronze Age and early/middle Iron Age periods was excavated. A number of sites were excavated in the vicinity of Danesfort 2, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. To the east, *c.* 300m away, at Danesfort 1, a ringditch containing cremated bone within its fills has been dated to the middle Iron Age. Also to the ENE, located *c.* 250m away, excavations were carried out at Danesfort 3, however no features of archaeological significance were uncovered here. To the north-east of Danesfort 2, *c.* 650m away, a hearth and possible structure were excavated at Croan 1, however dates returned from a fill of the hearth indicate a post medieval date.

There were a number of archaeological excavations to the immediate south of Danesfort 2, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. At Danesfort 13, located *c.* 350m to the south-west Bronze/Iron Age and early medieval activity was recorded. The Bronze Age archaeology primarily consisted of a ringditch

and a cremation pit. The early medieval phase consisted of a field boundary ditch and a metalworking area that included a charcoal-producing kiln, a furnace and a possible forging area. Further to the south-west, *c*. 550m away, multiple periods of activity were excavated at Danesfort 12, consisting of a possible late Neolithic temporary structure, an early Bronze Age pit circle, a middle Bronze Age industrial complex and two late Bronze/Iron Age ringditches and cremation pits. Also excavated was an iron working furnace probably dating to the early medieval period and a rectangular ditch enclosure.

3.3 Typological Background of 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 agricultural activity and are no longer visible on the field surface. Nevertheless even disturbed spreads of burnt mound material often preserves the underlying associated features, such as troughs, pits and gullies, intact.

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

Burnt mound sites are principally Bronze Age monuments and reach their pinnacle of use in the middle/late Bronze Age (Brindley *et al*. 1989–90; Corlett 1997). Earlier sites, such as Enniscoffey Co. Westmeath (Grogan *et al*. 2007, 96), have been dated to the Neolithic and later sites, such as Peter Street, Co. Waterford (Walsh 1990, 47), have been dated to the medieval period. Thus although burnt mound sites generally form a 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 mounds sites were used as cooking sites. O'Kelly (1954) and Lawless (1990) have demonstrated how joints of meat could be efficiently cooked in trough of boiling water. The use of burnt mound sites for bathing or as saunas has been suggested as an alternative function (Lucas 1965, Barfield and Hodder 1987, O' Drisceoil 1988). This proposal is largely influenced by references in the early Irish literature to sites of a similar character and is very difficult to prove, or disprove. Others, such as Jeffrey (1991), argue that they may have been centres of textile production for the fulling or

dyeing of cloth. More recent demonstrations by Quinn and Moore (2007) have shown that troughs could have been used for brewing, however, this theory has been criticised by leading Irish environmentalists due to the absence of cereal remains from most burnt mound sites (McClatchie *et al*. 2007).

3.4 Summary of the Excavation Results

The excavation has identified Burnt Mound activity at the site. This was represented by two main phases of occupation, one in the early Bronze Age and a second in the Early Iron Age, although there is an indication that there may be two separate phases of occupation in the Bronze Age.

The earliest dated feature on the site consisted of a sub-oval, bowl shaped trough (Trough 1) with an adjacent hearth identified by a smaller cut with scorched sides and base to the east of the trough. The trough was dated to the early Bronze Age. A shallow extension to the trough on the west side may have served as a step. A number of small pit features were identified in the general vicinity around the trough but it is not clear if these were directly related or indeed what their function was.

In the north of the site there was a very large and deep pit which may have functioned as a cistern or waterhole. The large pit was dated to the early Bronze Age but appears to be slightly later in date than Trough 1. It may therefore represent a second phase of Bronze Age activity on the site. The waterhole was not sealed by the main burnt mound spread however, there was evidence that some burnt mound material had been tipped into the feature, presumably after it was abandoned.

Located between the waterhole and Trough 1 were a series of features that represent the Iron Age phase of occupation of the site. These consisted of a large sub-oval trough (Trough 2) and adjacent large pit to the west. A number of irregular pits were identified to the east of the trough and may represent storage or perhaps evidence of land clearance in advance of the activity associated with the trough. Two structures were identified, the first of which (Structure A) consisted of a number of circular post-pits in a horseshoe shaped formation around the east of the trough. While the pits did not seem deep enough to support large (long) structural posts, the regular arrangement may have supported a platform erected on shorter posts around the trough. Some small stakeholes appear to have augmented the structure. At a distance of 5m to the east of Trough 2 was Structure B. This consisted of two parallel lines of 4 postholes. It is again interpreted that this may have been the location for a small platform (1.5m by 0.5m). Both Trough 2 and Structure B have been dated to the early Iron Age.

The overlying burnt mound deposits sealed almost all of the pits and troughs identified at the site with the notable exception of the large waterhole. This probably indicates that the water in the waterhole was not heated, and it was a storage facility. It was not possible to identify which deposits were associated with the Bronze Age activity and which were associated with the Iron Age as the mound deposits had been substantially levelled and disturbed over time. A number of modern drainage channels were also recorded, which truncated some of the features on the site.

3.5 Summary of the Specialist Analysis

A number of specialists provided analysis of samples and artefacts recovered from the site as part of the post-excavation works. This work in part formed the basis for the dating evidence for the site. The detailed reports on the results of all analysis are in Appendix 2

Lithics analysis
The lithic finds from the archaeological excavation at Danesfort 2, Co. Kilkenny are a flint convex end scraper, a quartz crystal scraper and two rubbing stones. The assemblage is morphologically and technologically diagnostic and dates to the first half of the Neolithic period. It represents a residual earlier phase at this site and is most likely waste which is possibly related to domestic activities. This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

Small finds analysis
A copper alloy stick pin (E3540:3:6) with an undifferentiated head was recovered from the burnt mount spread C3. According to O'Rahilly's typology of stick pins found in the Dublin area, stick pins with undifferentiated heads date from the start of the 12th century to the early decades of the 13th century (Scully, Appendix 2.2).

Charcoal and Wood Species identification
Charcoal was examined from four contexts at Danesfort 2, from two pits and two troughs. Five wood taxa were identified. The results are dominated by oak.

Analysis of Plant Remains
Two samples were examined from this site, C58 (S25) and C54 (S14). There were no charred seeds from these samples.

Animal Bone Analysis
A total of 51 animal bone and burnt bone fragments recovered from archaeological contexts C3 and C64 on Danesfort 2 were submitted for examination. The bone samples were assessed and identified to species where possible; a total of 9 bone fragments recovered were identified to the species of cow, pig, sheep and goat. Due to the size and fragmented nature of the individual bone pieces it was not possible to identify 42 fragments to species. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation. A series of early Neolithic lithic artefacts as well as a copper alloy medieval stick pin were also recovered within clay spread C3.

Petrographical analysis
A total of 19 samples were submitted for analysis from Danesfort 2. Coarse grained sandstone is typical of *fulacht fiadh* material. The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles is clear evidence of the use of secondary sources. Angular pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

Radiocarbon Dating
A total of four samples were sent for AMS radiocarbon dating.

A sample of Prunus sp. charcoal from fill C105 of Trough 2 (C128) was radiocarbon dated. The 2 sigma calibrated result was 744–407BC (UBA 11000).

A sample of Ash and Prunus sp. charcoal from Trough 1 fill C54 was radiocarbon dated. The 2 sigma calibrated result was 2464–2214BC (UBA 12186).

A sample of Pomoideae charcoal from waterhole (C109) fill C111 was radiocarbon dated. The 2 sigma calibrated result was 2116–1893BC (UBA 15553).

A sample of Cherry charcoal from posthole fill (Structure B) C122 was radiocarbon dated. The 2 sigma calibrated result was 806–595BC (UBA 15554).

4 DISCUSSION AND CONCLUSIONS

4.1 Discussion

The excavation at Danesfort 2 has identified burnt mound activity with two main phases of occupation dating to the early Bronze Age and the early Iron Age. The site was located in a shallow valley adjacent to a tributary of the King's River. The valley runs from west to east and is U-shaped and the site was located on the bottom of the south slope and on the valley floor (Figure 4; Plate 1). It is very probable that at some point in the past this valley was a conduit for water into the Ennisnag tributary, if only during period of flooding. The physical landscape of the site is one that is typically associated with burnt mound type sites. It is common that these sites are located in low-lying, often marginal areas, adjacent to water sources, rivers and streams. In this regard the identification of the activity at Danesfort 2 would not be unexpected as the land, while not wet all year round is prone to flooding in wet weather. During the course of the excavation the site became flooded following heavy rain. A modern drainage channel identified extending along the valley base provides further evidence of the seasonally wet nature of the immediate surrounding landscape.

There are no previously recorded monuments in the immediate vicinity that would date to the prehistoric period. The monuments in the vicinity consist of ringforts and enclosures which would all date to the early medieval period or later. In this regard the identification of the site, particularly one with two phases dating to the Bronze Age and Iron Age could be seen as unexpected. However, the excavations as part of the N9/N10 Phase 4 have identified many sites in the vicinity within Danesfort with dates ranging from the late Neolithic through to the medieval and post-medieval period. The excavations have identified a particular cluster of activity dating to the Bronze Age, with the nearby funerary site of Danesfort 12, to the southwest, producing contemporary early Bronze Age dates and the Bronze Age domestic settlement site at Danesfort 5 also containing a kiln which is contemporary with the Iron Age phase at Danesfort 2. What has become clear is that there has been intensive settlement of this landscape throughout prehistory and in this context it could have been anticipated that sites of similar type and date to Danesfort 2 would be identified.

The nature and form of burnt mound sites can be particularly varied, and there are many debates as to their function. At a basic level these sites are connected by the use of hot-stone technology - a process where stones are heated in a fire and then immersed into water, usually in the trough, so that the water is heated. More simple sites may have functioned as pot-boilers with the stones being placed directly into a pit rather than into a water-filled trough. It is generally accepted that this activity is more often than not associated with cooking, however other uses for the heated water and troughs are suggested based on evidence from recent excavations and research (see section 3.3).

The earliest phase of activity at Danesfort 2 was associated with early Bronze Age features that would be commonplace on most burnt mound sites – a trough, an adjacent hearth, outlying pits, occasional postholes and an overlying mound of heat shattered stones and blackened soil. Subsequent early Bronze Age activity however consisted of a very large waterhole or well, away from the earlier mound. It seems likely, both from the radiocarbon dates and their physical location, that the waterhole was not associated with the earliest burnt mound activity and may not have been related to any other features on the site.

In general terms, the presence of larger pits, such as the wells or cisterns identified on this site, would be less common, although a large number of burnt mound sites

from the N9/N10 Phase 4 exhibited similar features, from several stages in prehistory: - Kellymount 2 and 3, Stonecarthy West 1 and Maddockstown 1. These very large pits have been interpreted as water-holes that were potentially designed for bulk water storage, unlike the usual troughs which were the "vessel" in which water was heated rather than stored. On these other sites water storage pits were generally associated with a trough.

It is suggested that the waterholes may indicate a bathing site, where a large volume of water was required but which may not necessarily have had to be boiled (as for cooking), but merely heated for bathing. The function of the waterhole at Danesfort 2 is unclear as it was not contemporary with any of the other dated archaeology. The single shallow pit adjacent to it contained no burnt mound material which suggests that it was probably not a trough.

The Iron Age phase on the site was associated with features commonly found on burnt mound sites, in terms of a trough, pits and burnt mound spread. The trough (Trough 2) however, does appear to have been particularly deep and at 0.70m would have been approximately twice the depth of an average trough. Another deep, large pit adjacent to the west end of the trough was not as large as the Bronze Age waterhole. The function of this pit, and indeed Trough 2 is worthy of consideration; given their particular size and depth, and it would seem unlikely that they were designed for cooking. As outlined above, the volume of water in such deep features would be more easily heated (for bathing) than boiled (for cooking). Trough 2 was also surrounded by a series of possible post-pits (Structure A) which may have supported a platform around the trough or indeed a small enclosed or roofed structure over the trough. A second possibly small structure or platform (Structure B) 5m to the east consisted of parallel rows of four postholes. Structure A, Structure B and the trough were all on a similar east-west alignment which is not likely to be coincidental. The precise function of both structures or indeed the trough and pit is not known but collectively they represent a very formal arrangement that is not commonplace on burnt mound sites.

It has been a popular theory for some time that burnt mounds were used as bathing sites or saunas (Lucas 1965; Barfield and Hodder 1987; O'Drisceoil 1988) yet few sites had produced evidence of the necessary associated structures. Features interpreted as being associated with possible sweathouses or bathing have been identified at a number of burnt mound sites from different projects over the last number of years, largely as a result of the increase in the volume of development led excavations particularly from infrastructural projects similar to the N9/N10. A probable sweathouse was documented from the N25 Waterford Bypass at Rathpatrick (Eogan, 2007). Here the main feature was a 5m diameter sunken area with thirty six stake-holes identified around the periphery of the base representing a structure, as well as other features including a possible bath (trough) and an annexe to the main structure. It is interpreted that the stakeholes would have supported a hemispherical, tent-like structure. Eogan identified parallels in other cultures with particular similarities to the Rathpatrick structure in Native American sweatlodges. Clearly an enclosed structure is a key element to the functioning of a sweathouse or sauna, and it is interpreted that the slots and postholes at Blanchvillespark 3 on the N9/N10 Phase 4 could easily have been associated with such an enclosed area. Similarities between the two sites can also be seen by the sunken nature of the interior of the structure and the creation of an adjacent annex, although the shape and plan of the basic sweathouse structure is different in each site. Another similar site to Rathpatrick was identified at Ballykeoghan in south Kilkenny which was excavated as part of the N9/N10 Phase 2 (Laidlaw, 2008). Burrow or Glenanummer 3 Co Offaly, which was excavated as part of the N6 Kilbeggan to Athlone, also

consisted of a sunken circular area with stakeholes around the perimeter, with an elaborate system of additional troughs designed for water to flow from one to another (Coughlan, 2010). Two bone pendants recovered from the sweathouse area at this site represent personal ornaments that were probably lost while bathing.

The Ballykeoghan and Rathpatrick sites both date to the late Bronze Age/early Iron Age, while Burrow or Glenanummer was dated to the late Bronze Age, but all three are later in date than Blanchvillespark 3. Blanchvillespark is therefore quite an early example of possible sweathouse and bathing activity at a burnt mound site. A number of other possible sweathouses that date to the Iron Age have been identified as part of the N9/N10 Phase 4. At Stonecarthy West, an oval slot trench that could have supported structural walls enclosed a shallow hollow and may have acted as a sweathouse. The Kellymount sites showed evidence of structural activity both outside and inside the troughs with possible enclosing palisades and a variety troughs and pits, with some very large waterhole or well features. This slot trench from Stonecarthy West 1 and a trough from Kellymount 3 are contemporary with the Iron Age dates from Danesfort 2, which may be coincidental. It seems unlikely that water heated in the very large waterhole pits would have been boiled due to the volume of water that would have been involved so a bathing function is being considered. Kellymount 2 also produced a fragment of amber bead from the base of the waterhole, and similar to Burrow and Glenanummer this may represent a personal ornament lost while bathing. It is clear therefore that there is growing evidence that some burnt mound sites functioned as sweathouses or bathing places.

The Iron Age Phase at Danesfort 2 was as such potentially a bathing place. This is significant in terms of our wider understanding of the function of *fulachta fiadh*/burnt mounds. It has been identified that this site type can have many functions and often the precise nature of the activity at excavated burnt mounds is unclear. The results of excavations at Danesfort 2 indicate that these varying functions can potentially occur in tandem when we consider the simpler trough and pits from the early Bronze Age; the subsequent un related very large early Bronze Age waterhole/cistern and the Iron Age possible bathing site.

4.2 Conclusions

Danesfort 2 is an important site locally as it represents the first evidence of early Iron Age activity in the immediate area and it adds to the considerable evidence from the Bronze Age that has been gathered through excavations as part of the N9/N10 Phase 4. It is however also of regional significance based on the nature of the burnt mound activity identified at the site, in particular the Iron Age possible bathing site. A number of potential sweathouses and bathing sites have been confirmed from recent excavations of burnt mounds across the country and the results of the Danesfort 2 excavation will significantly add to the further study, analysis and understanding of the varied function and form of burnt mound sites.

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PLATES

Plate 1: Burnt mound, pre-excavation, facing east

Plate 2: Waterhole C109, Trough 2 and Trough 1, mid-excavation, facing east

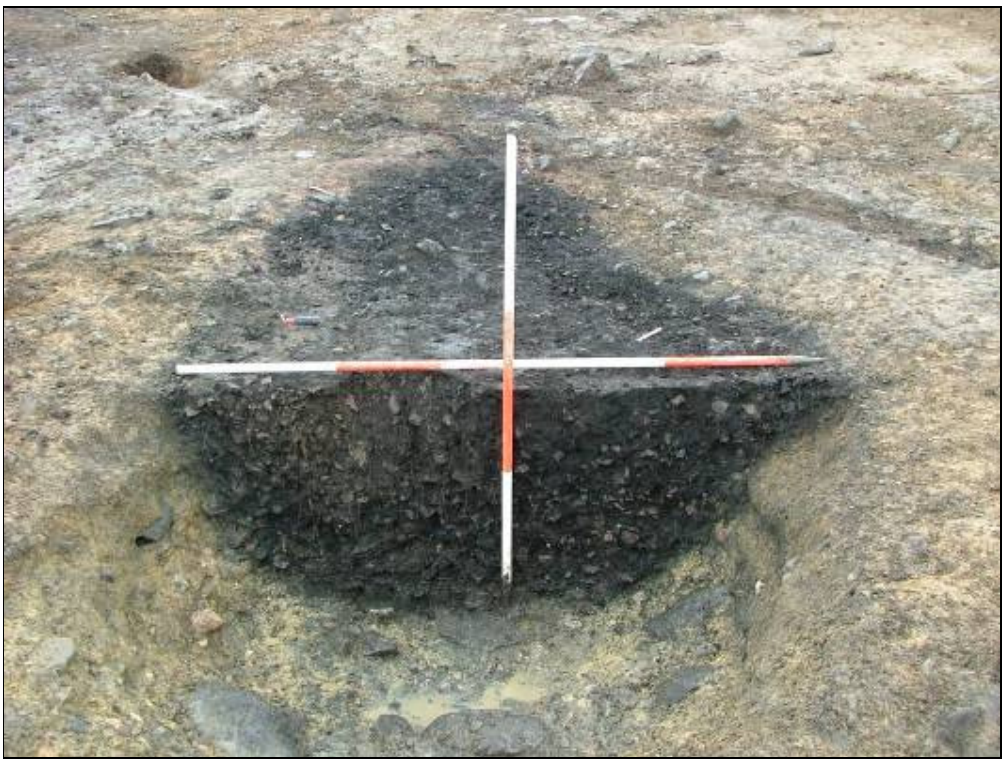

Plate 3: Trough 1, mid-excavation, facing east

Plate 4: Trough 1 and hearth C7a, mid-excavation, facing east

Plate 5: Trough 2, mid-excavation, facing east

Plate 6: Posthole C95 cutting pit C118, mid-excavation, facing north

Plate 7: Structure B, post-excavation, facing north west

Plate 8: Waterhole C109, mid-excavation, facing east

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
1	N/A				Topsoil	Dark brown sandy silty clay.		
2	N/A				Natural	Mid grey sandy gravely clay		
3	N/A	14.35	13.80	0.57	Spread	Mixed black and brown burnt clay with stones and charcoal, few finds including a bronze pin, hammer stone and flint.	C46	C2
4	Void							
5	N/A	1.60	1.50	0.11	Cut of pit	Oval in shape, W-E, imperceptible break of slope with concave sides leading to an irregular base.	C6	C2
6	C5	1.60	1.50	0.11	Fill of pit	Loosely compacted greyish black silt with no inclusions.	C1	C5
7	N/A	4.50	2.20	0.75	Cut of trough	Irregular in shape, W-E, gradual break of slope with irregular sides and a flat base.	C54	C2
7a	N/A	1.30	1.30	0.20	Hearth cut	Roughly circular hearth cut	C8	C2
8	C7/7a	4.50	1.30	0.30	Fill of trough	Loosely compact dark greyish black ashy silt with occasional stones and charcoal.	C3	C53
9	N/A	0.23	0.17	0.11	Natural depression		C10	C2
10	C9	0.23	0.17	0.11	Natural depression			
11	N/A	1.27	0.42	0.13	Cut of pit	NW-SE, elongate in shape, gradual break of slope with sloping sides leading to a concave base.	C12	C2
12	C11	1.27	0.42	0.13	Fill of pit	Loosely compact black silty sand with pebble inclusions.	C3	C11
13	N/A	0.48	0.35	0.07	Cut of pit	Sub-circular in shape, gradual break of slope with concave base.	C14	C2
14	C13	0.48	0.35	0.07	Fill of pit	Medium to loosely compacted, black sandy silt with burnt angular fulacht stones included and occ. charcoal	C3	C13
15	N/A	0.90	0.68	0.12	Cut of pit	Oval in shape, N-S, gradual break of slope with irregular sides and oval shape of base.	C16	C2
16	C15	0.90	0.68	0.12	Fill of pit	Loosely compact black sandy silt with stone and pebble inclusions.	C1	C15
17	N/A	2.80	0.49	0.22	Cut of channel like feature	Curvilinear roughly going SW-NE, gradual break of slope with concave base.	C18	C2
18	C17	2.80	0.49	0.22	Fill of channel like feature	Medium to tightly compacted dark brown silty sand with some small stones.	C3	C17
19	N/A	0.35	0.33	0.21	Cut of posthole	Circular in shape, sharp break of slope with vertical sides and flat shape	C20	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						of base.		
20	C19	0.35	0.33	0.21	Fill of posthole	Loosely compacted mid black silty clay with a light grey hue, stone and charcoal inclusions.	C3	C19
21	N/A	0.05	0.06	0.11	Cut of stakehole	Circular in shape, gradual break of slope with gradual sides and tapered round pointed base.	C22	C2
22	C21	0.06	0.08	0.11	Fill of stakehole	Mid greyish brown silty clay with small stones and some charcoal.	C3	C21
23	N/A	0.25	0.18	0.13	Cut of stakehole	Oval in shape, SW-NE, gradual break of slope with gradual sides and concave base.	C24	C2
24	C23	0.25	0.18	0.13	Fill of stakehole	Medium to loosely compacted, dark greyish brown silty sand with charcoal and small stones.	C1	C23
25	N/A	0.45	0.25	0.18	Cut of pit	Sub oval in shape, NW-SE, gradual break of slope with undercut edges leading to concave base.	C26	C2
26	C25	0.45	0.25	0.18	Fill of pit	Medium to loosely compacted mid greyish brown silty sand with big and small stones.	C1	C25
27	N/A	0.20	0.15	0.35	Cut of stakehole	Circular in shape, sharp break of slope with vertical sides and concave base.	C28	C2
28	C27	0.20	0.15	0.35	Fill of stakehole	Very loosely compacted black soil with small stones and roots.	C3	C27
29	N/A	0.33	0.31	0.14	Cut of posthole	Circular in shape, sharp break of slope- top and gradual break of slope-base with vertical sides leading to a concave base.	C30	C2
30	C29	0.33	0.31	0.14	Fill of posthole	Loosely compacted black soil with greyish hue, charcoal flecks and some pebble inclusions.	C3	C29
31	N/A	0.42	0.28	0.05	Non-archaeological			
32	C31	0.42	0.28	0.05	Non-archaeological			
33	C7	1.50	0.75	0.35	Fill of trough	Loosely compacted light brownish grey silt with lots of small irregular sharp edged stones.	C3	C53
34		1.60	1.20	0.10	Natural	Firmly compacted reddish orange clay with no inclusions.		
35-36	N/A					Irregular in shape		
37	N/A	4.00	2.00	0.15	Spread	Loosely compact dark brown silty clay with heat shattered stones	C1	C3
38	N/A	4.20	1.50	0.35	Spread	Loosely compact light brown silty clay with heat shattered stones	C1	C3
39	N/A	2.30	1.20	0.25	Spread	Loosely compact grey brown silty clay with heat shattered stones	C1	C3
40	Void							
41-43	C99	1.30	1.20	0.20	Fills of Test trench		C1	C42
44	C59	0.35	0.37	0.06	Fill of pit	Loosely compacted mid greyish brown fine sand with a small amount of charcoal.	C60	C59

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
45	N/A							
46	N/A	35	9	0.30	Spread	Mid brown clay with heat shattered stones and charcoal	C1	C3
47	N/A							
48	N/A	0.35	0.30	0.39	Cut of posthole	Circular in shape, sharp break of slope- top, gradual break of slope- base with vertical sides and concave shape of base.	C49	C2
49	C48	0.35	0.30	0.39	Fill of posthole	Very loosely compacted black silt with greyish hue, large pieces of charcoal and stones included.	C3	C48
50	N/A	0.37	0.29	0.25	Cut of posthole	Circular in shape, sharp break of slope- top and base with vertical sides and flat shape of base, no inclusions.	C51	C2
51	C50	0.24	0.20	0.11	Fill of posthole	Loosely compacted light black silty clay with grey hue, flecks of charcoal and some stones included.	C3	C50
52	C109	1.35	0.8	0.30	Fill of pit	Tightly compacted light brown clay with small stones within.	C2	C106
53	C7	2.50	1.80	25.4	Fill of trough	Loosely compacted greyish black clayish silt with a few stones and charcoal included.	C8	C53
54	C7	1.80	1.60	0.25	Fill of trough	Firmly compacted blackish grey silty clay with charcoal.	C53	C7
55	N/A	0.36	0.32	0.36	Cut of posthole	Circular in shape, sharp break of slope top and base with vertical sides and flat base.	C56	C2
56	C55	0.36	0.32	0.36	Fill of posthole	Loosely compacted black silty clay with a light grey hue with charcoal and stone inclusions.	C3	C55
57	N/A	2.40	2.20	0.32	Cut of pit	Oval in shape, NE-SW, gradual break of slope with sloping sides and concave base.	C117	C2
58	C57	1.10	0.88	0.17	Fill of pit	Loosely compacted greyish black silty sand with stone and charcoal inclusions.	C3	C57
59	N/A	0.76	0.74	0.20	Cut of pit	Circular in shape, gradual break of slope with a concave base.	C44	C2
60	C59	0.70	0.66	0.15	Fill of pit	Loosely compacted black fine sand with heat shattered stone and charcoal.	C3	C44
61	N/A	0.95	0.65	0.16	Cut of pit	Circular in shape, sharp break of slope with gradual sides leading to cone like base.	C62	C2
62	C61	0.95	0.65	0.16	Fill of pit	Loosely compacted black fill, burnt soil=50%, burnt stone =50%.	C3	C61
63	N/A	1.35	1.05	0.37	Cut of pit	Irregular in shape, NE-SW, with sharp break of slope and sloping sides leading to concave base, no inclusions.	C64	C2
64	C63	1.35	1.05	0.37	Fill of pit	Loosely compacted black silty sand with stone and burnt bone inclusions.	C3	C63
65	N/A	0.75	0.45	0.19	Natural depression	Irregular in shape, break of slope taken out by digger with flat shape of base, no inclusions.	C66	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
66	C65	0.75	0.45	0.19	Natural depression	Moderately compacted black soil with no inclusions.	C1	C65
67-70	N/A							
71	N/A	0.32	0.28	0.12	Cut of pit	Circular in shape with gradual break of slope, sloping sides with concave base.	C72	C2
72	C71	0.32	0.28	0.12	Fill of pit	Loosely compacted black silty sand with stone and charcoal inclusions.	C3	C71
73-74	Void							
75	N/A	0.33	0.33	0.07	Spread	Greyish black silty sand spread	C76	C2
76	Void							
77	N/A	0.22	0.14	0.11	Cut of stakehole	Circular in shape, sharp break of slope- top with sharp sides to gradual on NE; break of slope- base is sharp on W side and gradual on E;	C78	C2
78	C77	0.22	0.14	0.11	Fill of stakehole	Loosely compacted black to dark brown soil with small stones included.	C3	C77
79	N/A	0.10	0.08	0.09	Cut of stakehole	Circular in shape, sharp break of slope top and base with vertical sides and circular base, no inclusions.	C80	C2
80	C79	0.10	0.08	0.09	Fill of stakehole	Loosely compacted black soil with one small stone.	C3	C79
81	N/A	1.00	0.50	0.25	Cut of pit	Irregularly shaped, sharp break of slope with gradual sides and a concave base.	C82	C2
82	C81	1.00	0.40	0.25	Fill of pit	Moderately compacted black sandy clay with small stones and roots throughout.	C3	C81
83	N/A	0.85	0.40	0.30	Cut of posthole	Circular in shape, sharp break of slope with sharp sides and a sharp base.	C84	C2
84	C83	0.85	0.40	0.30	Fill of posthole	Moderately compacted dark brown black sandy clay with small stones and roots throughout.	C3	C83
85-86	N/A							
87	N/A	0.13	0.11	0.22	Cut of stakehole	Circular in shape, sharp break of slope with vertical sides and concave base, no inclusions.	C88	C2
88	C87	0.13	0.11	0.22	Fill of stakehole	Loosely compacted greyish black silty clay with charcoal and stones within.	C3	C87
89	N/A	0.14	0.13	0.16	Cut of stakehole	Circular in shape with gradual break of slope, vertical sides and a concave base, no inclusions.	C90	C2
90	C89	0.14	0.13	0.16	Fill of stakehole	Loosely compacted grey silty sand with charcoal and stones.	C3	C89
91	N/A	0.80	0.40	0.13	Cut of pit	Curved linear, NW-SE, sharp break of slope with sharp and gradual (west part) sides leading to linear base.	C92	C2
92	C91	0.80	0.40	0.13	Fill of pit	Greyish black silty sand		
93	N/A	1.25	0.60	0.32	Cut of pit	L shaped feature, S-N, sharp break of slope- top with sloping to vertical	C94	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						sides, gradual break of slope-base and concave base.		
94	C93	1.25	0.60	0.32	Fill of pit	Loosely compacted black silty sand with occasional charcoal and pebbles.	C3	C93
95	N/A	0.40	0.38	0.40	Cut of posthole	Circular in shape, sharp break of slope- top and gradual break of slope-base with vertical sides and concave base, no inclusions.	C96	C2
96	C95	0.40	0.38	0.40	Fill of posthole	Loosely compacted black silty sand with pebbles and charcoal within.	C3	C95
97	N/A	0.60	0.50	0.21	Cut of pit	Circular in shape, sloping break of slope- top and gradual break of slope-base with sloping sides and an oval shape of base.	C123	C2
98	C97	0.24	0.20	0.09	Fill of pit	Loosely compacted brownish black silty clay with occasional stone and charcoal.	C1	C123
99	N/A	3.00	1.20	0.60	Cut of Test Trench	Rectangular in shape, E-W, gradual break of slope on north side with a sharp break of slope from south side, steep mid slightly convex sides, gradual break of slope- base leading to flat base.	C43	C3
100	N/A	2.90	2.70	0.70	Cut of pit	Irregular in shape (almost triangular), E-W, gradual northern break of slope- top, sharp south and western break of slope- top with sloped- N,S to steep- W, E sides, gradual break of slope- base leading to a flat base.	C151	C2
101	N/A	0.34	0.30	0.42	Cut of posthole	Circular, sharp break of slope- top, gradual break of slope- base with vertical sides and concave base.	C102	C2
102	C101	0.34	0.30	0.42	Fill of posthole	Loosely compacted black silt with a greyish hue, some charcoal flecks and angular stones.	C3	C101
103	N/A	0.17		0.06	Non-archaeological			
104	C103	0.17		0.06	Non-archaeological			
105	C128	2.25	1.50	0.74	Fill of pit	Loosely compacted dark greyish black sandy silt, small and large irregular stones and charcoal included.	C99	C128
106	C109	1.65	2.50	0.20	Fill of waterhole	Moderately compacted dark brown silty clay with a few small stones.	C3	C110
107	C109	2.10	3.50	0.30	Fill of waterhole	Loosely compacted dark brown wet clay with lots of small stones.	C106	C2
108	C109	0.60	2.00	0.65	Fill of waterhole	Loosely compacted medium brown silty clay with small stones.	C3	C109
109	N/A	6.00	6.00	0.75	Cut of waterhole	Circular in shape, sharp break of slope with sharp sides and sharp base, no inclusions.	C108	C2
110	C109	6.00	3.50	0.75	Fill of waterhole	Tightly compacted dark grey thick marl with lots of small stones.	C106	C2
111	C109	1.70	1.70	0.25	Fill of waterhole	Loosely compacted black clay soil with small stones and charcoal.	C3	C110
112	C118	0.71	0.67	0.20	Fill of pit	Loosely compacted dark brownish black silty sand with pebbles and occasional charcoal.	C3	C118
113-116	N/A							

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
117	C57	2.40	2.20	0.21	Fill of pit	Firmly compacted orange brown silty sand with stone and charcoal inclusions.	C58	C57
118	N/A	0.71	0.67	0.20	Cut of pit	V shaped feature, W-E, sharp break of slope top and gradual break of slope- base with vertical to sloping sides and concave base.	C112	C2
119	N/A	0.39	0.25	0.37	Cut of posthole	Oval in shape, W-E, with sharp break of slope top and base; sides- vertical from E and sloping inwards to W; flat shape of base.	C120	C2
120	C119	0.39	0.25	0.37	Fill of posthole	Loosely compacted black silty clay with light grey hue, charcoal flecks and stones included.	C3	C119
121	N/A	0.28	0.26	0.39	Cut of posthole	Circular in shape, gradual break of slope- base with vertical sides and concave base.	C122	C2
122	C121	0.28	0.26	0.39	Fill of posthole	Very loosely compacted black soil with greyish hue, large flecks of charcoal and angular stones included.	C3	C121
123	C97	0.60	0.50	0.15	Fill of pit	Loosely compacted mid brown sandy clay with large stone included.	C98	C97
124	N/A	0.16	0.16	0.34	Cut of stakehole	Circular in shape, gradual break of slope top and base with vertical sides and concave base.	C125	C2
125	C124	0.16	0.16	0.34	Fill of stakehole	Loosely compacted greyish black silty sand, no inclusions.	C3	C124
126	Void							
127	Void							
128	N/A	2.25	1.60	0.75	Cut of pit	Oval in shape, E-W, gradual break of slope top and base with slightly concave sides and concave base.	C105	C2
129	N/A	1.00	1.00	0.30	Cut of pit	Irregular in shape, E-W, gradual break of slope with sloping sides and flat base.	C64	C2
130	C129	1.00	1.00	0.30	Fill of pit	Loosely compacted black silty sand with a few stones.	C3	C129
131	N/A	0.55	0.55	0.28	Cut of pit	Rounded in shape, sharp break of slope- top and gradual break of slope- base with concave sides and flat shape of base.	C132	C2
132	C131	0.55	0.55	0.15	Fill of pit	Loosely compacted dark grey clayey silt with small irregular stone inclusions.	C3	C131
133-134	N/A							
135	N/A	1.25	0.72	0.40		Loose to moderately compacted grey brown gravely sandy soil with a few stones.		
136	N/A	1.25	0.72	0.40		Moderate compaction, mottled orange brown and black silty soil with no inclusions.		
137	N/A	0.12	0.10	0.09	Cut of stakehole	Circular in shape, sharp break of slope- top, gradual break of slope- base with steep sides and concave base.	C138	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
138	C137	0.12	0.10	0.09	Fill of stakehole	Loosely compacted black clayey silt with greyish hue, stones and charcoal included.	C3	C137
139	N/A	0.11	0.09	0.05	Cut of stakehole	Circular in shape, sharp break of slope- top, gradual break of slope- base with steep sides and concave base.	C3	C140
140	C139	0.11	0.09	0.05	Fill of stakehole	Loosely compacted black clayey silt with greyish hue, stones and charcoal included.	C3	C139
141	C142	0.39	0.30	0.20	Fill of stakehole	Loosely compacted greyish black silty sand with charcoal and stones included.	C3	C142
142	N/A	0.39	0.30	0.20	Cut of stakehole	Oval in shape, N-S, gradual break of slope top and base with a concave base and sloping sides	C141	C2
143	C144	0.50	0.40	0.47	Fill of posthole	Loosely compacted brownish black silty clay with occasional stone and charcoal.	C3	C144
144	N/A	0.50	0.40	0.47	Cut of posthole	Oval in shape, W-E, gradual break of slope top and base with vertical sides and concave base.	C143	C2
145	N/A	0.35	0.35	0.20	Cut of pit	Rounded in shape, gradual break of slope with concave sides and concave base.	C146	C2
146	C145	0.35	0.35	0.20	Fill of pit	Loosely compacted dark greyish black clayey silt with small irregular stones and charcoal.	C3	C145
147	N/A	0.90	0.40	0.25	Cut of pit	Rectangular E-W, sharp break of slope- top and base with vertical sides and a flat base.	C148	C2
148	C147	0.90	0.40	0.25	Fill of pit	Loosely compacted dark greyish black clayey silt with small irregular stones and charcoal.	C99	C147
149	=106							
150	=109							
151	C100	2.90	2.70	0.70	Fill of pit	Loosely compacted dark greyish black sandy silt, small and large irregular stones and charcoal included.	C3	C100
152	N/A	0.67	0.42	0.21	Cut of pit	Oval in shape, N-S, sharp break of slope top and base with almost vertical sides and flat base.	C153	C2
153	C152	0.67	0.42	0.21	Fill of pit	Lightly compacted black silty clay with stones and charcoal.	C3	C152
154	Void							
155	Void							
156	Void							
157	Void							
158	N/A		1.26	0.51	Cut of ditch	Linear in shape, N-S, sharp break of slope- top and gradual break of slope- base, sloped sides and flat base	C161	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
159	C158		0.91	0.26	Fill of ditch	Loosely compacted greyish brown silty clay with occ. stones.	C3	C161
160	C158		0.39	0.27	Fill of ditch	Loosely compacted greyish black silty sand with charcoal.	C3	C161
161	C158		0.65	0.38	Fill of ditch	Loosely compacted light grey silty clay with snail shells.	C160	C158
162	=111						C149	C163
163	=111						C162	C109
164	N/A	5.50	4.30	0.30	Non-archaeological			
165	N/A	2.40	1.50	0.34	Non-archaeological			
166	C165	2.40	1.50	0.34	Non-archaeological			

Appendix 1.2 Finds Register

Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3540:003:001	3	1	Scraper	Flint convex end scraper	Flint	A flint convex end scraper produced on a single-platform flake using a soft stone hammer	N/A
E3540:003:002	3	2	Chunk	Natural chunk of quartz crystal	Quartz crystal	Natural chunk of quartz crystal	N/A
E3540:003:003	3	3	Scraper	Quartz crystal scraper	Quartz crystal	A possible quartz crystal scraper	N/A
E3540:003:004	3	4	Stone	Quartzite rubbing stone	Quartzite	A quartzite rubbing stone which is flattened and smoothened on one surface	N/A
E3540:003:005	3	5	Stone	Quartzite rubbing stone	Quartzite	A quartzite rubbing stone which is flattened and smoothened on one surface and was probably used as a mano	N/A
E3540:003:006	3	6	Pin	Copper alloy stick pin	Copper alloy	Copper alloy stick pin. Undifferentiated head (O'Rahilly Class 7). Circular shank, widens below the head and decorated with transverse lines. Dates to 12th Century – early 13th Century.	N/A

Appendix 1.3 Sample Register

During post excavation works specific samples were processed with a view to further analysis. A total of 30 soil samples were taken from features at Danesfort 2 and all 32 samples were processed by flotation and sieving through a 250µm mesh. The following are the ecofacts recovered from these samples:

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	Seeds and hazelnut	Burnt animal bone	animal bone	human bone	metallurgical waste	Other
C3	11	Mound				90.8g			
C8	2	Possible trough	3.1g						
C14	5	Pit	4.7g						
C15	8	Pit	5.5g						
C18	9	Curvilinear	0.3g						
C24	7	Pit	0.8g						

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	Seeds and hazelnut	Burnt animal bone	animal bone	human bone	metallurgical waste	Other
C26	6	Pit	0.3g						
C28	4	Pit	1.3g						
C33	3	Possible trough	1.6g						
C43	16	Pit	19.5g						
C44	18	Pit	0.6g						
C51	28	Posthole	3.0g						
C53	13	Pit	0.9g						
C54	14	Pit	0.3g	<0.1g					
C56	27	Posthole	1.0g						
C58	25	Pit	4.7g	0.2g					
C60	15	Pit	3.4g						
C64	26	Pit	0.4g		0.1g				
C64	35	Pit			1.2g				
C72	36	Pit	0.3g						
C76	17	Fill of [075]	0.4g						
C82	43	Pit	0.8g						
C94	34	Pit	4.3g						
C98	24	Pit	5.1g						
C102	29	Posthole	0.7g						
C105	39	Fill of pit	0.5g						
C111	32	Posthole	3.1g						
C112	23	Posthole	0.3g						
C122	31	Posthole	35.2g						
C153	41	Fill of pit	0.2g						

Appendix 1.4 Archive Index

Project: N9/N10 Phase 4 Knocktopher to Powerstown		
Site Name: AR078 Danesfort 2		
Excavation Registration Number: E3540		
Site director: Richard Jennings		
Date: November 2010		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	14	5 pre-ex, 17 section sheets, 4 mid-ex and 5 post-ex plans
Site sections, profiles, elevations	17	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1	
Site registers (folders)	2	
Survey/levels data (origin information)	514	
Context sheets	166	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	141	
Photographs (print)	0	
Photographs (slide)	0	

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Lithics Report – Farina Sternke MA, PHD

Appendix 2.2 Small Finds Report – Siobhán Scully

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Appendix 2.4 Plant Remains Analysis Report – Penny Johnson

Appendix 2.5 Animal Bone and Burnt Bone Report – Aoife McCarthy

Appendix 2.6 Petrographical Report – Stephen Mandal MIAI PGEO

Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

Appendix 2.1 Lithics Report – Farina Sternke MA, PHD

Lithics Finds Report for E3540 Danesfort 2 (A032/065), Co. Kilkenny
N9/N10 Road Scheme – Phase 4
Farina Sternke MA, PhD

Contents

List of Tables

Introduction
A total of five lithic finds from the archaeological investigations of a prehistoric site at Danesfort 2, Co. Kilkenny were presented for analysis (Table 1). The finds are associated with a *fulacht fiadh* with an associated trough, and pits and postholes.

Find Number	Context	Material	Type	Condition	Cortex	Length (mm)	Width (mm)	Thickness (mm)	Complete	Retouch
E3540:003:1	3	Flint	Retouched artefact	Reasonably fresh	No	29	15	4	Yes	Left edge direct semi-abrupt
E3540:003:2	3	Quartz crystal	Natural chunk							
E3540:003:3	3	Quartz crystal	Retouched artefact	Reasonably fresh	No	22	9	4	Yes	Distal left edge direct abrupt
E3540:003:4	3	Quartzite	Rubbing stone	Slightly weathered		64	49	30	No	No
E3540:003:5	3	Quartzite	Rubbing stone	Slightly weathered		104	99	41	No	No

Table 1 Composition of the Lithic Assemblage from Danesfort 2 (E3540)

Methodology
All lithic artefacts are examined visually and catalogued using Microsoft Excel. The following details are recorded for each artefact which measures at least 20mm in length or width: context information, raw material type, artefact type, the presence of cortex, artefact condition, length, with and thickness measurements, fragmentation and the type of retouch (where applicable). The technological criteria recorded are based on the terminology and technology presented in Inizan *et al.* 1999. The general typological and morphological classifications are based on Woodman *et al.* 2006. Struck lithics smaller than 20mm are classed as debitage and not analysed further, unless they represent pieces of technological or typological significance, e.g. cores etc. The same is done with natural chunks.

Quantification
The lithics are one flaked piece of flint, one flaked piece of quartz crystal and two utilised pieces of quartzite (Table 1). In addition, one natural piece of quartz crystal. Four artefacts are larger than 20mm in length and width and were therefore recorded in detail.

Provenance
The lithic artefacts were recovered from context *c.* 3.

Condition:
The lithics survive in reasonably fresh (E3540:003:1 and E3540:003:3) and weathered (E3540:003:4 and E3540:003:5) condition. Two artefacts are incomplete (E3540:003:4 and E3540:003:5)

Technology/Morphology:
The artefacts are two retouched tools and two macro tools.

Retouched Artefacts:
The retouched artefacts are two miscellaneous retouched artefacts which were probably used as scrapers. Artefact E3540:003:1 is made of flint and was produced on a single-platform flake using a soft stone hammer. This artefact appears to have been used as a convex end scraper. The other retouched artefact (E3540:003:3) is made of quartz crystal. The artefacts measure 29mm and 22mm long, 15mm and

9mm wide and 4mm and 4mm thick, respectively. They most likely date to the first half of the Neolithic period.

Macro Tools:
The macro tools are two quartzite rubbing stones (E3540:003:4 and E3540:003:5) which are flattened and smoothened on one surface. Artefact E3540:003:5 was probably used as a mano. The rubbing stones measure 64mm and 104mm in length, 49mm and 99mm in width and 30mm and 41mm in thickness, respectively. They probably date to the Neolithic period.

Dating:
The assemblage is technologically and typologically diagnostic and dates to the first half of the Neolithic period.

Conservation
Lithics do not require specific conservation, but should be stored in a dry, stable environment. Preferably, each lithic should be bagged separately and contact with other lithics should be avoided, so as to prevent damage and breakage, in particular edge damage which could later be misinterpreted as retouch. Larger and heavier items are best kept in individual boxes to avoid crushing of smaller assemblage pieces.

Discussion
Flint is available in smaller nodules along the Wicklow, Wexford and Waterford coast or in the glacial tills in Co. Kilkenny in the form of remanié pebbles. The use of a limited single platform and dominant bipolar technology on small to medium sized pebbles is in parts the result of this availability. The flint used at Danesfort 2 is beach pebble flint which almost certainly derives from the Wicklow, Wexford or Waterford coast. The majority of these flint nodules are rather small pebbles with an average dimension of 30–50mm and often only permit the use of a bipolar technology to efficiently reduce the nodule achieving a maximum outcome, i.e. the largest possible amount of suitable and usable blanks. The result is the regionally dominant split pebble bipolar (Neolithic and Bronze Age) character of the south-eastern flint assemblages (O'Hare 2005).

Summary
The lithic finds from the archaeological excavation at Danesfort 2, Co. Kilkenny are a flint convex end scraper, a quartz crystal scraper and two rubbing stones. The assemblage is morphologically and technologically diagnostic and dates to the first half of the Neolithic period. It represents a residual earlier phase at this site and is most likely waste which is possibly related to domestic activities. This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

Recommendations for Illustration
- Convex End Scraper (E3540:003:1)

References
Inizan, M-L, Reduron-Ballinger, M., Roche, H. and Tixier, J. 1999 *Technology and Terminology of Knapped Stone* 5. CREP, Nanterre.
O'Hare, M. B 2005 The Bronze Age Lithics of Ireland. Unpublished PhD Thesis. Queen's University of Belfast.
Woodman, P. C., Finlay, N. and Anderson, E. 2006 *The Archaeology of a Collection: The Keiller-Knowles Collection of the National Museum of Ireland*. National Museum of Ireland Monograph Series 2. Wordwell, Bray.

Appendix 2.2 Small Finds Report – Siobhán Scully

N9/N10 Knocktopher to Powerstown
Phase 4
Danesfort 2 Small Finds Report
E3540 A032/065 AR078
Siobhán Scully, Margaret Gowen & Co. Ltd
December 2009

Introduction
This report details a single piece of metal retrieved from the excavations at Danesfort 2 (E3540) as part of the N9/N10 Knocktopher to Powerstown road scheme.

Metal
A copper alloy stick pin (003:6) with an undifferentiated head was recovered from the burnt mount spread C3. The circular, tapering shank is decorated with transverse lines and is hipped in the upper part of the shank, which would have helped the pin to grip the garment. According to O'Rahilly's typology of stick pins found in the Dublin, stick pins with undifferentiated heads date from the start of the twelfth century to the early decades of the thirteenth century (1998, 33).

Catalogue
E3540:003:6 Copper alloy stick pin. Undifferentiated head (O'Rahilly Class 7). Circular shank, widens below the head and decorated with transverse lines. L 69.5mm Diam. 1.2–2.8mm. 12th Century – early 13th Century.

Reference
O'Rahilly, C. 1998 'A Classification of Bronze Stick-Pins from the Dublin Excavations 1962-1972' in C. Manning (ed.), *Dublin and Beyond the Pale: Studies in Honour of Patrick Healy*, 23–33. Wordwell, Bray.

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Site Name – Danesfort 2
Excavation Number – E3540 AR078
Co. Kilkenny
Author – Lorna O'Donnell
Date –17/7/09

Illustrations

Figures

Tables

Introduction

This report describes the charcoal analysis of samples from a burnt mound, excavated by Richard Jennings at Danesfort 2, Co. Kilkenny. The site was excavated as part of along the N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Jennings 2009). Charcoal was examined from four contexts, including pit and trough fills. The aim of the work is to identify enough suitable material for radiocarbon dating, and to provide a floristic background to the site, as well as wood selection patterns for the burnt mound. This report is summary in nature only, further analysis, discussions and comparisons of results will be incorporated into a final integrated charcoal and wood report for all sites along the N9/N10 (Lyons *et al* forthcoming).

Methodology (After IAC Ltd)

Processing

- A mechanical flotation tank using a pump and water recycling system is used for soil flotation.
- The soil is washed using a 1mm mesh in the flotation tank and a 300 micron and 1mm sieve is used to catch floated material.
- The volume of all soil samples are recorded in litres using a measuring jug.
- The sample is then placed into the 1mm mesh in the flotation tank, the tank is then filled with water and the sample washed. Any large lumps of soil can be carefully broken down by hand, but the jets of water in the flotation tank gently clean the rest of the sample.
- Once the sample is clean (just stones, charcoal, artefacts remaining in the mesh) the tank is fill up with water and at this stage any floating material (charcoal, seeds etc) should flow over the spout and into the sieves.
- The retent is then gently poured into a labelled tray (containing site code, site name, sample number and context number) and place on a shelf to dry.
- The flots are securely packaged in tissue, labelled and hung up to dry. This prevents any loss of light material (seeds) which could result once the flots are dry and being moved (if they are dried on trays).
- Before washing a new sample all equipment used (measuring jugs, 1mm mesh, sieves etc) are thoroughly washed using clean water.
- The large black settling tanks (and water) are cleaned between every site, or if a large site is being processed, every 1–2 weeks.
- Any samples containing high clay content will be soaked in water for 1–2 days to aid the sieving process.

Charcoal identification

Each piece of charcoal was examined and orientated first under low magnification (10x-40x). They were then broken to reveal their transverse, tangential and longitudinal surfaces. Pieces were mounted in plasticine, and examined under a binocular microscope with dark ground light and magnifications generally of 200x and 400x. Each taxon or species will have anatomical characteristics that are particular to them, and these are identified by comparing their relevant characteristics to keys (Schweingruber 1978; Hather 2000 and Wheeler *et al* 1989) and a reference collection supplied by the National Botanical Gardens of Ireland, Glasnevin. Fifty fragments were identified from each sample, where possible.

2.3 Details of charcoal recording

The general age group of each taxa per sample was recorded, and the growth rates were classified as slow, medium, fast or mixed. It was not within the scope of this project to measure all the ring widths from the charcoal, however, some measurements were taken with a graticule in the microscope in order to make the

scale of slow, medium and fast growth less subjective. Slow growth within the charcoal from this site was considered to be approximately 0.4mm per annum, medium approximately 1mm per annum and fast approximately 2.2mm per annum.

The ring curvature of the pieces was also noted – for example weakly curved annual rings suggest the use of trunks or larger branches, while strongly curved annual rings indicate the burning of smaller branches or trees (Fig. 1). Tyloses in vessels in species such as oak can denote the presence of heartwood. These occur when adjacent parenchyma cells penetrate the vessel walls (via the pitting) effectively blocking the vessels (Gale 2003, 37). Insect infestation is usually recognised by round holes, and is considered to be caused by burrowing insects. Their presence normally suggests the use of decayed degraded wood, which may have been gathered from the woodland floor or may have been stockpiled.

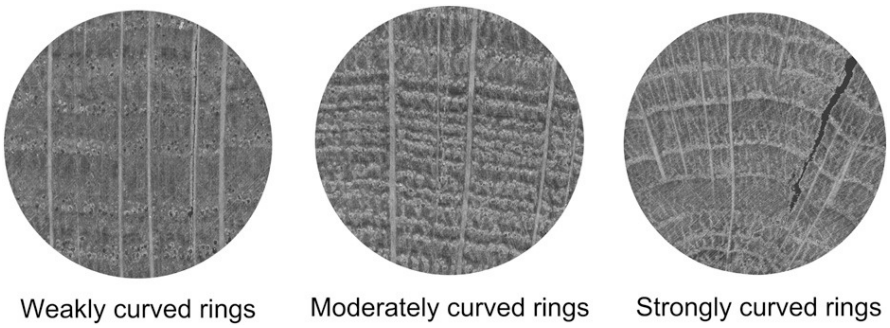

Fig. 1 Ring curvature. Weakly curved rings indicate the use of trunks or large branches.
(After Marguerie and Hunot 2007 1421, Fig. 3).

Results

Five wood taxa or trees were identified from the Danesfort 2 samples, hazel (*Corylus avellana*), ash (*Fraxinus* sp.), pomaceous fruitwood (Pomoideae), wild/bird cherry (*Prunus avium/padus*) and oak (*Quercus* sp.). The results are dominated by oak (Fig. 2).

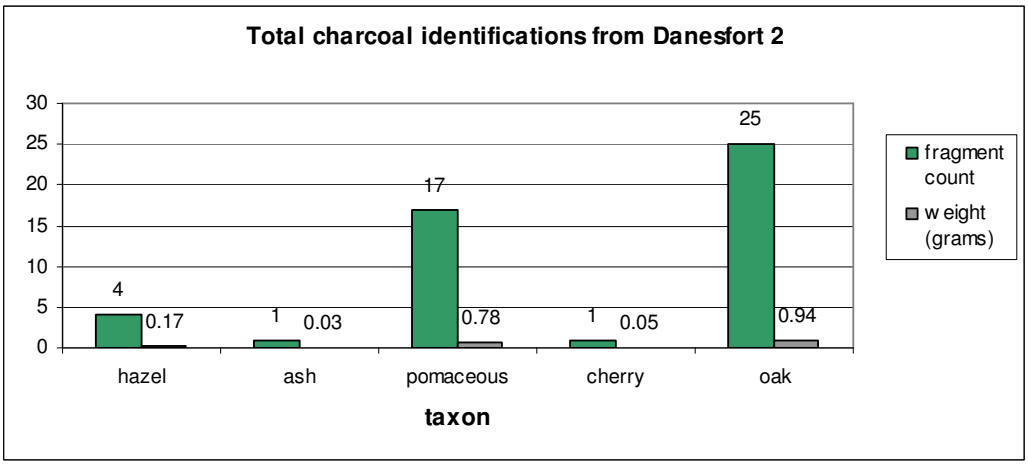

Fig. 2

Charcoal was examined from two pit fills at Danesfort 2 (Cut 93 and 109; Fill 94 and 111). The level of charcoal is low from C94, only one fragment of oak was identified. Pomaceous fruitwood and oak were identified from C111. Charcoal was also

examined from trough fills (Trough 1 Cut 7 and Trough 2 Cut 128; Fill 8 and 105). A variety of trees was identified from C8 (hazel, ash, pomaceous fruitwood and oak), while pomaceous fruitwood and oak only were identified from C105 (Table 1).

Discussion

The oak present could be either our native pedunculate (*Quercus robur*) which prefers more wet, heavier clays than the sessile oak (*Quercus petraea*) (Beckett 1979, 40–41).The Pomoideae group (pomaceous fruitwood), a sub family of the Rosaceae includes crab apple, wild pear, rowan/whitebeam and hawthorn. Crab apple (*Malus sylvestris*) is a tree of hedges, copses and oak woodland, thriving in fertile and heavy soils. It often grows singly, with large distances between individual trees (Lipscombe and Stokes 200, 78). Wild pear (*Pyrus pyraster*) can grow on woodland edges and also can be found growing in a solitary situation (Lipscombe and Stokes 2008, 114 ; Stuijts 2005, 142). Rowan (*Sorbus aucuparia*) is a tough colonizer which can tolerate peaty soils and exposed conditions. It needs plenty of light to thrive (Hickie 2002, 65). It is a tree of mountains, woodlands and valleys, growing on a wide range of soils, including chalks, acid soils and even peat (Lipscombe and Stokes 2008, 120). Whitebeam (*Sorbus aria*) grows up to 20m high and has a preference for limestone soils (Orme and Coles 1985, 11). Hawthorn (*Crataegus monogyna)* can thrive in all but the most acid of soils (Gale and Cutler 2000). As wild pear is not a native Irish species, it is likely that the charcoal represents other types encompassed in the Pomoideae group.

Hazel is a very tolerant tree, it can grow from wet to dry conditions (but not waterlogged ones (Orme and Coles 1985, 9). It was once very common in Ireland, Mc Cracken writes that it was once widespread to an extent that is hard to imagine today (1971, 19). It can grow as a tree or can form hazel scrub. Wild/bird cherry can grow well in light conditions such as near woodland margins (Orme and Coles 1985, 11).

Ash trees prefer moist, well drained and fertile soils. It is very intolerant of shade (Lipscombe and Stokes 2008, 188)

Summary

Charcoal was examined from four contexts at Danesfort 2, from two pits and two troughs. Five wood taxa were identified, the results are dominated by oak.

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Table 1 Charcoal identification details from Danesfort 2

Context number	Cut number	Sample number	Flot weight (g)	Context description	Wood taxon	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Growth	Weakly or strongly curved rings	Comment
8	7	2	3.1	Trough fill - Trough 1	*Corylus avellana* (hazel)	4	0.17	4-5	2-6	medium		radial cracks
					Fraxinus sp. (ash)	1	0.03	5-6	3-4	medium		
					Pomoideae spp. (pomaceous)	7	0.39	5-6	3-4	medium		
					Prunus avium/padus sp. (wild/bird cherry)	1	0.05	5-6	3-4	medium		
					Quercus sp. (oak)	3	0.22	5-6	3-4	medium		
94	93	14	0.3	Pit fill	*Quercus* sp. (oak)	1	0.01					
105	128	39	3.5	Trough fill - Trough 2	Pomoideae spp. (pomaceous)	5	0.08	4-5	2-3	medium	strongly curved	
					Quercus sp. (oak)	15	0.21	4-5	2-3	slow		
111	109	32	3.1	Pit fill	Pomoideae spp. (pomaceous)	5	0.31	4-5	2-4	medium		
					Quercus sp. (oak)	6	0.5	4-5	2-4	medium		

Appendix 2.4 Plant Remains Analysis Report – Penny Johnston

Plant Remains Analysis Report for
E3540 Danesfort 2 (A032/065), Co. Kilkenny
N9/N10 Road Scheme – Phase 4

Penny Johnston, Eachtra

Introduction
This report details the analysis of plant remains recovered from excavations in advance of the construction of the N9/N10 Knocktopher to Powerstown Road (Phase 4). The excavation was directed by Richard Jennings on behalf of Irish Archaeological Consultancy Ltd. The archaeological site was located in the townland of Danesfort (E3540).

The excavated remains included evidence for Bronze Age occupation and burnt mound/*fulachta fiadh* activity.

Methodology
The samples were processed by the client, who also carried out a preliminary sorting of the samples. This pre-selection of the plant remains may bias the final plant records from these sites, as it is possible that many small items, such as weed seeds and chaff, were not picked out.

The selected material was sent to Eachtra Archaeological Projects where it was examined under a low-powered binocular microscope (X6 –X45). Suitable plant material was identified and the results of analysis are presented.

Danesfort 2 E3540 AR078
This was a burnt mound/*fulacht fiadh* site with deposits of charcoal and heat affected stones, a trough, several pits and a well. A total of 2 samples were examined from this site, C.58 (S.25) and C.54 (S.14). There were no charred seeds from these samples.

Appendix 2.5 Animal Bone Report – Aoife McCarthy

Osteoarchaeological Report of Faunal Remains and Burnt Bone from
E3540 A032/: Danesfort 2 AR078
Co. Kilkenny
N9/N10 Kilcullen to Waterford Scheme
Phase 4: Knocktopher to Powerstown

Author: Aoife McCarthy MA BA
Date: March 2010

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1. Introduction

1.1 Introduction

This report details the osteological analysis of faunal remains and burnt bone samples recovered during excavations at Site E3540 AR078 Danesfort 2 in the townland of Danesfort, Co. Kilkenny as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme. Aoife McCarthy MA (Osteoarchaeology University of Southampton 2006) undertook the analysis on behalf of Irish Archaeological Consultancy Ltd in February 2010. At the time of writing this report, background archaeological information was obtained from a draft interim excavation report (Jennings, R. 2009) and from consulting the original site register documents.

1.2 General Osteological Information

The osteological analysis of both hand retrieved faunal remains and burnt bone fragments recovered during sieving of bulk soil samples was undertaken to provide an overview of the osteoarchaeological aspect of the site and determine if the material could provide further interpretation of site activity.

A total of 51 fragments from 45 possible skeletal elements and weighing 91.93g were recorded within the assemblage. The degree of preservation of the bone assemblage recovered varied from well preserved to moderate preservation for retrieved faunal remains and to poor for burnt bone fragments. A modest rate of fragmentation was also noted within the combined assemblage.

A large portion of the faunal remains assemblage recovered at Danesfort 2 originated from C64 the black silty-sand fill of pit feature C63 which accounted for 36 bone fragments or 70.6% of the total. A series of two charcoal samples retrieved from archaeological contexts C105 and C54 were classified to species and issued for AMS dating. A sample of *prunus spp* charcoal identified within pit fill C105 was sent for radiocarbon dating and returned a two sigma calibrated date of Cal. 744–407BC; whilst ash and *prunus spp* charcoal retrieved within pit fill C54 returned a two sigma calibrated date of Cal. 2464–2214BC. The AMS dates returned place activity within the Bronze Age, stretching into the early Iron Age period.

A total of 9 bone fragments (17.6%) of the combined assemblage were classified to species. Due to fragmentation combined with poor preservation and small size of the individual bone fragments it was not possible to identify 42 fragments (82.4%) these were classed as indeterminate vertebrate. Bone elements were identified where possible.

The faunal remains assemblage recovered from Danesfort 2 contained bones from a possible 4 different species including; cow, pig, sheep and goat. The domestic species of pig and cow accounted for 5 fragments (55.6%) and 2 fragments (22.2%) respectively of identified material.

2. Methodology

SPECIES IDENTIFICATION: Identification of the bones involved reference to Schmid (1972) and Hillson (1992) as well as comparison with the author's own reference material. The closely related taxa of sheep and goat are difficult to distinguish and where grouped under the term '*caprinae*'

- NISP: Number of Identified Specimens Indicates the total number of fragments found.

- MNI: Minimum Number of Individuals. Indicates the minimum number of individuals from every species that were present in the material. Estimating MNI is calculated on the specimen of the most abundant skeletal element present; whilst taking age, sex, size and archaeological context into account.

- In order to calculate accurate MNI and MNE figures for each species, bird as well as mammal, a method of zoning was implemented when recording (Serjeantson, 2000). This method was used so as to compensate for any possible biases due to fragmentation; siding was also taken into account at this point.

- MNE: Minimum Number of Elements. Indicates the minimum number of anatomical units that are present and what side they are from. To avoid getting a higher MNE all loose epiphyses have to be paired with all un-fused diaphysis.

AGEING: Two main methods are used to determine the age of faunal remains; tooth eruption and degree of Epiphysial fusion (a less reliable method). Tooth eruption and wear stages were recorded for the following teeth where possible; dP4 (deciduous fourth premolar), P4 (fourth premolar), M1 (first molar), M2 (second molar) and M3 (third molar) of cattle, sheep/goat and pig (Grant 1982). The analysis of tooth wear patterns refers to the alteration of the enamel surface and exposure of inner dentine through use.

BIOMETRICAL DATA: Due to fragmentation, small size and the nature of the remains recovered measurements and biometrical analysis was not possible.

SEX DETERMINATION: Sex determination of animal remains is possible by analysis of certain sexually dimorphic elements. For example goat horncores may be classified as male or female based on their morphology and cattle metacarpals can be defined as male or female through calculation of the slenderness index (McCormick 1992). Sexual determination of species was not possible due fragmentation and the nature of the bone material recovered from Danesfort 2.

BUTCHERY/GNAWING/BURNING: Evidence for butchery was recorded under the categories of cut, chopped, chopped and cut. All specimens were analysed for evidence of rodent or carnivorous gnawing as well as evidence of burning. Burnt bones were recorded in accordance with colour changes resulting from differing heat levels e.g. calcined bones acquire a bluish-whitish hue through exposure to high temperatures.

PATHOLOGY: The discovery of any injury and/or pathology was recorded for all specimens, where present.

3. Results

Context 3 Sample 11
A total of 15 bone fragments (90.6g) representing 12 possible skeletal elements were identified within burnt clay spread C3. Species identified within spread material C3 included cow, pig and sheep/goat (*caprinae*). Small fragment size combined with a poor degree of preservation meant it was not possible to identify the species of 6 fragments (24.3g).

***Bos*/Cow**
A moderately preserved fragment of tibia diaphysis and a complete naviculo-cuboid (51.7g) were recovered. The single tibia diaphysis fragment displayed evidence of minor singeing in the form of blackening of the bone surface. As Devlin J.P. & Herrmann N. P (2008, 109) state "increasing exposure to heat bone progresses through a sequence of colours from unburned tan, to shades of dark brown to black, progressing to blue and grey and finally to white." A low degree of surface eburnation was recorded on the auricular surfaces of the complete naviculo-cuboid bone; indicating possible osteoarthritis.

***Sus*/Pig**
A series of 5 poorly preserved fragments of rib corpus (5.9g) were recovered from spread material C3. Measurements of the largest rib corpus fragment were recorded at 49mm long, 22mm wide and 7mm thick. Frequent chatter marks and surface striations consistent with rodent gnawing were noted on all 5 rib corpus fragments.

Sheep/Goat (*Caprinae*)
Loose permanent caprinae Molar 1 & Molar 2 teeth were recovered within clay spread C3. Dental wear patterns were recorded for both retrieved mandibular teeth. The single age category of 2–3 Years was represented (Appendix 1).

Indeterminate Vertebrate
Due to fragmentation, poor preservation and small fragment size 6 bone fragments recovered from spread material C3 were not identified to species. A single tibia diaphysis fragment from a large size vertebrate showed evidence of exposure to a high level of heat; resulting in calcination of the bone surface and colour change to grey. Evidence of butchery in the form cut and chop marks were also catalogued on the tibia diaphysis fragment. Frequent surface striations combined with chatter marks consistent with rodent gnawing were noted on 2 diaphysis fragments. A quantity of 4 of the unidentifiable bone fragments recovered comprised small–tiny fragments of trabecular bone.

Context 64 Sample 35
A series of 32 calcined rib corpus, long bone and unidentifiable burnt bone fragments (1.23g) of a small size mammal were retrieved within C64 the silty-sand fill of pit feature C63.

Indeterminate Vertebrate
A high degree of fragmentation combined with small fragment size and poor preservation meant that the long bone diaphysis, rib corpus and unidentifiable burnt bone fragments recovered from pit fill C64 were not identifiable to species. The long bone diaphysis fragment retrieved measured 9mm long, 6mm wide and 4mm thick. All 32 bone fragments displayed evidence of exposure to a high level of heat and resulting calcination of the bone. This was manifested as bone surface colour change to grey-white, combined with bone surface cracking. Contact of bone with heat diminishes its moisture content and results in the combustion of the organic or collagen component; the remaining structure of the bone after this process is mineral. A white or pale grey colour indicates exposure of bone to temperatures in excess of *c.* 600°C combined with a ready oxygen supply (McKinley, 2004). Such distortion to the bone structure reduces its size and as detailed above alters bone colour (Luff R. & Pearce J. 1994). A quantity of 20 unidentifiable bone fragments recovered consisted of small–tiny fragments of trabecular bone.

Context 64 Sample 26
A total of 4 calcined fragments of unidentifiable trabecular bone were recovered within sample 26 of pit fill C64.

4. Summary
Fifty one animal bone & burnt bone fragments recovered from archaeological contexts C3 and C64 on Danesfort 2 were submitted for examination. The bone samples were assessed and identified to species where possible; a total of 9 bone fragments recovered were identified to the species of cow, pig, sheep and goat. Due to the size and fragmented nature of the individual bone pieces it was not possible to identify 42 fragments to species. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Site AR078 Danesfort 2 due to its limited size and poor degree of bone preservation. A series of early Neolithic lithic aretfacts as well as a copper alloy medieval stick pin were also recovered within clay spread C3.

Bone Database:

Spec	C	S	Taxa	Anat	Side	Prox	Dist	1	2	3	4	5	6	7	8	But	Bu	G	Q	W (g)	Comments
1	C3	11	Shp/Gt	M1	R														1	3.30	Single loose M1 tooth in wear. Dental notes taken.
2	C3	11	Shp/Gt	M2	R														1	5.40	Single loose M2 tooth in wear. Dental notes taken.
3	C3	11	Pig Sz	Rib	R													R	4	5.00	Series of moderately preserved fragments of corpus, degree of trabecular bone exposed. Length 49mm, Width 22mm, Thickness 7mm
4	C3	11	Cow	Tibia			fsd							1			B		1	37.70	Moderately preserved, distal tibia fragment. Minor singeing of surface, degree of trabecular bone exposed.
5	C3	11	Unid	Tibia						1						7a, 12a	G	R	1	23.40	Well preserved fragment. Large sz mammal. Minor exposure to heat, surface greyed
6	C3	11	Unid	Unid															4	0.30	Small poorly preserved fragments of trabecular bone
7	C3	11	Pig Sz	Rib														R	1	0.90	Trabecular bone exposed poor preservation.
8	C3	11	Unid	Unid													Br, B	R	1	0.60	Trabecular bone exposed poor preservation.
9	C3	11	Cow	Naviculo-Cuboid	R			1	1	1	1	1	1	1	1				1	14.00	Well preserved & complete. Low degree of eburnation on auricular surfaces
10	C64	26	Unid	Unid													W, G		4	0.10	Series of small-tiny calcined fragments of trabecular bone
11	C64	35	Unid	Long Bone													W, G		8	0.58	Series of calcined fragments of long bone diaphysis. Small sz mammal Largest fragment 9mm long, 6mm wide & 4mm thick
12	C64	35	Unid	Rib													W, G		4	0.33	Poorly preserved, calcined fragments of rib corpus, trabecular bone.
13	C64	35	Unid	Unid													W, G		20	0.32	Series of small-tiny calcined fragments of trabecular bone

Key:

C= Context
S=Sample
Anat=Anatomical Element
Prox=Proximal
Dist=Distal

But=Butchery
Bu=Burnt
G=Gnaw
Q=Quantity of Pieces
G=Grey

N=No
Unid=Unidentifiable
Taxa=Taxon
B=Black

W=White
R=Rodent
Cn=Carnivore

Table 1: Dental Ageing Database

SPEC No	C	S	TAXA	(DP4) P4	M1	M2	M3	COMMENTS/AGE CATEGORY
1	C3	11	Shp/Gt		H			2-3 Years
2	C3	11	Shp/Gt			G-H		2-3 Years

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GLOSSARY OF TERMS:
BOS: Latin term for Cow
SUS: Latin term for Pig
CERVUS: Latin term for Deer
EQUUS: Latin term for Horse
OVIS: Latin term for Sheep
CAPRINAE: Latin term for Sheep/Goat
CANIS: Latin term for Dog
LEPUS: Latin term for Hare
AVES: Latin term for Bird
TAPHONOMY: The study of the processes affecting an organism after death from the time of burial until collection.
TRABECULAR BONE: Osseous tissues that fill the interior cavity of bones and resemble a sponge or honeycomb.
DIAPHYSIS: Bone shaft
CORPUS COSTAE: Body of Rib Bone

Appendix 2.6 Petrographical Report – Stephen Mandal MIAI PGEO

Petrographical Report on Site Samples Taken During Archaeological Excavations at Danesfort 2 (E3540), Co. Kilkenny

Eurgeol Dr Stephen Mandal MIAI PGEO

Introduction
This report is based on the macroscopic (hand specimen) examination of stone samples taken during archaeological excavations in advance of the N9/N10 Phase 4 Knocktopher to Powerstown Road Scheme. The purpose of the study was to identify the rock types from which the stone objects were made, to highlight potential sources for them, and to comment on their possible function. It is important to note that macroscopic petrographical studies have been considered of limited value in comparison to microscopic (thin section and geochemical analysis) studies. On the other hand, macroscopic studies provide an excellent preliminary assessment tool and have proven to be of considerable value in petrographical studies (e.g. see Mandal 1997; Cooney and Mandal 1998).

Solid Geology and Soils of the Site (see Figure 1; McConnell 1994)
The bedrock under the site consists of fossiliferous dark-grey muddy limestone belonging to the Ballysteen Formation (shown on Figure 1 as BA).

The stratigraphical sequence in the area consists of the following. Gaps in the stratigraphically sequence are represented by line breaks.

Carboniferous (Silesian)
Killeshin Silstone Formation (KN) – Muddy siltstone and silty mudstone
Luggacurren Shale Formation (LS) – Mudstone and shale with chert and limestone

Carboniferous (Dinantian)
Clogrenan Formation (CL) – Cherty, muddy calcarenite limestone
Ballyadams Formation (BM) – Crinoidal wackestone/ packstone limestone
Butlersgrove Formation (BU) – Very dark grey argillaceous limestones
Ballysteen Formation (BA) – Fossiliferous dark-grey muddy limestone
Ballymartin Formation (BT) – Limestone and dark grey calcareous shales
Porter's Gate Formation (PG) – Sandstones, shales and thin limestones

Devonian
Kiltorean Formation (KT) – Yellow and red sandstones, green mudstones
Carrigmaclea Formation (CI) – Red, brown conglomerates and sandstones

Ordovician
Oaklands Formation (OA) – Green, red-purple, buff shale, siltstone
Maulin Formation (MN) – Dark blue-grey slate, phyllite, schist

Igneous Intrusions (undated)
Granite (Gr) – Undifferntiated
Dolerite (D)

The geology of the area is generally dominated by Lower Carboniferous Age rocks, principally limestones. These rocks, which also make up much of the Midlands of Ireland, represent the northward return of the sea at the end of the Devonian, *c.* 360 million years ago, owing to the opening of a new ocean to the south called the Palaeo-Tethys in what is now central Europe.

To the south of the study area occur Ordovician-Devonian Age rocks. The Devonian Age rocks consist of coarse sandstone and conglomerates representing terrestrial sediments resulting from a period of tectonic uplift.

The older, Ordovician Age rocks represent tectonic activity, relating to the closure of the Iaepetus Ocean, a major ocean which at its widest was probably greater than

3000km across. These rocks have been metamorphosed to slates, phyllites and schists by the intrusion of the Tullow granite pluton *c.* 405 million years ago.

Bedrock is not exposed at surface at the site; instead the overburden consists of boulder clay; surface drift from early glaciations. The area is part of a physical region known as the Caledonian province of the south-east. The soils of the area consist of acid brown earths (Aalen et al. 1997).

Results

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
Danesfort 2	A032/065	AR078	E3540	2	8	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	3	33	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	4	28	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	13	53	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	14	54	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red, contains burnt limestone piece
Danesfort 2	A032/065	AR078	E3540	15	60	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	16	43	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	17	76	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	23	112	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	26	64	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	27	56	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	29	102	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	31	122	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	32	111	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	34	93/94	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	36	72	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	39	105	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	41	153	Burnt;	Angular to Sub-rounded; broken	Sandstone, coarse grained, quartz rich, red

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
							cobbles	
Danesfort 2	A032/065	AR078	E3540	43	82	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red

Table 1. Results of petrographical analysis of stone samples from the site

Potential Sources
Coarse grained sandstone does not occur in bedrock in the immediate vicinity of the site. The dominant rock type in the area is limestone. Whilst there are minor sandstones within some of the limestone formations, the closest bedrock source for coarse grained yellow / red sandstone is within the Devonian Age Kiltorean Formation (yellow and red sandstones, green mudstones) and Carrigmaclea Formation (red, brown conglomerates and sandstones) (see Figure 1, shown as KT and CI respectively). It is important to note that these rock types were not necessarily sourced from bedrock. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles. It is therefore possible that these rocks were sourced locally.

Discussion
Whilst it is not possible to determine a definitive source for these stone samples based on macroscopic examination alone, it can be stated that these rock types are available locally in outcrop and within the glacial tills / sub-soils. It is therefore probable that the material in these samples were sourced in the vicinity of the site.

A total of 52 samples were also examined from the scheme across 6 sites during the course of the main excavations (A032 – phase 4; see Table 2). The samples showed a remarkable consistency across the scheme in terms of the principal rock type utilised; coarse grained sandstone, typically red in colour. All samples contain a variation of this type of rock as their principal component. All but one of the samples from UA2 (sample 3) are clearly burnt / altered. All contain angular pieces of stone. A total of 37 (70%) also contain sub-rounded to rounded pieces; in all cases these samples contain pebbles and / or cobbles, in most cases broken. Three of the samples contain minor amounts of limestone as a secondary rock type to sandstone.

Site	Licence			No.	Burnt	Angular	Rounded	Limestone
UA2				3	2	3	0	0
Baysrath 4	A032/089	AR057	E3629	2	2	2	2	2
Danganbeg 1	A032/075	AR058	E3606	15	15	15	15	0
Stonecarthy West 1	A032/079	AR067	E3610	8	8	8	0	0
Danesfort 2	A032/065	AR078	E3540	19	19	19	19	1
Danesfort 5	A032/058	AR082	E3456	5	5	5	0	0
Grand Total				**53**	**52**	**53**	**37**	**3**

Table 2. Results of petrographical analysis of stone samples from the N9/N10 Phase 4 Road Scheme

These samples are also very consistent with the samples examined from the N9/N10 Phase 4b road scheme to the north.

Coarse grained sandstone is typical of *fulacht fiadh* material (e.g. see Mandal 2004). The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles is clear evidence of the use of secondary sources. Angular

pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

References

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Mandal, S. 2004 Petrographical Report on Stone Samples found during Archaeological Investigations relating to the Sligo Inner Relief Road (Licence No. 03E0535). Unpublished report commissioned by ACS Ltd for the NRA.

McConnell, B. (ed.) 1994 *Geology of Carlow-Wexford: A Geological Description to Accompany the Bedrock Geology 1:100,000 Map Series, Sheet 19, Carlow-Wexford*. Geological Survey of Ireland Publications. Westprint: Sligo.

Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

The "Measured radiocarbon age" is quoted in conventional years BP (before AD 1950). The error is expressed at the one-sigma level of confidence.

The "Calibrated date range" is equivalent to the probable calendrical age of the sample material and is expressed at the two-sigma (95.4% probability) level of confidence.

Calibration data set: intcal04.14c (UBA 11000, 12186)

Calibration data set: intcal09.14c (UBA 15553, 15554)

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C105, Fill of C128	39	Charcoal	*Prunus spp.* / 0.1g	QUB	UBA 11000	AMS (Std)	703–414 BC (1 sigma), 744–407 BC (2 sigma)	2434±20	-22.6
C54, Fill of a pit	14	Charcoal	*Fraxinus excelsior &Prunus spp.* / 0.5g	QUB	UBA 12186	AMS (Std)	2453–2293BC(1 sigma), 2464–2214BC (2 sigma)	3869±26	-21.8
C111, Fill of waterhole	32	Charcoal	Pomoideae / 0.1g	QUB	UBA 15553	AMS (Std)	2024–1943BC (1 Sigma) 2116–1893BC (2 Sigma)	3619±30	-28.8
C122, Fill of a posthole	31	Charcoal	*Cherry*	QUB	UBA 15554	AMS (Std)	797–769BC (1 Sigma) 806–595BC (2 Sigma)	2571±25	-26.9

References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, PG Blackwell, C Bronk Ramsey, CE Buck, GS Burr, RL Edwards, M Friedrich, PM Grootes, TP Guilderson, I Hajdas, TJ Heaton, AG Hogg, KA Hughen, KF Kaiser, B Kromer, FG McCormac, SW Manning, RW Reimer, DA Richards, JR Southon, S Talamo, CSM Turney, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111–1150.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14
NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

APPENDIX 3 LIST OF RMP IN AREA

RMP No	Description
KK023-005	Enclosure
KK023-007	Moated site
KK023-081001	Church
KK023-081002	Graveyard
KK023-081003	Grave slab
KK023-077	Ringfort (Unclassified)
KK023-076	Ringfort (Unclassified)
KK023-080	Castle Ringwork
KK023-080001	Designed Landscape (Folly)
KK023-083	Not in RMP
KK023-078	Ringfort (Unclassified)
KK023-079	Ringfort (Unclassified)

See Figure 2 for location.

APPENDIX 4 LIST OF SITE NAMES

Site Name	Site Code	E Number	Director	NGR
Baysrath 2	AR055	E3627	Fintan Walsh	251593/137855
Baysrath 3	AR056	E3628	Fintan Walsh	251672/138000
Baysrath 4	AR057	E3629	Fintan Walsh	251515/138280
Danganbeg 1	AR058	E3606	Emma Devine	251462/138754
Danganbeg 2	AR059	E3607	Emma Devine	251397/138939
Danganbeg 3	AR060	E3671	Emma Devine	251430/139245
Danganbeg 4	AR061	E3676	Emma Devine	251401/139372
Knockadrina 1	AR062	E3677	Ed Lyne	251422/139420
Tinvaun 1	AR063	E3678	Ed Lyne	251482/139625
Tinvaun 2	AR064	E3680	James Kyle	251445/139736
Tinvaun 3	AR065	E3608	James Kyle	251501/139832
Tinvaun 4	AR066	E3609	James Kyle	251508/139917
Stonecarthy West 1	AR067	E3610	James Kyle	251538/140023
Knockadrina 2	AR068	E3611	James Kyle	251647/140237
Rathduff 1	AR069	E3612	Ed Lyne	251286/142167
Rathduff Upper 1	AR070	E3613	Ed Lyne	251280/142559
Kellsgrange 1	AR071	E3575	James Kyle	250911/143732
Kellsgrange 2	AR072	E3577	James Kyle	250967/143861
Kellsgrange 3	AR073	E3576	James Kyle	250948/144003
Ennisnag 1	AR074	E3614	Richard Jennings	251416/145690
Ennisnag 2	AR075	E3615	Richard Jennings	251638/146068
Danesfort 12	AR076	E3616	Richard Jennings	251669/146186
Danesfort 13	AR077	E3617	Richard Jennings	251765/146384
Danesfort 2	AR078	E3540	Richard Jennings	251953/146745
Danesfort 4	AR079	E3539	Richard Jennings	251880/147579
Danesfort 3	AR080A	E3542	Richard Jennings	252221/146845
Danesfort 1	AR080B	E3541	Richard Jennings	252267/146707
Croan 1	AR081	E3543	Emma Devine	252280/147332
Danesfort 5	AR082	E3456	Emma Devine	252567/147767
Danesfort 6	AR083	E3538	Emma Devine	252764/147995
Danesfort 7	AR084	E3537	Emma Devine	252878/148099
Danesfort 8	AR085	E3461	Richard Jennings	253020/148246
Danesfort 9	AR086	E3458	Richard Jennings	253089/148345
Danesfort 10	AR087	E3459	Richard Jennings	253229/148414
Danesfort 11	AR088	E3460	Richard Jennings	253245/148462
Rathclogh 1	AR089	E3726	Patricia Lynch	253365/145515
Rathclogh 2	AR090	E3727	Patricia Lynch	253650/148848
Kilree 1	AR091	E3728	Patricia Lynch	254088/149310
Kilree 2	AR092	E3729	Patricia Lynch	254320/149500
Kilree 3	AR093	E3643	Patricia Lynch	254449, 149639
Kilree 4	AR094	E3730	Patricia Lynch	255330/150084
Dunbell Big 2	AR095	E3853	Yvonne Whitty	256684/151066
Holdenstown 1	AR096	E3681	Yvonne Whitty	256737/151253
Holdenstown 2	AR097/98	E3630	Yvonne Whitty	256891/151781
Holdenstown 3	AR099	E3854	Yvonne Whitty	256990/152085
Holdenstown 4	AR100	E3682	Yvonne Whitty	256828/152048
Dunbell Big 1	AR101	E3855	Yvonne Whitty	257034/152315
Rathcash 1	AR102	E3859	Tim Coughlan	258178/154199
Rathcash 2	AR103	E3860	Tim Coughlan	258294/154293
Rathcash East 1	AR104	E3892	Tim Coughlan	259419/154546
Rathcash East 2	AR105	E3893	Tim Coughlan	259555/154566
Rathcash East 3	AR106	E3861	Tim Coughlan	259821/154653
Blanchvillespark 1	AR107	E3894	Richard Jennings	260535/155212
Blanchvillespark 2	AR108	E3895	Tim Coughlan	260637/155449
Blanchvillespark 3	AR109	E3913	Tim Coughlan	260785/155653

Site Name	Site Code	E Number	Director	NGR
Blanchvillespark 4	AR110	E3914	Tim Coughlan	261442/156269
Blanchvillespark / Ballyquirk 1	AR111	E3862	Ruth Elliott	261531/156323
Ballyquirk 1	AR112	E3863	Ruth Elliott	261531/156323
Ballyquirk 2	AR113	E3864	Ruth Elliott	261811/156508
Ballyquirk 3	AR114	E3865	Ruth Elliott	261875/156559
Ballinvally 1	AR115	E3836	Emma Devine	263258/157521
Garryduff 1	AR116	E3852	Emma Devine	263933/157991
Kilmacahill 1	AR117	E3915	Tim Coughlan	264267/158369
Kilmacahill 2	AR118	E3833	Tim Coughlan	264380/158453
Jordanstown 1	AR119	E3834	James Kyle	264546/158643
Jordanstown 2	AR120	E3851	James Kyle	264893/159038
Kellymount 6	AR121	E3758	Przemaslaw Wierbicki	265130,159277
Jordanstown 3	AR122	E3916	Przemaslaw Wierbicki	265103/159227
Kellymount 1	AR123	E3756	Przemaslaw Wierbicki	265250/159397
Kellymount 2	AR124	E3757	Przemaslaw Wierbicki	265164/159463
Kellymount 3	AR125	E3856	Przemaslaw Wierbicki	265338/159597
Kellymount 4	AR126	E3857	Przemaslaw Wierbicki	265412/159803
Kellymount 5	AR127	E3858	Przemaslaw Wierbicki	265530,159977
Shankill 2	AR128	E3738	Richard Jennings	265924/160651.
Shankill 3	AR129	E3737	Richard Jennings	266052/161141
Shankill 4	AR130	E3838	Richard Jennings	266286/161526
Shankill 5	AR131	E3850	Richard Jennings	266374/161730
Shankill 6	AR132	E3840	Richard Jennings	266403/161836
Moanmore 1	AR133	E3835	Richard Jennings	266476/162016
Moanmore 2	AR134	E3843	Sinead Phelan	266756/162866
Moanmore 3	AR135	E3837	Sinead Phelan	266856/163259
Bannagagole 1	AR136	E3844	Sinead Phelan	266942/163569
Moanduff 1	AR137	E3839	Robert Lynch	267261/164397
Coneykeare 1	AR138	E3683	Sinead Phelan	267836/166209
Coolnakisha 1	AR139	E3768	Ellen O'Carroll	268175/167274
Coolnakisha 2	AR140	E3767	Ellen O'Carroll	268306/167559
Cranavonane 1	AR141	E3842	Tim Coughlan	268554/167895
Cranavonane 2	AR142	E3732	Ellen O'Carroll	268830/168154
Cranavonane 3	AR143	E3731	Ellen O'Carroll	269123/168362
Tomard Lower 1	AR144	E3733	Ellen O'Carroll	269349/168496
Paulstown 1	AR145	E3642	Ruth Elliot	265889/158499
Paulstown 2	AR146	E3632	Ruth Elliot	265664/158651
Rathgarvan or Clifden 1	AR147	E3760	Przemaslaw Wierbicki	257026/154123
Maddockstown 1	AR148	E3759	Przemaslaw Wierbicki	256886/154199
Templemartin 3	AR149	E3845	Emma Devine	255095/155200
Templemartin 4	AR150	E3841	Emma Devine	254920/155427
Templemartin 5	AR151	E3846	Emma Devine	254706/155636
Templemartin 1	AR152	E3849	Emma Devine	254504/155826
Templemartin 2	AR153	E3847	Emma Devine	254173/156236
Leggetsrath East 1	AR154	E3734	Emma Devine	253793/156484
Moanduff 2	AR155	E3735	Sinead Phelan	267470/164887
Moanduff 3	AR156	E3736	Sinead Phelan	267515/164979
Ballyquirk 4	AR157	E3848	Richard Jennings	262596/157025
Shankill 1	AR158	E3766	Przemaslaw Wierbicki	265707/160269
Rathgarvan or Clifden 2	AR159	E3921	Tim Coughlan	257095/154119
Ballynolan 1	AR160	E3755	Sinead Phelan	267714/165597
Rathduff Upper 3	UA2	E3974	Tim Coughlan	250991/143565
Rathduff Bayley	UA4	E4011	Tim Coughlan	251005/143564

N9/N10 KILCULLEN TO WATERFORD SCHEME, PHASE 4 – KNOCKTOPHER TO POWERSTOWN

Ministerial Direction Scheme Reference No.	A032
Registration No.	E3540
Site Name	AR078, Danesfort 2
Townland	Danesfort
County	Kilkenny
Excavation Director	Richard Jennings
NGR	251953 146745
Chainage	34925

FINAL REPORT

ON BEHALF OF KILKENNY COUNTY COUNCIL

FEBRUARY 2012

IAC Irish Archaeological Consultancy

PROJECT DETAILS

Project	N9/N10 Kilcullen to Waterford Scheme, Phase 4: Knocktopher to Powerstown
Ministerial Direction Reference No.	A032
Excavation Registration Number	E3540
Excavation Director	Richard Jennings
Senior Archaeologist	Tim Coughlan
Consultant	Irish Archaeological Consultancy Ltd, 120b Greenpark Road, Bray, Co. Wicklow
Client	Kilkenny County Council
Site Name	AR078, Danesfort 2
Site Type	Burnt mound
Townland(s)	Danesfort
Parish	Danesfort
County	Kilkenny
NGR (easting)	251953
NGR (northing)	146745
Chainage	34925
Height OD (m)	54.431
RMP No.	N/A
Excavation Dates	25 June–23 July 2007
Project Duration	20 March 2007–18 April 2008
Report Type	Final
Report Date	February 2012
Report By	Richard Jennings and Tim Coughlan
Report Reference	Jennings, J. and Coughlan, T. 2012 E3540 Danesfort 2 Final Report. Unpublished Final Report. National Monument Service. Department of the Environment, Heritage and Local Government, Dublin.

ACKNOWLEDGEMENTS

This final report has been prepared by Irish Archaeological Consultancy Ltd in compliance with the directions issued to Kilkenny 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 Kilkenny County Council and Irish Archaeological Consultancy Ltd.

CONSULTING ENGINEERS – N9/N10 KILKENNY CONSULT

James Eogan (NRA Senior Archaeologist), Ed Danaher (NRA Archaeologist) and Bernice Kelly (NRA Assistant Archaeologist)

Project Liaison Officer, Kilkenny Co. Council – Joe Gannon and Lisa Mulcahy

NATIONAL MONUMENTS, DOEHLG

Archaeologist – Martin Reid

IRISH ANTIQUITIES DIVISION, NATIONAL MUSEUM OF IRELAND

Assistant Keeper – Nessa O'Connor

ABSTRACT

Irish Archaeological Consultancy Ltd (IAC), funded by the National Roads Authority (NRA) through Kilkenny County Council, undertook an excavation at the site of AR078, Danesfort 2 along the proposed N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Figure 1). The following report describes the results of archaeological excavation at that site. The area was fully excavated by Richard Jennings under Ministerial Direction A032 and Excavation Registration Number E3540 issued by the DOEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between 25 June and 24 July 2007.

The site was identified as two phases of burnt mound activity, one in the early Bronze Age and a second in the early Iron Age. It is possible there were two separate phases of occupation in the Bronze Age.

The earliest dated feature on the site consisted of a sub-oval, bowl shaped trough (Trough 1) with an adjacent hearth, identified by a smaller cut with scorched sides and base. The trough was dated to the early Bronze Age. A shallow extension to the trough on the west side may have served as a step. A number of small pit features were identified in the general vicinity of the trough but it is not clear if these were directly related, and indeed their function remains unclear.

In the north of the site there was a very large and deep pit which may have functioned as a cistern or waterhole. The large pit was dated to the early Bronze Age but appears to be slightly later in date than Trough 1. It may therefore represent a second phase of Bronze Age activity on the site. The waterhole was not sealed by the main burnt mound spread however; there was evidence that some burnt mound material had been tipped into the feature, presumably after it was abandoned.

Located between the waterhole and Trough 1 were a series of features that represent the Iron Age phase of occupation of the site. These consisted of a large sub-oval trough (Trough 2) and adjacent large pit to the west. A number of irregular pits were identified to the east of the trough and may represent storage or perhaps evidence of land clearance in advance of the activity associated with the trough. Two structures were identified, the first of which (Structure A) consisted of a number of circular post-pits in a horseshoe shaped formation around the east of the trough. While the pits did not seem deep enough to support large (long) structural posts, the regular arrangement may have supported a platform erected on shorter posts around the trough. Some small stakeholes appear to have augmented the structure. At a distance of 5m to the east of Trough 2 was Structure B. This consisted of two parallel lines of four postholes. It is again interpreted that this may have been the location for a small platform (1.5m by 0.5m). Both Trough 2 and Structure B have been dated to the early Iron Age.

The overlying burnt mound deposits sealed almost all of the pits and troughs identified at the site, with the notable exception of the large waterhole. This probably indicates that the water in the waterhole was not heated, and it was a storage facility. It was not possible to identify which deposits were associated with the Bronze Age activity and which were associated with the Iron Age, as the mound deposits had been substantially levelled and disturbed over time. A number of modern drainage channels were also recorded, which truncated some of the features on the site.

Four samples were sent for AMS radiocarbon dating. A sample of ash and *Prunus* sp. charcoal from trough fill C54 was radiocarbon dated. The 2 sigma calibrated result was 2464–2214BC (UBA 12186). A sample of Pomoideae charcoal from

waterhole fill C111 had a 2 sigma calibrated result of 2116–1893BC (UBA 15553). A sample of cherry charcoal from posthole fill C122 was also radiocarbon dated. The 2 sigma calibrated result was 806–595BC (UBA 15554). A sample of *Prunus* sp. charcoal from pit fill C105 returned a 2 sigma calibrated result of 744–407BC (UBA 11000).

The Iron Age phase on the site contains features which conform in many ways with the features commonly found on burnt mound sites in terms of a trough, pits and burnt mound spread. The trough (Trough 2) however, does appear to be particularly deep and at 0.70m is approximately twice the depth of an average trough. Another deep, large pit is adjacent to the west end although not as large as the Bronze Age waterhole. The function of this pit, and indeed Trough 2 needs to be considered given their particular size and depth and it would seem unlikely that they were designed for cooking. The volume of water in such deep features would be more easily heated (for bathing) than boiled (for cooking). Trough 2 was also surrounded by a series of possible post-pits which may have supported a platform around the trough or indeed a small enclosed or roofed structure over the trough. A second possibly small structure or platform (B) 5m to the east consisted of parallel rows of four postholes. Structure A, Structure B and the trough were all on a similar east-west alignment, which is not likely to be coincidental.

The Iron Age phase at Danesfort 2 potentially represents a bathing place. This is significant in terms of our wider understanding of the function of *fulachta fiadh*/burnt mounds. It has been identified that this site type can have many functions and often the precise nature of the activity at excavated burnt mounds is unclear. The results of excavations at Danesfort 2 indicate that these varying functions can potentially occur in tandem when we consider the simpler trough and pits from the early Bronze Age; the subsequent unrelated very large early Bronze Age waterhole/cistern and the Iron Age possible bathing site.

Danesfort 2 is an important site locally as it represents the first evidence of early Iron Age activity in the immediate area and it adds to the considerable evidence from the Bronze Age that has been gathered through excavations as part of the N9/N10 Phase 4. It is, however, also of regional significance, based on the nature of the burnt mound activity identified at the site, in particular the Iron Age possible bathing site. A number of potential sweathouses and bathing sites have been confirmed from recent excavations of burnt mounds across the country and the results of the Danesfort 2 excavation will significantly add to the further study, analysis and understanding of the varied function and form of burnt mound sites.

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1 INTRODUCTION

1.1 General

This report presents the results of the archaeological excavation of Danesfort 2, AR078 (Figure 1), in the townland of Danesfort undertaken by Richard Jennings for IAC, on behalf of Kilkenny County Council and the NRA, in accordance with the Code of Practice between the NRA and the Minister for Arts, Heritage, Gaeltacht and the Islands. It was carried out as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4, which extends between Knocktopher in Co. Kilkenny to Powerstown in Co. Carlow. The excavation was undertaken to offset the adverse impact of road construction on known and potential subsoil archaeological remains in order to preserve the site by record.

The site measured 2834m^2 and was first identified during testing carried out in between 30 January and 3 March 2006 by Melanie McQuade (E3882) for Margaret Gowen & Co. Ltd. on behalf of the National Roads Authority. Danesfort 2 was excavated between June 25 and July 24 2007 with a team of one director, one supervisor and 14 assistant archaeologists.

1.2 The Development

For the purposes of construction, the N9/N10 Kilcullen to Waterford Road Scheme has been divided into separate sections, known as Phases 1–4. Phase 2 of the scheme extends from the tie-in to the Waterford City Bypass at Dunkitt, to Knocktopher in Co. Kilkenny (Ch. 2+000–Ch. 25+400). Phase 4 continues from Knocktopher to Powerstown in Co. Carlow (Ch. 25+400–Ch. 76+000) and includes the Kilkenny Link Road.

The roadway of the entire scheme includes approximately 64km of mainline high quality dual carriageway and 6.2km of the Kilkenny Link Road, which will connect the road development to the Kilkenny Ring Road Extension. The road development requires the realignment and modification of existing national, regional and local roads where the mainline intersects them. It requires the acquisition of 305 hectares of land for its construction. A further link road will connect the scheme to Paulstown in County Kilkenny, while six new grade separated junctions and three roundabouts are part of the road development.

1.3 Archaeological Requirements

The archaeological requirements for the N9/N10 Kilcullen to Waterford Road Scheme, Phase 4: Knocktopher to Powerstown, are outlined in the Archaeological Directions issued to Kilkenny 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 Kilkenny County Council and Irish Archaeological Consultancy Ltd. These instructions form the basis of all archaeological works undertaken for this development. The archaeological excavation works under this contract are located between the townlands of Knocktopher, Co. Kilkenny, and Powerstown, Co. Carlow.

The proposed N9/N10 was subjected to an Environmental Impact Assessment, the archaeology and cultural history section of which was carried out by Valerie J. Keeley Ltd and published in February 2005. The Record of Monuments and Places, the Site Monument Record, Topographical files, aerial photography, the Kilkenny and Carlow County Archaeological Urban Survey, and literary sources were all consulted. Two phases of geophysical survey were also conducted by Target (post-EIS geophysics carried out by ArchaeoPhysica) and an aerial survey was carried out by Margaret Gowen & Co. Ltd. As a result of the paper survey, field inspections and geophysical

survey, 35 sites were recorded in proximity to this section of the overall route alignment.

A previous archaeological assessment of Phase 2 of the scheme (test trenching conducted by Margaret Gowen & Co. Ltd. in 2006) extended into the lands acquired for Phase 4 to a point at Ch. 37+100 in the townland of Rathclogh, Co. Kilkenny. Thirty-four archaeological sites were identified within this area between Knocktopher and Rathclogh and subsequently excavated by Irish Archaeological Consultancy Ltd. as part of this archaeological contract.

Advance archaeological testing of the area between Rathclogh (Ch. 37+100) and Powerstown (Ch. 76+000) was completed by IAC during March–May 2007 and excavation of the sites identified during this process was also conducted by IAC between August 2007 and April 2008.

1.4 Methodology

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

All archaeological features were fully excavated by hand and recorded on *pro forma* record sheets using a single context recording system best suited to rural environment, with multi context plans and sections being recorded at a scale of 1:50, 1:20 or 1:10 as appropriate.

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

An environmental strategy was devised at the beginning of the excavation based on IAC in-house post-excavation and site methodologies and guidelines. Features exhibiting large amounts of carbonised material were the primary targets.

All artefacts uncovered on site were dealt with in accordance with the guidelines as issued by the NMI and where warranted in consultation with the relevant specialists. All archive is currently stored in IAC's facility in Lismore, Co Waterford and will ultimately be deposited with the National Museum of Ireland.

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

All excavation and post excavation works were carried out in accordance with the relevant approvals and in consultation and agreement with the National Roads Authority (NRA) Project Archaeologist, the National Monuments Section of the DoEHLG and the National Museum of Ireland. Where necessary licences to alter and export archaeological objects were sought from the National Museum of Ireland.

References to other sites excavated as part of the N9/N10 Phase 4: Knocktopher to Powerstown are referenced throughout this report only by their site name e.g.

Paulstown 1. A list of these sites and details including director's name and National Monuments Excavation Reference Number can be referenced in Appendix 4.

Final Report Date Ranges

The following date ranges for Irish prehistory and medieval periods are used for all final reports for the N9/N10 Phase 4: Knocktopher to Powerstown excavations.

Mesolithic: 7000–4000BC
Neolithic: 4000–2500BC
Early Bronze Age: 2500–1700BC
Middle Bronze Age: 1700–1200BC
Late Bronze Age: 1200–800BC
Iron Age: 800BC–AD500
Early medieval period: AD500–1100
Medieval period: AD1100–1600
Post-medieval: AD1600–1800

Source:
Carlin, N., Clarke, L. & Walsh, F. 2008 *The M4 Kinnegad-Enfield-Kilcock Motorway: The Archaeology of Life and Death on the Boyne Floodplain*. NRA Monograph Series No. 2, Wordwell, Bray.

2 EXCAVATION RESULTS

Danesfort 2, a burnt mound, was located in a valley adjacent to a tributary that joins the King's River at the village of Ennisnag. The valley runs from west to east and is U-shaped. The burnt mound was located on the southern slope and base of the valley (Figure 4, Plate 1). It was not visible prior to excavation as it was obscured beneath a band of redeposited topsoil that lined the valley slopes. The valley sides were formed of boulder clay but its base was characterised by a loose concentration of medium- and large sized angular and sub-rounded stones. These probably related to a path which is depicted on the first edition Ordinance Survey Map (1839). At this time the valley was within Danesfort Demesne (the external stone wall perimeter of the Demesne is visible in Plate 1). It is very probable that at some point in the past this valley carried water into the Ennisnag tributary. Although dry and under pasture at the start of the excavation, when it rained the ground became saturated and the archaeological features rapidly filled with water, despite the presence of a modern drainage pipe running on the valley base. The location of the site in a gently winding valley only 54m OD meant that views from the site were quite restricted in all directions.

The burnt mound was situated within an archaeologically rich Bronze Age landscape (Ch. 33740-37100, Danesfort and Croan townlands). Evidence of funerary and domestic activity was discovered 0.4–0.6km to the south-west at sites Danesfort 12 and 13 where three ringditches, a pit circle and three cremations were found in low-lying land beside the Ennisnag tributary. Another ringditch was found 0.3km to the south-east at Danesfort 1 while Graves (1860–1) reported the discovery in 1838 of an intact Bronze Age urn in a sand pit next to a post-medieval turret (RMP KK023-080) which is visible 0.2km to the south of Danesfort 2. A prehistoric shelter on higher ground was recorded 0.7km to the north-east (Croan 1, AR081). Bronze Age sites were also excavated 1–1.8km to the north and north-east at Danesfort 5–7 including a settlement and cremation pits with late Bronze Age pottery. The next closest recorded burnt mound activity was recorded in a shallow basin at Danesfort 11, *c.* 2.3km to the north-west. In that instance, there was no mound and only features cut into the boulder clay survived.

2.1 PHASE 1 Natural Drift Geology

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A				Medium grey sandy gravel clay.	Natural

The subsoil comprised sandy, gravel clay.

2.2 PHASE 2 Early Bronze Age Activity

The primary features excavated at Danesfort 2 were dated to the early Bronze Age and were associated with burnt mound activity (Figure 5; Plate 2).

2.2.1 Trough 1 with adjoining Hearth

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C7	N/A	4.50	2.20	0.75	Irregular shaped cut of trough and hearth	Cut of trough
C7a	N/A	1.30	1.30	0.20	Roughly circular hearth cut	Cut of hearth
C8	C7/7a	4.50	1.30	0.30	Dark greyish black clayey silt	Upp. fill trough/hearth
C21	N/A	0.05	0.06	0.11	Circular shaped cut	Cut of stakehole
C22	C21	0.06	0.08	0.11	Mid greyish brown silty clay	Fill of stakehole
C33	C7	1.50	0.75	0.35	Light brownish grey silt	Upper fill of trough
C53	C7	2.50	1.80	25.4	Greyish black clayey silt	Middle fill of trough
C54	C7	1.80	1.60	0.25	Blackish grey silty clay	Basal fill of trough

Finds: None

The trough, C7, was located in the southern area of the site (Figure 5). It was bowl-shaped with an uneven stony base (Plate 3). The area to the west of the trough consisted of a shallower, sub-rectangular extension to the main bowl shaped trough cut that perhaps functioned as a small step. The trough was adjoined on its eastern (upslope) side by a small hearth C7a (Plate 4). It was impossible to distinguish between the fills of the two features as the fill of the hearth and the upper fill of the trough were identical. This fill contained a high ash component while the sides of the hearth were reddened due to the scorching of the earth. The lower fills of the trough also contained ash but in less substantial quantities. These fills, which had matrices of clay or silt, were dominated by charcoal and small angular fragments of heat-shattered sandstone. The evidence suggests that the hearth was used to heat sandstone blocks which were then placed into the water-filled trough to boil water. A solitary stakehole was identified adjacent to the hearth. The function of a single stakehole cannot be accurately assessed.

Charcoal analysis of fill C8 (fill of trough C7) indicated a predominance of hazel (*Corylus avellana),* ash (*Fraxinus excelsior*), pomaceous fruitwood (*Pomoideae*) wild/bird cherry (*Prunus avium/padus* sp.) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

A sample of plant remains (S14) from C54 was examined and no charred seeds were recovered from this sample (Johnston, Appendix 2.4).

Stone retrieved from C8, C33, C53 and C54 was analysed and was found to be coarse grained, quartz-rich, red sandstone. The sample examined from C54 also contained a burnt limestone piece. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.05g) of ash and prunus was chosen for AMS dating from C54 and returned a result of 3869±26 (UBA 12186). The 2 Sigma calibrated result for this was 2464–2214BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age period.

2.2.2 Features Adjacent to Trough 1

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C11	N/A	1.27	0.42	0.13	Elongated shallow pit	Cut of pit
C12	C11	1.27	0.42	0.13	Black silty sand with pebbles	Fill of pit
13	N/A	0.48	0.35	0.07	Sub-circular, gradual slope, concave base.	Cut of pit
14	C13	0.48	0.35	0.07	Black sandy silt with burnt stones, charcoal	Fill of pit
C15	N/A	0.90	0.68	0.12	Oval shaped shallow pit	Cut of pit
C16	C15	0.90	0.68	0.12	Black silty sand with stone and pebbles	Fill of pit
C17	N/A	2.80	0.49	0.22	Curvilinear shaped cut	Cut of channel
C18	C17	2.80	0.49	0.22	Dark brown silty sand	Fill of channel
C23	N/A	0.25	0.18	0.13	Oval shaped cut	Cut of pit
C24	C23	0.25	0.18	0.13	Dark greyish brown silty sand	Fill of pit
C25	N/A	0.45	0.25	0.18	Oval shaped cut	Cut of pit
C26	C25	0.45	0.25	0.18	Greyish brown silty sand	Fill of pit
C27	N/A	0.20	0.15	0.35	Circular cut	Cut of pit
C28	C27	0.20	0.15	0.35	Black silty sand	Fill of pit
C152	N/A	0.67	0.42	0.21	Oval shaped cut	Cut of pit
C153	C152	0.67	0.42	0.21	Black silty clay	Fill of pit

Finds: None

There were a number of features in the vicinity of the trough. These were generally shallow and probably not particularly significant. They were probably related to activity associated with the trough but form no particular pattern and contained nothing diagnostic in their fills to suggest a particular function. The most prominent feature was C17, a small curvilinear channel filled with burnt mound material. There was not enough evidence to suggest that it was structural and it may have formed naturally as a result of water erosion. Charcoal was identified from the fills but this was not sent for further analysis.

Stone retrieved from C153 (fill of pit C152) and C28 (fill of pit C27) was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.2.3 Large Waterhole C109 and adjacent Pit C5

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C5	N/A	1.60	1.50	0.11	Oval shallow pit with irregular base	Cut of pit
C6	C5	1.60	1.50	0.11	Grey-Black silt with no inclusions	Fill of pit
C52	C109	1.35	0.8	0.30	Tightly compacted light brown clay with small stones within.	Fill of pit
C106	C109	1.65	2.50	0.20	Dark brown silty clay	Fill of pit
C107	C109	2.10	3.50	0.30	Dark brown clay	Fill of pit
C108	C109	0.60	2.00	0.65	Medium brown silty clay	Fill of pit
C109	N/A	6.00	6.00	0.75	Oval shaped cut	Cut of pit
C110	C109	6.00	3.50	0.75	Dark grey thick marl	Fill of pit
C111	C109	1.70	1.70	0.25	Black clay with heat shattered stones	Fill of pit

Finds: None

At the north of the excavated area was a large pit which may have functioned as a waterhole/cistern. This may have utilised the location near the base of the valley to store water during periods of rain when there would be a surplus of surface water available. In drier conditions there was no obvious water source. The size of the waterhole appears to be slightly excessive given the small number of features identified on the site (Figure 4; Plate 8). Perhaps another site was located close by, although the proposed N9/N10 ran along the valley floor where it seems most likely that additional burnt mound activity would have been located if it had existed.

The waterhole was located away from the main cluster of burnt mound features and was not sealed by the dispersed burnt mound spread. Nevertheless, burnt mound material did find its way into the waterhole. It was found tipped into the waterhole (C111) on its southern side nearest Trough 2. The layer of burnt mound material was within thick, dark-grey marl (C110) which also contained occasional large sandstone rocks. These were probably the types of stones that were heated and then dumped into the troughs. Only one feature of archaeological potential was located in proximity of the waterhole. This consisted of a small shallow pit C5 which had no inclusions and as such its function is unclear.

While the waterhole was dated to the early Bronze Age (see below), the calibrated dates suggest that it was not contemporary with Trough 1, being slightly later in date. This may indicate a second phase of early Bronze Age activity on the site. The activity to the south of the waterhole has been dated to the Iron Age with the early

Bronze Age trough 1 being further south again. There is some indication that the Iron Age features have truncated some earlier features. Perhaps these were contemporary with the waterhole.

Charcoal analysis of fill C111 (fill of pit C109) indicated a predominance of pomaceous fruitwood (*Pomoideae*) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

Stone retrieved from C111 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of pomaceous fruitwood was chosen for AMS dating from C111 and returned a result of 3619±30 (UB 15553). The 2 Sigma calibrated result for this was 2153–1893BC (QUB, Appendix 2.7) dating this feature to the early Bronze Age period.

2.3 PHASE 3 Iron Age Activity

2.3.1 Trough 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C128	N/A	2.25	1.60	0.75	Oval shaped cut	Cut of pit/Trough
C105	C128	2.25	1.60	0.75	Dark grey-black sandy silt, shattered stones	Fill of pit/Trough

Finds: None
Trough 2 consisted of a large, deep oval pit C128 with a U-shaped profile (Figure 4-6; Plate 5). No surviving timbers or stakeholes were found to suggest that it was wooden lined. Its fill of heat-shattered stones differed from that of the overlying burnt mound material in that it contained infrequent medium and large sized stones and was siltier and less clayey than the mound. It has been dated to the early Iron Age (see below). Associated with the trough were two separate phases of pits, predominantly to the east of the trough. The second phase of features appeared to be directly related to a structure erected over/around the trough. The earlier features were more irregular in plan and pattern and may be unrelated to the trough, perhaps being associated with the previously outlined early Bronze Age activity. These features were all located to the east of the trough.

Charcoal analysis of fill C105 (fill of trough C128) indicated a predominance of pomaceous fruitwood (*Pomoideae*) and oak (*Quercus* sp.). This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3). A fragment of *Prunus* sp. was identified for radiocarbon analysis. This species was not identified in the wider analysis of the sample.

Stone retrieved from C105 was analysed and was found to be coarse grained, quartz rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of *Prunus* sp charcoal was chosen for AMS dating from C105 and returned a result of 2434±20 (UBA 11000). The 2 Sigma calibrated result for this was 744–407BC (QUB, Appendix 2.7) dating this feature to the early Iron Age period.

2.3.2 Large Pit C100

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C100	N/A	2.90	2.70	0.70	Irregular shaped cut	Cut of pit
C151	C100	2.90	2.70	0.70	Dark greyish black sandy silt	Fill of pit

Finds: None

A large sub-rectangular pit, C100, was located to the west of Trough 2 (Figure 5). The fill of this pit contained the same dark-greyish-black, sandy silt that was found in the adjoining trough. For this reason it is likely that the pit was contemporary with the trough and that the two were directly associated rather than one being a replacement for the other. No further analysis was carried out on the fill material C151.

2.3.3 Primary Phase of Pits to East of the Trough

A series of irregular shaped pits were identified in the area to the east of the trough.

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C44	C59	0.35	0.37	0.06	Mid greyish brown fine sand	Fill of pit
C57	N/A	2.40	2.20	0.32	Oval shaped cut	Cut of pit
C58	C57	1.10	0.88	0.17	Greyish black silty sand	Fill of pit
C59	N/A	0.76	0.74	0.20	Circular shaped cut	Cut of pit
C60	C59	0.70	0.66	0.15	Black fine sand	Fill of pit
C61	N/A	0.95	0.65	0.16	Circular shaped cut	Cut of pit
C62	C61	0.95	0.65	0.16	Black soil with stones	Fill of pit
C63	N/A	1.35	1.05	0.37	Irregular shaped cut	Cut of pit
C64	C63	1.35	1.05	0.37	Black silty sand	Fill of pit
C71	N/A	0.32	0.28	0.12	Circular shaped cut	Cut of pit
C72	C71	0.32	0.28	0.12	Black silty sand	Fill of pit
C75	N/A	0.33	0.33	0.07	Greyish black silty sand	Spread
C81	N/A	1.00	0.50	0.25	Irregular shaped cut	Cut of pit
C82	C81	1.00	0.40	0.25	Black sandy clay	Fill of pit
C91	N/A	0.80	0.40	0.13	Curved linear, gradual sides, linear base.	Cut of pit
C92	C91	0.80	0.40	0.13	Greyish black silty sand	Fill of pit
C93	N/A	1.25	0.60	0.32	L- shaped cut- upper part	Cut of pit
C94	C93	1.25	0.60	0.32	Black silty sand	Fill of pit
C112	C118	0.71	0.67	0.20	Dark brownish black silty sand	Fill of pit
C117	C57	2.40	2.20	0.21	Orange brown silty sand	Fill of pit
C118	N/A	0.71	0.67	0.20	V-shaped cut	Cut of pit
C129	N/A	1.00	1.00	0.30	Irregular shaped cut	Cut of pit
C130	C129	1.00	1.00	0.30	Black silty sand	Fill of pit

Finds: None

The pits were concentrated upslope on the eastern side of the trough over a 7m by 5m area. These comprised ten irregular-shaped shallow pits, the largest of which, C57, was 2.4m by 2.2m by 0.3m. All generally contained silty sand burnt mound material and must have performed some function that was related to the nearby trough. None of their bases were scorched to suggest that *in situ* burning took place in them. Perhaps their function was to store some form of organic material that has not survived in the archaeological record. They may also have been the result of some land clearance to facilitate the trough and associated structures. It seems unlikely that the purpose of the pits was to hold water given the adjacent presence of

a large trough and pit. Soil samples were processed from the pits to assess if any diagnostic material could be identified to suggest a function but predominantly only charcoal fragments were recovered. A few fragments of burnt bone were found in C64 (fill of pit C63) which may indicate domestic waste.

None of the pits were dated, however some of the pits were truncated by postholes and pits probably associated with a structure erected around or over Trough 2. It is possible therefore that these pits were associated with the early Bronze Age phase of activity on site, perhaps with the large waterhole C109 to the north. However their location, clustered immediately east of Trough 2 suggests a primary phase of activity associated with the trough.

Charcoal analysis of fill C94 (fill of pit C93) indicated a predominance of oak (*Quercus* sp.) although the level of charcoal from this context was low. This material may represent the remains of firing events associated with *fulacht fiadh* activity at the site and represent wood that was sourced locally (O'Donnell, Appendix 2.3).

A sample of plant remains from C58 was examined and no charred seeds were recovered from this sample (Johnston, Appendix 2.4).

Burnt animal bone fragments were recovered from fill C64 of pit C63. A total of four calcined fragments of unidentifiable trabecular bone were recovered. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation (McCarthy, Appendix 2.5).

Stone retrieved from C60, C64, C72, C82, C93 and C112 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.3.4 Structure A at Trough 2

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C77	N/A	0.22	0.14	0.11	Circular shaped cut	Cut of stakehole
C78	C77	0.22	0.14	0.11	Black to dark brown soil	Fill of stakehole
C79	N/A	0.10	0.08	0.09	Circular shaped cut	Cut of stakehole
C80	C80	0.10	0.08	0.09	Black soil	Fill of stakehole
C87	N/A	0.13	0.11	0.22	Circular shaped cut	Cut of stakehole
C83	N/A	0.85	0.40	0.30	Circular shaped cut	Cut of pit
C84	C83	0.85	0.40	0.30	Black sandy clay	Fill of pit
C88	C87	0.13	0.11	0.22	Greyish black silty clay	Fill of stakehole
C89	N/A	0.14	0.13	0.16	Circular shaped cut	Cut of stakehole
C90	C89	0.14	0.13	0.16	Grey silty sand	Fill of stakehole
C95	N/A	0.40	0.38	0.40	Circular shaped cut	Cut of pit/posthole
C96	C95	0.40	0.38	0.40	Black silty sand	Fill of pit/ posthole
C97	N/A	0.60	0.50	0.21	Circular shaped cut	Cut of pit
C98	C97	0.24	0.20	0.09	Brownish black silty clay	Fill of pit
C123	C97	0.60	0.50	0.15	Mid brown sandy clay	Fill of [pit
C131	N/A	0.55	0.55	0.28	Rounded shaped cut	Cut of pit
C132	C131	0.55	0.55	0.15	Dark grey clayey silt	Fill of pit
137	N/A	0.12	0.10	0.09	Circular, steep sides and concave base.	Cut of stakehole
138	C137	0.12	0.10	0.09	Loosely compact black clay silt with grey hue.	Fill of stakehole
139	N/A	0.11	0.09	0.05	Circular, steep sides and concave base.	Cut of stakehole
140	C139	0.11	0.09	0.05	Loosely compact black clay silt with grey	Fill of stakehole

					hue.	
C141	C142	0.39	0.30	0.20	Greyish black silty sand	Fill of stakehole
C142	N/A	0.39	0.30	0.20	Circular within oval shaped pit	Cut of stakehole
C143	C144	0.50	0.40	0.47	Brownish black silty clay	Fill of pit/posthole
C144	N/A	0.50	0.40	0.47	Oval shaped cut	Cut of pit/posthole
C145	N/A	0.35	0.35	0.20	Rounded shaped cut	Cut of pit
C146	C145	0.35	0.35	0.20	Dark greyish black clayey silt	Fill of pit

Finds: None

Seven circular pits formed a horseshoe shaped structure around the trough. These pits contrasted with those of the earlier phase in that they were of consistent size and shape and tended to have steep sides and flat bases. The one characteristic that prevented all of them from being definitively categorised as postholes was their shallowness. Only three exceeded depths of 0.3m and the majority were over 0.4m in diameter. Also, none of them contained postpipes or packing material that might give an indication that they supported posts. However, the horseshoe-shaped distribution of the pits, effectively around the perimeter of the trough, suggests that they had a structural function, so perhaps they held short and thick posts which served as the foundation for a wooden platform that may have existed over or around the sides of the trough.

In four examples the circular pits truncated some of the irregular pits of the earlier phase. It was impossible to detect the cut of three examples due to their containing similar fills of charcoal and heat-shattered stones. If there was a difference, the matrices of the earlier pits tended to be silty sand while the circular pits had a greater silty clay component. This might indicate that the earlier pits had been deliberately backfilled while the later ones had naturally silted up. One cut was very clear: circular pit C95 truncated C118 (Figure 6; Plate 6).

Seven stakeholes were probably associated with the structure, being located predominantly along its east side. They may have provided some additional support to the post-pits. Some of them appeared to be cut into the earlier phase of pits including C89, C83 and C144.

Stone retrieved from C93/94 was analysed and was found to be coarse grained, quartz rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

2.3.5 Shallow Pit C147

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C147	N/A	0.90	0.40	0.25	Rectangular shaped cut	Cut of pit
C148	C147	0.90	0.40	0.25	Dark greyish black clayey silt	Fill of pit

Finds: None

A small rectangular pit C147, was cut into the northern side of the trough. It appeared to modify the existing oval trough creating a shallow step. Perhaps its function was related to the possible platform Structure A. Indeed, it appeared to respect one of the supporting post-pits C131. Its precise function is unclear.

2.3.6 Structure B

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C19	N/A	0.35	0.33	0.21	Circular shaped cut	Cut of posthole
C20	C19	0.35	0.33	0.21	Mid black, light grey hue, silty clay	Fill of posthole
C29	N/A	0.33	0.31	0.14	Circular shaped cut	Cut of posthole
C30	C29	0.33	0.31	0.14	Black soil with greyish hue	Fill of posthole
C48	N/A	0.35	0.30	0.39	Circular shaped cut	Cut of posthole
C49	C48	0.35	0.30	0.39	Black silt with greyish hue	Fill of posthole
C50	N/A	0.37	0.29	0.25	Circular shaped cut	Cut of posthole
C51	C50	0.24	0.20	0.11	Black, mid grey hue, silty clay	Fill of posthole
C55	N/A	0.36	0.32	0.36	Circular shaped cut	Cut of posthole
C56	C55	0.36	0.32	0.36	Black, light grey hue, silty clay	Fill of posthole
C101	N/A	0.34	0.30	0.42	Circular shaped cut	Cut of posthole
C102	C101	0.34	0.30	0.42	Black silt with greyish hue	Fill of posthole
C119	N/A	0.39	0.25	0.37	Oval shaped cut	Cut of posthole
C120	C120	0.39	0.25	0.37	Black , light grey hue silty clay	Fill of posthole
C121	N/A	0.28	0.26	0.39	Circular shaped cut	Cut of posthole
C122	C121	0.28	0.26	0.39	Black soil with greyish hue	Fill of posthole
C124	N/A	0.16	0.16	0.34	Circular shaped cut	Cut of stakehole
C125	C124	0.16	0.16	0.34	Greyish black silty sand	Fill of stakehole

Finds: None

Another possible structure - Structure B - was identified 5.5m east of and upslope of Trough 2. It comprised two parallel rows of four near-circular postholes, which were approximately 0.5m apart from each other (Plate 7). The postholes in each of the rows were also tightly spaced and in some instances were connected by a very shallow channel. The postholes were on average 0.35m in diameter and ranged in depth from 0.14m to 0.42m. There was no direct physical relationship between this structure and Trough 2. The postholes did however more closely resemble the post-pits of Structure A than the irregular pits of the earlier phase possibly suggesting the two structures were related. Both possible structures were also on the same alignment and contained similar fills of silty clays, charcoal and heat-shattered stones. The proximity of the postholes of Structure B suggests that their purpose was to support a small platform apparently measuring 1.5m long by 1m wide. Stakehole C124, located to the west of these postholes, may also have formed part of this structure.

Stone retrieved from C56, C102 and C122 was analysed and was found to be coarse grained, quartz-rich, red sandstone. Coarse grained sandstone is typical of *fulacht fiadh* material. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles, it is therefore possible that these rocks were sourced locally (Mandal, Appendix 2.6).

A small fragment (0.1g) of cherry charcoal was chosen for AMS dating from C122 and returned a result of 2571±25 (UB 15554). The 2 Sigma calibrated result for this was 806–595BC (QUB, Appendix 2.7) dating this feature to the early Iron Age period.

2.4 PHASE 4 Burnt Mound Deposits

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	14.35	13.80	0.57	Black silty clay, burnt stones, charcoal	Spread
C46	N/A	25.00	9.00	0.30	Mid brown clay, burnt stones, charcoal	Spread
C37	N/A	4.00	2.00	0.15	Dark brown silty clay, burnt stones, charcoal	Spread
C38	N/A	4.20	1.50	0.35	Light brown silty clay, burnt stones	Spread
C39	N/A	2.30	1.20	0.25	Grey brown silty clay, burnt stones	Spread

Finds

Context	Find Number	Material	Period	Description
C3	E3540:003:001	Flint	Early Neolithic	Retouched artefact, probable scraper
C3	E3540:003:002	Quartz crystal	Early Neolithic	Natural chunk
C3	E3540:003:003	Quartz crystal	Early Neolithic	Retouched artefact, probable scraper
C3	E3540:003:004	Quartzite	Early Neolithic	Rubbing stone
C3	E3540:003:005	Quartzite	Early Neolithic	Rubbing stone
C3	E3540:003:006	Copper alloy	Medieval	Stick pin

The burnt mound (C3/C46) was not noticeable as a mound prior to excavation as its sides were covered by topsoil and ploughsoil deposits of up to 0.5m deep (Figure 4). The highest point of the mound was covered by only 0.25m of soil. The removal of the soil revealed an irregular shaped mound 13m by 14m that was up to 0.57m deep (Figure 4; Plate 1). The darkest and densest visible concentrations of charcoal and heat-shattered stone were located in the area between the two troughs and in the waterhole to the north of Trough 2. No tip lines or multiple phases could be distinguished within the burnt mound even though two phases of activity were recorded. The mound itself had a silty clay matrix with abundant charcoal and heat-shattered sandstones. The sandstone fragments were pinkish in colour, angular, easily scratched and typically 0.07m long. A few prehistoric finds were recovered from the mound including flint flakes and a possibly later copper-alloy pin.

C37, C38, C39 and C46 were deposits found on top of, or banked up against, the main burnt mound deposit C3 (Figure 6). They all contained heat-shattered stones which were lighter in colour than the mound as a result of contact with ploughsoil. Those in the valley base (C46) had probably come displaced from the mound due to water erosion, drainage, agricultural activity or the construction of the path that once ran on the valley base.

While the burnt mound deposits were clearly associated with two distinct phases of activity on the site - Bronze Age and Iron Age - it was not possible to identify which deposits were related to which phase as the mound material had been substantially levelled and disturbed presumably by post-medieval and modern agricultural practices.

Five lithics were retrieved from C3. These include one flint retouched artefact (Figure 7) and one quartz crystal retouched artefact both of which were probably used as scrapers, two quartzite rubbing stones and one natural chunk of quartz crystal. The assemblage is technologically and typologically diagnostic and dates to the first half of the Neolithic period (Sternke, Appendix 2.1). No Neolithic activity was identified on the site but the presence of these artefacts within the disturbed burnt mound material may indicate that Neolithic activity was located nearby.

A copper alloy stick pin (003:6) with an undifferentiated head was also recovered from C3. It has a circular, tapering shank that is decorated with transverse lines and is hipped in the upper part of the shank, which would have helped the pin to grip the garment. It dates to the medieval period, specifically to the early 12th/13th centuries (Scully, Appendix 2.2). While no medieval activity was recorded at Danesfort 2, there is activity recorded to this period in the locality. Excavations carried out along the N9/10 identified medieval activity at Danesfort 4 and 6 in particular. In the 13th century Danesfort was the centre of a thriving borough in a manor of the same name (Empey 1990, 80).

Burnt and unburnt animal bone fragments were recovered from burnt mound spread C3. A total of 15 bone fragments (90.6g) (including two teeth) representing 12 possible skeletal elements were identified. Species identified included cow (*Bos*), pig

(*Sus*) and sheep/goat (*Caprinae*). Small fragment size combined with a poor degree of preservation meant it was not possible to identify the species of 6 fragments (24.3g). One fragment of unidentified bone had evidence of butchering. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation (McCarthy, Appendix 2.5).

It is significant that sandstone is the predominant rock type in the mound material given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area (Mandal, Appendix 2.6).

2.5 PHASE 5 Modern activity

2.5.1 Drains

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C4	N/A	ran across site	0.37	0.34	Cut of linear feature	Modern drain
C36	C4	ran across site	0.37	0.34	Contained plastic water pipe	Fill over Pipe
C158	N/A	ran across site	1.26	0.50	Cut of linear feature	Modern drain
C159-161	C158	ran across site	1.26	0.50	Fills of linear feature	Fills of modern drain

Finds: None

These modern drainage features demonstrated the necessity of draining the land due to the low-lying location created by the valley (Figures 4–5).

2.6 PHASE 6 Topsoil and Plough soil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A	across site		0.25-0.50	Dark brown sandy silty clay	Topsoil

Finds: None

The topsoil comprised sandy, silty clay and contained no artefacts.

3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Danesfort 2. This includes the analysis of the physical and archaeological landscape, the compilation of information gathered during research into the site type, date, and function, and the results of the excavation and specialist analysis of samples taken during the course of on-site works.

3.1 Landscape Setting

3.1.1 The General Landscape – compiled by Michelle Brick

The topography of the region through which the route passes is generally flat with an average height of 70m O.D. The southern periphery of the route is bordered by Kilmacoliver (261m) and Carricktriss Gorse (314m), with Slievenamon (721m) further west. The Slieveardagh hills (340m) are visible on the western horizon in the south of the route and with the exception of Knockadrina Hill (140m), the enclosed landscape is made up of minor undulations. In the centre of the route Freestone Hill (130m) and Knocknagappoge (334m) further north are the significant uplands. A number of hills and mountains are visible in the distance to the east and west of this area of the landscape but the topography remains generally flat. To the north the Castlecomer Plateau influences a rise in the overall topography of the region. This expanse of terrain stretches along the north-east margins of Kilkenny, crosses the county border into Carlow and stretches northwards into Laois. This plateau consists of a variety of hills and peaks including Mountnugent Upper (334m), Baunreagh (310m), Knockbaun (296m), Brennan's Hill (326m) and Fossy Mountain (330m). These hills contain seams of anthracite coal as a result of millions of years of compression, and consequently Shales and Sandstones were formed which are evident throughout the plateau. Mining in the region began in the 17th century, continued for over 300 years and it is for what Castlecomer is best known. According to the Environmental Protection Agency soil maps of Ireland, the underlying bedrock of the entire region primarily consists of Carboniferous Limestone. However there is also a small amount of surface bedrock, sands, gravels, shales and sandstone Tills present along the route. The soil cover of the region is primarily composed of Grey Brown Podzolics, Renzinas and Lithosols. Additional soil types also present along the route include Brown Earths, surface Water Gleys and Ground Water Gleys.

The prevailing water courses within the landscape of the N9/N10 Phase 4 are the Rivers Nore and Barrow. The River Nore rises on the east slopes of the Devil's Bit in Co. Tipperary and flows eastwards through Borris-in-Ossory and then south through Co. Kilkenny, passing through the towns of Durrow (Laois), Ballyragget, Kilkenny, Bennettsbridge and Thomastown to join the River Barrow upstream of New Ross, Co. Wexford. It is 140 kilometres long and drains a total catchment of 1572 square kilometers and runs through the central and southern sections of the route. In the south of the route three main tributaries of the River Nore are evident. The Kings River flows east through Callan and Kells. It is joined by the River Glory which meanders on a north-south axis towards the western margins of the route landscape and the Little Arrigle River flows along the southern fringes. These rivers are flanked by low-lying valleys that are characterised by wet, marshy land. The condition of the soil improves further north beyond the King's River where the influence of these waterways declines. In the northern area of the route the River Dinin is a tributary of the River Nore flowing south-west from Brennan's Hill through the Castlecomer Plateau. The Plateau is the tableland that is the watershed between the Rivers Nore and Barrow (Lyng 1984). The River Barrow is the second longest river (193 kilometres) in Ireland after the River Shannon. It rises in the Slieve Bloom Mountains in Co Laois and flows east across bogs and lowlands and then turns south into the lowland immediately east of the Castlecomer Plateau. It passes through

Portarlington, Athy, Carlow, and Graiguenamanagh and runs through northern section of the route. It is joined by the River Nore at New Ross. The Maudlin River is the notable tributary of the River Barrow within the landscape of the route and flows east from Old Leighlin, with minor tributaries of it flowing through Bannagagole. There are also streams and minor watercourses present throughout the entire landscape and these waterways would have been a valuable resource to past communities and would also have had a major influence on settlement and the surrounding land use.

The physical landscape through which the N9/N10 Phase 4 passes can be divided into three principal areas defined by the main rivers and their catchments. The southern area is located in the undulating landscape on the western flanks of the Nore Valley. The central area is dominated by the fertile watershed between the Barrow and Nore systems in the hinterland of Kilkenny City. The northern area is located on the western flanks of the Barrow Valley overlooked by uplands to the north and west. Danesfort 2 is located in the central landscape area.

3.1.2 The Central Landscape

The central landscape of the route encompasses the environs of the Nore Valley and the hinterland of Kilkenny City. The underlying bedrock of the region is made up of Carboniferous Limestone sands and gravels, Carboniferous Limestone Tills, Shale's and Sandstone Tills. According to the EPA the natural soils of the region consist of Renzinas and Lithosols in areas dominated by underlying bedrock of Carboniferous Limestone sands and gravels. Soil cover consisting of Grey Brown Podzolics and Brown Earths is present in areas of underlying Carboniferous Limestone Tills and Surface Water Gleys and Ground Water Gleys are the soils present where the underlying bedrock is made up of Shale's and Sandstone Tills. This landscape is underlain not only by the Butlersgrove geological formation but also by the Ballyadams formation (thick-bedded calcarenitic wackestone on erosional surfaces). A large number of quarries in the area, some of which produced the distinctive blue 'Kilkenny limestone' that was used to construct the medieval and later city, occur around the city itself and extend southward into the dolomite formations along the Nore around Dunbell (Tietzsch-Tyler, 1994).

The glacial drift around the Kilkenny City hinterland, along the Kilkenny Link Road, comprises sandy (50–60%), gravely clay with a noticeably higher sand content than along the southern plain of the River Nore. As this section crosses existing watercourses, areas of granular deposits and several isolated sand and gravel lenses were noted. The floodplain of the Nore extends *c.* 80m on the western side and *c.* 50m on the eastern side, creating marsh and wet grassland within the immediate area. The nature of the glacial drift and geology, combined with the water sources and floodplains in the area, has resulted in the high quality of the local pastoral and arable agricultural landscape. The topography in this section remains between 50m and 80m OD creating open and expansive views over the confluence of the Nore and Kings Rivers. Mountains are visible on the horizon to the north, east and south-east. Freestone Hill (130m) is located directly to the North and Knocknaguppoge beyond this rises to 334m. Outside the parameters of this landscape lies Brandon Hill (513m) to the south-east and further to the east are the Blackstairs Mountains (735m) and Mount Leinster (795m). The River Nore is the prevailing water course of the region and the River Barrow flows along the margins to the east. The Kings River is located to the south and would have influenced activity in and around this area.

3.1.3 Site Specific Landscape

Danesfort 2, a burnt mound, was located in a valley adjacent to a tributary that joins the King's River at the village of Ennisnag. The valley runs from west to east and is U-shaped. The burnt mound was located on the southern slopes and base of the valley (Figure 4; Plate 1). It was not visible prior to excavation as it was obscured beneath a band of redeposited topsoil that lined the valley slopes. The valley sides were formed of boulder clay but its base was characterised by a loose concentration of medium- and large sized angular and sub-rounded stones. These probably related to a path which is depicted on the first edition Ordinance Survey Map (1839). At this time the valley was within Danesfort Demesne (the external stone wall perimeter of the Demesne is visible in Plate 1). It is very probable that at some point in the past this valley carried water into the Ennisnag tributary. Although dry and under pasture at the start of the excavation, when it rained the ground became saturated and the archaeological features rapidly filled with water, despite the presence of a modern drainage pipe running on the valley base. The location of the site in a gently winding valley only 54m OD meant that views from the site were fairly restricted in all directions.

The burnt mound was situated within an archaeologically rich Bronze Age landscape (Ch. 33740–37100, Danesfort and Croan townlands). Evidence of funerary and domestic activity was discovered 0.4–0.6km to the south-west at sites Danesfort 12 and 13 where three ringditches, a pit circle and three cremations were found in low-lying land beside the Ennisnag tributary. Another ringditch was found 0.3km to the south-east at Danesfort 1 while Graves (1860–1) reported the discovery in 1838 of an intact Bronze Age urn in a sand pit next to a post-medieval turret (RMP KK023-080) which is visible 0.2km to the south of Danesfort 2. A prehistoric shelter on higher ground was recorded 0.7km to the north-east (Croan 1). Bronze Age sites were also excavated 1–1.8km to the north and north-east at Danesfort 5–7 including a settlement and cremation pits with late Bronze Age pottery. The next closest recorded burnt mound activity occured in a shallow basin at Danesfort 11, *c.* 2.3km to the north-west. In that instance, there was no mound and only features cut into the boulder clay survived.

3.2 The Archaeological Landscape

As part of the general research relating to sites along the scheme and the specific research relating to Danesfort 2, the known archaeology within the surrounding landscape was assessed in order to establish the level and type of activity in the surrounding area in the past. This included a review of information from the Record of Monuments and Places, previous excavations and other relevant documentary sources including mapping and other sites excavated as part of the N9/N10 Phase 4 scheme. The excavated archaeology at Danesfort 2 has been identified as being Bronze Age and Iron Age in date.

3.2.1 General Bronze Age Landscape of the Scheme – compiled by Michelle Brick

The archaeological record implies that the Irish Bronze Age (2500–800BC) population dramatically increased from that of the Neolithic and the evidence for permanent settlements with considerable longevity becomes much more substantial. In addition, a wide range of ritual and funerary activity associated with this settlement is apparent. The overall environmental record for Ireland suggests that there was a general climatic deterioration in the Bronze Age, bringing wetter, colder conditions; during this period there was also accelerated forest clearance with more intensive habitation in the drier lowlands. As a result of extensive development-led projects across the country, understanding of settlement and burial patterns from the early Bronze Age has greatly developed. The distribution of the prehistoric evidence shows

that the Rivers Nore and Barrow provided a focus for settlement. In the central part of the current portion of the N9/N10 Phase 4 the fertile Kilkenny lowlands have produced some Bronze Age archaeology, particularly in Danesfort and Ennisnag townlands. In the northern part of the scheme intense settlement is indicated by both burnt mounds and barrows existing on the uplands of the Castlecomer Plateau and the flanking valleys of the Nore and Suir. Hillforts appear to be positioned to overlook the settlement activity, as well as the route of the Nore, the lower saddle to the north of the Slieveardagh Hills, and to the south of the spur surmounted by Clonmantagh. A considerable number of ringditches, cremation and inhumation burials (single and grouped), burnt mound sites, structures and domestic settlement evidence, have been recorded as part of the Bronze Age on of the N9/N10 Phase 4.

In the southern landscape the exposure of domestic Bronze Age settlement was less forthcoming than that of the northern landscape. There was little direct evidence for structures in the southern and central landscapes with the exception of a cluster of structures in the Danesfort area. Instead most of the settlement activity that fell within the roadtake was noted in the northern landscape, further to the north of Kilkenny and in Carlow. Ritual and burial is a dominant feature of the Bronze Age in Kilkenny and Carlow as indicated by the presence of flat cemeteries, burial cairns, ringditches, mounds, barrows and hillforts throughout these counties. Freestone Hill situated in Coolgrange, Co. Kilkenny, in the centre of the present landscape is just one example of these sites. Along the lower part of the Nore Valley, and concentrated in the Foulksrath and Jenkinstown areas, the landscape is dominated by barrows (in this case more specifically ringditches). The contrasting locations of these site types most probably relate to differential landscape exploitation by the same communities with some activities, possibly associated with the seasonal use of upland pasture, confined to higher terrain and settlement and funerary activity taking place in the more sheltered lowlands.

The significant number of burnt mound sites discovered due to the N9/N10 excavations, combined with the previously known examples in the RMP reinforces the concept that Bronze Age activity in Kilkenny and Carlow was considerable. A total of 36 sites with evidence for burnt mound activity were uncovered during the N9/N10 excavations, with an additional example discovered, and preserved outside, the roadtake. The burnt mounds are focussed in the upland area, especially along the river and stream valleys, such as at Clashduff, Coan West and Muckalee on the Dinin and Douglas Rivers, and in the upland hinterland of Freestone Hill.

The distribution of the prehistoric evidence shows that the Rivers Nore and Barrow provided a focus for Bronze Age settlement. The patterning of human activity in the region indicates that these were also the principal route-ways in prehistory; both were navigable by small craft but they, and the major tributaries of the Nore– the Dinin and King's Rivers – were also conspicuous landscape features that facilitated accurate navigation through this landscape. The Barrow and Nore also provided access to wider networks beyond the region.

The Central Landscape: Domestic Settlement

The characteristics of the prehistoric settlement landscape change from the peripheral activity located alongside the River Nore floodplains of the southern landscape to a slightly more permanent and defined settlement in the central landscape. The direct domestic settlement evidence, albeit limited, indicates the presence of a Bronze Age community in the locality. As the evidence for peripheral settlement activity including burnt mounds and funeral monuments was also limited, this area may have been dominated by small-scale settlement. The area contained soils amenable to farming and perhaps the area was cultivated, rather than settled.

The majority of the evidence was centred upon the Danesfort area which may consequently represent an important focus of activity, perhaps with considerable longevity.

Danesfort 5 was located upslope from a burnt mound site in Croan (unexcavated and not a Recorded Monument) and contained three post-built, circular houses with south-east-facing porches and internal hearths. Structure 1 overlay the remains of postholes, stakeholes and a possible fireplace, which may have represented an earlier structure or shelter. The morphology of these houses, with their regularly spaced postholes, would indicate a middle-late Bronze Age date, as also suggested by middle to late Bronze Age pottery. At Dunbell Big 2 there was a shallow, circular gully with internal postholes, an east-facing entrance (representing a possible structure) and a pit containing middle Bronze Age domestic pottery. A small lithic assemblage, including a convex end scraper, flake and debitage, came from Holdenstown 1. Holdenstown 3 also produced sherds from two fine middle Bronze Age domestic vessels.

A major prehistoric complex was identified at Templemartin 5 where settlement, industry and burial continued episodically until the late Bronze Age. The site was situated on the top of a northwest-southeast ridge and overlooked the surrounding countryside of rolling pasture land. At this site a series of six ringditches were recorded, two of which extended beyond the area of excavation and are therefore preserved *in situ*. One of the ringditches (5.2m external diameter) was penannular with a gap of 0.8m in the south-east and an almost-centrally located hearth. The presence of a hearth, with evidence for *in situ* burning, suggests that this 'ringditch' was the foundation trench for the wall of a structure, rather than a funerary monument. It was post-dated by another ringditch which cut through its western side. Other peripheral and possible settlement activity, in the form of pits, Bronze Age pottery and postholes, was noted at Danesfort 7, 8 and 9, as well as Ennisnag 1.

The Central Landscape; Funerary and Ritual activity

The previously known Bronze Age burial record of this landscape included two prehistoric burials excavated by Cassidy in 1991 at Dunbell Big (Cassidy 1991a and b). There at Ringfort No. 5, a pit containing a badly damaged Bronze Age food vessel was found and the second burial was discovered within a cist. The cist fill was mainly a reddish loam and on its side at its base was an intact food vessel containing and surrounded by burnt bone (*ibid*.). Other significant funerary activity includes the single grave sites of Garrincreen to the west and Grange Lower (Waddell 1990, 103) to the south-east. Bowl burials have also been discovered at Wells, Slyguff and Kilgraney, Co. Carlow, sites that border the eastern margins of this study area.

Ten sites produced evidence for funerary activity in this section of the N9/N10, primarily in the form of ringditches: Danesfort 1, 12 and 13, Kilree 4, Holdenstown 1 and Templemartin 5. However, the Danesfort 12 and 13 ringditches have produced Iron Age dates. The Danesfort 1 ringditch had cremated bone in the middle of its three fills, at opposite sides of the ditch. At Danesfort 6 a deep, flat-bottomed, straight-sided circular pit containing sherds of at least three vase urns and a cremation pit with a marker post were identified. At Danesfort 7 a middle-late Bronze Age flat cemetery was characterised by eight circular pits associated with token cremations. There are also some previously recorded finds from the Danesfort area, in particular a lidded vase that was found in the 19th century. Graves (1860) refers to the discovery of three 'sepulchral urns' found in Danesfort by Lady Elizabeth and Captain Wemyss, in the proceedings of the September meeting of the Kilkenny and South East of Ireland Archaeological Society in 1860; two of these are described as rare and highly ornamented. The exact location of these finds has been questioned

but excavated evidence of Bronze Age funerary activity in this townland, as a result of the N9/N10, supports the authenticity of the discovery.

An isolated cremation pit at Kilree 1 was capped with a saddle quern. At Kilree 4 a double ringditch was located on the edge of the Nore floodplain overlooking a potential crossing point. The fills of both the external and internal ringditch contained charcoal, animal bone and burnt bone. A possible cremation pit was identified and contained a single piece of copper in the middle fill; charcoal, burnt bone and burnt clay were also found in the fills. A funerary complex was identified at Holdenstown 1 and consisted of three ringditches, one of which was badly truncated. The primary phase of one of the small ringditches contained cremated material; this ringditch was later re-used to enclose a small inhumation cemetery. The activity at Holdenstown 1 fits into a wider landscape as the adjacent site of Dunbell Big 2 contained evidence for Bronze Age settlement and Holdenstown 2 also had evidence of prehistoric activity.

Two pits from the multi–phased site Templemartin 5 contained cremations in Grooved Ware vessels. In addition there were six ringditches, at least five of which were later in date than the two cremation pits. These ringditches formed the main concentration of activity probably during the Bronze Age and focused the funerary action on a rise to the north-east of the site, at the edge of a north-south gravel ridge overlooked by Freestone Hill. One was penannular, and its entrance faced the south-east, typical of the Bronze Age period and it pre-dated the other ringditches. It is possible that this represents the slot trench of a structure rather than a funerary monument. Fifteen cremation pits were identified on the site: two of these dated to the late Neolithic. The main focal point of the cemetery was also the highest point of the site and was on the edge of a ridge overlooking the surrounding countryside, and two of the ringditches and a concentration of Bronze Age cremation pits were located here. Five of the cremation pits had evidence for marker posts/stones and two others had been formally capped or sealed with sterile material. The amount of bone contained in any of the above cremations could only be considered as a token deposit of any individual. Two cremations, Cremations 9 and 11, display evidence of structured deposition and have larger chunks of bone than the others, suggesting these two might be slightly earlier, perhaps middle Bronze Age in date. The rest of the cremations had only very small pieces of bone which suggests that they were more intensely processed: perhaps more indicative of a late Bronze Age date. Possible pyre remains were represented by deposits located to the south of the main concentration of cremations

The Central Landscape; Burnt mounds

Only seven sites with evidence of burnt mound activity were uncovered within the central landscape. Two of the three Danesfort sites were located close together (Danesfort 10 and 11) and a further two sites were also located in proximity to each other (Rathgarvan or Clifden 1 and Maddockstown 1). Burnt mound activity discovered at Danesfort 2 was situated on the southern slopes of a small valley near the Ennisnag tributary of the King's River in the southern end of this landscape. Holdenstown 4 was not located close to any other burnt mounds however it was situated on flat terrain with good visibility southwards to Holdenstown 3. Rathgarvan or Clifden 1 and Maddockstown 1 were located on flat, wet grassland. Rathgarvan or Clifden 1 had evidence for natural springs and a waterhole which would have supplied water on-site. The River Nore meanders NNW–SSE to the south-east of both these sites. Burnt mound activity was also excavated at Leggetsrath East 1 which was located on the eastern edge of the floodplain of a small river/stream. This site was also on marginal land but was surrounded to the north and south by well-drained pastureland. Other burnt mound sites recorded in the vicinity include those at

Bishopslough West (KK024-037, 38), Maddockstown (KK020-052), Rathcash West (KK020-077, 78) and Cloghoge (KK020-039, 075, 76).

The Central Landscape; Route-ways and Communications

It is evident that the Nore, Dinin (and its tributary the Douglas) provided the landscape links within the extensive late Bronze Age settlement distribution to the north of Kilkenny extending from the lowlands up into the uplands of the Castlecomer Plateau. However, beyond this the Nore also leads to the lowland zone in mid-Laois with its core of prehistoric activity, as well as to the sources of the Suir and contact with other major settlement cores at, for example, Cahir and Cashel. To the south the King's River, rising in the Slieveardagh Hills, also provides access to the Suir Valley.

While it is clear that the rivers and streams are a major feature of the settlement networks, the distribution of prehistoric activity shows that other route–ways were functioning at both a local and regional scale. Some of these were already important in the early Neolithic while others became prominent only in the Bronze Age. Among the most significant of these are those on the eastern side of the Barrow in the Goresbridge area that formed the core of a settlement zone that in the Bronze Age extended westwards across the river into the Paulstown area of Co. Kilkenny. The immediate environs of Kilkenny City also appear in the Bronze Age as a settlement focus. Additionally the major focal site on Freestone Hill has been highlighted by the discovery of new sites on the lowlands immediately to the south around Rathcash.

The Central Landscape; Conclusions

While the central part of the N9/N10 Scheme through the fertile Kilkenny lowlands has produced some Bronze Age archaeology, particularly in the Danesfort and Ennisnag areas, this low level of activity reflects the known site distribution patterns. This picture provides an interesting contrast with the dense settlement in the early medieval and medieval periods but it is probably significant that the two nodes of Bronze Age settlement identified are in slightly more elevated terrain overlooking the Nore and King's Rivers. More significant in this study area is the rich array of Bronze Age funerary activity uncovered along this portion of the N9/N10 route.

3.2.2 The General Iron Age Landscape of the Scheme – compiled by Michelle Brick

As with wider settlement patterns in Ireland, direct evidence for Iron Age (800BC–AD500) domestic habitation was not identified, although several furnaces, kilns and ringditches date to this period and attest to an Iron Age presence in the area. It is possible that some smaller Iron Age ringditches were in fact structural, rather than funerary. Evidence for Iron Age domestic settlement activity remains indirect and peripheral in Kilkenny and Carlow, and in Ireland as a whole.

The Southern Landscape

Direct evidence of Iron Age activity in the southern landscape of the N9/N10 Phase 4 is limited. There is a marked absence of hillforts from south Kilkenny but this does not necessarily infer absence of settlement (Gibbons 1990, 20). A small number of features produced Iron Age dates in this landscape as a result of the N9/N10 Phase 4 excavations. A posthole dating to this period (165BC–AD16; UBA 10984) was excavated at Baysrath 2, and belongs to a possible structure indicating potential domestic settlement in the region. At Tinvaun 2 a possible hut structure was identified which consisted of four truncated slot-trench-like pits, a posthole and a shallow, roughly central pit in the interior of the area. Dates returned for this possible structure have indicated that it was in use during the Iron Age period (AD5–124; UBA 12169). There was also some metalworking activity on site and this structure may have been associated with it. Further to this, a posthole and a hearth excavated at Danganbeg 1 also dated to the Iron Age (762–416BC and 41BC–AD 55; UBA 14025

and UBA 14024 respectively). No funerary features belonging to the Iron Age were excavated as part of the present Phase 4 in the southern landscape. However, some metal working activity in the form of slag pits/furnaces and funerary activity in the form of a ringditch has been excavated at Baysrath directly to the south of the present excavations and have been dated to the Iron Age period (Channing 2007). Three circular structures excavated at this site have also been dated to this period (AD60–131, AD25–128 and 88BC–AD53; UBA 10684, UBA 10685 and UBA 10691 respectively) indicating a strong Iron Age presence in this area (*ibid.).* A ditch dating to the Iron Age (39BC–AD74; UBA 10993) was excavated at Tinvaun 1; burnt mound activity associated with the Bronze Age was also excavated at this site and this ditch relates to a later phase of activity at the site. At Knockadrina 2 (51BC–AD78; UBA 12178) an Iron Age furnace was excavated and at Stonecarthy West 1 a possible trough also yielded an Iron Age date (771–539BC; UBA 12174), however other features associated with a burnt mound on the site returned Bronze Age dates.

The Central Landscape

As with the southern landscape there is no direct evidence for Iron Age settlement although there are many early medieval RMP sites in this area, the majority of which are ringforts and enclosure sites, such as the ringforts recorded at Woolengrange (KK024-079 and KK024-082) and the enclosures at Carran (KK024-021001, 2) . Iron Age activity in the county is represented by the Hillfort at Freestone Hill where a defensive hillfort and inner enclosure (KK020-018002) was built encircling the hill-top (Gibbons 1990, 18), re-using the site of an earlier burial cairn (KK020-018001). The site was then re-occupied *c.* AD300 (Raftery 1969). Another possible Iron Age hillfort is located at Cotterallsrath located to the west of the southern end of this central landscape. Directly to the north-east of this site and located four miles south of Kilkenny City are the remains of a linear earthwork at Grevine West (Gibbons 1990, 20), also indicating an Iron Age presence in the region. Additionally, excavations were carried out at two ringforts in the townland of Dunbell; Dunbell 6 in 1972 and Dunbell 5 (KK024-010) in 1990 (Foley 1974; 2006; Cassidy 1991). The ringfort settlement at Dunbell 5 in particular produced dates from the Bronze Age to the eighth–10th centuries AD including evidence of Iron Age occupation.

Two clusters of Iron Age activity were noted from the N9/N10 excavations within the central landscape, at Danesfort and at Kilree and Holdenstown. These sites exhibited evidence for funerary activity and no evidence for domestic settlement was uncovered within this central landscape. At Danesfort 13 the primary fill of a ringditch returned a radiocarbon date of 503–384BC (UBA 10999) and was considered to be associated with two similar ringditches excavated at the neighbouring site of Danesfort 12. A fine glass bead found within a pit at Danesfort 13 also indicated that Iron Age activity continued in the Danesfort area, confirming the longevity of Danesfort as a focus for prehistoric funerary activity and although the area continued to be occupied in the early medieval period the focus then shifted towards settlement. Iron Age activity was excavated at Kilree 4, a site which contained a probable token cremation burial within a double ringditch (171BC–AD4), which was located on flat, gravely ground that overlooked the River Nore and its floodplain. At Holdenstown 1, three ringditches of possible Iron Age date were excavated. The largest was penannular in plan and had an undug, east-facing causeway. The two best preserved ringditches had evidence of re-cutting which may have been a symbolic act of redefining the burial monument. The primary phase has been interpreted as representing funerary feasting while the secondary phase consisted of burial possibly dating to the late Iron Age. Both ringditches were subsequently re-cut and were backfilled with material which included burnt bone, charcoal, seeds, and animal bone. The quantity of cremated bone is indicative of token cremation mixed with pyre debris. Although Ringditch 3 was heavily truncated, it also contained evidence of

token cremation. The evidence thus far is indicative of burial potentially in the Iron Age and the site was later re-used as an inhumation cemetery known as a ferta, during the early medieval period. A shallow, northeast-southwest linear ditch spanned the entire width of the site at Holdenstown 1. The precise function of this ditch is unknown; however, its length and the fact that no return was identified suggest that it may have been a boundary ditch. It is possible that it is broadly contemporary with the burials within Ringditch 2, as these burials followed the same alignment of this ditch and there was no truncation. The ditch has been dated to the Iron Age period (168–3BC; UBA 13108). It is then possible that the burials associated with Ringditch 2 and with this ditch were placed either inside or outside the boundary; both of which suggests a significant symbolism.

In Danesfort 12 a furnace had evidence of reddened sides and a burnt and blackened rim but the base was not scorched. The fills contained large quantities of charcoal and slag. It is possible that this activity was contemporary with the Iron Age funerary activity recorded on site. Metallurgical activity was also recorded at Danesfort 13 and included two smelting furnace pits, a metalled surface, three waste pits, and an occupation deposit. This activity may also have been contemporary with Iron Age funerary activity also recorded on site. At the multi-period site of Danesfort 5 a metalworking area was identified and included several pits and deposits. Of these pits one returned an Iron Age date of 786–543BC (UBA12192). A kiln excavated at Danesfort 5 also produced Iron Age dates ranging between 169BC and AD50, (UBA 12189–91). Other features at this site were dated to the late Bronze Age period and the Iron Age activity may indicate a continuity of settlement at the site. At Holdenstown 2 a total of five kilns were identified with one dating to AD21–203 (UBA 13111). Both Danesfort 2 and Holdenstown 4 returned Iron Age dates from features associated with burnt mound activity (744–407BC, UBA 11000; 765–420BC; UBA 13114).

The Northern Landscape

The northern landscape of the N9/N10 Phase 4 also contained Iron Age evidence. The aforementioned Freestone Hill (KK020-018) is located directly to the south of this landscape and two additional hillforts can also be located in the north of the county. Clomantagh (KK008-124002) overlooks Johnstown in north-west Kilkenny and similar to Freestone Hill, the site was originally used in the Bronze Age as a funerary complex (Gibbons 1990, 18). A linear earthwork has also been recorded at Woodsgift (Gibbons 1990, 20) and is located directly to the south of this site. The other possible hillfort in the region is recorded at Tooremore or Carndubh to the east (*ibid.*). This hillfort which is not shown on the Ordnance Survey maps, is situated on Corrandhu Hill, two miles east of Ballyragget, straddling the townland boundary between Toore More and Donaghmore (Condit and Gibbons 1988, 49). Further to these, located along the Kilkenny-Carlow border is a linear earthwork known as the Rathduff Trench (KK026-006). It ran for over three miles from the River Barrow at Duninga, in a north westerly direction to the foothills of the Castlecomer plateau above Shankill (Gibbons 1990, 20). A portion of this linear earthwork was excavated at Shankill 1 and consisted of a U shaped bank with a ditch.

Excavations in the northern landscape of the N9/N10 produced a small amount of domestic settlement evidence. The fill of a stakehole associated with a possible structure at Moanduff 1 produced an Iron Age date of AD215–376 (UBA 13124); the site also had evidence of occupation in the Bronze Age which implies that the site may have been used throughout both periods. Radiocarbon dating for Rathcash East 1 also indicates use of the site during the Iron Age period. The excavated features included a possible structure that may be inferred as a ringditch as a result of the middle Iron Age date retrieved from its fill (38BC–AD73; UBA 12221) and an

associated rubbish pit (37BC–AD123; UBA 12220). Excavations in the northern landscape of the N9/N10 did not produce any evidence for Iron Age funerary activity. However ephemeral Iron Age activity was discovered at a number of sites in the form of metal working and burnt mound activity. At Rathcash East 3 a large keyhole-shaped furnace that dated to the Iron Age (160BC–AD0; UBA 14032), aligned northeast–southwest was excavated along with six post-pits that may have supported a shelter around the west side of the furnace. The post - pits had a rectangular arrangement, being open on the east (furnace) side. The furnace had 18 fills, with the majority containing significant amounts of charcoal and frequent slag. Some of the post-pits contained charcoal, burnt clay and slag. One of the post-pits has been dated to 362–200BC (UBA 14033). A kiln and pit excavated at Cranavonane 3 have been dated to 104BC–AD50 (UBA 12251) and 341–54BC (UBA 12252) respectively. In addition to these features a pit excavated at Jordanstown 1 returned a date of 382–206BC (UBA 12233) and a pit at the multi-period site of Moanduff 2 retrieved a date of AD140–385 (UBA 12260). Features associated with burnt mound activity dating to this period were excavated at Rathcash 2 where the fill of a trough dated to 344–55BC (UBA 12219) and at Kellymount 2, where a waterhole has been dated to AD236–380 (UBA 14041). The fill of a trough at Kellymount 3 also returned a date of 751–409BC (UBA 14043).

Conclusion

The presence of the Iron Age ringditches along the N9/N10 Phase 4 and the number of sites displaying industrial activity dating to this period confirm the presence of an Iron Age community in the region. The possible structure at Rathcash East 1 may also be indicative of an Iron Age settlement site, further demonstrating Iron Age activity in the locality. The presence of three hillforts in north Kilkenny suggests that it was an area of considerable importance during this period (Condit and Gibbons 1988, 52). The lack of excavated domestic settlements along the route is not indicative of a sparse population at the time rather they were not located along the corridor of the N9/N10 route-way and have yet to be discovered.

3.2.3 The Site Specific Archaeological Landscape of Danesfort 2

There are no recorded monuments in the immediate vicinity of Danesfort 2. However a ringwork (KK023-080) and a designed landscape (KK023-080001) are located *c.* 250m to the south-east and a ringfort (KK023-079) is recorded *c.* 600m to the south. Three ringforts (KK023-076–78) are recorded to the south-west, 400m–750m away and further to the south-west, *c.* 900m away, a holy well (KK023-075) is recorded. A church and graveyard complex (KK023-081) is also recorded *c.* 700m to the north of Danesfort 2.

At Danesfort 2 burnt mound activity and associated features dating to the early Bronze Age and early/middle Iron Age periods was excavated. A number of sites were excavated in the vicinity of Danesfort 2, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. To the east, *c.* 300m away, at Danesfort 1, a ringditch containing cremated bone within its fills has been dated to the middle Iron Age. Also to the ENE, located *c.* 250m away, excavations were carried out at Danesfort 3, however no features of archaeological significance were uncovered here. To the north-east of Danesfort 2, *c.* 650m away, a hearth and possible structure were excavated at Croan 1, however dates returned from a fill of the hearth indicate a post medieval date.

There were a number of archaeological excavations to the immediate south of Danesfort 2, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. At Danesfort 13, located *c.* 350m to the south-west Bronze/Iron Age and early medieval activity was recorded. The Bronze Age archaeology primarily consisted of a ringditch

and a cremation pit. The early medieval phase consisted of a field boundary ditch and a metalworking area that included a charcoal-producing kiln, a furnace and a possible forging area. Further to the south-west, *c*. 550m away, multiple periods of activity were excavated at Danesfort 12, consisting of a possible late Neolithic temporary structure, an early Bronze Age pit circle, a middle Bronze Age industrial complex and two late Bronze/Iron Age ringditches and cremation pits. Also excavated was an iron working furnace probably dating to the early medieval period and a rectangular ditch enclosure.

3.3 Typological Background of 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 agricultural activity and are no longer visible on the field surface. Nevertheless even disturbed spreads of burnt mound material often preserves the underlying associated features, such as troughs, pits and gullies, intact.

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

Burnt mound sites are principally Bronze Age monuments and reach their pinnacle of use in the middle/late Bronze Age (Brindley *et al*. 1989–90; Corlett 1997). Earlier sites, such as Enniscoffey Co. Westmeath (Grogan *et al*. 2007, 96), have been dated to the Neolithic and later sites, such as Peter Street, Co. Waterford (Walsh 1990, 47), have been dated to the medieval period. Thus although burnt mound sites generally form a 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 mounds sites were used as cooking sites. O'Kelly (1954) and Lawless (1990) have demonstrated how joints of meat could be efficiently cooked in trough of boiling water. The use of burnt mound sites for bathing or as saunas has been suggested as an alternative function (Lucas 1965, Barfield and Hodder 1987, O' Drisceoil 1988). This proposal is largely influenced by references in the early Irish literature to sites of a similar character and is very difficult to prove, or disprove. Others, such as Jeffrey (1991), argue that they may have been centres of textile production for the fulling or

dyeing of cloth. More recent demonstrations by Quinn and Moore (2007) have shown that troughs could have been used for brewing, however, this theory has been criticised by leading Irish environmentalists due to the absence of cereal remains from most burnt mound sites (McClatchie *et al*. 2007).

3.4 Summary of the Excavation Results

The excavation has identified Burnt Mound activity at the site. This was represented by two main phases of occupation, one in the early Bronze Age and a second in the Early Iron Age, although there is an indication that there may be two separate phases of occupation in the Bronze Age.

The earliest dated feature on the site consisted of a sub-oval, bowl shaped trough (Trough 1) with an adjacent hearth identified by a smaller cut with scorched sides and base to the east of the trough. The trough was dated to the early Bronze Age. A shallow extension to the trough on the west side may have served as a step. A number of small pit features were identified in the general vicinity around the trough but it is not clear if these were directly related or indeed what their function was.

In the north of the site there was a very large and deep pit which may have functioned as a cistern or waterhole. The large pit was dated to the early Bronze Age but appears to be slightly later in date than Trough 1. It may therefore represent a second phase of Bronze Age activity on the site. The waterhole was not sealed by the main burnt mound spread however, there was evidence that some burnt mound material had been tipped into the feature, presumably after it was abandoned.

Located between the waterhole and Trough 1 were a series of features that represent the Iron Age phase of occupation of the site. These consisted of a large sub-oval trough (Trough 2) and adjacent large pit to the west. A number of irregular pits were identified to the east of the trough and may represent storage or perhaps evidence of land clearance in advance of the activity associated with the trough. Two structures were identified, the first of which (Structure A) consisted of a number of circular post-pits in a horseshoe shaped formation around the east of the trough. While the pits did not seem deep enough to support large (long) structural posts, the regular arrangement may have supported a platform erected on shorter posts around the trough. Some small stakeholes appear to have augmented the structure. At a distance of 5m to the east of Trough 2 was Structure B. This consisted of two parallel lines of 4 postholes. It is again interpreted that this may have been the location for a small platform (1.5m by 0.5m). Both Trough 2 and Structure B have been dated to the early Iron Age.

The overlying burnt mound deposits sealed almost all of the pits and troughs identified at the site with the notable exception of the large waterhole. This probably indicates that the water in the waterhole was not heated, and it was a storage facility. It was not possible to identify which deposits were associated with the Bronze Age activity and which were associated with the Iron Age as the mound deposits had been substantially levelled and disturbed over time. A number of modern drainage channels were also recorded, which truncated some of the features on the site.

3.5 Summary of the Specialist Analysis

A number of specialists provided analysis of samples and artefacts recovered from the site as part of the post-excavation works. This work in part formed the basis for the dating evidence for the site. The detailed reports on the results of all analysis are in Appendix 2

Lithics analysis
The lithic finds from the archaeological excavation at Danesfort 2, Co. Kilkenny are a flint convex end scraper, a quartz crystal scraper and two rubbing stones. The assemblage is morphologically and technologically diagnostic and dates to the first half of the Neolithic period. It represents a residual earlier phase at this site and is most likely waste which is possibly related to domestic activities. This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

Small finds analysis
A copper alloy stick pin (E3540:3:6) with an undifferentiated head was recovered from the burnt mount spread C3. According to O'Rahilly's typology of stick pins found in the Dublin area, stick pins with undifferentiated heads date from the start of the 12th century to the early decades of the 13th century (Scully, Appendix 2.2).

Charcoal and Wood Species identification
Charcoal was examined from four contexts at Danesfort 2, from two pits and two troughs. Five wood taxa were identified. The results are dominated by oak.

Analysis of Plant Remains
Two samples were examined from this site, C58 (S25) and C54 (S14). There were no charred seeds from these samples.

Animal Bone Analysis
A total of 51 animal bone and burnt bone fragments recovered from archaeological contexts C3 and C64 on Danesfort 2 were submitted for examination. The bone samples were assessed and identified to species where possible; a total of 9 bone fragments recovered were identified to the species of cow, pig, sheep and goat. Due to the size and fragmented nature of the individual bone pieces it was not possible to identify 42 fragments to species. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Danesfort 2 due to its limited size and poor degree of bone preservation. A series of early Neolithic lithic artefacts as well as a copper alloy medieval stick pin were also recovered within clay spread C3.

Petrographical analysis
A total of 19 samples were submitted for analysis from Danesfort 2. Coarse grained sandstone is typical of *fulacht fiadh* material. The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles is clear evidence of the use of secondary sources. Angular pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

Radiocarbon Dating
A total of four samples were sent for AMS radiocarbon dating.

A sample of Prunus sp. charcoal from fill C105 of Trough 2 (C128) was radiocarbon dated. The 2 sigma calibrated result was 744–407BC (UBA 11000).

A sample of Ash and Prunus sp. charcoal from Trough 1 fill C54 was radiocarbon dated. The 2 sigma calibrated result was 2464–2214BC (UBA 12186).

A sample of Pomoideae charcoal from waterhole (C109) fill C111 was radiocarbon dated. The 2 sigma calibrated result was 2116–1893BC (UBA 15553).

A sample of Cherry charcoal from posthole fill (Structure B) C122 was radiocarbon dated. The 2 sigma calibrated result was 806–595BC (UBA 15554).

4 DISCUSSION AND CONCLUSIONS

4.1 Discussion

The excavation at Danesfort 2 has identified burnt mound activity with two main phases of occupation dating to the early Bronze Age and the early Iron Age. The site was located in a shallow valley adjacent to a tributary of the King's River. The valley runs from west to east and is U-shaped and the site was located on the bottom of the south slope and on the valley floor (Figure 4; Plate 1). It is very probable that at some point in the past this valley was a conduit for water into the Ennisnag tributary, if only during period of flooding. The physical landscape of the site is one that is typically associated with burnt mound type sites. It is common that these sites are located in low-lying, often marginal areas, adjacent to water sources, rivers and streams. In this regard the identification of the activity at Danesfort 2 would not be unexpected as the land, while not wet all year round is prone to flooding in wet weather. During the course of the excavation the site became flooded following heavy rain. A modern drainage channel identified extending along the valley base provides further evidence of the seasonally wet nature of the immediate surrounding landscape.

There are no previously recorded monuments in the immediate vicinity that would date to the prehistoric period. The monuments in the vicinity consist of ringforts and enclosures which would all date to the early medieval period or later. In this regard the identification of the site, particularly one with two phases dating to the Bronze Age and Iron Age could be seen as unexpected. However, the excavations as part of the N9/N10 Phase 4 have identified many sites in the vicinity within Danesfort with dates ranging from the late Neolithic through to the medieval and post-medieval period. The excavations have identified a particular cluster of activity dating to the Bronze Age, with the nearby funerary site of Danesfort 12, to the southwest, producing contemporary early Bronze Age dates and the Bronze Age domestic settlement site at Danesfort 5 also containing a kiln which is contemporary with the Iron Age phase at Danesfort 2. What has become clear is that there has been intensive settlement of this landscape throughout prehistory and in this context it could have been anticipated that sites of similar type and date to Danesfort 2 would be identified.

The nature and form of burnt mound sites can be particularly varied, and there are many debates as to their function. At a basic level these sites are connected by the use of hot-stone technology - a process where stones are heated in a fire and then immersed into water, usually in the trough, so that the water is heated. More simple sites may have functioned as pot-boilers with the stones being placed directly into a pit rather than into a water-filled trough. It is generally accepted that this activity is more often than not associated with cooking, however other uses for the heated water and troughs are suggested based on evidence from recent excavations and research (see section 3.3).

The earliest phase of activity at Danesfort 2 was associated with early Bronze Age features that would be commonplace on most burnt mound sites – a trough, an adjacent hearth, outlying pits, occasional postholes and an overlying mound of heat shattered stones and blackened soil. Subsequent early Bronze Age activity however consisted of a very large waterhole or well, away from the earlier mound. It seems likely, both from the radiocarbon dates and their physical location, that the waterhole was not associated with the earliest burnt mound activity and may not have been related to any other features on the site.

In general terms, the presence of larger pits, such as the wells or cisterns identified on this site, would be less common, although a large number of burnt mound sites

from the N9/N10 Phase 4 exhibited similar features, from several stages in prehistory: - Kellymount 2 and 3, Stonecarthy West 1 and Maddockstown 1. These very large pits have been interpreted as water-holes that were potentially designed for bulk water storage, unlike the usual troughs which were the "vessel" in which water was heated rather than stored. On these other sites water storage pits were generally associated with a trough.

It is suggested that the waterholes may indicate a bathing site, where a large volume of water was required but which may not necessarily have had to be boiled (as for cooking), but merely heated for bathing. The function of the waterhole at Danesfort 2 is unclear as it was not contemporary with any of the other dated archaeology. The single shallow pit adjacent to it contained no burnt mound material which suggests that it was probably not a trough.

The Iron Age phase on the site was associated with features commonly found on burnt mound sites, in terms of a trough, pits and burnt mound spread. The trough (Trough 2) however, does appear to have been particularly deep and at 0.70m would have been approximately twice the depth of an average trough. Another deep, large pit adjacent to the west end of the trough was not as large as the Bronze Age waterhole. The function of this pit, and indeed Trough 2 is worthy of consideration; given their particular size and depth, and it would seem unlikely that they were designed for cooking. As outlined above, the volume of water in such deep features would be more easily heated (for bathing) than boiled (for cooking). Trough 2 was also surrounded by a series of possible post-pits (Structure A) which may have supported a platform around the trough or indeed a small enclosed or roofed structure over the trough. A second possibly small structure or platform (Structure B) 5m to the east consisted of parallel rows of four postholes. Structure A, Structure B and the trough were all on a similar east-west alignment which is not likely to be coincidental. The precise function of both structures or indeed the trough and pit is not known but collectively they represent a very formal arrangement that is not commonplace on burnt mound sites.

It has been a popular theory for some time that burnt mounds were used as bathing sites or saunas (Lucas 1965; Barfield and Hodder 1987; O'Drisceoil 1988) yet few sites had produced evidence of the necessary associated structures. Features interpreted as being associated with possible sweathouses or bathing have been identified at a number of burnt mound sites from different projects over the last number of years, largely as a result of the increase in the volume of development led excavations particularly from infrastructural projects similar to the N9/N10. A probable sweathouse was documented from the N25 Waterford Bypass at Rathpatrick (Eogan, 2007). Here the main feature was a 5m diameter sunken area with thirty six stake-holes identified around the periphery of the base representing a structure, as well as other features including a possible bath (trough) and an annexe to the main structure. It is interpreted that the stakeholes would have supported a hemispherical, tent-like structure. Eogan identified parallels in other cultures with particular similarities to the Rathpatrick structure in Native American sweatlodges. Clearly an enclosed structure is a key element to the functioning of a sweathouse or sauna, and it is interpreted that the slots and postholes at Blanchvillespark 3 on the N9/N10 Phase 4 could easily have been associated with such an enclosed area. Similarities between the two sites can also be seen by the sunken nature of the interior of the structure and the creation of an adjacent annex, although the shape and plan of the basic sweathouse structure is different in each site. Another similar site to Rathpatrick was identified at Ballykeoghan in south Kilkenny which was excavated as part of the N9/N10 Phase 2 (Laidlaw, 2008). Burrow or Glenanummer 3 Co Offaly, which was excavated as part of the N6 Kilbeggan to Athlone, also

consisted of a sunken circular area with stakeholes around the perimeter, with an elaborate system of additional troughs designed for water to flow from one to another (Coughlan, 2010). Two bone pendants recovered from the sweathouse area at this site represent personal ornaments that were probably lost while bathing.

The Ballykeoghan and Rathpatrick sites both date to the late Bronze Age/early Iron Age, while Burrow or Glenanummer was dated to the late Bronze Age, but all three are later in date than Blanchvillespark 3. Blanchvillespark is therefore quite an early example of possible sweathouse and bathing activity at a burnt mound site. A number of other possible sweathouses that date to the Iron Age have been identified as part of the N9/N10 Phase 4. At Stonecarthy West, an oval slot trench that could have supported structural walls enclosed a shallow hollow and may have acted as a sweathouse. The Kellymount sites showed evidence of structural activity both outside and inside the troughs with possible enclosing palisades and a variety troughs and pits, with some very large waterhole or well features. This slot trench from Stonecarthy West 1 and a trough from Kellymount 3 are contemporary with the Iron Age dates from Danesfort 2, which may be coincidental. It seems unlikely that water heated in the very large waterhole pits would have been boiled due to the volume of water that would have been involved so a bathing function is being considered. Kellymount 2 also produced a fragment of amber bead from the base of the waterhole, and similar to Burrow and Glenanummer this may represent a personal ornament lost while bathing. It is clear therefore that there is growing evidence that some burnt mound sites functioned as sweathouses or bathing places.

The Iron Age Phase at Danesfort 2 was as such potentially a bathing place. This is significant in terms of our wider understanding of the function of *fulachta fiadh*/burnt mounds. It has been identified that this site type can have many functions and often the precise nature of the activity at excavated burnt mounds is unclear. The results of excavations at Danesfort 2 indicate that these varying functions can potentially occur in tandem when we consider the simpler trough and pits from the early Bronze Age; the subsequent un related very large early Bronze Age waterhole/cistern and the Iron Age possible bathing site.

4.2 Conclusions

Danesfort 2 is an important site locally as it represents the first evidence of early Iron Age activity in the immediate area and it adds to the considerable evidence from the Bronze Age that has been gathered through excavations as part of the N9/N10 Phase 4. It is however also of regional significance based on the nature of the burnt mound activity identified at the site, in particular the Iron Age possible bathing site. A number of potential sweathouses and bathing sites have been confirmed from recent excavations of burnt mounds across the country and the results of the Danesfort 2 excavation will significantly add to the further study, analysis and understanding of the varied function and form of burnt mound sites.

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PLATES

Plate 1: Burnt mound, pre-excavation, facing east

Plate 2: Waterhole C109, Trough 2 and Trough 1, mid-excavation, facing east

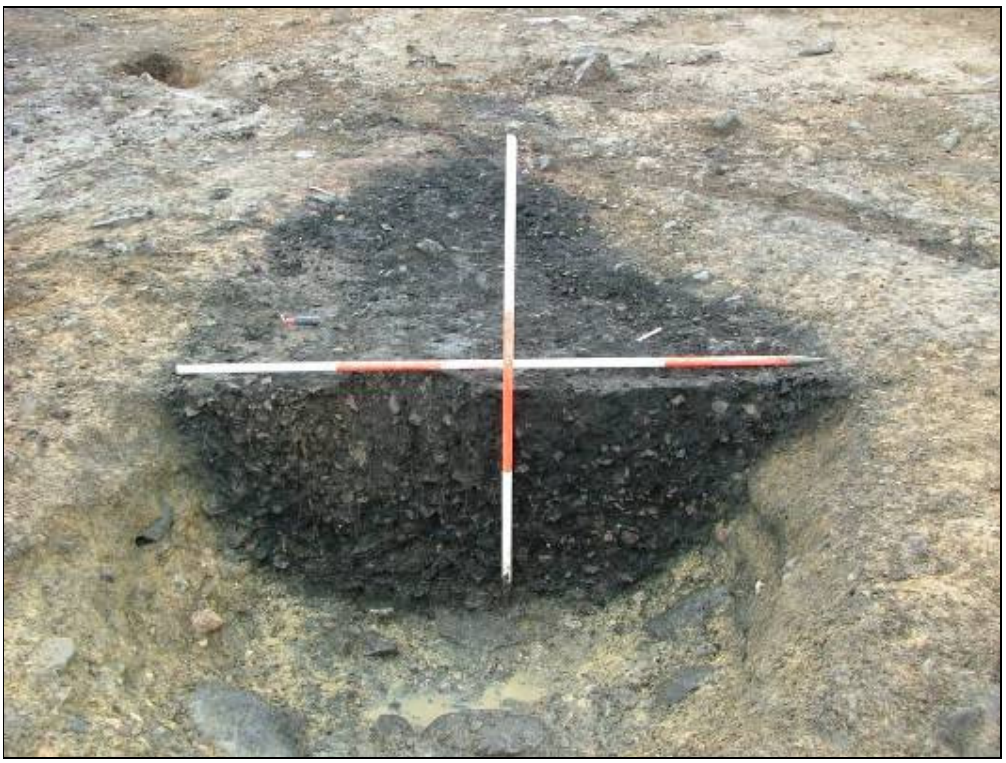

Plate 3: Trough 1, mid-excavation, facing east

Plate 4: Trough 1 and hearth C7a, mid-excavation, facing east

Plate 5: Trough 2, mid-excavation, facing east

Plate 6: Posthole C95 cutting pit C118, mid-excavation, facing north

Plate 7: Structure B, post-excavation, facing north west

Plate 8: Waterhole C109, mid-excavation, facing east

APPENDIX 1 CATALOGUE OF PRIMARY DATA

Appendix 1.1 Context Register

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
1	N/A				Topsoil	Dark brown sandy silty clay.		
2	N/A				Natural	Mid grey sandy gravely clay		
3	N/A	14.35	13.80	0.57	Spread	Mixed black and brown burnt clay with stones and charcoal, few finds including a bronze pin, hammer stone and flint.	C46	C2
4	Void							
5	N/A	1.60	1.50	0.11	Cut of pit	Oval in shape, W-E, imperceptible break of slope with concave sides leading to an irregular base.	C6	C2
6	C5	1.60	1.50	0.11	Fill of pit	Loosely compacted greyish black silt with no inclusions.	C1	C5
7	N/A	4.50	2.20	0.75	Cut of trough	Irregular in shape, W-E, gradual break of slope with irregular sides and a flat base.	C54	C2
7a	N/A	1.30	1.30	0.20	Hearth cut	Roughly circular hearth cut	C8	C2
8	C7/7a	4.50	1.30	0.30	Fill of trough	Loosely compact dark greyish black ashy silt with occasional stones and charcoal.	C3	C53
9	N/A	0.23	0.17	0.11	Natural depression		C10	C2
10	C9	0.23	0.17	0.11	Natural depression			
11	N/A	1.27	0.42	0.13	Cut of pit	NW-SE, elongate in shape, gradual break of slope with sloping sides leading to a concave base.	C12	C2
12	C11	1.27	0.42	0.13	Fill of pit	Loosely compact black silty sand with pebble inclusions.	C3	C11
13	N/A	0.48	0.35	0.07	Cut of pit	Sub-circular in shape, gradual break of slope with concave base.	C14	C2
14	C13	0.48	0.35	0.07	Fill of pit	Medium to loosely compacted, black sandy silt with burnt angular fulacht stones included and occ. charcoal	C3	C13
15	N/A	0.90	0.68	0.12	Cut of pit	Oval in shape, N-S, gradual break of slope with irregular sides and oval shape of base.	C16	C2
16	C15	0.90	0.68	0.12	Fill of pit	Loosely compact black sandy silt with stone and pebble inclusions.	C1	C15
17	N/A	2.80	0.49	0.22	Cut of channel like feature	Curvilinear roughly going SW-NE, gradual break of slope with concave base.	C18	C2
18	C17	2.80	0.49	0.22	Fill of channel like feature	Medium to tightly compacted dark brown silty sand with some small stones.	C3	C17
19	N/A	0.35	0.33	0.21	Cut of posthole	Circular in shape, sharp break of slope with vertical sides and flat shape	C20	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						of base.		
20	C19	0.35	0.33	0.21	Fill of posthole	Loosely compacted mid black silty clay with a light grey hue, stone and charcoal inclusions.	C3	C19
21	N/A	0.05	0.06	0.11	Cut of stakehole	Circular in shape, gradual break of slope with gradual sides and tapered round pointed base.	C22	C2
22	C21	0.06	0.08	0.11	Fill of stakehole	Mid greyish brown silty clay with small stones and some charcoal.	C3	C21
23	N/A	0.25	0.18	0.13	Cut of stakehole	Oval in shape, SW-NE, gradual break of slope with gradual sides and concave base.	C24	C2
24	C23	0.25	0.18	0.13	Fill of stakehole	Medium to loosely compacted, dark greyish brown silty sand with charcoal and small stones.	C1	C23
25	N/A	0.45	0.25	0.18	Cut of pit	Sub oval in shape, NW-SE, gradual break of slope with undercut edges leading to concave base.	C26	C2
26	C25	0.45	0.25	0.18	Fill of pit	Medium to loosely compacted mid greyish brown silty sand with big and small stones.	C1	C25
27	N/A	0.20	0.15	0.35	Cut of stakehole	Circular in shape, sharp break of slope with vertical sides and concave base.	C28	C2
28	C27	0.20	0.15	0.35	Fill of stakehole	Very loosely compacted black soil with small stones and roots.	C3	C27
29	N/A	0.33	0.31	0.14	Cut of posthole	Circular in shape, sharp break of slope- top and gradual break of slope-base with vertical sides leading to a concave base.	C30	C2
30	C29	0.33	0.31	0.14	Fill of posthole	Loosely compacted black soil with greyish hue, charcoal flecks and some pebble inclusions.	C3	C29
31	N/A	0.42	0.28	0.05	Non-archaeological			
32	C31	0.42	0.28	0.05	Non-archaeological			
33	C7	1.50	0.75	0.35	Fill of trough	Loosely compacted light brownish grey silt with lots of small irregular sharp edged stones.	C3	C53
34		1.60	1.20	0.10	Natural	Firmly compacted reddish orange clay with no inclusions.		
35-36	N/A					Irregular in shape		
37	N/A	4.00	2.00	0.15	Spread	Loosely compact dark brown silty clay with heat shattered stones	C1	C3
38	N/A	4.20	1.50	0.35	Spread	Loosely compact light brown silty clay with heat shattered stones	C1	C3
39	N/A	2.30	1.20	0.25	Spread	Loosely compact grey brown silty clay with heat shattered stones	C1	C3
40	Void							
41-43	C99	1.30	1.20	0.20	Fills of Test trench		C1	C42
44	C59	0.35	0.37	0.06	Fill of pit	Loosely compacted mid greyish brown fine sand with a small amount of charcoal.	C60	C59

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
45	N/A							
46	N/A	35	9	0.30	Spread	Mid brown clay with heat shattered stones and charcoal	C1	C3
47	N/A							
48	N/A	0.35	0.30	0.39	Cut of posthole	Circular in shape, sharp break of slope- top, gradual break of slope- base with vertical sides and concave shape of base.	C49	C2
49	C48	0.35	0.30	0.39	Fill of posthole	Very loosely compacted black silt with greyish hue, large pieces of charcoal and stones included.	C3	C48
50	N/A	0.37	0.29	0.25	Cut of posthole	Circular in shape, sharp break of slope- top and base with vertical sides and flat shape of base, no inclusions.	C51	C2
51	C50	0.24	0.20	0.11	Fill of posthole	Loosely compacted light black silty clay with grey hue, flecks of charcoal and some stones included.	C3	C50
52	C109	1.35	0.8	0.30	Fill of pit	Tightly compacted light brown clay with small stones within.	C2	C106
53	C7	2.50	1.80	25.4	Fill of trough	Loosely compacted greyish black clayish silt with a few stones and charcoal included.	C8	C53
54	C7	1.80	1.60	0.25	Fill of trough	Firmly compacted blackish grey silty clay with charcoal.	C53	C7
55	N/A	0.36	0.32	0.36	Cut of posthole	Circular in shape, sharp break of slope top and base with vertical sides and flat base.	C56	C2
56	C55	0.36	0.32	0.36	Fill of posthole	Loosely compacted black silty clay with a light grey hue with charcoal and stone inclusions.	C3	C55
57	N/A	2.40	2.20	0.32	Cut of pit	Oval in shape, NE-SW, gradual break of slope with sloping sides and concave base.	C117	C2
58	C57	1.10	0.88	0.17	Fill of pit	Loosely compacted greyish black silty sand with stone and charcoal inclusions.	C3	C57
59	N/A	0.76	0.74	0.20	Cut of pit	Circular in shape, gradual break of slope with a concave base.	C44	C2
60	C59	0.70	0.66	0.15	Fill of pit	Loosely compacted black fine sand with heat shattered stone and charcoal.	C3	C44
61	N/A	0.95	0.65	0.16	Cut of pit	Circular in shape, sharp break of slope with gradual sides leading to cone like base.	C62	C2
62	C61	0.95	0.65	0.16	Fill of pit	Loosely compacted black fill, burnt soil=50%, burnt stone =50%.	C3	C61
63	N/A	1.35	1.05	0.37	Cut of pit	Irregular in shape, NE-SW, with sharp break of slope and sloping sides leading to concave base, no inclusions.	C64	C2
64	C63	1.35	1.05	0.37	Fill of pit	Loosely compacted black silty sand with stone and burnt bone inclusions.	C3	C63
65	N/A	0.75	0.45	0.19	Natural depression	Irregular in shape, break of slope taken out by digger with flat shape of base, no inclusions.	C66	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
66	C65	0.75	0.45	0.19	Natural depression	Moderately compacted black soil with no inclusions.	C1	C65
67-70	N/A							
71	N/A	0.32	0.28	0.12	Cut of pit	Circular in shape with gradual break of slope, sloping sides with concave base.	C72	C2
72	C71	0.32	0.28	0.12	Fill of pit	Loosely compacted black silty sand with stone and charcoal inclusions.	C3	C71
73-74	Void							
75	N/A	0.33	0.33	0.07	Spread	Greyish black silty sand spread	C76	C2
76	Void							
77	N/A	0.22	0.14	0.11	Cut of stakehole	Circular in shape, sharp break of slope- top with sharp sides to gradual on NE; break of slope- base is sharp on W side and gradual on E;	C78	C2
78	C77	0.22	0.14	0.11	Fill of stakehole	Loosely compacted black to dark brown soil with small stones included.	C3	C77
79	N/A	0.10	0.08	0.09	Cut of stakehole	Circular in shape, sharp break of slope top and base with vertical sides and circular base, no inclusions.	C80	C2
80	C79	0.10	0.08	0.09	Fill of stakehole	Loosely compacted black soil with one small stone.	C3	C79
81	N/A	1.00	0.50	0.25	Cut of pit	Irregularly shaped, sharp break of slope with gradual sides and a concave base.	C82	C2
82	C81	1.00	0.40	0.25	Fill of pit	Moderately compacted black sandy clay with small stones and roots throughout.	C3	C81
83	N/A	0.85	0.40	0.30	Cut of posthole	Circular in shape, sharp break of slope with sharp sides and a sharp base.	C84	C2
84	C83	0.85	0.40	0.30	Fill of posthole	Moderately compacted dark brown black sandy clay with small stones and roots throughout.	C3	C83
85-86	N/A							
87	N/A	0.13	0.11	0.22	Cut of stakehole	Circular in shape, sharp break of slope with vertical sides and concave base, no inclusions.	C88	C2
88	C87	0.13	0.11	0.22	Fill of stakehole	Loosely compacted greyish black silty clay with charcoal and stones within.	C3	C87
89	N/A	0.14	0.13	0.16	Cut of stakehole	Circular in shape with gradual break of slope, vertical sides and a concave base, no inclusions.	C90	C2
90	C89	0.14	0.13	0.16	Fill of stakehole	Loosely compacted grey silty sand with charcoal and stones.	C3	C89
91	N/A	0.80	0.40	0.13	Cut of pit	Curved linear, NW-SE, sharp break of slope with sharp and gradual (west part) sides leading to linear base.	C92	C2
92	C91	0.80	0.40	0.13	Fill of pit	Greyish black silty sand		
93	N/A	1.25	0.60	0.32	Cut of pit	L shaped feature, S-N, sharp break of slope- top with sloping to vertical	C94	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
						sides, gradual break of slope-base and concave base.		
94	C93	1.25	0.60	0.32	Fill of pit	Loosely compacted black silty sand with occasional charcoal and pebbles.	C3	C93
95	N/A	0.40	0.38	0.40	Cut of posthole	Circular in shape, sharp break of slope- top and gradual break of slope-base with vertical sides and concave base, no inclusions.	C96	C2
96	C95	0.40	0.38	0.40	Fill of posthole	Loosely compacted black silty sand with pebbles and charcoal within.	C3	C95
97	N/A	0.60	0.50	0.21	Cut of pit	Circular in shape, sloping break of slope- top and gradual break of slope-base with sloping sides and an oval shape of base.	C123	C2
98	C97	0.24	0.20	0.09	Fill of pit	Loosely compacted brownish black silty clay with occasional stone and charcoal.	C1	C123
99	N/A	3.00	1.20	0.60	Cut of Test Trench	Rectangular in shape, E-W, gradual break of slope on north side with a sharp break of slope from south side, steep mid slightly convex sides, gradual break of slope- base leading to flat base.	C43	C3
100	N/A	2.90	2.70	0.70	Cut of pit	Irregular in shape (almost triangular), E-W, gradual northern break of slope- top, sharp south and western break of slope- top with sloped- N,S to steep- W, E sides, gradual break of slope- base leading to a flat base.	C151	C2
101	N/A	0.34	0.30	0.42	Cut of posthole	Circular, sharp break of slope- top, gradual break of slope- base with vertical sides and concave base.	C102	C2
102	C101	0.34	0.30	0.42	Fill of posthole	Loosely compacted black silt with a greyish hue, some charcoal flecks and angular stones.	C3	C101
103	N/A	0.17		0.06	Non-archaeological			
104	C103	0.17		0.06	Non-archaeological			
105	C128	2.25	1.50	0.74	Fill of pit	Loosely compacted dark greyish black sandy silt, small and large irregular stones and charcoal included.	C99	C128
106	C109	1.65	2.50	0.20	Fill of waterhole	Moderately compacted dark brown silty clay with a few small stones.	C3	C110
107	C109	2.10	3.50	0.30	Fill of waterhole	Loosely compacted dark brown wet clay with lots of small stones.	C106	C2
108	C109	0.60	2.00	0.65	Fill of waterhole	Loosely compacted medium brown silty clay with small stones.	C3	C109
109	N/A	6.00	6.00	0.75	Cut of waterhole	Circular in shape, sharp break of slope with sharp sides and sharp base, no inclusions.	C108	C2
110	C109	6.00	3.50	0.75	Fill of waterhole	Tightly compacted dark grey thick marl with lots of small stones.	C106	C2
111	C109	1.70	1.70	0.25	Fill of waterhole	Loosely compacted black clay soil with small stones and charcoal.	C3	C110
112	C118	0.71	0.67	0.20	Fill of pit	Loosely compacted dark brownish black silty sand with pebbles and occasional charcoal.	C3	C118
113-116	N/A							

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
117	C57	2.40	2.20	0.21	Fill of pit	Firmly compacted orange brown silty sand with stone and charcoal inclusions.	C58	C57
118	N/A	0.71	0.67	0.20	Cut of pit	V shaped feature, W-E, sharp break of slope top and gradual break of slope- base with vertical to sloping sides and concave base.	C112	C2
119	N/A	0.39	0.25	0.37	Cut of posthole	Oval in shape, W-E, with sharp break of slope top and base; sides- vertical from E and sloping inwards to W; flat shape of base.	C120	C2
120	C119	0.39	0.25	0.37	Fill of posthole	Loosely compacted black silty clay with light grey hue, charcoal flecks and stones included.	C3	C119
121	N/A	0.28	0.26	0.39	Cut of posthole	Circular in shape, gradual break of slope- base with vertical sides and concave base.	C122	C2
122	C121	0.28	0.26	0.39	Fill of posthole	Very loosely compacted black soil with greyish hue, large flecks of charcoal and angular stones included.	C3	C121
123	C97	0.60	0.50	0.15	Fill of pit	Loosely compacted mid brown sandy clay with large stone included.	C98	C97
124	N/A	0.16	0.16	0.34	Cut of stakehole	Circular in shape, gradual break of slope top and base with vertical sides and concave base.	C125	C2
125	C124	0.16	0.16	0.34	Fill of stakehole	Loosely compacted greyish black silty sand, no inclusions.	C3	C124
126	Void							
127	Void							
128	N/A	2.25	1.60	0.75	Cut of pit	Oval in shape, E-W, gradual break of slope top and base with slightly concave sides and concave base.	C105	C2
129	N/A	1.00	1.00	0.30	Cut of pit	Irregular in shape, E-W, gradual break of slope with sloping sides and flat base.	C64	C2
130	C129	1.00	1.00	0.30	Fill of pit	Loosely compacted black silty sand with a few stones.	C3	C129
131	N/A	0.55	0.55	0.28	Cut of pit	Rounded in shape, sharp break of slope- top and gradual break of slope- base with concave sides and flat shape of base.	C132	C2
132	C131	0.55	0.55	0.15	Fill of pit	Loosely compacted dark grey clayey silt with small irregular stone inclusions.	C3	C131
133-134	N/A							
135	N/A	1.25	0.72	0.40		Loose to moderately compacted grey brown gravely sandy soil with a few stones.		
136	N/A	1.25	0.72	0.40		Moderate compaction, mottled orange brown and black silty soil with no inclusions.		
137	N/A	0.12	0.10	0.09	Cut of stakehole	Circular in shape, sharp break of slope- top, gradual break of slope- base with steep sides and concave base.	C138	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
138	C137	0.12	0.10	0.09	Fill of stakehole	Loosely compacted black clayey silt with greyish hue, stones and charcoal included.	C3	C137
139	N/A	0.11	0.09	0.05	Cut of stakehole	Circular in shape, sharp break of slope- top, gradual break of slope- base with steep sides and concave base.	C3	C140
140	C139	0.11	0.09	0.05	Fill of stakehole	Loosely compacted black clayey silt with greyish hue, stones and charcoal included.	C3	C139
141	C142	0.39	0.30	0.20	Fill of stakehole	Loosely compacted greyish black silty sand with charcoal and stones included.	C3	C142
142	N/A	0.39	0.30	0.20	Cut of stakehole	Oval in shape, N-S, gradual break of slope top and base with a concave base and sloping sides	C141	C2
143	C144	0.50	0.40	0.47	Fill of posthole	Loosely compacted brownish black silty clay with occasional stone and charcoal.	C3	C144
144	N/A	0.50	0.40	0.47	Cut of posthole	Oval in shape, W-E, gradual break of slope top and base with vertical sides and concave base.	C143	C2
145	N/A	0.35	0.35	0.20	Cut of pit	Rounded in shape, gradual break of slope with concave sides and concave base.	C146	C2
146	C145	0.35	0.35	0.20	Fill of pit	Loosely compacted dark greyish black clayey silt with small irregular stones and charcoal.	C3	C145
147	N/A	0.90	0.40	0.25	Cut of pit	Rectangular E-W, sharp break of slope- top and base with vertical sides and a flat base.	C148	C2
148	C147	0.90	0.40	0.25	Fill of pit	Loosely compacted dark greyish black clayey silt with small irregular stones and charcoal.	C99	C147
149	=106							
150	=109							
151	C100	2.90	2.70	0.70	Fill of pit	Loosely compacted dark greyish black sandy silt, small and large irregular stones and charcoal included.	C3	C100
152	N/A	0.67	0.42	0.21	Cut of pit	Oval in shape, N-S, sharp break of slope top and base with almost vertical sides and flat base.	C153	C2
153	C152	0.67	0.42	0.21	Fill of pit	Lightly compacted black silty clay with stones and charcoal.	C3	C152
154	Void							
155	Void							
156	Void							
157	Void							
158	N/A		1.26	0.51	Cut of ditch	Linear in shape, N-S, sharp break of slope- top and gradual break of slope- base, sloped sides and flat base	C161	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
159	C158		0.91	0.26	Fill of ditch	Loosely compacted greyish brown silty clay with occ. stones.	C3	C161
160	C158		0.39	0.27	Fill of ditch	Loosely compacted greyish black silty sand with charcoal.	C3	C161
161	C158		0.65	0.38	Fill of ditch	Loosely compacted light grey silty clay with snail shells.	C160	C158
162	=111						C149	C163
163	=111						C162	C109
164	N/A	5.50	4.30	0.30	Non-archaeological			
165	N/A	2.40	1.50	0.34	Non-archaeological			
166	C165	2.40	1.50	0.34	Non-archaeological			

Appendix 1.2 Finds Register

Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3540:003:001	3	1	Scraper	Flint convex end scraper	Flint	A flint convex end scraper produced on a single-platform flake using a soft stone hammer	N/A
E3540:003:002	3	2	Chunk	Natural chunk of quartz crystal	Quartz crystal	Natural chunk of quartz crystal	N/A
E3540:003:003	3	3	Scraper	Quartz crystal scraper	Quartz crystal	A possible quartz crystal scraper	N/A
E3540:003:004	3	4	Stone	Quartzite rubbing stone	Quartzite	A quartzite rubbing stone which is flattened and smoothened on one surface	N/A
E3540:003:005	3	5	Stone	Quartzite rubbing stone	Quartzite	A quartzite rubbing stone which is flattened and smoothened on one surface and was probably used as a mano	N/A
E3540:003:006	3	6	Pin	Copper alloy stick pin	Copper alloy	Copper alloy stick pin. Undifferentiated head (O'Rahilly Class 7). Circular shank, widens below the head and decorated with transverse lines. Dates to 12th Century – early 13th Century.	N/A

Appendix 1.3 Sample Register

During post excavation works specific samples were processed with a view to further analysis. A total of 30 soil samples were taken from features at Danesfort 2 and all 32 samples were processed by flotation and sieving through a 250µm mesh. The following are the ecofacts recovered from these samples:

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	Seeds and hazelnut	Burnt animal bone	animal bone	human bone	metallurgical waste	Other
C3	11	Mound				90.8g			
C8	2	Possible trough	3.1g						
C14	5	Pit	4.7g						
C15	8	Pit	5.5g						
C18	9	Curvilinear	0.3g						
C24	7	Pit	0.8g						

Context #	Sample #	Feature type i.e. Structure A, hearth C45	charcoal	Seeds and hazelnut	Burnt animal bone	animal bone	human bone	metallurgical waste	Other
C26	6	Pit	0.3g						
C28	4	Pit	1.3g						
C33	3	Possible trough	1.6g						
C43	16	Pit	19.5g						
C44	18	Pit	0.6g						
C51	28	Posthole	3.0g						
C53	13	Pit	0.9g						
C54	14	Pit	0.3g	<0.1g					
C56	27	Posthole	1.0g						
C58	25	Pit	4.7g	0.2g					
C60	15	Pit	3.4g						
C64	26	Pit	0.4g		0.1g				
C64	35	Pit			1.2g				
C72	36	Pit	0.3g						
C76	17	Fill of [075]	0.4g						
C82	43	Pit	0.8g						
C94	34	Pit	4.3g						
C98	24	Pit	5.1g						
C102	29	Posthole	0.7g						
C105	39	Fill of pit	0.5g						
C111	32	Posthole	3.1g						
C112	23	Posthole	0.3g						
C122	31	Posthole	35.2g						
C153	41	Fill of pit	0.2g						

Appendix 1.4 Archive Index

Project: N9/N10 Phase 4 Knocktopher to Powerstown		
Site Name: AR078 Danesfort 2		
Excavation Registration Number: E3540		
Site director: Richard Jennings		
Date: November 2010		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	14	5 pre-ex, 17 section sheets, 4 mid-ex and 5 post-ex plans
Site sections, profiles, elevations	17	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1	
Site registers (folders)	2	
Survey/levels data (origin information)	514	
Context sheets	166	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	141	
Photographs (print)	0	
Photographs (slide)	0	

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Lithics Report – Farina Sternke MA, PHD

Appendix 2.2 Small Finds Report – Siobhán Scully

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Appendix 2.4 Plant Remains Analysis Report – Penny Johnson

Appendix 2.5 Animal Bone and Burnt Bone Report – Aoife McCarthy

Appendix 2.6 Petrographical Report – Stephen Mandal MIAI PGEO

Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

Appendix 2.1 Lithics Report – Farina Sternke MA, PHD

Lithics Finds Report for E3540 Danesfort 2 (A032/065), Co. Kilkenny
N9/N10 Road Scheme – Phase 4
Farina Sternke MA, PhD

Contents

List of Tables

Introduction
A total of five lithic finds from the archaeological investigations of a prehistoric site at Danesfort 2, Co. Kilkenny were presented for analysis (Table 1). The finds are associated with a *fulacht fiadh* with an associated trough, and pits and postholes.

Find Number	Context	Material	Type	Condition	Cortex	Length (mm)	Width (mm)	Thickness (mm)	Complete	Retouch
E3540:003:1	3	Flint	Retouched artefact	Reasonably fresh	No	29	15	4	Yes	Left edge direct semi-abrupt
E3540:003:2	3	Quartz crystal	Natural chunk							
E3540:003:3	3	Quartz crystal	Retouched artefact	Reasonably fresh	No	22	9	4	Yes	Distal left edge direct abrupt
E3540:003:4	3	Quartzite	Rubbing stone	Slightly weathered		64	49	30	No	No
E3540:003:5	3	Quartzite	Rubbing stone	Slightly weathered		104	99	41	No	No

Table 1 Composition of the Lithic Assemblage from Danesfort 2 (E3540)

Methodology
All lithic artefacts are examined visually and catalogued using Microsoft Excel. The following details are recorded for each artefact which measures at least 20mm in length or width: context information, raw material type, artefact type, the presence of cortex, artefact condition, length, with and thickness measurements, fragmentation and the type of retouch (where applicable). The technological criteria recorded are based on the terminology and technology presented in Inizan *et al.* 1999. The general typological and morphological classifications are based on Woodman *et al.* 2006. Struck lithics smaller than 20mm are classed as debitage and not analysed further, unless they represent pieces of technological or typological significance, e.g. cores etc. The same is done with natural chunks.

Quantification
The lithics are one flaked piece of flint, one flaked piece of quartz crystal and two utilised pieces of quartzite (Table 1). In addition, one natural piece of quartz crystal. Four artefacts are larger than 20mm in length and width and were therefore recorded in detail.

Provenance
The lithic artefacts were recovered from context *c.* 3.

Condition:
The lithics survive in reasonably fresh (E3540:003:1 and E3540:003:3) and weathered (E3540:003:4 and E3540:003:5) condition. Two artefacts are incomplete (E3540:003:4 and E3540:003:5)

Technology/Morphology:
The artefacts are two retouched tools and two macro tools.

Retouched Artefacts:
The retouched artefacts are two miscellaneous retouched artefacts which were probably used as scrapers. Artefact E3540:003:1 is made of flint and was produced on a single-platform flake using a soft stone hammer. This artefact appears to have been used as a convex end scraper. The other retouched artefact (E3540:003:3) is made of quartz crystal. The artefacts measure 29mm and 22mm long, 15mm and

9mm wide and 4mm and 4mm thick, respectively. They most likely date to the first half of the Neolithic period.

Macro Tools:
The macro tools are two quartzite rubbing stones (E3540:003:4 and E3540:003:5) which are flattened and smoothened on one surface. Artefact E3540:003:5 was probably used as a mano. The rubbing stones measure 64mm and 104mm in length, 49mm and 99mm in width and 30mm and 41mm in thickness, respectively. They probably date to the Neolithic period.

Dating:
The assemblage is technologically and typologically diagnostic and dates to the first half of the Neolithic period.

Conservation
Lithics do not require specific conservation, but should be stored in a dry, stable environment. Preferably, each lithic should be bagged separately and contact with other lithics should be avoided, so as to prevent damage and breakage, in particular edge damage which could later be misinterpreted as retouch. Larger and heavier items are best kept in individual boxes to avoid crushing of smaller assemblage pieces.

Discussion
Flint is available in smaller nodules along the Wicklow, Wexford and Waterford coast or in the glacial tills in Co. Kilkenny in the form of remanié pebbles. The use of a limited single platform and dominant bipolar technology on small to medium sized pebbles is in parts the result of this availability. The flint used at Danesfort 2 is beach pebble flint which almost certainly derives from the Wicklow, Wexford or Waterford coast. The majority of these flint nodules are rather small pebbles with an average dimension of 30–50mm and often only permit the use of a bipolar technology to efficiently reduce the nodule achieving a maximum outcome, i.e. the largest possible amount of suitable and usable blanks. The result is the regionally dominant split pebble bipolar (Neolithic and Bronze Age) character of the south-eastern flint assemblages (O'Hare 2005).

Summary
The lithic finds from the archaeological excavation at Danesfort 2, Co. Kilkenny are a flint convex end scraper, a quartz crystal scraper and two rubbing stones. The assemblage is morphologically and technologically diagnostic and dates to the first half of the Neolithic period. It represents a residual earlier phase at this site and is most likely waste which is possibly related to domestic activities. This site makes a minor contribution to the evidence for prehistoric settlement and land use in Co. Kilkenny.

Recommendations for Illustration
- Convex End Scraper (E3540:003:1)

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Appendix 2.2 Small Finds Report – Siobhán Scully

N9/N10 Knocktopher to Powerstown
Phase 4
Danesfort 2 Small Finds Report
E3540 A032/065 AR078
Siobhán Scully, Margaret Gowen & Co. Ltd
December 2009

Introduction
This report details a single piece of metal retrieved from the excavations at Danesfort 2 (E3540) as part of the N9/N10 Knocktopher to Powerstown road scheme.

Metal
A copper alloy stick pin (003:6) with an undifferentiated head was recovered from the burnt mount spread C3. The circular, tapering shank is decorated with transverse lines and is hipped in the upper part of the shank, which would have helped the pin to grip the garment. According to O'Rahilly's typology of stick pins found in the Dublin, stick pins with undifferentiated heads date from the start of the twelfth century to the early decades of the thirteenth century (1998, 33).

Catalogue
E3540:003:6 Copper alloy stick pin. Undifferentiated head (O'Rahilly Class 7). Circular shank, widens below the head and decorated with transverse lines. L 69.5mm Diam. 1.2–2.8mm. 12th Century – early 13th Century.

Reference
O'Rahilly, C. 1998 'A Classification of Bronze Stick-Pins from the Dublin Excavations 1962-1972' in C. Manning (ed.), *Dublin and Beyond the Pale: Studies in Honour of Patrick Healy*, 23–33. Wordwell, Bray.

Appendix 2.3 Charcoal and Wood Report – Lorna O'Donnell

Site Name – Danesfort 2
Excavation Number – E3540 AR078
Co. Kilkenny
Author – Lorna O'Donnell
Date –17/7/09

Illustrations

Figures

Tables

Introduction

This report describes the charcoal analysis of samples from a burnt mound, excavated by Richard Jennings at Danesfort 2, Co. Kilkenny. The site was excavated as part of along the N9/N10 Kilcullen to Waterford Scheme, Phase 4 – Knocktopher to Powerstown (Jennings 2009). Charcoal was examined from four contexts, including pit and trough fills. The aim of the work is to identify enough suitable material for radiocarbon dating, and to provide a floristic background to the site, as well as wood selection patterns for the burnt mound. This report is summary in nature only, further analysis, discussions and comparisons of results will be incorporated into a final integrated charcoal and wood report for all sites along the N9/N10 (Lyons *et al* forthcoming).

Methodology (After IAC Ltd)

Processing

- A mechanical flotation tank using a pump and water recycling system is used for soil flotation.
- The soil is washed using a 1mm mesh in the flotation tank and a 300 micron and 1mm sieve is used to catch floated material.
- The volume of all soil samples are recorded in litres using a measuring jug.
- The sample is then placed into the 1mm mesh in the flotation tank, the tank is then filled with water and the sample washed. Any large lumps of soil can be carefully broken down by hand, but the jets of water in the flotation tank gently clean the rest of the sample.
- Once the sample is clean (just stones, charcoal, artefacts remaining in the mesh) the tank is fill up with water and at this stage any floating material (charcoal, seeds etc) should flow over the spout and into the sieves.
- The retent is then gently poured into a labelled tray (containing site code, site name, sample number and context number) and place on a shelf to dry.
- The flots are securely packaged in tissue, labelled and hung up to dry. This prevents any loss of light material (seeds) which could result once the flots are dry and being moved (if they are dried on trays).
- Before washing a new sample all equipment used (measuring jugs, 1mm mesh, sieves etc) are thoroughly washed using clean water.
- The large black settling tanks (and water) are cleaned between every site, or if a large site is being processed, every 1–2 weeks.
- Any samples containing high clay content will be soaked in water for 1–2 days to aid the sieving process.

Charcoal identification

Each piece of charcoal was examined and orientated first under low magnification (10x-40x). They were then broken to reveal their transverse, tangential and longitudinal surfaces. Pieces were mounted in plasticine, and examined under a binocular microscope with dark ground light and magnifications generally of 200x and 400x. Each taxon or species will have anatomical characteristics that are particular to them, and these are identified by comparing their relevant characteristics to keys (Schweingruber 1978; Hather 2000 and Wheeler *et al* 1989) and a reference collection supplied by the National Botanical Gardens of Ireland, Glasnevin. Fifty fragments were identified from each sample, where possible.

2.3 Details of charcoal recording

The general age group of each taxa per sample was recorded, and the growth rates were classified as slow, medium, fast or mixed. It was not within the scope of this project to measure all the ring widths from the charcoal, however, some measurements were taken with a graticule in the microscope in order to make the

scale of slow, medium and fast growth less subjective. Slow growth within the charcoal from this site was considered to be approximately 0.4mm per annum, medium approximately 1mm per annum and fast approximately 2.2mm per annum.

The ring curvature of the pieces was also noted – for example weakly curved annual rings suggest the use of trunks or larger branches, while strongly curved annual rings indicate the burning of smaller branches or trees (Fig. 1). Tyloses in vessels in species such as oak can denote the presence of heartwood. These occur when adjacent parenchyma cells penetrate the vessel walls (via the pitting) effectively blocking the vessels (Gale 2003, 37). Insect infestation is usually recognised by round holes, and is considered to be caused by burrowing insects. Their presence normally suggests the use of decayed degraded wood, which may have been gathered from the woodland floor or may have been stockpiled.

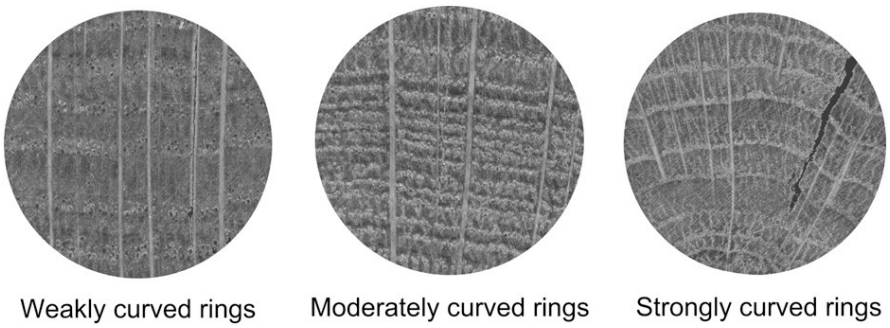

Fig. 1 Ring curvature. Weakly curved rings indicate the use of trunks or large branches.
(After Marguerie and Hunot 2007 1421, Fig. 3).

Results

Five wood taxa or trees were identified from the Danesfort 2 samples, hazel (*Corylus avellana*), ash (*Fraxinus* sp.), pomaceous fruitwood (Pomoideae), wild/bird cherry (*Prunus avium/padus*) and oak (*Quercus* sp.). The results are dominated by oak (Fig. 2).

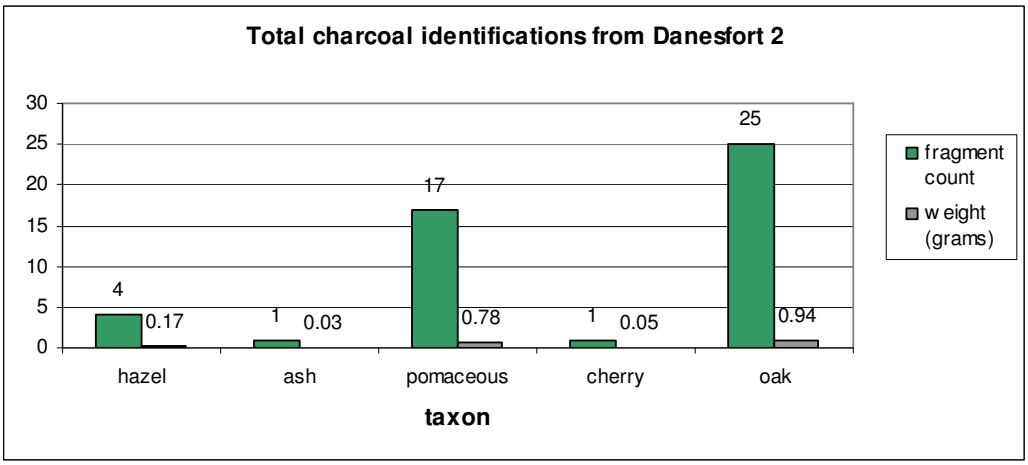

Fig. 2

Charcoal was examined from two pit fills at Danesfort 2 (Cut 93 and 109; Fill 94 and 111). The level of charcoal is low from C94, only one fragment of oak was identified. Pomaceous fruitwood and oak were identified from C111. Charcoal was also

examined from trough fills (Trough 1 Cut 7 and Trough 2 Cut 128; Fill 8 and 105). A variety of trees was identified from C8 (hazel, ash, pomaceous fruitwood and oak), while pomaceous fruitwood and oak only were identified from C105 (Table 1).

Discussion

The oak present could be either our native pedunculate (*Quercus robur*) which prefers more wet, heavier clays than the sessile oak (*Quercus petraea*) (Beckett 1979, 40–41).The Pomoideae group (pomaceous fruitwood), a sub family of the Rosaceae includes crab apple, wild pear, rowan/whitebeam and hawthorn. Crab apple (*Malus sylvestris*) is a tree of hedges, copses and oak woodland, thriving in fertile and heavy soils. It often grows singly, with large distances between individual trees (Lipscombe and Stokes 200, 78). Wild pear (*Pyrus pyraster*) can grow on woodland edges and also can be found growing in a solitary situation (Lipscombe and Stokes 2008, 114 ; Stuijts 2005, 142). Rowan (*Sorbus aucuparia*) is a tough colonizer which can tolerate peaty soils and exposed conditions. It needs plenty of light to thrive (Hickie 2002, 65). It is a tree of mountains, woodlands and valleys, growing on a wide range of soils, including chalks, acid soils and even peat (Lipscombe and Stokes 2008, 120). Whitebeam (*Sorbus aria*) grows up to 20m high and has a preference for limestone soils (Orme and Coles 1985, 11). Hawthorn (*Crataegus monogyna)* can thrive in all but the most acid of soils (Gale and Cutler 2000). As wild pear is not a native Irish species, it is likely that the charcoal represents other types encompassed in the Pomoideae group.

Hazel is a very tolerant tree, it can grow from wet to dry conditions (but not waterlogged ones (Orme and Coles 1985, 9). It was once very common in Ireland, Mc Cracken writes that it was once widespread to an extent that is hard to imagine today (1971, 19). It can grow as a tree or can form hazel scrub. Wild/bird cherry can grow well in light conditions such as near woodland margins (Orme and Coles 1985, 11).

Ash trees prefer moist, well drained and fertile soils. It is very intolerant of shade (Lipscombe and Stokes 2008, 188)

Summary

Charcoal was examined from four contexts at Danesfort 2, from two pits and two troughs. Five wood taxa were identified, the results are dominated by oak.

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Table 1 Charcoal identification details from Danesfort 2

Context number	Cut number	Sample number	Flot weight (g)	Context description	Wood taxon	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Growth	Weakly or strongly curved rings	Comment
8	7	2	3.1	Trough fill - Trough 1	*Corylus avellana* (hazel)	4	0.17	4-5	2-6	medium		radial cracks
					Fraxinus sp. (ash)	1	0.03	5-6	3-4	medium		
					Pomoideae spp. (pomaceous)	7	0.39	5-6	3-4	medium		
					Prunus avium/padus sp. (wild/bird cherry)	1	0.05	5-6	3-4	medium		
					Quercus sp. (oak)	3	0.22	5-6	3-4	medium		
94	93	14	0.3	Pit fill	*Quercus* sp. (oak)	1	0.01					
105	128	39	3.5	Trough fill - Trough 2	Pomoideae spp. (pomaceous)	5	0.08	4-5	2-3	medium	strongly curved	
					Quercus sp. (oak)	15	0.21	4-5	2-3	slow		
111	109	32	3.1	Pit fill	Pomoideae spp. (pomaceous)	5	0.31	4-5	2-4	medium		
					Quercus sp. (oak)	6	0.5	4-5	2-4	medium		

Appendix 2.4 Plant Remains Analysis Report – Penny Johnston

Plant Remains Analysis Report for
E3540 Danesfort 2 (A032/065), Co. Kilkenny
N9/N10 Road Scheme – Phase 4

Penny Johnston, Eachtra

Introduction
This report details the analysis of plant remains recovered from excavations in advance of the construction of the N9/N10 Knocktopher to Powerstown Road (Phase 4). The excavation was directed by Richard Jennings on behalf of Irish Archaeological Consultancy Ltd. The archaeological site was located in the townland of Danesfort (E3540).

The excavated remains included evidence for Bronze Age occupation and burnt mound/*fulachta fiadh* activity.

Methodology
The samples were processed by the client, who also carried out a preliminary sorting of the samples. This pre-selection of the plant remains may bias the final plant records from these sites, as it is possible that many small items, such as weed seeds and chaff, were not picked out.

The selected material was sent to Eachtra Archaeological Projects where it was examined under a low-powered binocular microscope (X6 –X45). Suitable plant material was identified and the results of analysis are presented.

Danesfort 2 E3540 AR078
This was a burnt mound/*fulacht fiadh* site with deposits of charcoal and heat affected stones, a trough, several pits and a well. A total of 2 samples were examined from this site, C.58 (S.25) and C.54 (S.14). There were no charred seeds from these samples.

Appendix 2.5 Animal Bone Report – Aoife McCarthy

Osteoarchaeological Report of Faunal Remains and Burnt Bone from
E3540 A032/: Danesfort 2 AR078
Co. Kilkenny
N9/N10 Kilcullen to Waterford Scheme
Phase 4: Knocktopher to Powerstown

Author: Aoife McCarthy MA BA
Date: March 2010

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1. Introduction

1.1 Introduction

This report details the osteological analysis of faunal remains and burnt bone samples recovered during excavations at Site E3540 AR078 Danesfort 2 in the townland of Danesfort, Co. Kilkenny as part of the archaeological mitigation programme of the N9/N10 Kilcullen to Waterford Road Scheme. Aoife McCarthy MA (Osteoarchaeology University of Southampton 2006) undertook the analysis on behalf of Irish Archaeological Consultancy Ltd in February 2010. At the time of writing this report, background archaeological information was obtained from a draft interim excavation report (Jennings, R. 2009) and from consulting the original site register documents.

1.2 General Osteological Information

The osteological analysis of both hand retrieved faunal remains and burnt bone fragments recovered during sieving of bulk soil samples was undertaken to provide an overview of the osteoarchaeological aspect of the site and determine if the material could provide further interpretation of site activity.

A total of 51 fragments from 45 possible skeletal elements and weighing 91.93g were recorded within the assemblage. The degree of preservation of the bone assemblage recovered varied from well preserved to moderate preservation for retrieved faunal remains and to poor for burnt bone fragments. A modest rate of fragmentation was also noted within the combined assemblage.

A large portion of the faunal remains assemblage recovered at Danesfort 2 originated from C64 the black silty-sand fill of pit feature C63 which accounted for 36 bone fragments or 70.6% of the total. A series of two charcoal samples retrieved from archaeological contexts C105 and C54 were classified to species and issued for AMS dating. A sample of *prunus spp* charcoal identified within pit fill C105 was sent for radiocarbon dating and returned a two sigma calibrated date of Cal. 744–407BC; whilst ash and *prunus spp* charcoal retrieved within pit fill C54 returned a two sigma calibrated date of Cal. 2464–2214BC. The AMS dates returned place activity within the Bronze Age, stretching into the early Iron Age period.

A total of 9 bone fragments (17.6%) of the combined assemblage were classified to species. Due to fragmentation combined with poor preservation and small size of the individual bone fragments it was not possible to identify 42 fragments (82.4%) these were classed as indeterminate vertebrate. Bone elements were identified where possible.

The faunal remains assemblage recovered from Danesfort 2 contained bones from a possible 4 different species including; cow, pig, sheep and goat. The domestic species of pig and cow accounted for 5 fragments (55.6%) and 2 fragments (22.2%) respectively of identified material.

2. Methodology

SPECIES IDENTIFICATION: Identification of the bones involved reference to Schmid (1972) and Hillson (1992) as well as comparison with the author's own reference material. The closely related taxa of sheep and goat are difficult to distinguish and where grouped under the term '*caprinae*'

- NISP: Number of Identified Specimens Indicates the total number of fragments found.

- MNI: Minimum Number of Individuals. Indicates the minimum number of individuals from every species that were present in the material. Estimating MNI is calculated on the specimen of the most abundant skeletal element present; whilst taking age, sex, size and archaeological context into account.

- In order to calculate accurate MNI and MNE figures for each species, bird as well as mammal, a method of zoning was implemented when recording (Serjeantson, 2000). This method was used so as to compensate for any possible biases due to fragmentation; siding was also taken into account at this point.

- MNE: Minimum Number of Elements. Indicates the minimum number of anatomical units that are present and what side they are from. To avoid getting a higher MNE all loose epiphyses have to be paired with all un-fused diaphysis.

AGEING: Two main methods are used to determine the age of faunal remains; tooth eruption and degree of Epiphysial fusion (a less reliable method). Tooth eruption and wear stages were recorded for the following teeth where possible; dP4 (deciduous fourth premolar), P4 (fourth premolar), M1 (first molar), M2 (second molar) and M3 (third molar) of cattle, sheep/goat and pig (Grant 1982). The analysis of tooth wear patterns refers to the alteration of the enamel surface and exposure of inner dentine through use.

BIOMETRICAL DATA: Due to fragmentation, small size and the nature of the remains recovered measurements and biometrical analysis was not possible.

SEX DETERMINATION: Sex determination of animal remains is possible by analysis of certain sexually dimorphic elements. For example goat horncores may be classified as male or female based on their morphology and cattle metacarpals can be defined as male or female through calculation of the slenderness index (McCormick 1992). Sexual determination of species was not possible due fragmentation and the nature of the bone material recovered from Danesfort 2.

BUTCHERY/GNAWING/BURNING: Evidence for butchery was recorded under the categories of cut, chopped, chopped and cut. All specimens were analysed for evidence of rodent or carnivorous gnawing as well as evidence of burning. Burnt bones were recorded in accordance with colour changes resulting from differing heat levels e.g. calcined bones acquire a bluish-whitish hue through exposure to high temperatures.

PATHOLOGY: The discovery of any injury and/or pathology was recorded for all specimens, where present.

3. Results

Context 3 Sample 11
A total of 15 bone fragments (90.6g) representing 12 possible skeletal elements were identified within burnt clay spread C3. Species identified within spread material C3 included cow, pig and sheep/goat (*caprinae*). Small fragment size combined with a poor degree of preservation meant it was not possible to identify the species of 6 fragments (24.3g).

***Bos*/Cow**
A moderately preserved fragment of tibia diaphysis and a complete naviculo-cuboid (51.7g) were recovered. The single tibia diaphysis fragment displayed evidence of minor singeing in the form of blackening of the bone surface. As Devlin J.P. & Herrmann N. P (2008, 109) state "increasing exposure to heat bone progresses through a sequence of colours from unburned tan, to shades of dark brown to black, progressing to blue and grey and finally to white." A low degree of surface eburnation was recorded on the auricular surfaces of the complete naviculo-cuboid bone; indicating possible osteoarthritis.

***Sus*/Pig**
A series of 5 poorly preserved fragments of rib corpus (5.9g) were recovered from spread material C3. Measurements of the largest rib corpus fragment were recorded at 49mm long, 22mm wide and 7mm thick. Frequent chatter marks and surface striations consistent with rodent gnawing were noted on all 5 rib corpus fragments.

Sheep/Goat (*Caprinae*)
Loose permanent caprinae Molar 1 & Molar 2 teeth were recovered within clay spread C3. Dental wear patterns were recorded for both retrieved mandibular teeth. The single age category of 2–3 Years was represented (Appendix 1).

Indeterminate Vertebrate
Due to fragmentation, poor preservation and small fragment size 6 bone fragments recovered from spread material C3 were not identified to species. A single tibia diaphysis fragment from a large size vertebrate showed evidence of exposure to a high level of heat; resulting in calcination of the bone surface and colour change to grey. Evidence of butchery in the form cut and chop marks were also catalogued on the tibia diaphysis fragment. Frequent surface striations combined with chatter marks consistent with rodent gnawing were noted on 2 diaphysis fragments. A quantity of 4 of the unidentifiable bone fragments recovered comprised small–tiny fragments of trabecular bone.

Context 64 Sample 35
A series of 32 calcined rib corpus, long bone and unidentifiable burnt bone fragments (1.23g) of a small size mammal were retrieved within C64 the silty-sand fill of pit feature C63.

Indeterminate Vertebrate
A high degree of fragmentation combined with small fragment size and poor preservation meant that the long bone diaphysis, rib corpus and unidentifiable burnt bone fragments recovered from pit fill C64 were not identifiable to species. The long bone diaphysis fragment retrieved measured 9mm long, 6mm wide and 4mm thick. All 32 bone fragments displayed evidence of exposure to a high level of heat and resulting calcination of the bone. This was manifested as bone surface colour change to grey-white, combined with bone surface cracking. Contact of bone with heat diminishes its moisture content and results in the combustion of the organic or collagen component; the remaining structure of the bone after this process is mineral. A white or pale grey colour indicates exposure of bone to temperatures in excess of *c.* 600°C combined with a ready oxygen supply (McKinley, 2004). Such distortion to the bone structure reduces its size and as detailed above alters bone colour (Luff R. & Pearce J. 1994). A quantity of 20 unidentifiable bone fragments recovered consisted of small–tiny fragments of trabecular bone.

Context 64 Sample 26
A total of 4 calcined fragments of unidentifiable trabecular bone were recovered within sample 26 of pit fill C64.

4. Summary
Fifty one animal bone & burnt bone fragments recovered from archaeological contexts C3 and C64 on Danesfort 2 were submitted for examination. The bone samples were assessed and identified to species where possible; a total of 9 bone fragments recovered were identified to the species of cow, pig, sheep and goat. Due to the size and fragmented nature of the individual bone pieces it was not possible to identify 42 fragments to species. No definite or statistically detailed conclusions could be drawn from the faunal remains and burnt bone assemblage retrieved from Site AR078 Danesfort 2 due to its limited size and poor degree of bone preservation. A series of early Neolithic lithic aretfacts as well as a copper alloy medieval stick pin were also recovered within clay spread C3.

Bone Database:

Spec	C	S	Taxa	Anat	Side	Prox	Dist	1	2	3	4	5	6	7	8	But	Bu	G	Q	W (g)	Comments
1	C3	11	Shp/Gt	M1	R														1	3.30	Single loose M1 tooth in wear. Dental notes taken.
2	C3	11	Shp/Gt	M2	R														1	5.40	Single loose M2 tooth in wear. Dental notes taken.
3	C3	11	Pig Sz	Rib	R													R	4	5.00	Series of moderately preserved fragments of corpus, degree of trabecular bone exposed. Length 49mm, Width 22mm, Thickness 7mm
4	C3	11	Cow	Tibia			fsd							1			B		1	37.70	Moderately preserved, distal tibia fragment. Minor singeing of surface, degree of trabecular bone exposed.
5	C3	11	Unid	Tibia						1						7a, 12a	G	R	1	23.40	Well preserved fragment. Large sz mammal. Minor exposure to heat, surface greyed
6	C3	11	Unid	Unid															4	0.30	Small poorly preserved fragments of trabecular bone
7	C3	11	Pig Sz	Rib														R	1	0.90	Trabecular bone exposed poor preservation.
8	C3	11	Unid	Unid													Br, B	R	1	0.60	Trabecular bone exposed poor preservation.
9	C3	11	Cow	Naviculo-Cuboid	R			1	1	1	1	1	1	1	1				1	14.00	Well preserved & complete. Low degree of eburnation on auricular surfaces
10	C64	26	Unid	Unid													W, G		4	0.10	Series of small-tiny calcined fragments of trabecular bone
11	C64	35	Unid	Long Bone													W, G		8	0.58	Series of calcined fragments of long bone diaphysis. Small sz mammal Largest fragment 9mm long, 6mm wide & 4mm thick
12	C64	35	Unid	Rib													W, G		4	0.33	Poorly preserved, calcined fragments of rib corpus, trabecular bone.
13	C64	35	Unid	Unid													W, G		20	0.32	Series of small-tiny calcined fragments of trabecular bone

Key:

C= Context
S=Sample
Anat=Anatomical Element
Prox=Proximal
Dist=Distal

But=Butchery
Bu=Burnt
G=Gnaw
Q=Quantity of Pieces
G=Grey

N=No
Unid=Unidentifiable
Taxa=Taxon
B=Black

W=White
R=Rodent
Cn=Carnivore

Table 1: Dental Ageing Database

SPEC No	C	S	TAXA	(DP4) P4	M1	M2	M3	COMMENTS/AGE CATEGORY
1	C3	11	Shp/Gt		H			2-3 Years
2	C3	11	Shp/Gt			G-H		2-3 Years

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GLOSSARY OF TERMS:
BOS: Latin term for Cow
SUS: Latin term for Pig
CERVUS: Latin term for Deer
EQUUS: Latin term for Horse
OVIS: Latin term for Sheep
CAPRINAE: Latin term for Sheep/Goat
CANIS: Latin term for Dog
LEPUS: Latin term for Hare
AVES: Latin term for Bird
TAPHONOMY: The study of the processes affecting an organism after death from the time of burial until collection.
TRABECULAR BONE: Osseous tissues that fill the interior cavity of bones and resemble a sponge or honeycomb.
DIAPHYSIS: Bone shaft
CORPUS COSTAE: Body of Rib Bone

Appendix 2.6 Petrographical Report – Stephen Mandal MIAI PGEO

Petrographical Report on Site Samples Taken During Archaeological Excavations at Danesfort 2 (E3540), Co. Kilkenny

Eurgeol Dr Stephen Mandal MIAI PGEO

Introduction
This report is based on the macroscopic (hand specimen) examination of stone samples taken during archaeological excavations in advance of the N9/N10 Phase 4 Knocktopher to Powerstown Road Scheme. The purpose of the study was to identify the rock types from which the stone objects were made, to highlight potential sources for them, and to comment on their possible function. It is important to note that macroscopic petrographical studies have been considered of limited value in comparison to microscopic (thin section and geochemical analysis) studies. On the other hand, macroscopic studies provide an excellent preliminary assessment tool and have proven to be of considerable value in petrographical studies (e.g. see Mandal 1997; Cooney and Mandal 1998).

Solid Geology and Soils of the Site (see Figure 1; McConnell 1994)
The bedrock under the site consists of fossiliferous dark-grey muddy limestone belonging to the Ballysteen Formation (shown on Figure 1 as BA).

The stratigraphical sequence in the area consists of the following. Gaps in the stratigraphically sequence are represented by line breaks.

Carboniferous (Silesian)
Killeshin Silstone Formation (KN) – Muddy siltstone and silty mudstone
Luggacurren Shale Formation (LS) – Mudstone and shale with chert and limestone

Carboniferous (Dinantian)
Clogrenan Formation (CL) – Cherty, muddy calcarenite limestone
Ballyadams Formation (BM) – Crinoidal wackestone/ packstone limestone
Butlersgrove Formation (BU) – Very dark grey argillaceous limestones
Ballysteen Formation (BA) – Fossiliferous dark-grey muddy limestone
Ballymartin Formation (BT) – Limestone and dark grey calcareous shales
Porter's Gate Formation (PG) – Sandstones, shales and thin limestones

Devonian
Kiltorean Formation (KT) – Yellow and red sandstones, green mudstones
Carrigmaclea Formation (CI) – Red, brown conglomerates and sandstones

Ordovician
Oaklands Formation (OA) – Green, red-purple, buff shale, siltstone
Maulin Formation (MN) – Dark blue-grey slate, phyllite, schist

Igneous Intrusions (undated)
Granite (Gr) – Undifferntiated
Dolerite (D)

The geology of the area is generally dominated by Lower Carboniferous Age rocks, principally limestones. These rocks, which also make up much of the Midlands of Ireland, represent the northward return of the sea at the end of the Devonian, *c.* 360 million years ago, owing to the opening of a new ocean to the south called the Palaeo-Tethys in what is now central Europe.

To the south of the study area occur Ordovician-Devonian Age rocks. The Devonian Age rocks consist of coarse sandstone and conglomerates representing terrestrial sediments resulting from a period of tectonic uplift.

The older, Ordovician Age rocks represent tectonic activity, relating to the closure of the Iaepetus Ocean, a major ocean which at its widest was probably greater than

3000km across. These rocks have been metamorphosed to slates, phyllites and schists by the intrusion of the Tullow granite pluton *c.* 405 million years ago.

Bedrock is not exposed at surface at the site; instead the overburden consists of boulder clay; surface drift from early glaciations. The area is part of a physical region known as the Caledonian province of the south-east. The soils of the area consist of acid brown earths (Aalen et al. 1997).

Results

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
Danesfort 2	A032/065	AR078	E3540	2	8	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	3	33	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	4	28	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	13	53	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	14	54	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red, contains burnt limestone piece
Danesfort 2	A032/065	AR078	E3540	15	60	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	16	43	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	17	76	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	23	112	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	26	64	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	27	56	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	29	102	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	31	122	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	32	111	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	34	93/94	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	36	72	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	39	105	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red
Danesfort 2	A032/065	AR078	E3540	41	153	Burnt;	Angular to Sub-rounded; broken	Sandstone, coarse grained, quartz rich, red

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
							cobbles	
Danesfort 2	A032/065	AR078	E3540	43	82	Burnt;	Angular to Sub-rounded; broken cobbles	Sandstone, coarse grained, quartz rich, red

Table 1. Results of petrographical analysis of stone samples from the site

Potential Sources
Coarse grained sandstone does not occur in bedrock in the immediate vicinity of the site. The dominant rock type in the area is limestone. Whilst there are minor sandstones within some of the limestone formations, the closest bedrock source for coarse grained yellow / red sandstone is within the Devonian Age Kiltorean Formation (yellow and red sandstones, green mudstones) and Carrigmaclea Formation (red, brown conglomerates and sandstones) (see Figure 1, shown as KT and CI respectively). It is important to note that these rock types were not necessarily sourced from bedrock. The sample is clearly a shattered cobble, indicating a secondary source, such as in the glacial tills / river cobbles. It is therefore possible that these rocks were sourced locally.

Discussion
Whilst it is not possible to determine a definitive source for these stone samples based on macroscopic examination alone, it can be stated that these rock types are available locally in outcrop and within the glacial tills / sub-soils. It is therefore probable that the material in these samples were sourced in the vicinity of the site.

A total of 52 samples were also examined from the scheme across 6 sites during the course of the main excavations (A032 – phase 4; see Table 2). The samples showed a remarkable consistency across the scheme in terms of the principal rock type utilised; coarse grained sandstone, typically red in colour. All samples contain a variation of this type of rock as their principal component. All but one of the samples from UA2 (sample 3) are clearly burnt / altered. All contain angular pieces of stone. A total of 37 (70%) also contain sub-rounded to rounded pieces; in all cases these samples contain pebbles and / or cobbles, in most cases broken. Three of the samples contain minor amounts of limestone as a secondary rock type to sandstone.

Site	Licence			No.	Burnt	Angular	Rounded	Limestone
UA2				3	2	3	0	0
Baysrath 4	A032/089	AR057	E3629	2	2	2	2	2
Danganbeg 1	A032/075	AR058	E3606	15	15	15	15	0
Stonecarthy West 1	A032/079	AR067	E3610	8	8	8	0	0
Danesfort 2	A032/065	AR078	E3540	19	19	19	19	1
Danesfort 5	A032/058	AR082	E3456	5	5	5	0	0
Grand Total				**53**	**52**	**53**	**37**	**3**

Table 2. Results of petrographical analysis of stone samples from the N9/N10 Phase 4 Road Scheme

These samples are also very consistent with the samples examined from the N9/N10 Phase 4b road scheme to the north.

Coarse grained sandstone is typical of *fulacht fiadh* material (e.g. see Mandal 2004). The use of angular and rounded pieces is interesting. Rounded pieces and / or the use of pebbles / cobbles is clear evidence of the use of secondary sources. Angular

pieces are more indicative of the use of bedrock sources, but it is important to note that they could also represent angular blocks occurring in tills.

It is significant that sandstone is the predominant rock type given that, due to the differing underlying bedrock, it would not be the most abundant rock type available, either in outcrop or in the overlying tills. This indicates that sandstones were deliberately being selected for use in preference to the more abundant finer grained rock types in the area.

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Appendix 2.7 Radiocarbon Dating Results – QUB Laboratory

The "Measured radiocarbon age" is quoted in conventional years BP (before AD 1950). The error is expressed at the one-sigma level of confidence.

The "Calibrated date range" is equivalent to the probable calendrical age of the sample material and is expressed at the two-sigma (95.4% probability) level of confidence.

Calibration data set: intcal04.14c (UBA 11000, 12186)

Calibration data set: intcal09.14c (UBA 15553, 15554)

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C105, Fill of C128	39	Charcoal	*Prunus spp.* / 0.1g	QUB	UBA 11000	AMS (Std)	703–414 BC (1 sigma), 744–407 BC (2 sigma)	2434±20	-22.6
C54, Fill of a pit	14	Charcoal	*Fraxinus excelsior &Prunus spp.* / 0.5g	QUB	UBA 12186	AMS (Std)	2453–2293BC(1 sigma), 2464–2214BC (2 sigma)	3869±26	-21.8
C111, Fill of waterhole	32	Charcoal	Pomoideae / 0.1g	QUB	UBA 15553	AMS (Std)	2024–1943BC (1 Sigma) 2116–1893BC (2 Sigma)	3619±30	-28.8
C122, Fill of a posthole	31	Charcoal	*Cherry*	QUB	UBA 15554	AMS (Std)	797–769BC (1 Sigma) 806–595BC (2 Sigma)	2571±25	-26.9

References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, PG Blackwell, C Bronk Ramsey, CE Buck, GS Burr, RL Edwards, M Friedrich, PM Grootes, TP Guilderson, I Hajdas, TJ Heaton, AG Hogg, KA Hughen, KF Kaiser, B Kromer, FG McCormac, SW Manning, RW Reimer, DA Richards, JR Southon, S Talamo, CSM Turney, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111–1150.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14
NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

APPENDIX 3 LIST OF RMP IN AREA

RMP No	Description
KK023-005	Enclosure
KK023-007	Moated site
KK023-081001	Church
KK023-081002	Graveyard
KK023-081003	Grave slab
KK023-077	Ringfort (Unclassified)
KK023-076	Ringfort (Unclassified)
KK023-080	Castle Ringwork
KK023-080001	Designed Landscape (Folly)
KK023-083	Not in RMP
KK023-078	Ringfort (Unclassified)
KK023-079	Ringfort (Unclassified)

See Figure 2 for location.

APPENDIX 4 LIST OF SITE NAMES

Site Name	Site Code	E Number	Director	NGR
Baysrath 2	AR055	E3627	Fintan Walsh	251593/137855
Baysrath 3	AR056	E3628	Fintan Walsh	251672/138000
Baysrath 4	AR057	E3629	Fintan Walsh	251515/138280
Danganbeg 1	AR058	E3606	Emma Devine	251462/138754
Danganbeg 2	AR059	E3607	Emma Devine	251397/138939
Danganbeg 3	AR060	E3671	Emma Devine	251430/139245
Danganbeg 4	AR061	E3676	Emma Devine	251401/139372
Knockadrina 1	AR062	E3677	Ed Lyne	251422/139420
Tinvaun 1	AR063	E3678	Ed Lyne	251482/139625
Tinvaun 2	AR064	E3680	James Kyle	251445/139736
Tinvaun 3	AR065	E3608	James Kyle	251501/139832
Tinvaun 4	AR066	E3609	James Kyle	251508/139917
Stonecarthy West 1	AR067	E3610	James Kyle	251538/140023
Knockadrina 2	AR068	E3611	James Kyle	251647/140237
Rathduff 1	AR069	E3612	Ed Lyne	251286/142167
Rathduff Upper 1	AR070	E3613	Ed Lyne	251280/142559
Kellsgrange 1	AR071	E3575	James Kyle	250911/143732
Kellsgrange 2	AR072	E3577	James Kyle	250967/143861
Kellsgrange 3	AR073	E3576	James Kyle	250948/144003
Ennisnag 1	AR074	E3614	Richard Jennings	251416/145690
Ennisnag 2	AR075	E3615	Richard Jennings	251638/146068
Danesfort 12	AR076	E3616	Richard Jennings	251669/146186
Danesfort 13	AR077	E3617	Richard Jennings	251765/146384
Danesfort 2	AR078	E3540	Richard Jennings	251953/146745
Danesfort 4	AR079	E3539	Richard Jennings	251880/147579
Danesfort 3	AR080A	E3542	Richard Jennings	252221/146845
Danesfort 1	AR080B	E3541	Richard Jennings	252267/146707
Croan 1	AR081	E3543	Emma Devine	252280/147332
Danesfort 5	AR082	E3456	Emma Devine	252567/147767
Danesfort 6	AR083	E3538	Emma Devine	252764/147995
Danesfort 7	AR084	E3537	Emma Devine	252878/148099
Danesfort 8	AR085	E3461	Richard Jennings	253020/148246
Danesfort 9	AR086	E3458	Richard Jennings	253089/148345
Danesfort 10	AR087	E3459	Richard Jennings	253229/148414
Danesfort 11	AR088	E3460	Richard Jennings	253245/148462
Rathclogh 1	AR089	E3726	Patricia Lynch	253365/145515
Rathclogh 2	AR090	E3727	Patricia Lynch	253650/148848
Kilree 1	AR091	E3728	Patricia Lynch	254088/149310
Kilree 2	AR092	E3729	Patricia Lynch	254320/149500
Kilree 3	AR093	E3643	Patricia Lynch	254449, 149639
Kilree 4	AR094	E3730	Patricia Lynch	255330/150084
Dunbell Big 2	AR095	E3853	Yvonne Whitty	256684/151066
Holdenstown 1	AR096	E3681	Yvonne Whitty	256737/151253
Holdenstown 2	AR097/98	E3630	Yvonne Whitty	256891/151781
Holdenstown 3	AR099	E3854	Yvonne Whitty	256990/152085
Holdenstown 4	AR100	E3682	Yvonne Whitty	256828/152048
Dunbell Big 1	AR101	E3855	Yvonne Whitty	257034/152315
Rathcash 1	AR102	E3859	Tim Coughlan	258178/154199
Rathcash 2	AR103	E3860	Tim Coughlan	258294/154293
Rathcash East 1	AR104	E3892	Tim Coughlan	259419/154546
Rathcash East 2	AR105	E3893	Tim Coughlan	259555/154566
Rathcash East 3	AR106	E3861	Tim Coughlan	259821/154653
Blanchvillespark 1	AR107	E3894	Richard Jennings	260535/155212
Blanchvillespark 2	AR108	E3895	Tim Coughlan	260637/155449
Blanchvillespark 3	AR109	E3913	Tim Coughlan	260785/155653

Site Name	Site Code	E Number	Director	NGR
Blanchvillespark 4	AR110	E3914	Tim Coughlan	261442/156269
Blanchvillespark / Ballyquirk 1	AR111	E3862	Ruth Elliott	261531/156323
Ballyquirk 1	AR112	E3863	Ruth Elliott	261531/156323
Ballyquirk 2	AR113	E3864	Ruth Elliott	261811/156508
Ballyquirk 3	AR114	E3865	Ruth Elliott	261875/156559
Ballinvally 1	AR115	E3836	Emma Devine	263258/157521
Garryduff 1	AR116	E3852	Emma Devine	263933/157991
Kilmacahill 1	AR117	E3915	Tim Coughlan	264267/158369
Kilmacahill 2	AR118	E3833	Tim Coughlan	264380/158453
Jordanstown 1	AR119	E3834	James Kyle	264546/158643
Jordanstown 2	AR120	E3851	James Kyle	264893/159038
Kellymount 6	AR121	E3758	Przemaslaw Wierbicki	265130,159277
Jordanstown 3	AR122	E3916	Przemaslaw Wierbicki	265103/159227
Kellymount 1	AR123	E3756	Przemaslaw Wierbicki	265250/159397
Kellymount 2	AR124	E3757	Przemaslaw Wierbicki	265164/159463
Kellymount 3	AR125	E3856	Przemaslaw Wierbicki	265338/159597
Kellymount 4	AR126	E3857	Przemaslaw Wierbicki	265412/159803
Kellymount 5	AR127	E3858	Przemaslaw Wierbicki	265530,159977
Shankill 2	AR128	E3738	Richard Jennings	265924/160651.
Shankill 3	AR129	E3737	Richard Jennings	266052/161141
Shankill 4	AR130	E3838	Richard Jennings	266286/161526
Shankill 5	AR131	E3850	Richard Jennings	266374/161730
Shankill 6	AR132	E3840	Richard Jennings	266403/161836
Moanmore 1	AR133	E3835	Richard Jennings	266476/162016
Moanmore 2	AR134	E3843	Sinead Phelan	266756/162866
Moanmore 3	AR135	E3837	Sinead Phelan	266856/163259
Bannagagole 1	AR136	E3844	Sinead Phelan	266942/163569
Moanduff 1	AR137	E3839	Robert Lynch	267261/164397
Coneykeare 1	AR138	E3683	Sinead Phelan	267836/166209
Coolnakisha 1	AR139	E3768	Ellen O'Carroll	268175/167274
Coolnakisha 2	AR140	E3767	Ellen O'Carroll	268306/167559
Cranavonane 1	AR141	E3842	Tim Coughlan	268554/167895
Cranavonane 2	AR142	E3732	Ellen O'Carroll	268830/168154
Cranavonane 3	AR143	E3731	Ellen O'Carroll	269123/168362
Tomard Lower 1	AR144	E3733	Ellen O'Carroll	269349/168496
Paulstown 1	AR145	E3642	Ruth Elliot	265889/158499
Paulstown 2	AR146	E3632	Ruth Elliot	265664/158651
Rathgarvan or Clifden 1	AR147	E3760	Przemaslaw Wierbicki	257026/154123
Maddockstown 1	AR148	E3759	Przemaslaw Wierbicki	256886/154199
Templemartin 3	AR149	E3845	Emma Devine	255095/155200
Templemartin 4	AR150	E3841	Emma Devine	254920/155427
Templemartin 5	AR151	E3846	Emma Devine	254706/155636
Templemartin 1	AR152	E3849	Emma Devine	254504/155826
Templemartin 2	AR153	E3847	Emma Devine	254173/156236
Leggetsrath East 1	AR154	E3734	Emma Devine	253793/156484
Moanduff 2	AR155	E3735	Sinead Phelan	267470/164887
Moanduff 3	AR156	E3736	Sinead Phelan	267515/164979
Ballyquirk 4	AR157	E3848	Richard Jennings	262596/157025
Shankill 1	AR158	E3766	Przemaslaw Wierbicki	265707/160269
Rathgarvan or Clifden 2	AR159	E3921	Tim Coughlan	257095/154119
Ballynolan 1	AR160	E3755	Sinead Phelan	267714/165597
Rathduff Upper 3	UA2	E3974	Tim Coughlan	250991/143565
Rathduff Bayley	UA4	E4011	Tim Coughlan	251005/143564