M8/N8 Cullahill to Cashel Road Improvement Scheme:
Archaeological Resolution

FINAL REPORT
Ministerial Direction: A027/000
Registration No.: E2383

Site AR 41, Inchirourke Townland,
Co Tipperary

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ABSTRACT

This report comprises the final results of the archaeological excavation of Site AR 41, in the townland of Inchirourke, Co Tipperary South Riding. Work was undertaken as part of the archaeological mitigation programme for the proposed M8N8 Cullahill to Cashel Road Improvement Scheme. Excavation was conducted under Ministerial Direction No. A027/000, (Registration No E2383) by Mick Ó Droma, for Valerie J Keeley Ltd, from 24th July to 8th August 2006.

Excavation of this site produced a single Early Bronze Age cremation (78g) of an adult of indeterminate sex, within a small circular pit with an associated 'marker' posthole. Both contained cremated human bone, charred hazelnut shell and oak charcoal, which was used as fuel and returned a radiocarbon date of 2332 – 2126 Cal BC. The site also revealed two Middle Bronze Age pits, containing charcoal that returned a date of 1494 – 1325 Cal BC, and undated agricultural activity in the form of plough furrows and oxidized linear features, plus a series of parallel post medieval / early modern field boundary ditches. This field boundary was depicted on both 1st and 2nd edition Ordnance Survey map and contained two 19th century artefacts.

All archaeological work is now complete for this site and this report constitutes the final report on this excavation. A digital copy of the archive is available at the post excavation offices of Valerie J Keeley Ltd., Brehon House, Kilkenny Road, Castlecomer, Co. Kilkenny. The original paper archive for this excavation will rest with the Road Design Offices of Kilkenny County Council.

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1.0 INTRODUCTION

1.1 Aims & Objectives

Valerie J. Keeley Ltd. was appointed by Kilkenny County Council to excavate archaeological sites first identified during a programme of centreline testing carried out by Margaret Gowen & Co. Ltd., Scheme No./ Works No. A0027/000 (McQuade *et al* 2006). The scope of the archaeological measures was:

- To strip the topsoil from an area measuring a total of 4500m² along the main M8/N8 road corridor and identify the previously discovered archaeological features and any other features that may be present in this area.
- Photograph and plan any archaeological features or possible features.
- Excavate any features identified and record their contexts and sections, retaining samples where necessary, to resolve them with preservation by record.

The goal of this project being to preserve by record the archaeological site/s exposed within the take of the proposed route, and to further assess areas previously unavailable for testing (McQuade *et al* 2006).

These works took place in accordance with the Directions issued by the Minister for Environment, Heritage and Local Government under Section 14A(2) of the National Monuments Acts (1930-2004), in accordance with the terms of the Contract between Kilkenny County Council and Valerie J Keeley Ltd and according to the terms of the *Code of Practice* agreed between the National Roads Authority and the Minister of Arts, Heritage, Gaeltacht and the Islands. The excavations also complied with the Policy and Guidelines on Archaeological Excavation (Govt of Ireland 1999) and were overseen by the Project Archaeologist.

1.2 Summary of Archaeological Significance

Excavation of this site produced a single Early Bronze Age cremation pit and associated 'marker' posthole, containing a single unsexed adult (78g), charred hazelnut shells and oak charcoal. This represents one of a number of single or small flat cremation cemeteries in the wider locality and region from the Bronze Age. The site also revealed two Middle Bronze Age charcoal – rich pits, and a series of post medieval field boundaries and ditches and agricultural activity in the form of plough furrows and oxidized linear features. The cremation pit returned an date of 2332 – 2136 Cal BC while the charcoal rich pit returned a date of 1494 – 1325 Cal BC with the post medieval field boundary ditches depicted on the 1st and 2nd editions of the Ordnance Survey map.

1.3 Timescales

Topsoil was stripped from this site on 24th July 2006. Excavation commenced on the 31st July 2006 with the site being resolved on 2nd August 2006. The site was backfilled on resolution (See Plate 1).

1.4 Site Location & Access

The site was located along the line of the proposed M8/N8 Cullahill to Cashel Road Improvement Scheme, from Gortmakellis, Cashel, Co. Tipperary to Oldtown Townland, Cullahill, Co. Laois. The road scheme consists of a 39.5 km route from its tie in with the M7/M8 Portlaoise to Cullahill Scheme south of Cullahill in Co. Laois to its tie in with the N8 Cashel bypass north of Cashel in County Tipperary South Riding. This site was located along the central section of the proposed M8/N8 Cullahill to Cashel Road Improvement Scheme, 2.5km southwest of Urlingford (NGR 226188E, 162483N, 130m OD, Chainage: 26550 – 26590; See Figures 1 – 7; Plates 1 – 3). The site was situated in a large, open level tillage field, and could be was accessed via a field just off the existing N8 carriageway, southwest of Urlingford town.

2.0 BACKGROUND

2.1 Topography & Geology

The site was located in Inchirourke townland, in the Parish of Fennor, the Barony of Slieveardagh, County of Tipperary South Riding. The townlands through which the road passed in Slieveardagh Barony are Fennor, Carrownaroagh, Inchirourke and Longfordpass North. The topography and geology of this region is typical of the plain in general, with a gentle undulating landscape and occasional hillocks not exceeding 134m OD. The area is drained by the River Goul and its tributaries. The majority of land use was dairy farming pasture with some tillage. This site lay in a region set within a broad low lying 25km east – west, 40km north – south plain with a gradual northeast – southwest slope trend (falling 130 – 110m OD).

The present undulating nature of the landscape was created during the last glacial period from the morainic deposition of churned bedrock material, smoothed by passing glaciers. The plain is bounded by the Silvermine and Devil's Bit range of hills to the west and north, the Slieveardaghs to the east and is dotted with a small number of low hills not exceeding 235m OD. From 15km north of Thurles to the south, it is effectively bisected and drained by the River Suir and its tributaries. Between the limit of useful farmland east and northwest of the Suir and the Slieveardaghs, is a network of raised bogs – Derryville Bog to the northwest and Littleton Bog to the east. This section of the scheme is situated on relatively well-drained land, northeast of the junction of both stretches of bog.

The underlying bedrock throughout the plain is Carboniferous limestone with occasional erosion resistant blocks, such as the knoll that forms the Rock of Cashel. The bedrock is sealed by glacially deposited sediments, which in poorly drained regions tend to support tracts of raised bog. The greater proportion of the plain however, supports well drained farmland, the majority of it dairy farming pasture interspersed with marshy areas around the low lying flood plains of minor rivers.

2.2 Historical Overview

While the scheme as a whole comprises an essentially artificial geographic unit, defined by townlands traversed by the M8/N8 road corridor, the townlands of the central northern section can be readily placed in a historical/geographic context as they lie entirely within the medieval parish of Fennor and the Barony of Slieveardagh.

2.2.1 Early Origins

The historic period in Ireland begins with the arrival of writing in the early medieval period, concurrent with the spread of Christianity. Little can be definitively stated about the internal geographic boundaries and political structures of Ireland prior to this time and indeed until about the 8th century AD, although we can project known early medieval divisions back to the near proto-historic period. The earliest traditional division of the country was

into two halves along a boundary that ran roughly from Dublin to Galway (Byrne 2001, 168). The north was Leth Cuinn (Conn's Half) and the south was Leth Moga (Mugs Half). Conn was the progenitor of the Connachta, a tribal grouping from whom the later rulers of Connaught and Ulster claimed descent, while Mug was believed to be the first of the Eoganachta, from whom the kings of Munster and Leinster claimed descent. The two Halves of Ireland were more cultural than they were political, but it is from them that the very real polities of the Fifths of Tara (*Mide*), Ulster, Connaught, Leinster and Munster emerge. Munster itself was subdivided into Fifths; *Aurmumu* (Ormond) east Munster, *Taudmumu* (Thomond) north Munster, *Medón Muman* mid Munster, *Desmumu* (Desmond) south Munster, and *Iarmumu* west Munster (*ibid.* 165). Each Fifth was a conglomeration of sub-provincial kingdoms under the suzerainty of a provincial over-king. The sub-provincial kingship of *Aurmumu* was centred on the rock of Cashel, as was the kingship of Munster itself, and was held exclusively between the fifth and tenth centuries by various septs of the Eoganachta. In the proto-historic period and for the majority of the early medieval period, the site fell under the hegemony of the Fifth of *Aurmumu*.

The site and the general route of the M8N8 also lay along a branch of the broad northeast – southwest running corridor of the Slige Dála, the main prehistoric and early medieval route way from Leinster to Munster, with which the M8/N8 shares a similar axis (Byrne 2001, 169).

2.2.2 Anglo – Norman Era

The 12th century saw a dramatic change to Gaelic Ireland, following the arrival of Anglo-Norman armies and the submission of Irish kings to Henry II, making Ireland a lordship of England. While daily life for the majority of the population continued much as it had before, a new population group became established across the country bringing with them a new material culture and a new system of civil and ecclesiastic administration. In areas under Anglo-Norman control the various strata of provincial, sub-provincial and local kingships were replaced with a manorial system under lordships and earldoms. The idiosyncratic organisation and practices of the Irish church were adapted to fit the European norm with the introduction of a parochial system following the submission of the Irish Bishops to Henry II at Cashel in 1172 (Scott & Martin eds. 1978, 99). New geographic units such as cantreds, baronies, counties and palatinate counties were created to facilitate the Anglo-Norman colonisation. The manorial system and new geographic units by and large followed pre-existing boundaries, although their precise definition and function remained in a state of flux throughout the medieval period.

The progress of the colonisation programme in the 13th / 14th century Tipperary was erratic and subject to pressure from Gaelic lordships bordering the colony, conflicts between Anglo-Irish lords themselves and the paucity of colonists beyond urban centres. Settlers in the Earldom of Ormond were constantly under threat from the Gaelic lordship of the dispossessed Mac Gilla Pátraics to their immediate north (O' Byrrne 2003, 88). A major setback for the colonists was the worst recorded famine in medieval Ireland in 1314-1318 coupled with the wide spread devastation caused by de Bruce's invasion in 1315-1318 (Marnane 2003, 193). The spread of bubonic plague throughout the urban centres of Ireland in the 1350's had a major impact on the English colony as a whole, but a minor one on the dispersed populations of the Gaelic lordships. The weakening civil administration

of the colony fuelled continuing conflict throughout the fifteenth century between Desmond, Ormond and Thomond and factional conflict between the various lords within these earldoms and lordships defined the political background for the region in this period.

2.2.3 Late Medieval

The ongoing nature of low-scale warfare throughout north Munster in the late medieval period created a political and militarily unstable society for Anglo-Irish and Gaelic areas alike. A physical manifestation of this was the proliferation of tower houses constructed in the 15th and 16th century, with multiple strongholds built in each lordship. The scale of conflict between Ormond and Desmond can be seen in the largest densities of tower houses in the country in counties Limerick (Desmond), Kilkenny and Tipperary (Ormond) (Marnane 2003, 220). The comparatively large number of such strongholds in the area may also be due to the fact that Ormond and Desmond escaped the Elizabethan plantations of the early 16th century. Three tower houses were constructed along this section of the route in Foulkescourt, Glashare and the strategic crossing point of the River Goul at Urlingford.

The second half of the 16th century saw the most dramatic political change in Ireland since the submission of the Irish kings to Henry II. In the 1540's Henry VIII instituted wide scale administrative and ecclesiastic reforms in Ireland including the Reformation of the church, and a new Irish policy of Surrender and Regrant; through which the Gaelic lordship of Thomond became the earldom of Thomond (Lennon 2005, 145 – 166). The definitive symbol of this period of transformation was the change in title of Irish crown territory from the Lordship of Ireland to the Kingdom of Ireland in 1541. The new found English interest in Ireland also meant the projection of direct influence on what for centuries had been semi-autonomous Anglo-Irish earldoms and a diminution of the independence of Gaelic lords. This interference in feudal Irish society, in addition to forced Anglicisation and opposition to the Reformation caused simmering resentment against the crown that spilled over into the unsuccessful Desmond Rebellions of 1569-73 and 1579-83. The result of the rebellions was the creation of the Presidency of Munster in 1576 and the crown confiscation of Desmond land in Munster in 1586 (Marnane 2003, 247 – 266, Lennon 2005, 210 – 231).

The brief window of peace following defeat of the second Geraldine rebellion in the south of Ireland at the close of the 16th century was closed by another major rebellion led from the north of the country - The Nine Years War, during which Ormond lands in Kilkenny and Tipperary were attacked by the Earl of Tyrone's forces, as were most pro-crown settlements in Munster and west Leinster. The ultimate failure of the Desmond and O'Neill rebellions and the subsequent Flight of the Earls were followed by a period of relative peace and increased English settlement on confiscated lands. Ormond loyalty to the crown was to prove disastrous when it and The Confederacy of Kilkenny allied itself with Charles I in the 1640's English Civil War.

Unlike the relatively organised military Desmond Rebellions that preceded it, 1641 was more typified by sectarian conflict and the brutal activities of the Roundhead army. The ruthless suppression of this rebellion by Oliver Cromwell led to a massive confiscation of rebel Catholic property and the ethnic cleansing of their former owners

(To Hell or to Connaught). The unparalleled land seizures, larger in scope than the first Anglo-Norman period of settlement, were facilitated by the commissioning of the Civil and Down Surveys, which mapped out lands to be divided up amongst a new wave of English settlers.

The Williamite War of 1689-1691 was the last formal war in Ireland. Its conclusion following the Treaty of Limerick in 1691 was marked by a mass exodus of Irish soldiers and commanders to the continent and with them left the last vestiges of autonomous Irish military strength. The following centuries saw the demise of Gaelic Ireland and the firm establishment of English law and governance across the country. The 18th century saw the economic development of territories seized as a result of the 17th century wars; in particular large scale drainage works, the development of an integrated road network and a renewed investment in urban centres. A new town was built at Urlingford on reclaimed bog in 1755, replacing the dilapidated village which built up around the tower house there (Lanigan 1980, 69).

2.3 Archaeological Background

2.3.1 Prehistoric Archaeology

Prior to this scheme and its associated works of archaeological works, there were no known prehistoric sites identified in the vicinity. However, there is a *Togher* (RMP Ref: TI 036 – 050) recorded in the bog to the north of the site, 'toghers' or wooden tracks or causeways may date from the prehistoric period up to the post medieval period. A possible contemporary Bronze Age house and a burnt mound/ *fulacht fiadh* were also excavated for the M8N8 Road scheme, at sites E2384 / AR42 (Ó Droma *et al forthcoming*) and E2385 / AR43 (Conboy *et al* 2008), both in the townland of Fennor, located 600m to the northeast of the site.

2.3.1 Historical Archaeology

As the townland contains large areas of bog there are few known sites within the townland, the RMP records show only three sites in the townland of Inchirourke. An unclassified castle (RMP Ref: TI 036-049), an enclosure (RMP Ref: TI 036-049) and a *togher* (RMP Ref: TI 036 – 050). There are also a number of recorded archaeological sites in the vicinity that include an earthwork enclosure located 200m southwest of the site (RMP ref.: TI 042: 062 / EIS ref.: Site 27. See Figure 1), a large trivallate Ringfort, was also located 600m to the southeast and was visible from the site (RMP ref.: TI 042: 062), a castle located 800m northwest of the site (RMP ref.: TI 036: 049), and a castle (listed as Fennor Castle; RMP ref.: TI 042: 003). The 1st (1839 – 40) and 2nd edition (1905) Ordnance Survey maps indicate the land in the immediate environs of the site was primarily used for agriculture and a corresponding extensive field system was evident on these early maps (See Figures 3 & 4). In addition, five limekilns are recorded within the townland of Inchirourke itself and a further three limekilns in the neighbouring eastern townland of Fennor.

2.4 Inchirourke Townland

Inchirourke townland falls within the modern parish of Fennor, the Barony of Slieveardagh, Co. Tipperary South Riding. It is bounded by the townlands of Derryfadda, Co. Tipperary and Islands, Co Kilkenny to the north. Fennor and Graiguepadeen to the east. Longfordpass North to the south. Castletown is located to the west. The 1st edition (1842) and 2nd edition (1902) Ordnance Survey maps show little archaeological activity surrounding the townland, most of which appears to be taken up by large areas of bog to the north and lowland (See Figures 3, 4). The townland name of Inchirourke derives from *Inis Uí Ruairc*, O'Rourkes' Island (Keeley 2004). It was one of a number of pockets of dryland, which occur adjacent to or within this extensive bog chain. Townland names such as *Inís* provide place name evidence for the presence of these "islands" of dryland in the Longford Pass – Derryville Bog complexes, which would have been a prime location for settlement and/or burial in the prehistoric period.

3.0 THE EXCAVATION

3.1 Site Description & Topography

The site was situated in a large, open, level tillage field within the townland of Inchirourke, Co Tipperary, South Riding. The Longford Pass – Derryville Bog complex was located less than 1km west of the excavated area. The limit of this wetland delineates both the county boundary between Tipperary, Kilkenny and Laois, and provincial boundary of Leinster and Munster.

3.2 Previous Archaeological Assessment

An EIS report was compiled by Valerie J Keeley Ltd in 2003 (Keeley 2004), with regards to the Archaeological, Architectural and Cultural Heritage of the entire route of the proposed scheme. The area through which the proposed road scheme passes was subject to an advanced oblique survey by Marcus Casey in 2004.
Geophysical Survey by Target Archaeological Geophysics was carried out in March 2005 and archaeological testing in September/October 2005, by Melanie McQuade, for Margaret Gowen & Co. Ltd. (Scheme No./ works No. A0027/013) revealed a series of pits and possible cremations at Chainage 26570 (McQuade *et al* 2006). The site '*comprised three pits and a posthole within an area measuring 4.5m by 4m. The pits measured 0.3m – 0.35m in diameter and had frequent inclusions of charcoal in their fills. A section was excavated through one of the pits which was 0.10m in depth. Another pit contained fragments of burnt bone. The posthole measured 0.1m in diameter and was located 1m to the west of two pits and 0.20m to the south of the third*'. (Ref.: A027/013 at Ch 26570, NGR: 226188.82E, 162483.93N).

3.3 Method

Topsoil from a cutting measuring 4427.58m² was removed from the site utilising a hydraulic excavator under the direction, supervision and monitoring of a qualified archaeologist. Once the topsoil had been removed, the entirety of the site area was cleaned back to reveal the features identified during the previous testing (*ibid*) and to identify any new features, which may have been exposed.

Upon location all archaeological materials were cleaned and excavated by hand using methods appropriate to their composition, nature and date. All archaeological contexts were photographed and planned (in relation to the site grid) prior to excavation. Sections were excavated through all features to obtain profiles and to expose the stratigraphic sequences and then fully excavated. All sections and cut features were photographed and drawn. The possible cremation pit was excavated in 5cm spits and 100% sampled. The position of any finds and samples were recorded in three-dimensions (where appropriate) in relation to the site-grid. The composition, stratigraphic position and interpretation of all contexts were recorded on a context sheet prior to excavation. Contexts have been sampled for palaeobotanical material, radiocarbon dating, micromorphology, petrology and

wood identification, where appropriate. Features that proved to be of modern origin were fully investigated and characterised.

3.4 Stratigraphic Summary

3.4.1 Natural

The natural subsoil at this site was a mottled yellow, grey, orange, very compact clay with moderate to frequent angular and sub angular lime stone pebbles throughout [c2]. The general topography was level ground. (See Figures 1, 2; Plates 1, 2)

3.4.2 Early Bronze Age Cremation Pit & Associated Feature

Two prehistoric features consisted of one cremation pit and a marker post which both produced charcoal, charred shell and cremated human bone. The cremation pit and marker posthole occurred 0.81m apart and in the centre of the site. (See Figures 6, 7; Plates 3, 4)

Cremation Pit: The cremation pit [c11] occurred on level ground, 0.81m northeast of posthole [c5], and had an oval shape in plan with steep sides and an irregular base due to the presence of a large stone in the subsoil (See Figures 6 & 7; Plates 3, 4). The pit measured 0.29m (north – south) in length, 0.26m in width and 0.24m in depth. The single fill [c12] was a mid brown sandy silt with frequent charcoal chunks and flecks and frequent large chunks and small flecks of cremated human bone (E2383:7, 79.3g in weight), which were visible to the naked eye during excavation. The average size of the bone fragments was 0.01 – 0 .02m, with the remainder (20%) measuring approx. 0.26m (See Geber, Section 9.1). Oak charcoal and charred hazelnut shell were recovered from this fill (See Sections 9.2, 9.3). No artefacts were retrieved from this feature. A radiocarbon date of 2332 – 2136 Cal BC was returned from a sample of cremated human bone (See Section 9.4).

Posthole: A possibly associated marker post/burial marker [c5] was located 0.81m southwest of the cremation pit [c11] and had a slightly irregular oval shape in plan, with straight sides and a concave base (See Figures 6 & 7; Plate 4). It measured 0.46m in length (north northwest – south southeast), 0.20m in width (north northeast – south southwest) and 0.45m in depth. The single fill [c6] was a dark brown to black stony charcoal rich sandy silt. A trace amount of cremated human bone (E2383:8, 0.5g) was recovered from flotation of the soil sample (see Section 9.1). Oak charcoal and charred hazelnut shell were also recovered from this fill of this feature (See Sections 9.2, 9.3). This environmental evidence suggested the two features were associated.

3.4.3 Middle Bronze Age Pits

Two charcoal-rich pits, 2.5m apart, were situated 20m south of the cremation pit and the marker posthole (See Figures 6 & 7; Plates 5 & 6). The southern most pit [c17] cut into the silted up tree bowl [c27]/[c20] and was circular in plan, with straight sides and a slightly uneven concave base, measuring 0.15m in diameter and 0.10m in depth. There were two fills within this pit; the lower fill [c19] was a charcoal rich mid greyish brown medium sandy silt, whilst the upper fill [c18] was a mid greyish brown charcoal rich fine sandy silt.

The second pit [c15] was a slightly irregular, oval shape in plan, with straight sides and had an irregular base. It's dimensions were 0.41m in length (east – west), 0.37m in width and 0.35m in depth. There were three fills: a basal fill [c26] of orangey black stony, charcoal rich silty sand, a middle fill [c21] of charcoal rich silty sand, while the upper fill [c16] was a brown sandy silty clay with occasional small pebble inclusions. A date of 1494 – 1325 Cal BC was returned from a sample of charcoal (*pomoideae*) from the lower fill [c26] (See Sections 9.3, 9.4)

3.4.4 Undated Tree Bowl

An undated tree bowl [c27] was located in the far southeastern corner of the site. This feature had an irregular shape in plan with irregular sides and an irregular base and measured 0.60m (east-west) in length, 0.40m in width and a maximum depth of 0.20m. The single fill [c20] was a mid brown sandy silt with occasional small sub angular pebble inclusions. (See Figures 6 & 7)

3.4.5 Post Medieval / Early Modern Field Boundaries

Two parallel field boundary ditches were also revealed in excavation, extending along the northern and western edges of the excavated area that formed two arms and a right – angle corner of a square field shown on the 1st & 2nd edition Ordnance Survey maps (See Figures 3 & 4, 7). Both arms of the field boundary extended beyond the limits of excavation to the east and south.

The field boundary consisted of a pair of parallel ditches, flanking the remains of a levelled earthen bank (See Figure 7; Plate 7). The bank was levelled into the ditches by machine in the 1980's to facilitate an increase in the cultivable area (*local info*).

In the western half of the site, this field boundary extended on a north northwest – south southeast orientation, and consisted of two parallel ditches and a central bank, measuring 64.83m in excavated length, 3.93m in composite width. The eastern – most ditch [c3], which was the larger of the two linear boundary ditches, had gradually sloped sides and a flat, but slightly undulating base. It measured 1.28m in width and 0.46m in average depth, and contained a single dark brown stony silt fill [c4], which produced post medieval pottery (Find No. E2383: 1) and clay pipe (Find No. E2383: 2) (See Section 4). The opposing, parallel ditch [c31] was narrow, shallow and had a steep V – shaped profile, which measured 0.35m in width and 0.29m in depth. It also contained single fill [c32] of mid brown silt with frequent stone inclusions, and also contained a modern, plastic water pipe, found in the base of the ditch, but this was probably a later insertion into the ditch. A central bank [c29] located between the ditches, was evidenced by a shallow, light brown stony silty deposit, which was 2.30m

in width and 0.07m in depth. This field boundary extended into the southern baulk, and also possibly the northwestern baulk, where it conjoined a similar, but perpendicular, field boundary (See Figures 6 & 7; Plate 2).
In the northern quarter of the site, a perpendicular field boundary abutted this boundary and continued on an east northeast – west southwest orientation, which measured 42m in excavated length, 3.35m in width (See Figures 4, 5). This field boundary was also represented by a larger, inner, linear ditch [c22] (possibly the continuation of [c3]), which had concave sides and a flat base and measured 1.42m in width, 0.40m in depth. This ditch contained a single fill [c23] of mid brown silt with frequent stone inclusions, which produced an English penny dated to 1853 (Find No. E2383: 3) (See Section 4.1). The outer parallel ditch [c24] (possibly a continuation of [c31]) had concave sides, a flat base and measured 0.80m in width and 0.31m in depth. It contained a single mid brown silt fill [c25], with frequent large stone and occasional charcoal fleck inclusions, and also a metal object, interpreted as a component of farm machinery (Find No. E2383: 4). The central bank [c28] (possibly a continuation of [c29]?) was evident as light brown fine silt with frequent stone inclusions. Its dimensions were 1.1m in width and 0.06m in depth. This field boundary extended into the northeast baulk, and also possibly the northwestern baulk (See Figures 6 & 7; Plate 7).

3.4.6 Other Agricultural Features

A number of furrows were represented in the southeastern sector of the site. These occurred, parallel to each other, with a northwest – southeast orientation. The furrows (recorded as [c34], [c37] and [c38]) were linear in plan, with concave profiles and flat or irregular base, ranging in width from 0.26m – 0.9m and 0.01m – 0.03m in depth. They each contained a dark greyish brown silty sandy fill with occasional small pebble inclusions ([c35], [c37] and [c39] respectively).
Interspersed with the furrows were a series of irregular linear patches of oxidation of the topsoil and subsoil. These deposits were roughly parallel and occurred intermittently on the same alignment as the furrows (northwest – southeast). Excavation revealed this to be an orangey mid brown stony silt deposit [c30] with moderate inclusions of charcoal chunks. The dimensions of these oxidised areas varied considerably but averaged 10m in length (northwest-southeast), 0.30m in width, and 15mm in depth.
Also located in the eastern sector of the site, approx. 2m southeast of the oxidised linear [c30], was an irregular cut feature [c9]. It had an irregular oval shape in plan with steep sides and a slightly undulating base and measured 0.60m in length (north northwest – south southeast), by 0.36m in width and 0.11m in depth. The single fill [c10] was a light greyish brown silty clay with moderate oxidised clay inclusions.
A second irregular cut feature [c13] was situated to the southeast 3.70m of the oval feature [c9]. It had a sub-oval shape in plan with irregular sides and an irregular base. The dimensions were 0.62m in length (northwest-southeast), 0.40m in width, and 0.12m in depth. The contained a single light grey charcoal rich sandy silt fill [c14] fill.

3.4.7 Topsoil

Topsoil across this site [c1] comprised a friable silty clay with occasional small stone inclusions and was consistent throughout the excavated area. The depth ranged from 0.2m and 0.5m. The land was under tillage cultivation prior to the commencement of archaeological works. The field size was large and many field boundaries had previously been removed. Extant field boundaries comprised raised earthen banks with a shallow ditch running either side.

3.5 Condition Post Excavation

The contractor Roadbridge / Sisk Joint Venture took possession of the site in November 2007 for the construction of the M8N8 Cullahill to Cashel Road Scheme. The site formed part of the mainline for the new road and part of the footings for the underpass accommodating the Inchirouke to Fennor road.

4.0 THE FINDS

4.0.1 Overview

No prehistoric artefacts were recovered from this excavation. However, a number of post medieval objects were recovered from sealed and unstratified contexts. These included four metal objects, comprising two iron sheet fragments and two copper alloy coins, these were all examined by Jacqueline Mac Dermott (See Section 4.1 below). In addition, a single sherd of 19th century pottery was analysed by Clare McCutcheon (See Section 4.2) and one fragment of early 19th century clay pipe, examined by Joe Norton (See Section 4.3).

4.1 Metal Artefacts by Jacqueline MacDermott

4.1.1 Summary

Four metal objects were retrieved, two iron sheet fragments E2383:4 [c23] and E2383:6 [c25], and two copper alloy coins E2383:3 [c23] and E2383:5 (unstratified)). The sheet fragments contain no rivets or other features. E2383:3 is amorphous and badly corroded E2383:6 is sub-rectangular and has been folded back on itself. Coin E2383:3 is an English halfpenny, from Victoria's reign, dating to 1853. E2383:5 is an English penny, dated 1904, belonging to the reign of Edward VII.

4.1.2 Catalogue of Artefacts

E2383:3

English halfpenny. Copper alloy. Victoria 'young head'coinage 1853. Obverse: Head facing left; VICTORIA DEI GRATIA. 1853 under head. Reverse: Britannia seated right; BRITANNIAR: REG: FID: DEF:; Garland underneath. Diameter: 27.2mm. Thickness: 2.1mm.

E2383:4

Sheet metal fragment. Iron. Amorphous, flat. Length: 69mm. Width: 40mm. Thickness: 1.5mm.

E2383:5

English penny. Copper alloy. Edward VII 1904. Obverse: Head facing right; (EDWARDVS VII DEI) GRA BRITT OMN REX FID (DEF IND IMP). Reverse: Britannia seated right; ONE PENNY. 1904 underneath. Diameter: 30.5mm. Thickness: 2.1mm.

E2383:6

Sheet metal fragment. Iron. Sub-rectangular, folded back c.1/3rd along length. Length: 45mm. Width: 39.2mm. Thickness: 1.5mm.

4.2 Post Medieval Pottery by Clare McCutcheon

4.2.1 Summary

A single sherd of post-medieval pottery (E2383:1) was presented for study and was identified visually. It was recovered from the topsoil.

4.2.2 Description

This is a piece of flown blue ware, split laterally and also badly chipped. It probably comes from the rim of a plate and dates to the nineteenth century. The technical description of this decorative style is described as 'the soft but unattractive colour which results from the diffusion of blue pigment into the glaze as a result of firing in an atmosphere containing volatile chlorides' (Savage & Newman 2000, 125).

4.2.3 References

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

4.3 Clay Pipes by Joe Norton

4.3.1 Catalogue of Clay Pipe

E2383:2

Stem fragment, possibly early 19th century. The find was retrieved from the fill (4) of a ditch [3].

4.5 Artefact Curation

Artefacts will be temporarily stored at the post excavation offices of Valerie J. Keeley Ltd., Castlecomer, Co. Kilkenny until completion of all specialist analysis, cataloguing and packaging. Once complete the full artefact assemblage will be sent to the National Museum of Ireland. Permanent storage and long term curation will be held by the National Museum of Ireland, or at a location and facility approved by the National Museum of Ireland.

5.0 DISCUSSION

5.1 Overview

Cremation of the dead was a common burial practice in prehistoric Ireland. This entailed the deposition of cremated bone and charcoal from a funeral pyre in various types of pits in the ground. These deposits of bone and charcoal varied in their relative proportions and were often accompanied by ceramic and lithic material. A wide range of depositional practice is known from the archaeological record. Pits containing pottery vessels, intact or incomplete and broken, stone arrowheads and beads, as well as those with just charcoal and a small amount of bone are all known. The cremation pits can be found as isolated examples or as part of a cemetery. Some cremations were enclosed by shallow circular or in rarer cases, rectangular ditches.

5.2 Cremation Pits

The cremation pit [c11] at Site AR 41 contained frequent charcoal chunks and burnt bone fragments typical of cremation pits dating to the prehistoric period. The total amount of burnt bone accounted for 10% of the fill with the presence of larger pieces of bone suggesting that not all of the bones were crushed. This was a feature of Bronze Age tradition as later Iron Age cremations tended towards smaller token deposits in which all of the bone had been crushed. The bones could be identified as human from two fragments of the cranial vault, one fragment of a femur (diaphysis) and four long bone fragments. Sex could not be determined. Age was assessed from the general size of the identified fragments, and it appear most likely that this individual was an adult (>18 years) at the time of death (See Geber, Section 9.1).

While there is, as yet, no evidence for conscious decisions by our prehistoric ancestors to bury their cremated dead along territorial boundaries, it is possible that the location of the cremation burial close to the townland boundary at Inchirourke may not only be significant, but also indicative of a boundary which predates the historic age. There is evidence for burial of the dead close to territorial boundaries during the prehistoric period, notably the Iron Age bog bodies such as at Baronstown West, Co Kildare, which was found near a barony boundary and the recent discovery of Old Croghan Man, Co. Offaly, close to what is now a townland and parish boundary (Kelly, 2006).

Archaeological excavations in advance of The Lisheen (Lead Zinc) Mine, at Derryville Bog, Co. Tipperary, located 5.5km west of this site, uncovered four cremation sites in the townland of Killoran, Co. Tipperary. Two of these sites (Killoran 4 & 10) consisted of flat cremation cemeteries and two (Killoran 6 & 7) were isolated cremation pits (Stevens 2005, 292). All of the cremation sites in Killoran were dated to the Bronze Age. Pottery sherds, dated to the Middle Bronze Age, were found in association with cremations at Killoran 4 and 10. Sites Killoran 4, 6 and 7 were all located on a glacial ridge in close proximity to each other, while the largest cemetery, Killoran 10, like site AR 41, was situated on level ground. The spatial arrangement of the cremation and the possible posthole at AR 41, plus their profiles and morphology, suggested that this may represent a burial and associated burial marker. Parallels may be drawn with excavations at Killoran 6 and 10. The latter revealed an

oak post in one cremation pit, interpreted by the excavator as a burial marker (Stevens 2005, 288). The composition of the upper fills of both charcoal pits at AR 41 [c15] and [c17] was a redeposited natural clay seal or cap similar to those recorded at Killoran 10, where 26 of the 67 cremation pits did not produce cremations, but were sealed or partially sealed with a natural clay capping (Stevens 2005, 292). A similar but larger site was revealed at Templenoe, south of Cashel near New Inn, Co Tipperary. Excavation of this flat cremation cemetery revealed the remains of 74 pits, of which 57 contained cremated bone, which the director interpreted as being aligned in linear fashion. Examination of the human remains produced evidence for twenty adults, four sub-adults with seven uncertain. Only two individuals could be sexed, one female and one which was likely male. The cemetery was radiocarbon dated to the Early to Middle Bronze Age. Artefacts included two tanged flint arrowheads and a small quantity of pottery (Doody 2008). In Camlin townland (Conboy 2008) a cemetery consisting of four cremation pits was excavated in association with settlement site, one of pits contained an upright urn provisionally dated to the middle Bronze Age.

Research carried out by (Mount 1995) in the mid 1990's (and prior to the building boom) revealed the majority of early Bronze Age cemetery sites in the south east of the country were discovered as the result of quarrying and agricultural activity. The construction of major road schemes in the south east and midlands has led to the discovery of some large Bronze Age cemeteries. It should be noted at this point that the concentration of major road building in the southern half of the country has likely created some degree of bias regarding the distribution of these sites nationally.

Mount examined fifty-nine sites in the south east which represented less than a third of the known sites from this time. Twenty-nine cemeteries (49%) contained only cist graves, twenty-five (42%) contained cist and pit burials and five (8%) contained pit burial only. He examined in detail the cemeteries excavated at Edmondstown, Co. Dublin and Keenoge, Co. Meath, both of which contained a combination of cist and pit burials. In brief, he concluded that pit burials and mixed burial where under represented in the archaeological record, that the cemeteries examined produced evidence of a complex social structure and that adult males were represented more than females and adults overall were more represented than children.

Sites excavated in this region over the past ten years continue to produce a pattern of diversity regarding Bronze Age burial practice; these include the Early Bronze Age burial site at Carmanhall, Co. Dublin, where two pits contained the cremated remains of three individuals contained within two vases and a vase urn dating to the Early Bronze Age (Reilly 2005). At Darcytown, Co. Dublin, ten pits containing cremated remains contained eight upright urns along with a number of 'blind' burials (Wiggins 2003). In Coolmore, Co. Kilkenny, a flat cemetery consisting of 17 pits with cremated bone and a number of 'blind' pits were excavated, this has provisionally been dated to the later Bronze Age (Monteith 2008). Also in Kilkenny, at Knockmoylan a cemetery consisting of five cist burials and five pit burials; pottery from this site has provisionally dated the site to the Early Bronze Age (McKinstry 2008).

Cremation cemeteries were also revealed elsewhere on the M8N8 Cullahill to Cashel Road Scheme. In Borris, Co. Tipperary (9 km southwest of this site), excavations at Site E2375 / AR 32, revealed nine pits with cremated

remains, seven 'blind' burials and three possible 'blind' pits in a tight cluster on a low glacial ridge. Three adults and one non adult could be identified from the burials but no sex or pathologies could be determined. It is possible that a number of the pits may be aligned in short rows oriented in a similar direction as those at site E2491 / AR 36, however a case could also be made for a NNE / SSW orientation. Cremated bone from this site produced middle Bronze Age dates of 1603 – 1427 cal BC and 1629 – 1454 cal BC (Ó Droma *et al forthcoming*).

At E2491 / AR 36, 13 cremation pits were excavated on the east – facing slope of a low ridge with early Bronze Age dates of 2204 – 2038 Cal BC and 2024 – 1896 Cal BC. At least 13 individuals were represented with 5 posssible 'blind' burials or cenotaphs were also excavated. A number of the burials (including the 'blind' burial pits) appeared to be concentrated in small clusters or short rows. The rows are orientated in a WNW/ESE. To the south east of the burials is a row of three pits while to the north of this was a central cluster of six. To the east of this was another row of three pits. The remaining pits would seem to be positioned in pairs (Conboy *et al forthcoming*).

A rectangular 'ring' ditch, with a centrally – placed cremation pit, was excavated on a low south-east facing gravel ridge at site AR 31/E2374, (Ó Droma *et al forthcoming*) and three cremation pits were identified internal to Enclosure D at site AR 33/E2376 (Ó Droma *et al forthcoming*). An isolated possible cremation pit was also revealed in testing for the scheme at site AR 11, Moycarky, Co. Tipperary (Fegan *et al* 2008; McQuade *et al* 2006).

5.3 Siting & Location

Of the cremation sites excavated within Tipperary the two sites located in Borris townland were located on elevated ground, Site E2375 / AR 32 was located on the brow of a small ridge and Site E2491 / AR 36 was located on the east facing slope of a low ridge. This site (E2383 / AR 41 in Inchirourke) was located in a flat field. Other sites in Tipperary reveal a similar mixed pattern, three of the four sites excavated in Killoran towland, Co. Tipperary, were on elevated ground, while the largest unenclosed cemeteries in the country located at Templenoe, Co. Tipperary and the nearby Killoran 10, Co Tipperary (Doody 2008, Stevens 2005) were also located on flat land. The cemetery at Camlin, Co. Tipperary, was located at the near the base of an east facing slope (Conboy 2008).

5.4 Funerary Pyres/ Grave Markers

From the colour of the fragments from AR 41 / E2383 it can be concluded that the bones had been well burnt in temperatures exceeding 700-800ºC which is a prerequisite for a successful cremation. The samples were heavily fragmented possibly the result of pyre collapse, ground pressure, frost-action, archaeological excavation, sex and age of the individual, or that the bones were crushed after the burning and prior to burial (See Geber, Section 9.1). Charcoal identified from the cremation contexts is likely to represent the pyre material used. There is some ethnographic evidence to suggest that oak planks were used as platforms for laying out the human

remains during the cremation process and this may be the case here at Inchirourke townland. This hypothesis is based on cremation rituals as described at a modern Hindu funeral in Pashupatinath, Katmandu, where the body is lain out on a wooden stretcher before it is burnt or cremated (See O'Carroll Section, 9.3)

At the cemetery site in Templenoe a cluster of four large pits to the northeast of the cremations where interpreted as venting pits dug under the pyre (Doody 2008). At Borris, Co Tipperary, site E2491 / AR 36, two large pits [c42] and [c44] were located to the northeast of the cemetery in a similar position to those at Templenoe. At the time of excavation these features produced no evidence of burning or of function, however in light of the evidence from Templenoe (of similar type features) these two pits may have some form of association with the cremation process.

At Borris, Co Tipperary, Site E2375 / AR 32, a posthole which truncated the fill of a cremation pit [c13] was interpreted as a marker post for that grave, while another posthole [c60] to the northwest of the cemetery may have been a marker post for the entire cemetery (Ó Droma *et al forthcoming*). In the final report for Templenoe, Co Tipperary, the excavator M. Doody, made the point that while no grave markers were discovered it was likely that some form of marker would have been required in order to maintain some type of order within the cemetery. No features were excavated from Site E2491 / AR 36 which could be identified as grave markers (Conboy *et al forthcoming*).

At Inchirouke, the posthole [c5] was 0.81m from the cremation pit [c11], a distance which may suggest it as a grave marker.

Other marker posts/grave markers have also been recorded at cremation cemeteries at Croagh and Kiltenan South, Co. Limerick during work on the the Bord Gáis Éireann Pipeline to the West (Dennehy 2002a & b). Eight pit cremations with three marker posts were recorded at Site 37, Newrath Co. Kilkenny as part of the N25 Waterford Bypass which also produced three postholes, interpreted as the possible remains of a cremation platform (Wren 2004a). Also on the N25 Waterford Bypass twelve pits and some stake-holes associated with cremation and burial were. Three of the pits contained cremated bone and one contained an Early Bronze Age food vessel. Three other pits may have held marker posts locating the burials while two other pits with charcoal-rich fills were discovered north of the main burial area similar to those on AR 41 (Wren 2004b). As part of the excavations on the N11 Gorey–Arklow scheme 60 pit features, 53 postholes and 150 stakeholes were excavated on Site 37 in the townland of Ask, Co. Wexford. Only a small percentage of post- or stake-holes contained cremated bone and it is likely that some functioned as post markers for adjacent cremation pits, while the remainder may have supported a series of small structures or frame set-ups connected to the funerary use of the site (i.e. funeral pyres) (Martin 2005). The remains of a cremation burial of a juvenile and associated marker post were excavated at a portion of grounds surrounding the remains of the Franciscan friary at Kildare. This burial deposit was sealed with a 0.1m-thick capping layer of brown clay mottled with orange redeposited subsoil. A 2 sigma calibrated 14C date of 1142–1310 BC was obtained from the charcoal of the burial deposit (Dennehy 2005).

5.5 Agricultural Activity

The agricultural features encountered during the course of excavations represent the remains of a number of farming practices typical of the post medieval/modern period, many of which were gradually adopted in Ireland following the English Agricultural Revolution of the 18th and 19th centuries. In 1716, approximately 5% of the country was under tillage. By the turn of the next century this had increased by 1.5 million acres, all of this reclaimed land (Feehan 2003, 98).

The oxidised linear features revealed in excavation were probably the result of "liming", a common agricultural practice which prevailed in Ireland, in the 18th / 19th Centuries. This involved the use of calcium oxide or quicklime a fine powder produced in limekilns and spread on the land as a fertiliser (Rynne 2006, 157). Lime fertiliser was particularly useful on very acidic soils or in the reclamation of marginal land such as bogs. The incorporation of unslaked lime into damp soil would have led to a chemical reaction, taking place between the lime and the moisture in the soil. This reaction would have generated heat resulting in an oxidation or reddening of the soil. The lime would have often been incorporated into plough furrows, which would account for the linear shape of the patches of oxidation and common orientation, encountered during excavation. Such were the benefits of liming that Lord Forster of Co. Meath, who was a firm advocate of this practice, claimed that "the use of lime raised the yield of his lands from 3-4 barrels of oats to 20-22 of barley" (Feehan 2003, 261). In fact, application of lime to the land provided beneficial effects for eight to nine years. In a pre chemical fertiliser age, this was an innovation not to be overlooked that compared very favorably with the alternative, annual chore of spreading seaweed or manure to provide nutrients to the soil (Bell & Watson 1986, 37). However, an increasing awareness of the harmful effects of over liming, coupled with the introduction of guano and super-phosphates in the 1870's, saw a major reduction in the use of lime as a fertiliser in Ireland (Feehan 2003, 261).

5.6 Environmental Evidence

A restricted variety of native taxa was identified, comprising oak, hazel, blackthorn, pomoideae, willow and *Prunus spp.* Oak was exclusively identified from the cremation pit, while pomaceous fruitwood dominated the fills of the miscellaneous pit. Oak was also exclusively identified from the posthole feature. Although the majority of the charcoal is likely to be representative of fuel collection policies from the immediate environment of the site and in association with the rituals of cremation, it is also likely that certain taxa were selected for their heat-producing or calorific qualities associated with the rituals of the dead. The charcoal identifications are broadly comparable with nearby analysed sites and representative of results from other parts of the country. Features identified at nearby AR36/E2491, excavated as part of this same road scheme, produced similar evidence, with oak, hazel, ash, pomoideae and *Prunus* spp growing in Inchirourke townland during the Late Bronze Age/Early Iron Age horizon. (See O Carroll Section 9.3)

The absence of oak charcoal from the pit [c15] and the presence of large quantities of pomaceous fruitwood suggest that this feature may have been associated with the rituals of the dead but may have played a different

role in relation to such processes on the site. The oak exclusively identified from the post hole [c5] is most likely related to the structural use of oak wood at the site in the Early to Middle Bronze Age. The wood identified from the sample could have originated from hedgerows, scrub-type woodland or from mixed primary woodlands (oak and hazel) nearby. Oak and hazel are more indicative of dryland woods. Pomoideae and *Prunus spp* are normally associated with scrub type woodlands, understory trees or small trees located at the margin of woodlands while willow suggests a slightly wetter terrain. The woodland trees and scrub type trees would most likely have grown in woods on the nearby dryland margins (*ibid*).

Hazel nut shells were also recorded from [c6] and [c12]. The hazelnut shell was only recorded in the cremation pit deposits – plant remains were absent from the miscellaneous pit deposits. The hazelnut shell may represent food that was consumed or deposited in association with cremation activities, or may alternatively indicate the use of hazel wood as fuel in this location (See McClatchie Section 9.2).

Analysis of the fills of the pits from sites along the N8/M8 produced small quantity of cereal grain (Mc Clatchie 2008). At Borris, Co Tipperary, site E2491 / AR 36 [c12] a 'blind' burial produced two cereal grain fragments of indeterminate type, [c36] produced one seed possible of the rose family. A cremation [c4] produced grains of an indeterminate weed, a 'blind' burial [c8] produced a false oat-grass tuber, and a further 'blind' burial [c20] produced seven hazel nut fragments and several possible haw nutlets.

At Borris, Co Tipperary, site E2491 / AR 36 it is almost exclusively pits which did not contain cremated bone that contained material such as cereal, a tuber and nut shells. In contrast, to this it was a number of cremation pits from sites E2383 / AR 41 and at Borris site E2375 / AR 32, which produced the evidence of grain and hazel nut. From the former, the cremation pit [c11] and posthole [c5] produced a single hazel shell apiece, at the latter [c5] and [c13] produced evidence grain and shell. (a possible 'blind' burial [c11] also contained grain and nut shell). (*ibid*)

5.7 Artefactual Evidence

All four metal finds were recorded from the field boundary ditches [c22 & c24] and included two amphorous fragments and two coins dating from 1853 and 1904. One sherd of 19th century pottery was recovered from the topsoil and one stem fragment of an early 19th century clay pipe was recorded from the field boundary [c3]. This would be broadly in keeping with the cartographic evidence for the field boundary, which was raised prior to 1839-40 and was either open or regularly cleaned out in the 19th and 20th centuries, but backfilled in 1980.

5.8 Chronology & Dating

The earliest known Irish example of a cremation burial is that recently excavated at Hermitage, Co. Limerick, which has been radiocarbon dated to the early Mesolithic (Collins & Coyne, 2006). During the Neolithic period, cremations were particularly associated with deposition in megalithic tombs, particularly passage tombs, such as at Fourknocks I, Co. Meath (Cooney & Grogan, 1994). However, the greatest number of cremations encountered

during archaeological excavation date to the Bronze Age, when this was the dominant burial ritual. Variations in Bronze Age funerary practices did occur, as some cremated bones were placed directly into pits in the ground, some into stone lined cists, while others were buried in association with bowls, vases, inverted urns and other grave goods. It is likely that the smaller quantities of crushed bone retrieved from Iron Age cremations represent token deposits, with the majority of the bone ritually disposed elsewhere, perhaps in a riverine context (Buckley & Buckley 1999). There appears to be an approximate chronological progression from larger deposits containing larger fragments of bone in the Bronze Age to smaller, token deposits containing crushed bone in the Iron Age. Consequently, information such as age and gender of the individual interred is generally more readily accessible to the osteoarchaeologist from cremations dating to the Bronze Age. Cremation as a method of treatment of the dead all but ceased with the arrival of Christianity to Ireland, as resurrection of the body as a whole was integral to the Christian belief system (Buckley & Buckley 1999).

An Early Bronze Age date of 2332 – 2136 Cal BC was returned from a sample of cremated human bone from the cremation pit [c11] while a Middle Bronze Age date of 1494 – 1325 Cal BC was returned from a sample of charcoal (*pomoideae*) from the lower fill [c26] of the charcoal rich pit [c15] (see Section 9.4).

6.0 CONCLUSION

Excavation of this site produced a single cremation pit dating to the Early Bronze Age, 2332 – 2136 Cal BC, with an associated marker post. Two charcoal rich pits were also identified due south of the cremation with a middle Bronze Age date of 1494 – 1325 Cal BC being recorded. A series of post medieval agricultural plough furrows, tree bowl and field boundary, the latter depicted on the 1st and 2nd edition Ordnance Survey maps were also identified.

Excavations at the site are complete and no further work is recommended. All post excavation archaeological work is now complete for this site and this report constitutes the final report on this excavation. A digital copy of the archive is available at the post excavation offices of Valerie J Keeley Ltd., Brehon House, Kilkenny Road, Castlecomer, Co. Kilkenny. The original paper archive for this excavation will rest with the Road Design Offices of Kilkenny County Council.

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8.0 REFERENCES

Bell J. & Watson M., 1986, *Irish Farming 1750-1900,* Edinburgh

Brindley, A.L. 2007 The Dating of Food Vessels & Urns in Ireland, Bronze Age Studies 7, Dept. of Archaeology, National University of Ireland, Galway 2007

Brindley, A.L 1995 Radiocarbon, Chronology and the Bronze Age, Ireland in the Bronze Age, proceedings of the Dublin Conference, April 1995. The Stationary Office 1995

Buckley L & Buckley V, Ashes to ashes? The archaeology of cremation, *Archaeology Ireland,*13(4)*,* 25

Conboy, G. 2008, Camlin, Co. Tipperary. E3746 Unpublished Preliminary report for Valerie J Keeley Ltd.

Cooney G & Grogan E, 1994, *Irish Prehistory; a social perspective,* Wicklow, Wordwell Ltd

Collins T & Coyne F, 2006, As old as we felt…*Archaeology Ireland,* **20**(4), 21

Dennehy, E. 2002a 'Croagh' I. Bennett (ed.*), Excavations 2002: summary accounts of archaeological excavations in Ireland*. Wordwell Ltd, Bray

Dennehy, E. 2002b 'Kiltenan South' I. Bennett (ed.*), Excavations 2002: summary accounts of archaeological excavations in Ireland*. Wordwell Ltd, Bray

Dennehy, E. 2005 'Kildare/Grey Abbey/Kildare' I. Bennett (ed.*), Excavations 2005: summary accounts of archaeological excavations in Ireland*. Wordwell Ltd, Bray

Doody, M., 2008, Templenoe, Co Tipperary, Ministerial Direction A035/000 Registration No. E2290, *Unpublished report for Margaret Gowen & Co. Ltd.*

Dunne, L. 1999, Late Iron Age Crematoria at Ballyvelly, Tralee, *Archaeology Ireland,* **13**(2), 10-11.

Fegan, G, Stevens, P. & Green, B. 2008, M8N8 Cullahill to Cashel Road Improvement Scheme, AR 11, Moycarky, Co. Tipperary. *Unpublished Final Report for Kilkenny County Council*: Valerie J Keeley Ltd.

Feehan, J. 2003, *Farming in Ireland,* Tipperary, Walsh printers

Flanagan, D. & Flanagan, L. 2002 Irish Place Names, Gill & Macmillan: Dublin

Geber, J 2008, Osteological Analysis of the cremation burials from E2491 (AR36) Borris, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme.

Geber, J 2008, Osteological Analysis of the cremation burials from E2375 (AR32) Borris, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme.

Geber, J 2008, Osteological Analysis of the cremation burials from E2383 (AR41) Inchirourke, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme.

Kelly, E 2006, Kingship and Sacrfice: Iron Age bog bodies and boundaries, *Archaeology Ireland Heritage Guide No. 35*, 1-2

Joyce, P.W. 1869 *Irish Names of Places* Vol II. Pheonix Publ. Co.

Martin, K. 2005 'Sites 37 Ask' I. Bennett (ed.*), Excavations 2005: summary accounts of archaeological excavations in Ireland*. Wordwell Ltd, Bray

McClatchie, M. 2008 Analysis of Non-Wood Plant Macro Remains from E2491 (AR36) Borris townland, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme.

McClatchie, M. 2008 Analysis of Non-Wood Plant Macro Remains from E2375 (AR32) Borris townland, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme

McClatchie, M. 2008 Analysis of Non-Wood Plant Macro Remains from E2383 (AR41) Inchirourke townland, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme

McKinstry, L. 2008 N9/N10 Kilcullen to Waterford Road Improvement Scheme, E3009 Site AR 34-36, Knockmoylan, Co. Kilkenny *Unpublished Preliminary Report for Kilkenny County Council:* Valerie J. Keeley Ltd.

Mount, C. 1995 New Research on Irish Early Bronze Age Cemeteries. Ireland in the Bronze Age, proceedings of the Dublin Conference, April 1995. The Stationary Office 1995

O Carroll, E. Charcoal report from E2491 (AR36) Borris townland, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme.

O Carroll, E. Charcoal report from E2375 (AR32) Borris townland, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme.

O Carroll, E. Charcoal report from E2383 (AR41) Inchirourke townland, Co. Tipperary. M8/N8 Cullahill to Cashel Road Improvement Scheme.

O Kelly, J. 1989. Early Ireland. Cambridge University Press.

Reilly, F. 2005 Final report of a Bronze Age Cemetery Site at Carmahall Townland, Co.Dublin 02E036.Unpublished Final Report for Valerie J Keeley Ltd.

Rynne C, 2006, *Industrial Ireland 1750-1930: An Archaeology,* Cork, Collins Press

Stevens P., 2005, Catalogue of dryland sites in M. Gowen, J. Ó Néill & M. Phillips, (ed.s), *The Lisheen Mine Archaeological Project 1996-8,* Wiltshire, Cromwell Press

Waddell, J. 1990. The Bronze Age Burials of Ireland, Galway University Press

Walsh P, 1995 Structure and Deposition in Irish Wedge Tombs: an Open and Shut Case ? Ireland in the Bronze Age, proceedings of the Dublin Conference, April 1995. The Stationary Office 1995

Wiggins, Kenneth. 2003 Darcytown, Co. Dublin 03E0067 ext. Unpublished preliminary report for Judith Carroll & Co. Ltd.

Wren, J. 2004a 'Sites 36 and 37 Newrath' I. Bennett (ed.*), Excavations 2004: summary accounts of archaeological excavations in Ireland*. Wordwell Ltd, Bray

Wren, J. 2004b 'Sites 38, 39 and 46 Rathpatrick' I. Bennett (ed.*), Excavations 2004: summary accounts of archaeological excavations in Ireland*. Wordwell Ltd, Bray

9.0 SPECIALIST APPENDICES

9.1 Osteological Report By Jonny Geber

9.1.1 Introduction

The archaeological excavation at Site AR 41 in Inchirourke Townland of the M8/N8 Cullahill to Cashel Road Improvement Scheme project revealed two cremation burials [c5], [c11] and two possible cremation burial cenotaphs [c15], [c17]. The burials had not been dated prior to the osteological analysis. Isolated cremation burial pits are mainly dated to the Bronze Age period, but are also present in the Iron Age.

9.1.2 Methodology

As part of the osteological analysis, the bones were sieved in >10mm, 5mm and 2mm mesh size categories for the purpose of assessing the fragmentation of the sample. The bone fragments were thereafter counted, weighed (to an accuracy of 0.01g), and identified to species and skeletal elements, body side and colour/degree of incineration.

9.1.3 Results

Burial [c5]: This burial contained three fragments of burned bone which weighed only 0.02g. Due to the small sample, none of the fragments could be identified to species. However, when taking into consideration the archaeological interpretations of the feature, as well as the presence of the human bones in pit [c11] (see below), it appears likely that these remains are human in origin.

Burial [c11]: The remains in this burial weighed 78.91g and contained about 1884 fragments. The bones could be identified as human from two fragments of the cranial vault, one fragment of a femur (diaphysis) and four long bone fragments. Sex could not be determined. Age was assessed from the general size of the identified fragments, and it appeared most likely that this individual was an adult (>18 years) at the time of death.

9.1.4 Discussion

Burial Practice & Cremation Technology: Too little bones were present in the pits for any solid conclusions or discussions regarding the prehistoric burial practice or funerary ritual regarding these burials. One can however conclude from the colour of the fragments that the bones had been well burnt in temperatures exceeding 700-800ºC which is a prerequisite for a successful cremation (Herrmann 1988, 578).

The samples were heavily fragmented (Table 1), but the reason for this is uncertain. Fragmentation in cremation burials have previously been explained by either factors such as pyre collapse, ground pressure, frost-action and archaeological excavation (see Lisowski 1968, 79; McKinley 1989, 72), or that the bones were crushed after the burning and prior to burial (Holck 1997, 35; Sigvallius 1994, 33; Wegewitz 1972, 169). None of these explanations are mutually exclusive and a robust explanation would posit that bone fragmentation is likely to be a result of a combination of the factors mentioned above, alongside other agents such as the sex and age of the individual, other weather conditions (besides just frost-action), pyre technology and so on (Geber 2003).

Token Burials & Possible Cenotaphs: The remains in burial [c5] could not be identified to species, but considering the site context in which it was found it appears likely that they are human. Burial [c11] contained a token deposit of very fragmented human remains of an adult individual. The remains could not be sexed.

It is obvious that only token amounts of bones had been deposited in the burial pits, a burial practice which appears to have been widely practised in prehistoric Ireland. A cremation of a full adult human body would produce a bone weight of between 1000-2400g of bone (McKinley 1993, 285), and the bone quantity in the burials from Site AR41 are therefore evidently much less than what is to be expected.

There have been several proposed explanations to why this is so. One theory is that the actual handling of the remains during the transfer from the pyre to the grave would have been a very difficult practical task (Eichhorn 1927; Gejvall 1947, 40). However, a Polish experiment has concluded that it is not difficult to find and collect bone fragments from the ashes after a cremation (Piontek 1976).

An additional possibility for the lack of bone in many cremation burials is that they constitute the remains of children. This is a possible explanation to the few fragments found in burial [c5], but is disproved regarding the remains in burial [c11] which was osteologically determined as bones from an adult skeleton.

Two additional pits were initially interpreted archaeologically as possible cenotaphs or “blind” cremation burial pits however this was later dismissed in the light of both radiocarbon and environmental evidence. The pits contained a charcoal rich deposit, but no bone. Whether these pits are cenotaphs is impossible to determine osteologically. Acidity in the soil might have dissolved any osteological remains (see Knight 1985 in Lyman 1994, 390), resulting in an “empty” burial pit. However, burnt bone has the potential of surviving most taphonomical processes since the organic substance in the bones is destroyed when exposed to the high temperatures in a cremation. The calcium salts are transformed into calcium apatite which is a virtually indestructible substance (Herrmann 1988, 577ff.; Hummel and Schutkowski 1986, 141; Iregren and Jonsson 1973, 97).

9.1.5 References

Eichhorn, E. 1927. *Der Urnenfriedhof auf der Schanze bei Grossromstedt*, Leipzig

Geber, J. 2003. *Fragment och tolkning. En osteologisk studie av kremationer från förromersk järnålder på Seltorp 1:1, Vist socken, Östergötland*. Unpublished MA thesis in archaeoosteology, University of Gotland, Visby.

Gejvall, N-G. 1947. Bestämning av brända ben från forntida gravar, *Fornvännen **42***, 39-47

Herrmann, B. 1988. Behandlung von Leichenbrand, In: *Wesen und Methoden der Anthropologie. 1 Teil. Wissenschaftstheorie, Geschichte, morphologische Methoden* (R. Knussmann ed.), Stuttgardt, 576-585

Holck, P. 1997. *Cremated bones. A medical-anthropological study of archaeological material on cremated burials*. Oslo.

Hummel, S. and Schutkowski, H. 1986. Neue Ansätze in der Leichenbranduntersuchung, In: *Innovative Trends in der prähistorischen Anthroplogie* (B. Herrmann ed.), Berlin, 141-146

Iregren, E. and Jonsson, R. 1973. Hur ben krymper vid kremering, *Fornvännen **68***, 97-100

Lisowski, F.P. 1968. The Investigation of Human Cremations. In *Anthropologie und Humangenetik*, (T. Bielicki *et al.* eds), pp.76–83.

Lyman, R.L. 1994. *Vertebrate taphonomy*, Cambridge

McKinley, J.I. 1989. Cremations: Expectations, methodologies and realities. *British Archaeological Reports **211***. Oxford, pp. 65–76

McKinley, J.I. 1993. Bone fragment size and weight of bone from modern British cremations and the implications for the interpretation of archaeological cremations, *International Journal of Osteoarchaeology **3***, 283-287

Piontek, J. 1976. Proces kremacji i jego wpływ na morfologię kości w świetle wyników badań eksperymentalnych, *Archeologia Polski **21(2)***, 247-280

Sigvallius, B. 1994. Funeral Pyres. Iron Age Cremations in North Spånga. *Theses and Papers in Osteology **1***. Stockholm

Wegewitz, W. 1972. *Das langobardische Brandgräberfeld von Putesen, Kreis Harburg*. Hildesheim.

Appendix 1: Osteological Catalogue

Cut number: 5
Fill number(s): 6
Sample number(s): 1
Period: Undated
Context/Container: Pit
Estimated number of fragments: 3 *(0.00% identified)*
Weight: 0.02g *(0.00% identified)*
Maximal linear fragment size: < 2mm
Fragmentation category (Wahl 1982): I
Incineration category (Wahl 1982): V
Colour: White
Clean/Sooty: Indeterminable
MNI: 1
Age: Indeterminable
Sex: Indeterminable
Pathology: Not present

Cut number: 11
Fill number(s): 12
Sample number(s): 3

Period: Undated
Context/Container: Pit
Estimated number of fragments: 1884 *(0.37% identified)*
Weight: 78.91g *(8.53% identified)*
Maximal linear fragment size: 37.50mm
Fragmentation category (Wahl 1982): I
Incineration category (Wahl 1982): V
Colour: White
Clean/Sooty: Indeterminable
Skull: Vault (1.19g)
Axial: Not identified
Upper limb: Not identified
Lower limb: Femur, long bone (5.54g)
MNI: 1
Age: 18+ years
Sex: Indeterminable
Pathology: Not present
Animal bones: Not present.

Appendix 2 Fragmentation of the Cremation Burials

Sample	*Cut*	*Fill*	*Weight (g)*	*Fragment*	*Weight (g) by mesh category*							
					> 10mm		*5-10mm*		*2-5mm*		*< 2mm*	
1	5	6	0.02	3	0.00	*0.00%*	0.00	*0.00%*	0.00	*0.00%*	0.02	*0.00%*
3	11	12	78.91	1884	2.04	*2.58%*	18.68	*23.67%*	48.20	*61.08%*	9.99	*12.66%*
Total:			*78.93*	*1887*	*2.04*	*2.58%*	*18.68*	*23.67%*	*48.20*	*61.07%*	*10.01*	*12.68%*

Table 1: The fragmentation of the cremation burials from Site AR 41

9.2 Non Wood Plant Remains by Meriel McClatchie

Non-technical summary

Analysis of two deposits from an Early Bronze Age cremation pit and five deposits from a Middle Bronze Age miscellaneous pit at Inchirourke, Co. Tipperary produced evidence for a small number of hazelnut shell fragments. The hazelnut shell was only recorded in the cremation pit deposits – plant remains were absent from the miscellaneous pit deposits. The hazelnut shell may represent food that was consumed or deposited in association with cremation activities, or may alternatively indicate the use of hazel wood as fuel in this location.

9.2.1 Introduction

An archaeological excavation was carried out at Site AR41 under the direction of Mick Drumm of Valerie J. Keeley Ltd (Licence number E2383). The site was excavated as part of works associated with the M8/N8 Cullahill–Cashel road scheme. Seven deposits were presented for archaeobotanical analysis, two of which contained non-wood plant macro-remains (Table 2).

Context	Sample	Interpretation	Plant
6	1	Fill of cremation pit	✓
12	3	Fill of cremation pit	✓
16	5	Fill of pit	…
16	10	Fill of pit	…
16/21	10	Fill of pit	…
21	10	Fill of pit	…
26	11	Fill of pit	…

Table 2: Deposits analysed for archaeobotanical content

This report provides information on the recovery and analysis of non-wood plant macro-remains from the examined deposits. The methods employed in the extraction and identification of remains will firstly be outlined. The following section will investigate the types of plant remains recorded, the method of preservation encountered and the deposits from which the material was derived. These results will then be discussed in a more general temporal and geographic context. Finally, a non-technical summary of results will be provided.

9.2.2 Methodology

Processing of Soil Samples: The soil samples had previously been processed under the supervision of Ríona McMorrow of Valerie J. Keeley Ltd. The samples were processed using conventional flotation methods, with the smallest sieve mesh-aperture measuring 250µm. The flots and retents were then presented to the author for analysis.

Extraction and identification of remains: Examination of the flots was carried out using a stereo-microscope, with magnifications ranging from x6.3 to x50. The retents were examined without the use of magnification. The flots and retents were scanned in order to confirm the presence of archaeobotanical material, which was then extracted. The archaeobotanical material was identified by comparison to reference material in McClatchie's collection of modern diaspores and the drawings from various seed keys (Anderberg 1994; Beijerinck 1947; Berggren 1969; 1981; Katz *et al.* 1965). Botanical names follow the nomenclature of *Flora Europaea* (Tutin *et al.* 1964–83), and common names follow those provided in *New flora of the British Isles* (Stace 1991).

9.2.3 Material recorded

Non-wood plant macro-remains: Two deposits [c6] & [c12] from a cremation pit each contained a single charred shell fragment of *Corylus avellana* L. (hazelnut). Five deposits [c16], [c21] & [c26] from a miscellaneous pit did not produce any non-wood plant macro-remains.

9.2.4 Date of remains

The cremation pit and miscellaneous pit at this site have been radiocarbon dated to the Early-Middle Bronze Age. Cremated bone from the cremation pit [c12] was dated to the Early Bronze Age (3789±28BP; 2σ 2332-2136 cal. BC; UBA-10843). Charcoal from the miscellaneous pit [c26] was dated to the Middle Bronze Age (3146±27BP; 2σ 1494-1325 cal. BC; UBA-11153).

9.2.5 Discussion

Evidence for the collection of hazelnuts in prehistoric Ireland has often been recorded (McComb and Simpson 1999), representing a resource that could have provided a nutritious foodstuff. The presence of hazelnut remains in these cremation deposits may represent the remains of meals consumed by the living during burial ceremonies. Food remains could also have been deliberately placed into the cremation pits in order to accompany or represent the dead. More comprehensive sampling of Bronze Age burial deposits in recent years has revealed the presence of cereal and other food remains at a number of sites in Ireland, such as the cremation deposits recently excavated on the Bord Gáis Pipeline to the West (Johnston 2007).

Alternatively, hazelnuts may have been inadvertently introduced to the site along with hazel wood, which could have been used as fuel in cremation activities at the site.

9.2.7 References

Anderberg, A.-L. 1994. *Atlas of seeds part 4: Resedaceae-Umbelliferae*. Stockholm: Swedish Museum of Natural History.

Beijerinck, W. 1947. *Zadenatlas der Nederlandsche Flora*. Wageningen: H. Veenman & Zonen.

Berggren, G. 1969. *Atlas of seeds part 2: Cyperaceae*. Stockholm: Swedish Museum of Natural History.

Berggren, G. 1981. *Atlas of seeds part 3: Salicaceae-Cruciferae*. Stockholm: Swedish Museum of Natural History.

Johnston, P. 2007. Analysis of carbonised plant remains. In E. Grogan, L. O'Donnell and P. Johnston (eds), *The Bronze Age landscapes of the Pipeline to the West: an integrated archaeological and environmental assessment*, 70–9. Bray, Co. Wicklow: Wordwell.

Katz, N.J., Katz, S.V. and Kipiani, M.G. 1965. *Atlas and keys of fruits and seeds occurring in the quaternary deposits of the USSR*. Moscow: Nauka.

McComb, A.M.G. and Simpson, D. 1999. The wild bunch: exploitation of the hazel in prehistoric Ireland. *Ulster Journal of Archaeology* 58, 1-16.

Stace, C. 1991. *New flora of the British Isles*. Cambridge: Cambridge University Press.

Tutin, T.G., Heywood, V.H., Burges, N.A., Valentine, D.H., Walters, S.M. and Webb, D.A. 1964–83. *Flora Europaea (Volumes 1–6)*. Cambridge: Cambridge University Press.

9.3 Wood & Charcoal Identification by Ellen O'Carroll

9.3.1 Introduction

Six samples from five contexts were analysed, comprising; S1/[c6] fill of posthole [c5]; S3/[c12] fill of cremation pit [c11], S10/[c16]; upper fill of pit [c15]; S5/[c16] upper fill of pit [c15]; S11/[c26] basal fill of pit [c15]; S10/[c21] middle fill of pit [c15]. The level of preservation within the charcoal assemblage was good to excellent. Taphonomic alteration, such as repeated saturation, had not affected the quality of the charcoal. There was no evidence to suggest that the charcoal had become coated with any calcareous concretions that would compromise future radiocarbon dating submissions. A total of 308 charcoal fragments providing a combined charcoal weight of 24.9g, were analysed and a variety of native taxa was identified.

Dating from samples ranged from 2332- 1325 BC (cal. QUB 2 Sigma), placing activity on the site in the Early - Middle Bronze Age.

Wood and its by-product, charcoal, was a vital and widely used material from prehistoric to medieval times, although its importance is rarely reflected in the analysis of archaeological assemblages mainly due to its perishable nature. It is important to note that people in prehistoric, Early Christian and medieval communities were mainly dependant on woodland resources for the construction of buildings, for the manufacture of most implements and for fuel for wood-burning and metalworking activities. The woods in a surrounding catchment area were exploited and often managed to provide an essential raw material for the community. A study of the range of species on an archaeological site offers an indication of the composition of local woodland in its period of use and any selection policies for particular species at any given time and place.

The analysis of charcoal can provide information on two different levels. Charcoal analysis is an important component of any post-excavation environmental work, as it can help in re-constructing an environment hitherto lost. However, this must be done with caution, as sufficient sample numbers are required for a complete and full understanding of the immediate environment. Keepax (1988) suggests fifty samples in a European temperate climate. Charcoal is also analysed and identified to determine what species are used and selected for particular functions on site *i.e.* post-holes, wall-posts, burnt remains of wattle and so on. In summary, charcoals are excellent indicators of exploited environments and the vegetation that developed within them.

Large assemblages of wood and charcoal from numerous excavations and subsequent analysis of the sampled wood and charcoal are on-going in Ireland. The analysis completed from the charcoal excavated from AR41 will contribute to the rapidly expanding database of environmental indicators in the area. This is especially important in Ireland where there are very little written records up to the 18th century relating to the amount and type of woodland (McCracken 1971, 15).

The analysis presented in this report concentrates on species identification, species selection and the composition of the local woodland during the Early to Middle Bronze Age in the area of Inchirourke townland, Co. Tipperary.

9.3.2 Methodology

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

Charcoal

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

The identification of charcoal material involves breaking the charcoal piece along its three sections (transverse, tangential and radial) so clean sections of the wood pieces can be obtained. This charcoal was then identified to species by Ellen OCarroll 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. Identification was undertaken according to the anatomical characteristics described by Schweingruber (1990) and Butterfield and Meylan (1980) to the highest taxonomic level possible (usually that of genus), with nomenclature according to Stace (1991). Individual taxa were quantified (mature and twig separated), and the results tabulated.

The purpose of the charcoal identifications was two-fold. In some cases the identifications were carried out prior to ^{14}C dating in order to select specific species for dating. In other cases the charcoal was analysed to determine fuel selection policies and selection of wood types for structural use. Each species was identified, bagged together and then weighed. Insect channels were noted on the charcoal fragments identified, as this may indicate the use of dead or rotting wood used for fuel or other such functions. The distinction can sometimes be made between trunks, branches and twigs if the charcoal samples are large enough. This was noted where possible. When charcoal samples showed indications of fast or slow growth this was also recorded. The samples identified for environmental reconstruction and wood usage were counted per fragment and then weighed. The smaller sample amounts with less than 50 fragments were all identified while 50-100 fragments were identified from the larger samples.

A number of wood taxa cannot be identified to species or sub-species level anatomically. They are listed in this report as *Quercus spp* (oak), *Salix spp* (willow)*, Prunus spp* (blackthorn/cherry) and pomoideae.

9.3.3 Description of Feature Types & Receiving Environment

E2383 / AR 41 comprised the remains a single cremation pit, a posthole and two pits. The site was excavated in 2006 as part of the resolution of the M8/N8 Cullahill to Cashel Road Improvement Scheme. The excavation took

place in the townland of Inchirourke, *c.* 2.5km southwest of Urlingford (par. Fennor; Slieveardagh barony; NGR 226188E/162483N; 130m OD; Chainage: 26550–26590). The site was located in a large, open, level tillage field. The Longford Pass–Derryville Bog complex is located less than 1km west of the excavated area. The limit of this wetland delineates both the county boundary between Tipperary, Kilkenny and Laois, and provincial boundary between Leinster and Munster. The townland name is thought to derive from *Inis Uí Ruairc*, or 'O' Rourke's Island'. It was one of a number of pockets of dryland, which occur adjacent to or within this extensive bog. A possible Bronze Age house and *fulacht fiadh* were also excavated as part of this same road scheme at AR42/E2384 and AR43/E2385, both of which are in the townland of Fennor, and which lay *c.* 600m to the northeast of the site (Loughman and Ó Droma 2008b, 2). There are also a number of Recorded Monuments in the vicinity, including an earthwork enclosure, located 200m southwest of the site (RMP TI042-062), a multi-vallate ringfort (RMP TI042-062) *c.* 600m to the southeast and two castle (RMP TI036-049 and TI042-003). The 1st (1839–40) and 2nd (1905) editions of the Ordnance Survey maps indicate the land in the immediate environs of the site was primarily used for agriculture. The archaeology was identified during the previous testing phase by Margaret Gowen & Co. Ltd. (*ibid*.)

Charcoal for analysis was recovered from five contexts; S1/[c6] fill of posthole [c5]; S3/[c12] fill of cremation pit [c11]; S10/c16; upper fill of pit [c15]; S5/c16 upper fill of pit [c15]; S11/[c26] basal fill of pit [c15]; S10/[c21] middle fill of pit [c15]. A total of 308 charcoal fragments, weighing 24.9g, were analysed and a small variety of native taxa was identified. Dating from samples ranged from 2332- 1325 BC (cal. QUB 2 Sigma), placing activity on the site in the Early - Middle Bronze Age.

9.3.4 Results & Analysis

A total of six taxa were identified from the charcoal sampled from AR41 (E2383). Charcoal for analysis was recovered from [C6], [C12], [C16], [C21] and [C26]. Pomoideae (apple/pear/hawthorn/mountain ash or rowan) was the dominant taxa (178 fragments out of a total of 308), followed by oak (*Quercus* spp; 106 fragments), with fewer fragments of *Prunus* spp (blackthorn or cherry; 17 fragments), blackthorn (*Prunus spinosa*; 4 fragments), willow (*Salix* spp; 2 fragments) and hazel (*Corylus avellana*; 1 fragment), present. The weight and fragment count identified from each taxon type at each site is represented below in Chart 1 and Table 3.

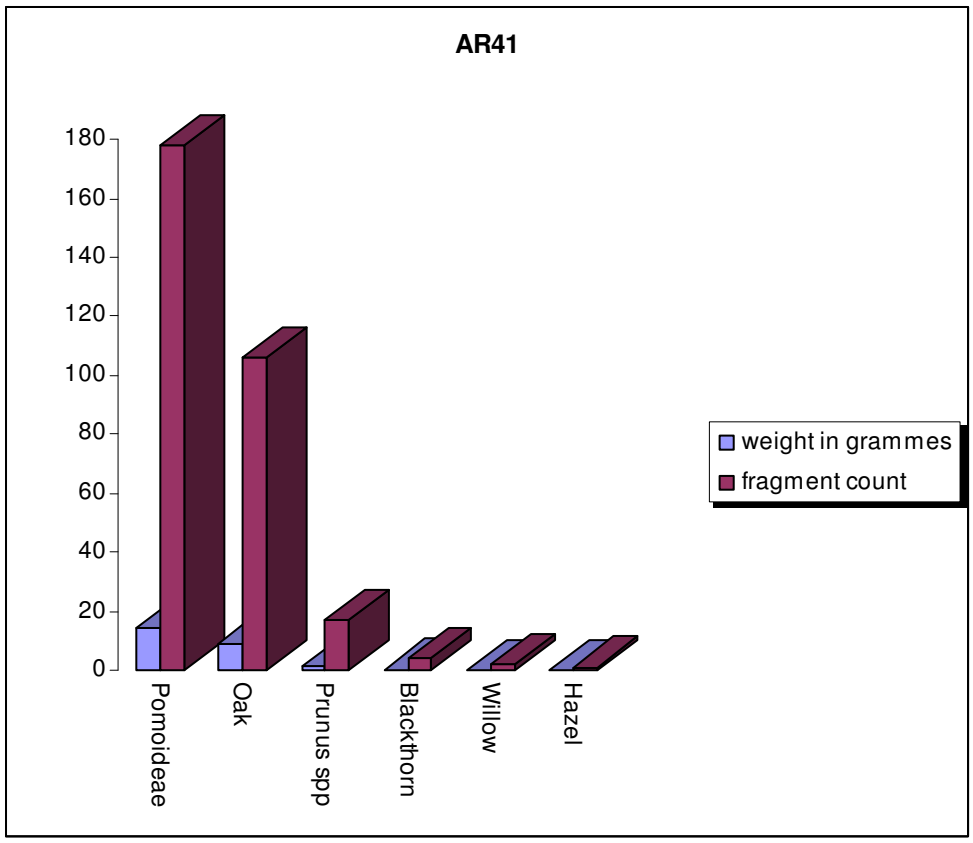

Chart 1: All taxa identified from AR41, Inchirourke townland

Sample No.	Context No.	Context Description	Identifications	Date
10	[c16]	Upper fill of pit [c15].	Hazel (0.05g*; 1f*); Pomoideae (6.45g; 79f); *Prunus* spp (1.15g; 17f); Willow (0.15g; 2f).	
5	[c16]	Upper fill of pit [c15].	Pomoideae (4.5g; 48f); Blackthorn (0.2g; 1f); Oak (0.05g; 1f).	
11	[c26]	Basal fill of pit [c15].	Pomoideae (0.05g; 4f).	1494 – 1325 BC (cal QUB 2 Sigma)
1	[c6]	Fill of posthole [c5].	Oak (2.4g; 55f).	
10	[c21]	Middle fill of pit [c15].	Pomoideae (3.1g; 47f); Blackthorn (0.1g; 3f).	
3	[c12]	Fill of cremation pit [c11].	Oak (6.7g; 50f).	Cremated bone from this context was dated to 2332-2136 BC (cal QUB 2 Sigma).

Table 3: Wood taxa present in the charcoal assemblage from AR41, Inchirourke townland

*g = weight in grammes *f = fragment counts

9.3.5 Discussion

Aims of the study

1. To determine the types of wood selected for use either as fuel or as structural wood.
2. To re-construct the environment that the charcoal and wood was selected from.
3. To determine use and function of particular features and their associated charcoal through the identification of taxa types.

Three hundred and eight charcoal fragments providing a combined charcoal weight of 24.9g were analysed from a series of features excavated at E2383 / AR 41, Inchirourke townland, Co. Tipperary as part of the archaeological resolution of the M8/N8 Cullahill to Cashel Road Improvement Scheme. Charcoal was recovered from five contexts; [c6, c12, c16, c21 & c26].

A total of six taxa were identified from the entire assemblage. Taxa identified comprised pomoideae (apple/pear/hawthorn/mountain ash or rowan; 178 fragments out of a total of 308), oak (*Quercus* spp; 106 fragments), *Prunus* spp (blackthorn or cherry; 17 fragments), blackthorn (*Prunus spinosa*; 4 fragments), willow (*Salix* spp; 2 fragments) and hazel (*Corylus avellana*; 1 fragment).

Although the charcoal may be representative of fuel collection policies associated with the ritual of the dead from the immediate environment of the site, it is also likely that certain taxa were selected for their heat-producing or calorific qualities associated with the cremation of human remains. The oak identified from the posthole [c5] may relate to the structural use of oak as a post at the site.

9.3.6 Wood types identified from charcoal assemblages

Botanical Name	Species
Pomoideae	Apple/pear/hawthorn/mountain ash
Quercus spp	Oak
Prunus spp	Blackthorn or cherry
Prunus spinosa	Blackthorn
Corylus avellana	Hazel
Salix sp	Willow

Table 4: Taxa types identified from the charcoal assemblage from AR41, Inchirourke townland

Charcoal was an important fuel as it could be obtained locally and it gave off a much better heat than wood and produced less smoke. As the dominant taxa identified in the sample submitted for analysis, pomoideae charcoal was present in [c16]/S5 and S10; [c26]/S11 and [c21]/S10, all of which comprise the fills of a pit [c15]. Pomoideae accounted for 57.7% of the total amount of charcoal identified from the assemblage.

Pomoideae includes apple, pear, hawthorn and mountain ash. It is impossible to distinguish these wood species anatomically but as wild pear is not native and crab apple is a rare native species in Ireland, it is likely that the species identified from AR41 is either hawthorn or mountain ash (rowan; Nelson 1993, 194-200). Hawthorn (*Crataegus monogyna*) is a native species, and is found in many hedgerows throughout Ireland. Mountain ash (*Sorbus aucuparia*) is also a common tree in Ireland growing particularly well in rocky and hilly mountainous places.

Oak charcoal was also collected and used for activities associated with AR41. It was the only taxon present in [c12]/S3, the fill of the cremation pit and [c6]/S1, the fill of the posthole. In addition, a single fragment of oak charcoal was identified in [c16]/S5. The oak exclusively identified from the posthole may suggest that oak was selected for use as structural wood at the site. The use of oak as structural wood in all periods is well attested to in wood and charcoal results from various sites. Oak is also almost exclusively used with cremation burials, particularly during the Bronze Age.

Oak charcoal was also important, as it burned hotter and cleaner than wood and was considered superior to wood. The density of oak wood makes for an optimum fuel. Oak woods were also valued for their natural resource of timber for many requirements. Oak is a dense wood and is very suitable for charcoal production and metal working activities. It is also almost exclusively found in association with cremation burials during the prehistoric period. It can burn for a considerable period of time and can reach extremely high temperatures necessary for the production of metal objects, smelting activities and for the cremation of human and animal remains. It also makes good firewood when dried and will grow in wetter areas when other variable conditions are present. Oak has excellent properties of durability and strength and was frequently used throughout the medieval period for the production of large timbers, for charcoal production and for activities associated with metal working activities. The quantity of oak present suggests that there was a supply of oak in the surrounding environment.

As oak can grow to be a very old tree (300-400 years) it is generally unsuitable for ^{14}C dating. As a result, «the old-wood effect» may need to be taken into consideration when ^{14}C dates are returned (Warner 1979, 159-172). The samples identified could be of a more recent date than the rings represented on the original tree. The old wood effect is particularly important in relation to later dated sites such as the transition from Early Christian to Viking to medieval. Since the time span of prehistoric periods are wider and less transparent, it is my belief that the old wood effect is not as significant when the ^{14}C dates are returned during these periods.

Far fewer quantities of *Prunus spp* (blackthorn/cherry), blackthorn, willow and hazel charcoal were identified from the assemblage. *Prunus spp* was identified in [c16]/S10 only. The genus *Prunus spp* includes *Prunus spinosa* (Blackthorn), *Prunus avium* (Wild cherry) and *Prunus padus* (Bird cherry). Wild cherry and blackthorn are more common in Ireland than bird cherry. There is very little archaeological evidence for the use of cherry wood in Ireland although the wild cherry tree is commonly found in many hedgerows (Nelson 1993, 167). Both blackthorn and cherry are durable woods and are as strong as oak. Three fragments of blackthorn were present in S10/[c21] and a single fragment was identified in S5/[c16]. The sloe bush, as blackthorn is often referred to, is a thorny

shrub found in woods and scrubs on all soil types. In a woodland situation, it is more likely to occur in clearings and at the woodland edges. Willow (*Salix* spp) 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 both 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. Two fragments of willow were identified in [c16]/S10.

Hazel is a native species and was very common up to the end of the 17th century and was regarded as one of the *airig fedo* or 'nobles of the wood'. One fragment of hazel charcoal was identified in [c16]/S10. 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 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. Hazel also makes good fuel.

The wood identified from the sample could have originated from hedgerows, scrub-type woodland or from mixed primary woodlands (oak and hazel) nearby. Oak and hazel are more indicative of dryland woods. Hazel, *Prunus spp* and pomoideae are normally associated with scrub type woodlands, understory trees or small trees located at the margin of woodlands while willow is generally related with wetter areas.

The charcoal analysis shows that the area was likely to have been surrounded by mixed woodland with scrub-type species on its margins during the Middle Bronze Age.

9.3.7 Comparative Material

The analysis completed for AR41 in the townland of Inchirourke, Co. Tipperary, adds to the growing amount of information obtained from the analysis of wood and charcoal from cremation cemeteries around the country. Oak has been shown from previous results to be the dominant taxon present at these sites.

Charcoal analysis at E2383 / AR 41 produced evidence for oak, hazel, pomoideae, willow and *Prunus spp* growing in Inchirourke townland during the Middle Bronze Age. Features identified at nearby AR36/E2491, excavated as part of this same road scheme, produced similar evidence, with oak, hazel, ash, pomoideae and *Prunus* spp growing in Inchirourke townland during the Late Bronze Age/Early Iron Age horizon.

Oak charcoal was the only taxon present in S1/[c6], the fill of a cremation pit. Similar analyses undertaken from cremation pits throughout Ireland by this author and others have produced similar results (e.g. O'Donnell 2007).

Results indicate that oak, which was likely to have been specially selected, was the main species present in these assemblages. A supply of such material would have been available in the area. At AR32, excavated as part of this same road scheme, samples taken from cremation burials in Borris townland showed that oak was the dominant taxa (441 fragments out of a total of 576), with fewer fragments of *Prunus* spp (51 fragments), pomoideae (50 fragments) and hazel (34 fragments), present (O Carroll 2009h). At AR32 we also see further comparisons where the charcoal from miscellaneous pits found in association with cremations are also generally represented by non-oak taxa and mainly comprise pomoideae, *Prunus* sp and hazel.

Fourteen charcoal samples from a central burial pit associated with a barrow, postholes, stakeholes, possible burial preparation areas and spreads at Carnmore 5 (03E0873), excavated as part of the Dundalk By-pass in 2003, showed that oak was the preferred charcoal used in association with funerary activity on the site (O Carroll 2008e). Two fragments of pomoideae charcoal were also identified. The author noted that charcoal analysis at other prehistoric cremation sites (Bettystown/98E072, Ballybrowney Lower 1/03E1058 and Hermitage/01E0319) supported these findings (*ibid.*). Excavations from the Gas Pipeline to the West showed that oak charcoal was the preferred fuel for cremation deposits (O'Donnell 2007). Oak was also the dominant taxon present from excavated cremation sites on the N8 Cashel to Mitchelstown Road Scheme. In both cases, the charcoal samples analysed were dated to the Bronze Age (O'Donnell, forthcoming).

Charcoal identified from cremation contexts is likely to represent the pyre material used. There is some ethnographic evidence to suggest that oak planks were used as platforms for laying out the human remains during the cremation process and this may be the case here at Inchirourke townland. This hypothesis is based on cremation rituals as described at a modern Hindu funeral in Pashupatinath, Katmandu, where the body is lain out on a wooden stretcher before it is burnt or cremated (O'Donnell 2007). There is also considerable ethnographic evidence to suggest a connection between the deliberate selection of oak for the construction of domestic buildings and for use in burial ritual (Harding 2000, 108-09). Although generally associated with the Neolithic period, there is now considerable evidence to suggest that this practice continued into the Bronze Age.

However, charcoal analysis of S10/[c16], S10/[c21], S5/[c16] and S11/[c26] uncovered intriguing results. Pomoideae was the dominant taxa indentified from these fills, all of which came from a miscellaneous pit [c15]. The almost exclusive use of pomaceous wood in the assemblage from this feature would seem to indicate that it was deliberately selected and oak, commonly found with cremations, was avoided.

A small variety of wood was also deliberately for its heat-producing qualities e.g. *Prunus spp* and hazel. The charcoal identifications are broadly comparable with nearby analysed sites (e.g. AR36 & Ar32) and representative of results associated with wood types used with cremation burials from other parts of the country.

9.3.8 Summary & Conclusions

Charcoal analysis carried out at AR41 comprised the remains of a single cremation pit, a posthole and two pits.

A total of 308 charcoal fragments, weighing 24.9g, were analysed. Six samples were collected from five contexts, comprising; S1/[c6] fill of posthole [c5]; S3/[c12] fill of cremation pit [c11]; S10/[c16]; fill of pit [c15]; S5/[c16] fill of pit [c15]; S11/[c26] fill of cremation pit [c15]; S10/[c21] fill of cremation pit [c15]. Dating from samples ranged from 2332- 1325 BC (cal. QUB 2 Sigma), placing activity on the site in the Early - Middle Bronze Age.

A restricted variety of native taxa was identified, comprising oak, hazel, blackthorn, pomoideae, willow and *Prunus spp.* Oak was exclusively identified from the cremation pit, while pomaceous fruitwood dominated the fills of the miscellaneous pit. Oak was also exclusively identified from the posthole feature.

Although the majority of the charcoal is likely to be representative of fuel collection policies from the immediate environment of the site and in association with the rituals of cremation, it is also likely that certain taxa were selected for their heat-producing or calorific qualities associated with the rituals of the dead. The charcoal identifications are broadly comparable with nearby analysed sites and representative of results from other parts of the country. The absence of oak charcoal from the pit [c15] and the presence of large quantities of pomaceous fruitwood suggest that this feature may have been associated with the rituals of the dead but may have played a different role in relation to such processes on the site.

The oak exclusively identified from the post hole [c5] is most likely related to the structural use of oak wood at the site in the Early to Middle Bronze Age.

The wood identified from the sample could have originated from hedgerows, scrub-type woodland or from mixed primary woodlands (oak and hazel) nearby. Oak and hazel are more indicative of dryland woods. Pomoideae and *Prunus spp* are normally associated with scrub type woodlands, understory trees or small trees located at the margin of woodlands while willow suggests a slightly wetter terrain. The woodland trees and scrub type trees would most likely have grown in woods on the nearby dryland margins.

9.3.9 Acknowledgements

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9.3.10 References

Butterfield, B.G. and Meylan, B.A., 1980 *Three-Dimensional Structure of Wood. An Ultrastructural Approach.* Chapman and Hall, London and New York.

Conboy, L. W., 2007 M8/N8 Cullahill to Cashel Road Improvement Scheme: Archaeological Resolution; Preliminary Report; E2491; Site AR36, Borris Townland, Co. Tipperary NR. Unpublished excavation report, VJK/NRA, December 2007.

Beckett, J.K., 1979 *Planting native trees and shrubs*. Jarrold and Sons Ltd, Norwich.

Eogan, G., 1983 *Hoards of the Irish Later Bronze Age*. University College Dublin

Edlin, H.L., 1956 *Trees, wood and man*. Collins, London

Ferran Dincauze, D. 2000 *Environmental Archaeology: Principles and Practice*. Cambridge University Press.

Flanagan, D. and Flanagan, L. 1994 *Irish placenames*. Gill & Macmillan, Dublin.

Grogan, E., O'Donnell, L. & Johnston, P. 2007 *The Bronze Age landscapes of the Pipeline to the West: an integrated archaeological and environmental assessment*. Wordwell Ltd., Dublin.

Grogan, E., 2005 *The North Munster Project*. 2 Volumes. Wordwell Ltd., Dublin.

Gowen, M, O Neill, J, Phillips, M. 2005, *The Lisheen Mine Archaeological Project 1996-98*. Wordwell. Wicklow

Conboy, C. 2008 M8/N8 Cullahill to Cashel Road Improvement Scheme: Archaeological Resolution. Preliminary Report E2491 Site AR36, Borris townland, Co. Tipperary NR. Unpublished report. VJK Ltd.

Heery, A., 1998 *The vegetation history of the Irish midlands: Palaeoecological reconstructions of two lake sites adjacent to eskers.* PhD thesis, University of Dublin (Trinity College).

The Heritage Council 2007 *A review of research needs in Irish archaeology*. The Heritage Council of Ireland Series, Tipperary NR.

Hall, V., 1995, Woodland depletion in Ireland over the last millennium. In J.R. Pilcher and S. Mac An tSaoir (Eds), *Wood, trees and forests in Ireland*. Royal Irish Academy, Dublin, 23-35.

Hall, V, 1997. *The development of the landscape of Ireland over the last 2000 years, fresh evidence from pollen and analytical studies.*

http://www.ucc.ie/chronicon/index.html

Harding, A.F. 2000 *European societies in the Bronze Age*. Cambridge University Press.

Hurley, M.F., 1982 Wooden artefacts from the excavation of the medieval City of Cork. In S. McGrail, *Woodworking techniques before A.D 1500,* BAR 129, 301-311.

Hurley, M.F., 1986 *A study of skeletal and wooden artefacts from medieval Cork.* Unpublished M.A. Thesis, University College Cork.

Hurley, M. & Scully, O., 1997 *Late Viking Age and Medieval Waterford Excavations 1986-1992.* Waterford Corporation.

Kelly, F., 1988 *A Guide to Early Irish Law.* Institute for Advanced Studies, Dublin.

Keepax, C. A. 1988 *Charcoal analysis with particular reference to archaeological sites in Britain*. Ph.D. Dissertation, University of London.

Le Fanu, T.P. 1893 The Royal forest of Glencree. *J.R.S.A.I* 23, 268-80.

Loughman, M. and Ó Droma, M. 2008 M8/N8 Cullahill to Cashel Road Improvement Scheme: Archaeological Resolution. Preliminary Report E2375/Site AR32, Borris townland, Co. Tipperary NR. Unpublished report. VJK Ltd.

Mac Coitir, N., 2003 *Irish trees, myths, legends and folklore*. The Collins Press.

McCracken, E., 1971 *The Irish Woods Since Tudor Times.* Institute of Irish Studies, Belfast.

McLoughlin, G. 2009a Archaeological excavation at Haynestown-Haynestown, Dundalk, Co. Louth; Site 17; Stratigraphic report on behalf of Mc Garrell Reilly Developments Ltd. Licence No. 06E0483. Unpublished report IAC Ltd. Jan. 2009.

McLoughlin, G. 2009b Archaeological excavation at Haynestown-Haggardstown, Dundalk, Co. Louth; Site 18; Stratigraphic report on behalf of Cannon and Kirk Developments Ltd; Licence No. 06E0475. Unpublished report IAC Ltd. Jan. 2009.

McLoughlin, G. 2009c Archaeological excavation at Haynestown-Haggardstown, Dundalk, Co. Louth; Site 13; Stratigraphic report on behalf of Cannon and Kirk Developments Ltd; Licence No. 06E0485. Unpublished report IAC Ltd. Jan. 2009.

Morgan, R., 1975 The selection and sampling of timber from archaeological sites for identification and tree-ring analysis. *Journal of Archaeological Science* 2, 221-230.

Muhr, K. 2002 Early traditions and place names. *Insight: New perspectives in Irish Studies,* Issue 2. IRQUAS.

Nelson E.C., 1993 *Trees of Ireland.* The Lilliput Press, Dublin.

Moloney *et al* 1994 *Excavations at Clonfinlough, Co. Offaly*. Crannóg Publications.

O Carroll, E., 1996 *The analysis of two wooden assemblages from Corlea Bog, Co. Longford and King John's Castle, Co. Limerick.* Unpublished M.A. Thesis, University College Cork.

O Carroll, E., 2004 The analysis of wood and charcoal from Monanny, Co. Monaghan. Unpublished report for IAC.

O Carroll, E., 2004 The analysis of charcoal remains from Newcastle, Co. Meath. Unpublished specialist report for ACS Ltd.

O Carroll, E., 2007a The analysis of wood and charcoal from Cashelduff, Co. Mayo. Unpublished report for Mayo County Council.

O Carroll, E., 2007b The analysis of wood and charcoal from the N11 Arklow to Rathnew, Co. Wicklow. Unpublished report for the NRA/Wicklow County Council.

O Carroll, E, 2007c Wood and Charcoal identifications from the N5 Charlestown By-pass. Mayo Co. Co./NRA.

O Carroll, E, 2008a Wood and charcoal identifications from the M7/M8. ACS Ltd/NRA.

O Carroll, E, 2008b Wood and charcoal identifications from the N6 KEK. VJ Keeley Ltd/NRA.

O Carroll, E, 2008c Wood and charcoal identifications from AR8; E2361; N8/M8, VJ Keeley Ltd/NRA.

O Carroll, E, 2008d Wood and charcoal identifications from AR37; E2379; N8/M8, VJ Keeley Ltd/NRA.

O Carroll, E, 2008e Charcoal identifications from Carnmore 5 03E0873 Dundalk By-pass. Unpublished report, April 2008.

O Carroll, E, 2009a Wood and charcoal identifications from AR28; E2372; N8/M8, VJ Keeley Ltd/NRA.

O Carroll, E, 2009b Wood and charcoal identifications from AR45; E2387; N8/M8, VJ Keeley Ltd/NRA.

O Carroll, E, 2009c Wood and charcoal identifications from the AR44, E2386, N8/M8, VJ Keeley Ltd/NRA.

O Carroll, E, 2009d. Wood and charcoal identifications from the AR15, E2367, N8/M8, VJ Keeley Ltd/NRA.

O Carroll, E, 2009e Wood and charcoal identifications from Site 18; 06E0475; Haynestown townland, Dundalk, Co. Louth. IAC Ltd.

O Carroll, E, 2009f Wood and charcoal identifications from Site 17; 06E0483; Haggardstown townland, Dundalk, Co. Louth. IAC Ltd.

O Carroll, E, 2009g Charcoal report; Site 13; 06E0485; Haggardstown townland, Dundalk, Co. Louth. IAC Ltd.

O Carroll, E, 2009h Wood and charcoal identifications from AR32; E2375; Borris, Co. Tipperary; N8/M8 Road Improvement Scheme. VJ Keeley Ltd/NRA.

O' Sullivan, A., 1987 Wood in Archaeology. *Archaeology Ireland* 4**,** 69-73.

O' Sullivan, A., 1994 The use of trees and woodland in early medieval Ireland. *Irish Forestry* 51**,** 80-94.

Rackham, O., 1976 *Trees and woodlands in the British landscape.* Weidenfeld & Nicholson, London.

Rackham, O., 1980 *Ancient woodland: its history, vegetation and uses in England.* Edward Arnold, London.

Rossen, J, and Olson, J, 1985 The controlled carbonisation and archaeological analysis of SE US wood charcoals. *Journal of Field Archaeology* 12, 445-456.

Schweingruber, F.H., 1990 *Microscopic Wood Anatomy*. Birmensdorf: Swiss Federal Institute for Forest, Snow and Landscape Research. 3rd edition.

Sands, R. 1997 *Prehistoric woodworking. The analysis and interpretation of Bronze and Iron Age toolmarks.* Institute of Archaeology, University of London

Stace, C., 1991. New Flora of the British Isles. Cambridge University Press.

Warner, R.B., 1987 A proposed adjustment for the « Old-Wood Effect ». In W. Mook & H. Waterbolk (eds) *Proc. 2nd Symp of 14C & Archaeology, Groningen 1987,* 29, 159-172.

Webb, D.A., 1977 *An Irish Flora*. Dundalgan Press Ltd., Dundalk.

Western, C. A., 1970 Wood and Charcoal in Archaeology. *Science in Archaeology, 178*-187.

9.4 Radiocarbon Dating

9.4.1 Results

Two radiocarbon determinations were submitted for analysis from this excavation, for the cremation pit [c5] and from the charcoal rich pits [c15]; both were sent to the ^{14}C Chrono Centre, Queens University Belfast, N. Ireland for analysis. Results of calibration of radiocarbon dates are given in Table 5. An Early Bronze Age date of 3789 +/- 28 BP (2332 – 2136 Cal BC) (UB-10843) was returned from a sample of cremated human bone from the cremation pit [c11] while a Middle Bronze Age date of 3146 +/- 27 BP (1494 – 1325 Cal BC) (UB-11153) was returned from a sample of charcoal (*pomoideae*) from the lower fill [c26] of the charcoal rich pit [c15].

Lab Code	**Sample Ref**	**Radiocarbon Age** BP	**Calibrated Age Ranges 68.2% probability** (1 sigma)	**Calibrated Age Ranges 95.4% probability** (2 sigma)
UBA-10843	Fill [c12] from cremation [c11] (Sample 3)	3789 ± 28	(2283 – 2147 BC) 2283-2248 BC (40.1%) 2233-2217 BC (15.7%) 2169-2147 BC (20.5%)	(2332 – 2136 BC) 2332-2326 BC (0.4%) 2299-2136 BC (99.6%)
UBA-11153	Fill [c26] from pit [c15] (Sample 11)	3146 ± 27	(1448 – 1403 BC) 1448-1403 BC (100%)	(1494 – 1325 BC) 1494-1385 BC (98.8%) 1331-1325 BC (1.2%)

Table 5: Calibrated Radiocarbon dates

Radiocarbon Date Certificate

Laboratory Identification:	UBA-10843
Date of Measurement:	2009-02-17
Site:	M8, E2383, Inchirourke Co. Kilke
Sample ID:	M8:AR41:S3:C12
Material Dated:	Cremated bone
Pretreatment:	Cremated Bone
Submitted by:	Jason Marchant VJK Ltd

^{14}C Date: 3789±28

AMS $\delta^{13}C$: -23.5

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

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

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

Radiocarbon Date Certificate

Laboratory Identification:	UBA-11153
Date of Measurement:	2009-03-27
Site:	M8N8:AR41:E2383:Inchirourke
Sample ID:	M8:AR41:S11:C26
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Jason Marchant VJK Ltd

^{14}C Date: 3146±27

AMS δ^{13}C: -28.5

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

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

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

10.0 EXCAVATION RECORD

A. CONTEXT REGISTER

C#	Type	Interpretation	Description	Dimensions
[c1]	Deposit	Topsoil	Friable silty clay with occasional small stone inclusions	0.2m and 0.5m
[c2]	Subsoil	Subsoil	Mottled yellow grey orange clay with frequent small to medium angular & sub angular limestone & very occasional large limestone boulders.	
[c3]	Cut	Field Boundary Ditch	Cut of a linear WNW–ESE ditch with gradual sides & a flat undulating base. . Parallel to c31/c29, same to [c22]; Part of a field boundary evident on the1st edition OS map. Post medieval/modern <1904	64.83m+ x 0.81-1.28m x 0.46m in depth
[c4]	Deposit	Fill of [c4]	Dark brown stony silt, with stone inclusions (0.20-0.50m diam.). Deliberate backfill	64.83m+ x 0.81-1.28m x 0.46m in depth
[c5]	Cut	Posthole/ Possible Marker	Elongated oval cut in plan with vertical sides & a concave base, located 0.80m south of [c11]	0.46m x 0.20m x 0.45m in depth
[c6]	Deposit	Fill of [c5]	Dark brown / black charcoal rich sandy silt with 20% charcoal chunks, 20% small sub angular stones & <1g burnt bone inclusions.	0.46m x 0.20m x 0.45m in depth
[c7]			VOID	
[c8]			VOID	
[c9]	Natural	Stone Socket.	Irregular oval shaped with irregular sides & an irregular base. In an area of subsoil with frequent large limestone inclusions. Probably result of agricultural ploughing.	0.60m x 0.36m x 0.11m in depth
[c10]	Deposit	Fill of [c9]	Naturally-formed fill of light greyish brown silty clay with occasional oxidised clay inclusions probably washed or blown into the stone socket from c30	0.60m x 0.36m x 0.11m in depth
[c11]	Cut	Cremation Pit	Oval cut with a sharp break of slope at top & base, vertical sides & an irregular base incorp. large limestone boulder in the natural. Possibly assoc. with ?marker post [c5].	0.29m x 0.26m x 0.24m in depth
[c12]	Deposit	Fill of [c11]	Morphological characteristics of a cremation pit. Mid brown sandy silt with frequent (deliberate) cremated human bone fragments & frequent charcoal flecks /chunks (?funeral pyre remnants).	0.29m x 0.26m x 0.24m in depth
[c13]	Natural	Tree Bowl	Irregular in plan, gradual break of slope at top & base, irregular sides & an irregular base. Probably represents field clearance.	0.62m x 0.40m x 0.12m in depth

[c14]	Deposit	Fill of [c13]	Light grey sandy silt with occasional (2-4%) charcoal inclusions. Naturally deposited fill	0.62m x 0.40m x 0.12m in depth
[c15]	Cut	Pit	Slightly irregular shaped pit, with gradual break of slope at top & base, vertical sides & a slightly undulating base. Located 20m S of [c11].	0.41m x 0.37m x 0.35m in depth
[c16]	Deposit	Upper fill of [c15]	Brown sandy silty clay with occasional small pebble inclusions.	0.26m x 0.26m x 0.12m in depth
[c17]	Cut	Pit	Circular in plan, with a sharp break of slope at top & base, vertical sides & a slightly uneven concave base. 20m S of [c11], cuts [c27]	0.15m x 0.15m x 0.10m in depth
[c18]	Deposit	Upper fill of [c17]	Mid greyish brown fine sandy silt with frequent (20%) charcoal chunks	0.16m x 0.09m x 0.09m in depth
[c19]	Fill	Fill of [c17]	Mid greyish brown sandy silt with (30%) charcoal chunks.	0.17m x 0.17m x 0.10m in depth
[c20]	Deposit	Fill of [c27]	Natural silting; mid brown sandy silt with moderate (5%) small angular pebbles & moderate (5%) charcoal inclusions. Cut by [c17]	0.20m x 0.20m x 0.11m in depth
[c21]	Fill	Basal fill of [c15]	Black silty sand with frequent charcoal chunk inclusions.	0.30m in 0.30m x 0.10m in depth
[c22]	Cut	Field Boundary Ditch	Cut of a linear ENE -WSW ditch with gradual break of slope at top & base, gradual sides & slightly undulating base. Parallel to [c24]/[c28], same as [c3]; Part of a field boundary evident on the1st edition OS map. Post medieval/modern pre1840	42m+ x 1.42m x 0.40m in depth
[c23]	Deposit	Fill of [c22]	Mid brown silt with frequent (10%) stones of various shapes & sizes. Concentration of stone in the base of the fill. Deliberately backfill	42m+ x 1.42m x 0.40m in depth
[c24]	Cut	Field Boundary Ditch	Cut of linear ENE-WSW ditch c24 was a linear ditch with a gradual break of slope at top & base, gradual sides & slightly undulating base. Parallel to [c22]/[c28], same as [c31]; Part of a field boundary evident on the1st edition OS map. Post medieval / early modern pre1840	24.8m+ x 0.80m x 0.31m in depth
[c25]	Deposit	Fill of [c24]	Brown silt with (10%) stones & (5%) charcoal inclusions. Deliberately backfill	24.8m+ x 0.80m x 0.31m in depth

[c26]	Deposit	Middle fill of [c15]	Orangey black silt with (10%) charcoal & (10%) small stones.	0.27m x 0.27m x 0.075m in depth
[c27]	Cut	Tree Bowl	Natural cut of tree bowl; irregular in plan, with irregular sides & an irregular base	0.43m x 0.24m x 0.20m in depth
[c28]	Deposit.	Bank	Levelled bank; light brown stoney silt. Parallel to c31/c3, same as [c29]; Part of a field boundary evident on the1st edition OS map. Post medieval / early modern pre1840	42m+ x 1.1m x 0.06m in depth
[c29]	Deposit	Bank	Levelled bank; light brown stoney silt. Parallel to c31/c3, same as [c28]; Part of a field boundary evident on the1st edition OS map. Post medieval/ medieval / early modern pre1840	42m+ x 1.1m x 0.06m in depth
[c30]	Deposit	Oxidisation	Linear spread of oxidised ground. Orangey /mid brown stony silt with moderate (5%) charcoal chunks, moderate (5%) oxidised clay chunks. Multiple features: discontinuous but on the same orientation furrows [c34], [c36], [c38]. 18th /19th C	10m x 0.30m x 0.010-0.020 in depth
[c31]	Cut	Field Boundary Ditch	Cut of a boundary ditch, WNW-ESE linear ditch with gradual sides & a flat undulating base. Parallel to [c3]/[c29], same as [c24]; Part of a field boundary evident on the1st edition OS map. Post medieval / early modern pre1840	64.83m+ x 0.35m x 0.29m in depth
[c32]	Deposit	Fill of [c31]	Mid brown silt with frequent (10%) stones of various sizes & shapes. Deliberately backfilled. Intrusive modern water pipe inserted into the base of this ditch.	64.83m+ x 0.35m x 0.29m in depth
[c33]			VOID	
[c34]	Cut	Furrow	NNE-SSW linear in plan with a gradual break of slope at top & base, with straight sides & a flat but slightly undulating base. One of multiple furrows (incl. [c36], [c38])	42m x 0.26m x 0.03m in depth
[c35]	Deposit	Fill of [c34]	Dark greyish brown silty sand with moderate (5%) small pebble inclusions. Naturally formed - washed or blown in	42m+ x 0.26m x 0.03m in depth
[c36]	Cut	Furrow	NNE-SSW linear in plan with a gradual break of slope at top & base, with straight sides & a flat but slightly undulating base. One of a number of furrows	42m+ x 0.31m x 0.02m in depth
[c37]	Deposit	Fill of [c36]	Dark greyish brown silty sand with moderate (5%) small pebble inclusions. naturally formed washed or blown in	42m+ x 0.31m x 0.02m in depth

[c38]	Cut	Furrow	NNE-SSW linear in plan with a gradual break of slope at top & base, with straight sides & a flat but slightly undulating base. One of multiple furrows (incl. [c34]/[c36])	42m x 0.09m x 0.01m in depth
[c39]	Deposit	Fill of [c38]	Dark greyish brown silty sand with moderate (5%) small pebble inclusions. Naturally-formed; washed or blown in	42m x 0.09m x 0.01m in depth

B. FINDS REGISTER

Artefact No.	Context	Cut No.	Material	Type	Description
E2383:1	[c4]	[c3]	Ceramic	Pottery	Rimsherd of flow blue ware plate, dating from 19th century.
E2383:2	[c4]	[c3]	Ceramic	Clay pipe	Stem fragment of clay pipe, possibly dating from early 19th century. L 4; D 0.7; D bore 0.2
E2383:3	[c23]	[c22]	Copper alloy	Coin	English halfpenny made of copper alloy. Coinage dating to 1853 with Victoria 'young head' design. D 2.72; T 0.21
E2383:4	[c25]	[c24]	Iron	Object	Rectangular flat iron sheet metal fragment, from unknown object. L 6.9; W 4; T 0.15
E2383:5	[c33]		Copper alloy	Coin	English penny made of copper alloy. Coinage dating to 1904, reign of Edward VII. L 3.05; T 0.21
E2383:6	[c25]	[c24]	Iron	Object	Sub-rectangular iron sheet metal fragment. Folded back along length. L 4.5; W 3.9; T 0.15
E2383:7	[c6]	[c5]	Human Remains	Human Remains	3 fragments cremated bone, not identified to species but probably human.
E2383:8	[c12]	[c11]	Human Remains	Human Remains	1884 fragments of cremated bone, identified as human through 2 cranial fragments, 1 femur fragment and 4 long bone fragments.

C. SAMPLE REGISTER

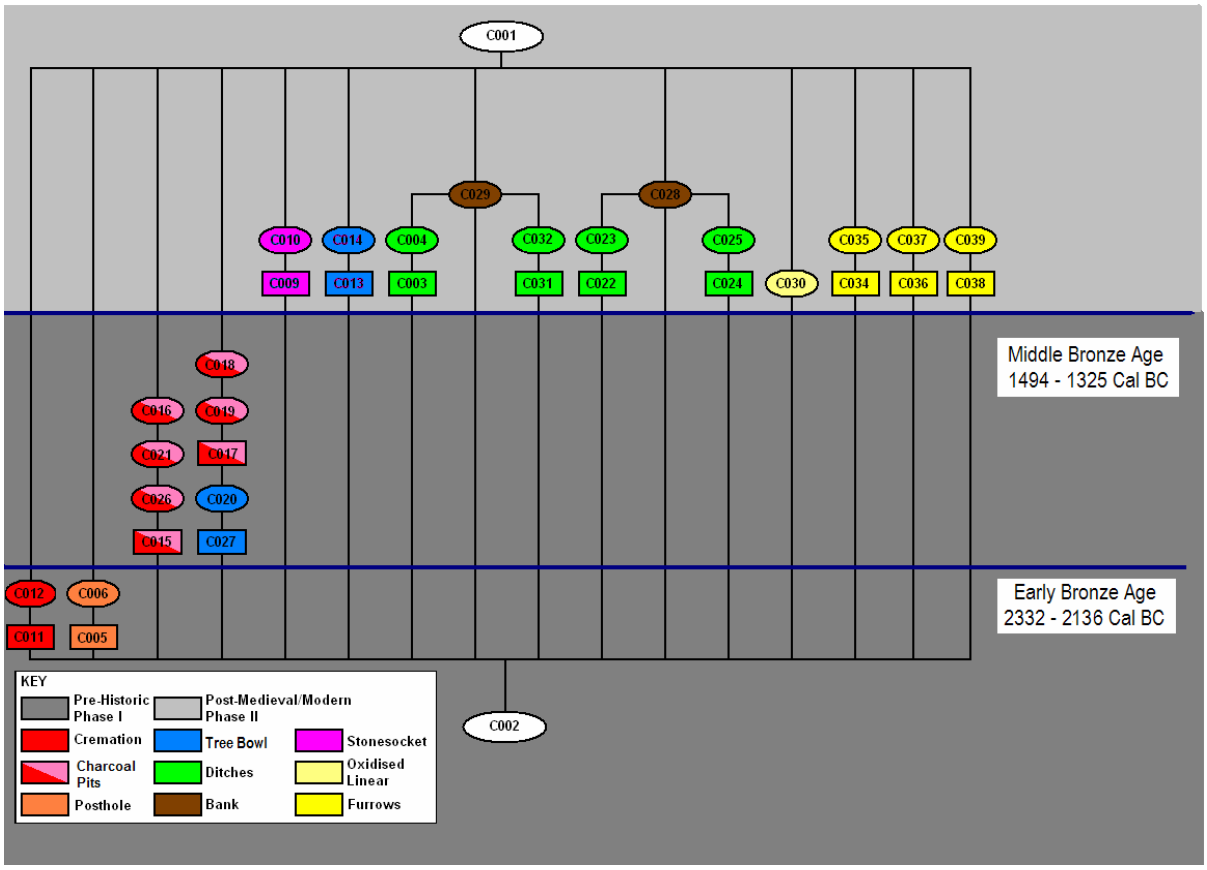
Sample	Context	Type/ Purpose	Specialist Analysis	No. of Bags	Feature Type	Cut
1	[c6]	Bulk soil/flotation	Environmental/species id/radiocarbon dating	4	Posthole	[c5]
2			VOID			
3	[c12]	Bulk cremation	Flotation/ Environmental/specialist analysis /radiocarbon dating	4	Cremation pit	[c11]
4	[c14]	Bulk soil/flotation	Sieve/charcoal/ environmental	2	Tree bowl	[c13]
5	[c16]	Bulk soil/ flotation	Sieve/charcoal/ environmental	5	Possible blind cremation	[c15]

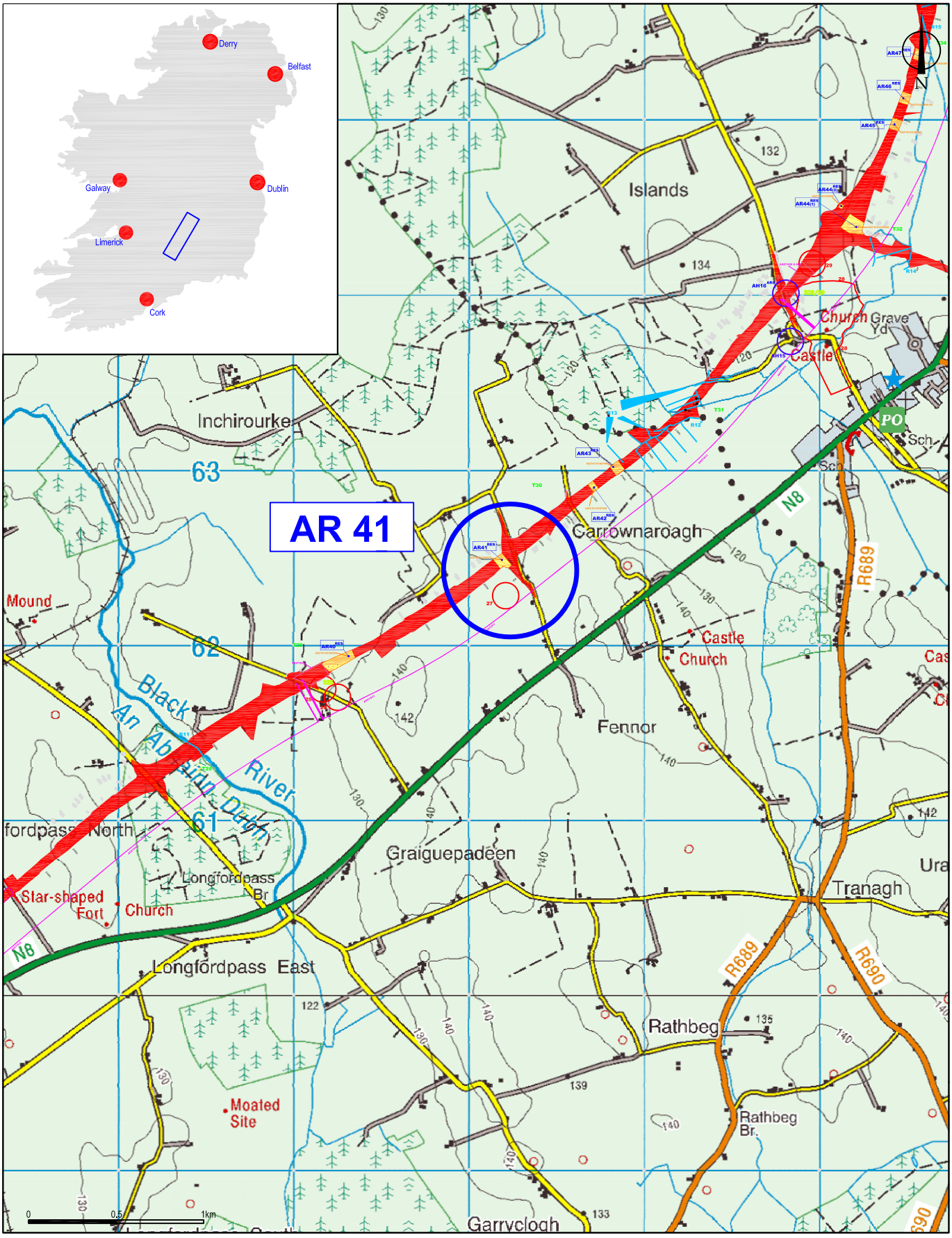
Sample	Context	Type/ Purpose	Specialist Analysis	No. of Bags	Feature Type	Cut
6	[c18], [c19], [c20]	Bulk soil/flotation	Sieve/charcoal/ environmental	1	Possible blind cremation	[c17]
7	[c19]	Bulk soil/flotation	Sieve/charcoal/ environmental	1	Possible blind cremation	[c17]
8	[c18]	Bulk soil/flotation	Sieve/charcoal/ environmental	1	Possible blind cremation	[c17]
9	[c20]	Bulk soil/flotation	Sieve/charcoal/ environmental	1	Possible blind cremation	[c17]
10	[c16], [c21]	Bulk soil/flotation	Sieve/charcoal/ environmental	1	Possible blind cremation	[c15]
11	[c26]	Bulk soil/flotation	Sieve/charcoal/ environmental	1	Possible blind cremation	[c15]
12			VOID			
13			VOID			
14			VOID			
15	[c30]	Bulk soil/flotation	Sieve/charcoal/specialist id	1	Oxidised linear	[c17]

D. LIST OF QUANTITIES

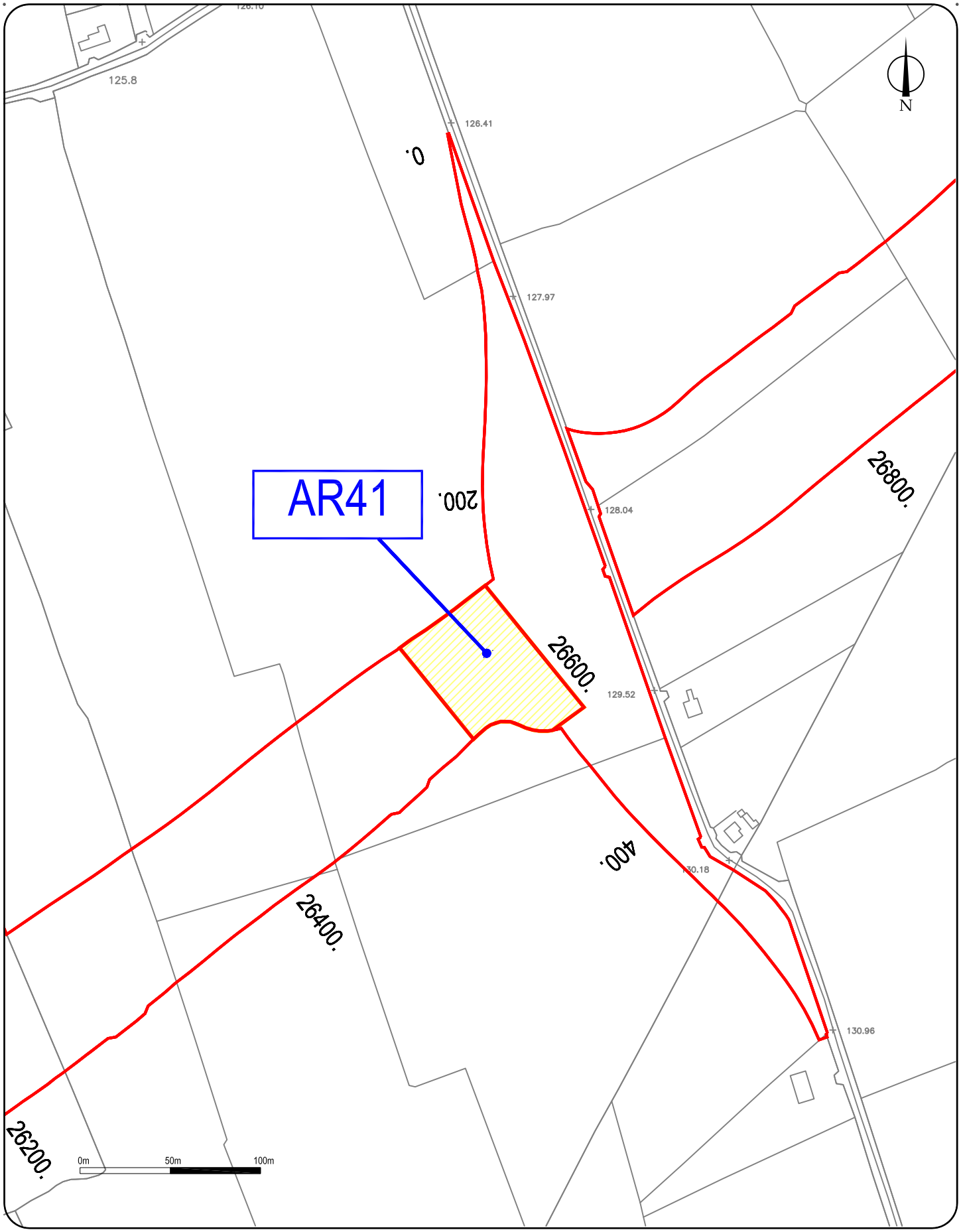
Context Sheets	Drawings	Samples	Finds	Photos	Registers	Notebooks
36	18	15	6	97	4	1

E. PHASED STRATIGRAPHIC MATRIX





Title AR 41 Location Map (Discovery)			**Notes**			VJK Valerie J. Keeley Ltd. ARCHAEOLOGICAL CONSULTANCY Brehon House Kilkenny Road Castlecomer Co. Kilkenny. Tel: (+353) 056 4440236 Fax: (+353) 056 4440237 Email: vjk@vjk.ie Website: www.vjk.ie	
						Client Kilkenny County Council	
Works/Exc No. A027/000 E2383	**Drawn by** AB/BOF	**CAD reference** 1269-06-400 Tera 3	**Date** September 09	**Scale** 1:30000	**Drawing No.** Figure 1	**Project** M8/N8 Cullahill to Cashel Road Improvement Scheme	



Title
Scheme map with excavation area denoted

Notes

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Works/Exc No.	Drawn by	CAD reference	Date	Scale	Drawing No.
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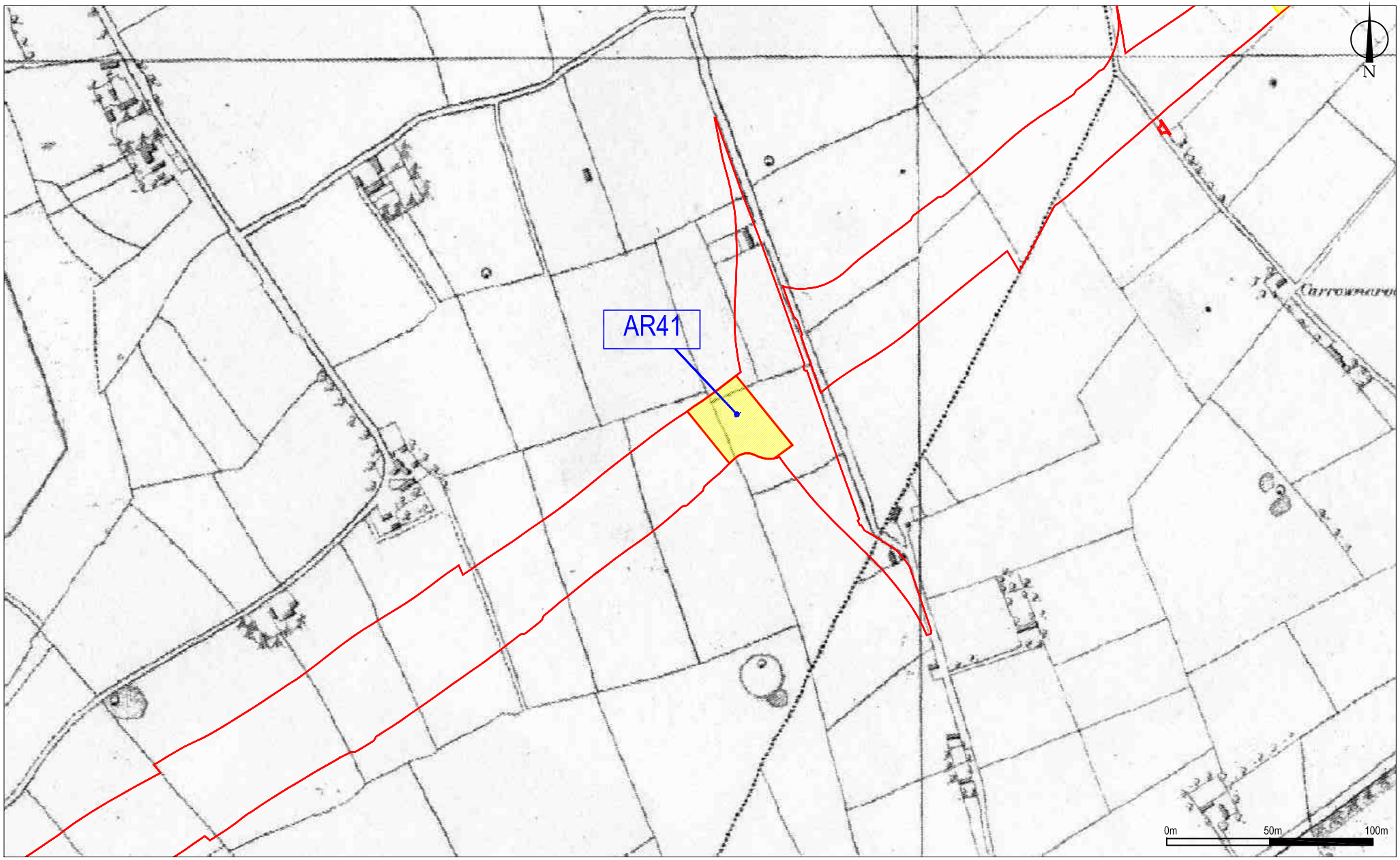
Project
M8/N8 Cullahill to Cashel Road Improvement Scheme



Title	Notes	Works/Exc No.	Compiled by	CAD reference	Client
1st edition Ordnance Survey map		A027/000 E2383	AB/BOF	1269-06-400 Tera 3	Kilkenny County Council
		Date September 09	**Scale** 1:5000	**Drawing No.** Figure 3	**Project** M8/N8 Cullahill to Cashel Road Improvement Scheme

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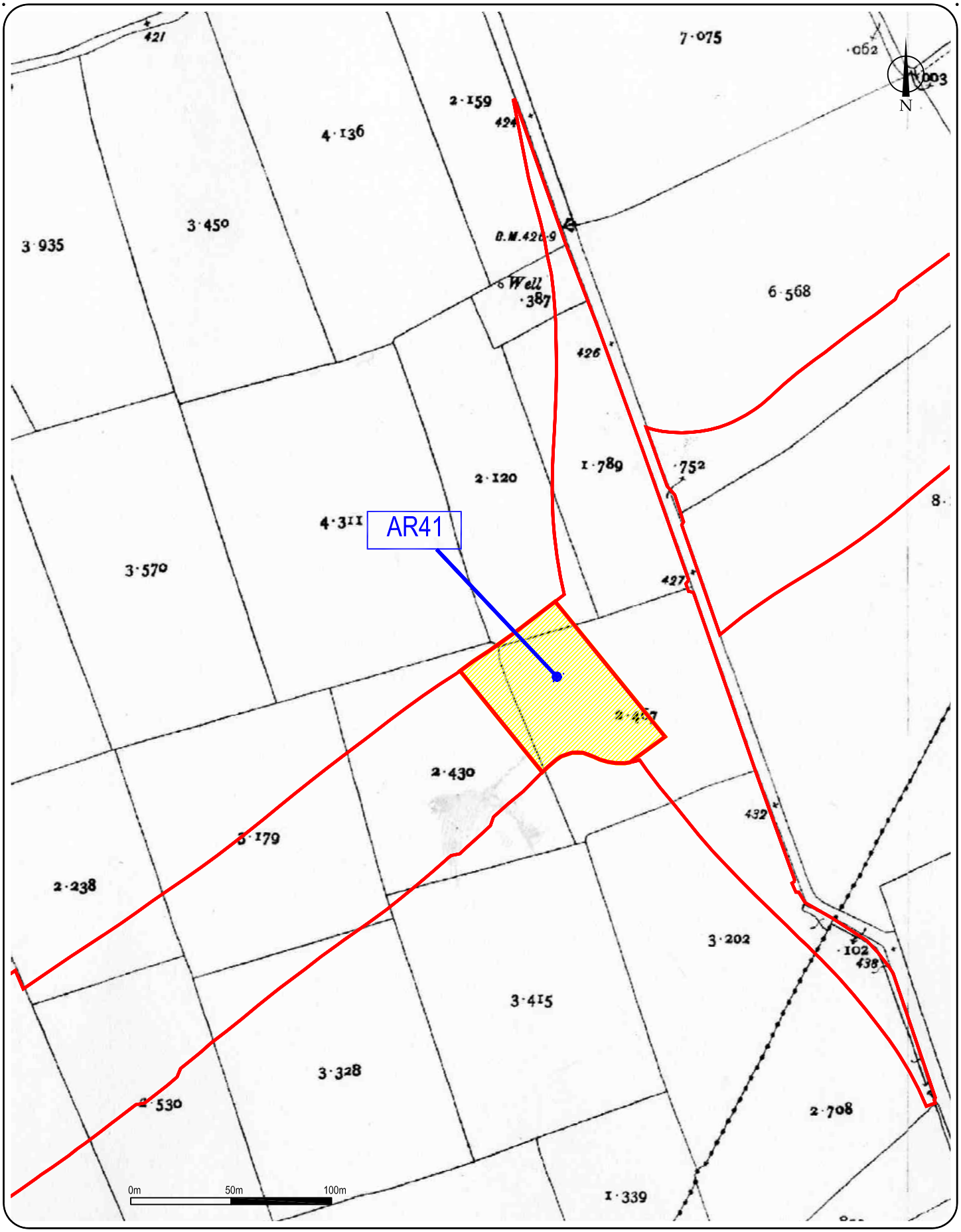

Title	Notes	Client
2nd edition Ordnance Survey map		Kilkenny County Council

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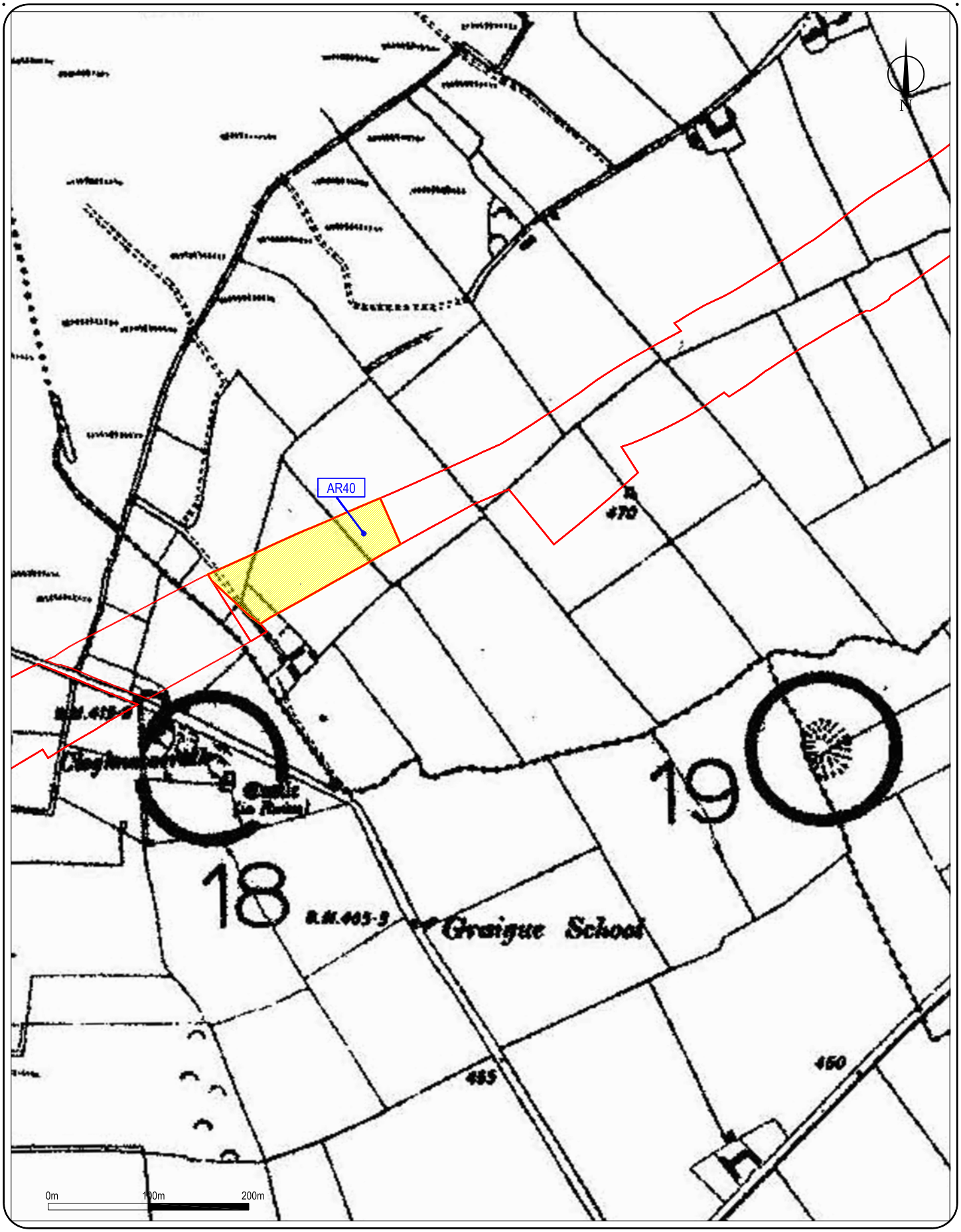
Works/Exc No.	Drawn by	CAD reference	Date	Scale	Drawing No.	Project
A027/000 E2383	AB/BOF	1269-06-400 Tera 3	September 09	1:2500	Figure 4	M8/N8 Cullahill to Cashel Road Improvement Scheme



Title RMP map showing site location			**Notes**			
Works/Exc No. A027/000 E2383	**Drawn by** BOF	**CAD reference** 1269-06-400 Tera 3	**Date** September 09	**Scale** 1:5000	**Drawing No.** Figure 5	**Project** M8/N8 Cullahill to Cashel Road Improvement Scheme

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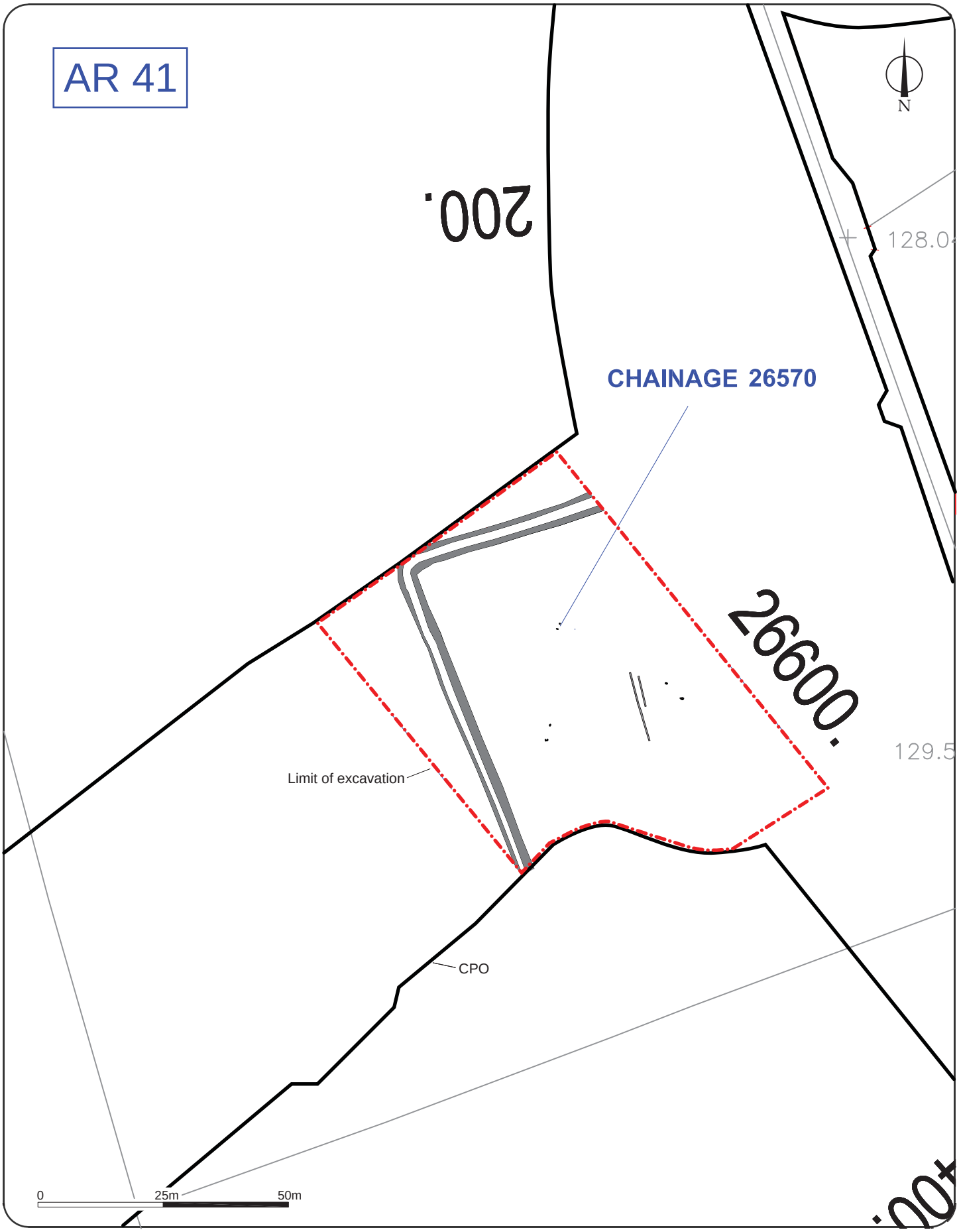
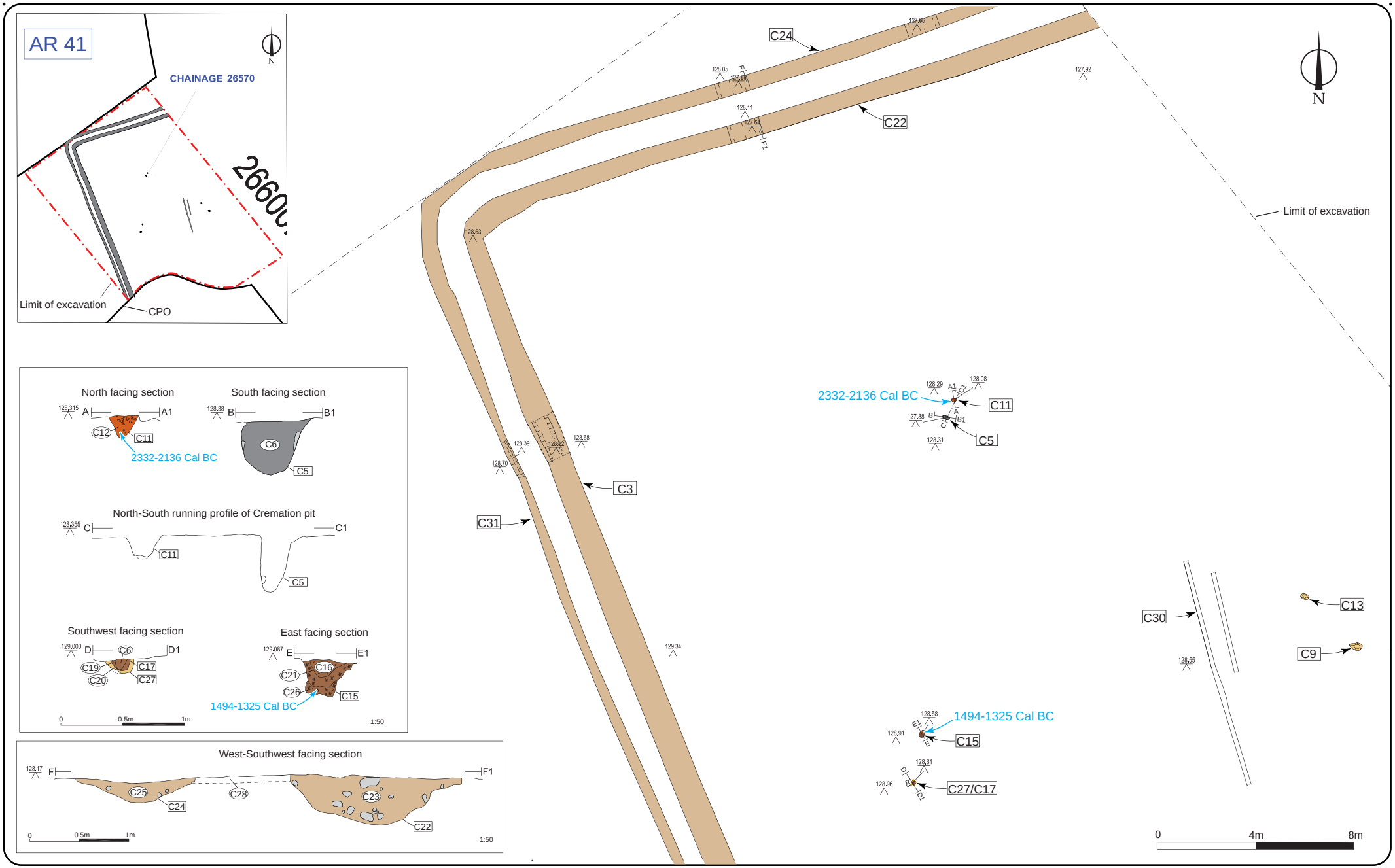


Title AR 41 Site Overview			**Notes**			VJK Valerie J. Keeley Ltd. ARCHAEOLOGICAL CONSULTANCY Brehon House, Kilkenny Road, Castlecomer, Co. Kilkenny. Tel: (+353) 056 4440236 Fax: (+353) 056 4440237 Email: vjk@vjk.ie Website: www.vjk.ie
						Client Kilkenny County Council
Works No. A027/000/E2383	**Drawn by** L.Wilson	**CAD reference** 1269-06-400/TERA3	**Date** September 09	**Scale** 1:1000	**Drawing No.** Figure 6	**Project** M8/N8 Cullahill to Cashel Road Improvement Scheme



Title Plan, Sections & Profile of Site	**Notes** Cremation Pit Charcoal rich Pit Marker post/Cenotaph Tree bowl/Natural Post-Medieval ditch	**Works/Exc. No.** A027/000/E2383	**Compiled by** L.Wilson	**CAD reference** 1269-06-400 Tera 3	**Client** Kilkenny County Council	VJK Valerie J. Keeley Ltd. ARCHAEOLOGICAL CONSULTANCY	Brehon House Kilkenny Road Castlecomer Co. Kilkenny.
		Date September 09	**Scale** 1:200	**Drawing No.** Figure 7	**Project** M8/N8 Cullahill to Cashel Road Improvement Scheme		Tel: (+353) 056 4440236 Fax: (+353) 056 4440237 Email: vjk@vjk.ie Website: www.vjk.ie

PLATES

Plate 1: Aerial view of site, and surrounding topography. Looking north

Plate 2: Site overview showing ditches [c31] and [c3] in the foreground. Looking southeast.

Plate 3: Post excavation view of cremation pit [c11]. Looking south. (Scale = 0.4m)

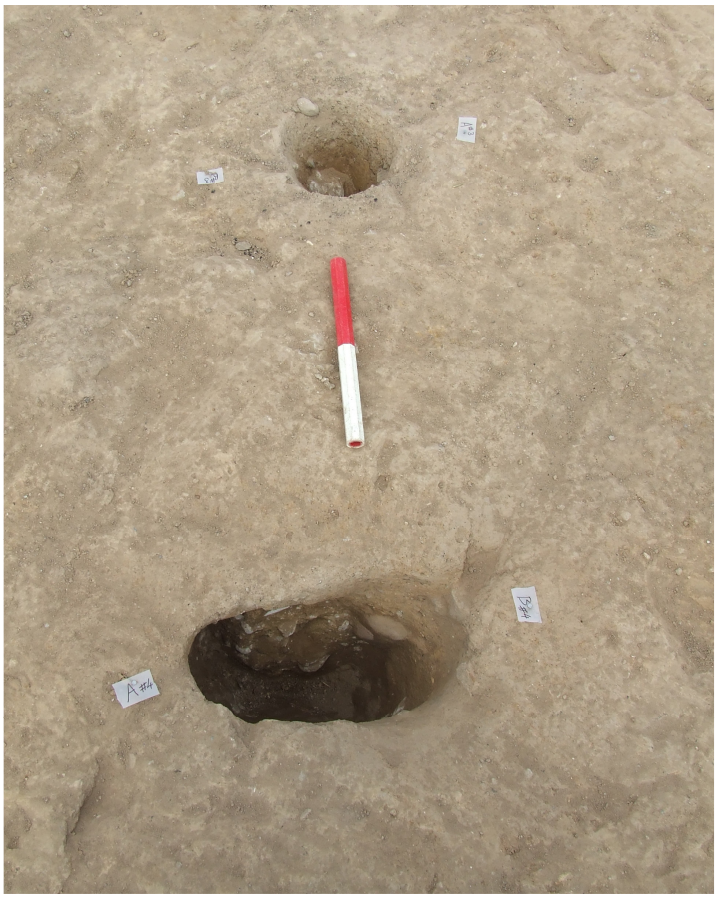


Plate 4: Early Bronze Age cremation pit [c11] (foreground) & posthole [c5]. Looking north (Scale = 0.4m)

Plate 5: Section of Middle Bronze Age charcoal rich pit [c15]. Looking west. (Scale = 0.4m)

Plate 6: Post excavation view of Middle Bronze Age charcoal rich pit [c15]. Looking west. (Scale = 0.4m)

Plate 7: View of post medieval ditches [c22 & c24]. Looking east northeast