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Final Report on Archaeological Excavation

In advance of pipelaying works for

Ballinasloe Water Services Infrastructure Upgrade Contract 2.

Licence No. 18E0423

RMP No.GA087-083 Church & GA087-083001 Graveyard

at

St. Josephs Place, Garbally Demesne,

Ballinasloe, Co. Galway

On behalf of SIAC Ltd.



Angela Wallace MSc., M.I.A.I. & Bernie Doherty BA, M.I.A.I.

Archaeologists, Atlantic Archaeology, March 2021

PROJECT DETAILS

Project	Ballinasloe Water Services Infrastructure Upgrade Contract 2.
Report Type	Final Archaeological Excavation Report
Archaeologists	Angela Wallace and Bernadette Doherty
Client	Siac Construction
Site	St. Josephs Place
Townland	Garbally Demesne
ITM Ref.	E584106 N730721
RMP No.	GA087-083 Church & GA087-083001 Graveyard
Licence No.	18E0423
Report Date	25 th March 2021

NON-TECHNICAL SUMMARY

The following report details the results of a small-scale archaeological excavation in advance of works for upgrade of water services within residential housing development at St. Josephs Place, Garbally Demesne, Ballinasloe, Co. Galway. Advance archaeological excavation was required along the route of proposed pipeline within the area of Recorded Monuments GA087-083 Church & GA087-083001 Graveyard. This site was previously destroyed and levelled during the construction of housing development at St. Josephs Place in the 1950s. A significant quantity of *in situ* and disarticulated human remains were identified beneath road surface around the north-east area of central green in St. Josephs during advance archaeological testing (Licence No.11E0242ext.).

As a result design of pipeline was altered to avoid main areas where human remains were identified. Area of excavation under current Licence No. 18E0423 was focused on a narrow laneway within the north-east area of St. Josephs Place to the rear of House Numbers 29-33. Archaeological material was encountered at ITM 584109, 730714 (rear of House No.33). Archaeological deposits then extended from this location to the northern end of the laneway for a distance of c.35m. Trench excavation was 1.2m in width x 0.5-1.4m in depth.

Human remains (20 small fragments with a weight of 60.4g in total) were recorded in very small scattered quantities during excavation. These remains were 0.30-0.40m below present ground level. A small fragment of human bone was dated to 1480 +/-30BP or Cal. 530-650AD placing the site within the early medieval period. This is in keeping with some of the artefacts recovered by museum staff in the 1950s. The concentration of human remains is far less in this area than findings from testing around the north-east area of central green.

A total of 3.90Kg of animal bone was collected during excavation. A wide range of species (13 in total) were identified, including both domestic and wild animals. The assemblage represents butchery and food waste, reflecting a diet of beef, mutton and pork augmented by occasional venison and small game. The evidence indicates that the non-food domesticates (horse, dog, and cat) were also present at the site. The presence of mainly animal bone within this area indicates it is more likely to be at the edge of the cemetery site, food waste was usually disposed of around the edges or within enclosing ditches of early medieval settlement and cemetery sites.

A modern stormwater pipe was evident at a depth of c.0.60m below present ground level along the eastern side of the trench at northern end. It was apparent this had caused further disturbance. Very few artefacts were recovered. A single coin dated from 1689 was recovered from upper fill C18, this coin can be clearly identified as King James gunmoney of sixpence. The presence of this coin may indicate possible links between this site and the nearby Battle of Aughrim which took place in 1691. A possible chisel point was also recovered, this wedge shaped iron artefact may have been used for stone carving or metal working in medieval times.

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1. INTRODUCTION

This report details the results of an archaeological excavation at St. Josephs Place, Garbally Demesne, Ballinasloe, Co. Galway, located along the route of a proposed pipeline as part of *Ballinasloe Water Services Infrastructure Upgrade Contract 2* (see Figures 1-2; E584106 N730721). The archaeological site was identified during archaeological monitoring of site investigation works and subsequent archaeological testing under archaeological licence No. 11E00242 issued by the National Monuments Service, Department of Culture, Heritage & the Gaeltacht, in consultation with the National Museum of Ireland (NMI).

Archaeological excavation of this site was undertaken by Angela Wallace and Bernadette Doherty of Atlantic Archaeology under licence 18E0423, over a period of four weeks from Monday 27th August, 2018. Full time team on this site also consisted of site assistants Paul Monaghan and Maria Colmenar. Crew were also assisted at various times by Niall Jones and Fiona Maguire.

This work was carried out on behalf of SIAC Construction in response to conditions of contract stipulated by Irish Water/Galway County Council. Logistical support for works within the construction program was provided by Marty Healy & John Killeen of SIAC Construction, survey support provided by Cathal MacHugh of SIAC Construction. Supervision of works on behalf of Irish Water/Galway County Council was carried out by Kevin Nally and Ciaran MacAlary from Ryan Hanleys Consultant Engineers.

2. THE DEVELOPMENT

Advance archaeological excavation was along the route of proposed pipeline within the area of Recorded Monuments GA087-083 Church & GA087-083001 Graveyard. This site has been destroyed and levelled since the construction of a housing development at St. Josephs Place, in the townland of Garbally Demesne, Ballinasloe in the 1950s.

Archaeological condition for excavation at St. Josephs Place was based on results of a previous programme of archaeological monitoring of slit trenches and subsequent testing carried out along the route of proposed pipelines under Licence No.11E0242. A bone of a juvenile was identified during monitoring of slit trenches. Further *in situ* and disarticulated human remains were identified during archaeological testing (Licence No.11E0242ext.). As a result design of pipeline was altered to avoid main areas where human remains were recovered around the north-east of central green within St. Josephs Place. Area of excavation under current Licence No. 18E0423 was focused on a narrow laneway within the north-east area of St. Josephs Place.

The area of excavation within laneway and excavation for house connections along this area was highlighted for advance archaeological excavation within the contract for works. Launch pits for house connections at north-east end of laneway were mechanically excavated to a depth of 0.30m and remaining material was hand-excavated and recorded and all bone material was sampled. It was advised that directional drilling be used for house connections in this area to avoid hand-excavation in back gardens and to minimize physical impact.

3. ARCHAEOLOGICAL ASSESSMENT

3.1 Garbally Demesne Historical Background

St. Josephs Place in the townland of Garbally Demesne is located within the present day urban district of Ballinasloe, the townland is located on the south-west side of the town and incorporates remnants of the 17th and 18th century landed estate held by the Trench family within this townland. These lands were formerly held by the Tullys and prior to that the Kellys.

The history of Ballinasloe is much older than the name of the town itself. Originally known as Dunlo, the town has been known by its present name since as early as the fifteenth century in Irish - Béal Átha na Slua or the "Mouth of the Ford of the Hosts" - however, gives a clear indication why the town developed. The ford of Ballinasloe over the River Suck was the crossing point for traffic approaching from Athlone and both Irish king and Norman baron found its fortification a necessary link in the defence of Connacht.

In pre-history, this area was reputedly occupied by the Delbhna Nuadat, the Magh SenChineoil and the Fir Bolg. About the fourth century, a new people came and conquered the area, led by Maine Mór, the legendary founder of the Kelly Clan who ruled the kingdom of Hymany for centuries. Maine Mór's military feat over the Fir Bolg was greatly helped by Saint Grellan, who as a consequence became patron saint of Ballinasloe and the Kelly Clan.

There is a strong possibility the church and graveyard at Garbally Demesne are linked to St. Grellan given the townland immediately west is known as Tobergrellan, the holy well (GA087:212) linked to St. Grellan is located 2.1Km west of the church and graveyard site in Garbally Demesne. Garbally Demesne is located within the parish of Kilclooney and the main church linked to the early settlement of St. Grellan today is located in the townland of Kilclooney 2.1km north-west of the site.

The cemetery itself may not necessarily have an ecclesiastical connection and may be more likely to form part of a medieval secular cemetery as has been observed during the excavation of many previously unknown enclosure/cemetery sites over the past two decades (O'Sullivan *et. al.*, 2008, 174-184).

The strategic importance of the Ballinasloe area was recognised by Turloch O'Connor, who in 1120 built a bridge over the River Suck. In 1124, a castle was added which was located where St Michael's Church now stands. When they arrived in the area, the Normans erected a castle at Suicín, now known as Creagh. The Norman influence was weak, however, and the O'Kelly family of Clonmacnoon dominated the area until the seventeenth century. They resided at Tuaim Sruthra, now the townland of Ashford. It is also possible that the O'Kellys built the castle, now known as Ballinasloe Castle and located on River Street.

Garbally Demesne and the Tully Family

Thanks to the very comprehensive research of Donal G. Burke on the Tully family of east Galway there are some accounts of the history of Garbally Demesne which was owned by this family through much of the 16th and 17th centuries before it was confiscated and acquired by the Trench family.

Of Gaelic origin and based at an early period about the later County Roscommon, MacTully was recorded by a near contemporary as the physician of Cathal crobhdhearg O Connor and present at his inauguration as king of Connacht about the beginning of the thirteenth century. Records later indicate that Mahe McTully was seated at Garowally (modern townland of Garbally demesne), parish of Kilcloony in 1574 on lands claimed by the Church (Nolan 1900-1901). The family lands in the early seventeenth century lay about the parishes of Kilcloony and Creagh on either side of the River Suck, about which the modern provincial town of Ballinasloe would later develop.

...Kyvas Tully, seated at Garbally in the parish of Kilcloony in east Galway embraced Protestantism and in 1601 was appointed Protestant Dean of Clonfert. ... Kyvas served as dean at a time when there were few within the diocese of Clonfert who embraced Protestantism but he was noted at the Regal Visitation of the diocese in 1615 for having 'a house in good repair and his hospitality there is commended by the testimony of many'.

Miagh Tully of Garvally (recte: Garbally) in Co. Galway, gentleman' held one cartron of Garvally, a fourth part of a cartron of Kealraghle (ie. 'Caltreleagh', the modern townlands of Deerpark and Eskerroe) and a fifth part of a cartron of Meakny, all in the parish of Kilcloony in 1618 (Cal. Pat. 16 James I, p. 417). No mention is made at that time to a tower house or castle at Garbally.

About the time of the Cromwellian land redistributions in the late 1650s Frederick Trench, a Protestant of Huguenot origin, appears to have acquired an interest through mortgage on lands held by the Tully family in the parish of Kilclooney. About 1661 or 1669 Frederick Trench died and was succeeded by his son, also named Frederick.

Trench Family of Garbally Demesne/Ballinasloe and Battle of Aughrim

In 1691 Ballinasloe and Aughrim took centre stage during a battle for the crown of England. The battle of Aughrim was fought between Jacobite and Williamite forces on 30th June 1691 and it was the bloodiest battle ever fought on Irish soil with up to 7000 soldiers killed. It was bloody and it was decisive: after the battle the city of Galway surrendered without a fight and the Jacobite's main army in Limerick surrendered shortly afterwards.

As Protestants and Huguenots the Trenches supported the Williamites during the Battle of Aughrim. Family memoirs record that a map of the Jacobite position at Aughrim was given to the Williamite General Ginkel and that the house at Garbally was thrown open to King William's army and was used as a field hospital (Clancarty 1874). The Rev John Trench, a brother of Frederick, was active on the Williamite side and it is said that he contributed the heel of his boot in the effort to raise the gun which was to kill the Jacobite General St Ruth (Egan 1960, 108).

The third Frederick Trench succeeded his father in 1704 (Egan 1960, 133) and he became one of the most powerful men in Co. Galway. He acted as High Sheriff of the county from 1703 and became one of the knights of the shire, and therefore the acting member of Parliament for the area. He also added to his estate: in theory the Act of Settlement after the Cromwellian confiscations set aside the barony of Clonmacowen for transplanter from Carlow, Waterford and Limerick. In reality one major grant was made to William Spenser whose son Nathaniel sold his interest to the third Frederick Trench in 1716 (Egan 1960, 94). The third Frederick Trench was succeeded by his son, Richard Trench, in 1752.

In the early part of the 19th century the Trench Family commissioned the English architect, Thomas Cundy I, to rebuild Garbally House, the family seat, after an older house on the site was burned down in 1798. Cundy first exhibited at the Royal Academy in 1795 and became a successful country house architect from c. 1807 (Placzek 1982, 482). In conjunction with the rebuilding of Garbally the cartographic evidence suggests that the Trench family also built Mackney House at the end of the 18th century (Kelly 2004). Mackney House and grounds also underwent a period of extensive development during the early 17th century. Lewis in his Topographical Dictionary of 1837 references the estate of Mackney as one of the principal houses in Ballinasloe and it is listed as the residence of Charles le Poer Trench who was brother to Richard, Earl of Clancarty, and acted as his agent.

The responsibilities of estate ownership involved fostering agricultural and industrial modernisation, hoping to improve conditions for the people who lived and worked on the estate as well as increase revenues from the estate. Ballinasloe was developed largely under the auspices of the Trench family. For example, sometime around 1750 Frederick Trench was advertising and giving active encouragement for the development of a linen or woollen industry. Plots were offered along with accommodation and additional farming land (Egan 1960, 134-5). The Trench family also encouraged the Ballinasloe fair as a profitable business. This annual October livestock fair, which is reputedly the largest such fair in Europe and had a national reputation even in the 19th century, created a large amount of prosperity in the town (Egan 1960, 136).

3.2 Garbally Demesne Archaeological Background

3.2.1 Record of Monuments and Places

The following is a list of all the RMPs within the townland of Garbally Demesne (Figure 2). There are a total of 22 listed monuments within this townland. Of these two are listed as redundant records GA087:084 and GA087:086.

SMR No.	Class	ITM Easting	ITM Northing
GA087-069----	Enclosure	581726	730126
GA087-070----	Enclosure	581816	730080
GA087-071----	Ringfort - rath	582863	729666
GA087-071001-	Ringfort - rath	582928	729616
GA087-072----	Children's burial ground	582909	729352
GA087-073----	Castle - unclassified	583235	730335
GA087-073001-	Monumental structure	0	0
GA087-073002-	Well	0	0
GA087-074----	Country house	583384	730438
GA087-075----	Icehouse	583276	730572
GA087-076----	Crannog	583359	730997
GA087-077----	Crannog	583475	730998
GA087-078----	Earthwork	583586	730956
GA087-079----	Burial ground	583934	731508
GA087-080----	Tunnel	583184	730713
GA087-081----	Fish-pond	582496	731065
GA087-082----	Church	581781	730644
GA087-083----	Church	584075	730690
GA087-083001-	Graveyard	584075	730690
GA087-084----	Redundant record	0	0
GA087-085----	School	584687	730964
GA087-086----	Redundant record	0	0

The monuments listed in the Record of Monuments Places (RMP) and the nature of previously identified archaeological sites clearly demonstrate that the surrounding landscape is made up of different periods of both historic and prehistoric activity and the features within the modern landscape serve as reminders and indicators of past land use practices and cultural changes.

There are seven sites which are linked to settlement activity in the early medieval period ranging from c. 400 – 1000 AD, these site types include enclosures, ringfort-raths and crannogs. Crannogs can often be used over a long period of time and are often associated with high status activity.

Six of the listed monuments in Garbally Demesne date to the 18th and 19th century and are linked to the Garbally Estate landscape formerly owned by the Trench family or to the 18th/early 19th century development of Ballinasloe town. GA087:074 Country House and associated demesne features such as GA087:075 Icehouse, GA087:080 Tunnel, GA087:081 Fish Pond, GA087:073001 and GA087:073002 Monumental Structure (Obelisk) and well are all monuments dating to the Trench estate development in the 18th and 19th century.

GA087:073002 is meant to be on the location of an earlier castle GA087: 073. There is very little information on when this castle was built or demolished. The castle is reputed to have been linked to the O'Kellys but may have been built during the time of Miagh Tully of Garvally, however there is no mention of it in 1618 (in the Calendar of the Patent Rolls of the Chancery of Ireland, 1800, I James I). Records indicate that Frederick Trench purchased Garbally castle and lands (before 1703), on the western outskirts of Ballinalsoe, from a Colonel Carey Dillon. ...Trench ownership of Garbally castle was confirmed by patent from Charles II (Egan 1960, 107).

3.2.2 Archaeological Background for St. Josephs Place

There are two recorded archaeological sites originally located to the north-east of St. Josephs Place GA087-083 Church and GA087-083001 Graveyard. The location for this site was altered to the present location based on recommendations from findings during monitoring and testing under Licence No. 11E00242. The following records linked to this site were obtained from files held in Archaeological Survey Archives and extract from museum publication was taken directly from Topographical file held for Garbally Demesne in National Museum of Ireland.

Archaeological Survey of Ireland File for GA087-083

Townland: Garbally Demesne

Barony: Clonmacnowen

Parish: Kilcloony

Type: Church

Class: Medieval

Period: 10th century

The attached reference places the site to the West of Portiuncla Hospital. This area now contains a housing estate known as St. Josephs Terrace. All trace of this site and its associated graveyard (Garbally Demesne 19) has been obscured by the construction of the above mentioned estate. Unfortunately the area was not scientifically excavated before construction took place, consequently further information concerning this site is unlikely to be forthcoming.

Reverend Egan in his thorough historical study of the area *The Parish of Ballinasloe: Its History from the Earliest Times to the Present Day* (1960:15) writes the following:

There is some evidence of a church in Dunlo in Kilcloony Parish in the 10th century the high church yard or infants burial ground was the 17th century name, since forgotten 'of a quarter of land belonging to the towne of Dunlow'. In Pettys Atlas it is placed somewhat west of the town of Ballinasloe, which would locate its position within the Garbally Demesne. No noticeable trace of a burial ground appeared there and no memory of its existence survived, but in 1955 in excavations preparatory to the building of St. Josephs Terrace west of Portiuncula Hospital large quantities of adult human remains were unearthed. Associated finds included a bronze harp-peg and pin and a bone spindle whorl pointed to the existence of a Christian Burial ground and therefore a church dating to the 9th or 10th century.

Extract from Topographical Files National Museum of Ireland

Cahill M. & Sikora M. 2012 *Breaking Ground, finding graves – reports on the excavations of burials by the National Museum of Ireland, 1927-2006 Volume 2*, p.453-454.

In March 1955 human remains were discovered during the digging of foundations for a housing development at Garbally Demesne, near Ballinasloe, Co. Galway. The discovery was reported to the museum by P.J. Hartnett and investigated by Joseph Raftery. A number of burials were still visible in situ at the time of Rafterys visit and lay at a depth of 0.09-0.30m below ground level in a layer of dark earth. Some of the grave cuts were visible in the section and there did not appear to be any stone lining in any of the cuts, although the layer contained a number of large stone inclusions. According to reports, all of the burials were apparently extended and supine, aligned west/east.

A bronze pin from a ringed pin (1955:29) of the type usually associated with spiral ringheads was found beside one of the skulls, while a worked bronze bar which may be an unfinished pin shaft (1955:30) was discovered beside another. An iron spike (1955:31) was also found near one of the burials. Spiral ring-headed pins can be dated to the 6th-7th centuries.

3.3 Cartography Review

Although mentioned in the Archaeological Survey files as being 'In Pettys Atlas it is placed somewhat west of the town of Ballinasloe' no evidence for the site was located on Pettys 1670 Down Survey map (see Fig. 6). The site is not marked on any of the maps examined. The First Edition Ordnance Survey 25 and 6 inch maps (see Figs. 7 & 8) show the site location set within a demesne landscape and there is no indication of any church or graveyard.

3.4 Previous Excavations in the Vicinity

A search of the excavations database (www.excavations.ie) for Ballinasloe and nearby townlands was carried out and several entries were found. This database covers summary accounts of all the excavations carried out in Ireland – North and South – from 1970 to the present. The following are extracts from the excavations database:

- Monitoring (99E0509) was carried out in advance of development for four semi-detached houses beside the 18th century and possible medieval parish church at Creagh (GA088:006). Some modern pottery and glass fragments were recovered, but there were no features of archaeological significance. Monitoring (99E0265) was carried out in advance of development of an IDA business park on the Roscommon road close to recorded sites GA074A:006 (rath/cashel), GA088:008 (church/chapel) and GA088:0066 (church site). No archaeological features were uncovered.
- Monitoring of the Ballinasloe Regional Water Supply Scheme (00E0834) involved the installation of a pipeline 13km in length running from a new reservoir at Redmount Hill to the south-east of Laurancetown to Stapletons Cross south of Ballinasloe. The trench for the pipeline measured on average 0.5–1.5m wide by 1.5–2m deep, and was located entirely along the line of the existing road. Further work was carried out on the site of the reservoir at Redmount Hill, a water-tower at Sheepwalk and at pumping stations at Laurancetown and Ballinure. Monitoring of both the trenching and topsoil-stripping throughout the course of the scheme revealed nothing of archaeological significance.

(Extract below from www.excavations.ie excavation summary compiled by Declan Moore):

- An excavation (01E1180ext.) was carried out at Creagh Junction in Ballinasloe, Co. Galway in 2002. Excavation was carried out in advance of improvement of the junction between the R357 Ballinasloe– Athleague Road and the N6 Galway–Dublin Road. The site was between St Brigid's Hospital, formerly the Ballinasloe and District Lunatic Asylum, and the ruined Creagh church on the eastern side of the Athleague Road, in an area that was formerly part of the hospital grounds. During initial groundworks in 2001, human skeletal remains were uncovered, and, as a result, testing was carried out (Excavations 2001, No. 488). A total of 71 grave-cuts were observed, and a further 21 possible inhumations were evident on-site or in the section faces of trenches already dug. Galway County Council redesigned the proposed development in order to avoid the known burials.

During construction works associated with the road in August 2002, a number of burial cuts and inhumations were exposed to the west of the area where the main concentration of skeletal remains had been observed during earlier testing. After discussion with Dúchas, and given the advanced stage of construction works, full excavation of a strip at the eastern side of the road was undertaken. Twelve skeletons in varying states of preservation were excavated. It is clear from the plan of the cuts that the graves formed two regular north–south rows. Only one phase of burials was apparent.

White-glazed and decorated 19th- or early 20th-century ceramic was found in several of the grave fills, but there is little evidence to date the graves more accurately. If the above hypothesis concerning the former curtilage of Creagh church is correct, it is reasonable to assume that the later phase of burials associated with the hospital, or the Connaught Asylum as it was then, began where the burials already existed and extended westward and northward from this point. The burials excavated in this phase of work would therefore be among the latest on-site.

... A 19th-century map of the hospital and grounds, supplied by the hospital authorities, shows an area marked as ‘old burial-ground’ at the south-eastern corner of the grounds. ... The map is thought to have been drawn in the 1880s.

... Despite the generally good bone preservation, little was found of the coffin wood, reflecting the generally dry conditions across the site. Nails were found in abundance, but no fixtures, fittings, plates or handles were uncovered, all evidence pointing to simple Christian burials. It is suggested that the skeletons excavated were those of residents of the asylum, buried at some time in the later 19th or early 20th century.

- Monitoring (06E0656 & 06E0733) of broadband installation was undertaken over a period of five months from August 2006. The work involved the excavation of a trench 0.55–0.6m wide and 0.8m deep to facilitate the installation of broadband cables in the area of Ballinasloe town. The trenches were excavated in the streets surrounding the town centre and outlying roadways. A fragment of a cut stone recovered from a trench excavated close to the town centre was the only find of archaeological significance. The stratigraphy throughout indicated previous disturbance, with pipes, cables and services encountered throughout.

- Monitoring (15E0093) of Ballinasloe Watermain Rehabilitation was undertaken during 2015. The scheme involved the laying of 2km of watermain and 2km of sewer pipes in the western part of Ballinasloe, west of the river. Works took place in the townlands of Dunlo, Townparks, Brackernagh (Clancarty) and Garbally Demesne, almost all were located in the existing road network. Monitoring of pipe laying was undertaken sporadically between April and September 2015 along four roads and in one greenfield location. No archaeological features or deposits were encountered.

Several sites were discovered and excavated in the vicinity of Ballinasloe in advance of the N6 Galway–Ballinasloe road scheme in 2005. This scheme consisted of a dual carriageway, 56km in length, extending from the east side of Galway city, at Doughiska, to the east side of Ballinasloe, at Beagh Brabazon, in Co. Roscommon.

Partial excavation of two ringforts was undertaken at Loughbown to the south-west of Ballinasloe town. Partial excavation of another ringfort took place at Mackney, also to the south-west of the town, along with a second site comprising Bronze Age pits, post-holes and stake-holes. Two burnt mounds were also identified several kilometers south-west in the townlands of Urraghry and Barnacragh (O’Sullivan 2014).

4.0 Archaeological Excavation

Background

Advance archaeological excavation was along the route of proposed pipeline within the area of Recorded Monuments GA087-083 Church & GA087-083001 Graveyard (see Figs 1 & 2). This site was previously destroyed and levelled during the construction of a housing development at St. Josephs Place, in the townland of Garbally Demesne, Ballinasloe in the 1950s.

The excavation work was carried out under the supervision of Angela Wallace and Bernadette Doherty of Atlantic Archaeology on behalf of SIAC Construction in response to conditions of contract stipulated by Irish Water/Galway County Council. Archaeological condition for excavation at St. Josephs Place was based on results of a previous programme of archaeological monitoring of slit trenches and subsequent testing carried out along the route of proposed pipelines under Licence No.11E0242. A bone of a juvenile was identified during monitoring of slit trenches. Further *in situ* and disarticulated human remains were identified during archaeological testing (Licence No.11E0242ext.).

As a result design of pipeline was altered to avoid main areas where human remains were recovered around the north-east of central green within St. Josephs Place. Area of excavation under current Licence No. 18E0423 was focused on a narrow laneway within the north-east area of St. Josephs Place. Two test trenches were previously excavated along this laneway under Licence No.11E0242 (see Fig. 3). No archaeological material was encountered in test trench 8 at the south-east end of laneway, some rich soft brown clay silt with animal bone inclusions was encountered in Test Trench 9 at the north-east end of laneway. This was interpreted as possibly part of an enclosure ditch defining the limit of previous church and graveyard.

Results of Excavation

The area of excavation measured 94m in length x 1.0 -1.2m in width (see Figs. 4 & 5), depth ranged from 0.50-1.2m below present ground level. Length of excavation was opened in four different sections to minimise disruption to local residents. Depth required for laying pipe was 1.2m so excavation did not exceed this depth. Initially c.40m long x 1.0m width of pipe trench was opened at the SE end of laneway. Tar and road fill layers were removed using a mini digger to a depth of 0.30m. Five separate small test pits were then hand excavated at intervals across this stretch but no archaeological finds, features or deposits were discovered (see Plates 1 & 2). Natural subsoil horizon was encountered at depths of 0.50-0.60m along this stretch. The remaining material between test pits was removed using machine under archaeological supervision and all soil was scanned using a metal detector. No archaeological finds or deposits were discovered along this stretch (see Fig. 9).

An additional 10m was then opened further north where laneway intersects with a lane to the west, no archaeological material was encountered until the northern 2m of this trench at ITM 584109, 730714. Archaeological deposits then extended from this location to the northern end of the laneway i.e. from 48m – 94m, total distance of 46m on the western side of the trench (see Fig. 9) Deposits extended to over 1.2m in depth across most of the trench, apart from at the northern end where they appeared to rise up to 0.60m below present ground level. Deposits were not fully excavated beyond 1.2m as this is the depth required for the pipe and also it was not feasible from a safety or practical perspective as trench was too narrow. It would have had to be widened considerably and stepped to allow excavation at any greater depth.

At ITM 584109, 730714 and north of it, once upper layers of road material were removed to a depth of 0.30m **C005** a yellowish compact sandy silt was apparent, this overlay **C006**, a concentration of sub-angular stone rubble within **C007**, a brown silty sand (see Fig.10). C006 and C007 measured 0.16 – 0.21m in depth within the trench and appeared to continue northwards. The stones varied in size and were sub-angular in shape. The layers C006 and C007 were interpreted as archaeological layers as there were fragments of animal and human bone within them and C007 had the appearance and texture of a ditch fill. Further analysis revealed two small juvenile cranial fragments were located in this layer, total weight of 0.8g (see Appendix 3).

The trench was extended another 18m further north. As elsewhere the upper road fill layers extended to 0.30m in depth and were removed by an excavator with a toothless bucket. The trench was then cleaned down by hand, a number of possible features were identified (see Fig. 11). Very small fragments of disarticulated bone (possible human remains) were identified at various locations. This layer initially excavated with caution as concentrations of stone were interpreted as possible graves. The museum and Ballinasloe Garda Station were notified as per museum recommendations when dealing with human remains.

A Pre-ex plan (see Fig. 11) was prepared with possible features/stone concentrations and bones exposed (initially identified as possible skeletal remains numbered Samples 1 – 7). Subsequent analysis revealed most of the bone samples to be faunal remains linked primarily to cattle, sheep, goat and pig, with some horse, rabbit and dog bones also identified (refer Appendix 4).

As excavation progressed across this layer it became apparent that bone concentrations at the surface did not form part of complete skeletons but were very small fragments scattered amongst random concentrations of stony material within a soft brown silty sand **C007/C011**. Fourteen small fragments, possibly juvenile were identified from C011, four juvenile teeth and several small possible mandible fragments, a total of 2 grams. One adult femoral fragment was also identified from C11 weighing 52g (refer Appendix 3).

As trench was excavated further to the north **C010/C18**, (similar to/same as C006) stone within a dark clayey sandy silt fill became evident and contained random small fragmentary human skeletal remains (1 adult cranium fragment, 1 juvenile cranial fragment, and a possible juvenile mandible fragment, a total of 5.6g). Excavation continued at intervals removing the fills **C010/C018**, **C011/C019** at various locations within the trench in the form of test pits (see Plates 3 & 4). A single coin of 1689 King James gunmoney was also located within C18 indicating 17th century activity at this spot also (see Plates 8 & 9).

The trench was extended further at northern end with the removal of upper road fills by machine (averaged 0.30m in depth). A pipe was exposed along the eastern edge of the trench and disturbance from excavations associated with this is evident with areas of yellow grey gravelly sand (**C012, 014, 017**). These overlay **C018** dark brown sandy silt with moderate stone and animal bone (see Figs. 11, 13 & 14).

An area with a high concentration of stone was revealed (**C019**). It measured 4m in length and consisted of angular and sub-angular stone within dark brown silty sand (see Plate 4 & Fig. 12). This also contained animal and human bone. Similar to **C011** to the south, it had the appearance of a possible ditch fill. The concentration of stone and its location may suggest collapse of possible revetment on the bank of a ditch. The cut of a possible ditch appeared within the section at this location.

Feature C21 Posthole/Stone-lined pit

A possible substantial post hole/pit was uncovered during investigation of depth of ditch fill at 1.36m below the road surface. C21 consisted of a sub-circular feature with sub-angular stones (packing stones?) surrounding it at the edge (see Plate 5). Diameter 0.45m. Fill appears to consist of dark brown charcoal rich silty clay. Average size of stones at edge was 0.20m in length. Located under C20. Location E 184151.497/N230689.848. reduced Level 51.175. Due to its depth this was preserved *in situ* and not excavated (see Fig. 15)

Possible Ditch Cut

A sharp sloping cut within the east facing section (see Figs. 13 & 14) was revealed. This was only followed to a depth of 1.2m below the road surface (maximum depth required for proposed pipe) or its sloping side/base within the open trench. The possible ditch cut within the west facing section suggests a gradual sloping ditch, though this could be misinterpreted due to the angle of the trench through the feature.

Top of cut gradual to south. Slopes for 0.66m from south to north within the southern section of the trench. Base of the cut appears V shaped where it was exposed.

C10/C18, C11/C19, C20, C24 are all demonstrative of possible ditch fills; containing angular and sub-angular stone (see Plates 6 & 7), animal bone, and very occasional charcoal. The possible human skeletal remains are demonstrative of displaced burials in the vicinity. Note these were evident only within the upper layers C10/C18 and C11/C19.

Post-excavation synthesis and analysis suggests there is no definitive evidence for an enclosing ditch at location of excavation. The narrow nature of the trench, the later disturbance with storm drain on the eastern side of trench and the inclusions of small fragmentary human remains all point to considerable disturbance at this location. The natural subsoil does seem to dip considerably from 0.50m below current ground levels to between 0.80-1.2m + in the central area of excavation (see Fig. 13) and rises up to 0.80m in depth at northern end of trench (see Fig.14), this was interpreted as a ditch cut C23 during excavation but may be due to later disturbance.

The layers C10/C18/C6/C7 are all quite similar, C11/C19 are also similar and basal layers C20, C24 & C25 all have faunal remains included within layers and are quite typical of fills found within early medieval enclosures. There is a strong possibility these layers have been bulldozed or slightly displaced from their original location. The presence of an *in situ* stone setting with charcoal at the base of the trench C21 (unexcavated) suggests lower levels are more likely to be still *in situ* archaeological layers.

5.0 DISCUSSION & CONCLUSIONS

The first 48m of pipe trench at southern end within area of excavation did not have any evidence for archaeological finds, features or layers. The northern stretch of pipe from 48m – 94m, total distance of 46m had evidence for definitive archaeological layers and inclusions on the western side of the trench (see Fig. 9). It was difficult to determine if these were *in situ* or disturbed archaeological layers.

The upper 0.30m of material within trench consisted of road and modern fill material, below this were a series of layers mid-brown sandy silts and clays evident on the western side of the trench. Some disarticulated human bone and frequent inclusions of animal bone were evident within these fills. Human remains were mainly within the upper levels of fill material. Fills extended the entire depth of the trench to 1.2m and continued deeper but were not excavated beyond 1.2m as this was depth required for laying pipe.

Frequent inclusions and concentrations of medium and large angular and rounded stones were evident within these fills. They did not seem to conform to any distinct pattern, these stones may represent collapse material from a drystone boundary wall originally around cemetery site. Given the narrow nature of the trench it was difficult to interpret if mid-brown fills are *in situ*, deposits and inclusions of animal bone are consistent with possibly forming part of an enclosing ditch around a cemetery.

The lack of a clearly defined curvature over the 46m indicates that ditch and bank material was possibly spread out/levelled during the construction of nearby houses. The overall picture is further confused by the later insertion of the pipe on the east side of the trench.

Human remains (20 small fragments) recorded in very small scattered quantities during excavation (60.4g in total) were positively identified by osteoarchaeologist Linda Lynch (refer Appendix 3 for more detail). These remains were 0.30-0.40m below present ground level.

A small fragment of human bone was dated to 1480 +/-30BP or Cal. 530-650AD placing the skeletal remains at the site within the early medieval period, this is in keeping with some of the artefacts recovered by museum staff in the 1950s. The concentration of human remains is far less in this area than findings from testing around the north-east area of central green.

A total of 3.90Kg of animal bone was collected during excavation. A wide range of species (13 in total) were identified, including both domestic and wild animals. The assemblage represents butchery and food waste, reflecting a diet of beef, mutton and pork augmented by occasional venison and small game. The evidence indicates that the non-food domesticates (horse, dog, and cat) were also present at the site. The presence of mainly animal bone within this area indicates it is more likely to be at the edge of the cemetery site, food waste was usually disposed of around the edges or within enclosing ditches of early medieval settlement and cemetery sites (refer Appendix 4 for more detail).

Egan (1960) refers to finds of 'a bronze harp-peg and pin and a bone spindle whorl pointed to the existence of a Christian Burial ground and therefore a church dating to the 9th or 10th century'.

Sikora & Cahill (2012:453) refer to 'A bronze pin from a ringed pin (1955:29) of the type usually associated with spiral ringheads was found beside one of the skulls, while a worked bronze bar which may be an unfinished pin shaft (1955:30) was discovered beside another. An iron spike (1955:31) was also found near one of the burials. Spiral ring-headed pins can be dated to the 6th-7th centuries.'

The finds recorded in the National Museum give a good indication of dating for this cemetery to the 6th-7th centuries, the small fragment of human bone was dated to 1480 +/-30BP or Cal. 530-650AD also suggests primary use of the site within the early medieval period.

The finds recorded by Egan indicate site may also have been in use during the 9th or 10th century. Many early medieval cemetery sites fall within this date range. The presence of the 1689 coin may indicate the site may have continued in use over a longer period of time up to the 17th century or perhaps sporadic later reuse.

Reverend Egans (1960:15) reference to the 'evidence of a church in Dunlo in Kilcloony Parish in the 10th century the high church yard or infants burial ground was the 17th century name, since forgotten ' of a quarter of land belonging to the towne of Dunlow' suggests there is a strong possibility the burial ground in St.Josephs was in use up until the 17th century, perhaps more as a place for the burial of unbaptised infants and children which was evident in human remains recovered. It is common that in later centuries early medieval burial places were re-used for this purpose.

The majority of early medieval ditched enclosures, date to the sixth to ninth centuries AD and we see a significant decline in their use in the tenth century (O'Sullivan and Nicholls, 2011, 65).

The concentration of human remains discovered during excavation of pipe corridor is far less than findings around the north-east area of central green (Licence No. 11E0242). It is common to find large quantities of animal bone within enclosing ditches around early medieval sites. The presence of 3.9Kg of mainly animal bone within this area indicates it is more likely to be at the edge of the cemetery site.

Evidence from museum findings in the 1950s, initial phase of testing and subsequent excavation findings for this project provide strong evidence for medieval human remains and artefacts concentrated mainly around the north-east portion of the green area in the centre of the estate and also in north-west portion of laneway to the rear of green on north-east side (refer Figs. 3 & 9).

It is recommended that any future works within St. Josephs Place be archaeologically assessed in advance in order to minimize impacts on any sub-surface archaeological deposits.

Angela Wallace

Atlantic Archaeology

25th March 2021

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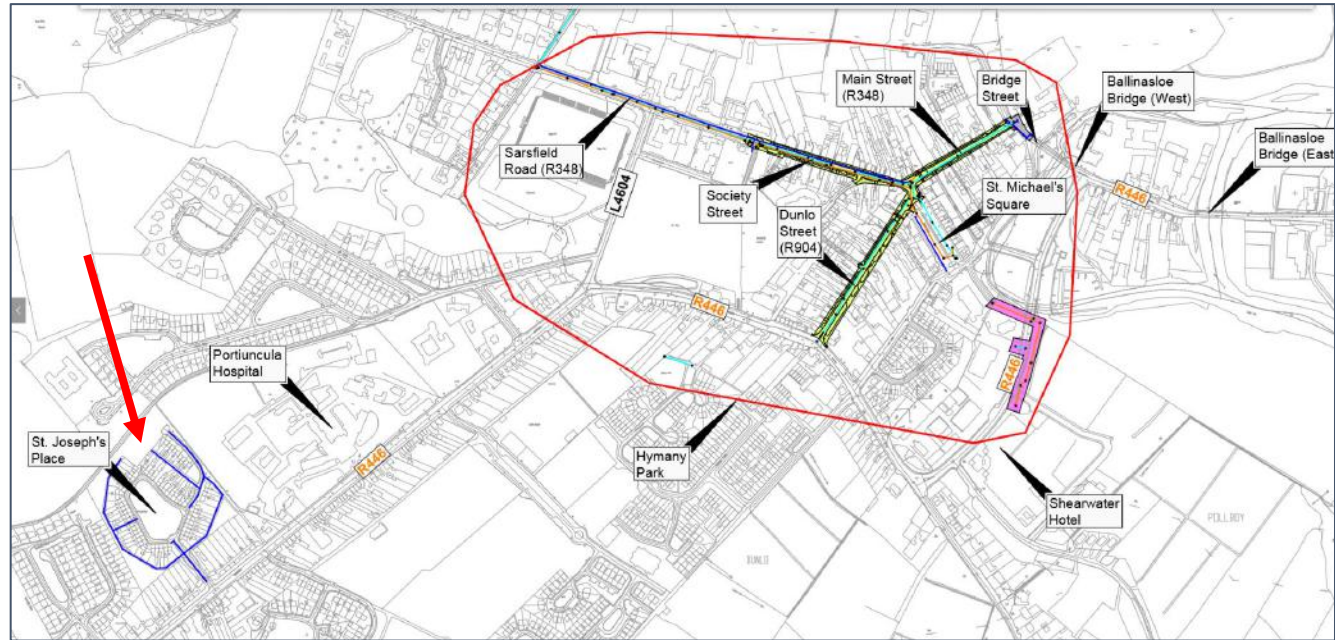


Fig. 1: Site Layout Plan showing location of St. Josephs Place

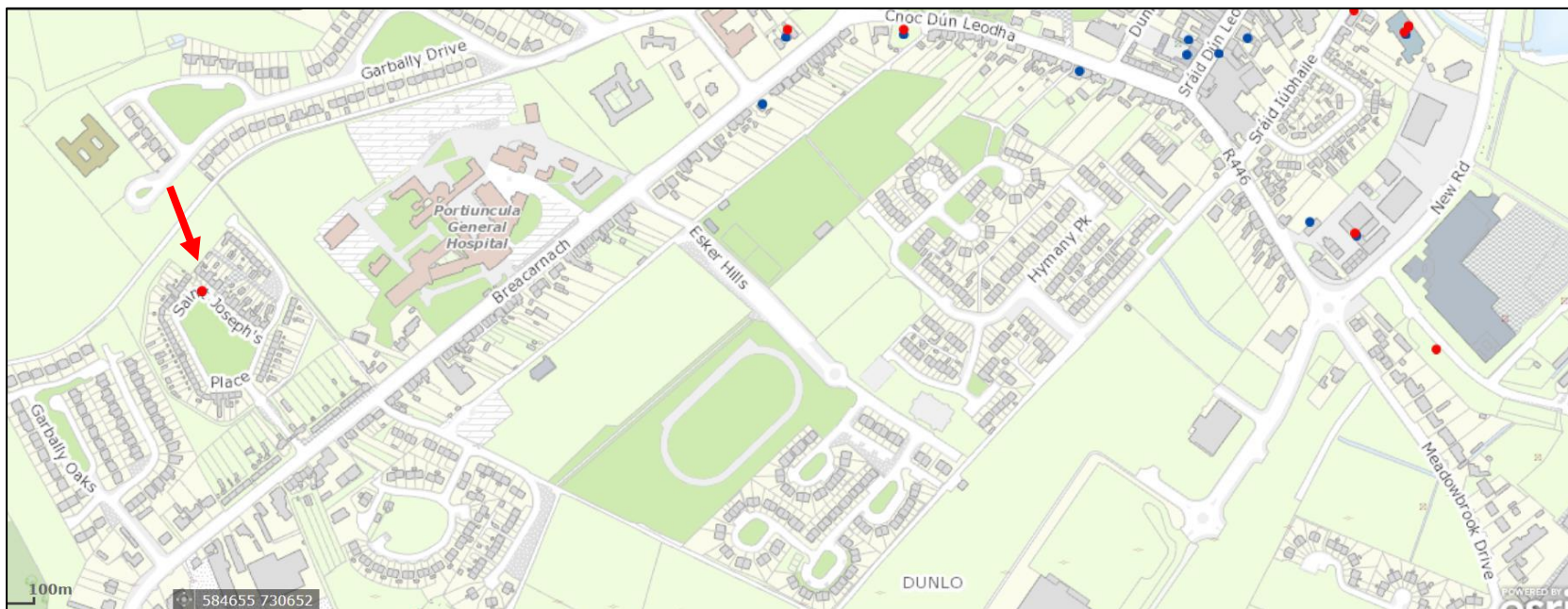


Fig. 2: Extract from Historic Environment Viewer showing location of Recorded Monument GA087-083 in St. Josephs Place to the south-west of town centre.

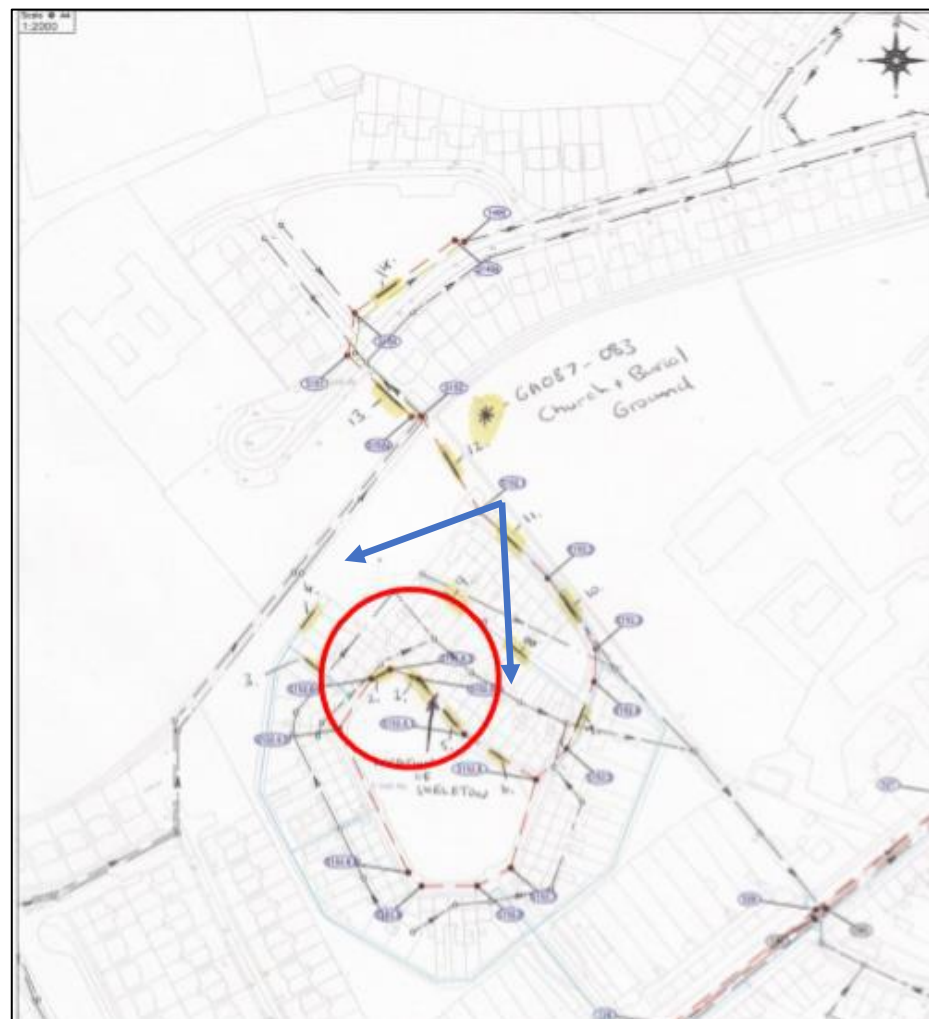


Fig. 3: Projected line of possible cemetery enclosure in red. Original location of GA087-083 marked further to the north-east. Area of Trenches 8 and 9 is where excavation was carried out.

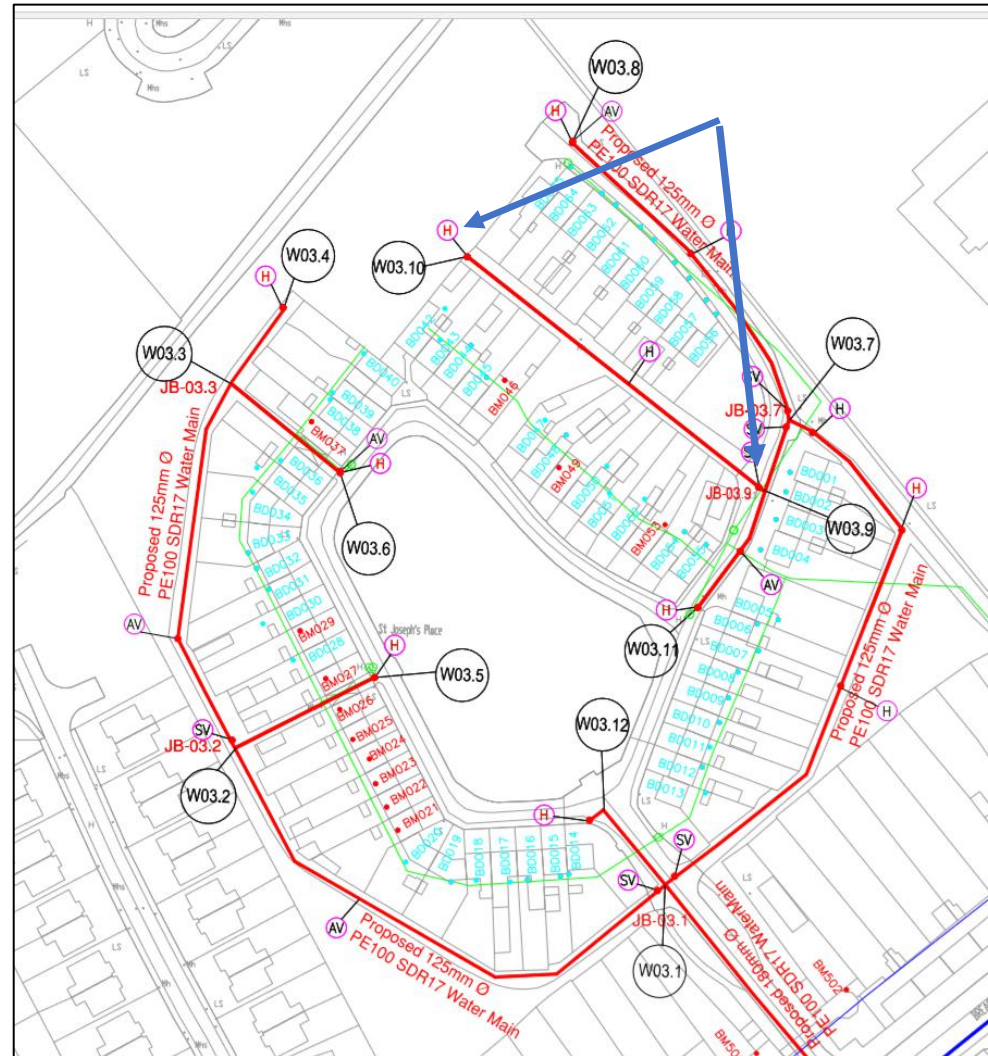


Fig. 4: Area of Excavation between W3.9-W3.10

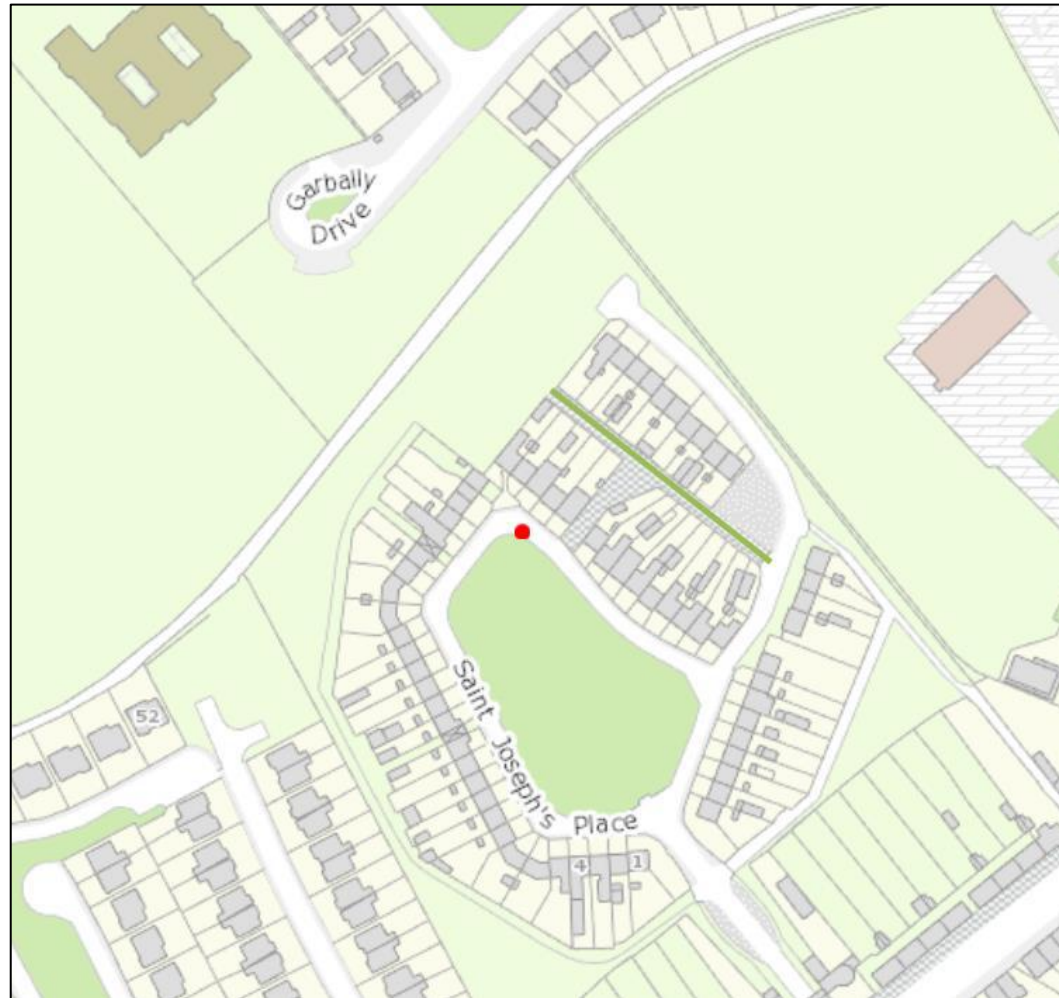


Fig. 5: Area of Excavation between W3.9-W3.10 for pipe trench (green line)

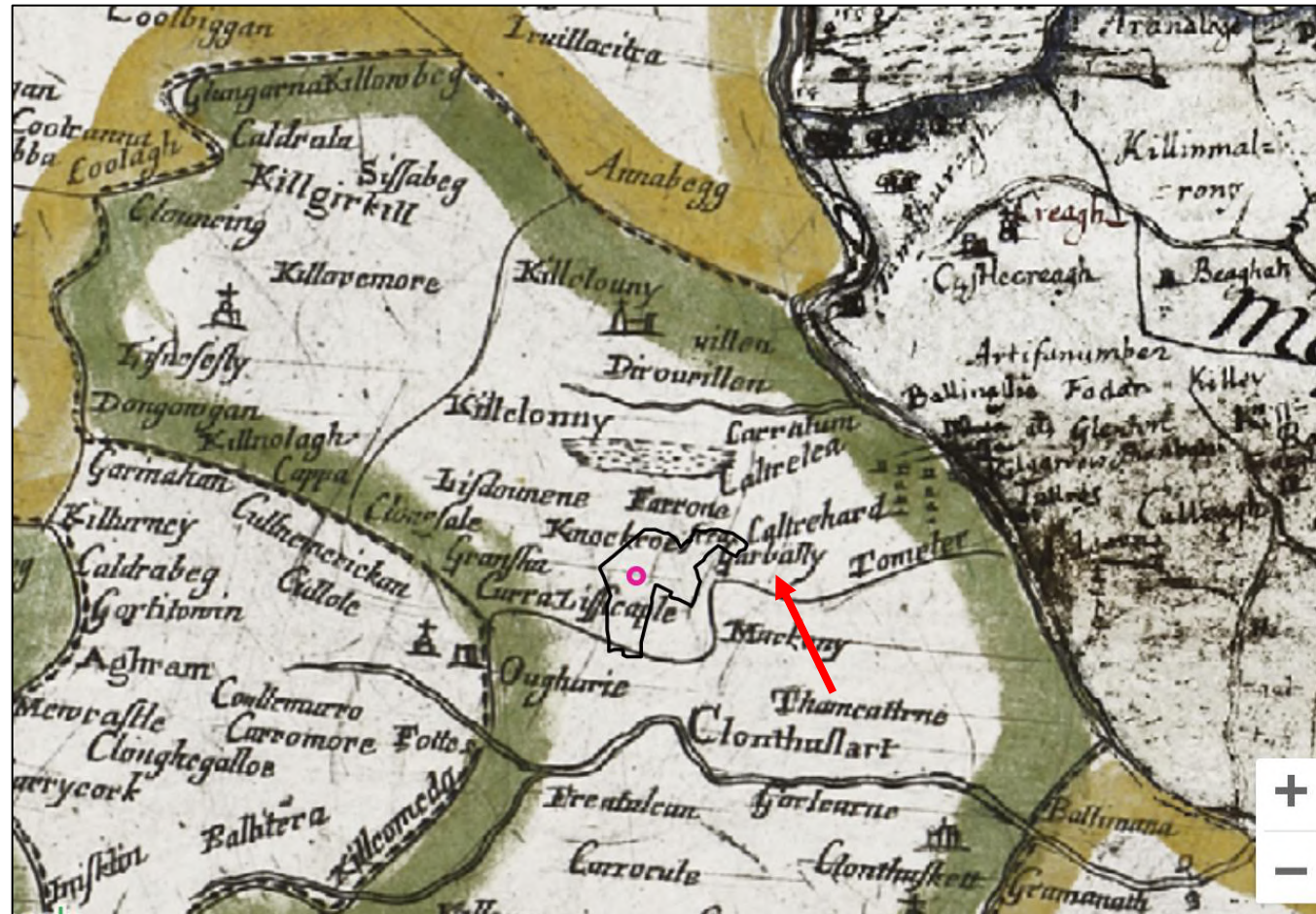


Fig.6: 1670 Down Survey Map showing location of Garbally Demesne and Kilcloony Parish

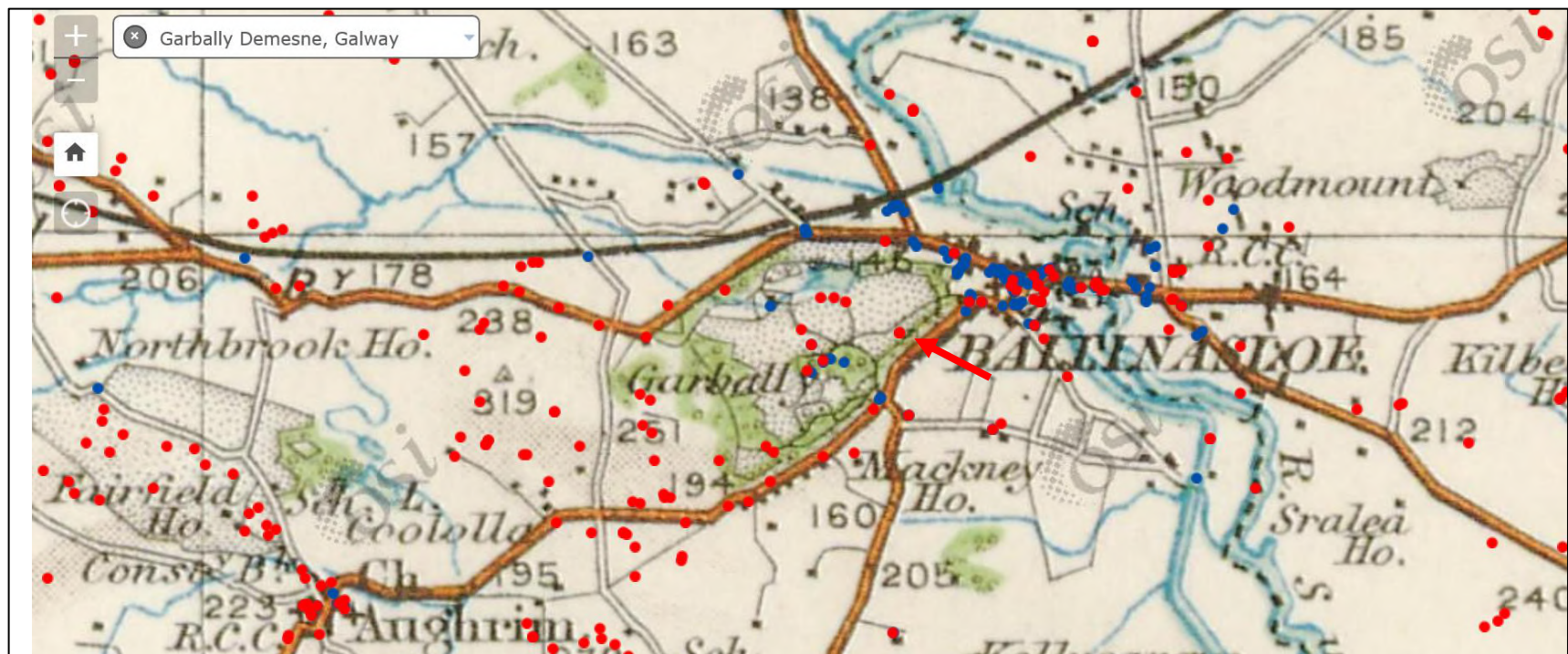


Fig. 7: Extract from Cassini 25 inch map showing location of site within former demesne landscape

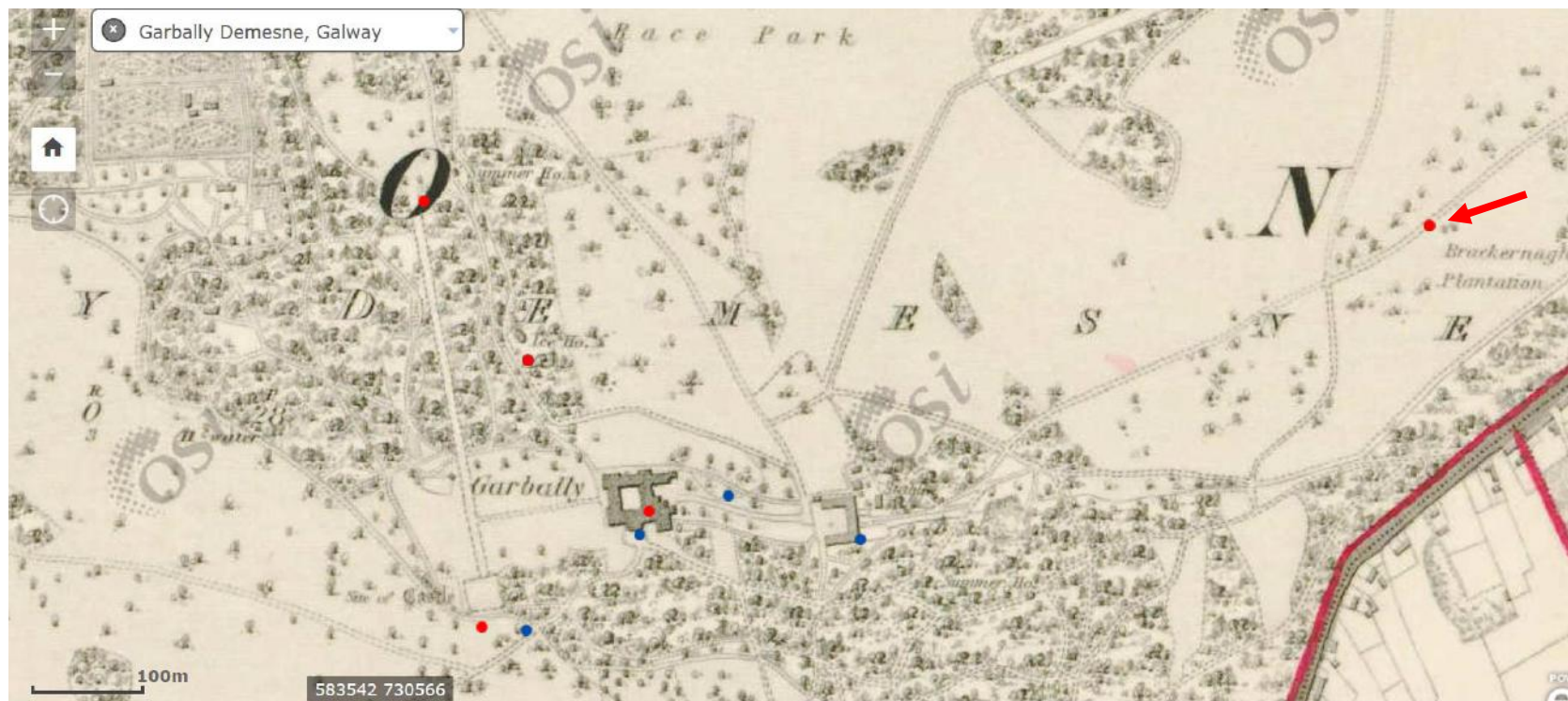


Fig.8: Historic 6 inch map showing location of site within Garbally Demesne landscape.

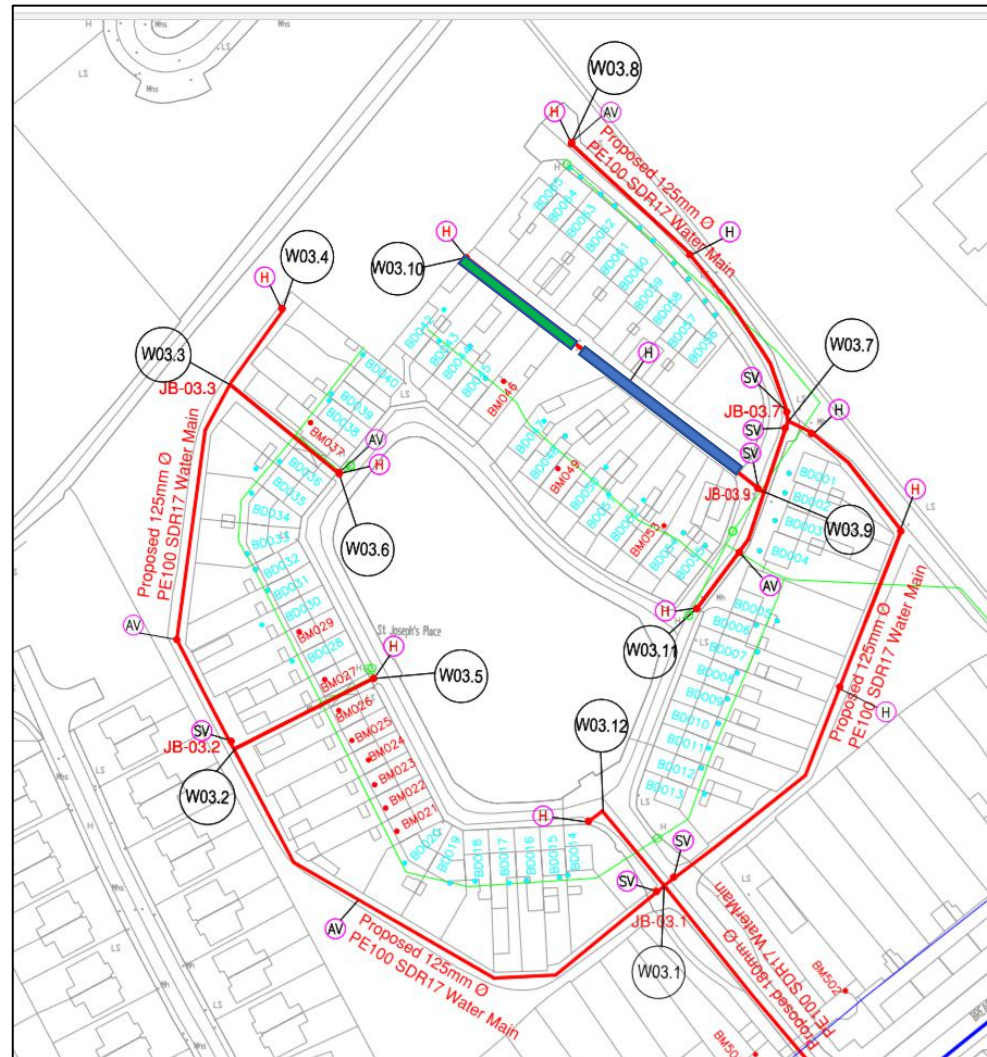


Fig. 9: Area of Excavation between W3.9-W3.10 Blue line indicates where initial investigations took place, trench opened and hand excavated test pits inserted, no archeological layers in this area. Green line indicates trench area where previously disturbed archaeological layers were identified.

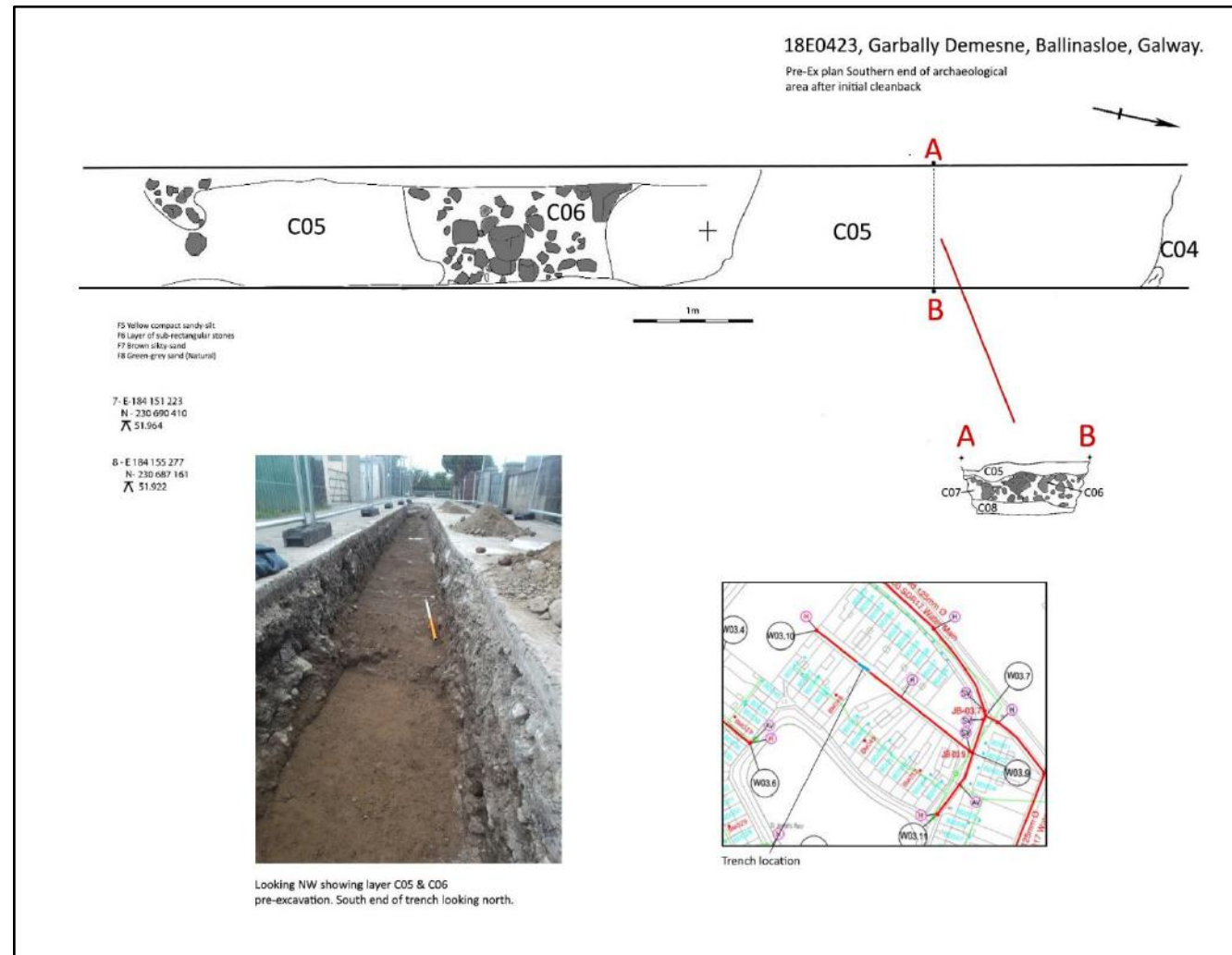


Fig. 10: Pre-Excavation Plan of southern end of trench C04, C05, And C06.

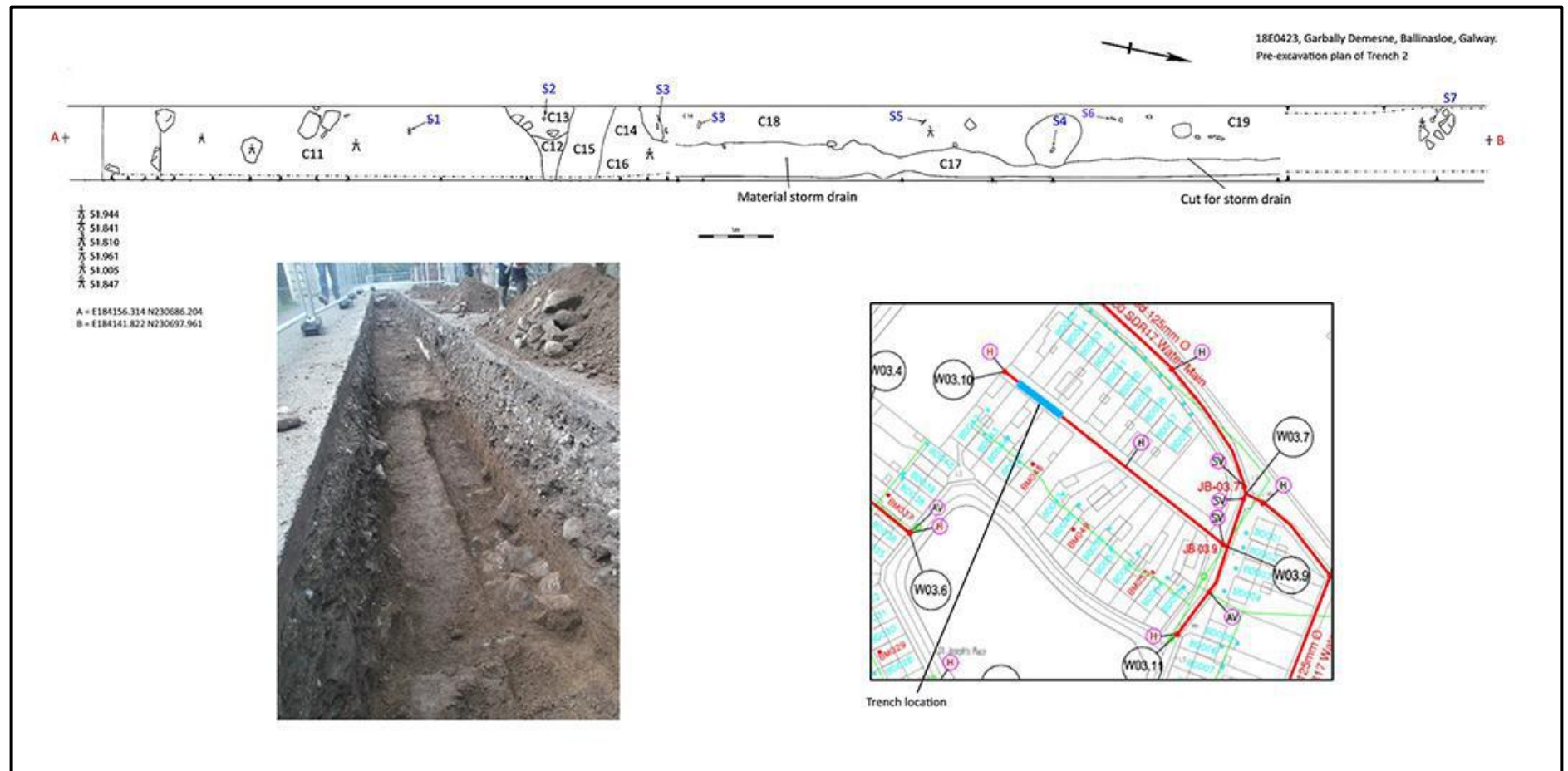


Fig. 11: Pre-excavation Plan of main section of Archaeological Trench showing C11, C12, C13, C14, C15, C16 C17, C18, C19

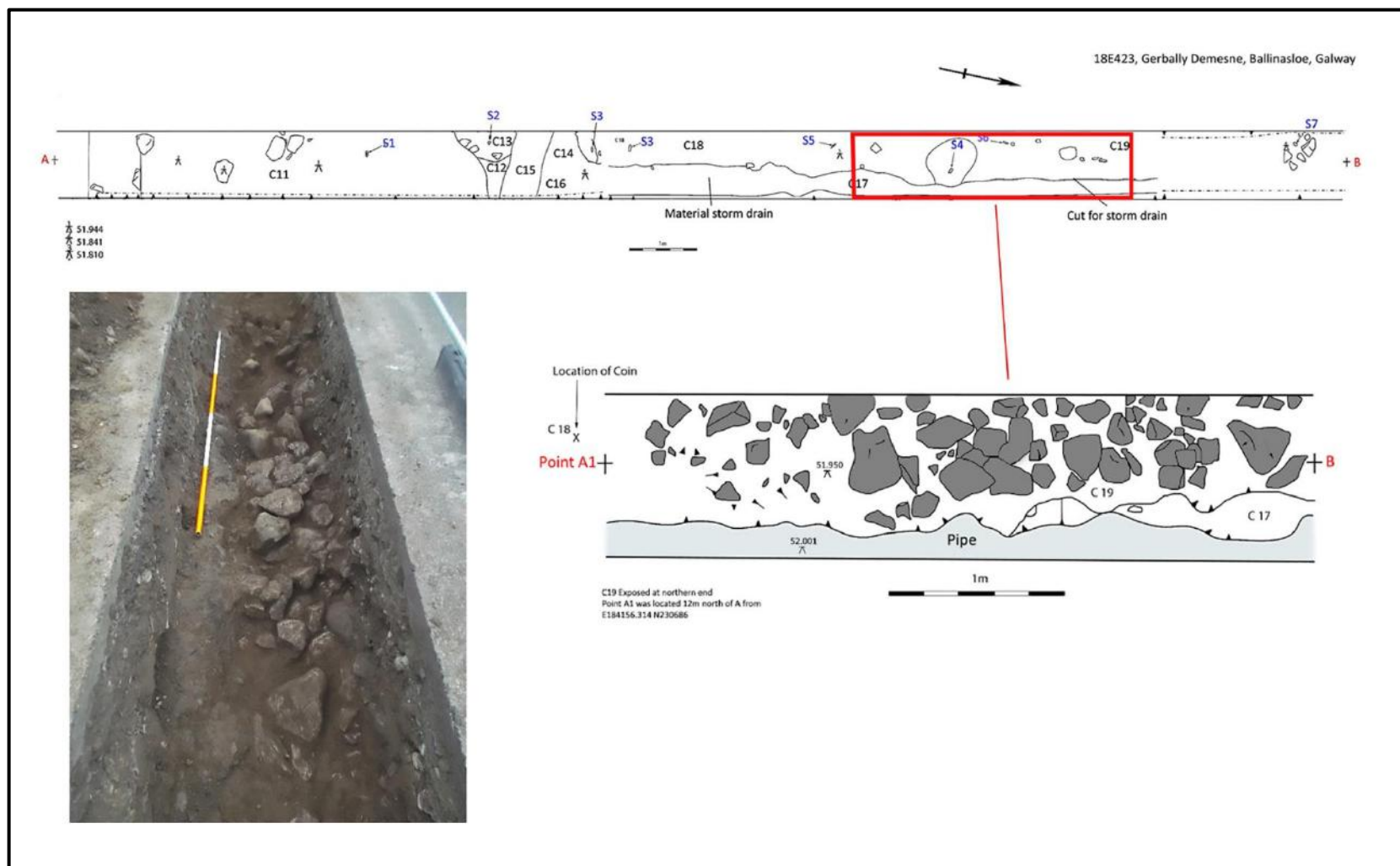
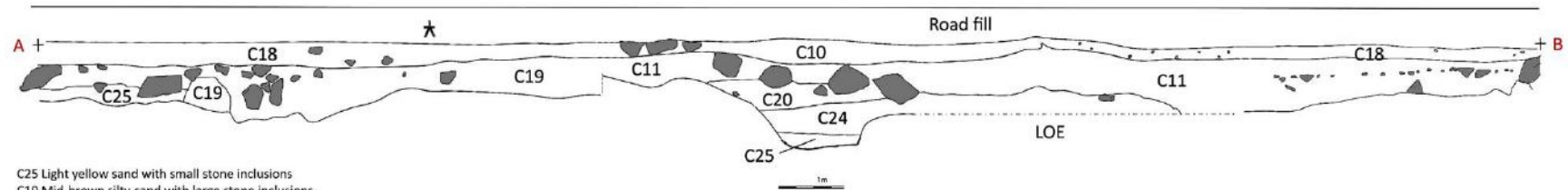
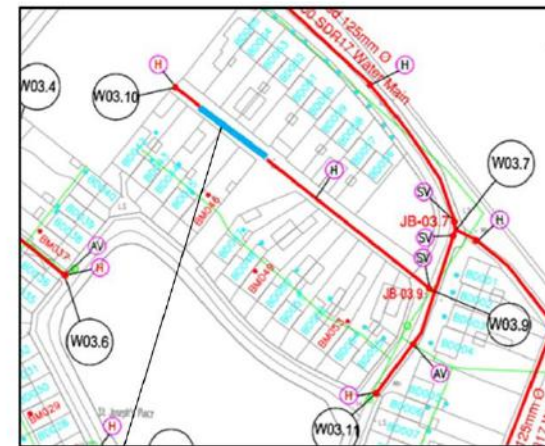


Fig. 12: Plan of C19 stony/rubble layer fully exposed

18E0423, Garbally Demesne, Ballinasloe, Galway
East facing section of Trench 3



C25 Light yellow sand with small stone inclusions
C19 Mid-brown silty-sand with large stone inclusions
C18 Dark-brown mixed clayey-sand stone
Point A - 184154.858/230686.934
★ 52.580



Trench location

Fig. 13: East facing section of main area of archaeological layers within trench

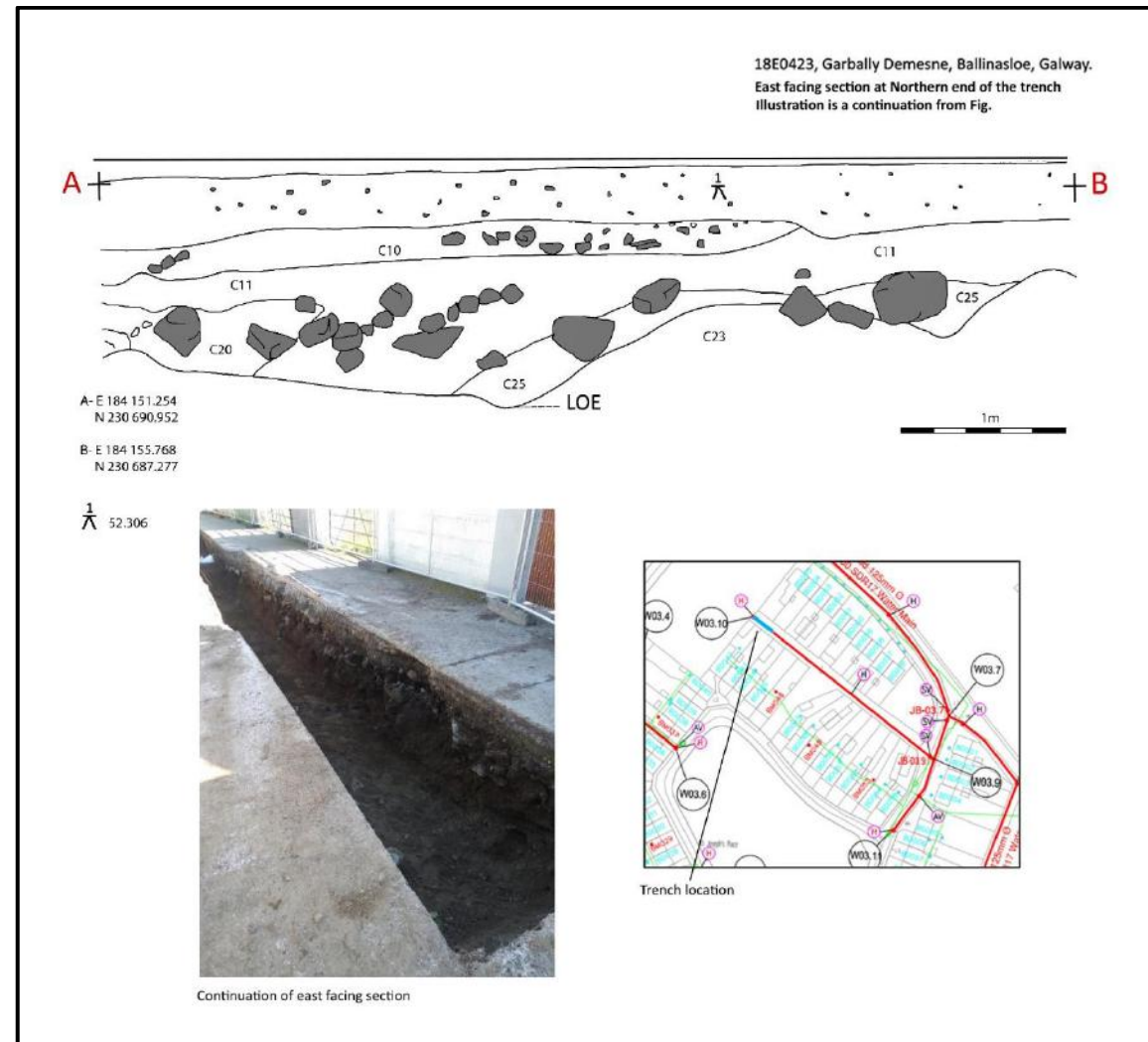


Fig. 14: East facing section of archaeological layers at northern end of the trench

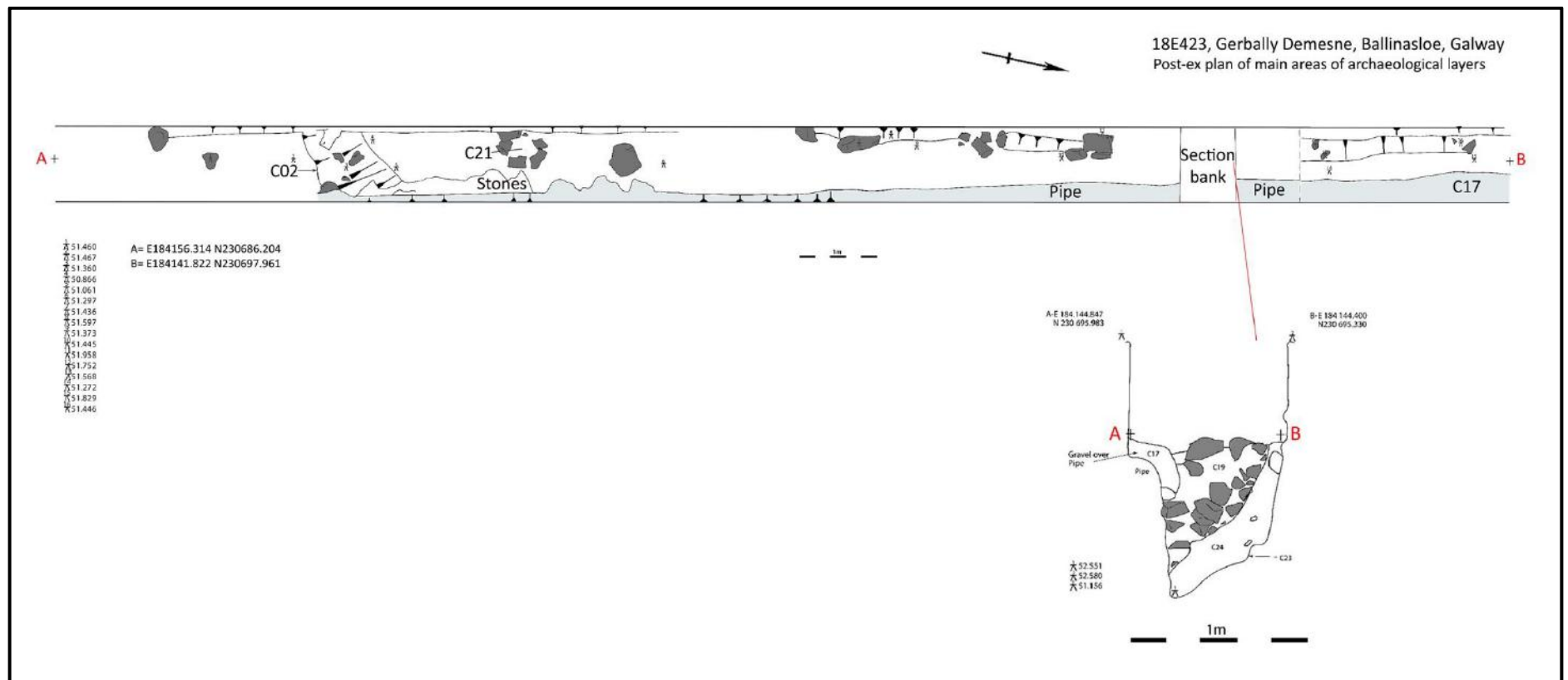


Fig. 15: Post-Excavation Plan of main section of trench where archaeological layers were identified



Plate 1: View of southern area of excavation of pipe trench with small test pits



Plate 2: View of hand excavated test pit in southern area of excavation of pipe trench



Plate 3: looking south along upper deposit C18 at northern end of laneway



Plate 4: Looking South showing C19, concentration of angular and sub-angular stone. Note location of Storm Drain pipe along the eastern side of the trench.



Plate 5: Looking west showing C21, possible post-hole with charcoal



Plate 6: East facing section showing stone 'collapse' within C23.



Plate 7: Northern end of the trench showing large rubble stones within fill and modern pipe cutting along east side of trench.



Plate 8: Northern end of trench looking south, storm pipe visible cutting through eastern side of trench



Plate 9: Front of coin



Plate 10: Back of coin

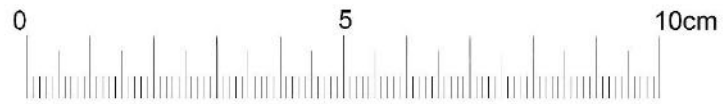


Plate 11: Chisel point (possible)/Strap tag after cleaning and conservation



Plate 12: Side profile of possible chisel point/strap tag

Appendix 1: List of Contexts

Context No.	Type	Description
001	Road fill	Asphalt Road Surface
002	Road Fill	Grey rubble layer beneath C001- Road Fill
003	Road Fill	Brown rubble fill under C002 – Sub-angular stone within granular sand – Road Fill
004	Road Fill	Orange brown sandy clay under C003.
005	Redeposited Natural	Yellow compact sandy silt under C004. Overlies C006.
006	Stone Deposit	Layer of sub-angular stone of varying sizes. Sitting within C007. Similar to C010.
007	Fill	Brown silty sand surrounding stones C006.
008	Natural Deposit	Green grey sand – natural underlying C007, also under C005. Similar to C25
009	Pipe truncating Trench	Storm water PIPE runs along eastern bank of trench associated with C12, C14, C17. Truncates through fills of ditch C23 in North South orientation.
10	Stone, similar to C006	Stone layer, possible feature (Paul) – Continuation of C006 measuring 4.2m length and .2m in depth. Overlies C011 within the southern section of Cut C23.
11	Fill	Mid brown sandy clay with occasional charcoal and gravel inclusion. Measures 10.4m length. Min Depth 0.2m Max depth .6m. Located under C10 (Paul area) Similar to C7, C19
12	Fill	Yellow grey gravelly sand similar to C14 & C17 - Upcast from pipe
13	Fill	Yellow brown sandy clay with moderate stone inclusions
14	Fill/recent	Yellow grey gravelly sand similar to C12, C17 Upcast from pipe

15	Fill of Cut C16	Dark mid brown sandy clay with moderate inclusion of stone, bone (disartic) (Cut C16) Length .4m, depth 0.22m.
16	Recent Cut	Cut filled with C15 – modern feature cut into C18
17	Fill/Recent	Gravelly fill overlying pipe and overlying C11, C18, C19. Similar to C14, C12
18	Fill of ditch C23	Dark brown sandy silt with stone and disarticulated skeleton remains within. Appears as feature in pre-ex plan with SK3 within. Overlies C19. Similar to C11. Length 11.4m, Depth .12m - .16m
19	Secondary Fill of ditch C23	Stone feature, concentration of angular stone (Angela) with disarticulated bone within mid brown silty sand. Under C18. Overlies C25 and within Cut C23. Similar to C11. Length
20	Primary Fill of ditch C23	Dark brown clayey silt with irregular shaped stone and animal bone throughout (Pauls). Varies in depth from 0.4m– 0.18m. 2m in length
21	Fill of Post-hole	Possible Post Hole Fill – UNEXCAVATED Location E184151.497/N230689.848 LEVEL 51.175. NO Cut Given as was not excavated.
22	Primary Fill of ditch C23	Dark brown clayey silt, under C18, with inclusions of stone, charcoal and decaying stone. Occasional bone inclusion. Average depth 0.4m.
23	Cut of ditch	Cut, filled with C20 (primary Fill) and C11. This cut is evident within certain areas of the trench. 14m revealed running in a North south orientation. Sharp sloping side evident within the east facing baulk of trench.
24	Primary fill of ditch C23	Primary fill of Cut C23 (Bernie section) Dark brown clayey silt with occasional stone and animal bone. Depth .23m. Located under C19.
25	NATURAL	Grey Gravelly sand, into which C23 is Cut.

Appendix 2: Finds

18E0423:011: 001 1689 King James gunmoney was located within C18 (see Plates 8 & 9).

Diameter; 21 mm, Thickness: 1mm, Weight; 2.850g

Gun money was an issue of coins made by the forces of James II during the Williamite War in Ireland between 1689 and 1691. They were minted in base metal (copper, brass or pewter), and were designed to be redeemed for silver coins following a victory by James II and consequently bore the date in months to allow a gradual replacement. As James lost the war, that replacement never took place, although the coins were allowed to circulate at much reduced values before the copper coinage was resumed. They were mostly withdrawn from circulation in the early 18th century.

The name "gun money" stems from the idea that they were minted from melted down guns. However, many other brass objects, such as church bells, were also used.

Metal detecting carried out by the TII in the vicinity of the Aughrim battlefield in 2004 in advance of construction of the M6 also uncovered a similar coin (A024/R002), a 1689 gunmoney shilling along with a number of other copper coins (O'Sullivan J., 2014).

18E0423:020:001 Iron Chisel Point (possible) /(also possibly a Strap End or Chape - worn at the end of a belt - a decorative accessory, to prevent the strap terminal fraying and also to keep it weighted down)

Length; 58mm Width; 5-10mm; Thickness; 1-7mm; Weight: 18 g

18E0423:020:002 Iron Nail/Rivet. Wide flattish head with shaft wide at the top and tapering near the base to a rounded point. Overall length 66mm, length of shaft 50mm, shaft tapers to 5mm in diameter at point and 13mm near the head, Head is 43mm in width and ranges from 7mm thick at the edges and 16mm thick where it meets shaft.

18E0423:020:003 Iron object

Appendix 3:

OSTEOARCHAEOLOGICAL REPORT ON DISARTICULATED HUMAN SKELETAL REMAINS

St Joseph's Place, Galbally Demesne, Ballinasloe, Co. Galway

Licence Number: 18E0423

By

Dr Linda G. Lynch MIAI

Consultant Human Osteoarchaeologist

16th March 2020

Figure 1. Annotated skeletal diagram (Mays 1998, 2, Fig. 1.1)	15
Figure 2. Anatomical directions (White and Folkens 1991, 29, Fig. 3.1)	16
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INTRODUCTION

A small quantity of skeletal remain was recovered in 2018 during licenced archaeological excavations, undertaken by Angela Wallace of Atlantic Archaeology Archaeological and Environmental Services, at St Joseph's Place in Ballinasloe, Co. Galway. The archaeological works were in advance of the proposed upgrading of the water services infrastructure in the town. The location, which is now a housing estate 'St Josphe's', is the site of two Recorded Monuments, **GA087-083----** 'church' and **GA087-083001-** 'graveyard'. No above-ground trace of these sites remains. Previous archaeology monitoring and test trenching in the area (under licence no. 11E0242) identified both disarticulate and *in situ* human skeletal remains. As a result, the line of the current pipeline was designed to avoid area of known concentrations of human remains. However, in order to minimise impact on potential archaeological deposits, an area measuring 94m in length by 1.0-1.2m in width was archaeological excavated by hand to the required pipeline depth of 1.2m. Disarticulated human skeletal remains were recovered from three contexts, an amalgamation of c.6/c.7/c.8, c.10, and c.11. All of these contexts were closely related. No *in situ* human skeletal remains were uncovered. Remains that initially had been identified as possible *in situ* burials (such as 'SK1' in Sample No. 29 in c.11, see below) were identified as disarticulated remains on further investigation (Wallace 2018).

The assemblage, as submitted to the writer, comprised a number of processed and bagged samples of both human and faunal skeletal remains. The samples were labelled by context and sample number. The aim of the osteoarchaeological analysis was to separate out human remains from animal bones, to assess the minimum number of individuals represented by the human bones, and to record any skeletal and/or dental pathological lesions or conditions which may be evident on the bones. All bones had been cleaned and processed post-excavation and were received in clearly labelled bags.

ANALYSIS

All animal bones were separated out and rebagged from any human bone, although one sample (no. 8) comprised faunal remains only. The human remains are detailed in **Table 1**. The faunal remains bones are listed in **Table 2**, for clarity, and are not referred to any further in the present report.

Table 1. Human skeletal remains identified from St Joseph's Place, Ballinasloe, Co. Galway

Context	Sample No.	Other Info.	Identified Elements	Weight (g)	No. of Frags
6/7/8	10		Juvenile cranial vault fragments	0.8	2
10	33		Adult cranial vault fragment from frontal with coronal suture*	3.6	1
			Juvenile cranial vault fragment	1.4	1
			Possible juvenile mandibular body fragment+	0.6	1
11	29	'SK1'	Small fragments, possibly juvenile	0.2	5
			Small fragments, possible juvenile mandible+	0.6	5
			Lower R permanent 2 nd incisor	0.3	1
			Lower R permanent canine	0.3	1
			Lower R deciduous 1 st molar	0.3	1
			Lower R deciduous 2 nd molar	0.3	1
11	1		Adult femoral fragment, midshaft to popliteal area	52	1
				60.4	20

* submitted for AMS dating

+ denoted fragments which refitted together

Table 2. List of animal bones recovered from St Joseph's Place, Ballinasloe, Co. Galway

Context	Sample No.	Elements	No. of Frags
6/7/8	10	Tooth	1
10	8	Unidentified	1
10	33	Unidentified	5
11	1	Unidentified	1

In general, the human remains were in relatively good condition. Fragmentation was an issue, but this is to be expected in a disarticulated assemblage. The large femoral fragment in Sample No. 1 from c.11 had suffered from minor surface erosion.

There is no duplication of morphological elements throughout the entire human bone assemblage. When the complete assemblage is considered, the MNI (minimum number of individuals) represented is two individuals. There is at least one adult; it was not possible to determine the sex but the open cranial suture in the frontal fragment from Sample No. 33 in c.10 suggests the individual was possibly aged between 18-30 years. There is also at least one as one juvenile. This individual was aged between 4-5 years at the time of death. The latter is based on the dental remains recovered in Sample No. 29 from c.11 on the dental methodology of Moorrees *et al* (1963). It is probably that most of the juvenile remains recovered are from this individual. Specifically, one of the juvenile mandibular fragments recovered as 'SK1' (Sample No. 29 in c.11) refitted with a mandibular fragment from Sample No. 33 in c.10 (noted by '+' in **Table 1** above). No skeletal or dental pathological lesions or conditions were present on the remains.

One sample of bone was submitted for AMS (accelerated mass spectrometry) dating, following receipt of the required licences. This was the fragment from the adult frontal bone (the forehead), recovered as Sample No. 33 in c.10. This returned a date of cal. AD 530-650 (ICA ID: 19B/0727; 1480+/-30BP, 95% probability) (after Reimer *et al.* 2013) .



Plate 1. Fragment of an adult (possibly 18-30 years) frontal bone, Sample No.33 from c.10, submitted for AMS dating

SUMMARY AND CONCLUSIONS

In total, just 20 fragments of disarticulated human bones and teeth were recovered during recent archaeological investigations at the site of a church and graveyard in Garbally Demense in Ballinsloe, Co. Galway, now the site of St Joseph's housing estate. The two Recorded Monuments are listed as **GA087-083----** 'church' and **GA087-083001-** 'graveyard'.

The human bones and teeth, weighing just 60.4g, represented an adult, possibly aged between 18-30 years at the time of death, and a juvenile, aged 4-5 years. No skeletal or dental pathological lesions or conditions were observed. No evidence of *in situ* burials were uncovered. However, this was a specific aim of the project and was based on previous archaeological findings at the site. One fragment of adult bone was radiocarbon dated to the sixth/seventh centuries. This is a significantly early date and raises the question as to whether the adult individual, who actually provided the datable material, was technically a Christian or 'pagan'. Only further archaeological investigation at this site could possibly provide any answers.

APPENDIX

OSTEOLOGICAL TERMS

A number of basic terms are used frequently in osteo-archaeology and these are outlined below.

The definitions are taken from White and Folkens (1991, 28-35) and Bass (1995, 319-321).

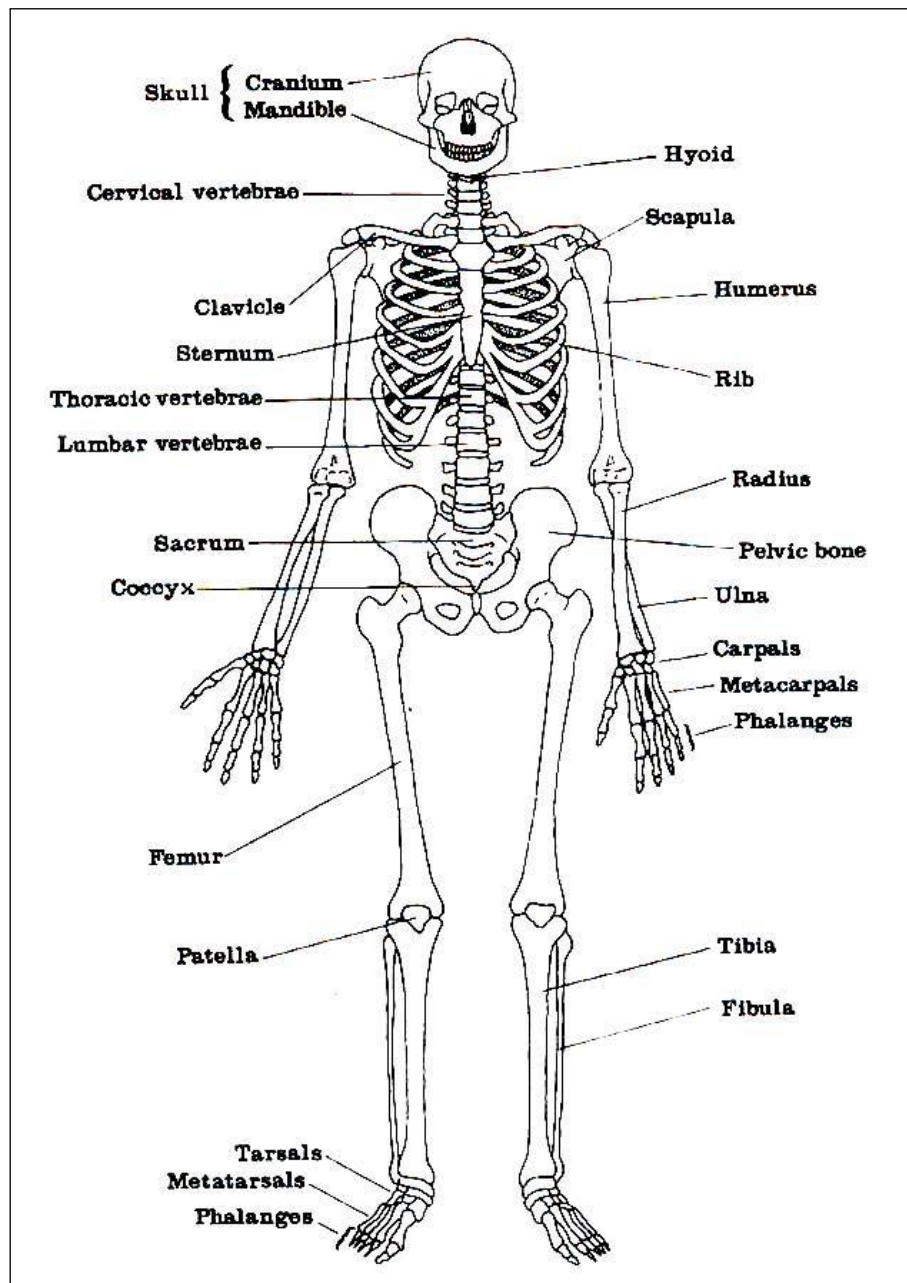


Figure 1. Annotated skeletal diagram (Mays 1998, 2, Fig. 1.1)

Directions - General

Superior	toward the head of the body.
Inferior	opposite of superior, body parts away from the head.
Anterior	toward the front of the body.
Posterior	opposite of anterior, toward the back of the individual.
Medial	toward the midline of the body.
Lateral	opposite of medial, away from the midline of the body.
Proximal	nearest the axial skeleton, usually used for long bones.
Distal	opposite of proximal, furthest from the axial skeleton.
Palmar	relating to the hand, the palm side
Plantar	relating to the foot, towards the sole of the foot
Dorsal	relating to the hand/foot, back of the hand, top side of the foot
Endocranial	inner surface of the cranial vault.
Ectocranial	outer surface of the cranial vault.

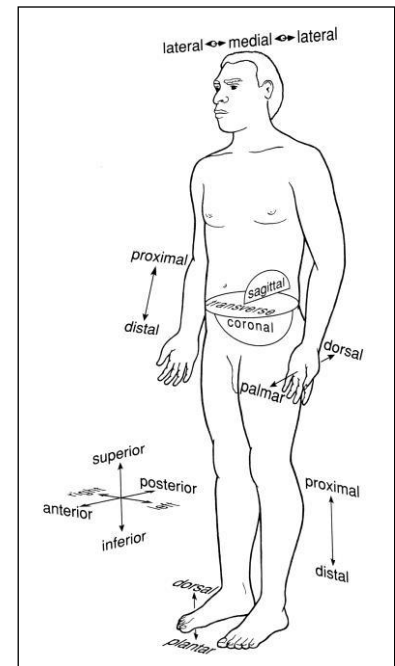


Figure 2. Anatomical directions
(White and Folkens 1991, 29, Fig. 3.1)

Directions - Teeth

Mesial	toward the point on the midline where the central incisors meet.
Distal	opposite of mesial.
Lingual	toward the tongue.
Labial	opposite of lingual, toward the lips.
Buccal	opposite of lingual, toward the cheeks.
Incisal	the biting surface of the tooth.
Occlusal	the chewing surface of the tooth.

General bone features/terms

Process	a bony eminence.
Eminence	a bony projection, usually not as prominent as a process.
Spine	generally a long, thinner, sharper process than an eminence.
Tuberosity	a large, usually roughened eminence of variable shape, often the site of a ligament attachment.
Tubercle	a small, usually roughened eminence, often a site of a ligament attachment.
Trochanters	two large, prominent, blunt, rugose processes found on the distal femur.
Malleolus	a rounded protuberance adjacent to the ankle joint.
Articulation	an area in which adjacent bones are in contact at a joint.
Condyle	a rounded articular process.
Epicondyle	a non-articular projection adjacent to a condyle.
Head	a large, rounded, usually articular end of a bone.
Shaft/diaphysis	the long, straight section between the ends of a long bone.
Epiphysis	end portion of a long bone which is expanded for articulation.
Neck	the section of a bone between the head and the shaft.
Torus	a bony thickening.
Ridge	a linear bony elevation, often roughened.
Crest	a prominent, usually sharp and thin ridge of bone.

Line	a raised linear surface, not as thick as a torus or as sharp as a crest.
Facet	a small articular surface, or tooth contact.
Metaphysis	a line of junction between epiphysis and diaphysis.
Osteoblastic	process of bone formation
Osteoclastic	process of bone resorption

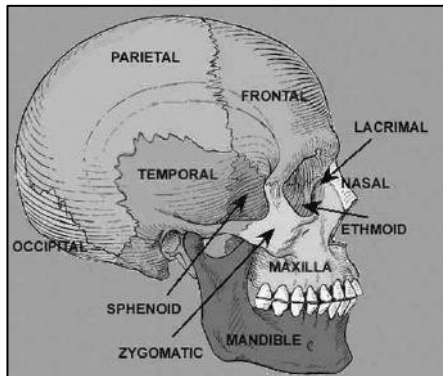


Figure 3. Annotated skull

C1-C7	cervical vertebrae (neck) numbered from 1-7.
CEJ	cemento-enamel junction, junction of crown of tooth and root.
DJD	degenerative joint disease.
T1-T12	thoracic vertebrae (torso) numbered 1-12.
TMJ	tempromandibular joint, joint of lower jaw.
L1-L5	lumbar vertebrae (lower back) numbered 1-5.
S1-S5	sacral vertebrae (in between left and right pelvis) numbered 1-5.
MC-	metacarpal (bones of the palm of the hand).
MT	metatarsal (bones of the arch of the foot).
IAM	Internal Auditory Meatus in temporal bone of cranium.
EAM	External Auditory Meatus in temporal bone of cranium.
MN	Minimum Number of Individuals.
CPR	Crude Prevalence Rate.
TPR	True Prevalence Rate.
SN/s	Schmorl's nodes, depression defects in the vertebral bodies.
AMTL	Ante-Mortem Tooth Loss

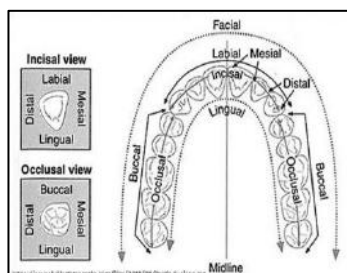


Figure 4. Dental directions

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Appendix 4: Analysis of the Animal Bone

from

Garbally Demesne, Ballinasloe, Co. Galway

18E0423

Siobhán G. Duffy, BSc MA

May 2019

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Introduction

This report presents an analysis of the animal bone assemblage recovered from excavations carried out in 2018 at Garbally Demesne, Ballinasloe, Co. Galway (Licence 18E0423) by Atlantic Archaeology, under the direction of Angela Wallace, in advance of pipelaying works. The site contained features and deposits, associated with an Early Medieval Church and Cemetery site (RMP nos. GA087-083 and GA087-083001). Precise dating of the site was not available at the time of writing, and the area was considerably disturbed in the 1950s, during the construction of the housing estate that now occupies the site (Wallace 2018, iii). The animal bone examined was recovered from a series of semi-stratified layers, cut through along one side by a modern storm-water pipe (Wallace 2018).

Methodology

Mammal and bird bones were examined for species and element identification, age, sex, post-depositional changes, butchery and other modifications, gnawing, non-metric traits, and pathologies. All data were recorded in an MS Excel spreadsheet.

Identification

Bone fragments were examined and identified to skeletal element and species where possible. Identification was carried out with the use of bone atlases (Schmid 1972; Hillson 1992, and Hillson 2005 for mammals; Cohen & Serjeantson 1996; Bochenksi & Tomek. 2009 for birds), the author's own reference collection, and the bird osteological collection of the National Museum of Ireland: Natural History.

Where it was not possible to identify an element to species level, broader categories were used, either at order level, e.g. passerine, rodent, carnivore, or at an even broader level, e.g. cow-sized mammal, sheep-sized mammal, cat-sized mammal, small mammal, and bird. With the exception of the atlas and axis, vertebrae and ribs were only identified to a size category. This was partly due to difficulties in identification of these elements to a particular species, and partly to negate any biases they would introduce into quantification data due to their higher frequency within the skeleton. For similar reasons, carpals, tarsals and sesamoids (other than the astragalus and calcaneus) were only identified to size categories.

The skeletal elements of sheep and goats are notoriously difficult to distinguish (Boessneck 1969, 331; Noddle 1994, 118), with the notable exception of horncores. Where possible post-cranial remains were identified as sheep or goat, following the criteria of Boessneck (1969), with the remaining bones classed as 'ovicaprid'.

Considering the uncertainty surrounding criteria used to distinguish between the dentition of sheep and goats (Zeder & Pilaar 2010), mandibles, maxillae and loose teeth were consistently identified as 'ovicaprid'.

Bone fragments that could not be reliably identified to element, or did not meet the requirements for a 'countable fragment' were classed as 'unidentified'.

Animals are referred to by their common names throughout the text, but are recorded by genus name (or an abbreviated version thereof) in the database. A complete list of the common and scientific names of species identified at the site is given in Appendix A.

Quantification

There has been much debate over what method of quantification provides a best estimation of the original proportions and relative importance of animals at a site (O'Connor 2003, 132): the principal methods used being Number of Identified Specimens (NISP); Minimum Number of Individuals (MNI); bone weight; and a restricted version of the NISP. No method is ideal, and use of one or more will depend on the assemblage and research aims of a particular project. The MNI and bone weights were considered unsuitable for the present study. MNI estimations (i.e. the minimum number of animals required to account for all bones) have become less popular in recent years due to their lack of mathematical integrity for further quantitative analysis (O'Connor 2001, 706; O'Connor 2003, 134). Bone weights, often regarded as a more direct estimation of meat yields, may be affected by the presence of higher proportions of non-meat bearing elements (e.g. heads, horns, loose teeth, and feet) (O'Connor 2003, 132-133) and by post-depositional factors, and remnants of soil remaining on the bone following cleaning.

For the purposes of this analysis, a restricted version of the NISP was adopted, as this was considered effective in reducing any bias between species or elements due to fragmentation without significant loss of information. For the purposes of quantification, each bone is considered as eight separate zones, following the methodology outlined by Serjeantson (1996; 2009) for mammals and birds, respectively. In the case of smaller bones, and bones of the axial skeleton a lesser number of zones is used, while loose teeth and sesamoid bones are unzoned, with an overall count of 1. The presence of at least 50% of any zone, or a specific diagnostic area (e.g. unfused diaphyses on long-bones), is given a count of 1 for that zone. Thus, a complete bone has an aggregate count of 8. This allows for better relative quantification both between species, and when assessing skeletal representation within species.

In cases of articulated and semi-articulated remains, while each bone was recorded and counted separately, they were recorded as belonging to a single individual with the addition of a Group (G) number. A group number was also assigned to matching unfused epiphyses and diaphysis, although these were recorded as a

single unit. Where bones were fragmented during excavation or the cleaning process, these were refitted where possible and considered a single element. If fragmentation was pre-excavation, fragments were counted as separate elements.

Sexing

Identification of sex is generally restricted to a small number of elements and is dependent on the presence of these elements in the assemblage. In the present study, goats were sexed according to horncore morphology, and pigs by the morphology of canine teeth. Female birds were identified by the presence of medullary bone in longbones.

Ageing

Age-at-death was estimated from the fusion status of the epiphyseal ends of longbones in mammals, following Silver (1969), with additional information for cats following Walker (1982, in Amorosi 1989, 117), and the ossification of longbone ends in birds (porous, unossified ends were considered juvenile). In addition, where no articular ends were present, but an element was obviously juvenile from its size, development and porosity, it was considered to be juvenile. Dental eruption and wear patterns were recorded for mandibular teeth following Grant (1982) for cattle, sheep and pigs, and Bull & Payne (1982) for pig eruption. Mandibular wear patterns for the main domestic species were correlated with the mandibular wear scores of O'Connor (2003, 160).

Measurements

Measurements were taken where possible on all non-pathological, fully developed bones, following the guidelines of von den Driesch (1976), with additional measurements after Weinstock (2000) and Cohen & Serjeantson (1996). Measurements up to 15cm were taken with a vernier callipers (to 0.1mm precision) and an osteometric board was used for larger measurements (to 0.5mm precision).

Results

A total of 1,104 hand-collected mammal and bird bone fragments, from some 15 deposits and layers, were examined for the present analysis. Of these, 252 (22.8%) met the criteria for NISP as set out in the Methodology. The remaining 852 fragments (77.2% of the total assemblage) could not be identified to a specific element or were considered non-countable. Some 28 fragments were recovered from disturbance associated with modern features. These were excluded from the main analysis and omitted from the final NISP, although individual bones may be referred to in the report. The NISP (Number of Identified Specimens), as used in the analysis hereafter, refers to bone from the remaining layers and deposits, which meet the identification criteria as set out in the Methodology.

Condition of the Bone

Weathering and Erosion

Overall preservation of the bone was good. Post-depositional factors such as soil erosion and root damage were widespread throughout the assemblage, causing mild surface damage to the bone. Some degree of weathering was evident on less than 2% of bones examined, indicating the bone had been exposed to the elements for a time before its final deposition. However, this was restricted to Stages 1 and 2 of Behrensmeyer's classification (Lyman 1994, 355), suggesting exposure prior to burial was in general of relatively short duration.

Fragmentation

Overall the assemblage was highly fragmented, with some 85% of the bones examined consisting of elements that were only a quarter complete or less. Just 2% of identified bones were complete, primarily loose teeth and the compact bones of the feet. Excluding the smaller metapodia, only three longbones were complete, all of which were identified as rabbit. Almost 76% of the assemblage showed some excavation damage, but some 81% of bones had been broken in antiquity. This suggests the high degree of fragmentation may relate to food preparation and cooking methods, or damage done during initial disposal of waste at the site, although damage through later post-depositional disturbance must also be considered.

Post-depositional changes

Areas of iron staining were visible on four bones, and visible as an irregular rust-stained area surrounded by a black margin (Fig.1). These may indicate close contact with iron objects within the soil, prior to disturbance, or may reflect contact with both heat and iron in their initial deposition at the site. Bones from cattle, sheep/goat and horse were affected, and from a range of elements.



Fig.1. Iron Staining on bone fragment
gnawing (white arrow)



Fig.2. Deer metacarpal showing scorching (black arrow) and

Gnawing

Gnawing by carnivores was present on 18 bones (Appendix C), indicating a possible time lapse between initial surface disposal of the bone and its final deposition. However, only four bones exhibited both gnawing and weathering evidence, suggesting any time lapse was of very short duration. Gnawing evidence was confined to the main domestic food species and a single deer bone, and may represent scavenging, or deliberate feeding of food waste to dogs at the site.

Burning

There was little evidence of burning within the assemblage, with no fully calcined bone fragments present. Mild scorching affected a small number of bones (eight in total) of cattle, sheep/goat, pig and deer (Fig.2). Areas of scorching were localised on bone elements, indicating limited direct exposure of bone to open flames, and suggesting the occasional use of roasting as a means of cooking.

Species Presence and Abundance

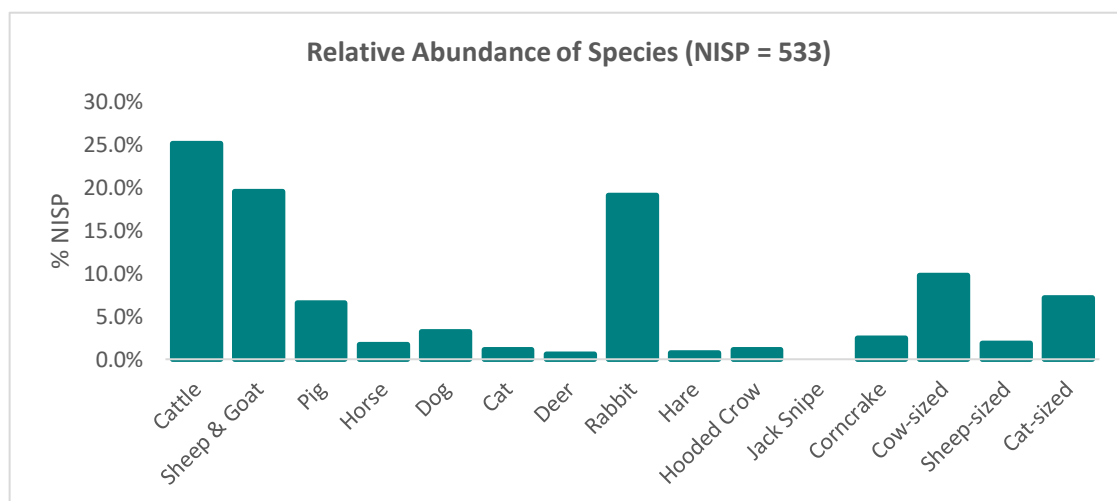


Fig.3. Relative Species Abundance at Garbally Demesne, excluding bones from modern disturbance.

A total of twelve species of mammal and bird were identified in the assemblage (Fig.3). These included the main domestic species of mammals, along with six species of wild mammal and bird. Both sheep and goat elements were identified in the assemblage; however, as most ovicaprid bones could not be positively identified as either species, they are all here treated within a single category.

Somewhat surprisingly, rabbits account for over 19% of the NISP, making them the third most frequently occurring species in the assemblage (after cattle and sheep/goats). In fact, if loose teeth are excluded, rabbits are the best represented species in the assemblage, with cattle a close second.

However, this may be due in part to the relatively small size of the assemblage, and the greater level of completeness and better preservation among the smaller bones: these factors would result in an apparent over-representation of smaller mammals in the assemblage. Nonetheless, when MNIs are considered for all species, the rabbit bones represent at least three animals, an MNI exceeded only by cattle (MNI=4) at the site, including samples from the modern disturbance. It is generally accepted that rabbits were introduced into Ireland in Medieval times, and access to them remained restricted until the later medieval period. The rabbit remains in the Garbally Demesne assemblage are more likely to represent evidence of later disturbance at the site.

The relatively high numbers, and the lack of any evidence of butchery or gnawing suggests their presence at the site as burrowing animals rather than food remains. Nonetheless, the rabbit bones were scattered over a number of contexts, suggesting disturbance at the site post-dates their presence there.

Other wild mammal species identified in the assemblage (deer, hare) are present in low numbers, as are the non-food domesticates (cat, dog and horse). While no domestic birds are represented, three wild bird species were recorded suggesting the absence of domestic species is not due to on-site retrieval issues. This pattern can be considered consistent with an Early Medieval site, as birds, and domestic fowl in particular, are relatively rare on sites (Hamilton-Dyer 2007, 106). Of the bird species identified at Garbally Demesne, one – the jack snipe – was only recovered from modern disturbance levels and may be of much later date.

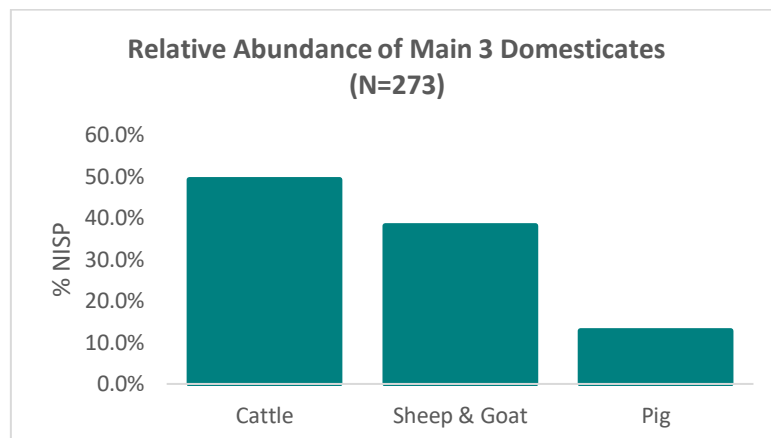


Fig.4. Relative Abundance of the main domesticates, excluding bones from modern disturbance.

In order to have a better idea of the relative abundance between the main three domesticates (cattle, sheep/goat and pig), these were compared in isolation from the rest of the species present (Fig.4). This shows a clear dominance by cattle (49.1%), followed by sheep/goat (38.1%) and pig (12.8%). The high abundance of cattle is consistent with information from other sites in Ireland, where cattle frequently exceed 50% of identified assemblages from Early Medieval, and later, sites (McCormick & Murray 2007). However, the high level of sheep/goat relative to pig is unusual in an Early Medieval context, where pigs are often more abundant

than sheep/goats (*ibid.*). While similarly low levels of pig are known from a small number of Early Medieval sites, these are invariably coastal, and it is suggested that a lack of local woodland may account for a lower suid presence (McCormick & Murray 2007, 105-107). This is less likely to explain the frequencies at the more inland location of Garbally Demesne.

The assemblage from Garbally Demesne was recovered from a relatively small area, considered to be at the edge of the original Early Medieval site (Wallace 2018, 15), and it must be considered that the abundances noted may not be representative of the site as a whole. Furthermore, as the rabbit bones and the presence of later artefacts (Wallace 2018) indicate, some level of disturbance occurred at the site, and the assemblage may contain some remains from later activity at the site. As such, it is difficult to interpret apparent anomalies in the assemblage too closely.

Cattle

Skeletal Representation

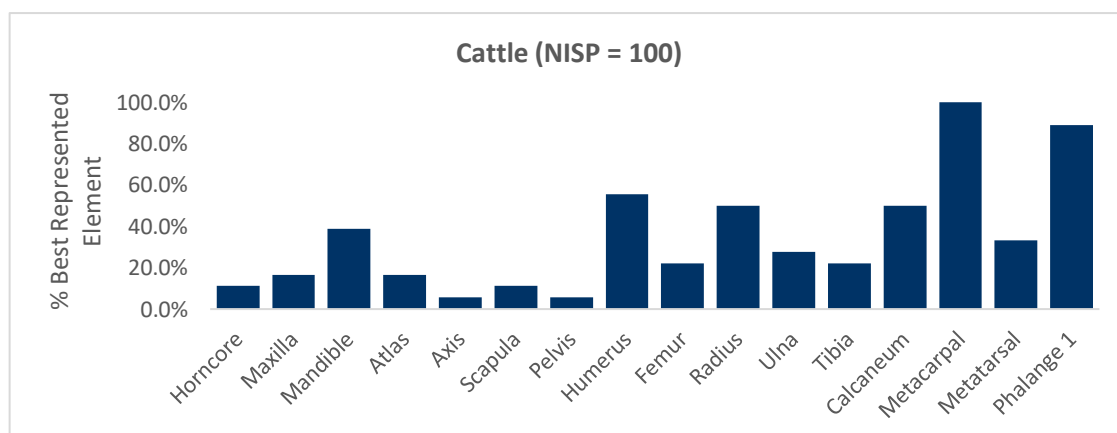


Fig.5. Skeletal Representation for Cattle, excluding loose teeth.

All the main skeletal elements are represented for cattle (Fig.5), suggesting the presence of whole animals, which were probably killed at the site. Both high and medium meat-bearing bones are well represented, although it should be noted that the humerus was predominantly represented by its distal end, which is often jointed along with the medium meat-bearing radius. The top meat-bearing bone (the femur), on the other hand, is underrepresented and this may indicate a bias towards medium meat-bearing joints, or suggest the better joints were disposed of elsewhere on the site.

The metacarpal was the most commonly occurring element: this is a low meat-bearing bone, but, as one of the densest bones in the skeleton, also has the highest survival rate and is often over-represented in archaeological assemblages. It is perhaps more noteworthy that its back-limb counterpart, the metatarsal, appears relatively underrepresented by comparison. Like the metacarpal, the metatarsal is a very dense, strong bone; however, it has straighter sides than the metacarpal, making it the optimal bone for use as a raw material. The lower than expected occurrence of metatarsals, may then represent the removal of these bones elsewhere for the purposes of craft-working. The low numbers of horncore, skull fragments, and the absence of the lower foot bones may suggest that hides and horns were also transported elsewhere for the purposes of leather- and horn-working.

Ageing

A single, partial mandible with an in-situ tooth was available for age-profile analysis. To augment this, a number of loose, lower second and third molars were also examined. The mandible was from a very young animal, of well under one year old, with the first or second molar still developing in its crypt which was still located within the vertical ramus. Of the loose teeth, two second molars were in the very stages of wear suggesting sub-adult animals and a third example was unerupted suggesting an immature animal. A loose third molar, meanwhile, was from an older adult. While the numbers are too low for any detailed analysis, this indicates that both younger and older animals were slaughtered.

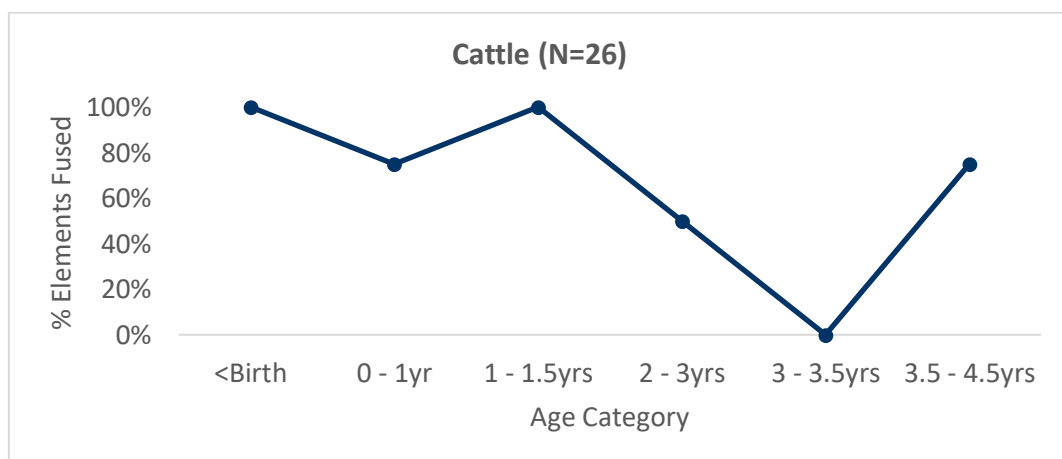


Fig.6. Fusion data for cattle, showing proportion of fused elements.

Examination of the fusion state of bones also suggests that cattle were slaughtered as subadults (1.5 – 3 years of age) or older adults, with a small number of young calves also killed (Fig.6). Again, the sample size is too low to draw definite conclusions, although it is noted that this would be consistent with a mixed economy herd, with both beef and milk of importance.

Sexing

No evidence was available for sexing the cattle remains.

Size

Few complete bones were present, but measurements were taken on bones where possible and are given in Appendix F. No complete longbones were available for withers heights calculations.

Butchery

Evidence of butchery was noted on 12% of bone elements, excluding those from the modern disturbance. Butchery marks on the distal shafts of two humeri, and two metacarpals were consistent with the dismemberment of carcasses into joints, using heavy knives. Lighter knife-cuts found on an atlas and an axis, may also relate to dismemberment – in this case the removal of the head from the carcass. A cutmark on a distal humerus, on the other hand, probably represents the removal of flesh from the bone in this area.

Two metacarpals and two metatarsals were split lengthways along the mid-line, a practice usually considered to indicate the removal of marrow from the medullary cavity of the bone.

Of note from the bones recovered from the modern pipe-trench disturbance, were two cow-sized ribs which both showed evidence of being sawn. Saws were not used in butchery until the eighteenth century (although they were associated with craftworking at a much earlier date), indicating the presence of much later bones in the more recently disturbed contexts. The absence of any evidence for sawing amongst the remainder of the assemblage, may suggest that, although disturbed, the bones are consistently from a pre-modern date.

A small number of cattle bones showed signs of scorching, indicating exposure to a naked flame for a short or intermittent period. In the case of a metacarpal, this was present on the proximal shaft close to the joint with the carpals, but not on the articular surface itself. This suggests the carpals were still attached to the lower bone, at the time of exposure to fire, probably by roasting. Likewise, an area of scorching on the posterior margin of an ulna would be consistent with cooking over an open fire.

Pathology

Pathological changes were evident in just six cattle bones in the assemblage, all but one associated with mild changes to joints of the lower limbs. These included isolated lesions on a tibia, metacarpal, tarsal and phalange, while a middle phalange displayed a slight expansion of the distal epiphysis and extra bone growth along its



Fig.7. Enamel hypoplasia on a cattle incisor.

plantar surface. All these changes are likely to relate to soft-tissue damage relating from excess strain on the joints, and may indicate the presence of draught animals, such as plough oxen, at the site. Non-pathological lesions were also noted on the joint surfaces of three of these bones (tibia, tarsal and phalange).

A loose incisor, which appears to have been unerupted at the time of death, showed evidence of dental enamel hypoplasia (DEH) on the upper crown (Fig.7). This results when growth is interrupted during growth phases of teeth, and is associated with nutritional deficiencies or infection by a pathogen during development (Bartosiewicz & Gál 2013, 169-170). In ruminants such as cattle and sheep, Bartosiewicz & Gál cite calcium deficiency, parasite attack and fluoride toxicosis as known causative agents in modern populations (*ibid.*, 170).

In addition to the above, calculus build-up was evident on 20 loose teeth and one maxilla. These mineralised deposits of tartar are very common on the teeth of herbivorous animals.

Skeletal variation

No non-metric variations were recorded on any of the identified cattle bone, although as mentioned above non-pathological lesions and clefts were recorded on a small number of joint surfaces of lower limb bones.

Sheep/Goat

Element	Sheep (NISP)	Goat (NISP)
Horncore	0	7
Pelvis	0	1
Humerus	6	0
Radius	4	0

Table 1. Positively identified sheep and goat elements.

The difficulties in distinguishing skeletal elements of sheep and goat have already been mentioned in the Methodology. Where possible the two species were separated, although in most cases this could not be done due to the high level of fragmentation present. Only four elements could be positively identified as goat, while

just two were positively identified as sheep. Goat is generally considered rare on Early Medieval sites (McCormick & Murray 2007, 105; O'Sullivan *et al* 2008, 194), and it probable that the majority of bones in the sheep/goat category are primarily those of sheep. However, given the presence of an identified post-cranial goat bone in the assemblage, the presence of further goat elements remains a distinct possibility and all sheep and goat bones were treated in a single combined category.

Skeletal Representation

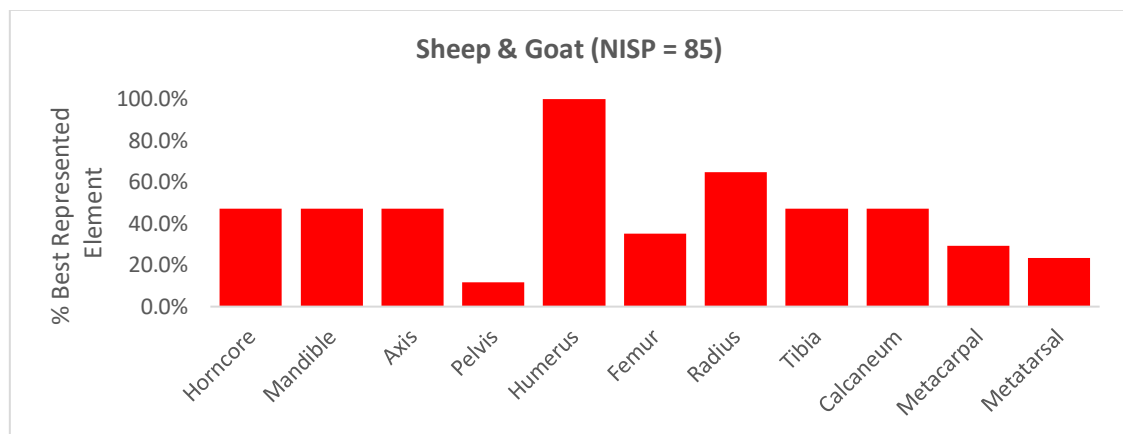


Fig.8. Skeletal Representation for combined Sheep & Goats, excluding loose teeth.

The barchart in Fig.8 represents the amalgamated sheep, goat and sheep/goat data. As with cattle, all the main elements are represented suggesting whole animals were present at the site. With the exception of loose teeth, the humerus was the best represented bone. This is a high meat-bearing bone and may have been favoured, although as with cattle the distal part was more common. Pelvis and scapulae are more given to fragmentation and survival potential may account for their underrepresentation in the assemblage. As noted for cattle, the femur and both metapodia appear underrepresented. This may suggest removal of some parts of the animal, for craftworking (in the case of the metapodia) or favoured food elsewhere (in the case of femora). However, the numbers are very low, making it difficult to assess the significance of these differences in representation.

Ageing

Tooth eruption and wear sequences from mandibles and loose lower third molars indicate that the animal represented were mature adults when slaughtered (MWS=A3, after O'Connor 2003). The presence of a deciduous premolar, meanwhile, suggests that some younger, sub-adult animals were also slaughtered. There was no toothwear evidence for very young animals, under one year of age.

Fusion data was only available for a small number of elements. Of these, earlier fusing elements (up to 2 years of age) were all fused, with no evidence for animals dying prior to one year of age (Fig.9). A sharp drop off in fused elements occurs in the middle fusing elements (2-3yrs), indicating most animals were killed at around

that age. However, no later fusing elements were available with fusion data for comparison. As the numbers involved are very low, it is difficult to interpret this in terms of herd economy, but it would point to animals reared for meat rather than milk or wool.

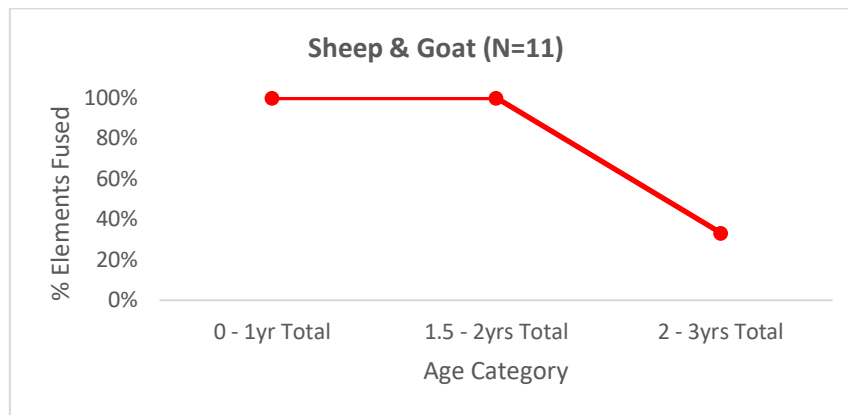


Fig.9. Fusion data for combined sheep & goat, showing proportion of fused elements.

Sexing

One female and one male goat were identified from horncore remains, while a partial pelvis from C.11 appeared to be that of a female goat. A second pelvis fragment, from the modern disturbance was also more likely to be female, although it could not be definitively identified as sheep or goat.

Size

Measurements were taken where possible on all ovicaprid bones and are given in Appendix F. No complete limb-bones were available for the calculation of withers heights.

Butchery

There was little evidence of butchery on recovered ovicaprid bones. Chopmarks consistent with dismemberment of a carcass were recorded on just two bones: the distal end of a femur, and mid-shaft on a metatarsal. No lighter cut marks were noted.

Pathology



Fig.10. Ovicaprid Tibia, with Osteochondritis dissecans

As with cattle, the occurrence of pathological changes within the assemblage were very low. One joint-related pathology was identified: a tibia from C.18 showed evidence of osteochondritis dissecans (Fig.10), a condition resulting from stress-based damage to cartilage within the tibia-astragalus articulation (Baker & Brothwell 1980, 129). A second joint-related pathology was identified on a humerus from the modern disturbance – this presented as an area of pitting on the distal articulation, with slight expansion of the articular surface. No further changes to the

bone were recorded, and the underlying cause of these changes is uncertain, but they may represent the early stages of an infectious arthritic condition.

A loose molar, from C.10, displayed morphological changes to the roots, in the form of irregular, spicule-like growth, with the root flaring outwards towards the apex. This may be the result of a nutritional deficiency during tooth development, or a reaction to an infectious pathogen.

As with cattle, calculus was evident on a high proportion of teeth, and was recorded on 12 loose teeth and two mandibles. While the level of deposits varied, it is uncertain to what extent this is due to taphonomic changes post-deposition.

Skeletal Variation

No skeletal variations were noted on sheep/goat bones.

Pig

Skeletal Representation

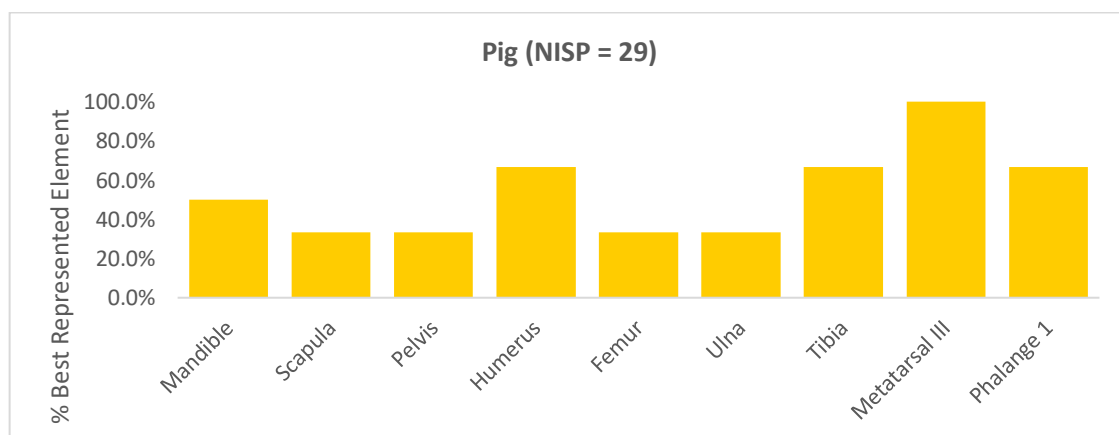


Fig.11. Skeletal Representation for pigs, excluding loose teeth.

As with the other main domesticates, the main parts of the skeleton are represented (Fig.11), suggesting the presence of whole animals, at the site. The notable exception to this is the radius, which is completely absent from the assemblage. The numbers for pig bones are very low, making any differences in frequency insignificant for analytical purposes.

Ageing

Only one mandible was available for age profiling: this retained a single deciduous 4th pre-molar, suggesting an animal under one year of age at time of death (Silver 1969).

Very little fusion data was available, and no clear pattern was visible. The evidence suggests that at least one individual died in the first year of life, one at less than two years of age, while one was at least 1.5 years old at time of death. No late fusing joints were available for comparison.

Sexing

Only one canine tooth was present in the assemblage; this was identified as female, but was recovered from the modern disturbance and as such may not relate to the main assemblage.

Size

Measurements were taken where possible on all pig bones and are given in Appendix F. No complete limb-bones were available for the calculation of withers heights.

Butchery

No evidence for butchery was identified on any of the pig bones examined.

Pathology

Visible pathological changes on the identified pig remains were present on just two teeth. One loose pre-molar, from the modern disturbance, exhibited changes to the roots, similar to that described above for sheep/goat. Irregular spicule-like growth and outward flaring towards the apices were recorded, and may indicate nutritional deficiency during tooth formation, or pathogen action.

Calculus was recorded on a loose molar from C.18. Calculus build-up is less usual on pig teeth than those of ruminants, and may indicate a diet similar to that of humans: the feeding of food-waste to pigs can result in dental problems similar to those experienced by humans.

Skeletal Variation

No skeletal variations were noted on any identified pig bones.

Horse

Skeletal Representation

Element	NISP
Scapula	2
Femur	1
Radius	2
Astragalus	2
Pre-molar	1
Molar	1
Total NISP	9

Table 2. Horse Elements identified in the Assemblage, excluding modern disturbance.

Horse elements were present in low numbers, with teeth, girdle and limb bones represented (Table 2). The bones were very highly fragmented: as horse was rarely used as a meat animal, this level of fragmentation is likely to have been the result of considerable disturbance since their original deposition.

Ageing and Sexing

No incisors were present to assess for toothwear patterns, while a loose lower deciduous pre-molar suggests a very young animal, between 8 and 16 months old (Silver 1969).

Fusion data was only available for one element: this was an unfused distal radius, indicating an animal less than 4.5 years in age.

No evidence of sex was present in the assemblage.

Size

None of the horse bones recorded were sufficiently intact to allow for measurement data to be collected.

Butchery

No butchery was recorded on any of the horse bones.

Pathology

No pathological changes were noted on any bones, although a heavy calculus deposit was recorded on a loose molar and pre-molar.

Skeletal Variation

No skeletal anomalies were noted on identified horse bones.

Dog

Element	NISP
Maxilla	1
Ulna	1
Metatarsal II	6
Metatarsal III	6
Metatarsal	2
Canine	1
Total NISP	17

Table 3. Dog Elements identified in the Assemblage, excluding modern disturbance.

A small number of dog bones were recovered, with the metatarsals the most commonly occurring element (Table 3). These are smaller bones, and more resistant to disturbance, which may have aided their survival at the site. All the bones could be accounted for by a single animal; indeed, the metatarsals recovered are consistent morphologically and taphonomically with such an interpretation. While no bones were recovered from the modern disturbance, three loose teeth were identified; comparison of these with the maxilla and molar recovered from C.6/7/8 strongly indicates that these too are all from a single animal, although the canine from C.18 may be from a smaller animal. However, while the metatarsals are those of a young animal (less than ten months old), the maxilla and teeth are from an adult animal. It seems likely, then, that the dog remains at the site belong to at least two individuals, the remains of which were scattered by later and successive disturbances at the site. It is not possible, however, to ascertain if these remains are contemporary with the rest of the assemblage.

Ageing and Sexing

From assessment of the fusion of limb-bones, the metatarsals recovered indicate an individual over 10 months of age.

No sexing information was available for dogs.

Size

Measurements were taken on all bones where possible and are given in Appendix F. As no complete main limb-bones were recovered, withers' heights could not be estimated.

Butchery

No butchery was noted on any dog remains.

Pathology/Skeletal Variations

No pathologies or skeletal anomalies were noted on any identified dog bones

Cat

Cat remains were represented by just three elements at the site (Table 4), one of which was recovered from the modern disturbance. As with the dog remains, these appear to represent at least one animal whose skeletal remains were scattered and fragmented by later disturbance at the site.

Element	NISP
Humerus	2
Ulna	4
Total NISP	6

Table 4. Cat Elements identified in the Assemblage, excluding modern disturbance.

Fusion data was only available for a single ulna, from C.6/7/8, which belonged to an adult animal.

No butchery was evident on any of the bones. No pathologies were noted on any of the bones present. Measurements were taken where possible (Appendix F).

Deer

Deer were represented by a single metacarpal and a loose pre-molar (NISP = 3). While deer remains are common on Early Medieval sites, these are often in the form of antler which was used extensively for craftworking. The presence of a post-cranial element at Garbally Demesne, however, indicates the presence of deer carcass at the site, suggesting some consumption of venison. This interpretation is supported by the presence of scorching on the metacarpal, which may have been caused by roasting on an open spit. Access to deer was greatly restricted following the Early Medieval period, and the elements recovered may be contemporary with the Early Medieval occupation of the site.

No fusion data was available for the metacarpal, but the lack of wear on the pre-molar suggests an immature animal or a young adult.

Rabbit

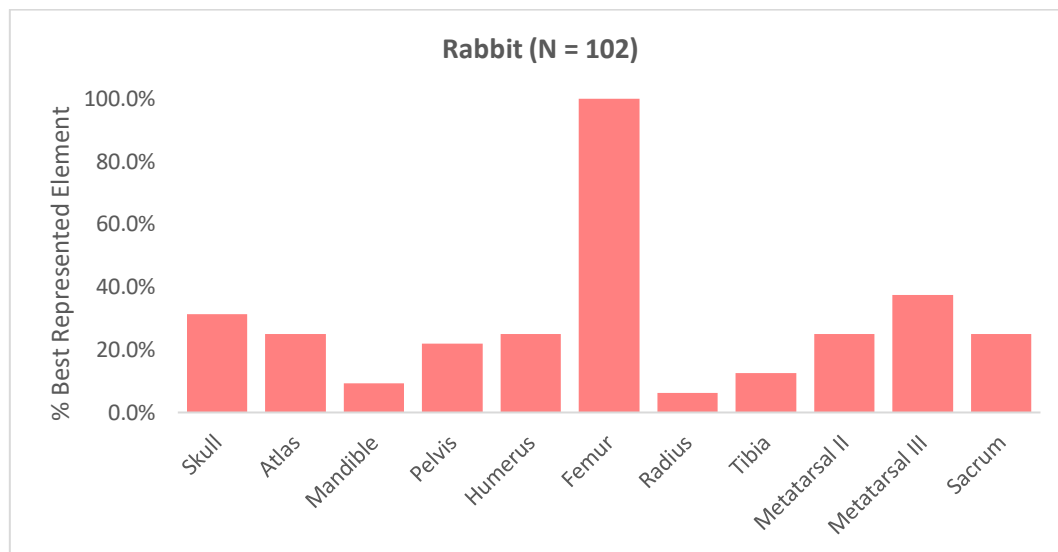


Fig.12. Skeletal Representation for rabbits, excluding loose teeth.

Rabbit is unusually well-represented in the assemblage and the skeletal representation suggests the presence of complete animals (Fig.12). The over-representation of femora may reflect their survival likelihood & greater chance of recovery.

Ageing.

All the early fusing elements were fused, although the presence of unfused later-fusing elements indicates the presence of some immature animals in the assemblage.

Size

Measurements were taken on all bones where possible and are given in Appendix F.

Butchery & Pathology

No butchery or pathological changes were noted on any of the bones.

Hare

Hare is represented by a single femur, from an adult animal. No butchery or evidence of scavenging was present on the bone, although it is likely it represents occasional use of game meat in the diet. A small area of grey woven bone at the distal end of the femur is indicative of an active infection in the surface layer of the

bone at time of death. This appears to be localised around the area of attachment of the lateral collateral ligament and the extensor tendons (Crum et al 2003) may have resulted from soft tissue damage to these sinews. Such an injury would have greatly impeded a hare's ability to escape capture, and, indeed, the lack of any evidence of healing, or remodelling of bone suggests the infection was not present for a lengthy time prior to death. The absence of any gnaw-marks on the bone, meanwhile, may point to human rather than carnivore predation.

Wild Birds

Crow

A single lower leg bone was recovered from lower levels at the site, and was identified as that of the hooded crow, *Corvus corone cornix*. Hooded crows replace carrion crows in Ireland, where they are commonly occurring scavengers. It is unlikely they were used as food animals, although crows and ravens are known to have sometimes been kept as pets in the past (Hamilton-Dyer 2007, 106).

The tarsometatarsus recovered at Garbally was from an adult bird, with no sexing data available. No modifications to the bone were evident.

Corncrake

Three bones were identified as those of the Corncrake, *Crex crex*, (Fig.13). Although recovered from different contexts (C18, C19), they are morphologically and taphonomically very similar and likely to derive from a single individual.

Corncrakes are summer visitors to Ireland, and were formerly very common on ungrazed grasslands between the months of April and October (Anderson 2008, 99; Cabot 1995, 50). The full ossification of, and the presence of medullary bone in, two of the bones recovered identifies the remains as those of an adult female bird, and suggests death occurred in the earlier part of her sojourn here. This is perhaps unsurprising, as corncrakes are ground-nesting birds, with females at their most vulnerable during the incubation period.



Corncrakes were highly regarded as a food source in historic times (Anderson 2008, 101), and although not commonly recovered from archaeological excavations, they have been recorded at Early Medieval (Clonmacnoise) and Medieval (Lough Gur; Dundrum (Hamilton-Dyer 2007, 108). Short, parallel marks close to

Fig.13. Corncrake bones recovered at Garbally Demesne. Arrow indicates the distal cut marks on the humerus

end of the femur recovered at Garbally Demesne are consistent with shallow knife marks (Fig.13), suggesting the bird's presence at the site was indeed as table fare.

Jack Snipe

A single bone recovered from modern disturbance, was identified as that of a Jack Snipe, *Lymnocyptes minmus*. The smallest of the wader family, Jack Snipe are winter visitors to Ireland and are found on wetter lands (Anderson 2008, 151). Like the corncrake, Jack Snipe were a highly regarded dish (*ibid.*), and this may have been the fate of the bird recorded at Garbally Demesne. As it was identified only in disturbed levels, however, it may be intrusive from a much later date, and is not considered in the overall interpretation of animal use at the site.

Discussion

Due to disturbance of the site in the mid-twentieth century, the potential mixing of earlier and later bone deposits presented a challenge to the analysis of the faunal remains from Garbally Demesne. To assess this further, the relative abundance of species was compared between groups of contexts: a) modern disturbance relating to a storm-water pipe; b) upper layers and c) lower layers (these last considered to have been less subject to disturbance – A. Wallace pers. comm.). While there was little difference between the upper and lower layers, the small bone assemblage from the modern disturbance was distinctly different, suggesting a much greater mixing and presence of later intrusive material in these contexts (Fig.14). This was further corroborated by the identification of later butchery practices in the modern disturbance, which was notably absent in the remainder of the assemblage.

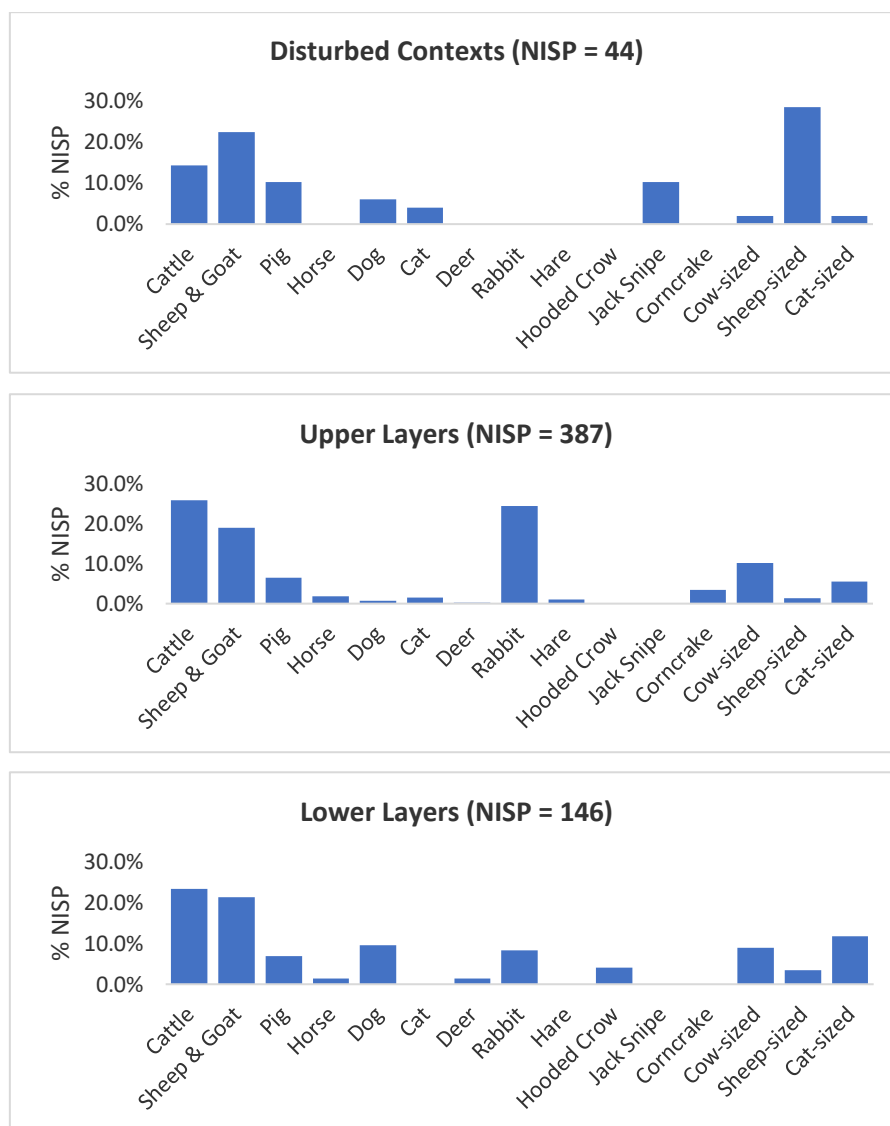


Fig.14. Comparison of Species Abundance between modern and older disturbed levels at Garbally Demesne.

Nonetheless, it was recognised that a level of disturbance and mixing had occurred in the bone collected from both the upper and lower layers. This was evidenced by the presence of scattered bones of rabbit, a medieval introduction to Ireland. Rabbits may have been present at lower levels on the site through burrowing, and their relative abundance at Garbally Demesne would support such a scenario. However, the non-localised nature of the bone recovered (small numbers of bones were recovered from five contexts), indicates that disturbance of the site occurred at a later date to their presence at the site.

Further evidence of the level of disturbance was present in the identification of a partial maxilla of a dog from C.6/7/8, with associated teeth recovered from three other contexts, including the modern disturbance. Likewise, three elements from what appears to be a single bird were recovered from two separate contexts. Both instances reflect the disturbance that occurred at the site, but what remains uncertain is to what extent later evidence is mixed with the original Early Medieval bone deposits, although modern bone appears to not

have been mixed with the layers to any notable extent. As a result, interpretation of the results as presented here is considered preliminary, and subject to revision should further faunal evidence be recovered from the site in the future.

In keeping with archaeological evidence from other sites in Ireland, cattle were the most commonly occurring species and, given their larger size relative to other food animals, would have been by far the largest contributor of meat to the diet. While ageing data is limited, it suggests a mixed dairy/beef economy, as represented by the current assemblage. Excluding the intrusive rabbit bones, sheep and goat as a combined category were second in importance at the site. Both sheep and goat were identified within the assemblage, the latter being more unexpected from Early Medieval levels. The number of bones available for sexing and ageing data were too low to allow for any conclusions to be drawn on herd management or husbandry, but indicate the animals represented were reared for meat rather than milk or wool.

Unusually for a potentially Early Medieval assemblage, the abundance of pig remains on the site are significantly lower than that of sheep/goat. With the exception of a small number of sites, pigs generally almost equal, and frequently exceed, sheep/goat numbers on earlier sites, with sheep/goats increasing in the medieval period. It is uncertain at Garbally Demesne if this reflects a true picture of the overall site, as factors such as differential deposition at the site, and the potential for the intrusion of later bone deposits must be considered. Possible reasons for a depression of pig numbers at a site include the absence of suitable woodland cover for pannage (McCormick & Murray 2007, 105-107), and the use of pigs as a tribute animal within the hierarchy. The former seems unlikely in the case of Garbally Demesne, while it is not possible to assess the probability of the latter in the absence of further information relating to the nature and extent of the site. Evidence of pathologies on the main domesticates were low, and generally related to joint stress. This may indicate older animals on the site, and the use of animals for heavy loading (e.g. plough oxen). However, an example of possible nutritional deficiency during early growth was also identified for each of cattle, sheep/goat and pig, and may reflect occasional restricted access to good feeding grounds.

The presence of wild animal species (deer, hare, corncrake), suggest that these supplemented the diet, albeit at a low level. Notably, the deer remains show evidence of exposure to open fire and may have been roasted on a spit. A small number of the bones from cattle, sheep/goats and pigs also show evidence of roasting, suggesting this was at least an occasional method of cooking at the site. In contrast, no fully burnt bones were present, although these have a high survival and retrieval rate. This suggests that bone was not subject to disposal by fire, at least in that part of the site represented by the assemblage.

The evidence indicates that the non-food domesticates (horse, dog, and cat) were also present at the site. These were recorded in very low numbers, however, and the possibility of intrusive elements must be considered. Nonetheless, secondary evidence for dogs was also present in the form of gnaw-marks, indicating that their presence at the site was contemporary with at least some of the main bone assemblage.

Conclusion

Animal bone assemblages ultimately represent waste products deposited at a site, and can provide information about diet, animal husbandry, and activities carried out at the site in relation to animals and waste disposal. However, the absence of securely stratified features and contexts, and the disturbance of the site associated with the construction of a housing estate in the mid-twentieth century, presented some difficulties in the interpretation of the animal bone assemblage recovered at Garbally Demesne.

Although the faunal assemblage was small and highly fragmented, a wide range of species (numbering 13 in total) were identified, including both domestic and wild animals. Notably, no domestic birds were identified, and only one species of wild food-bird was recovered from less disturbed contexts. Non-food animals and birds were represented in low numbers, and by very fragmentary remains. This latter probably relates to later disturbance of deposits rather than disposal methods at the site. The assemblage represents butchery and food waste, reflecting a diet of beef, mutton and pork augmented by occasional venison and small game. Rabbit present at the site most probably represent animals burrowing at the site in former times.

The uncertainty relating to the extent of disturbance at the site does not allow for further conclusions to be drawn in relation to the overall site, although the assemblage is consistent with a cattle-based economy, with sheep and goats present as a secondary livestock. The unexpectedly low levels of pig may be exaggerated due to the overall low numbers involved, or may be partly due to the disturbed nature of the layers excavated.

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Appendix 5: Radiocarbon Dating Certificate



International Chemical Analysis Inc.
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Summary of Ages

Submitter Name: Angela Wallace
Company Name: Atlantic Archaeology (Ireland)
Address: Pier Road, Enniscrone, Co. Sligo, Ireland F26 PX34
Date Received: July 30, 2019
Date Reported: August 20, 2019

ICA ID	Submitter ID	Material Type	Pretreatment	Conventional Age	Calibrated Age
19B/0727	Licence No 18E0423 C20: Sample No 33	Bone	Col-AAA	1480 \pm 30 BP	Cal 530 - 650 AD

- Calibrated ages are attained using INTCAL13: *IntCal13 and Marine13 Radiocarbon Age Calibration Curves 0–50,000 Years cal BP*. Paula J. Reimer, Edouard Bard, Alex Bayliss, J. Warren Beck, Paul G. Blackwell, Christopher Bronk, Ramsey, Caitlin E. Buck, Hai Cheng, R. Lawrence Edwards, Michael Friedrich, Pieter M. Grootes, Thomas P. Guilderson, Halldur Halldason, Irka Hajdas, Christine Hatté, Timothy J. Heaton, Dirk L. Hoffmann, Alan G. Hogg, Konrad A. Hughen, K. Felix Kaiser, Bernd Kromer, Sturt W. Manning, Mu Niu, Ron W. Reimer, David A. Richards, E. Marian Scott, John R. Southon, Richard A. Staff, Christian S. M. Turney, Johannes van der Plicht. *Radiocarbon* 55(4), Pages 1869–1887.
- Unless otherwise stated, 2 sigma calibration (95% probability) is used.
- Conventional ages are given in BP (BP=Before Present, 1950 AD), and have been corrected for fractionation using the delta C13.



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QC Report

Submitter Name: Angela Wallace
Company Name: Atlantic Archaeology (Ireland)
Address: Pier Road, Enniscrone, Co. Sligo, Ireland F26 PX34

Date Received	July 30, 2019	Date Reported	August 20, 2019
QC 1 Sample ID	IAEA C7	QC 2 Sample ID	NIST OXII
QC Expected Value	49.53 +/- 0.70 pMC	QC Expected Value	134.09 +/- 0.70 pMC
QC Measured Value	49.84 +/- 0.20 pMC	QC Measured Value	134.06 +/- 0.20 pMC
Pass?	YES	Pass?	YES

- pMC = Percent Modern Carbon.
- IAEA = International Atomic Energy Agency.