# N18 Ennis Bypass
# and N85 Western Relief Road

## Site AR103, Killow, Co. Clare

**Final Archaeological Excavation Report**

**for Clare County Council**

**Licence No: 04E0190**

**by Kate Taylor**

**Job J04/01**

**(NGR 136888 174611)**

**1st August 2006**

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## Summary

**Site name:** N18 Ennis Bypass and N85 Western Relief Road, Site AR103, Killow, Co. Clare

**Townland:** Killow

**Parish:** Doora

**Barony:** Bunratty Upper

**County:** Clare

**SMR/RMP Number:** N/A

**Planning Ref. No:** N/A

**Client:** Clare County Council, New Road, Ennis, Co. Clare

**Landowner:** Clare County Council, New Road, Ennis, Co. Clare

**Grid reference:** 136888 174611 (OSI Discovery Series, 1:50,000, Sheet 58. OS 6" Clare Sheet 42)

**Naturally occurring geology:** Orange sandy clay at north; pale grey alluvial clay with sandstone at south

**TVAS Ireland Job No:** J04/01

**Licence No:** 04E0190

**Licence Holder:** Kate Taylor

**Report author:** Kate Taylor

**Site activity:** Excavation

**Site area:** 1040m$^2$

**Sample percentage:** 100%

**Date of fieldwork:** 15/03/04 - 18/03/04

**Date of report:** 1$^{st}$ August 2006

**Summary of results:** A spread of burnt stone and charcoal rich soil measuring approximately 11m by 8m was found to have been partially truncated by a large water hole or well. The up-cast from this pit had been used to create a bank of earth down-slope of the hole. The burnt spread has been radiocarbon dated to the 9$^{th}$ to 10$^{th}$ centuries BC. No trough was revealed. The water hole and bank were not, however, thought to be of any great antiquity.

**Monuments identified:** Late Bronze Age burnt spread,

**Location and reference of archive:** The primary records (written, drawn and photographic) are currently held at TVAS Ireland Ltd, Ahish, Ballinruan, Crusheen, Co. Clare.



*Report edited/checked by*: *Graham Hull ✓01.08.2006*

# N18 Ennis Bypass, Site and N85 Western Relief Road, Site AR103, Killow, Co. Clare
# A Final Archaeological Excavation Report

by Kate Taylor

**Report J04/01p**

## Introduction

This report documents the final results of an archaeological excavation of a Late Bronze Age burnt stone spread and a later dated large pit and an earthen bank (Site AR103) on the route of the N18 Ennis Bypass and N85 Western Relief Road at Killow, Co. Clare (NGR 136888 174611) (Fig. 1). The excavation forms part of the Ennis Bypass Archaeological Contract 6.

A preliminary archaeological report for this site was produced in May 2004 (Taylor 2004).

The National Monuments Act 1930 (as amended) provides the legislative framework within which archaeological excavation can take place and the following government publications set out many of the procedures relating to planning/development and archaeology:

*Framework and Principles for the Protection of the Archaeological Heritage* (DAHGI 1999a)

*Policy and Guidelines on Archaeological Excavation* (DAHGI 1999b)

*Code of Practice between the National Roads Authority and the Minister for Arts, Heritage, Gaeltacht and the Islands* (NRA/MAHGI 2001)

## Project background

As part of the National Roads Authority scheme for upgrading the N18 Limerick to Galway Road, Clare County Council, in consultation with NRA Project Archaeologist Sébastien Joubert, requested a series of archaeological investigations along the route of the proposed Ennis Bypass and a Western Relief Road. The proposed scheme has an overall length of 21km and involves the construction of a 13.8km eastern bypass of Ennis from Latoon, north of Newmarket-on-Fergus, to Cragard, north of Barefield. The Western Relief Road is 7.1km long and is to link Killow and Claureen (Fig. 1).

A number of sites of archaeological interest were known to lie on the route of the new roads and the mitigation strategy agreed by the Project Archaeologist and the national licensing authorities for these sites was preservation by record, i.e. full archaeological excavation. Further sites, without surface expression, were located as the result of intensive test trenching along the course of the road (03E1291 Hull 2003 and 03E1293 Roger 2004). As preservation *in situ* was not a reasonable option, the resolution strategy for these new sites was also preservation by record.

The archaeological excavation and post excavation work were funded by Clare County Council through the National Roads Authority and part-financed by the European Union under the National Development Plan 2000-2006.

## Location, topography and geology

The site was located in the townland of Killow, parish of Doora, barony of Bunratty Upper and was centred on NGR 136888 174611 (Figs 1 and 2). The fields in which the excavation took place slope down from north to south, forming the northern side of a peat filled river valley, with a small stream

(the Killow-Carrowgar townland boundary) at the base of the slope, just 10m from the edge of the excavated area.

The topsoil in the field varied from a thin clayey loam at the top of the hill to a soft peat at the edge of the bog. The excavation area straddled this boundary. The underlying natural deposits also varied, being an orange sandy clay at the northern end of the site and a pale grey alluvial clay with sandstone inclusions at the south. At the time of the excavation the land was under pasture.

The excavated area sloped from approximately 3.5m above Ordnance Datum (OD) at the north to 1.0m OD at the south.

**Archaeological and historical background**

As part of the environmental assessment process for the road scheme, Clare County Council commissioned desk-based and walkover surveys that formed part of an Environmental Statement (Babtie Pettit 2000) and an archaeological study for the Environmental Impact Statement (Doyle 1999). A total of 36 sites of known or potential cultural heritage significance were identified along the entire route of the proposed Ennis Bypass and Western Relief Road.

Earthwork and geophysical survey were undertaken on potential archaeological sites and invasive testing and excavation took place in 2002 and 2003 on some of the above ground sites affected by the proposed road (Aegis 2002, IAC 2003, Geoquest 2002, Earthsound 2003).

A systematic programme of testing along the new road route, involving the mechanical excavation of a central linear trench with offsets, took place in Summer/Autumn 2003. Twenty-two previously unknown sites, including cremation cemeteries, burnt stone spreads, enclosures and brick clamps were found (03E1291 Hull 2003 and 03E1293 Roger 2004). Monuments dating from the Bronze Age to the modern period were found.

Earlier phases of archaeological intervention on newly constructed stretches of the N18 (Dromoland to Carrigoran), to the immediate south of this road project, have demonstrated that the locality has a rich range of prehistoric and later monuments (99E0350 Hull and Tarbett-Buckley 2001).

Recent archaeological work on the BGE Gas Pipeline to the West in the neighbourhood of the new road route has tended to support the picture of continuous human activity in Co. Clare from the Neolithic and even becoming intensive from the Bronze Age. A number of burnt stone spreads and burnt mounds were excavated near the route of the new road in the summer of 2002 (MGL 2002)

Despite the presence of the ruins of Killow church (CL034:102) 350m to the north-east, the only other new archaeological site discovered in the vicinity was site AR104, 450m to the north. Site AR104 consisted of a small hillock, enclosed in the medieval period, by two ditches, a small number of prehistoric cremation burials and a burnt spread (AR104, 04E0191, Taylor 2006).

**Earlier test excavations**

The field in which site AR103 lies was identified at the route planning stage as having archaeological potential. Test trenches were dug in this area in 2002 (Coyne 02E1499 and Connolly 03E0836, Aegis 2002) but no archaeological deposits were discovered.

Archaeological deposits were, however, found at this location during the centre-line and offset testing (03E1291 Hull 2003). At the border of the wet and dry land and to the east of the CPO, a burnt stone mound was found. The limits of this mound were established by extra trenching and the total area

covered by burnt stone was thought to be in the order of 8m-10m (east to west) by 10m-12m (north to south). It was seen that a modern drainage ditch truncated the mound at the eastern CPO boundary.

Additional trenches were dug in an attempt to locate further mounds at the interface of wet and dry within the CPO. No other archaeological deposits were found in the vicinity.

**Excavation aims and methodology**

A licence to excavate was granted to Kate Taylor by the National Monuments Section of the Department of the Environment, Heritage and Local Government, in consultation with the National Museum of Ireland, on behalf of the Minister for the Environment, Heritage and Local Government. The licence number is 04E0190.

The aims of the excavation were to:

1) Preserve by record all archaeological deposits and features within the excavation area
2) Produce a high quality report of the findings

The fieldwork took place between the 15th and 18th of February 2004 and was directed by Kate Taylor, supervised by Richard Oram and assisted by Tim Dean, Frank Mulcahy, Michael Parks and Alan Smart.

The site encompassed a rectangular area measuring approximately 42m by 24m (1040m$^2$). Topsoil and overburden were removed by a 15 tonne, 360º tracked machine fitted with a toothless grading bucket and operated under direct and continuous archaeological supervision. The spoil was visually scanned for artefacts.

The central area of the site was cleaned using hand tools to fully define the limits of the potential archaeological features. Slots were dug to investigate all possible features and deposits and those that proved to be of archaeological interest were fully excavated.

The large features that post-dated the burnt stone spread, the water hole and earthen bank, were hand-cleaned and then excavated mechanically.

A full written, drawn and photographic record was made according to the TVAS Ireland Field Recording Manual (First Edition 2003). The site was planned using a combination of digital and hand drawing methods. Digital plans were made using a Global Positioning System (GPS) unit, tied into the N18 surveying base station to provide millimetre accuracy.

**Excavation results** (Figs 3 and 4 and Plates 1-3)

The excavation has revealed evidence of at least three phases of activity ranging in date from the prehistoric period to late post-medieval or modern. All features and contexts are listed in Appendix 1.

The earliest deposits on the site were natural in origin, with a small patch of silt or decayed stone, deposit 55, overlying the natural alluvial clay. This was in turn overlain by peat deposit, 50, up to 0.40m thick. The peat varied in character being more rich and organic at the southern end of the excavated area.

The burnt stone spread, 1, which was the focus of the excavation, overlay the thin peat layers. Two deposits, 51 and 52, formed an amorphous mound that measured 11m by 8m (approximately 77m$^2$) and was up to 0.25m thick (Plates 1 and 2). The lower deposit, 51, was a loose silty layer and the

upper, 52, was largely composed of fire-cracked stones and charcoal. The original extent of the monument could not be determined as the eastern edge was truncated by a modern drainage ditch.

The next phase of activity consisted of the digging of a large hole, 3, and the construction of a bank, 2. Although this activity remains undated, the bank material partially overlay the edge of the burnt spread, providing a stratigraphic relationship between the features (Plate 3). Sub-circular pit 3 had a diameter of 4.7m and was 1.7m deep with steep sides. The fill, 56, appeared to be the result of natural silting and peat formation over a period of time. Bank 2 formed an arc around the southern, downhill side of the large pit, was 16.5m long, 1.8-3.4m wide and up to 0.25m thick on top of the peat. The deposit that formed the bank, 54 was redeposited natural sandy clay with limestone and sandstone pieces, probably the upcast material from the original excavation of pit 3.

The final phase of activity on the site was the excavation of the drainage ditch that ran down the hillside from north to south and almost coincided with the eastern edge of the CPO at this point. This ditch truncated burnt spread 1 and possibly the end of bank 2. This ditch was still visible from the modern ground surface as a shallow depression. Although no finds were recovered, it was clearly of recent date.

## Finds

The site produced a small assemblage of bone (Appendix 2). This material was mostly recovered from the fill of the large pit and is therefore possibly not of any great antiquity, however in the absence of a definite date for the activity the material is potentially of interest. In addition a small amount of burnt bone recovered during testing (find 03E1291:20) was found on the surface of the burnt stone spread. The deposit that produced the bone was recorded at the excavation stage as 52.

The finds have been cleaned, numbered, labelled, properly packed and will be deposited with the National Museum of Ireland in accordance with *Advice Notes for Excavators* (NMI 1997).

**Human and Animal bone** by Sîan Anthony

*Methodology*

Bone from five contexts was examined from Site AR103. Three of these assemblages were collected during excavation and the remaining assemblage was recovered from a soil sample that was wet-sieved to a 2mm fraction. All small pieces of bone were scanned rapidly as in many cases deposits only produced fragments under 1 or 2mm in size. The bones were not separated into size, so percentage fragmentation could not be calculated however the majority of fragments were less than 2mm leaving a lack of recognisable pieces throughout the assemblage.

Human osteological analysis followed recommendations from McKinley (1994, 2000) and Brickley and McKinley (2004). Mammalian bones were identified using standard texts (Hillson 1992 and Getty 1975), all were rapidly scanned and bones damaged on excavation were rejoined and counted as one bone. Small amounts of cremated material were only identified as mammalian only, this does not preclude the possibility that some may be human but could not be readily identified as such. Where they are recognised as animal this is noted.

*Results*

The bone is catalogued in Table 1.

Approximately 30 pieces of cremated mammalian bone were recovered from burnt stone deposit 51; all were burnt to a calcined state and unidentifiable to taxon although it is likely that they represent domestic animals for consumption.

Only a few burnt fragments were recovered from burnt stone deposit 554 (AR103 deposit 52). All were in poor condition.

Pit 3 contained several cattle bones. These bones were largely foot bones, which were likely to have been deposited articulated and represents a lower limb of a single adult cow. A cattle rib with a cut mark across and a piece of cattle scapula were also present in pit 3. All the cattle bones were in an excellent state of preservation confirming the likelihood of their modern nature. The scapula may exhibit a small puncture mark made from animal scavenging with some small parallel scratches presumably from the claws, it indicates non-rapid disposal of some elements on site.

The majority of the cremated bones were relatively well preserved, although some deposits retained a slightly worn and chalky appearance, trabecular bone was poorly represented with general limb bones and skull pieces often noted. However this is more likely from the easily identifiable nature of these pieces rather than any recognisable pattern in deposition. It has been demonstrated that trabecular bone and easily recognised articular surfaces are lost in adverse soil conditions (Neilson-Marsh et al 2000).

**Table 1: Catalogue of bone**

| Find Number | Cut | Deposit | Sample Number | Species | Pres. | Burnt? | Colour | Total | Weight (g) | Maximum fragment size (mm) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 04E0190:1 | 1 | 51 | 2 | Mammal | E | 30 | White/ dark grey | 30 | 3 | 17 | Fragments |
| 04E0190:2 | 3 | 56 - surface | | Cow | G | | | 8 | 102 | | Cow feet bones |
| 04E0190:3 | 3 | 56 - base | | Cow | G | | | 1 | 20 | | 1 cut cow rib |
| 04E0190:4 | 3 | 56 - spoil | | Cow | G | | | 1 | 142 | | 1 cow scapula |
| 03E1291:20 | - | 554 (=52) | | Mammal | G | 10 | White | 10 | 2 | <1 | Fragments |

**Samples**

Bulk soil samples were taken from each of the two layers of the burnt mound (Appendix 3). The sample from the lower (hence more secure) layer was floated and wet sieved though a 300micron mesh and then through a 2mm mesh in order to recover charred plant material and small artefacts. The heat-affected stone from the sample was retained.

**Identification of stone samples** by Dr Martin Feely

*Methodology*

TVAS delivered a plastic bag containing four stone samples taken from a burnt spread deposit from site AR103. The four stone samples were identified using a Nikon incident light binocular microscope. Each stone sample in each sample bag has been given a letter and the description of each stone is matched below to that letter (Table 2).

*Results*

**Table 2: Rock types**
I

| Cut | Deposit | Sample | Identification |
|---|---|---|---|
| - | 51 | 2 | 4 stones:<br>a) Carboniferous limestone<br>b) Coarse sandstone<br>c) Metamorphosed igneous rock containing hornblende and feldspar<br>d) Fine grained siliceous sediment with what appear to be fossiliferous fragments |

Fragmentation of stones

I see nothing exceptional about the stone samples and the average size of each stone is quite small, < 100mm to pebble size. They represent material I would expect to encounter in glacial debris. I cannot say that they are smaller fragments of larger heated stones dropped into cold water.

*Discussion*

In general the stone samples from the Ennis Bypass are either sandstone or limestone. The sandstones are of three main types: a common sandstone, a micaceous variety which has visible “shiny” flakes mica and finally a pebbly variety like a fine conglomerate. The limestone samples all have visible fossiliferous material similar to that found in the Lower Carboniferous limestones of Ireland.

Additional “stone” varieties include fragments of the mineral calcite, quartz and fine grained igneous rocks. The sandstone samples most likely represent Devonian sandstones while there is little doubt that the limestone is Lower Carboniferous in age. This is not surprising as both geological periods are represented by rock exposures in the west and southwest of the country. Glacial debris commonly contains disaggregated blocks of both rock types. The fragments of calcite and quartz probably formed part of geological structures termed veins, which transect existing rocks. The igneous varieties may represent samples of Carboniferous volcanic rocks but this is speculative.

**Charred plant macrofossils and other remains** by Val Fryer

*Introduction*

A single sample for the extraction of the plant macrofossil assemblage was taken from the lower charcoal rich layer (51) of the mound.

*Methods*

The sample was floated and wet sieved by TVAS Ireland Ltd, and the flot was collected in a 300 micron mesh sieve. The dried flot was scanned under a binocular microscope at magnifications up to x 16, and the plant macrofossils and other remains noted are listed below on Table 3. All plant remains were charred. The density of material within the assemblage is expressed in the table as follows: x = 1 – 10 specimens, xx = 10 – 100 specimens and xxx = 100+ specimens.

*Results*

Plant macrofossils

Charcoal formed the main component of the assemblage although a few small pieces of charred root or stem were also recorded.

Other remains

Small 'pellets' of mineralised soil were moderately common within the assemblage, and small fragments of burnt stone were also recorded.

**Table 3: Charred plant macrofossils and other remains**

| **Sample No.** | 2 |
|---|---|
| **Deposit No.** | 51 |
| Charcoal <2mm | x |
| Charcoal >2mm | xxx |
| Charred root/stem | x |
| Burnt stone | x |
| Mineralised soil concretions | xx |
| Sample volume (litres) | 10 |
| Volume of flot (litres) | 0.4 |
| % flot sorted | 25% |

*Conclusions*

In summary, although charcoal is abundant, other plant remains are absent. Similar assemblages are commonly recorded from burnt stone mounds across Ireland, Scotland and England.

**Charcoal** by Simon Gannon

*Introduction*

A single sample of charcoal fragments was retrieved from a single context from the site, consisting of a burnt spread. Identification of taxa of the retrieved charcoal may assist in the reconstruction of the local, contemporary woodland-environment and the use of the woodland resources by the people responsible for the archaeological features.

*Methodology*

In sorting fragments suitable for identification a guide size of at least 2mm in radial cross-section was used. From this sort 100% of fragments were analysed.

Initially the grain direction of the fragments was identified before fracturing across their transverse plains. Identifications were made under microscopic examination, in most cases. Further fractures were made to reveal radial and/or tangential plains in cases where identification was more difficult. Magnification of between x10 (hand lens) to x400 was used. Structural elements of the fragments were examined to allow for identification of roundwood, heartwood, and sapwood features.

Reference material comprised a reference collection of charred samples of taxa and reference publications, *Microscopic Wood Anatomy* (Schweingruber 1990) and *The Identification of the Northern European Woods* (Hather 2000).

*Analysis Results*

The results are summarized in Table 4. Classification follows that of *Flora Europae* (Tutin *et al* 1964-80). Certain related taxa cannot be securely differentiated on the basis of their anatomical characteristics and are assigned to their respective family groups as with the genera *Salix* and *Populus,* and the genera *Craetaegus, Malus* and *Sorbus.* Provisional identifications have been given in cases where the condition of the charcoal was degraded.

The various identifications of wood taxa were consistent with taxa from the following groups:

<u>Broadleaf taxa</u>
Betulaceae. *Alnus* sp., alder
Cornaceae. *Cornus* sp. dogwood
Corylaceae. *Corylus* sp., hazel
Fagaceae. *Quercus* sp., oak
Oleaeceae. *Fraxinus* sp., ash
Rosaceae.

Subfamily Pomoideae. *Craetagus* sp., hawthorn; *Malus* sp., apple; *Sorbus* spp., *Sorbus aucuparia*, rowan; *S. aria*, whitebeam; *S. hibernica*, Irish whitebeam, and other *Sorbus* species.

*Prunus* sp., *Prunus avium,* wild cherry; *P. spinosa,* blackthorn; *P. padus*, bird cherry.

Salicaceae. *Salix* sp., willow; *Populus* sp. poplar.

**Table 4: Number of identified charcoal fragments per sample**

| Sample | Cut | Deposit | Context type | *Alnus* | *Betula* | *Cornus* | *Corylus* | *Fraxinus* | Pomoideae | *Prunus* | *Quercus* | Salicaceae | *Taxus* | *Ulmus* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | - | 51 | Burnt spread | 1r | - | 3r | 14 (13r+1sh) | 2 (1r) | 54 (53r) | 13 (12r) | 4 (1r) | 3r | - | - |

(r: roundwood under 15mm; sh: nut shell).

*Discussion*

Anatomical characteristics from charcoal fragments do not allow for identification of individual species in every case. Several species belong to groups of species, species of genera, of sub-families and of families that cannot be separated anatomically (Schweingruber 1990 and Hather 2000). It is possible that a narrow range of species and, occasionally, one or two species can be indicated with a degree of confidence due to established factors, principally their native status and history of introduction by people (Huntley and Birks 1983, Peterken 1996 and Scannell and Synott 1987). The following section places the given charcoal based taxa identifications in the context of defined tree species allowing for implications related to their environmental characteristics and possible use by ancient peoples to be drawn. Reference works consulted include Goldstein *et al* 1984, Huntley and Birks 1983, Kelly 1998, Mitchell 1978, O'Sullivan 1996, Rackham 1976-90, Raftery 1996, Scannell and Synott 1987 and Tutin 1964-80.

Taxa descriptions

Alder

The sole native species is *Alnus glutinosa*, Common Alder, Irish fearnóg (family – Betulaceae).
Environment indications. Tolerant of nearly all soil types including relatively infertile soils, such as ironpan and peaty soils. Particularly tolerant of water logged conditions and is often a streamside tree. Has the ability to 'pioneer' into previously disturbed land. Native distribution throughout Ireland.
Uses in antiquity. A hardwood suitable for a variety of artefacts and smaller structural timber. Tends to harden when in contact with water and therefore suitable for making piles etcetera. It burns quickly when used for firewood but has been found suitable for charcoal production.

Ash

There is a single native species, *Fraxinus excelsior*, ash, fuinseog (family - Oleaceae).
Environmental indications. Requiring deep, fertile, moist but well drained, soils. Grows well in mixed stands when not shaded. Widespread throughout Ireland.
Uses in antiquity. A strong but elastic wood suitable for many purposes including structural timber (not where in prolonged contact with water or soil). Coppices readily. Burns well even when green, partly due to low water content.

Blackthorn/ cherry

Here there are three native species, wild cherry, *Prunus avium*, crann silin; blackthorn, *Prunus spinosa*, draighean and bird cherry, *Prunus padus*, donnroisc. (Family - Rosaceae).
Environmental indications. Tolerant of most soils, preferring well-drained, acid, neutral and alkaline soils. Can grow in semi-shade, e.g. light woodland, or no shade, requiring moist soil. *P. spinosa* is common as a shrub in woods, can grow in semi-shade, scrub, often forming thickets, sometimes small trees. *P. spinosa* is a pioneer species, invading cultivated fields. Natural distribution throughout Ireland. *P. padus* native over more northern parts of Ireland.
Uses in antiquity. *P. avium* and *P. padus* produce a very hard wood and, when attaining good size, highly rated for timber. *P. spinosa* has very hard wood but often twisted, of no structural use but useful for small components and used as livestock barriers.

Dogwood

The native species is *Cornus* sp. (family-Cornaceae).
Environmental indications. Broadly soil tolerant preferring moist calcareous soils, can grow in the shade of woodland or in scrub
Uses in antiquity. A tough, hard wood, useful for small items such as tool handles etc. producing an excellent fuel.

Hazel

There is a single native species, *Corylus avellana*, hazel, coll (family - Corylaceae).
Environmental indications. Botanically a shrub, but does not flower and fruit without sunlight, so is really a canopy tree preferring woodland edges and clearings though it bears moderate shade and is also found as understorey, typically in oak woodlands. Fairly tolerant of poor soils but does not grow on acid soils and preferring chalky, fertile, deep soil. Growing throughout Ireland.
Uses in antiquity. A tough and flexible wood, useful for small implements and small structural elements. Also grows easily in coppice-like form producing rods suitable for wattle and basketry type structures. Makes useful firewood.

Hawthorn/ *Sorbus*

The represented species is probably one or more of the following native members of the sub-family Pomoideae that includes several *Sorbus* species. (Family - Rosaceae).

Crab Apple, *Malus sylvestris*, cran fia-úll; hawthorn, *Crataegus monogyna*, sceach geal.
Environmental indications. Both species. Very rugged and adaptable to almost any climate and most soil types, requiring moist soil and can grow in semi-shade or no shade. Natural distribution throughout Ireland.
Uses in antiquity. Both species produce a very hard close grained wood, suitable for small implements such as mallets and splitting wedges. Both species make excellent fuel; *C. monogyna* can also make livestock barriers and is noted for being the hottest firewood.

*Sorbus*. One or more of the native group of at least six species that includes, the most widespread rowan, *Sorbus aucuparia*, caorthann, as well as whitebeam, *Sorbus aria*, fionncholl coiteann; and Irish whitebeam, *Sorbus hibernica*, fionncholl ghaelach.
Environmental indications. General. Very tolerant of soil quality generally, though requiring moist soil. Tolerating light shade, though fruiting better in a sunny position. Effective pioneer, Rowan natural to all of Ireland. Other *Sorbus* species native to Ireland have a much more restricted range within Ireland and elsewhere, with Irish whitebeam found only in Ireland.
Uses in antiquity. Heavy, close grained hard wood suitable for carving and useful for making bows, tool handles, mallet heads and, if sizable, beams etc. Coppices well.

Oak

There are two native species, pedunculate oak, *Quercus robur*, dair ghallda and sessile oak, *Quercus petraea*, dair ghaelach. (Family - Fagaceae).
Environmental indications. Broadly soil tolerant. *Q. robur* preferring alkaline or neutral soils rich in minerals, particularly damp clay soils and usually found in mixed woodland. *Q. petraea* preferring acid and lighter well drained soils, often in pure stands. Both species are naturally distributed throughout Ireland.
Uses in antiquity. Both species produce a hard wood resistant to abrasion and water degradation, particularly useful for structural timber and implements, poles and fencing. Woodland trees can be coppiced to produce stakes, straight poles etc.

Willow /poplar

The Salicaceae family provides various possible individual species, native to Ireland, including ten or more from the genera of willows and one from the genera of poplars.

Willow

There are ten or more willow species native to Ireland, though some having restricted range. Examples of the more widespread species being eared willow (*Salix aurita*), crann sníofa; goat willow (*Salix caprea*), sailchearnach; and grey willow (*Salix cinerea*), saileach liath.
Environmental indications. Extremely hardy and tolerant of a wide range of soils and habitats, often growing in, though not restricted to, wet places. Not tolerant of drought. *S. cinerea* and *S. purpurea* are not particularly shade tolerant, *S. caprea* is reputably more tolerant of shade. These are 'pioneer' species and can move into areas where the soil has been disturbed such as cleared woodland.
Uses in antiquity. Very tough and flexible wood useful for woven structures. Brittle branchwood not suitable as timber breaks violently when burnt. The stems are very flexible. Coppiceable, it can produce stout poles.

Poplar
Aspen, *Populus tremula*, crann creathach.
Environmental indications. Tolerant of poor soils growing on scrub, frequent on damp sites on hillsides, in rocky valley bottoms. A woodland tree where not under canopy. Moderately tolerant of drought as mature tree, not at all as a seedling. A short-lived pioneer tree. Native to Ireland.
Uses in antiquity. Wood is very soft with limited usefulness, of low flammability but making good charcoal.

Elm

The sole native species is *Ulmus glabra*, wych elm, leamhán sléibhe (family-Ulmaceae).
Environmental indications. Generally requiring non-calcareous top soil, can grow in heavy clay soil, needing moist but not waterlogged ground. Distribution throughout Ireland. Moderately shade tolerant.
Uses in antiquity. A hard, elastic, wood which is durable under water. Useful as structural timber, implements etcetera. Responds well to coppicing. The inner bark fibre can be used for ropes, mats etc.

The total range of taxa from AR103, Killow, comprises alder (*Alnus*), dogwood (*Cornus*), hazel (*Corylus*), ash (*Fraxinus*), hawthorn/apple/*Sorbus*-group (Pomoideae), cherry/ blackthorn (*Prunus*), oak (*Quercus*), and willow/ poplar (Salicaceae). These taxa belong to the groups of species represented in the native Irish flora and, conversely, non-native tree species such as lime (*Tilia*) and beech (*Fagus*) are not represented.

Generally, there are various, largely unquantifiable, factors that effect the representation of species in charcoal samples including bias in contemporary collection, inclusive of social and economic factors, and various factors of taphonomy and conservation (Théry-Parisot 2002). On account of these considerations the identified taxa are not considered to be proportionately representative of the availability of wood resources in the environment in a definitive sense and are possibly reflective of particular choice of fire making fuel from those resources.

As is seen in Table 4 the hawthorn/apple/*Sorbus*-group (Pomoideae) is the most numerous of the identified charcoal fragments. Pomoideae is generally common as fire debris, including from the total of Ennis Bypass sites.

The identified fragments are almost all distinguishable as small roundwood, unique from the Ennis Bypass sites, which suggests that a particular process was involved in the making of a fire at this site. This type of very light material would make for a rapid fire, without the sustained heat from typically larger pieces of wood and would usually burn out to ash. The combustion process subsequent to initial lighting would consume such light material thoroughly, passing through the stage of carbonization (pyrolysis) quickly. This small roundwood material may have survived as charcoal either on the periphery of a fire, or beneath the ashes of a fire, or on top of a mainly extinguished fire. However, the lack of surviving charcoal fragments from larger wood is an unusual circumstance. With the possibility that the light roundwood was the main constituent of the fire there could have been

deliberate interruption to the process of rapid consumption of the light wood, excluding oxygen, in order to achieve a specific end or as part of a specific process. An accumulation of fire debris from the residue of more than one fire would also usually provide fragments of larger wood underlying interpretation of a single specific activity.

A local environment with a relatively wide range of trees and shrubs is indicated from the charcoal of this site. The ratio of taxa represented as charcoal varies from that of most of the other Ennis Bypass sites excepting nearby Site AR104, Killow, with which there is a distinct correspondence in surviving charcoal taxa (Gannon 2006).

*Conclusion*

A varied woodland environment local to the site of AR103 is indicated by the range of taxa present in the samples. The identified taxa produce a picture of wood use that varies from most of the other Ennis Bypass sites but that corresponds closely to the other Killow site, AR104. Hawthorn/apple/*Sorbus*-group (Pomoideae) is the most represented taxa at this single sample site. The charcoal from the burnt spread was probably produced from a single fire event. A particular type of fire fuel, small roundwood, predominantly survived as charcoal and an activity distinct from a typical fire is indicated.

## Radiocarbon date

One radiocarbon determination was made by Beta Analytic Inc, Miami, Florida, from charcoal from the burnt stone spread (Table 5).

**Table 5: Radiocarbon determination**

| Sample material | Cut | Deposit | Sample | Lab code | Radiometric age | Calendrical calibrations |
|---|---|---|---|---|---|---|
| Charcoal Corylus shell | 1 | 51 | 2 | Beta-211588 | 2710±40 BP | 2 sigma (95%) Cal BC 920 to 800<br>1 sigma (68%) Cal BC 900 to 820 |

The sample material was selected from short-lived hazelnut shell to avoid the ‘old wood effect’. The date is therefore likely to fairly accurately reflect the formation of the burnt stone spread.

The radiocarbon date indicates that the burnt spread was formed in the 9$^{th}$ or early 10$^{th}$ centuries BC (the Late Bronze Age).

## Discussion

The excavation of site AR103 at Killow, Co. Clare has revealed evidence of a single fire event using small roundwoods that took place in the Late Bronze Age and the stratigraphically later excavation of a large pit.

A spread of burnt stone and charcoal-rich soil was excavated at the edge of a peat filled river valley. No directly related cut features such as troughs, nor hearths were revealed in the excavated area although the site was probably originally larger, having been truncated by a post-medieval drainage ditch.

It is not clear what specific activity the spread represents; however it is likely that the stone was used to heat water in a similar manner to *fulachta fiadh*, with the lack of a trough perhaps indicating that the water was held in a portable container. Although the majority of classic *fulachta fiadh* that have been

radiocarbon dated have proved to be Bronze Age, fewer isolated burnt stone spreads have been examined in detail. Burnt stone generating activity has produced dates ranging from the Mesolithic to the medieval period (Brindley et al. 1990).

Another burnt stone spread was excavated 450m to the north at site AR104 (Taylor 2006) and was radiocarbon dated to the 13th to 11th centuries BC. Also in the immediate vicinity is a *fulacht fiadh*, shown on the Sites and Monuments Record map, 280m to the north-east (CL034-19901).

The purpose of the large pit and bank that were located adjacent to the burnt stone spread is unclear. The size and depth of the pit would have been appropriate for a well, however the boggy location is unlikely to have been so dry that the excavation of a 1.7m deep well was required to reach the water table. Burnt stone spreads associated with large pits are not unknown; for example two sites were recently excavated by the author in Co. Limerick (02E0657 and 02E0660; Taylor 2003a and 2003b). In these cases, however, the sites were located some distance from the nearest water source and the pits were filled with large volumes of burnt stone material. The pit at Killow did not contain any burnt stone material and there is no evidence to suggest that the pit and bank were related to or contemporary with the stone spread. Another consideration is that the relatively small volume of burnt stone suggests a limited use of the site, which would not reflect the large effort that the digging of the pit would have entailed. It therefore seems likely that the pit and bank were later features, entirely unrelated to the burnt stone producing activity.

The presence of several 18th/19th century dwellings 80m to the north-west (Fig. 2) might help explain the digging of the large pit for an unrecognised domestic or agricultural purpose.

**Archaeological potential off the road CPO**

The burnt stone deposit was truncated at the east of the site (CPO edge) by a modern field drain and it was not possible to identify the limit of the archaeology. It is quite possible therefore, that the archaeological deposits continue off the road CPO into the field at the east.

**Publication plan**

A summary of the findings of the excavation has been submitted to *Excavations 2004*.

Copies of this final excavation report will be deposited with the Clare County Museum and the Local Studies Library, Ennis, Co. Clare

A summary article, describing the findings of this road project has been published in the local journal *The Other Clare* (Hull and Taylor 2005).

An illustrated information brochure describing the findings of this road project has been published by Clare County Council.

The stated aim of the National Roads Authority with regard to archaeological publication is clear, (O'Sullivan 2003) and it is anticipated that the results of this excavation will be disseminated as a component of a monograph dedicated to the archaeology of the Ennis Bypass. Publication is expected to take place in 2006/7 at the latest.

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TVAS Ireland Ltd
1st August 2006

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## Appendix 1: Catalogue of features and deposits

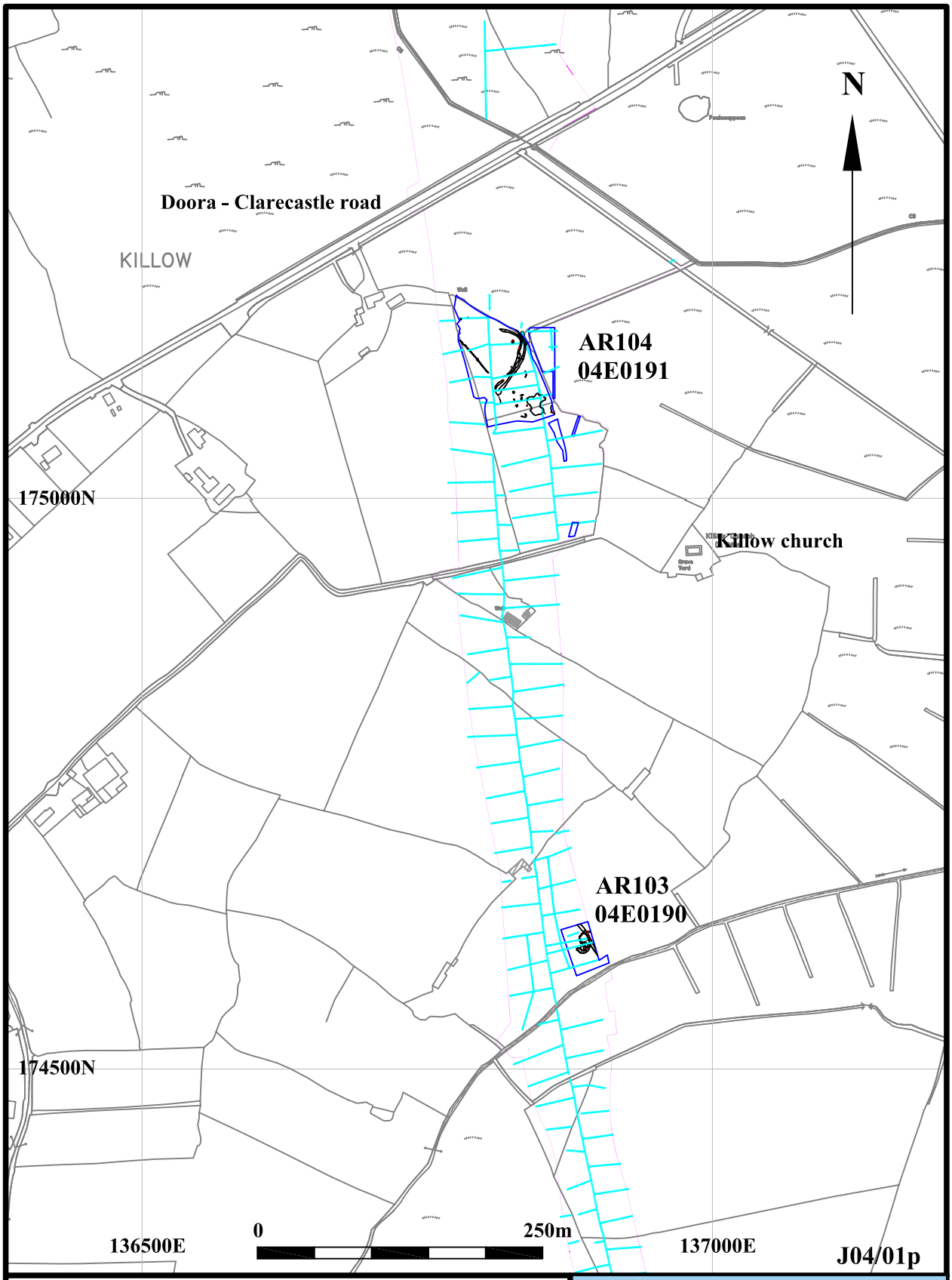
| Cut | Deposit | Group Number | Description | Samples | Finds |
|---|---|---|---|---|---|
| - | - | 1 | Burnt spread | - | - |
| - | - | 2 | Bank partially surrounding water hole 2 | - | - |
| 3 | 56 | - | Water hole | - | 2-4 = bone |
| - | 50 | - | Peat layer | - | - |
| - | 51 | 1 | Burnt spread deposit | 2 | 1 = bone |
| - | 52 | 1 | Burnt spread deposit | 1 | - |
| - | 53 | - | Peat layer – same as 50 | - | - |
| - | 54 | 2 | Bank deposit | - | - |
| - | 55 | - | Natural silt deposit | - | - |
| - | 57 | 1 | Burnt spread deposit – same as 51 | - | - |
| - | 58 | 1 | Burnt spread deposit – same as 52 | - | - |
| - | 59 | 2 | Bank deposit – same as 54 | - | - |

## Appendix 2: Catalogue of finds

| Find No | Cut | Deposit | Sample No | Category | Description | No pieces | Weight (g) |
|---|---|---|---|---|---|---|---|
| 04E0190:1 | 1 | 51 | 2 | Bone | Cremated animal bone fragments | 30 | 3 |
| 04E0190:2 | 3 | 56 - surface | | Bone | Cow feet bones | 8 | 102 |
| 04E0190:3 | 3 | 56 - base | | Bone | Cow rib fragment | 1 | 20 |
| 04E0190:4 | 3 | 56 - spoil | | Bone | Cow scapula (broken) | 1 | 142 |

## Appendix 3: Catalogue of samples

| Sample number | Cut | Deposit | Volume sieved (L) | Volume floated (L) | Finds? | Stone sample? | Charred plant remains? |
|---|---|---|---|---|---|---|---|
| 1 | - | 52 | Not sieved | - | - | - | - |
| 2 | - | 51 | 10 | 10 | Bone | Y | Y |




**N18 Ennis Bypass, Site AR103, Killow, Co. Clare**

**04E0190**

**Figure 2: Location of site in local landscape**

Scale 1:5000 OSI Licence: AR0049406
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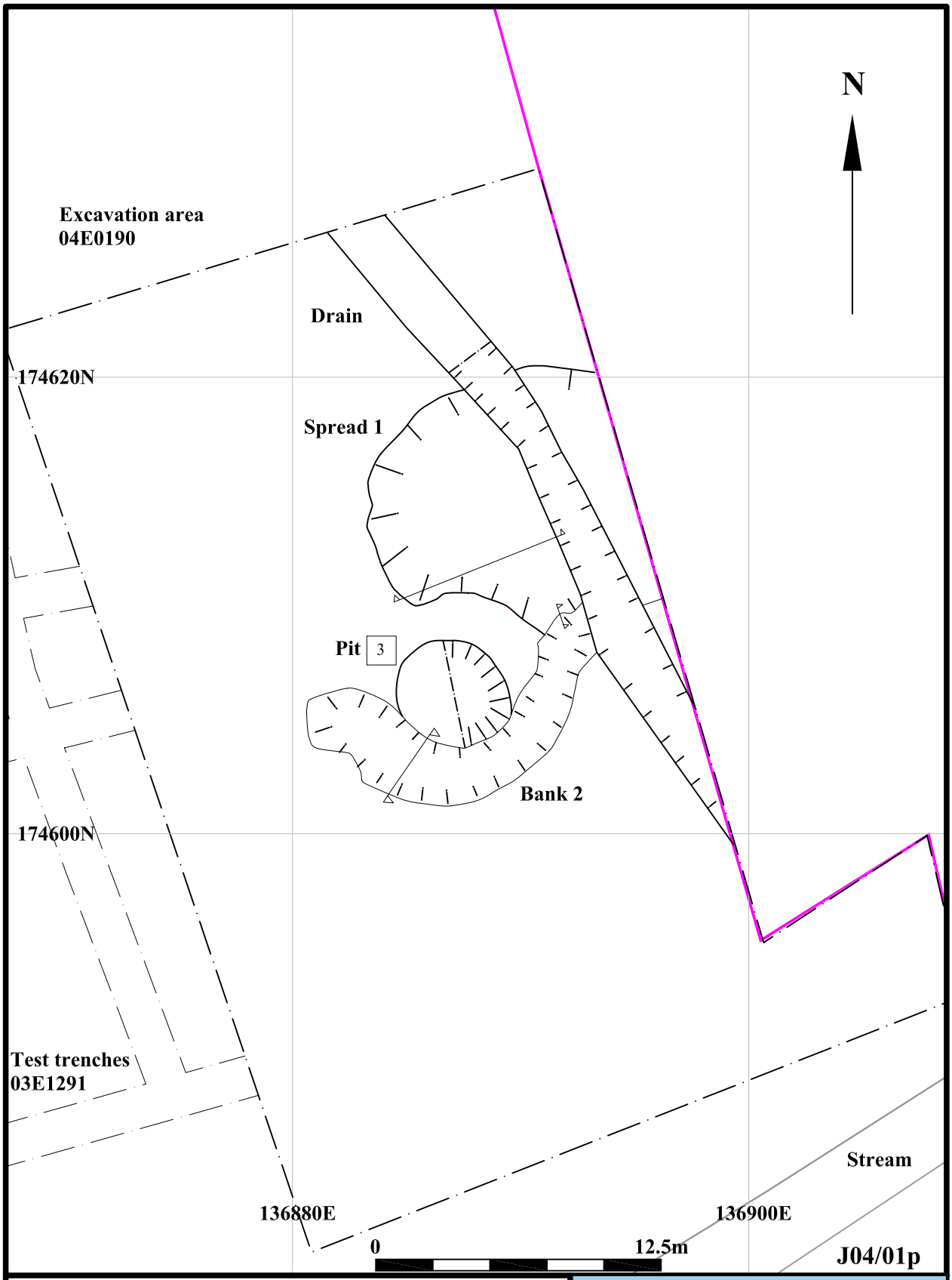


**N18 Ennis Bypass, Site AR103, Killow. Co. Clare**

**04E0190**

**Figure 3: Plan of site**

Scale 1:250 OSI Licence: AR0049406
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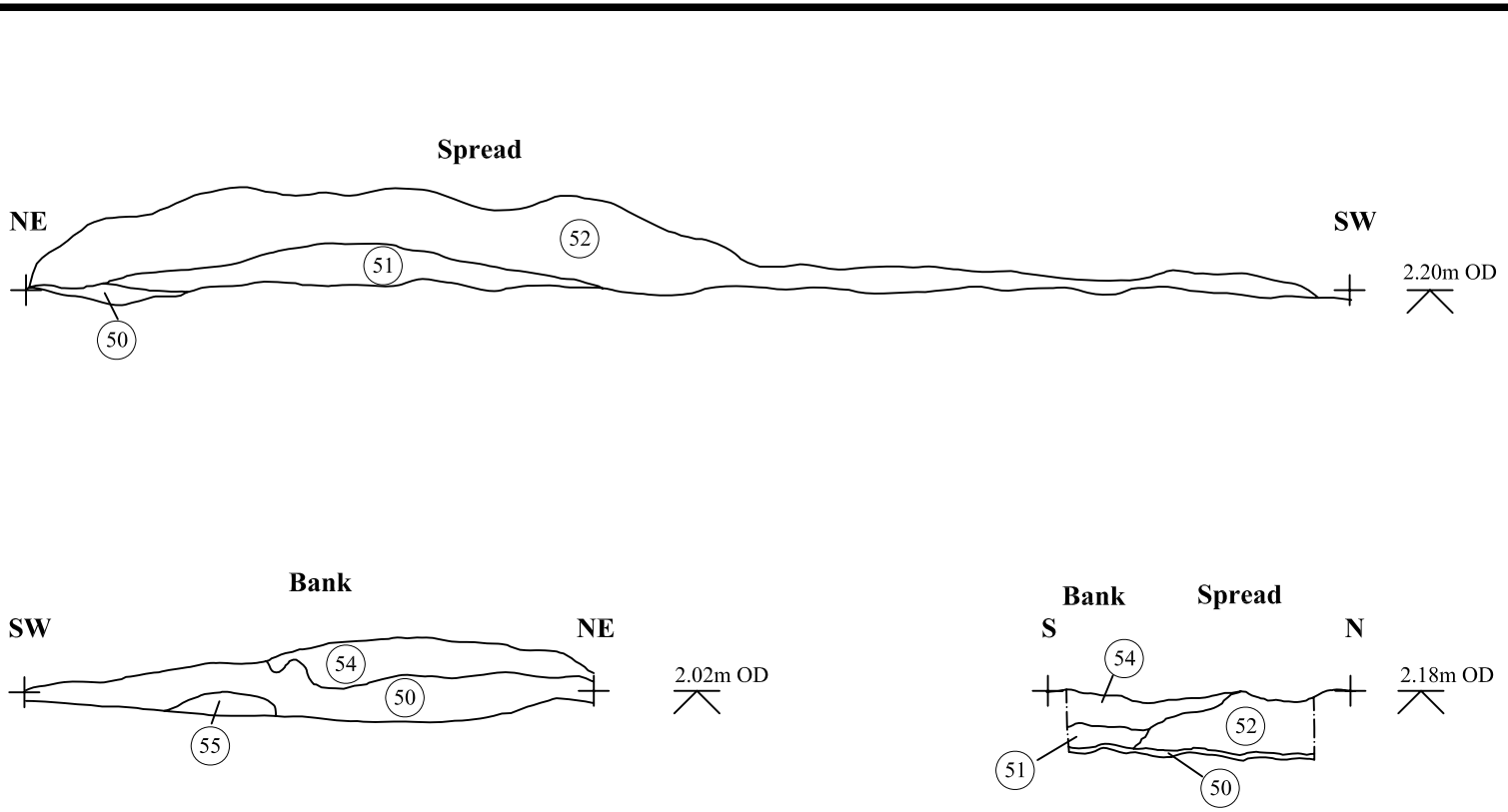


J04/01p

0 1m

**N18 Ennis Bypass, Site AR103, Killow, Co. Clare**

**04E0190**

**Figure 4: Sections of spread 1 and bank 2**

**Scale 1:20**

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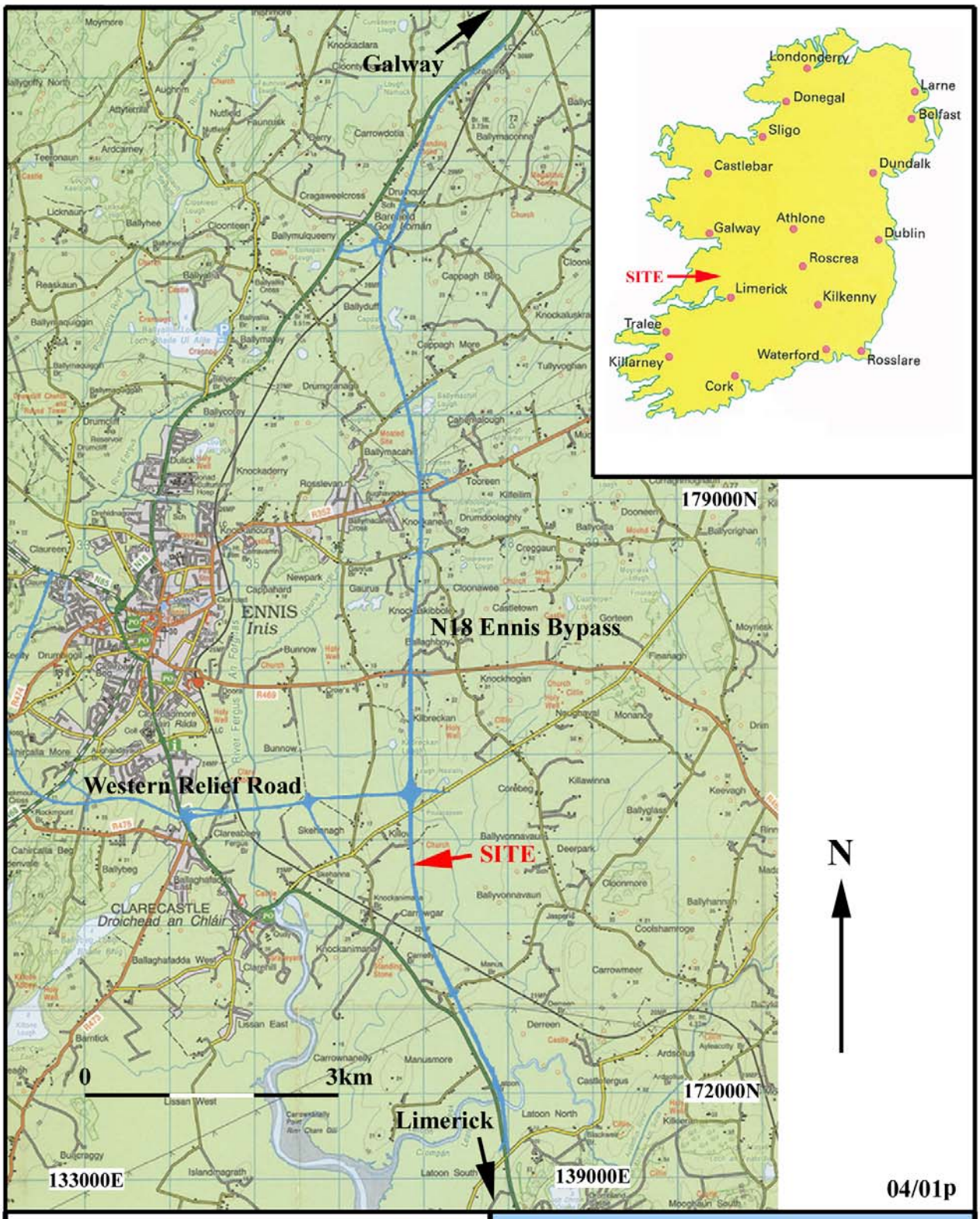


**N18 Ennis Bypass, Site AR103,**
**Killow, Co. Clare**
**04E0190**

**Figure 1: Site location**



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**Plate 1. Site AR103. Bank 2 and Pit 3 (foreground) and burnt spread 1 (background). Looking north**

**Plate 2. Slot across burnt spread 1. Looking south. Scale 0.3m**

**04E0190**

**Plate 3. Bank 2 overlying burnt spread 1. Looking north-west. Scale 0.3m**