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COMHAIRLE CHONTAE CHEATHARLOCHA

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

Ministerial Direction Scheme Reference No.	A032
Registration No.	E3835
Site Name	AR133, Moanmore 1
Townland	Moanmore
County	Carlow
Excavation Director	Richard Jennings
NGR	266476 162016
Chainage	67640

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	E3835
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	AR133, Moanmore 1
Site Type	Burnt mound complex
Townland(s)	Moanmore
Parish	Callan
County	Carlow
NGR (easting)	266476
NGR (northing)	162016
Chainage	67640
Height OD (m)	59.690
RMP No.	N/A
Excavation Dates	7 November–12 December 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, R. and Coughlan, T. 2012 E3835 Moanmore 1 Final Report. Unpublished Final Report. National Monument Service. Department of the Environment, Heritage and Local Government, Dublin.

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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.

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 AR133, Moanmore 1 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 E3835 issued by the DOEHLG in consultation with the National Museum of Ireland for IAC. The fieldwork took place between the 7 November and 12 December 2007.

Excavation at Moanmore 1 produced evidence of burnt mound activity. The activity was located at the site of a former stream or paleo-channel. The stream may represent an earlier channel of a small tributary of the Barrow that flows to the south of the site. The burnt mound activity was located at the bend in this watercourse. The majority of the activity was focussed on the south-west side of the stream and two separate troughs and a pit were located here. Trough 1 was roughly oval in plan, although a shallow extension of the cut to the west may have created a step, possibly for accessing the trough. A small circular pit was located to the south of Trough 1. Its function is unclear. To the west of Trough 1 and the pit was Trough 2. This was slightly larger than Trough 1 and had a post/stakehole in each corner. This was evidence that the trough was probably originally lined, most likely by timber planks that were held in position by the corner posts. Radiocarbon dating of the pit and Trough 2 indicates that the activity on the southwest of the stream bend is contemporary and dated to the mid-late Bronze Age.

Between Troughs 1 and 2 were four separate sets of post and stakeholes that appeared to make up the four corners of a roughly north south aligned square (Figure 5). The post/stakeholes in the two western groups were generally larger than those in the eastern groups. The concentration of postholes and stakeholes would suggest that one or more structures, associated with burnt mound activity, existed to the east of Trough 2. It seems likely that any erected structure was more directly associated with Trough 2 as the west posts/stakes appear to flank a possible entrance to the trough. The mirroring of the north-south clustering on the east side, despite the posts/stakes being smaller, would point towards a single structure that would have supported a canopy or light roof. This would have covered over the area in front of the entrance to Trough 2 and potentially covered a walkway between the two troughs. The quantity of post/stakeholes and the evidence of re-cutting of earlier posts/stakes would suggest that the structure or structures were temporary in nature and were rebuilt each time the trough was used.

A third trough (Trough 3) was located on the north side of the former water channel. Trough 3 was sub-rectangular in plan. Post/stakeholes around the perimeter of part of the base suggest that it was originally timber lined. The trough is undated so it is unclear whether it is contemporary with the activity on the other side of the stream. The burnt mound deposits associated with the activity on both sides of the river had become merged although the deposit most likely associated with Trough 3 had a distinctly redder tone. The reason for this is unclear.

In the north of the site there were three isolated pits which were filled with burnt mound material. Due to their distance from the main burnt mound activity it is unlikely that they are contemporary or related. They may represent a series of pit boilers or oven roasters, as no overlying mound deposit was recorded in the area.

Overlying the burnt mound deposits by the stream was a deposit of silty clay. This appeared to have formed naturally but it is not known when. It sealed some of the perimeter of the burnt mound spreads and may be associated with silt developing due to the stream being blocked with burnt mound material.

A total of two samples were sent for AMS radiocarbon dating. A sample of alder charcoal from pit fill C147 was radiocarbon dated. The 2 sigma calibrated result was 1258–1030BC (UBA 14052). A sample of ash charcoal from pit fill C37 was also radiocarbon dated. The 2 sigma calibrated result was 1256–937BC (UBA 14122).

This site consisted of a burnt mound complex situated beside a bend in a silted-up stream. The site is important locally as there have been few archaeological monuments recorded in this area dating to the Bronze Age and it represents the first site in the area definitively dated to the late Bonze Age. The site is also of regional importance in terms of the research and study of burnt mound sites and the function and form. The potential for structural activity between the two troughs is significant and the identification of structures outside the troughs themselves is not commonplace on burnt mound excavations. The fact that these structures were repeatedly erected in the same location shows that the site had multiple phases/seasons of use. This suggests that the site was not the location of a transient activity but was repeatedly returned to which could imply it had a significance socially or culturally. It is interpreted that the site may have been a bathing place, possibly in addition to cooking or feasting although no definitive evidence was recovered to clearly indicate its function.

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1 INTRODUCTION

1.1 General

This report presents the results of the archaeological excavation of Moanmore 1, AR133 (Figure 1), in the townland of Moanmore undertaken by Richard Jennings of 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 400m^2 and was first identified during testing carried out in April 2007 by Richard Jennings (E3364) for IAC Ltd. on behalf of the National Roads Authority. Moanmore 1 was excavated between 7 November and 12 December 2007 with a team of one director, one supervisor and 12 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.

No artefacts were uncovered on site. 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

This site was located on gently sloping, well-drained pastureland. The surrounding landscape was open and there were general views of the countryside in all directions. There were low lying hills to the north-west and west. The Blackstairs Mountains were prominent on the horizon to the east and south-east, the peak of Mount Leinster was also apparent. There was a dried up stream course running along the field boundary approximately 30m to the south. This followed the bend in the field boundary and ran on an approximate east–west axis. Shankill 6 was situated *c.* 150m beyond this to the south however the field boundary obscured the view. Moanmore 2 was located *c.* 1.1km to the north. Directly to the west there were some modern farm buildings and outhouses. Three further *fulachta fiadh* have been recorded nearby, CW015-014 *c.* 400m to the north, CW015-008 *c.* 1km to the north and KK016-003 *c.* 1km to the south-west.

2.1 PHASE 1 Natural Drift Geology

2.1.1 Subsoil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C2	N/A				Mid yellowish clayey sand	Subsoil

The subsoil in the excavation area consisted of glacial till with mid-yellowish-brown clayey sand with small stones.

2.1.2 Stream deposits

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
N/A	N/A	N/A	varied	varied	Irregular meandering stream	Natural stream
C191	N/A	25	1.1	0.15	Mid reddish grey sandy silt, frequent stones	Natural deposit
C192	N/A	0.4	0.55	0.1	Light yellowish grey, sandy silt.	Natural deposit
C197	N/A	1.4	0.3	0.05	Mid grey sandy silt.	Deposit

An old stream or paleochannel ran through the site (Figures 4 and 6–7; Plate 1). It contained deposits related to burnt mound activity and therefore must have been open and active when the burnt mound complex was operational. During the excavation, the stream was not immediately visible as it had completely silted up. It ran east to west across the site before turning 90 degrees and progressing southwards. It was adjacent to this bend in the stream that the majority of the burnt mound features were identified.

Deposits in the stream that potentially formed while the site was in use are discussed below in Phase 3, while those that washed into the stream after the site was abandoned are discussed in Phase 4. However, three deposits formed in the stream prior to the deposition of archaeological deposits: C191, C192 and C197. There were moderate amounts of charcoal in the C197 but these were interpreted as having washed in naturally owing to their position beneath the naturally formed silts of C192. There was no trace of heat-shattered stones in any of the three deposits.

2.1.3 Natural silts

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C146	N/A	8	6	2.04	Mid orangey grey green clayey silt	Deposit

Part of the burnt mound site was situated on natural silt deposits that rested on the glacial till. These silts probably formed when the stream flooded prior to the archaeological activity in the area.

2.2 PHASE 2 Bronze Age Burnt Mound Activity

The mid–late Bronze Age activity on the site was located on the south-west side of the stream and consisted of two troughs an associated pit and multiple postholes.

2.2.1 Trough 1 (C188)

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C24	C188	1.4	1.3	0.12	Light grey clayey silt	Deposit
C186	C188	1.9	1.3	0.18	Light greyish black, clayey silt	Fill of trough
C187	C188	1.9	1.3	0.05	Dark greyish black, clayey silt	Fill of trough
C188	N/A	1.9	1.3	0.3	Rectangular	Cut of trough
C202	C203	0.07	0.06	0.06	Light greyish brown clayey silt	Fill of Stakehole
C203	N/A	0.07	0.06	0.06	Oval feature	Cut of Stakehole
C204	C205	0.07	0.06	0.11	Light greyish brown clayey silt	Fill of Stakehole
C205	N/A	0.07	0.06	0.11	Oval feature	Cut of Stakehole

Finds: None

This small sub-rectangular trough (C188) was situated at the bend of the stream and north-east of Trough 2 (Figures 5–6; Plate 4). It had steep to vertical sides and a flat base. Two small stakeholes, C203 and C205, were located in the south-east and north-west corners of the base and may represent the remains of an internal lining, although further stakeholes may have been expected. The basal fill of the trough, C187, consisted of a thin dark clayey silt deposit rich in charcoal and organic material and could have formed the charred remains of the internal lining. This was sealed by the main fill of the trough, C186, comprising typical burnt mound waste material made up of heat-shattered stones and moderate amounts of charcoal and this was most likely deliberately deposited. This material filled up most of the trough although a shallow depression in the top of this deposit was filled in with C24, a light grey clayey silt deposit which had probably formed naturally.

In the south-west corner of the trough the cut was extended slightly to the west. This was not as steep sided as the main trough and was also not as deep. It is interpreted that this may have represented an access or step into the trough.

2.2.2 Pit C148

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C147	C148	0.58	0.54	0.21	Dark grey silty clay	Fill of pit
C148	N/A	0.58	0.54	0.21	Oval feature	Cut of pit
C181	C148	0.3	0.2	0.05	Dark greyish black clayey silt	Fill of pit

Finds: None

Pit C148 was located to the south of Trough 1 and was probably associated (Figures 5 and 8). It was almost circular in shape with steep to vertical sides and a generally flat base. It contained two fills: C181, a clayey silt patch on the base of the pit in its south-west corner and C147, a dark grey silty clay deposit, with abundant stones. The feature was sealed by C296, a silt deposit.

Charcoal was recovered from the pit fill C147 during post-excavation soil flotation. Two species were identified including alder *(Alnus glutinosa)* and ash (*Fraxinus excelsior)* charcoal fragments and unidentifiable bark pieces. The variety of species identified in the pit fill is most likely related to firewood and kindle used at the burnt mound site (O'Carroll, Appendix 2.1).

A sample of stones from the pit fill C147 was also analysed and identified as not altered, angular (blocky), coarse to medium grained, quartz rich, red sandstone. The dominant rock type in the area is limestone. Whilst it is not possible to determine a definitive source for the stone sample 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 (Mandal, Appendix 2.2).

A fragment (0.07g) of alder *(Alnus glutinosa)* charcoal from the pit fill C147 was chosen for AMS dating and returned a result of 2930±26 BP (UBA 14052). The 2 sigma calibrated date for this was 1258–1030BC (QUB, Appendix 2.3) dating this feature to the late Bronze Age.

2.2.3 Trough 2 (C32)

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C21	C32	1.9	1.25	0.32	Light grey clayey silt	Fill of trough
C32	N/A	2.3	2.05	0.56	Oval feature	Cut of trough
C33	C32	2.05	0.6	0.2	Light grey silty clay	Fill of trough
C34	C32	1.95	1.9	0.23	Light reddish yellow, clayey silt	Fill of trough
C35	C32	2.3	2.05	0.25	Light greyish black, silty clay	Fill of trough
C36	C32	1.5	1.15	0.09	Light reddish yellow, clayey silt	Fill of trough
C37	C32	1.72	1.15	0.07	Dark greyish black, silty clay	Fill of trough
C38	N/A	0.22	0.21	0.25	Oval feature	Cut of Stakehole
C39	C38	0.22	0.21	0.25	Dark greyish black silty clay	Fill of Stakehole
C40	N/A	0.16	0.15	0.33	Oval feature	Cut of Stakehole
C41	C40	0.16	0.15	0.33	Dark greyish black silty clay	Fill of Stakehole
C42	N/A	0.08	0.1	0.14	Oval feature	Cut of Stakehole
C43	C42	0.1	0.08	0.14	Light reddish clayey silt	Fill of Stakehole
C44	N/A	0.11	0.11	0.16	Oval feature	Cut of Stakehole
C45	C44	0.11	0.11	0.16	Light reddish clayey silt	Fill of Stakehole
C176	C32	2.30	2.1	0.35	Light reddish brown.	Fill of trough
C182	C183	0.07	0.04	0.1	Light reddish brown.	Fill of Stakehole
C183	N/A	0.07	0.04	0.1	Oval feature	Cut of Stakehole
C184	C185	0.09	0.1	0.16	Light reddish brown.	Fill of Stakehole
C185	N/A	0.09	0.1	0.16	Oval feature	Cut of Stakehole
C198	C199	0.05	0.05	0.09	Light reddish brown clayey silt.	Fill of Stakehole
C199	N/A	0.05	0.05	0.09	Oval feature	Cut of Stakehole
C200	C201	0.05	0.04	0.08	Light reddish brown clayey silt.	Fill of Stakehole
C201	N/A	0.05	0.04	0.08	Oval feature	Cut of Stakehole
C214	C215	0.1	0.09	0.11	Mid blackish brownish grey clayey silt	Fill of Stakehole
C215	N/A	0.1	0.09	0.11	Oval feature	Cut of Stakehole
C218	C219	0.08	0.08	0.1	Mid blackish grey, clayey silt.	Fill of Stakehole
C219	N/A	0.08	0.08	0.1	Oval feature	Cut of Stakehole

Finds: None

Trough 2 was the largest and deepest of the troughs identified on the site. It was orientated west–east and was located adjacent to and south of the stream (Figures 4, 5 and 8; Plate 3). Its cut (C32) was oval with concave to steep sides and a flat base. A series of post/stakeholes were identified at the base of the trough in each corner and these most likely supported a timber lining, although no remains of any lining were recorded. A single post/stakehole was located in both the north-east and south-east corners (C40 and C38, respectively), and three stakeholes were located in the north-west (C42, C199 and C201) and south-west corners (C44, C183 and C185). The presence of three post/stakeholes in both corners at the west of the trough

cannot be a coincidence and it is possible that these features had a structural function in addition to supporting the trough lining.

In the east of the trough the cut was extended slightly to the east. This was not as steep sided as the main trough and was also not as deep. It is interpreted that this may have represented an access or step into the trough. Two post/stakeholes were located at either side of this extra cut possibly to aid access to the trough.

The basal fill of the trough was a dark-greyish-brown, silty clay deposit (C37) that was rich in heat-shattered stones (50%) and charcoal (20%). At the sides of the trough this material was covered by steeply banked, sterile deposits of reddish-brown clay silt, C176. Some of this material also extended across the base where it was assigned the separate number C36. This layer was covered with a layer of burnt mound material which also banked up against the sides of the trough C35. A further sterile deposit of reddish-brown silt (C34) sealed C35, which was in turn sealed by a light-yellowish clay (C33) and a light-grey, clayey silt (C21). It was unclear whether the presence of silt in the fills, especially C36, had occurred due to deliberate or natural deposition. The majority of the remaining fills, most notably C34, C33 and C21, appeared to have washed in naturally.

This trough was particularly close to the stream and the presence of heat-shattered stones within the stream suggests that the waste material from the trough was discarded directly into the stream. Further waste material was also found to the east and to the south of the trough. The primary fill of the trough contained a relatively high proportion of charcoal and a significantly lower percentage of heat-shattered stones and may therefore represent the charred remains of the internal lining, the presence of which was attested to by the stakeholes in the trough's corners.

Charcoal recovered from trough fill C37 during post-excavation soil flotation was identified as being over forty ash (*Fraxinus excelsior)* fragments and two hazel (*Corylus avellana)* fragments. The charcoal identified from the trough is most likely related to firewood and kindle used at the burnt mound site. Ash was the most dominant taxon identified from most features analysed which suggests a more open type landscape as ash tends to grow in areas and clearings created by the first farmers to inhabit Ireland (O' Carroll, Appendix 2.1).

Charcoal was also recovered from the stakehole fill C39. A variety of species were identified including ash (*Fraxinus excelsior)* charcoal fragments hazel (*Corylus avellana),* willow (*Salix* sp.), elm (*Ulmus* sp.) holly *(Ilex acquifolium),* alder *(Alnus glutinosa)* and blackthorn/cherry (*Prunus* sp.) charcoal fragments. The variety of species identified in the stakehole fill is most likely related to firewood and kindle used at the burnt mound site. It is difficult to determine whether the wood analysed from the stakehole was related to actual post material due to the diverse nature and fragment number of each taxa present (*Ibid.*).

Two samples of stones from the trough fill C35 and stakehole fills C39 and C41 were analysed and identified as not altered, angular (blocky), coarse to medium grained, quartz rich, red sandstone. A sample of stones from the trough fill C37 was also analysed and identified as burnt angular to sub-rounded, coarse to medium grained, quartz rich, red/ yellow sandstone. 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 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 (Mandal, Appendix 2.2).

A fragment (0.3g) of ash *(Fraxinus excelsior)* charcoal from the trough fill C37 was chosen for AMS dating and returned a result of 2894±44 BP (UBA 14122). The 2 sigma calibrated date for this was 1256–937BC (QUB, Appendix 2.3) dating this feature to the late Bronze Age.

2.2.4 Possible Hearth C299

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C299	N/A	0.8	0.5	N/A	Dark brownish blackish red clayey silt	Deposit

Finds: None

Burnt soil was identified within an area formed and truncated by a cluster of postholes (Plate 5). No cut was evident to confirm that the burning was a formal hearth, but it clearly represents an area of *in situ* burning. The proximity of the deposit and Trough 2 suggested that perhaps it was associated with heating the stones for that trough.

2.2.5 Posthole and Stakehole Cluster

A large cluster of 105 postholes and stakeholes was identified in the area to the east of Trough 2 and south of Trough 1. These formed two distinct groups, one to the east and one to the west.

2.2.5.1 Eastern Group of Stakeholes and Postholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C46	C47	0.11	0.09	0.11	Mid blackish greyish brown clayey silt	Fill of Stakehole
C47	N/A	0.11	0.09	0.11	Oval feature	Cut of Stakehole
C48	C49	0.12	0.08	0.15	Light greyish brown clayey silt	Fill of Stakehole
C49	N/A	0.12	0.08	0.15	Oval feature	Cut of Stakehole
C50	C51	0.08	0.07	0.1	Dark greyish brown clayey silt	Fill of Stakehole
C51	N/A	0.08	0.07	0.1	Oval feature	Cut of Stakehole
C52	C53	0.08	0.11	0.13	Light greyish brown clayey silt	Fill of Stakehole
C53	N/A	0.11	0.08	0.13	Oval feature	Cut of Stakehole
C54	C55	0.08	0.1	0.1	Greyish brown clayey silt	Fill of Stakehole
C55	N/A	0.08	0.1	0.1	Oval feature	Cut of Stakehole
C56	C57	0.09	0.08	0.13	Dark blackish grey clayey silt	Fill of Stakehole
C57	N/A	0.09	0.08	0.13	Oval feature	Cut of Stakehole
C58	C59	0.05	0.08	0.07	Dark greyish brown clayey silt	Fill of Stakehole
C59	N/A	0.08	0.07	0.05	Oval feature	Cut of Stakehole
C60	C61	0.07	0.07	0.13	Yellowish grey brown clayey silt	Fill of Stakehole
C61	N/A	0.07	0.07	0.13	Oval feature	Cut of Stakehole
C62	C63	0.08	0.07	0.06	Yellowish light grey clayey silt	Fill of Stakehole
C63	N/A	0.08	0.07	0.06	Oval feature	Cut of Stakehole
C64	C65	0.06	0.06	0.1	Mid brownish grey, clayey silt	Fill of Stakehole
C65	N/A	0.06	0.06	0.1	Oval feature	Cut of Stakehole
C66	C67	0.08	0.06	0.09	Yellowish grey clayey silt	Fill of Stakehole
C67	N/A	0.08	0.06	0.09	Oval feature	Cut of Stakehole
C68	C69	0.1	0.08	0.14	Dark greyish brown clayey silt	Fill of Stakehole
C69	N/A	0.1	0.08	0.14	Oval feature	Cut of Stakehole
C70	C71	0.07	0.06	0.06	Dark greyish brown clayey silt	Fill of Stakehole
C71	N/A	0.07	0.06	0.06	Oval feature	Cut of Stakehole
C72	C73	0.06	0.06	0.05	Mid grey brown clayey silt	Fill of Stakehole
C73	N/A	0.06	0.06	0.05	Oval feature	Cut of Stakehole
C74	C75	0.0	0.08	0.04	Dark greyish brown clayey silt	Fill of Stakehole

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C75	N/A	0.08	0.08	0.04	Oval feature	Cut of Stakehole
C76	C77	0.05	0.05	0.07	Mid greyish black clayey silt	Fill of Stakehole
C77	N/A	0.05	0.05	0.07	Oval feature	Cut of Stakehole
C78	C79	0.06	0.06	0.13	Yellowish black dark brown clayey silt.	Fill of Stakehole
C79	N/A	0.06	0.06	0.13	Oval feature	Cut of Stakehole
C80	C81	0.15	0.1	0.18	Dark greyish brown clayey silt	Fill of Stakehole
C81	N/A	0.15	0.1	0.18	Irregular oval	Cut of Stakehole
C82	C83	0.06	0.05	0.09	Mid brownish grey, clayey silt	Fill of Stakehole
C83	N/A	0.06	0.05	0.09	Oval feature	Cut of Stakehole
C84	C85	0.08	0.07	0.06	Dark greyish brown clayey silt	Fill of Stakehole
C85	N/A	0.08	0.07	0.06	Oval feature	Cut of Stakehole
C86	C87	0.08	0.07	0.08	Dark greyish brown clayey silt	Fill of Stakehole
C87	N/A	0.08	0.07	0.08	Oval feature	Cut of Stakehole
C88	C89	0.08	0.07	0.12	Dark greyish brown clayey silt	Fill of Stakehole
C89	N/A	0.08	0.07	0.12	Oval feature	Cut of Stakehole
C90	C91	0.08	0.05	0.15	Yellow black dark brown clayey silt	Fill of Stakehole
C91	N/A	0.08	0.05	0.15	Oval feature	Cut of Stakehole
C92	C93	0.08	0.07	0.14	Mid greyish blackish brown, clayey silt	Fill of Stakehole
C93	N/A	0.08	0.07	0.14	Oval feature	Cut of Stakehole
C94	C95	0.09	0.07	0.09	Yellowish dark grey, clayey silt	Fill of Stakehole
C95	N/A	0.09	0.07	0.09	Oval feature	Cut of Stakehole
C96	C97	0.09	0.09	0.07	Greyish blackish brown clayey silt	Fill of Stakehole
C97	N/A	0.09	0.09	0.07	Oval feature	Cut of Stakehole
C98	C99	0.09	0.09	0.16	Mid greyish blackish brown, clayey silt	Fill of Stakehole
C99	N/A	0.09	0.09	0.16	Oval feature	Cut of Stakehole
C100	C101	0.07	0.05	0.09	Greyish blackish brown clayey silt	Fill of Stakehole
C101	N/A	0.07	0.05	0.09	Oval feature	Cut of Stakehole
C102	C103	0.08	0.08	0.11	Black brownish grey clayey silt	Fill of Stakehole
C103	N/A	0.08	0.08	0.11	Oval feature	Cut of Stakehole
C104	C105	0.09	0.07	0.14	Orangey black grey clayey silt	Fill of Stakehole
C105	N/A	0.09	0.07	0.14	Oval feature	Cut of Stakehole
C106	C107	0.14	0.09	0.08	Dark greyish brown clayey silt	Fill of Stakehole
C107	N/A	0.14	0.09	0.08	Oval feature	Cut of Stakehole
C108	C109	0.09	0.08	0.11	Dark greyish brown clayey silt	Fill of Stakehole
C109	N/A	0.09	0.08	0.11	Oval feature	Cut of Stakehole
C112	C113	0.1	0.19	0.08	Dark greyish brown clayey silt	Fill of Stakehole
C113	N/A	0.1	0.19	0.08	Oval feature	Cut of Stakehole
C114	C115	0.13	0.08	0.08	Dark greyish brown clayey silt	Fill of Stakehole
C115	N/A	0.13	0.08	0.08	Oval feature	Cut of Stakehole
C116	C117	0.08	0.06	0.08	Dark greyish brown clayey silt	Fill of Stakehole
C117	N/A	0.08	0.06	0.08	Oval feature	Cut of Stakehole
C118	C119	0.08	0.07	0.04	Dark greyish brown clayey silt	Fill of Stakehole
C119	N/A	0.08	0.07	0.04	Oval feature	Cut of Stakehole
C120	C121	0.08	0.05	0.09	Greyish brown clayey silt	Fill of Stakehole
C121	N/A	0.08	0.05	0.09	Oval feature	Cut of Stakehole
C122	C123	0.11	0.07	0.06	Dark greyish brown clayey silt	Fill of Stakehole
C123	N/A	0.11	0.07	0.06	Oval feature	Cut of Stakehole
C124	C125	0.06	0.04	0.07	Dark greyish brown clayey silt	Fill of Stakehole
C125	N/A	0.06	0.04	0.07	Oval feature	Cut of Stakehole
C126	C127	0.06	0.06	0.12	Yellow black dark brown clayey silt	Fill of Stakehole
C127	N/A	0.06	0.06	0.12	Oval feature	Cut of Stakehole
C128	C129	0.09	0.07	0.06	Dark greyish brown clayey silt	Fill of Stakehole
C129	N/A	0.09	0.07	0.06	Oval feature	Cut of Stakehole
C130	C131	0.07	0.06	0.08	Light brown greyish clayey silt	Fill of Stakehole
C131	N/A	0.07	0.06	0.08	Oval feature	Cut of Stakehole

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C132	C133	0.05	0.05	0.09	Mid brownish grey black, clayey silt	Fill of Stakehole
C133	N/A	0.05	0.05	0.09	Oval feature	Cut of Stakehole
C134	C135	0.07	0.05	0.04	Light brown greyish clayey silt	Fill of Stakehole
C135	N/A	0.07	0.05	0.04	Oval feature	Cut of Stakehole
C136	C137	0.07	0.06	0.09	Dark greyish brown clayey silt	Fill of Stakehole
C137	N/A	0.07	0.06	0.09	Oval feature	Cut of Stakehole
C138	C139	0.04	0.04	0.09	Orangey brown grey clayey silt	Fill of Stakehole
C139	N/A	0.04	0.04	0.09	Oval feature	Cut of Stakehole
C140	C141	0.06	0.05	0.09	Light brown greyish clayey silt	Fill of Stakehole
C141	N/A	0.06	0.05	0.09	Oval feature	Cut of Stakehole
C142	C143	0.06	0.06	0.13	Orangey brown clayey silt	Fill of Stakehole
C143	N/A	0.06	0.06	0.13	Oval feature	Cut of Stakehole
C144	C45	0.06	0.05	0.12	Orangey brown clayey silt	Fill of Stakehole
C145	N/A	0.06	0.05	0.12	Oval feature	Cut of Stakehole

Finds: None

A group of 49 stake/postholes was situated to the south of Trough 1(Figures 4–5; Plate 6). They extended for 1.90m north–south by 1.10m east–west, although the majority were concentrated within an 0.80m wide band. The average dimensions of the post/stakeholes were 0.1m long by 0.09m wide by 0.12m deep. The majority were filled with clayey silt which altered only slightly in its colouring. Most contained charcoal while some, particularly those closest to the trough, contained heat-shattered stones which identified them as contemporary with the burnt mound activity. Within the overall cluster there appeared to be a concentration in the north half and a concentration in the south half, with the central area containing fewer postholes. The number of postholes and the density of their distribution means that no meaningful pattern can be identified in their arrangement and it must be assumed that they represent repeated activity rather than one phase or one particular structure.

2.2.5.2 Western Group of Stakeholes and Postholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C110	C111	0.11	0.09	0.04	Dark blackish grey clayey silt	Fill of Stakehole
C111	N/A	0.11	0.09	0.04	Oval feature	Cut of Stakehole
C149	C150	0.16	0.16	0.2	Dark greyish black, clayey silt.	Deposit
C150	N/A	0.16	0.16	0.2	Oval feature	Cut of Stakehole
C152	C153	0.12	0.09	0.14	Greyish brown silty clay	Fill of Stakehole
C153	N/A	0.12	0.09	0.14	Oval feature	Cut of Stakehole
C156	C157	0.2	0.18	0.2	Greyish black silty clay	Fill of posthole
C157	N/A	0.2	0.18	0.21	Circular feature.	Cut of posthole
C158	C159	0.14	0.14	0.18	Black silty clay.	Fill of posthole
C159	N/A	0.14	0.14	0.18	Circular feature.	Cut of posthole
C160	C161	0.14	0.13	0.11	Blackish grey brown silty clay	Fill of Stakehole
C161	N/A	0.14	0.13	0.11	Oval feature	Cut of Stakehole
C162	C163	0.1	0.1	0.16	Brownish grey silty clay	Fill of Stakehole
C163	N/A	0.1	0.1	0.16	Circular feature.	Cut of Stakehole
C164	C165	0.13	0.12	0.15	Black greyish silty clay	Fill of Stakehole
C165	N/A	0.13	0.12	0.15	Oval feature	Cut of Stakehole
C166	C167	0.11	0.1	0.15	Black greyish silty clay	Fill of Stakehole
C167	N/A	0.11	0.01	0.15	Oval feature	Cut of Stakehole
C168	C169	0.3	0.21	0.14	Black greyish silty clay	Fill of posthole
C169	N/A	0.3	0.21	0.14	Circular feature.	Cut of posthole
C170	C171	0.11	0.1	0.07	Greyish brown silty clay	Fill of Stakehole
C171	N/A	0.11	0.1	0.07	Oval feature	Cut of Stakehole

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C172	C173	0.17	0.18	0.18	Dark greyish black silty clay	Fill of posthole
C173	N/A	0.17	0.18	0.18	Circular feature.	Cut of posthole
C174	C175	0.7	0.7	0.13	Greyish blackish silty clay	Fill of Stakehole
C175	N/A	0.7	0.7	0.13	Oval feature	Cut of Stakehole
C179	C180	0.06	0.06	0.1	Greyish brown silty clay	Fill of Stakehole
C180	N/A	0.06	0.06	0.1	Oval feature	Cut of Stakehole
C216	C217	0.05	0.05	0.08	Mid blackish brownish grey clayey silt	Fill of Stakehole
C217	N/A	0.05	0.05	0.08	Oval feature	Cut of Stakehole
C224	C225	0.06	0.05	0.06	Dark greyish brown clayey silt	Fill of Stakehole
C225	N/A	0.06	0.05	0.06	Oval feature	Cut of Stakehole
C226	C227	0.07	0.04	0.13	Greyish brown clayey silt	Fill of Stakehole
C227	N/A	0.07	0.04	0.13	Oval feature	Cut of Stakehole
C228	C229	0.11	0.11	0.15	Light greyish brown clayey silt	Fill of Stakehole
C229	N/A	0.11	0.11	0.15	Oval feature	Cut of Stakehole
C230	C231	0.18	0.18	0.23	Greyish black silty clay	Fill of Stakehole
C231	N/A	0.18	0.18	0.23	Oval feature	Cut of Stakehole
C232	C233	0.12	0.12	0.09	Greyish brown clayey silt	Fill of Stakehole
C233	N/A	0.12	0.12	0.09	Oval feature	Cut of Stakehole
C234	C235	0.08	0.08	0.18	Dark greyish black clayey silt	Fill of Stakehole
C235	N/A	0.08	0.08	0.18	Oval feature	Cut of Stakehole
C236	C237	0.06	0.08	0.08	Dark greyish brown clayey silt	Fill of Stakehole
C237	N/A	0.06	0.08	0.08	Oval feature	Cut of Stakehole
C238	C239	0.06	0.06	0.11	Greyish black clayey silt	Fill of Stakehole
C239	N/A	0.06	0.06	0.11	Oval feature	Cut of Stakehole
C240	C241	0.06	0.06	0.12	Dark greyish brown clayey silt	Fill of Stakehole
C241	N/A	0.06	0.06	0.12	Circular feature	Cut of Stakehole
C242	C243	0.06	0.06	0.05	Dark greyish brown black clayey silt	Fill of Stakehole
C243	N/A	0.06	0.06	0.05	Circular feature	Cut of Stakehole
C248	C249	0.08	0.07	0.08	Dark greyish brown clayey silt	Fill of Stakehole
C249	N/A	0.08	0.07	0.08	Circular feature	Cut of Stakehole
C250	C251	0.1	0.08	0.09	Dark greyish brown clayey silt	Fill of Stakehole
C251	N/A	0.1	0.08	0.09	Circular feature	Cut of Stakehole
C252	C253	0.1	0.1	0.19	Greyish brown clayey silt	Fill of Stakehole
C253	N/A	0.1	0.1	0.19	Circular feature	Cut of Stakehole
C254	C255	0.11	0.1	0.23	Blackish grey clayey silt	Fill of Stakehole
C255	N/A	0.11	0.1	0.23	Circular feature	Cut of Stakehole
C256	C257	0.05	0.05	0.05	Greyish brown clayey silt	Fill of Stakehole
C257	N/A	0.05	0.05	0.05	Circular feature	Cut of Stakehole
C260	C261	0.14	0.1	0.17	Dark greyish brown clayey silt	Fill of Stakehole
C261	N/A	0.14	0.1	0.17	Circular feature	Cut of Stakehole
C262	C263	0.1	0.1	0.07	Dark greyish brown clayey silt	Fill of Stakehole
C263	N/A	0.1	0.1	0.07	Oval feature	Cut of Stakehole
C266	C267	0.07	0.07	0.15	Mid blackish grey clayey silt	Fill of Stakehole
C267	N/A	0.07	0.07	0.15	Circular feature	Cut of Stakehole
C268	C269	0.08	0.08	0.13	Dark greyish brown clayey silt	Fill of Stakehole
C269	N/A	0.08	0.08	0.13	Circular feature	Cut of Stakehole
C272	C273	0.06	0.06	0.13	Blackish brown silty clay.	Fill of Stakehole
C273	N/A	0.06	0.06	0.13	Circular feature	Cut of Stakehole
C276	C277	0.1	0.1	0.18	Mid blackish grey clayey silt	Fill of Stakehole
C277	N/A	0.1	0.1	0.18	Circular feature	Cut of Stakehole
C278	C279	0.14	0.12	0.25	Dark greyish brown clayey silt	Fill of Stakehole
C279	N/A	0.14	0.12	0.25	Circular feature	Cut of Stakehole
C280	C281	0.06	0.05	0.05	Greyish black clayey silt	Fill of Stakehole
C281	N/A	0.06	0.06	0.05	Circular feature	Cut of Stakehole
C282	C283	0.12	0.11	0.13	Dark blackish grey clayey silt	Fill of Stakehole

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C283	N/A	0.12	0.11	0.13	Circular feature	Cut of Stakehole
C284	C285	0.15	0.14	0.02	Greyish black clayey silt	Fill of Stakehole
C285	N/A	0.15	0.14	0.22	Circular feature	Cut of Stakehole
C286	C287	0.13	0.11	0.1	Dark blackish grey clayey silt	Fill of Stakehole
C287	N/A	0.13	0.11	0.1	Circular feature	Cut of Stakehole
C288	C289	0.14	0.15	0.25	Dark blackish grey clayey silt	Fill of Stakehole
C289	N/A	0.14	0.15	0.25	Circular feature	Cut of Stakehole
C290	C291	0.15	0.14	0.18	Dark blackish grey clayey silt	Fill of Stakehole
C291	N/A	0.15	0.14	0.18	Sub circular feature.	Cut of Stakehole
C292	C293	0.11	0.1	0.1	Mid blackish grey clayey silt	Fill of Stakehole
C293	N/A	0.11	0.1	0.1	Circular feature	Cut of Stakehole
C294	C295	0.1	0.1	0.16	Mid blackish grey clayey silt	Fill of Stakehole
C295	N/A	0.1	0.1	0.16	Circular feature	Cut of Stakehole
C300	C301	0.12	0.11	0.24	Mid blackish grey clayey silt	Fill of Stakehole
C301	N/A	0.12	0.11	0.24	Circular feature	Cut of Stakehole

Finds: None

A group of 46 stake/postholes were situated to the east of Trough 2. As with the eastern group of postholes they extend for 1.90m north-south and 1.10m east west. They were similarly arranged to the eastern group also, with more obvious concentrations to the north and south and fewer postholes in the centre, with the majority of the postholes occupying an 0.80m wide band within the overall width of the area. The average dimensions of the post/stakeholes were 0.1m long by 0.09m wide by 0.12m deep, although the largest postholes were very obviously located in the southern half of the cluster. The majority of them were filled with clayey silt which altered only slightly in its colouring. Most contained charcoal while some, particularly those closest to the trough, contained heat-shattered stones which identified them as contemporary with the burnt mound activity. The number of postholes and the density of their distribution means that no meaningful pattern can be identified in their arrangement and it must be assumed that they represent repeated activity rather than one phase or one particular structure.

2.2.5.3 Discussion of the Posthole and Stakehole Clusters

Two main groups of post/stakeholes were identified – one to the east and one to the west. Those to the east were closer to Trough 1 and those to the west were closer to Trough 2 (Figures 4 & 5). Those in the west tended to be larger, more likely to be intercutting, and more concentrated than those in the east. The two sets of post/stakeholes were between 0.80-1.00m apart. Closer examination has identified that each is group was in fact made up of smaller clusters. In the west the southern area contained the largest post/stakeholes, while both east and west groups had obvious clusters to the north and the south with fewer features in the centre.

The concentration of postholes and stakeholes would suggest that one or more structures associated with burnt mound activity existed to the east of Trough 2. Whether they represent four separate structures (the north and south cluster on each side being separate activities), two structures (one east and one west), or one single large structure, of which each cluster represented a corner is difficult to assess. The fact that the postholes in the south-west cluster were distinctly larger than in any other area would point to separate activities or structures associated with each cluster. However it may just be that the west side, particularly the south-west corner of whatever overall structure was built, needed larger posts as it was carrying more of the load for a possible roof. It seems likely that any erected structure was more directly associated with Trough 2 as the west posts/stakes appeared to flank the possible entrance to the trough. The mirroring of the north-south clustering on the

east side, despite the posts/stakes being smaller, would point towards a single structure that would have supported a canopy or light roof. This would have covered over the area in front of the entrance to Trough 2 and potentially covered a walkway between the two troughs, given the locations of the possible entrances of both. The quantity of post/stakeholes and the evidence of re-cutting of earlier posts/stakes would suggest that the structure or structures were temporary in nature and were rebuilt each time the trough was used.

2.2.6 Other Post/stakeholes

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C154	C155	0.14	0.14	0.26	Grey silty clay	Fill of posthole
C155	N/A	0.14	0.14	0.26	Circular feature.	Cut of posthole
C177	C178	0.16	0.13	0.12	Grey silty clay	Fill of Stakehole
C178	N/A	0.16	0.13	0.12	Oval feature	Cut of Stakehole
C193	C194	0.16	0.11	0.12	Greyish brown, silty clay.	Deposit
C194	N/A	0.16	0.11	0.12	Rectangular	Cut of trough
C195	C196	0.07	0.06	0.06	Greyish brown silty clay.	Fill of Stakehole
C196	N/A	0.07	0.06	0.06	Oval feature	Cut of Stakehole
C244	C245	0.14	0.15	0.24	Mid blackish grey clayey silt	Fill of Stakehole
C245	N/A	0.14	0.15	0.24	Circular feature	Cut of Stakehole
C246	C247	0.09	0.09	0.12	Light greyish brown clayey silt	Fill of Stakehole
C247	N/A	0.09	0.09	0.12	Circular feature	Cut of Stakehole
C258	C259	0.09	0.09	0.18	Mid blackish grey clayey silt	Fill of Stakehole
C259	N/A	0.09	0.09	0.18	Circular feature	Cut of Stakehole
C264	C265	0.09	0.08	0.2	Mid brownish grey clayey silt	Fill of Stakehole
C265	N/A	0.09	0.08	0.2	Circular feature	Cut of Stakehole

Finds: None

Eight other post/stakeholes were identified away from the main concentrations of post/stakeholes associated with Trough 2. Four of these were in a small cluster to the north-east of Trough 2 – C245, C247, C259 and C265. The other four were more dispersed to the south of Trough 2. The function of any of these post/stakeholes either individually of collectively is unclear but it is likely they were associated with activity at either Trough 1 or 2.

2.3 PHASE 3 Undated Burnt Mound Activity

The burnt mound activity was located to the north of the stream, and as such was separated from the activity to the south. It is undated, so it is not clear if it is contemporary or represents a separate phase of activity.

2.3.1 Trough 3

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C22	C23	1.5	1.3	0.1	Dark greyish black, sandy silt	Fill of trough
C23	N/A	2.4	1.3	0.4	Rectangular	Cut of trough
C189	C23	2.3	1.4	0.25	Dark greyish black, clayey silt	Fill of trough
C206	C207	0.1	0.1	0.15	Dark greyish black, clayey silt.	Fill of Stakehole
C207	N/A	0.1	0.1	0.15	Oval feature	Cut of Stakehole
C208	C209	0.16	0.15	0.12	Mid greyish black, clayey silt.	Fill of Stakehole
C209	N/A	0.16	0.15	0.12	Oval feature	Cut of Stakehole
C210	C211	0.08	0.07	0.06	Dark greyish black, clayey silt.	Fill of Stakehole
C211	N/A	0.06	0.07	0.08	Oval feature	Cut of Stakehole
C212	C213	0.15	0.12	0.09	Mid greyish black, clayey silt.	Fill of Stakehole
C213	N/A	0.15	0.12	0.09	Oval feature	Cut of Stakehole
C220	C221	0.07	0.05	0.06	Dark greyish reddish black clayey silt	Fill of Stakehole
C221	N/A	0.07	0.05	0.06	Oval feature	Cut of Stakehole
C222	C223	0.11	0.1	0.17	Dark greyish reddish black clayey silt	Fill of Stakehole

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C223	N/A	0.11	0.1	0.17	Oval feature	Cut of Stakehole
C270	C271	0.1	0.1	0.2	Dark greyish reddish black clayey silt	Deposit
C271	N/A	0.1	0.1	0.2	Circular feature	Cut of Stakehole
C274	C275	0.11	0.12	0.23	Dark greyish reddish black clayey silt	Deposit
C275	N/A	0.11	0.12	0.23	Circular feature	Cut of Stakehole

Finds: None

Rectangular, north–south orientated Trough 3 (C23) was located on the north side of the stream. Its sides varied from steep to vertical with the steepest side being that nearest the stream (Figures 4 and 7). Its base was flat (Plate 2). Eight post/stakeholes were associated with the trough. Five were found within the trough and three on its exterior. Two of the inner five were located in the north-west and north-east corners (C207 and C209 respectively), two against the eastern side of the trough (C211 and C221) and a fifth in the southern centre of the trough (C213). The three post/stakeholes on the outside of the trough were near to the north-west corner, north-east corner, and south-eastern corner (C271, C275 and C233, respectively). All eight had vertical sides and gradually tapered bases. Their fills were also uniform, containing greyish black clayey silts similar to burnt mound material. The basal fill of the trough was C189, a clayey silt with frequent heat-shattered stones and charcoal flecks. This was covered by C22 which represented more burnt mound material within a sandy silt context. The surface of a C22 was concave and was covered by C20, one of the main episodes of natural sedimentation on the site (see Section 2.3).

The five post/stakeholes inside the trough formed a trapezoidal shape which may have supported an internal lining although the absence of stakeholes in two of the four corners meant it may not have extended across the whole trough. The presence of burnt mound material in the post/stakeholes in the base of the trough meant that these were probably removed prior to the abandonment of the trough. The fact that the trough was filled with burnt mound material also raises the possibility that it was intentionally backfilled (compared to the fills of Trough 2).

Charcoal was recovered from the stakehole fill C212 during post-excavation soil flotation. A variety of species were identified including elm (*Ulmus* sp.), holly *(Ilex acquifolium),* alder *(Alnus glutinosa),* birch *(Betula* sp.) and blackthorn (*Prunus spinosa*) charcoal fragments and unidentifiable bark pieces (O'Carroll, Appendix 2.1). The variety of species identified in the stakehole fill is most likely related to firewood and kindle used at the burnt mound site. It is difficult to determine whether the wood analysed from the stakehole was related to actual post material due to the diverse nature and fragment number of each taxa present (*Ibid.*).

2.3.2 Pits to the North-west

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C3	N/A	2.7	1.8	0.4	Oval feature	Cut of Pit
C4	C3	3.4	7.8	0.4	Black, silty clay	Fill of pit
C5	C3	0.8	0.6	0.1	Mid grey silty clay	Fill of pit
C6	C3	1.3	1.7	0.3	Light grey silty clay	Fill of pit
C7	C3	0.8	1.8	0.2	Mid grey silty clay	Fill of pit
C8	N/A	2.1	1.5	0.2	Oval feature	Cut of Pit
C9	C12	2.1	1.4	0.2	Mid grey silty clay	Fill of pit
C10	C12	2.1	0.73	0.04	Black, silty clay	Fill of pit
C11	C8	0.66	1.8	0.06	Orange silty clay	Fill of pit
C12	N/A	2.8	2.1	0.34	Oval feature	Cut of Pit
C13	C12	2	1.1	0.22	Black, silty clay	Fill of pit

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C14	C12	2	1.6	0.3	Light grey silty clay	Fill of pit
C15	C12	0.1	0.15	0.1	Dark grey silty sand	Fill of pit
C16	C12	2.3	2.1	0.08	Dark grey silty clay	Fill of pit

Three irregular pits, C3 (2.7m x 1.8m x 0.4m), C8 (2.1m x 1.4m x 0.2m) and C12 (2.8m x 2.1m x 0.34m), were located to the north-west of the main burnt mound complex (Figure 6). They had gentle sloping sides and flat to slightly undulating bases. The pits were joined together by two narrow channels: one running from C3 to C8 and the other from C8 to C12; these channels were not given separate context numbers.

Pit C3 contained two basal deposits, C4 and C7, which consisted of burnt mound material and two uppers deposits, C5 and C6, which were washed-in clay deposits. Fill C4 also extended along the channel that connected pits C3 and C8. Pit C8 had a basal fill, C11, of orange, silty clay that resembled re-deposited subsoil and that was covered with C9 and C10, two fills containing heat-shattered stones. Sterile silty sands, C15, and more burnt stone material, C16, formed in the channel leading from C12 to C8. Pit C12 contained a silty clay deposit on its base, C14, and typical burnt mound material, C13. The similarity of fill C16 to the upper fills of pit C8 made the depositional sequences between these two pits indeterminable.

These three pits were geographically isolated from the main burnt mound activity on the site but as they contained burnt mound material they were most probably contemporary and related to that activity. The precise purpose of the pits is unknown; they may have represented waste or storage pits, or as they were all connected with channels that could have formed part of a drainage or water collection system.

2.3.4 Burnt Mound Deposits

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C19	N/A	8	7	0.2	Dark greyish black, sandy silt	Deposit
C25	N/A	20	2–4.5	0.25	Mid reddish brown, sandy silt	Deposit in stream
C27	N/A	2.05	1.10	0.1	Black silty clay	Deposit
C296	N/A	6	1.8	0.15	Mid greyish brown clayey silt	Deposit
C297	N/A	2.5	3.8	0.28	Dark blackish grey clayey silt	Deposit
C298	N/A	3.3	2.5	0.1	Dark greyish reddish black sandy silt	Deposit

Finds: None

The main concentration of heat-shattered stones, charcoal and silts which formed the mound extended over a total area of 18m by 10m (Figures 4, 7 and 8; Plate 7). Some of the waste material ended up in the stream and the remainder rested over the working area of the site. Five contexts of burnt mound material were identified. C27 was a patch of black silty clay and burnt mound material on the stream base adjacent to Trough 3. C25 comprised burnt mound material with a reddish hue and lacking significant quantities of charcoal was found mainly in the lower depths of the stream. It extended for a total of 20m and was most concentrated on the base of the stream bend adjacent to the main *fulacht* activity. It sealed C27. C19 represented burnt mound material located south, east and north of Trough 2. It partially sealed C25 and also extended into the stream. Deposit C297 consisted of burnt mound material located to the north of Trough 2 which was almost identical to C19 but partially separated from it by C296, a deposit of naturally formed silt. C298 represented two patches of burnt mound material associated with Trough 3. C298 was found on the outside bank of the stream to the north and west of the trough. This burnt mound material had a reddish hue that was absent from the material associated with

Troughs 1 and 2 but otherwise was the same in terms of stone size and shape and charcoal concentration.

No tip lines were detected in any of the mound material. The sizes of the stones in the mound material were all very similar, measuring on average 0.05m in diameter and being angular or sub-angular in shape.

The fine deposits in C25 and the rarity of charcoal and organic material from C25 may indicate that it had been washed out, and the larger charcoal and material displaced by fluvial action. The reddish tinge in C298 might also indicate that the burnt mound material was bleached at some stage from flooding. Certainly, the location of these silty spreads, most notably C296, indicates repeated flooding in the area, thereby further suggesting that the burnt mound activity did indeed take place in a wet environment.

2.4 PHASE 4 Abandonment

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C20	N/A	N/A	N/A	0.2	Light grey clayey silt	Deposit
C190	N/A	N/A	N/A	0.1	Mid yellowish grey, clayey silt	Deposit

Finds: None

C20 was a clayey silt deposit that covered the burnt mound and extended across the excavation area and was also located in the stream (Figure 4). It had the appearance of a natural subsoil type deposit and initially disguised the true extent of the burnt mound material beneath. C20 was in turn covered by C190, another deposit of silt existing beneath the topsoil and above the prehistoric features. This was removed by machine but C20 was excavated by hand.

Both of these deposits had formed naturally at some point after the site was abandoned but exactly when was unknown.

2.5 PHASE 5 Post-medieval Activity

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C29	C31	10min	1.45	0.5	Mid reddish brown, sandy silt	Fill of ditch
C30	C31	10min	1.75	0.5	Mid greyish brown, sandy silt	Fill of ditch
C31	N/A	10min	1.45	0.5	Linear	Cut of ditch
C302	N/A	10min	0.50m	0.2	Modern linear stone drain	Stones drain

Finds: None

Ditch C29 was a linear, modern ditch with sterile deposits running northeast–southwest (Figure 4). It cut through the stream fill. Drain C302 cut through C8, one of the isolated pits in the area north-west of the main excavation.

2.6 PHASE 6 Topsoil

Context	Fill of	L(m)	W(m)	D(m)	Basic Description	Interpretation
C1	N/A	N/A	N/A	0.2-0.3	Dark brown sandy silt	Topsoil

Finds: None

The topsoil was a dark brown clayey silt.

3 SYNTHESIS

The synthesis presents the combined results of all of the archaeological analysis carried out at Moanmore 1. 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 Banagagole. 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. Moanmore 1 is located in the northern landscape area.

3.1.2 The Northern Landscape

The northern landscape of the N9/N10 crosses the border from Kilkenny into Carlow and traverses the western side of the River Barrow; the Blackstairs Mountains, which are of granite formation, are located to the east of the Barrow. This northern landscape is overlooked to the west by the Castlecomer Plateau, and the excavated sites are all situated on contours of 50–100m OD. From the south-west of the Barrow, and encroaching into the northern landscape, the underlying limestone is dolomitized and consequently the permeability has been increased. The glacial drift comprises slightly sandy (20–60%) slightly gravely clays with a moisture content of 10–20%. There is therefore significantly less sand but higher moisture content than in the southern and central landscapes. This moisture occurs in the wetter deposits in the top 1–2m before ground level in localised areas with silty sand and gravel lenses indicating a high water table. To the east of the River Barrow, localised silty, laminated clays and peat occur. Soft ground was noted in the river's floodplain. The area is also classified as a minor aquifer in the Kilkenny Groundwater Protection Scheme (Buckley & Fitzsimmons, 2002) due to these thick sand and gravel deposits. Progressing northwards, the views become more expansive, and the rising high ground of the Castlecomer Plateau (50–300m OD) bounds the distant landscape. This plateau consists of a variety of hills and peaks, which contain seams of anthracite, the focus of coal mining in the region from the 17th century. The Blackstairs Mountains (735m) are visible on the horizon to the south-east, and most obvious of these is the peak of Mount Leinster (795m). There are impressive views from these plateaus and hills especially to the south, east and west over the Barrow and Nore Valleys.

The prevailing watercourse of this region is the River Barrow which travels north–south through the landscape. The Maudlin River is a tributary of the River Barrow and flows from the west through Old Leighlin; minor tributaries of this river flow through Bannagagole, directly north of Moanmore, and the River Dinin is a tributary of the River Nore which travels south-west from Brennan's Hill through the Castlecomer Plateau. The suffix 'comer' signifies a meeting of the rivers; it also signifies any deep gripe, such, for instance, as the channel formed by a mountain stream (Carrigan 1905). From the hinterland of Kilkenny and the confluence of the Nore and Barrow the Monefelim River contributes to the occurrence of wet grassland and broadleaf woodland. The narrow tributaries of the River Barrow, including the Monefelim River, as well as the Maudlin River, flow from the higher, steep, escarpment located to the west. Subsoils in this area consist of undifferentiated alluvium and soils of mineral alluvium. The route crosses into County Carlow where at Moanmore (meaning 'great bog') a variety of archaeological features have been

recorded. At the most northerly point of the N9/N10 the land is again characterised by its views; here they include the Barrow Valley, Mount Leinster, Brandon Hill, and the Blackstairs Mountains.

3.1.3 Site Specific Landscape

This site was located on gently sloping, well-drained pastureland. The surrounding landscape was open and there were general views of the countryside in all directions. There were low lying hills to the north-west and west. The Blackstairs Mountains were prominent on the horizon to the east and south-east, the peak of Mount Leinster was also apparent. There was a dried up stream course running along the field boundary approximately 30m to the south. This followed the bend in the field boundary and ran on an approximate east–west axis. Shankill 6 was situated *c.* 150m beyond this to the south, however the field boundary obscured the view. Moanmore 2 was located *c.* 1.1km to the north. Directly to the west there were some modern farm buildings and outhouses. Three further *fulachta fiadh* have been recorded nearby, CW015-014 *c.* 400m to the north, CW015-008 *c.* 1km to the north and KK016-003 *c.* 1km to the south west.

3.2 The Archaeological Landscape

As part of the general research relating to sites along the scheme and the specific research relating to Moanmore 1, 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 Moanmore 1 has been identified as being Bronze Age in date.

3.2.1 The 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 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 Northern Landscape: Domestic Settlement

The domestic settlement evidence from the landscape along the northern sections of Kilkenny and the border with Carlow can be characterised by multi-period sites, such as at Moanduff 2–3, and by clusters of activity represented by multiple burnt mound sites and several, possibly associated, structures. This part of the Barrow is overlooked by the hillforts at Freestone Hill (KK020-018002) (Coolgrange), Ballinkillin (CW019-027) and Killoughternane (CW019-065). However, the distinct clustering of the Paulstown area sites suggests the existence of a community separate to that in the immediate vicinity of Freestone Hill although it is probable that the hillforts reflect a wider landscape control system involving co-operation or alliance between a number of communities in the Kilkenny region. In addition to the indirect evidence in the form of burnt mounds and cultural deposits in pits, several structures, of typical Bronze Age morphology, were recovered. At Garryduff 1 an external ring of 37 postholes and stakeholes was positioned in a shallow, curving slot-trench and enclosed an area 11m in diameter with an inner ring of 10 larger postholes (7m diameter). This structure was located on the edge of a break of slope, which led down to an adjacent river. Other features on site may represent a possible grain stand and pits for food storage/rubbish. In the south-western corner of the site a curving arc (12m long) of 18 postholes and stakeholes was identified which may continue beyond the site. Six kilometres to the north of Garryduff 1 was an oval-shaped structure at Shankill 4. This was most likely a hut (4m x 3m) and consisted of postholes, stakeholes, an internal hearth, and outlying pits. An arc of stakeholes measuring 3m by 2.5m on its north side might have formed an entrance porch. Sherds from at least one domestic cordoned urn came from the site. A roundhouse at

Moanmore 2 consisted of 14 postholes, a central hearth, and up to 50 associated stakeholes and postholes.

As well as two rectangular Neolithic structures at Moanduff 2–3 there were four, or possibly five, separate areas of Bronze Age activity identified. As the features representing this activity were heavily truncated it is impossible to identify their exact function however some may represent Bronze Age structures. A middle-late Bronze Age enclosure (180m x 160m) and late Bronze Age activity in the form of troughs with burnt clay and stone were also excavated on site. At Coneykeare 1 two very tentative structures were identified by the director and a fifth concentration of activity, incorporating burnt mounds and settlement activity; was noted at Coolnakisha 1. A five post, L-shaped possible temporary structure at Coolnakisha 1 was identified along with two pits containing burnt bone and a moderate amount of charcoal and flint. A spread, also containing a moderate amount of charcoal, burnt bone, flint and heat-shattered stones was located to the north-west of the possible structure. It is most likely that the burnt bone deposits within the features on this site are domestic in nature.

The Northern Landscape; Funerary and Ritual activity

Funerary evidence is represented by ringditches at Kellymount 5 and Paulstown 1 and simple pit cremations also at Paulstown 1. Evidence of the Bronze Age is present at Croan (Aghaviller Parish); where a food vessel was discovered, and also at Cruttenclough; where artefacts of amber, gold and bronze were found; there were 14 gold beads discovered with varying decoration together with graduated amber beads (Lyng 1984). The find circumstances of these artefacts is unknown however similar artefacts in the form of a necklace were discovered at Tara, around the neck of an adolescent male, buried in a pit (Herity and Eogan 1977) and it is likely that the Cruttenclough finds came from a similar burial context. They indicate trading links with Europe and a bronze sunflower pin was also discovered in this townland, which is of late Bronze Age type (Lyng 1984; Eogan 1974a, 87) and originally had a gold foil covering. Other material demonstrating a late Bronze Age presence in the area includes the large hoard from Ballytegan, Co. Laois (Eogan 1983); this contained three sunflower (two covered in gold foil) and one disc-headed pin, two socketed axes, a bracelet of twisted strands and a variety of both solid and hollow bronze rings. The rings are characteristic of Eogan's (1974b; 1993) midland province and this hoard demonstrates ritual activity in the region. Early Bronze Age activity is also evident in the adjacent area of Co. Carlow on the east side of the River Barrow. A cist burial at Killinane contained cremated bone and an upright tripartite bowl food vessel (Moore 1984). Similar discoveries were also found close by in Sliguff and Wells; both townlands are located in west Carlow along the Kilkenny border close to the landscape of the present scheme. The Sliguff cist contained a crouched inhumation that was accompanied by a bowl while the pit cemetery at Baunogenasraid was inserted into the mound of the earlier Linkardstown tomb (Raftery 1974). A large cemetery mound at Ballon Hill was discovered in the 19th century, which revealed a large assemblage of vases and collared urns in both pit and cist burials (Waddell 1990, 51–53).

Six of the sites in this northern landscape of the N9/N10 Phase 4 had evidence for prehistoric funerary activity which was represented by barrows, ringditches, cists and cremation deposits at Rathcash East 1, Garryduff 1, Paulstown 1–2, Kellymount 5, and Coolnakisha 1–2. This evidence broadens the funerary landscape of the Bronze Age in this region. A possible ringditch was recorded at Rathcash East 1. It was formed by two very shallow curvilinear cuts creating a circle with a diameter of 6m and potential openings or entrances (1.45m wide) mirroring one another on the south-east and north-west sides. Nearby activity included a hearth and possible

refuse pit. It is possible that this domestic activity was related to funerary practices associated with the ringditch; however, it is perhaps more plausible that, given the lack of associated burial activity (although the enclosed area had been truncated) and the occurrence of two entrances, the ringditch in fact represents a domestic structure.

At Garryduff 1 two unroofed structures, both comprising arcs of post- and stakeholes, may have been associated with a large, northwest–southeast pit (2m x 1.3m x 0.16m) located close to Structure 1. This pit contained a charcoal-rich deposit with burnt bone, heat-cracked stones and charred hazelnuts which had been deliberately deposited. Three postholes also containing similar material in their fills were arranged around the pit and a definite concentration of burnt bone was noted in this area of the site. It is possible that this pit and the adjacent postholes represent the remains of a draught pit for a pyre with the postholes at either side being used to stabilise the pyre structure for the duration of the process. Two cremation pits were located outside the enclosure which contained quite large chunks of human bone and possible pyre material.

The cemetery complex at Paulstown 1 consisted of both pit and cist burials. Three small cists (averaging 0.6m by 0.32m by 0.16m internally) were made expediently with slabs and blocks of local stone. Three other pits were less formally lined with stone. Each contained cremations but one cist produced two discrete deposits. Three other grave pits formed part of the cemetery. In one of these pits an unburnt human skull was placed on top of a washed cremation deposit. Several burials were accompanied by ceramic gravegoods. These gravegoods included burnt sherds from bipartite vases, a miniature cordoned urn and a miniature vase; a burnt flint scraper as well as charred seeds and hazelnuts also came from one of the cists. The largest grave at Paulstown consisted of a large pit or pits. This contained a complex sequence of deposition which appears to have begun with a circular pit which contained an inverted vase; this was disturbed by the insertion of Vessel 1, another inverted vase which survived intact. A miniature vase (No. 6) may have accompanied one of these burials. Subsequently, a second larger pit extended the grave to the south. The fragmentary remains of three pots (No.s 3–5) were deposited on the base of this pit and a large cremation deposit was placed over them. This deposit contained sherds from Vessels 5 and 6 as did a final silty fill. The evidence suggests that the grave was extended to accommodate burials disturbed from other graves. A large circular pit occurred on the edge of the cemetery (1.55m by 1.48m by 0.80m deep). This had originally been maintained as an open feature that filled naturally with water. Subsequently, a complex sequence of layers containing charcoal, burnt and unburnt bone, charred hazelnut shells and seeds, antler and flint (including flakes, blades and debitage), developed or was deposited in the pit. The proximity of this feature, which appears to have been a well, suggests that it was associated with the funerary activity on the site.

A double ringditch was identified at Kellymount 5. The external ringditch (12m diameter x 1.04m deep) was lined with a spread of burnt mound material, possibly relating to the earlier use of the site as a burnt mound complex. The only artefacts in this external ringditch consisted of three Bronze Age pottery sherds. The internal ringditch (5.6m diameter x 0.2m deep) was situated centrally within the external ringditch and also contained heat-shattered stones in its fills. A central pit had burnt bone inclusions. A further two pits were located to the south of the ringditches and both contained burnt bone inclusions. A substantial part of a vase urn came from one of the troughs associated with the burnt mound complex; while this may be derived from the funerary activity it is evident that the vessel had been used in a domestic context and may have been a deliberate deposit in the base of the trough.

Evidence for funerary activity was also excavated at Coolnakisha 2, where one pit (0.33m x 0.26m x 0.13m) contained 25.5g of charcoal, 0.1g of charred seeds and 390.3g of burnt bone. Other pits and possible pits and spreads also contained burnt bone inclusions, although in much smaller quantities. Both sites produced small quantities of probably middle Bronze Age while residual Neolithic material in the form of three flint scrapers came from Coolnakisha 1.

It is therefore apparent that the central, northern part of Kilkenny contained the most varied evidence for burial and funerary activity. As the N9/N10 progresses northwards sites with a probable continuity of function and chronology emerge: from the Danesfort complex near the King's River to the varied ringditches and cremations at Templemartin 5 and the amalgamation of ritual and burial at Paulstown 1–2.

The Northern Landscape; Burnt Mound Activity

The evidence from the northern landscape, was dominated by clusters of burnt mounds and reinforces the patterning already indicated by the previously known archaeological record. Several previously identified burnt mounds were recorded in Cloghoge (KK020-039, KK020-075, 076), Rathcash West (KK020-077, 078), Shankill (KK016-003, KK016-010) and at Moanmore (meaning 'great bog') (CW015-007, CW015-014). Twenty seven sites with evidence of burnt mound activity were uncovered as part of the N9/N10 Phase 4 excavations within the northern landscape. The underlying limestone geology/glacial drift consisted of sandy/gravel-clays which have a higher moisture content than the southern and central landscapes resulting in a high water table in localised areas. This helps explain the presence of the considerably sized waterholes at these burnt mound sites, notably within the Jordanstown and Kellymount cluster (Jordanstown 2 & 3 and Kellymount 1–3, 5 & 6). Other clusters of burnt mound activity in the northern landscape occurred at Ballyquirk 1, 2 & 4, Moanmore 1 & 3, Moanduff 1, 2 & 3, Rathcash 1 & 2, Blanchvillespark 2, 3 & 4 and Cranavonane 1 & 2. Other sites exhibiting burnt mound activity include Shankill 6, Bannagagole 1, Rathcash East 2, Tomard Lower 1 and Ballinvally 1. Due to the poor on-site conditions the sites at Cranavonane 2 and Blanchvillespark 2 were not fully resolved but were identified as burnt mounds. Burnt mounds were not excavated at Kellymount 1, Moanduff 2 & 3, Ballyquirk 1 and Ballinvally 1; however features associated with burnt mound activity were recovered and excavated at these sites indicating a clear association with this type of activity.

The Northern Landscape; Route-ways and communications

While it is clear that the rivers and streams are a major feature of the settlement networks the distribution of prehistoric activity, for example on the lowland fringes to the south of the Castlecomer Plateau, shows that other route-ways were functioning at both a local and regional scale. Within these network systems it is possible to identify particular concentrations of human activity. 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 in the area around Carlow, on the upper Barrow and its tributary the Burren River, which the archaeological work on the Carlow Bypass has highlighted (Dunne 2007). To the south of this, the eastern side of the Barrow in the Goresbridge area 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, underlined as a result of the N9/N10 excavations, while the southern end of the Castlecomer Plateau, with 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 Northern Landscape; Conclusions
In the northern part of the region, focussed on the uplands of the Castlecomer Plateau and the flanking valleys of the Nore and Suir, intense settlement is indicated by both burnt mounds and barrows. The burnt mounds are focussed in the upland area and 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. 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 large number of burnt mounds discovered on the lowland fringe to the east of the plateau, along the Barrow Valley, shows the development of intensive settlement throughout the northern part of the region. In this area the hillforts appear to be positioned to overlook the settlement landscape.

3.2.2 The Site Specific Archaeological Landscape of Moanmore 1

There are no previously recorded monuments dating to the prehistoric period in the vicinity of Moanmore 1. The site of a *fulacht fiadh* (CW015-014) is recorded *c*. 400m to the north and the site of a ringfort (CW015-016) is recorded *c*. 1.1km to the north-east. Ringforts (KK016-005 and 007) are also recorded *c*. 1.3km to the south-east and *c*. 950m to the south. A *fulacht fiadh* site (KK016-003) is also recorded *c*. 1km to the south-west and a settlement hearth site (KK016-002) is recorded *c*. 750m to the south-west of Moanmore 1.

At Moanmore 1 a burnt mound complex consisting of three troughs, an area of burning, a pit, and a series of stakeholes dating to the late Bronze Age was excavated. A number of sites were excavated to the NNE of Moanmore 1, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. At Moanmore 2, located *c*. 850m from Moanmore 1, two circular structures and associated features dating to the middle Bronze Age period were excavated. At Moanmore 3, located *c*. 1.25km to the NNE, burnt mound activity dating to the early Bronze Age was identified at this site. At Bannagagole 1, located *c*. 1.55km to the NNE of Moanmore 1, a burnt mound and associated features dating to the middle Bronze Age were excavated.

A number of sites were also excavated to the SSW of Moanmore 1, as part of the N9/N10 Phase 4: Knocktopher to Powerstown works. At Shankill 6, located *c*. 150m to the SSW, four undated small spreads/deposits were excavated at this site. They were the remnants of burnt mound material but no features associated with this type of monument were found and the material appeared to have washed into the area and had silted up in naturally formed depressions. At Shankill 5, located *c*. 300m to the SSW, the remnants of a structure, comprising two parallel slot-trenches was excavated. The slot-trenches may have served as an entrance porch to a larger structure, no longer extant, or may have been part of a small platform unrelated to a habitation dwelling. A nearby group of four shallow postholes may have formed a similar structure. A large stone-filled pit and three other shallow pits, one of which has been dated to the early Iron Age period, four stakeholes and a pit filled with hearth waste which has dated to the medieval period were the only other features of note on the site. It is likely that this site had a number of occupation phases as a stone axe was recovered during the cleaning back of the site ahead of its excavation and one sherd of Beaker pottery was recovered from topsoil. Shankill 4 was located *c*. 500m away and an oval prehistoric hut structure made up of postholes and stakeholes and a few shallow outlying pits was excavated. An arc of stakeholes on its north side might have formed a separate sheltered space. The structure was partially

covered by an occupation deposit. One of the outlying pits contained heat-shattered stones and the site therefore may have been a campsite linked to burnt mound activity. Sherds of middle Bronze Age pottery were recovered from the site and the site has been dated to the early Bronze Age period.

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

Excavation at Moanmore 1 produced evidence of burnt mound activity. The activity was located at the site of a former stream or paleo-channel. The stream may represent an earlier channel of a small tributary of the Barrow that flows to the south of the site. The burnt mound activity was located at the bend in this watercourse. The majority of the activity was focussed on the south-west side of the stream and two separate troughs and a pit were located here. Trough 1 was roughly oval in plan, although a shallow extension of the cut to the west may have created a step, possibly for accessing the trough. A small circular pit was located to the south of Trough 1. Its function is unclear. To the west of Trough 1 and the pit was Trough 2. This was slightly larger than Trough 1 and had a post/stakehole in each corner. This was evidence that the trough was probably originally lined, most likely by timber planks that were held in position by the corner posts. Radiocarbon dating of the pit and Trough 2 indicates that the activity on the south-west of the stream bend is contemporary and dated to the mid-late Bronze Age.

Between Troughs 1 and 2 were four separate sets of post and stakeholes that appeared to make up the four corners of a roughly north south aligned square (Figure 5). The post/stakeholes in the two western groups were generally larger than those in the eastern groups. The concentration of postholes and stakeholes would suggest that one or more structures, associated with burnt mound activity, existed to the east of Trough 2. It seems likely that any erected structure was more directly associated with Trough 2 as the west posts/stakes appear to flank a possible entrance to the trough. The mirroring of the north-south clustering on the east side, despite the posts/stakes being smaller, would point towards a single structure that would have supported a canopy or light roof. This would have covered over the area in front of the entrance to Trough 2 and potentially covered a walkway between the two troughs. The quantity of post/stakeholes and the evidence of re-cutting of earlier posts/stakes would suggest that the structure or structures were temporary in nature and were rebuilt each time the trough was used.

On the north side of the river was Trough 3 which was sub-rectangular in plan. Post/stakeholes around the perimeter of part of the base suggest that it was originally timber lined. The Trough is undated so it is unclear whether it is contemporary with the activity on the other side of the stream. The burnt mound deposits associated with the activity on both sides of the river had become merged although the deposit most likely associated with Trough 3 had a distinctly redder tone. The reason for this is unclear.

In the north of the site there were three isolated pits which were filled with burnt mound material. Due to their distance from the main burnt mound activity it is unlikely that they are contemporary or related. They may represent a series of pit boilers or oven roasters, as no overlying mound deposit was recorded in the area.

Overlying the burnt mound deposits by the stream was a deposit of silty clay. This appeared to have formed naturally but it is not known when. It sealed some of the perimeter of the burnt mound spreads and may be associated with silt developing due to the stream being blocked with burnt mound material.

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

Charcoal and Wood Species identification

Charcoal was examined from four features (trough, two stakehole fills and a pit) related to a Bronze Age *fulacht fiadh*. Ash followed by alder, hazel, holly, elm, blackthorn, willow, and birch were identified from the assemblage. Due to the large counts of ash identified we can speculate that there were open clearings or an open type landscape in the area surrounding Moanmore 1 in the Bronze Age. The results compare favourably to an early Bronze Age dated *fulacht* analysed from Moanmore 3 where ash dominates.

Petrographical analysis

A total of 6 samples were analysed. Coarse grained sandstone is typical of *fulacht fiadh* material (e.g. see Mandal 2004). 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 two samples were sent for AMS radiocarbon dating.

A sample of alder charcoal from pit fill C147 was radiocarbon dated. The 2 sigma calibrated result was 1258–1030BC (UBA 14052).

A sample of ash charcoal from pit fill C37 was radiocarbon dated. The 2 sigma calibrated result was 1256–937BC (UBA 14122).

4 DISCUSSION AND CONCLUSIONS

4.1 Discussion

The excavation of Moanmore 1 identified burnt mound type activity that has been dated to the late Bronze Age. This site was located on gently sloping, well-drained pastureland. The surrounding landscape was open and there were general views of the countryside in all directions. The site is located to the north of a small stream which forms a tributary of the River Barrow to the east. Burnt mound sites are often located adjacent to a water source or in marginal landscapes. During the course of the excavation the path of an old stream or paleo-channel was identified running through the site. The stream turns at right angles and it is at this bend that the archaeological activity is focussed. It is possible that this is an earlier channel of the stream to the south or a tributary of it that has dried up. In this regard the site is ideally located for burnt mound activity as it has a close supply of water for filling the troughs.

The surrounding archaeological landscape contains no previously recorded archaeological monuments in the immediate vicinity. However in the wider landscape three further *fulachta fiadh* have been recorded; CW015-014 *c.* 400m to the north, CW015-008 *c.* 1km to the north and KK016-003 *c.* 1km to the south west.

A number of sites were excavated as part of the N9/N10 Phase 4 in the surrounding landscape of Moanmore 1. At Moanmore 2, located *c.* 850m to the north possible domestic structures dating to the middle Bronze Age were excavated while further north at Moanmore 3 burnt mound activity dating to the early Bronze Age was identified. To the south of Moanmore 1 at Shankill 6, located *c.* 150m away, four undated small spreads/deposits of burnt mound material were excavated. Shankill 5 (300m south) identified various localised scattered features two of which were dated to the Iron Age and medieval period. Stray finds from the site included a stone axe and a sherd of Beaker pottery which may indicate earlier phases of activity. Shankill 4 was *c.* 500m away and a small possible domestic, temporary structure was identified that was dated to the early Bronze Age.

The evidence from the surrounding landscape shows an area that was not intensively settled in prehistory and there are no sites that are definitively contemporary with Moanmore 1. In this context the site is an important addition to the archaeological records for the area.

The nature and form of burnt mound sites can be particularly varied, and there are many debates as to what exactly their function was. At a basic level these sites are connected by the use of hot-stone technology - a process that involved placing fire-heated stones into a trough of water in order to heat or boil the water. Simpler sites may have functioned as pot-boilers with the stones being placed directly into a pit to 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, Typological Background of Burnt Mounds).

Moanmore 1 contains a range of features that are all commonly associated with burnt mound sites. The placing of stakeholes in the corners of two of the troughs is one of the most common forms of identifying evidence of a trough lining. It is interpreted that the posts/stakes would have supported vertical planks that would have placed along the sides of the trough, although no direct evidence of these planks was found at Moanmore 1. Clusters and scatters of other post/stakeholes are also commonly found on burnt mound site, although the cluster of stakeholes identified between

Trough 1 and 2 suggests that some form of temporary structure was erected between the two troughs. The fact that many of the post/stakeholes intercut each other suggests that this was a structure that was erected and removed repeatedly suggesting that the site was used over many phases. As has been outlined in the excavation results there are clear groupings within the main cluster, which is effectively made up of four separate smaller clusters creating four “corners” to the possible structure. The nature of the features in each cluster differed, with the two clusters on the west containing larger posts/stakes than those on the east, and the south-west cluster containing the largest ones. It is possible therefore that some type of lightly roofed structure was erected, with the main load bearing side located on the west. This could have covered the area between the two troughs.

There is no indication as to the function of the troughs as no diagnostic material was recovered. Traditionally burnt mound sites have been interpreted as being cooking places but there is no definitive evidence in the form of domestic waste to suggest that this was the case at Moanmore 1. A number of sites have been interpreted as bathing places or sweathouses both from the N9/N10 Phase 4 and other schemes and many of these sites have been dated to the late Bronze Age and early Iron Age – Stonecarthy West 1, Blanchvillespark 3 and Maddockstown 1 among others. Given the potential structural activity linking the two troughs, and the late Bronze Age date, perhaps Moanmore 1 was also a bathing site, but not a sweathouse as the troughs themselves were not enclosed.

The dating evidence suggests that the activity on the south/west of the paleo-channel was contemporary but it is unclear if the activity on the north of the channel is contemporary or represents a separate phase. It may represent an earlier phase, as Trough 3 was filled with burnt mound material, suggesting it was deliberately backfilled whereas Troughs 1 and 2 were not, suggesting they were left open when the site was abandoned. It is likely that the pits filled with heat shattered stone identified in a separate cutting over 50m to the north are unrelated chronologically. These pits also give an insight into the varying form of features and functions that can be associated with this site type. There is no definitive trough in this area and no overlying mound of heat shattered stone suggesting that the pits may not have held water, such as the troughs and would have functioned as pot boilers or oven roasters (see Section 3.3).

4.2 Conclusions

This site consisted of a burnt mound complex situated beside a bend in a silted-up stream. The site is important locally as there have been few archaeological monuments recorded in this area dating to the Bronze Age and it represents the first site in the area definitively dated to the late Bronze Age. The site is also of regional importance in terms of the research and study of burnt mound sites and their function and form. The potential for structural activity between the two troughs is significant and the identification of structures outside the troughs themselves is not commonplace on burnt mound excavations. The fact that these structures were repeatedly erected in the same location shows that the site had multiple phases/seasons of use. This suggests that the site was not the location of a transient activity but was repeatedly returned to which could imply it had a significance socially or culturally. It is interpreted that the site may have been a bathing place, possibly in addition to cooking or feasting although no definitive evidence was recovered to clearly indicate its function.

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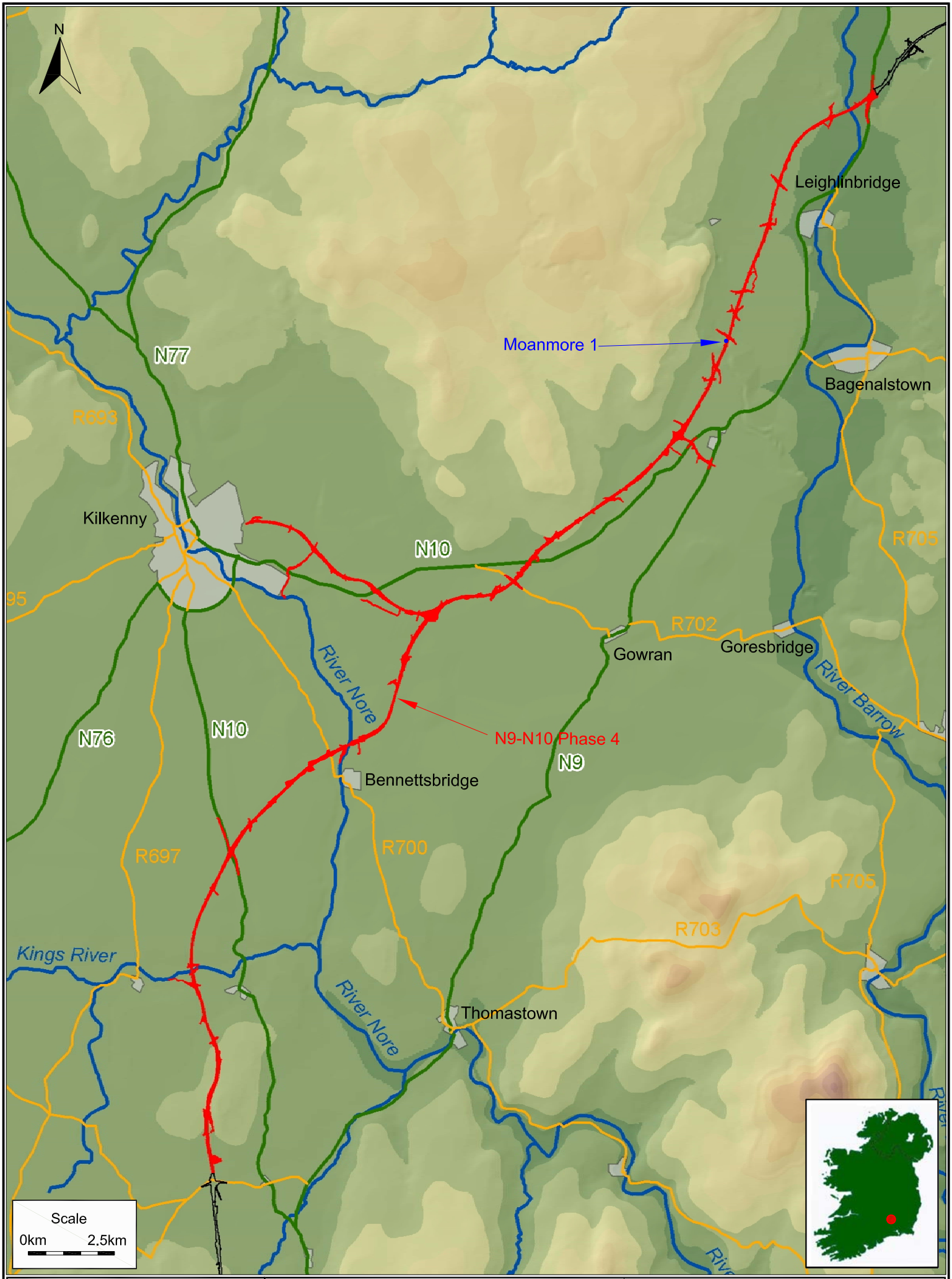

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			Job No: J2432
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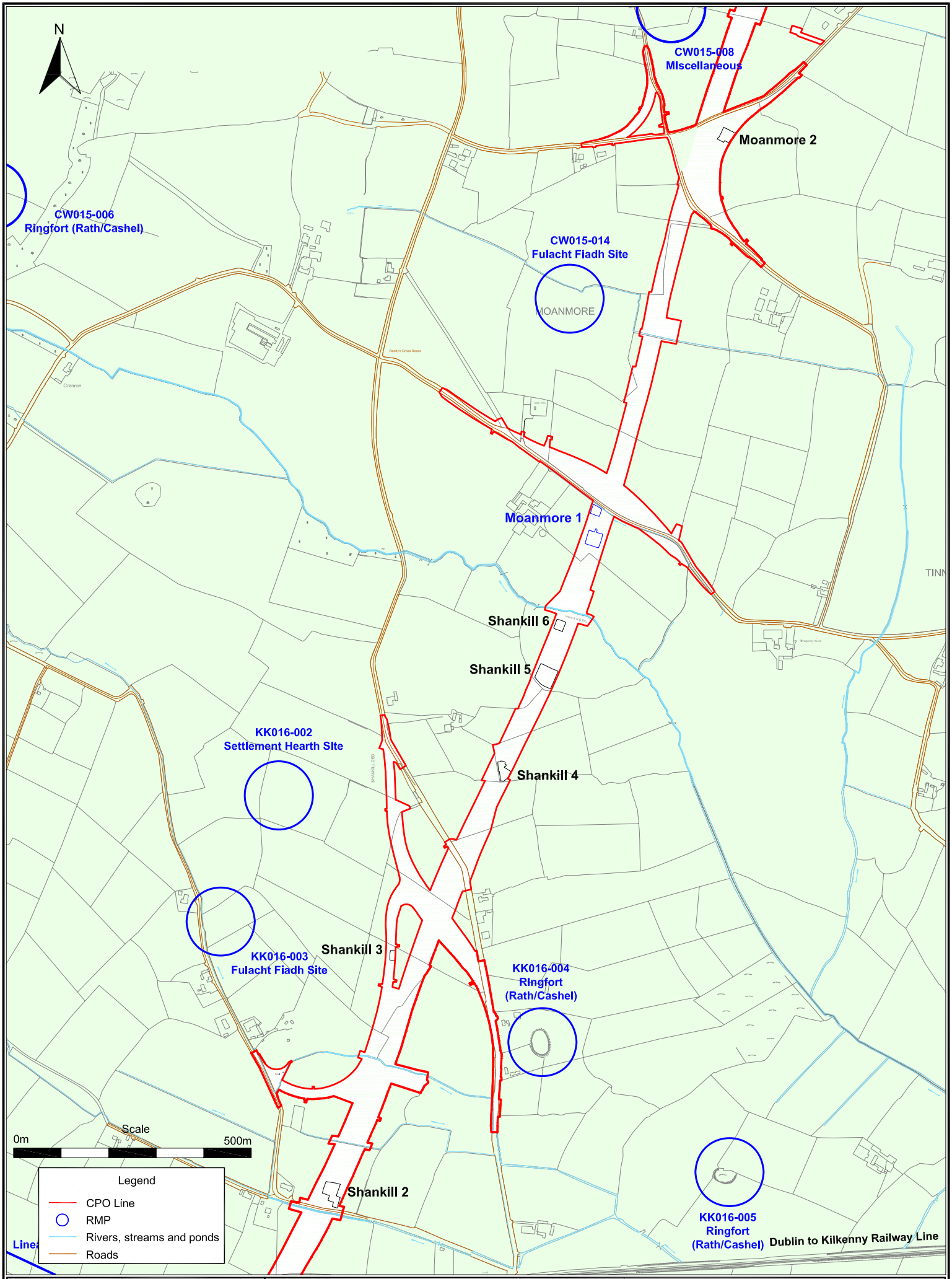
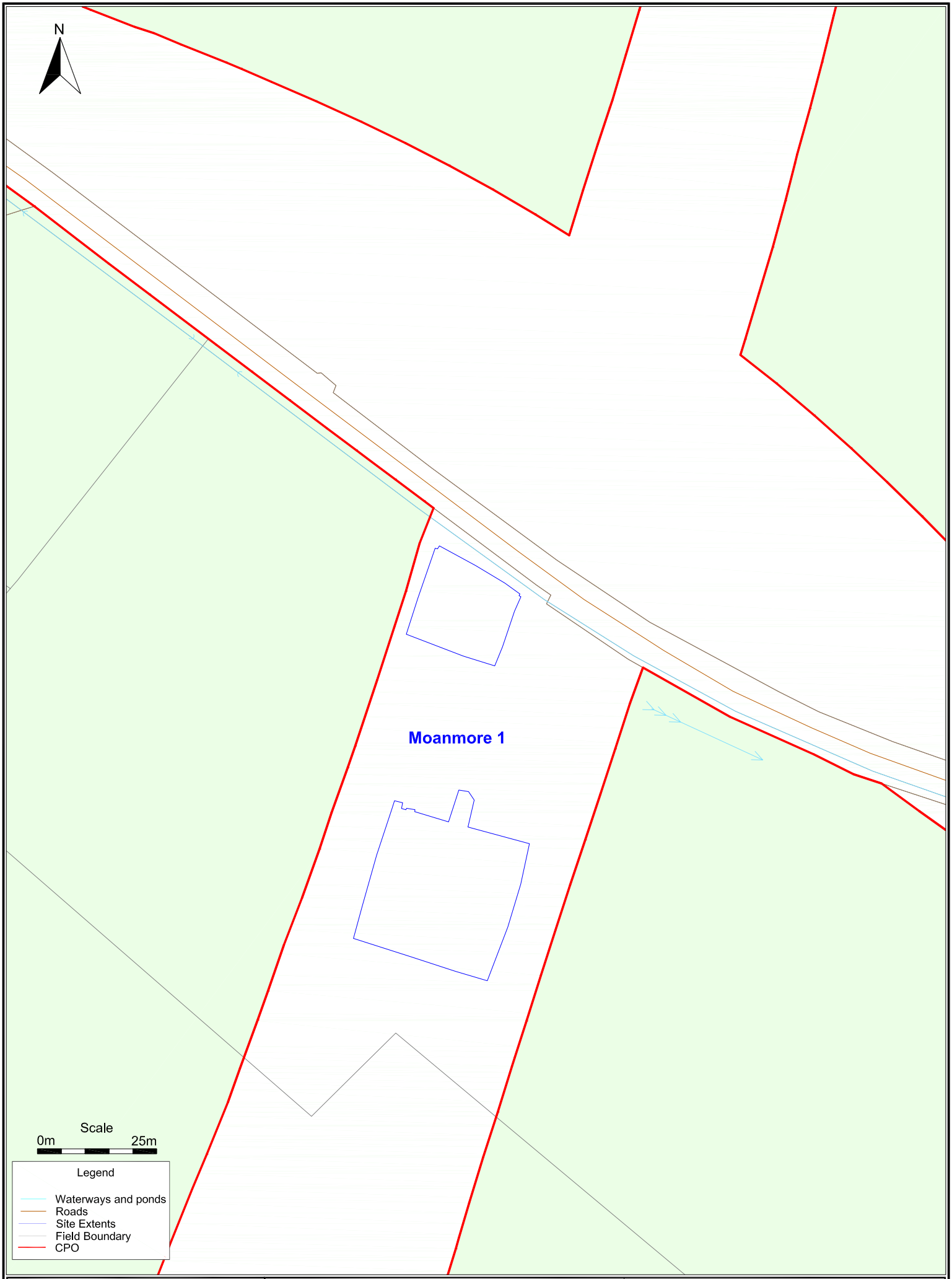


IAC Irish Archaeological Consultancy

Title:	Moanmore 1 - Location of site showing RMPs
Project:	N9-N10 Phase 4: Knocktopher to Powerstown
Client:	Kilkenny County Council

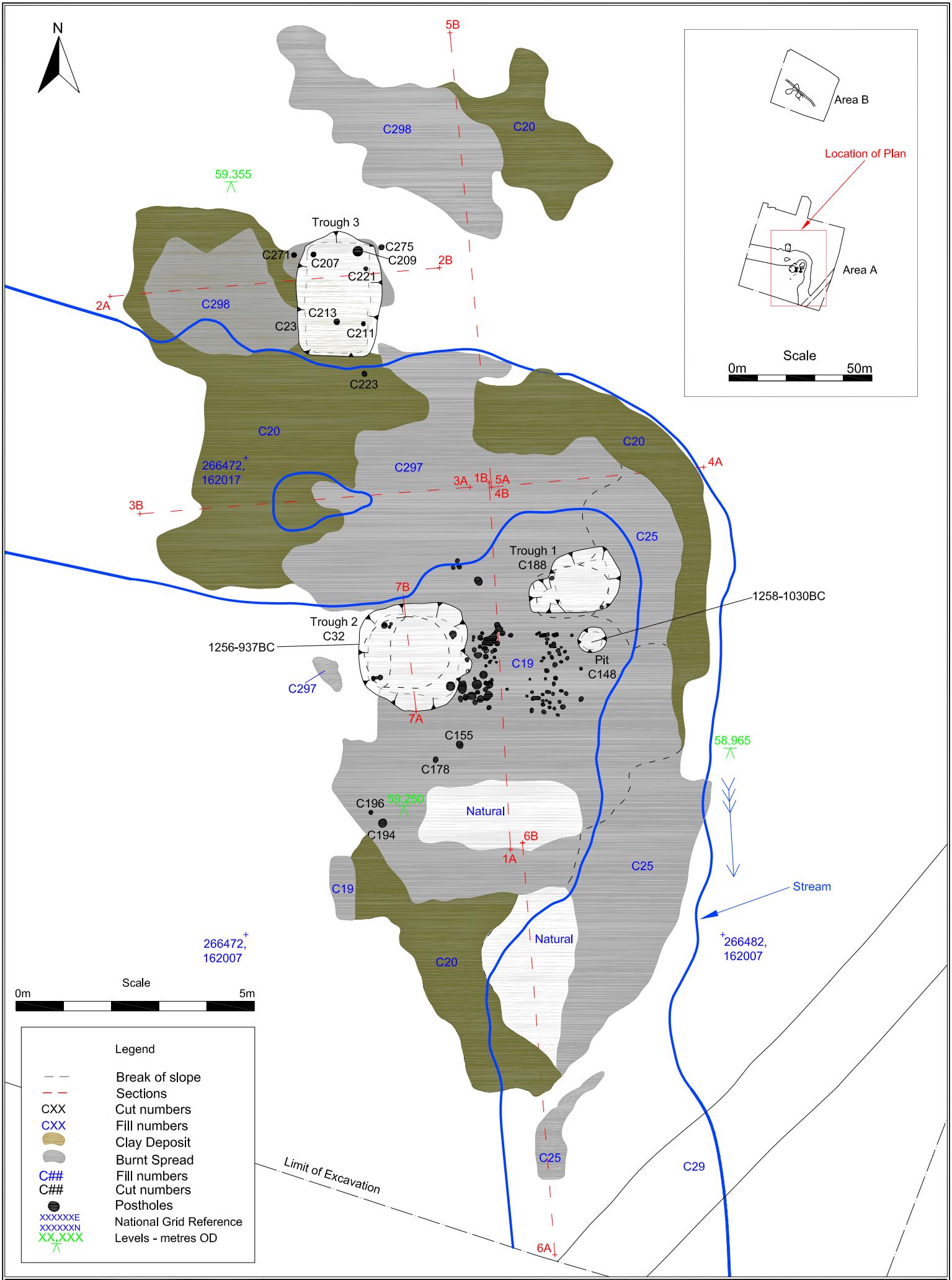
Scale:	1:10000 @ A4
Date:	17/05/10
Produced by:	P Higgins
Job No:	J2432
Figure No:	2



IAC Irish Archaeological Consultancy

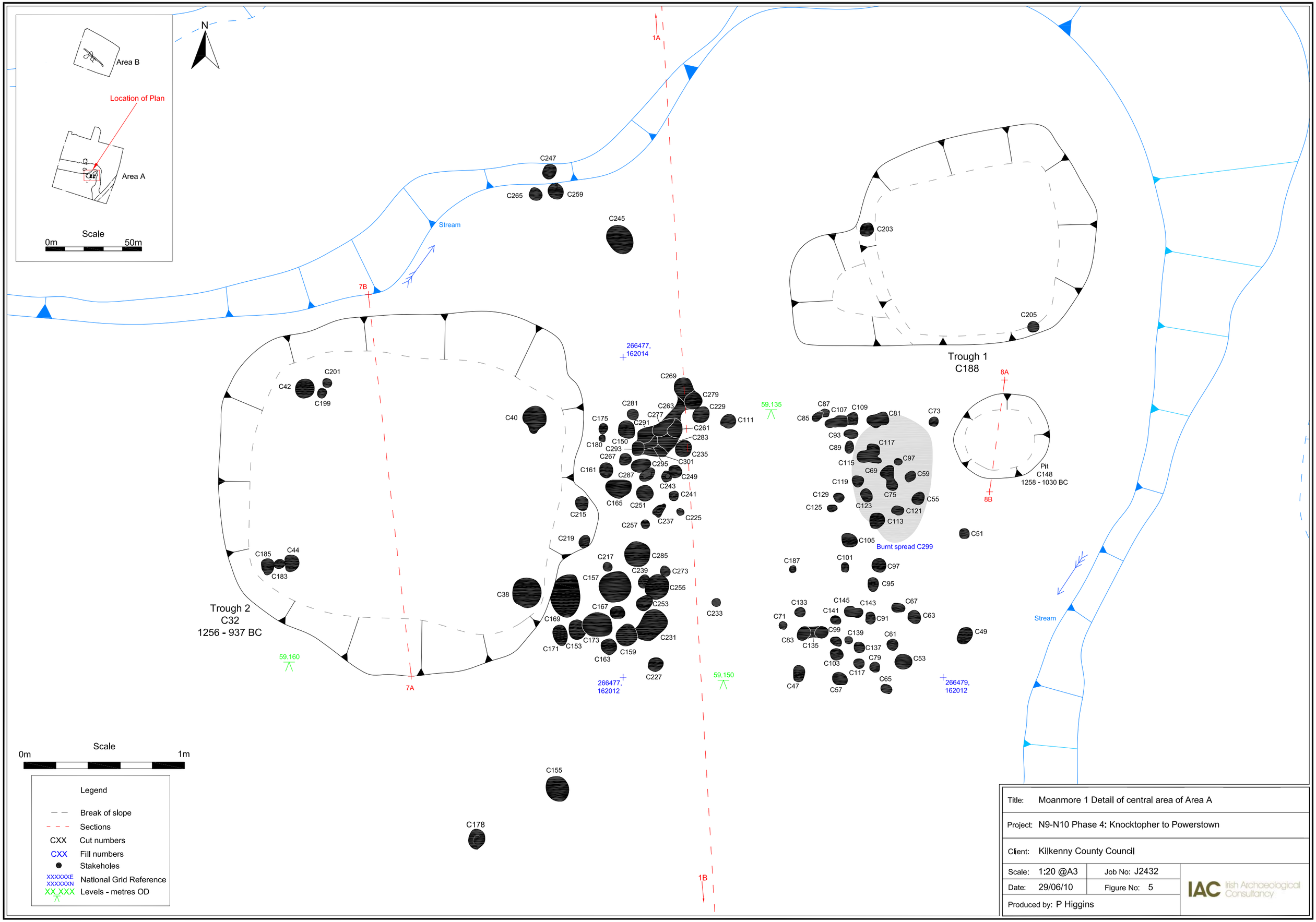
Title:	Moanmore 1 - Location of site within development
Project:	N9-N10 Phase 4: Knocktopher to Powerstown
Client:	Kilkenny County Council

Scale:	1:1000 @ A4
Date:	10/05/10
Produced by:	P Higgins
Job No:	J2432.1
Figure No:	3

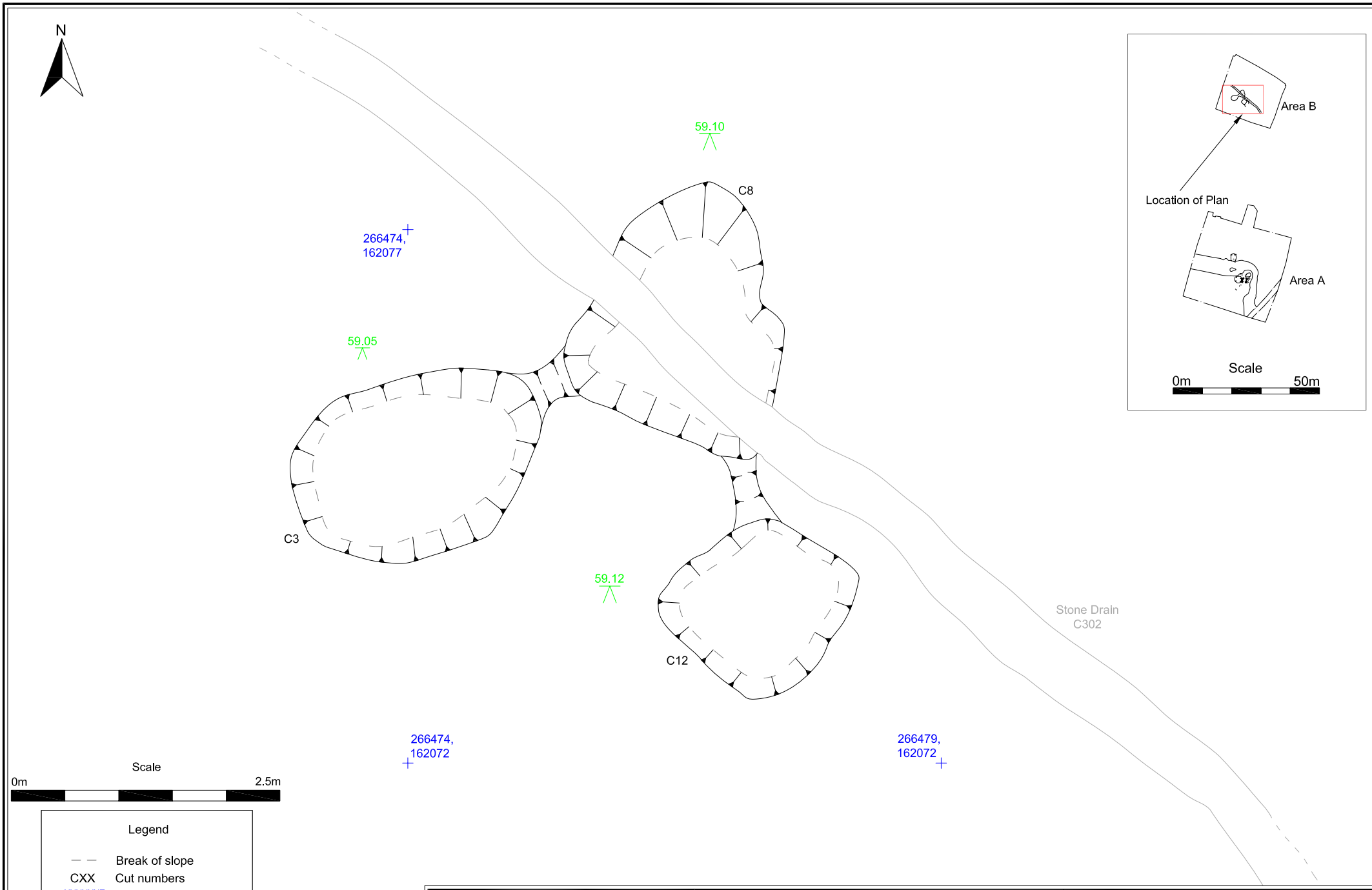


IAC Irish Archaeological Consultancy

Title:	Moanmore 1 - Plan of Area A
Project:	N9-N10 Phase 4: Knocktopher to Powerstown
Client:	Kilkenny County Council
Scale:	1:100 @ A4
Date:	29/06/10
Produced by:	P Higgins
Job No:	J2432
Figure No:	4



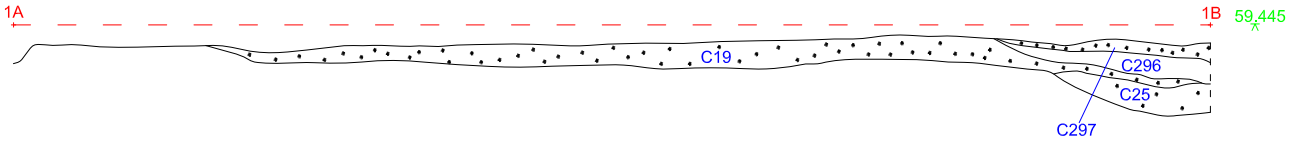
Title:	Moanmore 1 Detail of central area of Area A		
Project:	N9-N10 Phase 4: Knocktopher to Powerstown		
Client:	Kilkenny County Council		
Scale:	1:20 @A3	Job No: J2432	IAC Irish Archaeological Consultancy
Date:	29/06/10	Figure No: 5	
Produced by:	P Higgins		



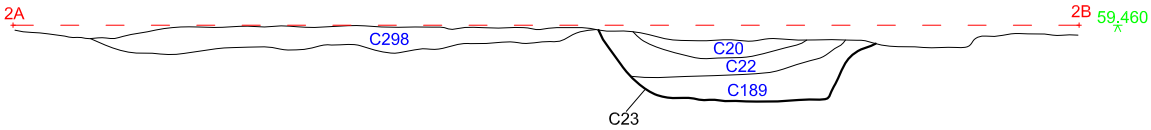
IAC Irish Archaeological Consultancy

Title:	Moanmore 1 Post-excavation detail of Area B
Project:	N9/N10 Phase 4b
Client:	Kilkenny County Council
Scale:	1:100 @ A4
Date:	29/06/10
Produced by:	P Higgins
Job No:	J2432
Figure No:	6

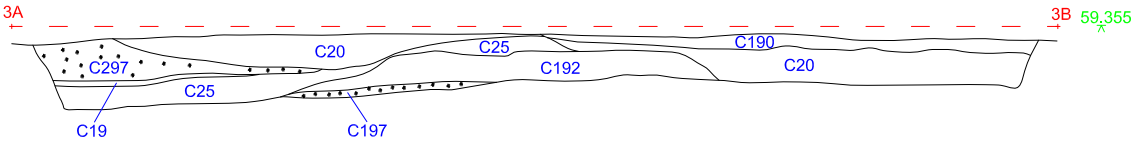
East facing section of C19, C25, C296, C297



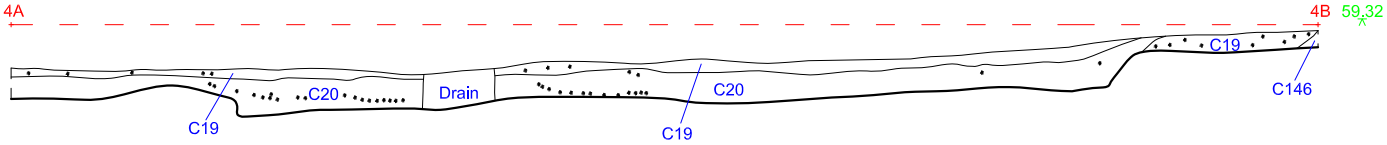
South facing section of C20, C22, C23, C189, C298



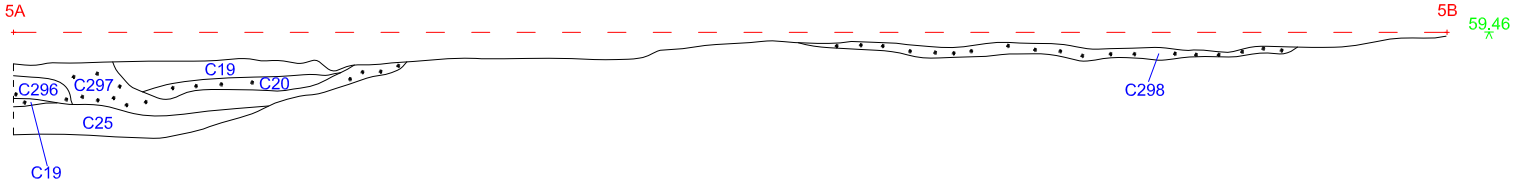
North facing section of C19, C20, C25, C190, C192, C197



North facing section of C19, C20, C146



East facing section of C19, C20, C25, C296, C297, C298



Scale

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Legend

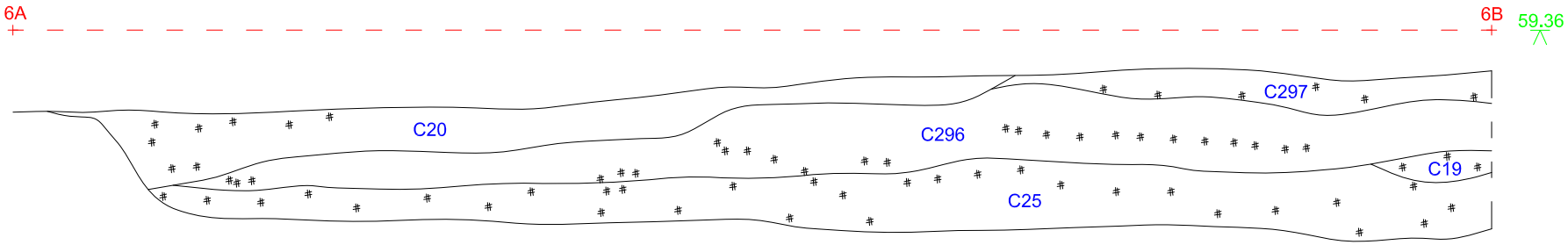
CXX	Cut Numbers
CXX	Fill Numbers
	Stone
#	Charcoal
XX.XXX	Levels - metres OD

IAC Irish Archaeological Consultancy

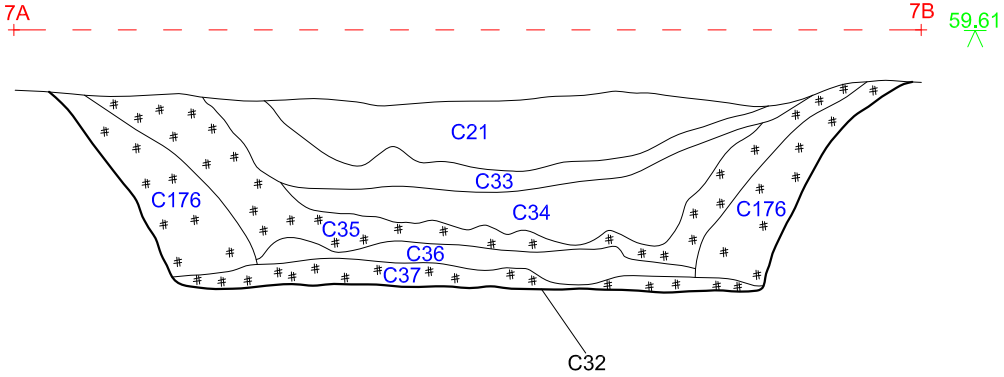
Title:	Moanmore 1 - Sections 1-5
Project:	N9-N10 Phase 4: Knocktopher to Powerstown
Client:	Kilkenny County Council

Scale:	1:50 @ A4
Date:	30/06/10
Produced by:	P Higgins
Job No:	J2432
Figure No:	7

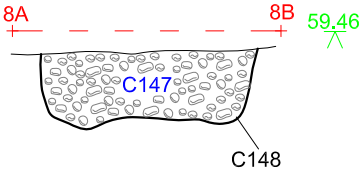
East facing section of C19, C20, C25, C296, C297



East facing section of C32



West facing section of C148



Scale

0m 1m

Legend

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

IAC Irish Archaeological Consultancy

Title:	Moanmore 1 - Sections 6-7
Project:	N9-N10 Phase 4: Knocktopher to Powerstown
Client:	Kilkenny County Council

Scale:	1:20 @ A4
Date:	30/06/10
Produced by:	P Higgins
Job No:	J2432
Figure No:	8

PLATES

Plate 1: Moanmore 1 showing the bend in the stream, post-excavation, facing north-west

Plate 2: Trough 3 and stakeholes, post-excavation, facing north

Plate 3: Trough 2 post excavation prior to excavation of stakeholes, facing east

Plate 4: Trough 1 and circular pit C148, post-excavation, facing south

Plate 5: Burnt area C299 cut through by stakeholes, mid-excavation, facing west

Plate 6: Trough 2 (right), Trough 1 (foreground) and cluster of postholes and stakeholes, post-excavation, facing south-west

Plate 7: Burnt mound, mid-excavation, facing north-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
C1	N/A	N/A	N/A	N/A	Topsoil		N/A	All
C2	N/A	N/A	N/A	N/A	Natural Subsoil		All	N/A
C3	N/A	2.7	1.8	0.4	Cut of Pit	Oval, break of slope top sharp, sides smooth, break of slope base not perceptible, base concave.	C4	C2
C4	C3	3.4	7.8	0.4	Fill of pit	Fairly loose, black, silty clay, burnt stones, charcoal.	C7	C3
C5	C3	0.80	0.60	0.10	Fill of pit	Compact, mid grey, silty clay, occasional flecks of charcoal.	C1	C6
C6	C3	1.30	1.70	0.3	Fill of pit	Compact, light grey, silty clay, occasional charcoal flecking.	C5	C7
C7	C3	0.80	1.80	0.20	Fill of pit	Loose, mid grey, silty clay, burnt stones, occasional charcoal flecking.	C6	C4
C8	N/A	2.10	1.50	0.20	Cut of Pit	Oval, break of slope top not perceptible, sides smooth, break of slope base not perceptible, base concave.	C11	C2
C9	C11	2.10	1.40	0.20	Fill of pit	Loose, mid grey, silty clay, burnt stones, occasional charcoal flecking.	C1	C10
C10	C12	2.10	0.73	0.04	Fill of pit	Fairly loose, black, silty clay, burnt stones, charcoal.	C9	C11
C11	C8	0.66	1.80	0.06	Fill of pit	Compact, orange, silty clay, occasional charcoal.	C10	C8
C12	N/A	4.8	2.10	0.34	Cut of Pit	Oval, break of slope top sharp, sides concave, break of slope base not perceptible, base concave.	C16	C2
C13	C12	2	1.10	0.22	Fill of pit	Fairly loose, black, silty clay, burnt stones, charcoal.	C1	C14
C14	C12	2	1.60	0.30	Fill of pit	Compact, mid grey, silty clay, orangey flecks.	C13	C15
C15	C12	0.10	0.15	0.10	Fill of pit	Compact, dark grey, silty clay.	C14	C16
C16	C12	2.3	2.10	0.08	Fill of pit	Loose, dark grey, silty clay, occasional flecks of charcoal.	C15	C12
C17	N/A	N/A	N/A	N/A	Stone deposit	N/A		
C18	N/A	N/A	N/A	N/A	Stone deposit	N/A		
C19	N/A	8	7	0.20	Deposit	Moderately compact, dark greyish black, sandy silt, frequent stones, and frequent charcoal.	C296	C25
C20	N/A			0.2	Deposit	Moderately compact, light grey, clayey silt, occasional stones.	C190	C20
C21	C32	1.90	1.25	0.32	Fill of trough	Soft, light grey. Clayey silt, no inclusions.	C190	C33
C22	C23	1.50	1.30	0.1	Fill of trough	Moderate, dark greyish black, sandy silt, frequent angular stones, frequent charcoal flecking	C20	C189
C23	N/A	2.40	1.30	0.40	Cut of trough	Rectangular, corners sharp, break of slope top sharp, sides straight, break of slope base sharp, base flat.	C211	C2

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C24	C188	1.40	1.30	0.12	Deposit	Moderate to compact, light grey, clayey silt, occasional angular stones, occasional charcoal flecks.	C19	C186
C25	N/A	2-4.5	20	0.25	Deposit	Moderately loose, mid reddish brown, sandy silt occasional charcoal flecking.	C19	C192
C26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C27	N/A	2.05	1.10	0.1	Deposit	Soft, black, silty clay, burnt stones, frequent charcoal	C25	C192
C28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C29	C31	10	1.45	0.5	Fill of ditch	Moderately soft, mid reddish brown, sandy silt occasional charcoal flecking.	C1	C30
C30	C31	10	1.75	0.5	Fill of ditch	Moderately soft, mid greyish brown, sandy silt, occasional charcoal flecking, moderate stones.	C29	C31
C31	N/A	10	1.45	0.50	Cut of ditch	Linear, break of slope top sharp, sides concave, break of slope base gradual, base flat.	C30	C2
C32	N/A	2.3	2.05	0.56	Cut of trough	Oval, corners rounded, break of slope top gradual, sides steep, break of slope bee sharp, base flat	C37	C2
C33	C32	2.05	0.6	0.2	Fill of trough	Loose, light yellowish grey, silty clay, burnt stones.	C21	C34
C34	C32	1.95	1.90	0.23	Fill of trough	Loose, light reddish yellow, clayey silt.	C33	C35
C35	C32	2.3	2.05	0.25	Fill of trough	Loose, light greyish black, silty clay, frequent stones, moderate charcoal flecking.	C34	C36
C36	C32	1.50	1.15	0.09	Fill of trough	Loose, light yellowish grey, silty clay.	C35	C176
C37	C32	1.72	1.15	0.07	Fill of trough	Loose, dark greyish black, silty clay, frequent stones, moderate charcoal flecking.	C176	C41
C38	N/A	0.22	0.21	0.25	Cut of Stakehole	Oval, break of slope top rounded, sides steep, break of slope base gradual, base U shaped.	C39	C32
C39	C38	0.22	0.21	0.25	Fill of Stakehole	Loose, dark greyish black, silty clay, burnt stones, moderate charcoal flecking.	C37	C38
C40	N/A	0.16	0.15	0.33	Cut of Stakehole	Oval, break of slope top rounded, sides steep, break of slope base gradual, base U shaped.	C41	C32
C41	C40	0.16	0.15	0.33	Fill of Stakehole	Loose, dark greyish black, silty clay, burnt stones, moderate charcoal flecking.	C37	C40
C42	N/A	0.08	0.10	0.14	Cut of Stakehole	Oval, break of slope top rounded, sides steep, break of slope base gradual, base U shaped.	C43	C32
C43	C42	0.10	0.08	0.14	Fill of Stakehole	Loose, light reddish clayey silt, moderate charcoal.	C37	C42
C44	N/A	0.11	0.11	0.16	Cut of Stakehole	Oval, break of slope top rounded, sides steep, break of slope base gradual, base U shaped.	C45	C32

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C45	C44	0.11	0.11	0.16	Fill of Stakehole	Loose, light reddish clayey silt, moderate charcoal.	C37	C44
C46	C47	0.11	0.09	0.11	Fill of Stakehole	Moderate, mid blackish brown clayey silt, moderate charcoal flecking.	C19	C47
C47	N/A	0.11	0.09	0.11	Cut of Stakehole	Oval, break of slope top rounded, sides steep, break of slope base gradual, base U shaped.	C46	C146
C48	C49	0.12	0.08	0.15	Fill of Stakehole	Loose, light greyish brown,. Clayey silt, frequent charcoal flecks.	C19	C49
C49	N/A	0.12	0.08	0.15	Cut of Stakehole	Oval, break of slope top rounded, sides steep, break of slope base gradual, base U shaped.	C48	C146
C50	C51	0.08	0.07	0.10	Fill of Stakehole	Soft, Dark greyish brown clayey silt, moderate charcoal.	C19	C51
C51	N/A	0.08	0.07	0.10	Cut of Stakehole	Oval, break of slope top sharp, sides sloping break of slope base gradual, base U shaped.	C50	C151
C52	C53	0.08	0.11	0.13	Fill of Stakehole	Loose, light greyish brown,. Clayey silt, frequent charcoal flecks.	C19	C53
C53	N/A	0.11	0.08	0.13	Cut of Stakehole	Oval, break of slope top sharp, sides steep break of slope base gradual, base U shaped.	C52	C146
C54	C55	0.08	0.10	0.1	Fill of Stakehole	Loose greyish brown,. Clayey silt, occasional charcoal flecks.	C19	C55
C55	N/A	0.08	0.10	0.10	Cut of Stakehole	Oval, break of slope top sharp, sides sloping break of slope base gradual, base U shaped.	C54	C151
C56	C57	0.09	0.08	0.13	Fill of Stakehole	Moderate , Dark blackish grey clayey silt, moderate charcoal flecking.	C19	C57
C57	N/A	0.09	0.08	0.13	Cut of Stakehole	Oval, break of slope top sharp, sides vertical, break of slope base gradual, base U shaped.	C56	C146
C58	C59	0.05	0.08	0.07	Fill of Stakehole	Loose, Dark greyish brown clayey silt, moderate charcoal.	C19	C59
C59	N/A	0.08	0.07	0.05	Cut of Stakehole	Oval, break of slope top sharp, sides sloping break of slope base gradual, base U shaped.	C58	C151
C60	C61	0.07	0.07	0.13	Fill of Stakehole	Loose, yellowish greyish brown, clayey silt, frequent charcoal flecking.	C19	C61
C61	N/A	0.07	0.07	0.13	Cut of Stakehole	Oval, break of slope top sharp, sides steep break of slope base gradual, base U shaped.	C60	C146
C62	C63	0.08	0.07	0.06	Fill of Stakehole	Loose, yellowish light grey, clayey silt, occasional charcoal flecks.	C19	C63
C63	N/A	0.08	0.07	0.06	Cut of Stakehole	Oval, break of slope top sharp, sides steep break of slope base sharp , base U shaped.	C62	C146
C64	C65	0.06	0.06	0.10	Fill of Stakehole	Moderate, mid brownish grey, clayey silt, moderate charcoal flecking.	C19	C65
C65	N/A	0.06	0.06	0.10	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual , base U shaped.	C64	C146
C66	C67	0.08	0.06	0.09	Fill of Stakehole	Loose, yellowish grey, clayey silt, occasional charcoal flecks.	C19	C67
C67	N/A	0.08	0.06	0.09	Cut of Stakehole	Oval, break of slope top sharp, sides steep break of slope base sharp, base U shaped.	C66	C146

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C68	C69	0.10	0.08	0.14	Fill of Stakehole	Loose, Dark greyish brown clayey silt, moderate charcoal.	C19	C69
C69	N/A	0.1	0.08	0.14	Cut of Stakehole	Oval, break of slope top sharp, sides sloping break of slope base gradual , base U shaped.	C68	C151
C70	C71	0.07	0.06	0.06	Fill of Stakehole	Loose, Dark greyish brown clayey silt, moderate charcoal.	C19	C71
C71	N/A	0.07	0.06	0.06	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual, base U shaped.	C70	C151
C72	C73	0.06	0.06	0.05	Fill of Stakehole	Soft, mid grey brown, clayey silt, occasional charcoal flecks.	C19	C73
C73	N/A	0.06	0.06	0.05	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base sharp, base tapered.	C72	C146
C74	C75	0.08	0.08	0.04	Fill of Stakehole	Loose, Dark greyish brown clayey silt, moderate charcoal.	C19	C74
C75	N/A	0.08	0.08	0.04	Cut of Stakehole	Oval, break of slope top gradual, sides slopping, break of slope base gradual, base concave.	C74	C151
C76	C77	0.05	0.05	0.07	Fill of Stakehole	Moderately compact, mid greyish black, clayey silt, moderate charcoal flecks.	C19	C77
C77	N/A	0.05	0.05	0.07	Cut of Stakehole	Oval, break of slope top gradual, sides tapered, break of slope base gradual, base tapered.	C76	C146
C78	C79	0.06	0.06	0.13	Fill of Stakehole	Loose, Yellowish black dark brown clayey silt, frequent charcoal flecking, moderate stones.	C19	C79
C79	N/A	0.06	0.06	0.13	Cut of Stakehole	Oval, break of slope top gradual, sides tapered, break of slope base gradual, base tapered.	C78	C146
C80	C81	0.15	0.10	0.18	Fill of Stakehole	Loose, Dark greyish brown clayey silt, moderate charcoal, occasional pebbles.	C19	C81
C81	N/A	0.15	0.10	0.18	Cut of Stakehole	Irregular oval, break of slope top sharp, sides steep, break of slope base gradual, base tapered.	C80	C146
C82	C83	0.06	0.05	0.09	Fill of Stakehole	Moderately compact, Mid brownish grey, clayey silt, occasional charcoal flecking.	C19	C83
C83	N/A	0.06	0.05	0.09	Cut of Stakehole	Oval, break of slope base sharp, sides tapered, break of slope base gradual, base tapered.	C82	C146
C84	C85	0.08	0.07	0.06	Fill of Stakehole	Soft, Dark greyish brown clayey silt, moderate charcoal.	C19	C85
C85	N/A	0.08	0.07	0.06	Cut of Stakehole	Oval, break Of lope top non perceptible, sides sloping, break of slope base gradual, base concave.	C84	C146
C86	C87	0.08	0.07	0.08	Fill of Stakehole	Soft, Dark greyish brown clayey silt, moderate charcoal.	C19	C87
C87	N/A	0.08	0.07	0.08	Cut of Stakehole	Oval, break of slope top shape sides sloping, break of slope base vertical base non perceptible.	C86	C19
C88	C89	0.08	0.07	0.12	Fill of Stakehole	Soft, Dark greyish brown clayey silt, moderate charcoal.	C19	C89

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C89	N/A	0.08	0.07	0.12	Cut of Stakehole	Oval, break of slope top shape sides sloping, break of slope base gradual base concave.	C88	C146
C90	C91	0.08	0.05	0.15	Fill of Stakehole	Loose, Yellowish black dark brown clayey silt, frequent charcoal flecking, moderate stones.	C19	C91
C91	N/A	0.08	0.05	0.15	Cut of Stakehole	Oval, break of slope top sharp, sides steep, break of slope base gradual, base tapered.	C90	C146
C92	C93	0.08	0.07	0.14	Fill of Stakehole	Soft, Mid greyish blackish brown, clayey silt, moderate charcoal flecking.	C19	C93
C93	N/A	0.08	0.07	0.14	Cut of Stakehole	Oval, break of slope top sharp, sides vertical, break of slope base gradual, base tapered.	C92	C146
C94	C95	0.09	0.07	0.09	Fill of Stakehole	Loose, Yellowish dark grey, clayey silt, moderate charcoal flecks.	C19	C95
C95	N/A	0.09	0.07	0.09	Cut of Stakehole	Oval, break of slope top sharp, sides steep, break of slope base gradual, base tapered.	C94	C146
C96	C97	0.09	0.09	0.07	Fill of Stakehole	Loose, Greyish blackish brown clayey silt, frequent charcoal flecking.	C19	C97
C97	N/A	0.09	0.09	0.07	Cut of Stakehole	Oval, break of slope top gradual, sides moderate, break of slope base sharp, base tapered.	C96	C146
C98	C99	0.09	0.09	0.16	Fill of Stakehole	Moderate , mid brownish blackish grey, clayey silt, moderate charcoal flecks, occasional pebbles.	C19	C99
C99	N/A	0.09	0.09	0.16	Cut of Stakehole	Oval, break of slope top sharp,, sides moderate, break of slope base gradual, base tapered.	C98	C146
C100	C101	0.07	0.05	0.09	Fill of Stakehole	Loose, Greyish blackish brown clayey silt, frequent charcoal flecking.	C19	C101
C101	N/A	0.07	0.05	0.09	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual, base tapered.	C100	C146
C102	C103	0.08	0.08	0.11	Fill of Stakehole	Moderate, Black brownish grey clayey silt, moderate charcoal flecking.	C19	C103
C103	N/A	0.08	0.08	0.11	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual, base tapered.	C102	C146
C104	C105	0.09	0.07	0.14	Fill of Stakehole	Loose, Orangey black grey clayey silt, frequent charcoal flecking, occasional pebbles.	C19	C105
C105	N/A	0.09	0.07	0.14	Cut of Stakehole	Oval, break of slope top sharp, sides steep break of slope base gradual, base tapered.	C104	C146
C106	C107	0.14	0.09	0.08	Fill of Stakehole	Loose, dark greyish brown, clayey silt, frequent charcoal.	C19	C107
C107	N/A	0.14	0.09	0.08	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual, base tapered.	C106	C146
C108	C109	0.09	0.08	0.11	Fill of Stakehole	Loose, dark greyish brown, clayey silt, frequent charcoal.	C19	C109
C109	N/A	0.09	0.08	0.11	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual, base tapered.	C108	C146

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C110	C111	0.11	0.09	0.04	Fill of Stakehole	Loose, Dark blackish grey clayey silt, frequent charcoal.	C19	C111
C111	N/A	0.11	0.09	0.04	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual, base concave	C110	C146
C112	C113	0.10	0.19	0.08	Fill of Stakehole	Loose, dark greyish brown, clayey silt, moderate charcoal.	C19	C113
C113	N/A	0.10	0.19	0.08	Cut of Stakehole	Oval, break of slope top sharp, sides steep break of slope base gradual, base concave	C112	C151
C114	C115	0.13	0.08	0.08	Fill of Stakehole	Loose, dark greyish brown, clayey silt, moderate charcoal.	C19	C115
C115	N/A	0.13	0.08	0.08	Cut of Stakehole	Oval, break of slope top gradual, sides sloping break of slope base gradual, base tapered	C114	C146
C116	C117	0.08	0.06	0.08	Fill of Stakehole	Loose, dark greyish brown, clayey silt, moderate charcoal.	C19	C117
C117	N/A	0.08	0.06	0.08	Cut of Stakehole	Oval, break of slope top sharp, sides sloping break of slope base sloping base tapered	C116	C146
C118	C119	0.08m	0.07m	0.04m	Fill of Stakehole	Soft, dark greyish brown, clayey silt, moderate charcoal.	C19	C119
C119	N/A	0.08m	0.07m	0.04m	Cut of Stakehole	Oval, break of slope top gradual sides sloping break of slope base sloping base tapered	C19	C120
C120	C121	0.08m	0.05m	0.09m	Fill of Stakehole	Loose, greyish brown clayey silt, frequent moderately flecking.	C19	C121
C121	N/A	0.08m	0.05m	0.09m	Cut of Stakehole	Oval, break of slope top sharp, sides steep break of slope base sharp base tapered	C120	C151
C122	C123	0.11m	0.07m	0.06m	Fill of Stakehole	Loose, dark greyish brown, clayey silt, moderate charcoal.	C19	C123
C123	N/A	0.11m	0.07m	0.06m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual base concave	C122	C151
C124	C125	0.06m	0.04m	0.07m	Fill of Stakehole	Loose, dark greyish brown, clayey silt, moderate charcoal.	C19	C123
C125	N/A	0.06m	0.04m	0.07m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual base concave	C124	C151
C126	C127	0.06m	0.06m	0.12m	Fill of Stakehole	Loose, Yellow black dark brown clayey silt, moderate charcoal flecks, occasional small stones.	C19	C127
C127	N/A	0.06m	0.06m	0.12m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base sharply base tapered	C126	C146
C128	C129	0.09m	0.07m	0.06m	Fill of Stakehole	Loose, dark greyish brown, clayey silt, moderate charcoal.	C19	C129
C129	N/A	0.09m	0.07m	0.06m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual base concave	C128	C146
C130	C131	0.07m	0.06m	0.08m	Fill of Stakehole	Loose, Light brown greyish clayey silt, occasional charcoal flecking.	C19	C131
C131	N/A	0.07m	0.06m	0.08m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base sharp, base tapered	C130	C146
C132	C133	0.05m	0.05m	0.09m	Fill of Stakehole	Soft, Mid brownish grey black, clayey silt, occasional charcoal flecks.	C19	C133

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C133	N/A	0.05m	0.05m	0.09m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical break of slope base gradual, base tapered	C132	C146
C134	C135	0.07m	0.05m	0.04m	Fill of Stakehole	Loose, Light brown greyish clayey silt, occasional charcoal flecking.	C19	C135
C135	N/A	0.07m	0.05m	0.04m	Cut of Stakehole	Oval, break of slope top gradual, sides steep, break of slope base gradual, base tapered	C134	C146
C136	C137	0.07m	0.06m	0.09m	Fill of Stakehole	Loose, Dark greyish brown clayey silt, moderate charcoal flecking.	C19	C137
C137	N/A	0.07m	0.06m	0.09m	Cut of Stakehole	Oval, break of slope top gradual, sides sloping, break of slope base gradual, base concave.	C136	C146
C138	C139	0.04m	0.04m	0.09m	Fill of Stakehole	Loose, Orangey brown grey clayey silt, moderate charcoal flecking.	C19	C139
C139	N/A	0.04m	0.04m	0.09m	Cut of Stakehole	Oval, break of slope top sharp sides steep, break of slope base gradual, base tapered.	C138	C146
C140	C141	0.06m	0.05m	0.09m	Fill of Stakehole	Loose, Light brown greyish clayey silt, occasional charcoal flecking.	C19	C141
C141	N/A	0.06m	0.05m	0.09m	Cut of Stakehole	Oval, break of slope top sharp sides steep, break of slope base sharp, base tapered.	C140	C146
C142	C143	0.06m	0.06m	0.13m	Fill of Stakehole	Loose, Light brown clayey silt, frequent charcoal flecking.	C19	C143
C143	N/A	0.06m	0.06m	0.13m	Cut of Stakehole	Oval, break of slope top sharp ,sides steep, break of slope base gradual, base tapered.	C142	C146
C144	C45	0.06m	0.05m	0.12m	Fill of Stakehole	Loose, Orangey brown grey clayey silt, frequent charcoal flecking.	C19	C145
C145	N/A	0.06m	0.05m	0.12m	Cut of Stakehole	Oval, break of slope top sharp ,sides steep, break of slope base gradual concave, base tapered.	C144	C146
C146	N/A	8m	6m	2.04m	Deposit	Soft, Mid orangey grey green clayey silt, occasional charcoal flecking.	C148	C2
C147	C148	0.71m	0.62m	0.21m	Fill of pit	Loose, Dark grey silty clay, frequent stones, frequent charcoal.	C19	C181
C148	N/A	0.71m	0.62m	0.21m	Cut of pit	Oval, break of slope top sharp ,sides vertical, break of slope base gradual , base irregular flat.	C181	C2
C149	C150	0.16m	0.16m	0.20m	Deposit	Soft, Dark greyish black, clayey silt, frequent charcoal, occasional angular stones.	C19	C150
C150	N/A	0.16m	0.16m	0.20m	Cut of Stakehole	Oval, break of slope top sharp ,sides vertical, break of slope base gradual , base tapered.	C149	C146
C151					Same as C299	Double numbered deposit		
C152	C153	0.12m	0.09m	0.14m	Fill of Stakehole	Loose, Greyish brown silty clay, occasional charcoal.	C19	C153
C153	N/A	0.12m	0.09m	0.14m	Cut of Stakehole	Oval, break of slope top gradual ,sides Concave, break of slope base gradual , base Concave.	C152	C146
C154	C155	0.14m	0.14m	0.26m	Fill of posthole	Loose, Grey silty clay, occasional charcoal flecking, occasional stones.	C19	C155
C155	N/A	0.14m	0.14m	0.26m	Cut of posthole	Circular, break of slope top sharp, sides vertical, break of slope base gradual, tapered base.	C154	C146

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C156	C157	0.20m	0.18m	0.20m	Fill of posthole	Loose, Greyish black silty clay, occasional charcoal	C19	C157
C157	N/A	0.20m	0.18m	0.21m	Cut of posthole	Circular, break of slope top gradual, sides vertical, break of slope base gradual, flat base.	C156	C146
C158	C159	0.14m	0.14m	0.18m	Fill of posthole	Loose, Black silty clay, frequent charcoal, moderate stones.	C19	C159
C159	N/A	0.14m	0.14m	0.18m	Cut of posthole	Circular, break of slope top sharp, sides vertical, break of slope base sharp, flat base.	C158	C146
C160	C161	0.14m	0.13m	0.11m	Fill of Stakehole	Loose, Blackish grey brown silty clay, frequent charcoal.	C19	C161
C161	N/A	0.14m	0.13m	0.11m	Cut of Stakehole	Circular, break of slope top gradual, sides concave, break of slope base sharp, tapered base.	C160	C146
C162	C163	0.10m	0.1m	0.16m	Fill of Stakehole	Loose , Brownish grey silty clay, occasional charcoal.	C19	C146
C163	N/A	0.10m	0.1m	0.16m	Cut of Stakehole	Circular, break of slope top sharp sides vertical, break of slope base gradual, concave base.	C162	C146
C164	C165	0.13m	0.12m	0.15m	Fill of Stakehole	Loose, Black greyish silty clay, frequent charcoal.	C19	C165
C165	N/A	0.13m	0.12m	0.15m	Cut of Stakehole	Oval, break of slope top gradual ,sides vertical, break of slope base gradual , base tapered.	C164	C146
C166	C167	0.11m	0.1m	0.15m	Fill of Stakehole	Loose, Black greyish silty clay, frequent charcoal.	C19	C167
C167	N/A	0.11m	0.01m	0.15m	Cut of Stakehole	Oval, break of slope top sharp ,sides vertical, break of slope base gradual , base concave.	C166	C146
C168	C169	0.30m	0.21m	0.14m	Fill of posthole	Loose, Black greyish silty clay, frequent charcoal, burnt stones.	C19	C169
C169	N/A	0.30m	0.21m	0.14m	Cut of posthole	Circular, break of slope top sharp, sides concave, break of slope base sharp, flat base.	C168	C146
C170	C171	0.11m	0.1m	0.07m	Fill of Stakehole	Loose, Greyish brown silty clay, occasional charcoal.	C19	C171
C171	N/A	0.11m	0.1m	0.07m	Cut of Stakehole	Oval, break of slope top gradual ,sides concave, break of slope base gradual , base concave.	C170	C146
C172	C173	0.17m	0.18m	0.18m	Fill of posthole	Soft, Dark greyish black silty clay, frequent charcoal flecks, occasional small pebbles.	C19	C173
C173	N/A	0.17m	0.18m	0.18m	Cut of posthole	Circular, break of slope top sharp, sides vertical, break of slope base gradual flat base.	C172	C146
C174	C175	0.7m	0.7m	0.13m	Fill of Stakehole	Loose, Greyish blackish silty clay, frequent charcoal	C19	C175
C175	N/A	0.7m	0.7m	0.13m	Cut of Stakehole	Oval, break of slope top sharp ,sides vertical, break of slope base gradual , base tapered.	C19	C175
C176	C32	2.30m	2.1m	0.35m	Fill of trough	Loose, Light reddish brown, clayey silt, moderate charcoal.	C36	C37
C177	C178	0.16m	0.13m	0.12m	Fill of Stakehole	Loose, Grey silty clay , moderate charcoal.	C19	C178
C178	N/A	0.16m	0.13m	0.12m	Cut of Stakehole	Oval, break of slope top sharp ,sides vertical, break of slope base gradual , base flat.	C177	C146

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C179	C180	0.06m	0.06m	0.10m	Fill of Stakehole	Loose, Greyish brown silty clay, occasional charcoal.	C19	C180
C180	N/A	0.06m	0.06m	0.10m	Cut of Stakehole	Oval, break of slope top sharp ,sides vertical, break of slope base gradual , base concave.	C179	C146
C181	C148	0.30m	0.2m	0.05m	Fill of pit	Soft, Dark greyish black clayey silt, frequent charcoal, occasional pebbles.	C181	C2
C182	C183	0.07m	0.04m	0.10m	Fill of Stakehole	Loose, Light reddish brown, clayey silt, moderate charcoal.	C37	C183
C183	N/A	0.07m	0.04m	0.10m	Cut of Stakehole	Oval, break of slope top sharp ,sides steeped, break of slope base gradual , base V shaped..	C182	C32
C184	C185	0.09m	0.1m	0.16m	Fill of Stakehole	Loose, Light reddish brown, clayey silt, moderate charcoal.	C37	C185
C185	N/A	0.09m	0.1m	0.16m	Cut of Stakehole	Oval, break of slope top sharp ,sides steeped, break of slope base gradual , base U shaped..	C184	C32
C186	C188	1.9m	1.3m	0.18m	Fill of trough	Moderate, Light greyish black clayey silt, frequent angular stones, moderate charcoal.	C24	C186
C187	C188	1.9m	1.3m	0.05m	Fill of trough	Soft, dark greyish black clayey silt, frequent angular stones, moderate charcoal.	C186	C188
C188	N/A	1.9m	1.3m	0.30m	Cut of trough	Rectangular, corners sharp, break of slope top sharp, sides straight, break of slope base sharp, base flat.	C187	C146
C189	C23	2.3m	1.4m	0.25m	Fill of trough	Soft, dark greyish black clayey silt, frequent angular stones, moderate charcoal.	C22	C23
C190	N/A	N/A	N/A	0.1m	Deposit	Soft, Mid yellowish grey, clayey silt, occasional charcoal flecks, occasional stones.	C1	C21
C191	N/A	25m	1.1m	0.15m	Deposit	Soft, Mid reddish grey, sandy silt, frequent stones, occasional charcoal flecking.	C192	C2
C192	N/A	0.4m	0.55m	0.10m	Deposit	Moderately compact, Light yellowish grey, sandy silt.	C25	C191
C193	C194	0.16m	0.11m	0.12m	Deposit	Loose, greyish brown, silty clay, occasional tones, and charcoal.	C19	C184
C194	N/A	0.16m	0.11m	0.12m	Cut of trough	Rectangular, corners sharp, break of slope top sharp, sides straight, break of slope base gradual, base concave.	C193	C146
C195	C186	0.07m	0.06m	0.06m	Fill of Stakehole	Loose, greyish brown, silty clay, occasional tones, and charcoal.	C19	C196
C196	N/A	0.07m	0.06m	0.06m	Cut of Stakehole	Oval, break of slope top gradual ,sides concave, break of slope base gradual , base concave..	C195	C146
C197	N/A	1.4m	0.3m	0.05m	Deposit	Moderately compact, mid grey, sandy silt, moderate charcoal flecking.	C192	C2
C198	C199	0.05m	0.05m	0.09m	Fill of Stakehole	Loose, Light reddish brown clayey silt., moderate charcoal flecking.	C37	C199
C199	N/A	0.05m	0.05m	0.09m	Cut of Stakehole	Oval, break of slope top gradual ,sides steep, break of slope base gradual , base U shape.	C198	C32
C200	C201	0.05m	0.04m	0.08m	Fill of Stakehole	Loose, Light reddish brown clayey silt., moderate charcoal flecking.	C37	C201

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C201	N/A	0.05m	0.04m	0.08m	Cut of Stakehole	Oval, break of slope top gradual ,sides steep, break of slope base gradual , base U shape.	C200	C32
C202	C203	0.07m	0.06m	0.06m	Fill of Stakehole	Loose, Light greyish brown clayey silt.	C187	C203
C203	N/A	0.07m	0.06m	0.06m	Cut of Stakehole	Oval, break of slope top gradual ,sides sloping, break of slope base gradual , base concave.	C202	C188
C204	C205	0.07m	0.06m	0.11m	Fill of Stakehole	Loose, Light greyish brown clayey silt.	C187	C205
C205	N/A	0.07m	0.06m	0.11m	Cut of Stakehole	Oval, break of slope top gradual ,sides sloping, break of slope base gradual , base concave.	C204	C188
C206	C207	0.1m	0.1m	0.15m	Fill of Stakehole	Moderately compact, Dark greyish black, clayey silt., moderate angular stones.	C189	C207
C207	N/A	0.1m	0.1m	0.15m	Cut of Stakehole	Oval, break of slope top sharp ,sides vertical, break of slope base gradual , base tapered.	C206	C23
C208	C209	0.16m	0.15m	0.12m	Fill of Stakehole	Moderately compact, Mid greyish black, clayey silt, occasional angular stones, occasional charcoal.	C189	C209
C209	N/A	0.16m	0.15m	0.12m	Cut of Stakehole	Oval, break of slope top gradual, sides vertical, break of slope base gradual , base tapered.	C208	C23
C210	C211	0.08m	0.07m	0.06m	Fill of Stakehole	Moderately compact, Dark greyish black, clayey silt., moderate angular stones, charcoal.	C189	C211
C211	N/A	0.06m	0.07m	0.08m	Cut of Stakehole	Oval, break of slope top gradual, sides vertical, break of slope base gradual , base tapered.	C210	C23
C212	C213	0.15m	0.12m	0.09m	Fill of Stakehole	Moderately compact, Mid greyish black, clayey silt, frequent angular stones, moderate charcoal.	C189	C213
C213	N/A	0.15m	0.12m	0.09m	Cut of Stakehole	Oval, break of slope top gradual, sides vertical, break of slope base gradual , base tapered.	C212	C23
C214	C215	0.1m	0.09m	0.11m	Fill of Stakehole	Soft, Mid blackish brownish grey clayey silt, occasional charcoal flecking.	C19	C215
C215	N/A	0.1m	0.09m	0.11m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical, break of slope base gradual , base tapered.	C214	C146
C216	C217	0.05m	0.05m	0.08m	Fill of Stakehole	Soft, dark blackish brownish grey clayey silt, occasional charcoal flecking.	C19	C217
C217	N/A	0.05m	0.05m	0.08m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical, break of slope base gradual , base tapered.	C216	C146
C218	C219	0.08m	0.08m	0.1m	Fill of Stakehole	Soft, Mid blackish grey, clayey silt, moderate charcoal flecking.	C19	C219
C219	N/A	0.08m	0.08m	0.1m	Cut of Stakehole	Oval, break of slope top gradual, sides vertical, break of slope base gradual , base tapered.	C218	C146

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C220	C221	0.07m	0.05m	0.06m	Fill of Stakehole	Soft, Dark greyish reddish black clayey silt, frequent angular stones, moderate charcoal flecking.	C189	C221
C221	N/A	0.07m	0.05m	0.06m	Cut of Stakehole	Oval, break of slope top gradual, sides concave, break of slope base gradual , base rounded.	C220	C23
C222	C223	0.11m	0.1m	0.17m	Fill of Stakehole	Soft, Dark greyish reddish black clayey silt, frequent angular stones, moderate charcoal flecking.	C25	C223
C223	N/A	0.11m	0.1m	0.17m	Cut of Stakehole	Oval, break of slope top gradual, sides concave, break of slope base gradual , base tapered.	C222	C2
C224	C225	0.06m	0.05m	0.06m	Fill of Stakehole	Soft, Dark greyish brown clayey silt, occasional pebbles.	C19	C225
C225	N/A	0.06m	0.05m	0.06m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical, break of slope base gradual , base concave.	C224	C146
C226	C227	0.07m	0.04m	0.13m	Fill of Stakehole	Soft, greyish brown clayey silt, occasional pebbles, occasional charcoal.	C19	C227
C227	N/A	0.07m	0.04m	0.13m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical, break of slope base gradual , base flat.	C226	C146
C228	C229	0.11m	0.11m	0.15m	Fill of Stakehole	Soft, Light greyish brown clayey silt, moderate stones.	C19	C146
C229	N/A	0.11m	0.11m	0.15m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical, break of slope base gradual , base concave.	C228	C146
C230	C231	0.18m	0.18m	0.23m	Fill of Stakehole	Soft, greyish black, silty clay, occasional charcoal, stones.	C19	C231
C231	N/A	0.18m	0.18m	0.23m	Cut of Stakehole	Oval, break of slope top sharp, sides vertical, break of slope base gradual , base concave.	C230	C146
C232	C233	0.12m	0.12m	0.09m	Fill of Stakehole	Soft, greyish brown clayey silt, occasional pebbles, occasional charcoal.	C19	C233
C233	N/A	0.12m	0.12m	0.09m	Cut of Stakehole	Oval, break of slope top gradual, sides convex, break of slope base gradual , base tapered.	C232	C146
C234	C235	0.08m	0.08m	0.18m	Fill of Stakehole	Soft, Dark greyish black clayey silt, occasional pebbles, frequent charcoal flecks.	C19	C235
C235	N/A	0.08m	0.08m	0.18m	Cut of Stakehole	Oval, break of slope top sharp , sides vertical, break of slope base gradual , base tapered.	C234	C146
C236	C237	0.06m	0.08m	0.08m	Fill of Stakehole	Soft, Dark greyish brown clayey silt, occasional pebbles.	C19	C237
C237	N/A	0.06m	0.08m	0.08m	Cut of Stakehole	Oval, break of slope top sharp , sides vertical, break of slope base gradual , base concave.	C236	C146
C238	C239	0.06m	0.06m	0.11m	Fill of Stakehole	Soft, greyish black clayey silt, occasional pebbles, frequent charcoal flecks.	C19	C239
C239	N/A	0.06m	0.06m	0.11m	Cut of Stakehole	Oval, break of slope top sharp , sides vertical, break of slope base gradual , base concave.	C238	C146

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C240	C241	0.06m	0.06m	0.12m	Fill of Stakehole	Soft, Dark greyish brown clayey silt, occasional pebbles, occasional charcoal.	C19	C241
C241	N/A	0.06m	0.06m	0.12m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual , base concave.	C240	C146
C242	C243	0.06m	0.06m	0.05m	Fill of Stakehole	Soft, Dark greyish brown black clayey silt, occasional pebbles, occasional charcoal.	C19	C243
C243	N/A	0.06m	0.06m	0.05m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base sharp, base flat.	C242	C146
C244	C245	0.14m	0.15m	0.24m	Fill of Stakehole	Soft, Mid blackish grey clayey silt, moderate charcoal flecks.	C19	C245
C245	N/A	0.14m	0.15m	0.24m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base sharp, base tapered.	C19	C244
C246	C246	0.09m	0.09m	0.12m	Fill of Stakehole	Soft, Light greyish brown clayey silt, moderate stones, occasional charcoal flecking.	C19	C247
C247	N/A	0.09m	0.09m	0.12m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base tapered.	C246	C146
C248	C249	0.08m	0.07m	0.08m	Fill of Stakehole	Soft, Dark greyish brown clayey silt, occasional pebbles.	C19	C249
C249	N/A	0.08m	0.07m	0.08m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C248	C146
C250	C251	0.1m	0.08m	0.09m	Fill of Stakehole	Soft, Dark greyish brown clayey silt, occasional pebbles.	C19	C251
C251	N/A	0.1m	0.08m	0.09m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base tapered.	C250	C146
C252	C253	0.1m	0.1m	0.19m	Fill of Stakehole	Soft ,greyish brown clayey silt, occasional charcoal.	C19	C253
C253	N/A	0.1m	0.1m	0.19m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base flat.	C252	C146
C254	C255	0.11m	0.1m	0.23m	Fill of Stakehole	Soft, blackish grey clayey silt, moderate charcoal flecks.	C19	C255
C255	N/A	0.11m	0.1m	0.23m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C254	C146
C256	C257	0.05m	0.05m	0.05m	Fill of Stakehole	Soft ,greyish brown clayey silt, occasional charcoal.	C19	C257
C257	N/A	0.05m	0.05m	0.05m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C256	C146
C258	C259	0.09m	0.09m	0.18m	Fill of Stakehole	Soft, Mid blackish grey clayey silt, moderate charcoal flecks.	C19	C259
C259	N/A	0.09m	0.09m	0.18m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base tapered.	C258	C146
C260	C261	0.14m	0.1m	0.17m	Fill of Stakehole	Soft, Dark greyish brown clayey silt.	C19	C261

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C261	N/A	0.14m	0.1m	0.17m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base tapered.	C260	C146
C262	C263	0.1m	0.1m	0.07m	Fill of Stakehole	Soft, Dark greyish brown clayey silt.	C19	C263
C263	N/A	0.1m	0.1m	0.07m	Cut of Stakehole	Oval, break of slope top sharp sides concave, break of slope base gradual , base tapered.	C262	C146
C264	C265	0.09m	0.08m	0.20m	Fill of Stakehole	Soft, Mid brownish grey clayey silt, moderate charcoal flecks.	C19	C265
C265	N/A	0.09m	0.08m	0.20m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C264	C146
C266	C267	0.07m	0.07m	0.15m	Fill of Stakehole	Soft, Mid blackish grey clayey silt, moderate charcoal flecks.	C19	C267
C267	N/A	0.07m	0.07m	0.15m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base tapered.	C266	C146
C268	C269	0.08m	0.08m	0.13m	Fill of Stakehole	Soft, Dark greyish brown clayey silt.	C19	C269
C269	N/A	0.08m	0.08m	0.13m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base tapered.	C19	C269
C270	C271	0.1m	0.1m	0.2m	Deposit	Soft, Dark greyish reddish black clayey silt, frequent angular cobbles.	C19	C271
C271	N/A	0.1m	0.1m	0.2m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base tapered.	C270	C
C272	C275	0.06m	0.06m	0.13m	Fill of Stakehole	Soft, Blackish brown silty clay, moderate charcoal.	C19	C273
C273	N/A	0.06m	0.06m	0.13m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C272	C146
C274	C275	0.11m	0.12m	0.23m	Deposit	Soft, Dark greyish reddish black clayey silt, frequent angular stones, moderate charcoal.	C298	C275
C275	N/A	0.11m	0.12m	0.23m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base tapered.	C274	C2
C276	C277	0.1m	0.1m	0.18m	Fill of Stakehole	Soft, Mid blackish grey clayey silt, frequent charcoal flecks.	C19	C277
C277	N/A	0.1m	0.1m	0.18m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base flat.	C276	C146
C278	C279	0.14m	0.12m	0.25m	Fill of Stakehole	Soft, Dark greyish brown clayey silt, occasional charcoal flecking.	C19	C279
C279	N/A	0.14m	0.12m	0.25m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C278	C146
C280	C281	0.06m	0.05m	0.05m	Fill of Stakehole	Soft ,greyish black clayey silt, frequent charcoal.	C19	C281
C281	N/A	0.06m	0.06m	0.05m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C280	C146
C282	C283	0.12m	0.11m	0.13m	Fill of Stakehole	Soft, Dark blackish grey clayey silt, frequent charcoal flecks.	C19	C283

Context	Fill of	L(m)	W(m)	D(m)	Interpretation	Description	Context Above	Context Below
C283	N/A	0.12m	0.11m	0.13m	Cut of Stakehole	Circular, break of slope top sharp , sides gradual, break of slope base gradual, base flat.	C282	C146
C284	C285	0.15m	0.14m	0.02m	Fill of Stakehole	Soft ,greyish black clayey silt, frequent stones, moderate charcoal.	C19	C285
C285	N/A	0.15m	0.14m	0.22m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base flat.	C284	C146
C286	C287	0.13m	0.11m	0.10m	Fill of Stakehole	Soft, Dark blackish grey clayey silt, frequent charcoal flecks.	C19	C287
C287	N/A	0.13m	0.11m	0.10m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C286	C146
C288	C289	0.14m	0.15m	0.25m	Fill of Stakehole	Soft, Dark blackish grey clayey silt, frequent charcoal flecks.	C19	C289
C289	N/A	0.14m	0.15m	0.25m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base sharp, base flat.	C288	C146
C290	C291	0.15m	0.14m	0.18m	Fill of Stakehole	Soft, Dark blackish grey clayey silt, frequent charcoal flecks.	C19	C291
C291	N/A	0.15m	0.14m	0.18m	Cut of Stakehole	Sub circular , break of slope top sharp , sides vertical, break of slope base sharp, base concave.	C290	C146
C292	C293	0.11m	0.1m	0.10m	Fill of Stakehole	Soft, Mid blackish grey clayey silt, frequent charcoal flecks.	C19	C293
C293	N/A	0.11m	0.1m	0.10m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base gradual, base concave.	C292	C146
C294	C295	0.1m	0.1m	0.16m	Fill of Stakehole	Soft, Mid blackish grey clayey silt, frequent charcoal flecks.	C19	C295
C295	N/A	0.1m	0.1m	0.16m	Cut of Stakehole	Circular, break of slope top sharp , sides sloping, break of slope base sharp base flat.	C294	C146
C296	N/A	6m	1.8m	0.15m	Deposit	Soft, Mid brownish grey clayey silt, moderate charcoal flecks.	C297	C19
C297	N/A	2.5m	3.8m	0.28m	Deposit	Soft, Dark blackish grey clayey silt, frequent charcoal flecks, frequent angular stones.	C20	C296
C298	N/A	3.3m	2.5m	0.1m	Deposit	Soft, Dark greyish reddish black sandy silt, frequent angular stones, frequent charcoal.	C20	C270
C299	N/A	0.8m	0.5m	N/A	Deposit	Soft, Dark brownish blackish red clayey silt, occasional charcoal flecking.	stakes	C146
C300	C301	0.12m	0.11m	0.24m	Fill of Stakehole	Soft, Mid blackish grey clayey silt, frequent charcoal flecks.	C19	C146
C301	N/A	0.12m	0.11m	0.24m	Cut of Stakehole	Circular, break of slope top sharp , sides vertical, break of slope base sharp base concave.	C300	C146
C302	N/A	10min	0.50m	0.10m	Drain	Drain made up of thin square – sub-rectangular cap stones	C1	C2

Appendix 1.2 Catalogue of Artefacts

Registration Number	Context	Item No.	Simple Name	Full Name	Material	Description	No. of Parts
E3835:37:1	37	1	Glass	Sherd of modern glass	Glass	Sherd of modern glass	N/A

Appendix 1.3 Catalogue of Ecofacts

During post excavation works specific samples were processed with a view to further analysis. A total of 18 soil samples were taken from features at Moanmore 1 and all 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 & hazelnut	burnt bone	animal bone	human bone	heat-affected stone	Others
C35	50	Trough	27.3g					0.03l	
C35	51	Trough	54.2g					0.2l	
C37	52	Trough	8.2g					0.01l	
C39	56	Stakehole	5.3g					0.02l	
C41	55	Stakehole	4.0g					0.01l	
C45	76	Stakehole	0.3g						
C46	4	Stakehole	0.6g						
C52	6	Stakehole	0.2g						
C98	27	Stakehole	0.9g						
C102	29	Stakehole	1.1g						
C147	80	Pit	2.0g					0.03l	
C166	67	Stakehole	0.8g						
C176	73	Trough	12.3g						
C176	74	Trough	11.7g						
C176	79	Trough	4.4g						
C208	87	Stakehole	0.8g						
C210	88	Stakehole	0.1g						
C212	89	Stakehole	1.8g						

Appendix 1.4 Archive Index

Project: N9/N10 Phase 4 Knocktopher to Powerstown		
Site Name: AR133 Moanmore 1		
Excavation Registration Number: E3835		
Site director: Richard Jennings		
Date: 02.03.11		
Field Records	**Items (quantity)**	**Comments**
Site drawings (plans)	7 plans	2 pre-ex plans, 3 post-ex plans, 2 mid-ex, 13 section sheets
Site sections, profiles, elevations	13 section sheets	
Other plans, sketches, etc.	0	
Timber drawings	0	
Stone structural drawings	0	
Site diary/note books	1	
Site registers (folders)	1	
Survey/levels data (origin information)	0	
Context sheets	299	
Wood Sheets	0	
Skeleton Sheets	0	
Worked stone sheets	0	
Digital photographs	99	
Photographs (print)	0	
Photographs (slide)	0	

APPENDIX 2 SPECIALIST REPORTS

Appendix 2.1 Charcoal and Wood Report – Ellen O' Carroll

Appendix 2.2 Petrological Report – Stephen Mandal

Appendix 2.3 Radiocarbon Dating Results – QUB Laboratory

Appendix 2.1 Charcoal and Wood Report – Ellen O' Carroll

Client – Irish Archaeological Consultancy Ltd
Site Name- Moanmore 1
Excavation number –E3835 AR133
County – Carlow
Author- Ellen O' Carroll

Date –4/01/10

1 Introduction

Four charcoal samples was identified and analysed from excavations associated with undated Bronze Age activity at Moanmore 1, Co. Carlow as part of the resolution of the N9/N10 Kilcullen to Waterford Scheme, Phase 4b – Knocktopher to Powerstown. The site at Moanmore 1 consisted of a burnt mound complex situated beside a silted-up stream course. The stream meandered from the North Kilkenny Mountains toward the River Barrow. The burnt mound was located in a bend of the stream. The main features of the site comprised the mound, three troughs, an area of burning, a pit, and a series of stakeholes situated east of the largest trough. Trough 3 had stakeholes in three of its corners and was associated with burnt mound material found on the opposite side of the stream bank. Trough 2 was almost square and had a stakehole in each corner. Trough 1 was oval shaped. The burnt mound material was spread over a considerable area. Two shallow pits were found 30m to the north-east of the main burnt mound activity. Washed-out burnt mound material was identified on the stream bed while a silt deposit was noted within the burnt mound; this suggested that the steam was active at the time of occupation (Jennings 2008). No dates have been returned for the site but the presence of elm in the assemblage is suggestive of an early Bronze Age date.

Charcoal analysis is an important component of any post-excavation environmental work as it can help in re-constructing an environment hitherto lost to us, although this must be done with caution as sufficient sample numbers are required for a complete and full understanding of the immediate environment. Keepax suggest 50 charcoal samples in a European temperate climate (Keepax 1988). Charcoal and wood are also analysed and identified to determine what species are used and selected for particular functions on site i.e. post-holes, wall posts, firewood, burnt remains of wattle and other structural uses.

The results of the analysis from Moanmore 1 will later form part of an overall scheme-wide charcoal study for the N9/N10 (Lyons, O'Donnell & OCarroll *forthcoming).*

2 Methodology (After IAC Ltd)

2.1 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.

2.2 Charcoal identification

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

A number of wood taxa cannot be identified to species or sub-species level anatomically. These include Sessile oak *(Quercus petraea)* and pedunculate oak *(Quercus robur)*; Hairy birch (*Betula pubescens Ehrh*) and silver birch (*Betula pendula Roth*) and English elm *(Ulmus procera)* and wych elm *(Ulmus glabra)*, all of which are native to Ireland. In addition, taxa referred to as pomoideae in this report include apple, pear, hawthorn and mountain ash, which cannot be identified microscopically. There are also over 13 species of willow (*Salix* sp.) and these species can-not be differentiated microscopically.

2.3 Details of charcoal recording

Each species was identified, bagged together and then weighed and each fragment counted. Insect channels and holes as well as fungal hyphae were noted on the charcoal fragments identified, as this may indicate the use of dead or rotting wood used for fuel or other such functions. The distinction can sometimes be made between trunks, branches and twigs if the charcoal samples are large enough. This was noted where possible by the presence of strongly or weakly curved rings. When charcoal samples showed indications of fast or slow growth this was also recorded. Finally the annual tree rings present on each charcoal fragment were counted.

3 Results

Ash followed by alder, hazel, holly, elm, blackthorn, willow and birch were identified from the assemblage (Figure 1).

Charcoal was examined from the trough fill **C37** where ash and hazel were identified. Two stakehole fills **C39** and **C212** were also analysed which included hazel, ash, willow, elm, holly, ash, birch, blackthorn and bark material. Alder, ash and bark were also identified from the pit fill **C147**. The charcoal from samples 56 & 89 from **C39** and **C212** (stakehole fills) was iron stained, microstructure was distorted and some fragments were difficult to identify. The remaining charcoal was in good to moderate condition (see **Table 1**). The weight and fragment count identified from each taxa type at each site is represented below in **Figure 1** and **Table 1**.

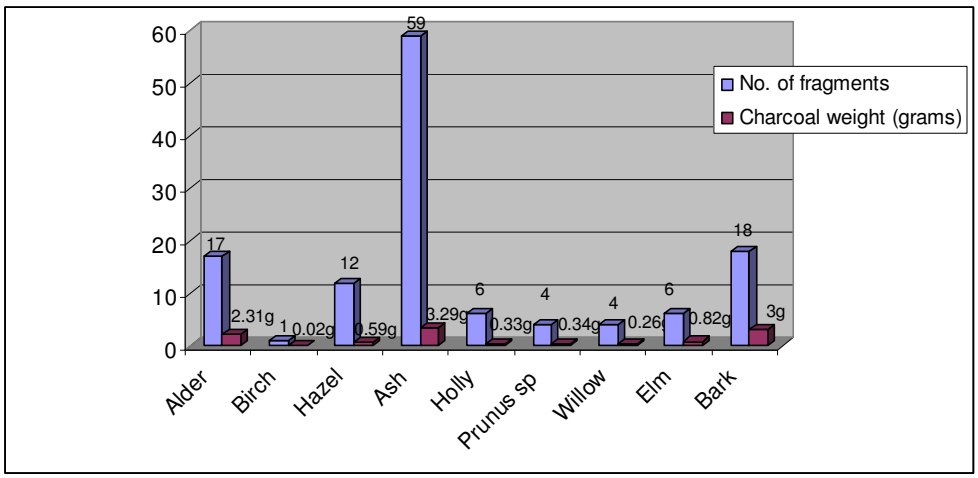


Fig. 1: Taxa types identified

4 Discussion

Wood use
The charcoal identified from the trough, pits and stakeholes at Moanmore 1 is most likely related to firewood and kindle used at the burnt mound site. It is difficult to determine whether the wood analysed from the stakeholes was related to actual post material due to the diverse nature and fragment number of each taxa present.

Ash was the most dominant taxon identified from most features analysed which suggests a more open type landscape as ash tends to grow in areas and clearings created by the first farmer to inhabit Ireland. Other taxa collected for use at the site for firewood in associated with the *fulacht fiadh* include alder, hazel, birch, willow, elm, holly and blackthorn. Interestingly oak was not present in the assemblage.

Environmental information related to the taxa from the identified charcoal
Vegetation reconstructions based on charcoal assemblages can be problematic, as the nature of the relationship between the charcoal assemblage, people and the contemporary environment is far from straightforward. Ideally, charcoal analysis should be backed up by pollen cores, plant macros and analysis of coleopteran remains for a more accurate picture. Below is detailed a list of attributes related to each taxa identified.

Ash (*Fraxinus excelsior*) is a native species to Ireland preferring lime rich freely draining soils. It is not a very durable timber in waterlogged conditions but has a strong elastic nature and is easily worked. Ash appears to have colonised the open land after the first farmers removed much of the native woodland therefore it is frequently used as structural timber in the Later Bronze Age periods such as at Clonfinlough in Co.Offaly (Moloney *et al* 1994). Ash is also abundant in native hedgerows and was quite common in the later historic period.

Alder (*Alnus glutinosa*) is a widespread native tree and occupies wet habitats along stream and river banks. It is an easily worked and split timber and therefore quite commonly manufactured into planks.

The sloe bush, as blackthorn is also known as, is a very durable wood and strong as oak. It is a thorny shrub found in woodland and scrub, on all soil types. In a woodland situation it is more likely to occur in clearings and at the woodland edges, where it

forms dense thickets. Blackthorn is a slow burning wood with plenty of heat and little smoke and therefore makes good fuel (Rackham 1980).

English elm *(Ulmus procera)* and wych elm *(Ulmus glabra)* cannot be separated by their wood structure. As suggested by Mitchell (1986) elm declined (although would not have completely died out) with the advent of farming and possibly Dutch elm disease around 3700BC. It generally prefers damp but not waterlogged woods particularly on limestone. Wych elm does not reproduce by suckering (new trees growing from roots of the original tree) and is only spread by seed. Despite being one of Ireland's most common trees before the arrival of man, elm is rare in Ireland due to its tendency to occupy the most fertile soils which are the most sought after for agriculture. Many different species of elm are still very common in hedgerows throughout Ireland, but truly native trees are probably confined to rocky hillsides and remote valleys in the west. It responds well to coppicing. Elm is a hard, elastic, wood and durable under water, making it useful as structural timber and for domestic implements. The inner bark fibre can be used for ropes and matting. Elm also burns slowly and regenerates relatively fast.

Hairy birch (*Betula pubescens Ehrh*) and silver birch (*Betula pendula Roth*) cannot be distinguished microscopically. Silver birch requires light and dry soil while hairy birch grows on wet or marginal areas. Birch is one of the first trees to establish itself on raised bogs. The wood from birch trees is strong but it rots quickly when exposed to outdoor conditions (Grieves 1998). Birch is used as firewood due to its high calorific value per unit weight and volume (Rackham 1980). It burns well even when frozen or freshly hewn. The bark is also used to start fires, which will burn well, even when wet, because of the oils it contains. With care, the bark can be split into very thin sheets that will ignite from even the smallest of sparks (*ibid.*).

Hazel is a native species and was very common up to the end of the 17th century. McCracken (1971, 19) points out that 'it was once widespread to a degree that is hard to imagine today'. With the introduction of brick, steel and slate the crafts associated with hazel became obsolete and today the woods that supplied hazel have diminished rapidly. Hazel wood has been used for making furniture, fencing and wickerwork. It is normally only about 3–5m in height and is often found as an understory tree in broadleaf woods dominated by oak. It also occurs as pure copses on shallow soils over limestone, as seen today in The Burren in Co. Clare and survives for 30 to 50 years. Its main advantage is seen in the production of long flexible straight rods through the process known as coppicing. In early Irish law, hazel was considered one of the *airig fedo* or 'nobles of the wood'. It also played a central role in Irish mythology and was associated with wisdom, truth and kingship (MacCoitir 2006, 72–81). In folklore, it was used as a protection against evil (*ibid.*).

Willow is a very strong wood in tree form and is excellent for the use as posts. It is also a very flexible wood and was commonly used for the construction and weaving of baskets. It is a native species in Ireland and can be found in a tree and shrub form. According to Webb (1971, 160–2) thirteen species of willow are found growing wild in Ireland, of which eight are certainly native. The wood of *Salix* trees and shrubs cannot be differentiated to species on the basis of anatomical features.

Holly is a shrub found quite commonly in hedgerows alongside blackthorn and gorse and in the understory of oak woods. The *Bretha Comaithchesa* (Laws of Neighbourhood), which are listed in the ancient Irish law tracts, records holly as one of the five 'nobles of the wood' namely for its use in the construction of cart-shafts and its leaves were valuable as cattle fodder during the winter months (Nelson 1993, 43). A single fragment of holly charcoal was present in **C203**.

Comparative analysis
Two further sites were analsyed with regards charcoal from Moanmore townland also along the N9/N10. Moanmore 3 is also classified as a burnt mound spread and ash was more dominant at this site which compares well to charcoal identified from Moanmore 1. The charcoal results from Moanmore 2, a habitation site, suggests more of a scrub type woodland comprising hazel, pomoideae and blackthorn as well as a watery place where alder would have been selected from. Primary woodland trees such as oak, ash and elm were also exploited but maybe to a lesser extent.

5 Summary

Charcoal was examined from four features related to Bronze Age *fulacht fiadh* located at Moanmore 1, Co. Carlow. The features analysed were the trough, two stakehole fills and a pit. Ash followed by alder, hazel, holly, elm, blackthorn, willow, and birch were identified from the assemblage. The elm suggests an early date for the *fulacht* site although this should be verified with C14 dates.

Due to the large counts of ash identified we can speculate that there were open clearings or an open type landscape in the area surrounding Moanmore 1 in the Bronze Age. The results compare favourably to an early Bronze Age dated *fulacht* analysed from Moanmore 3 where ash dominates.

Further analysis, discussions and comparative analysis will be completed for the final integrated charcoal report for all analysed sites along the N9/N10 (Lyons, O' Carroll & O Donnell, *forthcoming*)

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Table 1 Charcoal identification details from Moanmore 1

Context number	Sample number	Context description	Wood species	No. of fragments	Charcoal weight (grams)	Size of fragments (mm)	No. of growth rings	Comments
37	22	Trough fill	*Fraxinus excelsior* (ash)	48	2.59	3 - 7mm	2 - 5 rings	
			Corylus avellana (hazel)	2	0.14	4 - 6mm	4 - 6 rings	
39	56	Stakehole fill	*Corylus avellana* (hazel)	10	0.45	4 - 6mm	2 8 rings	Iron staining, very poor quality charcoal, hard to identify
			Salix sp (willow)	4	0.26	3 - 4mm	3 - 6 rings	
			Ulmus sp (elm)	3	0.56	4 - 7mm	2 - 5 rings	
			Ilex acquifolium (holly)	1	0.08	6mm	6 rings	
			Fraxinus excelsior (ash)	10	0.56	3 - 5 mm	1 - 5 rings	
			Alnus glutinosa (alder)	5	0.31	3 - 6mm	2 - 5 rings	
			Prunus sp (blackthorn/cherry)	2	0.2	2 - 4mm	2 - 6 rings	
147	80	Pit fill	*Unidentifiable/ cf bark*	8	1.8	4 - 5mm	5 rings	
			Fraxinus excelsior (ash)	1	0.14	1cm	10 rings	slow growth
			Alnus glutinosa (alder)	10	0.8	4 - 6mm	3 - 5 rings	
212	89	Stakehole fill	*Ulmus* sp *(elm)*	3	0.26	3 - 5mm	2 - 4 rings	Iron staining, gnarley, hard to identify
			Ilex acquifolium (holly)	5	0.25	3 - 5mm	2 - 6 rings	
			Birch (Betula sp.)	1	0.02	4mm	3 rings	
			Alnus glutinosa (alder)	2	1.2	3 - 6mm	2 - 5 rings	
			Prunus spinosa (blackthorn)	2	0.14	6mm	8 rings	
			Unidentifiable/ cf bark	10	1.2			

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Appendix 2.2 Petrological Report – Stephen Mandal

PETROGRAPHICAL REPORT ON STONE SAMPLES TAKEN DURING ARCHAEOLOGICAL EXCAVATIONS AT MOANMORE 1 (E3835)

EURGEOL DR STEPHEN MANDAL MIAI PGEO

1. 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 4b 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).

2. Solid Geology and Soils of the Site (see Figure 1; McConnell 1994)

The bedrock under the site consists of crinoidal wackestone/ packstone limestone belonging to the Ballyadams Formation (shown on Figure 1 as BM).

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

Carboniferous (Silesian)

Coolbaun Formation (CQ) – Shale and mudstone with this coals

Moyadd Coal Formation (MC) – Shale, siltstone and minor sandstone
Bregaun Flagstone Formation (BE) – Thick flaggy sandstone and siltstone
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
Milford Formation (MI) – Peloidal calcarenite 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
Quinagh Formation (QU) – Lenticular mudstone and coarse siltstone

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

The Tullow Pluton (Tw) – Fine to coarse granites dating to *c.* 405Ma

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).

3. Results

Site	Ministerial Direction		NMS Reg.	Sample	Context	Notes		
Moanmore 1	A032/156	AR133	E3835	50	35	Not altered;	Angular (blocky);	Sandstone, coarse to medium grained, quartz rich, red
Moanmore 1	A032/156	AR133	E3835	51	35	Not altered;	Angular (blocky);	Sandstone, coarse to medium grained, quartz rich, red
Moanmore 1	A032/156	AR133	E3835	52	37	Burnt;	Angular to sub-rounded	Sandstone, coarse to medium grained, quartz rich, red/yellow
Moanmore 1	A032/156	AR133	E3835	55	41	Not altered;	Angular (blocky);	Sandstone, coarse to medium grained, quartz rich, red/yellow
Moanmore 1	A032/156	AR133	E3835	56	39	Not altered;	Angular (blocky);	Sandstone, coarse to medium grained, quartz rich, red
Moanmore 1	A032/156	AR133	E3835	80	147	Not altered;	Angular (blocky);	Sandstone, coarse to medium grained, quartz rich, red

4. 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.

5. 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 159 samples were examined from the scheme across 33 sites (see Table 2). The samples showed a remarkable consistency across the scheme in terms of the principal rock type utilised; very coarse to medium grained sandstone, typically red to yellow in colour. All samples contained a variation of this type of rock as their

principal component. Just under half (73) of the samples are clearly burnt / altered, but this does not rule out the possibility that the stone from other samples had been burnt. All bar one (a sample from Kellymount 5 (E3858:43:156)) contained angular pieces of stone, and 122 (77%) also contained sub-rounded to rounded pieces. Sixty three of the samples contained pebbles and / or cobbles, in most cases broken. Five of the samples contained minor amounts of limestone as a secondary rock type to sandstone.

Site	Licence			No.	Burnt	Angular	Rounded	Pebbles	Limestone
Kilree 1	A032/107	AR091	E3728	1	0	1	0	0	0
Dunbell Big 2	A032/130	AR095	E3853	1	1	1	1	0	0
Holdenstown 4	A032/101	AR100	E3682	7	7	7	7	0	0
Rathcash 1	A032/133	AR102	E3859	3	0	3	3	3	0
Rathcash 2	A032/134	AR103	E3860	12	12	12	12	12	0
Rathcash East 2	A032/136	AR105	E3893	3	0	3	3	0	0
Blanchvillespark 3	A032/140	AR109	E3913	3	0	3	3	3	0
Blanchvillespark 4	A032/141	AR110	E3914	3	3	3	0	0	0
Ballyquirk 1	A032/143	AR112	E3863	1	1	1	1	0	0
Ballyquirk 2	A032/144	AR113	E3864	5	5	5	1	0	0
Ballinvally 1	A032/146	AR115	E3836	1	0	1	1	0	0
Garryduff 1	A032/147	AR116	E3852	4	0	4	0	0	0
Jordanstown 2	A032/151	AR120	E3851	4	4	4	0	0	0
Kellymount 6	A032/122	AR121	E3758	3	3	3	3	0	0
Jordanstown 3	A032/152	AR122	E3916	2	2	2	2	2	0
Kellymount 2	A032/111	AR124	E3757	11	4	11	11	9	1
Kellymount 3	A032/112	AR125	E3856	13	2	13	2	0	1
Kellymount 5	A032/114	AR127	E3858	27	10	26	24	21	3
Shankill 4	A032/153	AR130	E3838	5	1	5	4	0	0
Shankill 5	A032/154	AR131	E3850	2	1	2	1	0	0
Moanmore 1	A032/156	AR133	E3835	6	1	6	1	0	0
Moanmore 2	A032/157	AR134	E3843	2	0	2	2	0	0
Bannagagole 1	A032/159	AR136	E3844	3	2	3	3	3	0
Moanduff 1	A032/160	AR137	E3839	7	1	7	7	3	0
Coolnakisha 1	A032/128	AR139	E3768	1	0	1	1	1	0
Cranavonane 1	A032/164	AR141	E3842	2	2	2	2	2	0
Tomard Lower 1	A032/117	AR144	E3733	1	0	1	1	1	0
Paulstown 1	A032/093	AR145	E3642	3	1	3	3	2	0
Rathgarvan or Clifden 1	A032/125	AR147	E3760	1	0	1	1	0	0
Maddockstown 1	A032/126	AR148	E3759	3	3	3	3	0	0
Leggetsrath East 1	A032/118	AR154	E3734	1	1	1	1	0	0
Moanduff 3	A032/120	AR156	E3736	1	0	1	1	1	0
Ballyquirk 4	A032/167	AR157	E3848	17	6	17	17	0	0
Grand Total :				**159**	**73**	**158**	**122**	**63**	**5**

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

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.

6. References

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Appendix 2.3 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: intcal09.14c

Context	Sample No	Material	Species id/ Weight	Lab	Lab Code	Date Type	Calibrated date ranges	Measured radiocarbon age (BP)	13C/12C Ratio ‰
C147, fill of pit	80	Charcoal	*Alnus glutinosa*/ 0.07g	QUB	UBA 14052	AMS (Std)	1207–1056BC (1 sigma), 1258–1030BC (2 sigma)	2930±26	-30.1
C37, fill of trough	52	Charcoal	*Fraxinus excelsior/ 0.3g*	QUB	UBA 14122	AMS (Std)	1188–1006BC (1 sigma), 1256–937BC (2 sigma)	2894±44	-30.9

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 RMPS IN AREA

RMP No	Description
CW015-007	*Fulacht fiadh*
CW015-008	Miscellaneous
CW015-014	*Fulacht fiadh*
KK016-002	Hearth
KK016-003	*Fulacht fiadh*
KK016-004	Ringfort
KK016-005	Ringfort

See Figure 2 for detail.

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