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Llaniestyn Churchyard Extension, Llanddona, Anglesey

Archaeological MAP2 Phase 3 Report (Assessment of Potential for Analysis)

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Llaniestyn Churchyard Extension, Llanddona, Anglesey

Archaeological MAP2 Phase 3 Report (Assessment of Potential for Analysis)

Project No. G2420

Report No. 1344

Prepared for: Cyngor Ynys Mon

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Specialist Contributions by: Andrew Haycock, Denise Druse, Vickie Jamieson and George Smith

Front Cover: Upper femurs in Grave 21 (Photo G2420_118)

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1 Contents

Approvals Table				
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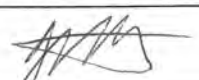
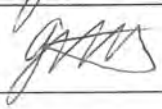
Reviewed by	Document Reviewer	John Roberts		11/11/16
Approved by	Principal Archaeologist	John Roberts		11/11/16

Revision History			
Rev No.	**Summary of Changes**	**Ref Section**	**Purpose of Issue**
1	Addition of Sample 11 to radiocarbon dating samples	Summary, 5	For GAPS approval
2	Minor text editing	3	For GAPS approval

Non-Technical Summary

Gwynedd Archaeological Trust has been commissioned by Cyngor Ynys Mon to complete a post-excavation Assessment of Potential for Analysis on the artefacts and ecofacts recovered from the excavation of a medieval cemetery at Llaniestyn. This follows a programme of archaeological mitigation during groundworks for a cemetery extension at St Iestyn's Church, Llanddona, Anglesey.

Sixty-one graves and associated features were identified during the archaeological mitigation. Thirty-one features, including a mortuary enclosure and 26 graves, were fully excavated, the remaining features and graves, located under the proposed road and car-park area, are to be preserved in situ.

Although confirmation of the date of the site would follow the obtaining of radiocarbon dates, the burials are morphologically of a type typically seen in early medieval cemeteries in the area (c.600AD to c.1100AD) and it would seem likely that the burials date from this time.

An assessment of the potential for analysis has been carried out on assemblages of bone, ecofacts, flint and worked stone. This has resulted in the production of three specialist reports, giving recommendations for further analysis.

The worked stone report, produced by the National Museum of Wales, assessed the lithology of the worked stones recovered from the mortuary enclosure and cist graves. The report noted that the lithology of all the stones was local. It noted that thirteen of the stones were sourced from the Anglesey Grits of the Penmon area, which included seven that showed clear evidence of tooling on them. There were five stones of local mudstone and sandstone, and one of a local fossiliferous limestone. The stones with tooling on them are probably reused stones from a former building in the area. There is no recommendation for further analysis work on the worked stones, and it is recommended that they are accessioned by Oriel Ynys Môn.

The worked flint report, produced by George Smith of Gwynedd Archaeological Trust, analysed three flints recovered from the mortuary enclosure ditch and two

graves. One of these was noted to be a natural flint, one possibly worked or natural, and one was a worked flint of prehistoric origin. All of these were from residual contexts and provide little information relating to the cemetery. No further analysis is recommended for the flints.

The ecofacts assessed by Oxford Archaeology North comprised charred plant remains and charcoal. The assessment concluded that the charred material was mostly observed in small quantities, and probably represented either redeposited material, or debris originating from the surface through which the graves were cut. No further analysis is recommended, however it is recommended that radiocarbon dating is undertaken from sample 11, as it has the potential to provide a date for the mortuary enclosure.

The bone was also assessed by Oxford Archaeology North. The assessment concluded that the highly fragmented nature and the degradation of the bone meant that it was not possible to provide any significant information about particular individuals. No further analysis of the bone was recommended, but it is recommended that radiocarbon dating is attempted on fragments from graves 16 and 21.

The only additional analysis work recommended for the MAP2 Phase 4 Analysis and Reporting stage is therefore the three radiocarbon dates. This information will be incorporated into the final report and the publication report and its implications discussed, along with all the information obtained during Phase 3 of the project.

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was initially asked by *Cyngor Ynys Mon* to complete a post-excavation Assessment of Potential for Analysis of artefacts and ecofacts recovered following an archaeological controlled strip and excavation in advance of groundworks associated with a cemetery extension to the south-east of St Iestyn's Church, Llanddona, Anglesey (centred on NGR SH58577955; Figure 01; HER Primary Reference Number (PRN) 60985). The work took place under Planning Application No. 22LPA987/CC.

The initial cemetery extension proposal measured approximately 61m by 45m and was located within an enclosed field to the southeast of St Iestyn's Church (PRN 2659 & 7024) and to the east of Ty'n Llan House (PRN 6477; Figure 01). The extension area was designed to accommodate 207 burial spaces and include a boundary wall, access road with parking and an internal footpath (as indicated on client drawing 027.68.81.01). The proposals were modified as a result of the archaeological activity, resulting in a reduced footprint being made available for burials.

Sixty-one graves and associated features were identified during the archaeological mitigation. Thirty-one features, including 26 graves, were fully excavated, the remaining features and graves, located under the proposed road and car-park area, are to be preserved in situ (Figure 02).

The project was monitored by GAPS for the duration of the work. GAPS are tasked also with the monitoring all subsequent phases, including all post-excavation work and reports.

The post-excavation work is being undertaken as a phased process in accordance with guidelines specified in *Management of Archaeological Projects – MAP2* (English Heritage, 1991), and relevant guidelines from *Management of Research Projects in the Historic Environment* (English Heritage 2015). Five project phases are specified in *MAP2* (English Heritage, 1991):

- MAP2 Phase 1: Project Planning
- MAP2 Phase 2: Fieldwork
- MAP2 Phase 3: Assessment of Potential for Analysis
- MAP2 Phase 4: Analysis and Report Preparation
- MAP2 Phase 5: Dissemination

The current report specifically relates to the assessment of the potential for analysis of recovered artefacts and ecofacts *(*MAP2 Phase 3*).* Subsequent analysis, dating, report preparation and dissemination will be undertaken as part of MAP2 Phases 4 and 5.

The MAP2 Phase 3 Assessment involved the processing of ecofacts and bone from the excavation in house by GAT, and the sending of the resultant material to specialists for assessment. In addition, worked stone and flint recovered from the site was sent for assessment. This has resulted in the production of three specialist reports, one the worked stone, one for the flint and one for the Archaeobotany (ecofacts) and Osteology. These reports gave recommendations for further analysis.

The stone report, produced by Andrew Haycock of the National Museum of Wales, assessed the lithology of the worked stones recovered from the mortuary enclosure and cist graves.

The worked flint report, produced by George Smith of Gwynedd Archaeological Trust, analysed three flints recovered from the mortuary enclosure ditch and two graves.

The Archaeobotany and Osteology report, produced by Denise Druce and Vickie Jamieson of Oxford Archaeology North, analysed the charred plant remains, charcoal and human bone recovered from the excavation.

The archaeological work was undertaken in accordance with the following guidelines:

- English Heritage, 2015, *Management of Research Projects in the Historic Environment (MoRPHE)*.
- English Heritage, 1991, *Management of Archaeological Projects*
- English Heritage 2005 *New Guidelines for the Treatment of Human Remains Excavated from Christian Burial Grounds in England*
- English Heritage, 2011, *Environmental Archaeology: A guide to the theory and practise of methods, from sampling and recovery to post-excavation.* English Heritage Publications. Swindon.
- McKinley, Jacqueline I. and Roberts, Charlotte 1993, *Excavation and post-excavation treatment of cremated and inhumed human remains.* CIFA Technical Paper No. 13
- Royal Commission on Ancient and Historic Monuments of Wales 2015 *Guidelines for digital archives.*

- *Standard and Guidance for Archaeological Excavation* (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).
- *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives* (Chartered Institute for Archaeologists, 2009 and 2014).
- *Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials* (Chartered Institute for Archaeologists, 2008 and 2014).

1.1 Acknowledgements

The assistance and advice of Jane Kenny of GAT in the production of this report is gratefully acknowledged. The help of Jenney Emmet and Ashley Batten of GAPS is also acknowledged here.

2 PROJECT BACKGROUND

2.1 Introduction

The regional Historic Environment Record (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor LL57 2RT), indicates that the known archaeological sites within the local area includes:

- Primary Reference Number (PRN) 2662 (SH58337961): Ffynnon Iestyn Well - Medieval Holy Well
- PRN 2659 (SH58507959): St. Iestyn's Church - Medieval Church. Grade II Listed Building
- PRN 7024 (SH58507959): Llaniestyn Parish Church – Medieval/ Post-medieval Church. Grade II Listed Building
- PRN 6477 (SH58537956): Ty'n Llan House - Post-medieval House

Both PRN 2659 and 7024 (Figure 01) relate to the Llaniestyn parish church which is dedicated to St. Iestyn. The present single cell church dates to the 12th century, with a 14th or 15th century east extension. The church includes a 14th century relief carving of St. Iestyn, probably commissioned by the patron who rebuilt the church at that time, Wenllian ferch Madoc and her nephew Gwilym (Haslam *et al.* 2009, 146). The church is bounded by an irregular dry stone wall, with an entrance to the southeast. The churchyard boundary wall to the north is somewhat curvilinear in character, and may represent part of the early medieval *llan* or churchyard enclosure boundary, with the boundary and access track to the south being of post-medieval date.

2.2 The Watching Brief

A watching brief took place from the 24th September 2015, with stone lines grave identified on 7th October 2015, and this was managed by Anne-Marie Oattes of GAT.

The site was then cleaned and planned. One grave (Grave 21; Figure 02) was fully excavated as a sample to test for the level of bone preservation on the site.

This phase of work identified 31 medieval graves. The details of this phase of the work are covered in the first interim report (Evans *et al.* 2015; Report 1277).

2.3 Controlled Strip and Excavation

The discovery of the graves in the watching brief phase of the work, and the likelihood of their presence extending further than the stripped area resulted in an archaeological controlled strip being required by GAPS during the stripping of an area to the south of the proposed footpath area running west east of the site, which was to house the new burial plots. The first phase of this was carried out on the 11th and 12th January 2016, covering an area of approximately 40m by 5m. This was cleaned archaeologically in advance of survey and full excavation. Following the full excavation of this area to the south of the proposed cemetery footpath, ten further graves were recorded.

A further eight graves were identified during the topsoil stripping of a second 40m by 5m strip to the south of the earlier one. This was carried out on 16th and 17th February 2016, and involved the excavated topsoil being placed on the earlier opened strip. Twelve features were identified, eight of which were identified as graves. Three further features (52, 55 and 59) were identified within 1m of the southern edge of the excavation. These were not excavated and will be preserved in situ.

The archaeological work resulted in a west-east orientated strip of land approximately 40m by 15m being made available for contemporary burials, with between 80-90 plots being created. The extent of the cemetery has been limited to this area in the short to medium term.

The archaeological mitigation was completed between September 2015 and March 2016 (Figure 02; GAT Report 1308). Forty-Seven graves and associated features were identified in total (Figure 02), of which, 31 features (including 26 graves) were

fully excavated; the remaining features and graves, located under the proposed road and car-park area, were preserved in situ.

Two of these contained quantities of human bone (Graves 16 and 21). It appears that the variable preservation is due to a different soil morphology created as the bone had been protected by collapsed capping stones. Small quartz stones were recovered from a number of the graves.

The mortuary enclosure, feature 19, was associated with worked stones forming a kerb around the two central graves. These were of a monumental character not seen in the rest of the cemetery, and were considered suitable for assessment.

The dating of the bone material from within Graves 16 and 21 will help inform the chronology of the site. In general, the burials are morphologically of a type typically seen in early medieval cemeteries in the area (600AD to 1100AD) and it would seem likely that the burials date from this time, as a precursor to the current church site of St. Iestyn to the north-west which is believed to date from around 1100AD (Brassil *et al.* 1991; Longley 2009, 106-111). All ecofact samples recovered from the excavated graves were processed and assessed for further potential.

3 METHODOLOGY

3.1 Specialist Assessment of the Worked Stone

3.1.1 In-house methodology

Thirteen stones (12 individual stones plus one stone in two pieces) were recovered from a kerb-like structure around the two graves within the mortuary enclosure (Feature 45), contexts (22) and (40), small finds 8 and 9. The kerb stones consisted of a number of apparently worked and unworked pieces, of which the local rubble fieldstone ones were not retained. Six other cist burial stones were also retained from other burials (Graves 16, 18, 47; small finds 23-25), making a total of 19. These stones have a varied geology and shape, although some appear to have been worked into rectangular blocks.

It was considered necessary that the stones were examined by a specialist to assess their petrology and report on their nature and character. This was in order to understand the types of stone used in the construction of mortuary structures and where the material was obtained from. Whether or not they appeared to be re-used building stone was also a material consideration.

The 19 potentially worked stones were examined by Andrew Haycock and Jana Horak, Head of Mineralogy and Petrology at the National Museum of Wales (NMW).

3.1.2 Specialist methodology

A petrological examination of the archaeological artefacts was undertaken following standard methodology detailed in British Standard EN 12407(2007); initial observation was made with the naked eye followed by use of a x10 Gowllands lens and x20 Gem-A lens. Observations were restricted to visual identification, with the exception of 3 samples (G2420 92_23 1 of 2, G2420 92_23 2 of 2, G2420 71_25 3 of 3) where standard thin sections were produced from fragments that had naturally broken away from the stones. This allowed for more detailed examination.

A standard thin section (30µm) was prepared from each of these specimens and observed using a polarizing microscope (Leica Ortholux Pol). This allowed for high magnitude identification of the mineral grains (shape, colour, cement etc.) and textures present within each rock. Distinct differences in the colour of minerals in cross-polarized light (birefringence) allows for very accurate mineral identification. Vacuum impregnating of the thin section with a blue oil dye, allows measurement of the free pore space between the grains.

During visual examination, the colour of the stone was estimated using standard Munsell colour charts and is presented thus (Munsell number [colour name]), and the grain size characterised using standard terminology (very-fine grained < 187µm, fine-grained 187 – 250µm, medium-grained 250 – 500µm, coarse 500 – 1000µm, very coarse 1 – 2mm, granules 2 – 4mm, pebbles > 4mm).

The petrological samples were all imaged using a Canon EOS 5D with 24 – 105mm lens. Images of samples are included to reference specific features in particular samples, or highlight areas of interest found during observations.

3.2 Specialist Assessment of Worked Flint Artefacts

3.2.1 In-house methodology

Three lithic artefacts (SF3, SF60 and SF61) were examined from the mortuary enclosure ditch fill (10), grave fills of grave 21 (4) and grave 37 (52) by George Smith, the GAT specialist on prehistoric lithics. These were reported upon and it was suggested that one, SF61 showed evidence of prehistoric working.

3.3 Specialist Assessment of the Archaeobotany and Osteoarchaeology

3.3.1 In-house methodology

A 100% bulk sample was recovered from the fill of Grave 21, comprising twelve 10 litre buckets. Three 10 litre bulk samples were recovered from each of the other adult graves and two from the infant graves of the 24 graves subsequently excavated. These were taken from the primary fill at the head, pelvic region and foot end of the graves. Samples were also recovered from the non-grave features. This resulted in the collection of 73 ten litre bulk samples.

The primary aim of the sampling strategy was:

1. to recover any bone fragments suitable for analysis, identification and dating;
2. to recover any teeth or teeth fragments for analysis and Amelogenesis assessment;
3. to recover artefacts/artefact fragments suitable for analysis and possible assessment and dating; and
4. to recover charcoal and other plant macrofossils; and
5. to recover possible faunal evidence, such as parasite eggs.

- The bulk sample was processed in house. This consisted of flotation and wet sieving using a 500 micron mesh to collect the residue (which collects more than the 1mm = 1000 micron), with the flot collected in a 250 micron mesh. The residues will be sorted to recover artefacts and non-floating ecofacts. Once sorted the residues will be discarded. The flots will be weighed, catalogued and assessed for bone fragments, teeth, artefacts, charcoal and other plant macrofossils, faunal evidence (possibly parasite eggs etc). Consultation with Denise Druce of Oxford Archaeology North (OAN) has suggested that successful recovery of parasite eggs from intestinal nematode worms from this type of grave contexts is unlikely to be productive however (*pers. comm.*), making this less of an archaeological priority.
- Recovered bone fragments (including the femur and tibia fragments from graves 16 and 21) and teeth fragments, were sent the bone specialist at OAN for further identification and assessment, with recommendations provided for any further

analysis, including dating. These currently consist of up to 782g of bone material from three graves, although more may be recovered from the bulk samples.

Recovered charcoal and other plant macrofossils were analysed by Denise Druce of OAN, for further identification and assessment, with recommendations provided for any further analysis, including dating. Bone analysis was carried out by Vickie Jamieson, also of OAN.

3.3.2 Specialist Methodology

Following processing by Gwynedd Archaeological Trust, the dried flots were sent to OAN, where they were assessed under a binocular microscope and their contents recorded. The flots were scanned using a Leica stereomicroscope and any plant material, including fruits, seeds, charcoal and wood fragments, was quantified, provisionally identified, and assessed, following Historic England guidelines (English Heritage 2011). Other remains, such as bone, molluscs, insects, small artefacts, industrial/metal waste, and coal/heat-affected vesicular material (havm), were also quantified. The presence of modern contaminants, such as modern roots, was also noted. Quantification is based on a score of 1 to 4 where 1 = rare (one to five items), 2 = present (6-25), 3 = common (26-100), 4 = abundant (>100 items). Nomenclature of the plant remains follows Stace (2010). 1.3.2 Any charcoal fragments within the bulk samples were quantified and provisionally identified where possible. In particular, the presence of any short-lived wood species, such as alder (Alnus glutinosa) or hazel (Corylusavellana), was noted. Charcoal identifications were made with reference to Hather (2000), and modern reference material.

Osteological assessment was undertaken in accordance with published guidelines (Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Cox and Mays 2003). All skeletal remains were examined macroscopically and recorded using *pro-forma* recording forms. It should be noted that, due to the highly fragile nature of the skeletal remains, they had not been washed prior to assessment. Completeness was estimated by recording, as a percentage, how much of the skeleton had survived and assigning it to one of the following categories: 0-25% complete; 25-50% complete; 50-75% complete; 75-100% complete. The condition of the bone was

assessed according to the degree of erosion of the bone surface and how much of the epiphyses (the ends of the bones) and cancellous bone (the spongy bone that is beneath the outer layer) had survived. Based on these factors, the remains were assigned to one of the following categories put forward by Brickley and McKinley (2004):

Grade 0: surface morphology clearly visible with fresh appearance to bone and no modifications;
Grade 1: slight and patchy surface erosion;
Grade 2: more extensive surface erosion than grade 1 with deeper surface penetration;
Grade 3: most of bone surface affected by some degree of erosion; general morphology maintained but detail of parts of surface masked by erosive action;
Grade 4: all of bone surface affected by erosive action; general profile maintained and depth of modification not uniform across whole surface;
Grade 5: heavy erosion across whole surface, completely masking normal surface morphology, with some modification of profile;
Grade 5+: as Grade 5 but with extensive penetrating erosion resulting in modification of profile.

All observations were made by scanning each skeletal fragment. While these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any possible future high-resolution examination. The potential of the remains to yield information relating to age and sex was estimated by determining if the appropriate skeletal elements were present so that standard methods could be employed (Brickley and McKinley 2004). The remains of the skeletons were also assessed for their potential to yield metrical data, in particular that which will allow stature estimation and facilitate age estimation for sub-adults, and sex estimation for adults. Stature may be estimated from human skeletal remains by applying the maximum length of complete long limb bones to the regression equations set out by Trotter and Gleser (1958; revised by Trotter 1970). Potential for metrical assessment was scored

on a scale of 1-5, where 1 denotes skeletons that showed no potential (*ie* no elements could be measured owing to fragmentation/poor preservation), and 5 denotes skeletons that showed considerable potential (*ie* the full range of standard cranial and post-cranial measurements could be taken). Other observations pertaining to metrical assessment involved noting which skeletal remains had sufficiently preserved bones, in particular crania, that could facilitate comparisons. All observations were made by scanning each skeletal fragment. While these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any possible future high resolution examination. An assessment of the potential for the skeletal remains to yield non-metrical data was scored on a scale of 1-5, where 1 denotes skeletons that showed no potential for non-metrical analysis (*ie* preservation prevented the observation of all standard cranial and post-cranial sites) and 5 denotes skeletons that showed considerable potential for non-metrical analysis (*ie* all standard cranial and post-cranial sites could be scored).

4 RESULTS

4.1 Specialist Assessment of the Worked Stone

Nineteen archaeological artefacts were examined to determine their lithology and a potential source for the stones, by matching the observed characteristics to known lithologies local to the area and further afield. A copy of the specialist assessment report is reproduced as Appendix II.

It was determined that all 19 artefacts are sedimentary rocks and considered to be highly likely to have a local origin (Plates 01-02). Thirteen stones have been sourced from the Anglesey Grits found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. The Anglesey Grits are very quartz-rich sandstone (quartz arenite) with varied grain-size (medium-sand to large pebble size). Five of the artefacts (very fine-grained sandstone / siltstone) are highly likely to have a source in the local Ordovician mudstone and sandstone sequence. This outcrops to the east of the site around Llangoed and Llanfaes, and to the north-west near Pentrellwyn.

One find, a fossiliferous limestone (bioclastic packstone) is highly likely to have been taken from the dark, foetid argillaceous limestone (packstones) of the Leete Limestone Formation outcropping between Penmon, Llangoed and the coast north of Bwrdd Arthur.

Evidence of tooling and working was noted on seven of the stones, suggestive of their working into building stones (Plate 01). As the stones are all of local origin, this suggests that they came from a building situated in the vicinity of the cemetery, the whereabouts of which is not known. The building must have been earlier in date than the cemetery, and a Roman date seems likely as stone buildings are not known in the area in the early post-Roman period.

No further work on the stones is recommended.

4.2 Specialist Assessment of Worked Flint Artefacts

Three flints were examined by George Smith of GAT. A copy of the specialist assessment report is reproduced as Appendix III.

One of these (SF60), from the fill of Grave 21, was shown to be a broken fragment of natural flint gravel. One (SF03), from the mortuary ditch fill (10) was considered to be either a naturally broken flake, or possibly a scalar waste piece of early Neolithic date. The third (SF61), from the fill of Grave 37 was a neatly struck but broken flake, which was not dateable, but was as the result of prehistoric human activity. The artefacts indicate that there was some early prehistoric activity in the vicinity of the cemetery site. All the artefacts were however in residual contexts, and cannot help in the further understanding of the development of the cemetery site. No further work is recommended on the worked flints.

4.3 Specialist Assessment of the Archaeobotany and Osteoarchaeology

Oxford Archaeology North assessed the flots and human bone from bulk and hand-retrieved samples taken during excavation works at the Llaniestyn cemetery. A copy of the specialist assessment report is reproduced as Appendix IV.

Bulk samples, from several graves and associated mortuary features, having been processed by GAT, were assessed by a palaeobotanist for the survival of any organic remains that might provide information on any burial practices or burial conditions. In addition, several, hand-retrieved, fragments of human bone were assessed by an osteologist for their potential for analysis. Both sets of data were also assessed for their potential to provide suitable material for radiocarbon dating. Little organic material was recovered, and the assessment demonstrated that there was no potential for palaeoenvironmental analysis. Similarly, due to its highly fragmented and degraded state, no further work was considered warranted on the bone. Radiocarbon dating was recommended to be attempted on bone fragments from graves **16** and **21**.

Charred plant remains, and a single uncharred fruit stone, were also considered to provide suitable material for radiocarbon dating, although their uncertain taphonomy means that any resulting dates from these remain tenuous.

5 CONCLUSION AND RECOMMENDATIONS

An assessment of the potential for analysis has been carried out on assemblages of bone, ecofacts, flint and worked stone from the cemetery excavation site at Llaniestyn, by Andrew Haycock of the NMW, Denise Druce and Vickie Jamieson of OAN, and George Smith of GAT (Appendices II-IV). This has resulted in the production of three specialist reports giving recommendations for their further analysis.

The worked stone report (Appendix II) analysed the lithology of the worked stones discovered at this site associated with the mortuary enclosure and cist graves. It identified that all the 19 stones were locally sourced, but of varied lithological types. It noted that thirteen of the stones were sourced from the Anglesey Grits of the Penmon area, which included seven that showed clear evidence of tooling on them. There were five stones of local mudstone and sandstone, and one of a local fossiliferous limestone. The stones with tooling on them are probably reused stones from a former building in the area. There is no recommendation for further analysis work on the stones, and full photographic archive of the stones has been produced. It is therefore proposed that the stones be retained by *Oriel Ynys Môn*. Discussions with regards to the stones are ongoing with Esther Roberts and Ian Jones at the Oriel in order to arrange this.

The flint report (Appendix III) noted that of the three flints identified; only one was certainly noted to be of human agency and of prehistoric origin. The flints were from residual grave contexts, which does not relate to their original use. It is not recommended that the flints are retained.

The Archaeobotany report (Appendix IV) recommended no further work on the charred plant remains and charcoal. This is because the taphonomy of these remains in doubt and there is not much that can be said about them. It appears rather uncertain whether the blackthorn or cherry pip was from a burial's stomach or was modern and brought down by worm action. As the latter is quite probable, it does not seem worth dating the pip. It is considered however that the charcoal from

sample 11 should be submitted for radiocarbon dating. The material is considered suitable for dating and provides the possibility of giving a date for the mortuary enclosure, the most significant element of the site. The charred plant remains will ultimately be disposed of.

There is no further analysis recommended for the bone, owing to the fragmentary nature of the surviving material. It is recommended that radiocarbon dates are obtained for two samples: one from bone from Grave **16** and one from bone from Grave **21**, although it is possible that a date might not be returned due to the survival of insufficient carbon. It will be confirmed by the nominated laboratory as to the viability of the samples. These dates would be able to give a snapshot of the time when the cemetery was in use, but would be insufficient to indicate the duration of the use of the cemetery. Once the selected samples are submitted for radiocarbon dating, the remaining bone should be returned to St. Iestyn's Church for reburial in accordance with the Ministry of Justice licence.

The only additional analysis work recommended for the MAP2 Phase 4 Analysis and Reporting stage is therefore the three radiocarbon dates on the bone from graves **16** and **21,** and the charcoal from the mortuary enclosure (sample **11**). This information will be incorporated into the final and the publication report and its implications discussed, along with all the information obtained during Phase 3 of the project.

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7 Appendix I

7.1 Project Design for MAP2 Phase 3 Assessment of Potential for Analysis

ST IESTYN'S CHRUCH, LLANDDONA

PROJECT DESIGN FOR AN ASSESSMENT OF POTENTIAL FOR ANALYSIS (MAP2 PHASE 3)

Prepared for Cyngor Ynys Mon Council, April 2016

Contents

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been commissioned by Cyngor Ynys Mon Council to complete a post-excavation *Assessment of Potential for Analysis (MAP2 Phase 3)*. This follows a programme of archaeological mitigation during groundworks for a cemetery extension at St Iestyn's Church, Llanddona, Anglesey (NGR SH58577955; Figure 1).

The cemetery extension was intended to measure *c.*61.0m by 45m and is located within an enclosed field to the southeast of St Iestyn's Church (PRN 2659 & 7024) and to the east of Ty'n Llan House (PRN 6477; Figure 1).

Sixty-one graves and associated features were identified during the archaeological mitigation. Thirty-one features, including 26 graves, were fully excavated, the remaining features and graves, located under the proposed road and car-park area, are to be preserved in situ (GAT Reports 1277 and 1308).

Although confirmation of the date of the site will be completed as part of the post-excavation programme, the burials are morphologically of a type typically seen in early medieval cemeteries in the area (c.600AD to c.1100AD) and it would seem likely that the burials date from this time. The opened areas did not cover the full extent of the medieval cemetery. Whilst a possible edge to the burial ground was noted to the east (no further graves) and to the south (ancient trackway), the limits of the cemetery remain unknown.

The post-excavation will be undertaken as a phased process in accordance with guidelines specified in *Management of Archaeological Projects – MAP2* (English Heritage, 1991), and relevant guidelines from *Management of Research Projects in the Historic Environment* (English Heritage 2015). Five project phases are specified in *MAP2* (English Heritage, 1991):

- MAP2 Phase 1: Project Planning
- MAP2 Phase 2: Fieldwork
- MAP2 Phase 3: Assessment of Potential for Analysis
- MAP2 Phase 4: Analysis and Report Preparation
- MAP2 Phase 5: Dissemination

The current design specifically relates to the assessment of recovered artefacts and ecofacts (MAP2 Phase 3). The proposed methodology and nominated specialists are noted in

Sections 3.1 and 3.2. Subsequent analysis, dating, report preparation and dissemination will be undertaken as part of MAP2 Phases 4 and 5.

Reference has also been made to the following guidelines:

- Campbell, G., Moffett, L. and Straker, V. *Environmental Archaeology: A guide to the theory and practise of methods, from sampling and recovery to post-excavation* (2nd edition). (English Heritage Publications. Swindon, 2011).
- *Standard and Guidance for Archaeological Excavation* (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).
- *Standard and Guidance for Archaeological Watching Brief* (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).
- *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives* (Chartered Institute for Archaeologists, 2009 and 2014).
- *Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials* (Chartered Institute for Archaeologists, 2008 and 2014).

NB. All phases of this project are being monitored by the Gwynedd Archaeological Planning Services (GAPS). The content of this and any future project designs and reporting must be approved by GAPS.

2 ARCHAEOLOGICAL RESULTS

The archaeological mitigation was completed between September 2015 and March 2016 (Figure 02; GAT Reports 1277 and 1308). Sixty-one graves and associated features were identified (Figure 02), of which, 31 features (including 26 graves) were fully excavated; the remaining features and graves, located under the proposed road and car-park area, were preserved in situ.

The medieval cemetery appears to have two grave clusters, one consisting of 27 graves concentrated at the north-west end of site, and one centred on the mortuary enclosure (Feature 45) to the east of the site consisting of 26 graves and associated features. Neither grave clusters is completely within the stripped areas, so this view may need to be modified in future, however there do appear to be no graves at the south-west end. This could possibly be as a result of the desirability of placing graves close to an important focal grave such as the mortuary enclosure (Brassil *et al.* 1991), or family or clan groupings.

The graves were a mixture of dug graves (at least 18 graves), and those with cist and packing stones (at least 29 graves) over both clusters of graves (Figure 02). Two of these contained quantities of human bone (Graves 16 and 21). It appears that the variable preservation is due to a different soil morphology created as the bone had been protected by collapsed capping stones. Small quartz stones were recovered from a number of the graves.

The dating of the bone material from within Graves 16 and 21 will help inform the chronology of the site. In general, the burials are morphologically of a type typically seen in early medieval cemeteries in the area (600AD to 1100AD) and it would seem likely that the burials date from this time, as a precursor to the current church site of St. Iestyn to the north-west which is believed to date from around 1100AD (Brassil *et al.* 1991; Longley 2009, 106-111). All ecofact samples recovered from the excavated graves will be processed and assessed for further potential.

3 METHODOLOGY - ASSESSMENT OF POTENTIAL FOR ANALYSIS: SPECIALIST ASSESSMENT

3.1 Ecofact Assessment

A 100% bulk sample was recovered from the fill of Grave 21, comprising twelve 10 litre buckets. Three 10 litre bulk samples were recovered from each of the other adult graves and two from the infant graves of the 24 graves subsequently excavated. These were taken from the primary fill at the head, pelvic region and foot end of the graves. Samples were also recovered from the non grave features. This resulted in the collection of 73 ten litre bulk samples. A full list of samples is given in Appendix I.

The primary aim of the sampling strategy is:

1. to recover any bone fragments suitable for analysis, identification and dating;
2. to recover any teeth or teeth fragments for analysis and Amelogenesis assessment;
3. to recover artefacts/artefact fragments suitable for analysis and possible assessment and dating; and
4. to recover charcoal and other plant macrofossils; and
5. to recover possible faunal evidence, such as parasite eggs.

- The bulk sample will be processed in house. This will consist of flotation and wet sieving using a 500 micron mesh to collect the residue (which collects more than the 1mm = 1000 micron), with the flot collected in a 250 micron mesh. The residues will be sorted to recover artefacts and non-floating ecofacts. Once sorted the residues will be discarded. The flots will be weighed, catalogued and assessed for bone fragements, teeth, artefacts, charcoal and other plant macrofossils, faunal evidence, such as parasite eggs, etc.
- Recovered bone fragments (including the femur and tibia fragments from graves 16 and 21) and teeth fragments, will be sent to to Jacqueline I. McKinley, Principal Osteoarchaeologist at Wessex Archaeology for further identification and assessment, with recommendations provided for any further analysis, including dating. These currently consist of up to 782g of bone material from three graves, although more may be recovered from the bulk samples.
- Recovered charcoal and other plant macrofossils will be sent to Roz McKenna, an independent palaeoenvironmental specialist, for further identification and assessment, with recommendations provided for any further analysis, including dating.
- In the event of any artefact recovery, these will be sent to specialists nominated on identification. Any nominated specialist will need to be approved by GAPS in advance

but cannot be identified at present until artefact type is confirmed. The specialist will provide further identification and assessment, with recommendations provided for any further analysis, including dating.

Any subsequent assessment and dating for bone fragements, teeth, artefacts, charcoal and other plant macrofossils, etc. will be defined in a MAP2 Phase 4 project design prepared by GAT as this phase will be outside of the scope of the current design.

3.2 Artefact Assessment

Thirteen stones (12 indivdual stones plus one stone in two pieces) were recovered from a kerb-like structure around the two graves within the mortuary enclosure (Feature 45), contexts (22) and (40), small finds 8 and 9. The kerb stones consisted of a number of apparently worked and unworked pieces, of which the local rubble fieldstone ones were not retained. Six other cist burial stones were also retained from other burials (Graves 16, 18, 47; small finds 23-25), making a total of 19. These stones have a varied geology and shape, although some appear to have been worked into rectangular blocks. A full list of artefacts is given in Appendix II.

It is necessary that the stones are examined by a specialist to assess their petrology and report on their nature and character. This is in order to understand the types of stone used in the construction of mortuary structures and where the material was obtained from. Whether or not they appear to be re-used building stone is also a material consideration.

Stone objects, in the form of unworked quartz pebbles, do not require further analysis. Small finds 4 and 5 were 19th century pottery from a modern context, and these do not require analysis either.

- The 19 potentially masoned stones will be examined by Jana Horak, Head of Mineralogy and Petrology at the National Museum of Wales. A report will be produced assessing the contextual information of the local geology of the stones, the likely origin of the material, and the characteristics of the working on the stones.

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Appendix I

Sample Register

Sample No.	Context No.	Purpose of sample	No. of Box/Bag	Drawing No.	Sheet No.
1	4	Human remains, shells etc.	10 box	01, 02, 03	01
2	10	Dating, environment etc.	1 box	18	15
3	12	Dating, environment etc.	1 box	17	14
4	10	Dating, environment etc.	1 box	18, 20	15
5	10	Dating, environment etc.	1 box	18, 20	15
6	17	Human remains and associated micro fossils, dating (head)	1 box	23	16
7	17	Human remains and associated micro fossils, dating (pelvic area)	1 box	23	16
8	23	Human remains, head, middle and feet	3 box	17	14
9	19	Human remains, and associated items, dating etc.	1 box	23	16
10	32	Human remains	1 box	32	16
11	21	Grave 19. Head upper, bones, dating etc.	4 box	24	17
12	26	Human remains	3 box	28	18
13	35	Stake hole - N	1 bag	18	15
14	36	Stake hole - S	1 bag	18	15
15	37	Primary fill of grave [22] - E end	1 box	35	17
16	45	Fill of pit [44]	1 box	18	15
17	46	Human remains (small frags noted when sample taken) - Head	1 box	34	16
18	30	Human remains, basal deposit of possible grave	1 box	26, 33	16
19	46	Human remains - foot end of grave	1 box	37	16
20	50	Human remains - head of grave 32	1 box	43	16
21	47	Fill of [48] - charcoal, dating etc.	1 box	42	16
22	52	Fill of [51] - Grave 37. Charcoal, bone etc.	2 box	51	19
23	52	Fill of [51] - foot end of grave 37	1 box	51	19
24	54	Fill of [51] - plant micro etc.	1 box	51	19
25	58	Fill of [57] - charcoal	1 box	56	19
26	55	Possible human remains, dating etc.	3 box	57	19
27	62	Fill of [61] - human remains and associated items, dating etc.	1 box	60, 32	16, 14
28	62	Human bone	1 bag	60, 32	16, 14
29	62	Human bone - head area	1 bag	60, 32	16, 14
30	63	Human bone - dating etc	3 box	64	19
31	70	Plant macrofossils etc	1 box	70	24
32	73	Head end of grave - human remains,	2 box	75	24

Sample No.	Context No.	Purpose of sample	No. of Box/Bag	Drawing No.	Sheet No.
		dating			
33	75	Head end of grave - human remains, dating	1 box	74	24
34	76	Plant macrofossils etc	1 box	25	17
35	77	Human remains, dating	2 box	79	25
36	75	Foot end of grave, human remains, dating	1 box	74	24
37	80	Plant macrofossils etc	1 box	74	24
38	82	Human remains, microfossils, dating etc	3 box	84	26
39	84	Human remains, microfossils, dating etc	2 box	88	24
40	93	Human remains, microfossils, dating etc	2 box	91	25
41	95	Dating, plant macrofossils etc.	2 box	91	25
42	90	Human remains, microfossils, dating etc	2 box	93	24
43	96	Plant macrofossils etc	1 box	93	24
44	104	Human remains, microfossils, dating etc	3 box	101	26
45	101	Human remains, microfossils, dating etc	2 box	100	25
46	106	Human remains, microfossils, dating etc	2 box	106	27
47	108	Dating, plant macrofossils etc.	1 small bag	104	27
48	109	Human remains, microfossils, dating etc	2 box	109	28

Appendix II

Finds Register

Finds No.	Context No.	Site Sub.	Material	Description	Weight (g)	Plans No.	Sheet No.
1	4	Grave 21	Bone	Material from the left and right femur	447	2	1
2	2	Grave 23	Quartz	Quartz pebble from upper fill of Grave 23	11.2	1	1
3	10	[11]	Flint	Flint piece in mortuary ditch fill (10)	3.2	20,18	15
4	31	[22]	Pottery	Taken from subsoil lying directly above (23)	11.1	18	15
5	31	[20]	Pottery	Taken from subsoil lying directly above (21)	2.1	18	15
6	23	Grave 19	Crystal	Found at base of (21) adjacent to human remains		24	17
7	52	Grave 37	Quartz stone	Quartz found within grave fill (52)	12.4	52	19
8	24	Grave 19	Masoned Stone	Edging stones taken from S side of Grave 19 [22]		35	17
9	40	Grave 19	Masoned Stone	Edging stones taken from N end of Grave 19 [20]		36	17
10	70	Grave 16	Quartz	Irregular quartz pebble from uppper fill (70)	77.4	76	24
11	73	Grave 20	Quartz pepples	Rounded quartz pebble w/ rose veins. Found nr W feacing section	20.1	75	24
12	73	Grave 20	Red granite/quartz	Large red/rose stone w/quartz veins. Found on surface of deposit	92.5	75	24
13	75	Grave 16	Human Bone	Small fragments from fill (75) of grave 16	8.7	76	24
14	76	Quartz 20	Quartz	Small quartz pieces found		75	24
15	75	Grave 16	Bone	0.19m length of upper femur within fill (75) of Grave 16	114	76, 81	24
16	75	Grave 16	Bone	0.20m length of lower tibia, within fill (75) of Grave 16	139	76, 81	24
17	75	Grave 16	Bone	Lower tibia/fibula of right leg, within fill (75) of Grave 16	82	76, 81	24
18	82	Grave 56	Quartz	Assortment of quartz pieces from west section of Grave 56	35.5	84	26
19	82	Grave 56	Red-iron stone	Large, heavy, ferrous stone with natural markings	67.3	84	26
20	104	Grave 56	Quartz	Large quartz stone, found near lining stone at head end of Grave 56	118.1	84	26

Finds No.	Context No.	Site Sub.	Material	Description	Weight (g)	Plans No.	Sheet No.
21	106	Grave 49	Quartz	Large quartz stone and small pebble in head end of grave 49	26.2	102	27
22	109	Grave 51	Quartz	Quartz piece within grave fill (109) of Grave 51	125.7	108	28
23	92	Grave 47	Masoned Stone	Edging/marker stones [92^] for Grave 47, two retained		91	25
24	79	Grave 18	Masoned Stone	Large, flat marking stone for Grave 18		82	25
25	71	Grave 16	Masoned Stone	Collapsed capping stones for Grave 16, three retained		81	24

9 Appendix II

9.1 Worked Stone Specialist Report

A Petrological Examination of archaeological finds from St Iestyn's Church, Llanddona, Anglesey

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Mineralogy & Petrology Section: Department of Natural Science

Amgueddfa Cymru – National Museum Wales

Contents

1. Introduction

This report was commissioned by the Gwynedd Archaeological Trust (GAT) to provide a petrological characterisation of 19 archaeological finds, excavated from graves during ground works associated with a proposed new cemetery close to St Iestyn's Church, Llanddona. Anglesey (Ordnance Survey grid reference SH 5855 7960). The report was undertaken by Andrew Haycock, Curator of Mineralogy and Petrology, Geology Section, Department of Natural Sciences, Amgueddfa Cymru – National Museum of Wales.

2. Methodology

A petrological examination of the archaeological finds was undertaken following standard methodology detailed in British Standard EN 12407(2007); initial observation was made with the naked eye followed by use of a x10 Gowllands lens and x20 Gem-A lens. Observations were restricted to visual identification, with the exception of 3 samples (G2420 92_23 1 of 2, G2420 92_23 2 of 2, G2420 71_25 3 of 3) where standard thin sections were produced from fragments that had naturally broken away from the finds. This allowed for more detailed examination.

A standard thin section (30µm) was prepared from each of these specimens and observed using a polarizing microscope (Leica Ortholux Pol). This allowed for high magnitude identification of the mineral grains (shape, colour, cement etc.) and textures present within each rock. Distinct differences in the colour of minerals in cross-polarized light (birefringence) allows for very accurate mineral identification. Vacuum impregnating of the thin section with a blue oil dye, allows measurement of the free pore space between the grains.

During visual examination, the colour of the stone was estimated using standard Munsell colour charts and is presented thus (Munsell number [colour name]), and the grain size characterised using standard terminology (very-fine grained < 187µm, fine-grained 187 – 250µm, medium-grained 250 – 500µm, coarse 500 – 1000µm, very coarse 1 – 2mm, granules 2 – 4mm, pebbles > 4mm).

The petrological samples were all imaged using a Canon EOS 5D with 24 – 105mm lens. Images of samples are included to reference specific features in particular samples, or highlight areas of interest found during observations.

3. Background Geology

The bedrock at the archaeological site is of altered lavas (metadolerite) and greenschists, of the Gwna Group. This unit is bounded to the west by mica schist and metabasites (blueschists and greenschists) of the Aethwy Belt, and bounded on the north-west side by the Berw Shear Zone. To the east and north-west, the unit is bounded by Ordovician age interbedded sandstone and mudstone.

To the north-east of the site, along the coast between Bwrdd Arthur and Penmon, Carboniferous aged limestones outcrop. These include the Leete, Loggerheads and Cefn Mawr Limestone formations of the Clwyd Limestone Group, Carboniferous Limestone Supergroup.

The Leete Limestones comprise rhythmic units of dark, argillaceous skeletal packstone and paler grainstone, overlain by porcellaneous limestone (Davies 2011). The Loggerhead Limestone consists mainly of pale, thickly-bedded, skeletal and peloidal packstones. On Anglesey these limestones are interbedded with distinctive sheet and channel sand bodies (Davies 2011). These coarse-grained and pebbly sandstones are commonly referred to as the 'Anglesey Grits'. The sandstones (quartz arenties) are extremely quartz rich (more than 95 %), with grains lightly cemented by quartz. Pebbles of quartz and jasper are common throughout. Overlying much of the solid geology in this region are Devensian age glacial tills.

A general overview of the solid geology and key can be seen in Figures 1 & 2.

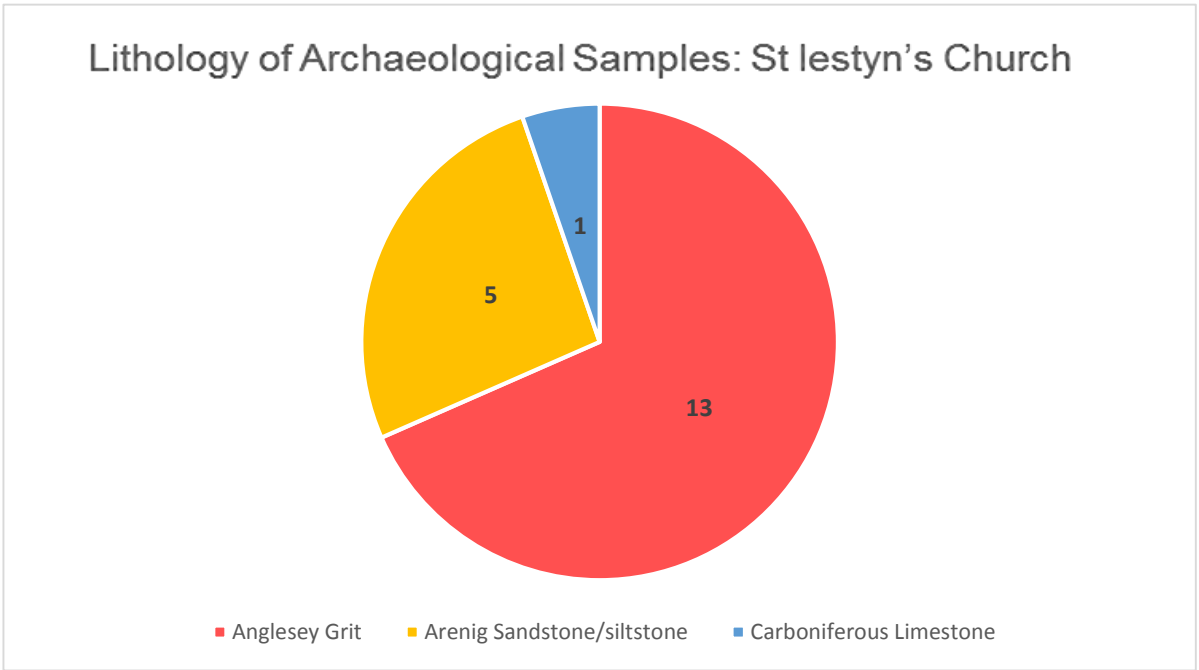
4. Petrological assessment of archaeological find

4.1 Summary

Nineteen archaeological finds were examined to determine their lithology and a potential source for the stones, by matching the observed characteristics to know lithologies local to the finds area and further afield.

It was determined that all 19 finds are sedimentary rocks and considered to be highly likely to have a local origin. Thirteen finds have been sourced from the Anglesey Grits found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. The Anglesey Grits are very quartz-rich sandstone (quartz arenite) with varied grain-size (medium-sand to large pebble size). Five of the finds (very fine-grained sandstone / siltstone) are highly likely to have a source in the local Ordovician mudstone and sandstone sequence. This outcrops to the east of the site around Llangoed and Llanfaes, and to the north-west near Pentrellwyn.

One find, a fossiliferous limestone (bioclastic packstone) is highly likely to have been taken from the dark, foetid argillaceous limestone (packstones) of the Leete Limestone Formation outcropping between Penmon, Llangoed and the coast north of Bwrdd Arthur.



4.2 Description of individual Archaeological finds

4.2.1 *G2420: 40_9 - 1 of 5*

A very quartz-rich sandstone with varied grain-size. The stone is predominantly medium (with some finer material) to very-coarse grained with granules and large pebbles up to 17mm. The lithology is cream coloured on a fresh surface, weathering Munsell 2.5Y 7/2 – 8/2 to 7/3 – 8/3 (light grey – pale yellow). It has a sub-angular to sub-rounded, grain-supported structure composed of rounded to well-rounded pebbles of quartz, red/orange coloured jasper and dark iron oxide grains, which can be seen amongst the quartz grains. The coarser granules and pebbles are more concentrated in the lower half of the block (as inspected), while the finer material to the upper part. This block is part of a 'fining upwards' sedimentary structure. The block appears to show evidence of working with tool marks on surfaces.

The sandstone (quartz arenite) matches the lithology of the Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.2 *G2420: 40_9 - 2 of 5*

This stone fits together with G2420 40_9 1 of 2, and is the larger of the two (see Figure 3).

A very quartz-rich sandstone with varied grain-size. The stone is predominantly medium (with some finer material) to very-coarse grained with granules and large pebbles up to 17mm. The lithology is cream coloured (lighter than 10YR 8/1 - white) on a fresh surface, weathering Munsell 10YR 7/3 – 8/3 to 7/4 – 8/4 (very pale brown). It has a sub-angular to sub-rounded, grain-supported structure composed of rounded to well-rounded pebbles of quartz, red/orange coloured jasper and dark iron oxide grains, which can be seen amongst the quartz grains. The coarser granules and pebbles are more concentrated in the lower half of the block (as inspected), while the finer material to the upper part. This block is part of a 'fining upwards' sedimentary structure. The block appears to show evidence of working with tool marks on surfaces.

The sandstone (quartz arenite) matches the lithology of the Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.3 *G2420: 40_9 - 3 of 5*

A very quartz-rich sandstone with varied grain-size. The stone is medium to very-coarse grained with granules and large pebbles up to 16-17mm, one pebble measuring 26mm. The lithology is cream coloured (lighter than 10YR 8/1 – white) on a fresh surface, weathering

Munsell 7.5YR 6/3 – 7/3 to 6/4 – 7/4 (pink to light brown). It has a sub-rounded to rounded, grain-supported structure composed of rounded to well-rounded pebbles of quartz, and red/orange coloured jasper. The pebbles are more concentrated in the lower half of the block, while the finer material to the upper part. Tool marks appear to be quite evident along the large faces and sides of the block. The large faces of the block are bound by bedding planes, one face is very pebbly (see Figure 4) whilst the opposite face is much finer-grained. This block is part of a 'fining upwards' sedimentary structure. The sides of the block do not appear to be natural joints or bedding planes, the tool marked surfaces (see Figure 4) suggest that the block has been worked.

The sandstone (quartz arenite) matches the lithology of the Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.4 *G2420: 40_9 - 4 of 5*

A very quartz-rich sandstone with varied grain-size. The stone is medium (with some finer material) to coarse-grained, with granules and medium pebbles up to 14mm. The lithology appears cream to yellow on a fresh surface, but there is little clean/fresh surface for accurate colour recording, it has weathered Munsell 10YR 7/2 – 7/3 to 8/2 – 8/3 (light grey to very pale brown). It has a sub-rounded to rounded, grain-supported structure composed of rounded to well-rounded pebbles of quartz, red/orange coloured jasper and dark iron oxide grains, which can be seen amongst the quartz grains. Crude bedding can be seen in the lateral surfaces of the block. Granules and pebbles are concentrated in thin horizons along crude bedding (at approx.10 - 15° angle) between the two larger faces of the stone. This block is part of a cross-bedded sedimentary structure.

Prominent features that appear on the large faces and lateral surfaces of the block are interpreted as tool marks. The large faces are at an angle to the crude bedding so are unlikely to be bedding surfaces. The sides of the block do not appear to be natural joints or bedding planes

The sandstone (quartz arenite) matches the lithology of the Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.5 *G2420: 40_9 - 5 of 5*

A well-sorted quartz-rich sandstone medium to coarse grained grain-size with granules and rare medium sized pebbles up to 10mm. Very little clean/fresh surfaces for accurate colour recording, the sample was weathering Munsell 10YR 7/2 – 7/3 (light grey to very pale brown). It has a sub-rounded to rounded, grain-supported structure composed of rounded to well-rounded pebbles of quartz, orange coloured jasper and dark iron oxide grains, which can be seen amongst the quartz grains. Very weakly-developed bedding can be seen in the lateral surfaces of the block at an angle to the larger faces. This block forms part of a cross-bedded sedimentary structure.

Obvious 'tool marks' observed on the top surface of block (as found in-situ) are not natural in origin. They may be masonry marks, or alternatively a result of plough damage (see Figure 5).

The sandstone (quartz arenite) matches the lithology of the finer grained Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.6 *G2420: 24_8 - 1 of 9*

A well-sorted quartz-rich sandstone, medium to coarse grained grain-size, with some medium pebbles up to 10mm. The lithology is approx. Munsell 10YR 8/4 (very pale brown) on a fresh surface, but the sample was too dirty / lacking fresh surfaces for an accurate colour recording, weathering Munsell 10YR 6/3 – 7/3 (pale brown to very pale brown). It has a sub-rounded to rounded, grain-supported structure, with rare rounded to well-rounded pebbles of quartz. The stone appears to be roughly worked.

The sandstone (quartz arenite) matches the lithology of the Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.7 *G2420: 24_8 - 2 of 9*

A well-sorted quartz-rich sandstone, fine/medium to very coarse-grained grain-size, with granules and some small pebbles up to 8mm. The lithology is lighter than Munsell 2.5Y 8/2 (pale yellow) on a fresh surface, weathering Munsell 10YR 6/3 – 7/3 (pale brown to very pale brown). It has a sub-rounded to rounded, grain-supported structure, with occasional rounded to well-rounded pebbles of quartz and purple/red jasper. The stone appears to be roughly

worked. A good fresh surface allowed detailed observation of grains, the specimen is very quartz rich, with rare green coloured quartz.

The sandstone (quartz arenite) matches the lithology of the less pebbly Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.8 *G2420: 24_8 - 3 of 9*

A very well-sorted, homogenous, quartz-rich sandstone, fine/medium to granule size grains. The lithology is Munsell 5 Y 8/1 – 8/2 (white to pale yellow) on a fresh surface, weathering Munsell 10YR 7/4 – 8/4 (very pale brown). It has a sub-rounded to well-rounded, grain-supported structure. A good fresh surface allowed detailed observation of grains, specimen very quartz rich with pink quartz throughout. The stone appears to be roughly worked.

The sandstone (quartz arenite) matches the lithology of the less pebbly, more homogenous Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.9 *G2420: 24_8 - 4 of 9*

A quartz-rich sandstone, fine/medium to very coarse grained grain-size, with granules and medium pebbles up to 16mm, one large pebble 20mm. The lithology is cream – yellow on a fresh surface, weathering Munsell 2.5Y 8/3 (pale yellow). It has a sub-rounded to rounded, grain-supported structure, with sub-rounded to rounded pebbles of quartz, some mottled red and white, and rare elongated lithic clasts (5-11mm). Some green quartz and dark iron oxide grains observed throughout. Slight lamination / bedding observed in the sides of the block (see Figure 6) are parallel to the two larger faces, which are interpreted as bedding surfaces. The stone appears to be roughly worked. The larger faces defined by bedding, and the lateral faces worked.

The sandstone (quartz arenite) matches the lithology of the slightly pebbly Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.10 *G2420: 24_8 - 5 of 9*

A well-sorted, quartz-rich sandstone, medium to very coarse grained grain-size, with granules and small pebbles up to 5-6mm. The lithology is Munsell 2.5Y 8/3 (pale yellow) on weathered surfaces. It has a sub-rounded to rounded, grain-supported structure, with sub-rounded to rounded pebbles of quartz. Occasional clasts of red and green coloured, fine-grained, lithic material were observed. Coarse, up to granule size, grains are concentrated within 5-6mm thick bands observed in the sides of the block. The stone appears to be very well worked on one corner, with a very well rounded edge (see Figure 7).

The sandstone (quartz arenite) matches the lithology of the slightly pebbly Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.11 *G2420: 24_8 - 7 of 9*

A poor to moderately-sorted, quartz-rich conglomerate sandstone, coarse-grained to conglomeratic (with very large pebbles up to 35-36mm). No fresh surface for Munsell colour observation was present, but on weathered surfaces is Munsell 10YR 8/3 - 8/4 (very pale brown). It has a sub-rounded to rounded, grain-supported structure, with numerous sub-rounded to rounded pebbles of milky quartz and some red jasper (see Figure 8), and green grains of quartz. Very crude lamination were observed in the sides of block, parallel to the two larger faces. The stone appears to be roughly worked on the lateral sides of the block, one edge particularly flat and straight in comparison to the other edges (see Figure 8).

The sandstone (quartz arenite conglomerate) matches the lithology of the very pebbly Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.12 *G2420: 24_8 - 8 of 9*

A well-sorted, quartz-rich sandstone, medium to very coarse grained grain-size, with granules and medium pebbles up to 10mm. No fresh surfaces were present for Munsell colour observation, the colour was approximated as cream/pale yellow. The lithology is Munsell 10YR 8/2 - 8/3 (very pale brown) on weathered surfaces. It has a sub-rounded to rounded, grain-

supported structure, with sub-rounded to rounded pebbles of quartz. The stone has been obviously worked on one of the large faces, prominent marks show working in two different direction, these marks are not natural in origin (see Figure 9). The lateral surface of the block do not appear to be natural joints or bedding planes.

The sandstone matches the lithology of the Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.13 *G2420: 24_8 - 9 of 9*

A well-sorted, quartz-rich sandstone, medium to coarse grained grain-size, with numerous granules and some medium pebbles up to 22-23mm throughout. No good fresh surface for Munsell colour observation. The lithology is Munsell 10YR 7/2 - 7/3 (light grey to very pale brown) on weathered surfaces. It has a sub-rounded to rounded, grain-supported structure, with sub-rounded to rounded pebbles of quartz. One yellow/green coloured lithic clast may be reworked schist material from the Gwna Group. The stone appears to be roughly worked.

The sandstone matches the lithology of the Anglesey Grits, found within the Carboniferous Loggerheads Limestone Formation outcropping north-east and north-west of Penmon. It is therefore reasonable to conclude it has a source in this local lithology.

4.2.14 *G2420: 71_25 1 of 3*

A very well-sorted, very-fine grained sandstone / siltstone, rich in quartz, mica and dark iron oxide grains. No fresh surface for Munsell colour observation, with iron discolouration: 10 YR 8/5 – 8/6 (yellowish brown to brownish yellow), elsewhere weathering 10YR 6/4 – 6/6 (light yellowish brown to brownish yellow). It has rounded to well-rounded grains, and is very finely laminated (see Figure 10). The rock splits readily along the laminations, the largest faces of the block is oriented parallel to them, and represent a natural bedding surface. It is not possible to say if this block has been spilt by hand or its form is defined by natural fractures. The sides of the block whilst perpendicular to bedding, appear to have quite a strong, straight and smooth edge. This would suggest fracturing along a natural joint surface. The siltstone is quite soft, and no obvious tool marks appear to be present.

Based on observations of thin section samples taken from samples G2420 92_23 2 of 2 and 71_25 3 of 3 (see below), this rock has a very similar lithology to them, and is therefore interpreted as being from the same source.

The compaction of grains observed in the two thin sections (resulting from the burial history) suggests the rock is Ordovician in age, rather than a younger lithology such as the Carboniferous sequence which has not been so extensively buried. It is unlike sandstones observed (both in hand specimens and thin section) from the Carboniferous sequence of Anglesey.

It is highly likely that this lithology was sourced from the local Ordovician mudstone and sandstone sequence, which outcrops to the east of the site around Llangoed and Llanfaes, and to the north-west near Pentrellwyn.

4.2.15 *G2420: 71_25 2 of 3*

A very well-sorted, very-fine grained sandstone / siltstone, rich in quartz, mica and dark iron oxide grains. The lithology is Munsell 10 YR 6/2 – 7/2 (light brownish grey to light grey) on a fresh surface, weathering 10YR 6/4 – 6/8 (light yellowish brown to brownish yellow). It has rounded to well-rounded grains, and is very finely laminated. The rock splits readily along these laminations and the largest faces of the block are oriented parallel to them and represent a natural bedding surface. It is not possible to state whether this block has been spilt by hand or has split naturally along these planes. The sides of the block whilst perpendicular to bedding, appear to have quite a strong, straight and smooth edge. This would suggest fracturing along a natural plane of weakness e.g. jointing. The siltstone is quite soft, and no obvious tool marks were observed.

Based on observations of thin section samples taken from samples G2420 92_23 2 of 2 and 71_25 3 of 3 (see below), this rock has a very similar lithology and it is highly likely that it is derived from the same source.

The compaction of grains observed in the two thin sections (resulting from its burial history) suggests the rock is Ordovician in age rather than a younger lithology such as the Carboniferous sequence which has not been so extensively buried. It is unlike sandstones observed (both in hand specimens and thin section) from the Carboniferous sequence of Anglesey.

It is highly likely that this lithology was sourced from the local Ordovician mudstone and sandstone sequence, which outcrops to the east of the site around Llangoed and Llanfaes, and to the north-west near Pentrellwyn.

4.2.16 *G2420: 71_25 3 of 3*

A very well-sorted, iron-rich, very-fine grained sandstone / siltstone, rich in quartz, mica and dark iron oxide grains. The lithology is Munsell 10 YR 6/6 (brownish yellow) on a fresh surface, weathering 10YR 6/3 – 6/4 (pale brown to light yellowish brown). It has rounded to well-rounded grains, and is very finely laminated. The rock splits readily along these laminations, the largest faces of the block are oriented parallel to them and are defined by natural bedding surfaces. As the rock would be easy to split along these laminations it is not possible to state if the form of the stone is entirely natural in origin or if it has been fashioned by human intervention. The sides of the block (perpendicular to bedding) appear to have quite a strong straight and smooth edge. This would suggest the rock has fractured along a natural plane of weakness e.g. jointing. One large fragment from this stone was acquired for thin sectioning. This fragment had previously split away from the rest of the block leaving a very straight edge (see Figure 11). This appears to confirm the straight edges of the block have formed naturally along pre-existing lines of weakness. The siltstone is quite soft, and no obvious tool marks appear to be present.

In thin section of the fragment, the composition of the siltstone as identified in hand specimens was confirmed. In addition lithic grains and small very-fine black grains were observed. The sub-lithic arenite – siltstone shows pressure solution between many of the grains, providing a more compact texture, and with a low estimated porosity of 2%.

The compaction of the grains observed in thin section (resulting from its burial history) suggests the rock is Ordovician in age rather than a younger lithology such as the Carboniferous sequence which has not been so extensively buried. It is unlike sandstones observed (both in hand specimens and thin section) from the Carboniferous sequence of Anglesey.

It is highly likely that this lithology was sourced from the local Ordovician mudstone and sandstone sequence, which outcrops to the east of the site around Llangoed and Llanfaes, and to the north-west near Pentrellwyn.

4.2.17 *G2420: 92_23 1 of 2*

A dark-coloured, very-well sorted, fine-grained, fossiliferous limestone. The lithology is Munsell 10YR 5/1 – 5/2 (grey to greyish brown) on a fresh surface, and 10YR 6/1 – 6/2 (grey to light brownish grey) on a weathered surface. Rich in fossil fragments (<2mm) and carbonate veins throughout. The rock has a strong reaction to dilute hydrochloric acid, which confirms the presence of calcium carbonate. The stone is crudely laminated and has split into a large

narrow elongate slab. The larger faces are parallel to bedding and represent a bedding surfaces. No obvious tool marks were observed in the lateral surface of the stone.

A fragment taken away for detailed study and thin section preparation allowed for further identification. Under a binocular microscope, the limestone was confirmed to be packed with numerous fossil fragments including crinoids, foraminifera, brachiopods and tiny, black phosphatic teeth of fish (shark). In thin section the features observed in hand specimen were confirmed. The limestone is composed almost entirely of grain-supported fossils fragments with a carbonate cement, typical of a bioclastic packstone.

The source of the limestone is very likely local, as the lithology matches that of the dark, foetid argillaceous limestone (packstones) of the Leete Limestone Formation outcropping between Penmon, Llangoed and the coast north of Bwrdd Arthur.

4.2.18 *G2420: 92_23 2 of 2*

A very well-sorted, iron-rich, very-fine grained sandstone / siltstone, rich in quartz, mica, with black and orange iron oxide grains and iron pyrite. A pitted surface has resulted where some of the pyrite has been weathered out. The lithology is Munsell 10 YR 5/2 – 5/3 (greyish brown to brown) on a weathered surface. The stone is very finely laminated, and splits readily along these layers. The largest faces of the block are oriented parallel to these laminations and are defined by natural bedding surfaces. Many fragments have broken away along different layers on this surface resulting in a slightly stepped appearance. It is not possible to state whether this block has been spilt by hand or naturally weathered as such. The sides of the block (perpendicular to bedding) appear to have quite a strong, straight and smooth edge. This would suggest the rock has fractured along a natural line of weakness e.g. jointing. The siltstone is quite soft, and no obvious tool marks appear to be present.

A fragment taken away for detailed study and thin section preparation allowed for further identification. Under a binocular microscope, the nature of the siltstone as identified in hand specimen was confirmed.

In thin section the lithic arenite - siltstone shows pressure solution between many of the grains providing resulting in compact texture, porosity was estimated at 5-10%. The compaction of the grains observed in thin section (resulting from its burial history) suggests the rock is Ordovician in age rather than a younger lithology such as the Carboniferous sequence which has not been so extensively buried. It is unlike sandstones observed (both in hand specimens and thin section) from the Carboniferous sequence of Anglesey.

It is highly likely that this lithology was sourced from the local Ordovician mudstone and sandstone sequence, which outcrops to the east of the site around Llangoed and Llanfaes, and to the north-west near Pentrellwyn.

4.2.19 *G2420: 79_24 1 of 1*

A very well-sorted, iron-rich, very-fine grained sandstone / siltstone, rich in quartz, mica, with black and orange grains of iron oxide and pyrite. A pitted surface has resulted where some of the pyrite has been weathered out. The lithology is Munsell 10 YR 6/4 (light yellowish brown)) on a weathered surface. The stone is very finely laminated, and will split readily along these laminations. The largest faces of the block are oriented parallel to these laminations and are defined by them. One large face is very flat, whilst the opposite face is less planar and contains several reworked clasts of very fine lithic material (up to 30mm). Although the surface of the stone is defined by the lamination surfaces, it is not possible to say if this has formed naturally or was split by human activity.

The sides of the block (perpendicular to bedding) appear to have quite a strong, straight and smooth edge. This would suggest the rock has fractured along a natural line of weakness e.g. jointing. The siltstone is quite soft, and no obvious tool marks appear to be present.

Based on the observations of thin section samples taken from samples G2420 92_23 2 of 2 and 71_25 3 of 3 (see below), this rock has a very similar lithology to these samples, and it is highly likely that it is from the same source.

The compaction of grains observed in the two thin sections (resulting from its burial history) suggests the rock is Ordovician in age rather than a younger lithology such as the Carboniferous sequence which has not been so extensively buried. It is unlike sandstones observed (both in hand specimens and thin section) from the Carboniferous sequence of Anglesey.

It is highly likely that this lithology was sourced from the local Ordovician mudstone and sandstone sequence, which outcrops to the east of the site around Llangoed and Llanfaes, and to the north-west near Pentrellwyn.

5. Figures

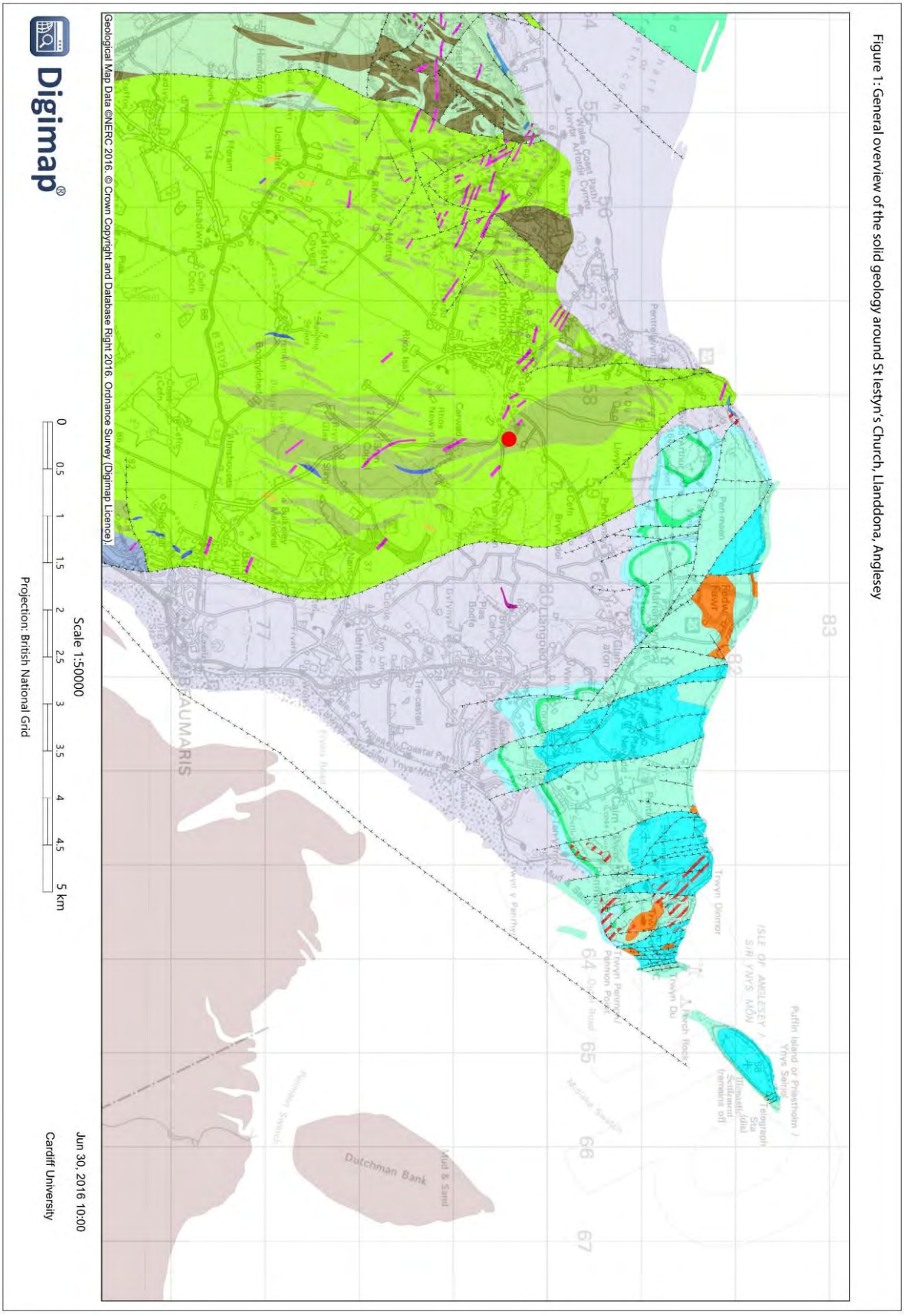
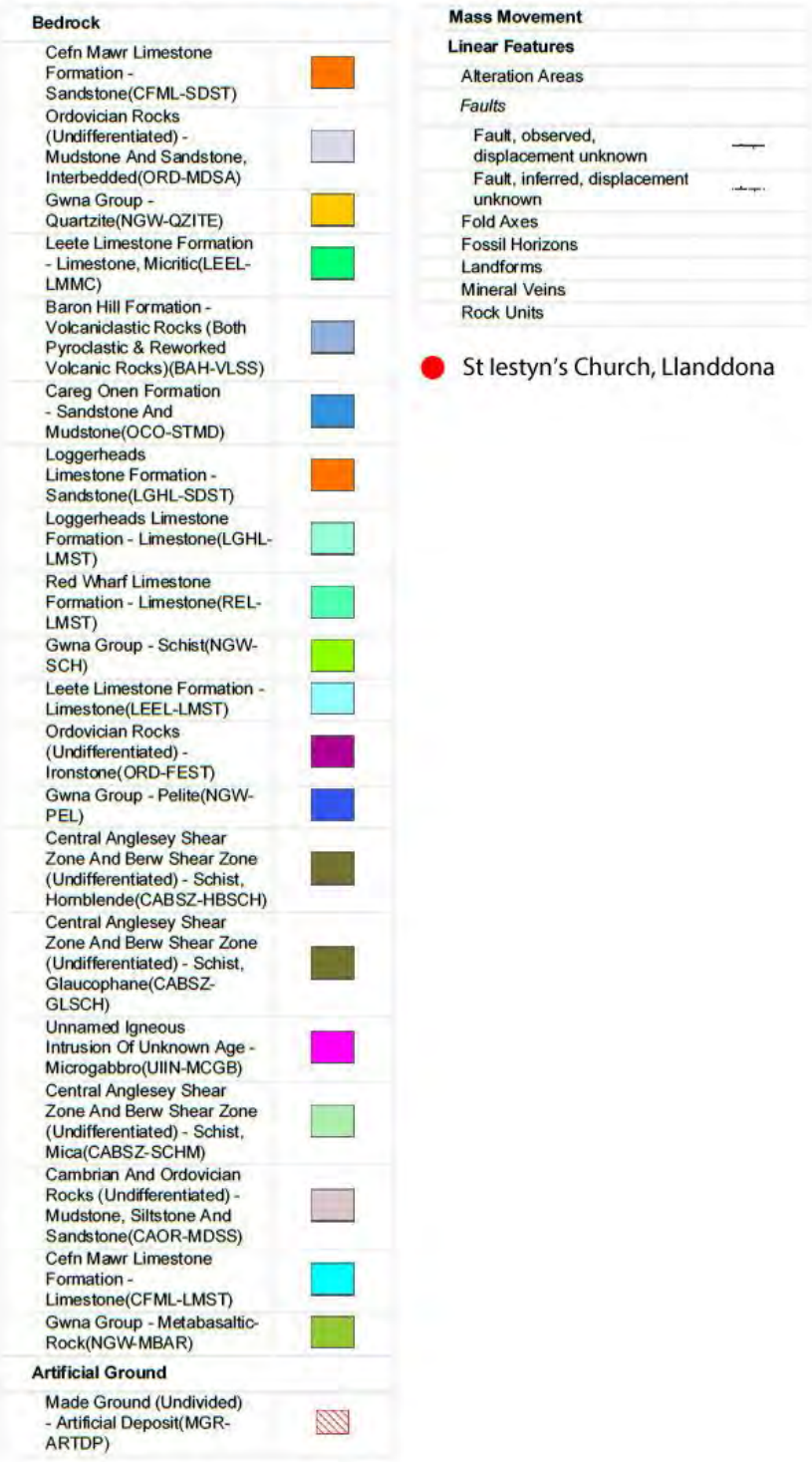


Figure 1: General overview of the solid geology around St Iestyn's Church, Llanddona, Anglesey

Geology Roam

Map Product: DiGMapGB-50 Rock Unit
Basemap: (1:50 000) Rock Unit

Figure 2: Key to lithological units to accompany Fig. 1



Digimap

Figure 3: Image showing specimens G2420: 40_9 - 1 of 5 (right) and 2 of 5 (left) were originally joined together

Figure 4: Specimen 40_9 - 3 of 5: Pebble rich horizon in lower half of block and tool marks on lateral surface (nearest viewer).

Figure 5: Specimen 40_9 - 5 of 5: Obvious ‘tool marks’ observed in face of block (nearest viewer) NB these may be masonry marks, or alternatively the result of plough damage

Figure 6: Specimen 24_8 - 4 of 9: Lamination / bedding observed in lateral surface of block (nearest viewer), note occasional quartz pebbles.

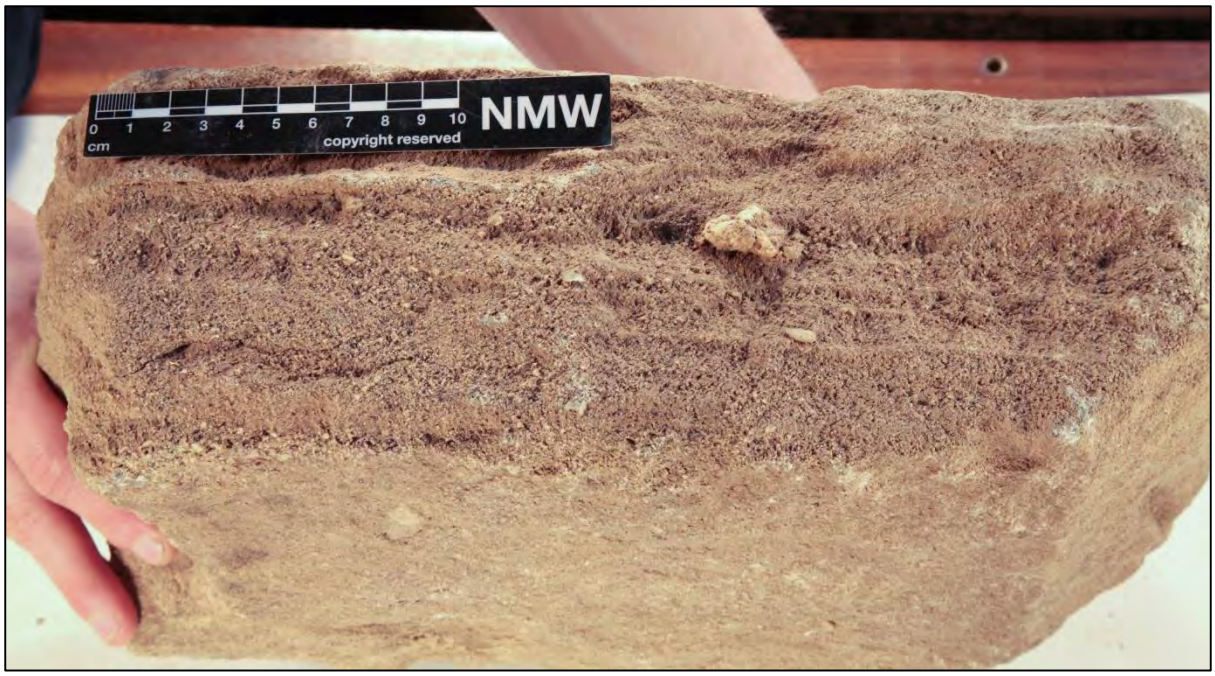


Figure 7: Specimen *24_8 - 5 of 9: Very well rounded corner of block showing evidence of working by hand*

Figure 8: Specimen *24_8 - 7 of 9: Conglomerate rich in quartz pebbles and jasper, straight and flat worked edge (base of image)*

Figure 9: Specimen *24_8 - 8 of 9: Obvious masonry marks observed on large face of block (nearest viewer)*

Figure 10: Specimen *71_25 1 of 3: Laminations observed in lateral face of block*

Figure 11: Specimen *71_25 3 of 3: Fragment splitting away from main block leaving very straight edge*

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10 Appendix III

10.1 Flint Specialist Report

WORKED FLINT REPORT, LLANIESTYN CHURCHYARD EXTENSION

SF3, Context 10. Secondary flake fragment. Grey-brown translucent flint. 25mmx20mmx4mm

Thin yellow-brown cortex. Pronounced bulb and with battering around the bulbar end suggesting difficult flake removal. No secondary working. Possibly a scalar waste piece, which would be of Early Neolithic date but could also just be a natural pebble broken by plough impact, for instance.

SF60, Context 04. Primary microfragment. Black opaque flint. 07mmL max. Partly rolled outer surface shows it is just a broken fragment of natural flint gravel.

SF61, Context 52. Thin tertiary flake tip fragment. Mid-grey flint. 08mmL max. Probably part of a quite neatly struck flake but broken due to fractures from slight burning. No secondary working but the thin, sharp tip has microchipping and edge polish suggesting the piece is a utilised flake fragment. Undatable but indicating that there was some early prehistoric activity in the vicinity.

11 Appendix IV

11.1 Archaeobotany and Osteoarchaeology Specialist Report

Llaniestyn Churchyard Extension (G2420), Llanddona, Anglesey

Palaeoenvironmental and Osteological Assessment Report

Oxford Archaeology North

October 2016

Gwynedd Archaeological Trust

Issue No: 2016-17/1761
OAN Job No: L10984
NGR: SH 5857 7955

Document Title: **Llaniestyn Churchard Extension, Llanddona, Anglesey**

Document Type: **Palaeoenvironmental and Osteological Assessment Report**

Client Name: **Gwynedd Archaeological Trust**

Issue Number: 2016-17/1761
OA Job Number: L10984

National Grid Reference: SH 5857 7955

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CONTENTS

SUMMARY

Oxford Archaeology North (OA North) was commissioned by Gwynedd Archaeological Trust in June 2016, to assess the flots and human bone from bulk and hand-retrieved samples taken during excavation works in advance of an extension of the cemetery at Llaniestyn Churchyard, Llanddona, Anglesey (SH 5857 7955), in February 2016. Although no firm dating evidence is available for the site, the burials are morphologically of a type typically seen in early medieval cemeteries in the area (*c* AD 600 to *c* AD 1100). Bulk samples, from several graves and associated mortuary features, were processed by Gwynedd Archaeological Trust, and assessed by a palaeobotanist for the survival of any organic remains that might provide information on any burial practices, or burial conditions. In addition, several, hand-retrieved, fragments of human bone were assessed by an osteologist for their potential for analysis. Both sets of data were also assessed for their potential to provide suitable material for radiocarbon dating. Little organic material was recovered, and the assessment demonstrated that there was no potential for palaeoenvironmental analysis. Similarly, due to its highly fragmented and degraded state, no further work is warranted on the bone. Radiocarbon dating could be attempted on bone fragments from graves ***16*** and ***21***. Charred plant remains, and a single uncharred fruit stone, may also provide suitable material for radiocarbon dating, although their uncertain taphonomy means that any resulting dates remain tenuous.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank Gwynedd Archaeological Trust, in particular Bethan Jones, for commissioning the work. Denise Druce carried out the palaeoenvironmental assessment of the bulk samples, whilst Vickie Jamieson assessed the human bone, both contributing to the report. Editing and quality assurance was provided by Rachel Newman, Senior Executive Officer, Research and Publication.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 Archaeological investigations carried out in advance of an extension of the cemetery at Llaniestyn Churchyard, Llanddona, Anglesey (SH 5857 7955), in February 2016, revealed a number of graves morphologically of a type typically seen in early medieval cemeteries in the area (*c* AD 600 to *c* AD 1100; Gwynedd Archaeological Trust 2016). Other features, including a ditch surrounding a mortuary enclosure, and a pit, were also discovered. In line with current practice, bulk samples were taken for the assessment of the survival of any organic remains that might provide information on burial practices, or burial conditions, and suitable material for radiocarbon dating. Any surviving bone fragments were also retrieved to assess their potential for analyses and dating. Gwynedd Archaeological Trust commissioned Oxford Archaeology North (OA North) in June 2016 to carry out the assessment of the processed material.

1.2 QUANTIFICATION

1.2.1 In total, 54 environmental bulk samples were processed by Gwynedd Archaeological Trust and assessed by OA North. Of these, eight were taken from specific locations within grave ***21*** (from fill ***04***; *Appendix 1*); the remaining 47 came from 23 other graves (details of which are given in *Appendix 2*), the mortuary enclosure ditch, (fill ***10***), and a pit (fill ***45***). The osteological samples comprised a minimum of three individuals from fragments found within graves ***16***, ***21*** and ***45***, and very small fragments were recovered from a further five individuals from graves ***19***, ***20***, ***37***, ***44*** and ***58***.

1.3 METHODOLOGY

1.3.1 Following processing by Gwynedd Archaeological Trust, the dried flots were sent to OA North, where they were assessed under a binocular microscope and their contents recorded. The flots were scanned using a Leica stereo-microscope and any plant material, including fruits, seeds, charcoal and wood fragments, was quantified, provisionally identified, and assessed, following Historic England guidelines (English Heritage 2011). Other remains, such as bone, molluscs, insects, small artefacts, industrial/metal waste, and coal/heat-affected vesicular material (havm), were also quantified. The presence of modern contaminants, such as modern roots, was also noted. Quantification is based on a score of 1 to 4 where 1 = rare (one to five items), 2 = present (6-25), 3 = common (26-100), 4 = abundant (>100 items). Nomenclature of the plant remains follows Stace (2010).

1.3.2 Any charcoal fragments within the bulk samples were quantified and provisionally identified where possible. In particular, the presence of any short-lived wood species, such as alder (*Alnus glutinosa*) or hazel (*Corylus avellana*), was noted. Charcoal identifications were made with reference to Hather (2000), and modern reference material.

1.3.3 Osteological assessment was undertaken in accordance with published guidelines (Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Cox and Mays 2003). All skeletal remains were examined macroscopically and recorded using *pro-forma* recording forms. It should be noted that, due to the highly fragile nature of the skeletal remains, they had not been washed prior to assessment.

1.3.4 Completeness was estimated by recording, as a percentage, how much of the skeleton had survived and assigning it to one of the following categories: 0-25% complete; 25-50% complete; 50-75% complete; 75-100% complete. The condition of the bone was assessed according to the degree of erosion of the bone surface and how much of the epiphyses (the ends of the bones) and cancellous bone (the spongy bone that is beneath the outer layer) had survived. Based on these factors, the remains were assigned to one of the following categories put forward by Brickley and McKinley (2004):

- Grade 0: surface morphology clearly visible with fresh appearance to bone and no modifications;
- Grade 1: slight and patchy surface erosion;
- Grade 2: more extensive surface erosion than grade 1 with deeper surface penetration;
- Grade 3: most of bone surface affected by some degree of erosion; general morphology maintained but detail of parts of surface masked by erosive action;
- Grade 4: all of bone surface affected by erosive action; general profile maintained and depth of modification not uniform across whole surface;
- Grade 5: heavy erosion across whole surface, completely masking normal surface morphology, with some modification of profile;
- Grade 5+: as Grade 5 but with extensive penetrating erosion resulting in modification of profile.

1.3.5 All observations were made by scanning each skeletal fragment. While these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any possible future high-resolution examination.

1.3.6 The potential of the remains to yield information relating to age and sex was estimated by determining if the appropriate skeletal elements were present so that standard methods could be employed (Brickley and McKinley 2004). The remains of the skeletons were also assessed for their potential to yield metrical data, in particular that which will allow stature estimation and facilitate age estimation for sub-adults, and sex estimation for adults. Stature may be estimated from human skeletal remains by applying the maximum length of complete long limb bones to the regression equations set out by Trotter and Gleser (1958; revised by Trotter 1970). Potential for metrical assessment was scored on a scale of 1-5, where 1 denotes skeletons that showed no potential (*ie* no elements could be measured owing to fragmentation/poor preservation), and 5 denotes skeletons that showed

considerable potential (*ie* the full range of standard cranial and post-cranial measurements could be taken).

1.3.7 Other observations pertaining to metrical assessment involved noting which skeletal remains had sufficiently preserved bones, in particular crania, that could facilitate comparisons. All observations were made by scanning each skeletal fragment. While these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any possible future high-resolution examination.

1.3.8 An assessment of the potential for the skeletal remains to yield non-metrical data was scored on a scale of 1-5, where 1 denotes skeletons that showed no potential for non-metrical analysis (*ie* preservation prevented the observation of all standard cranial and post-cranial sites) and 5 denotes skeletons that showed considerable potential for non-metrical analysis (*ie* all standard cranial and post-cranial sites could be scored).

2. RESULTS

2.1 PALAEOENVIRONMENTAL ASSESSMENT

2.1.1 The results of the palaeoenvironmental assessment are given in *Appendices 1* and *2*, where the potential of each sample to sustain palaeoenvironmental analysis, as well as for providing suitable material for radiocarbon dating, is given. Very few charred plant remains were present, which comprised rare cereal grains, including barley (*Hordeum* sp), wheat (*Triticum* sp), and grass/heathgrass (Poaceae/*Danthonia decumbens*) seeds. Several of the samples contained charred grass stem and rhizome/tuber fragments. Charcoal was generally more abundant, and many of the samples contained frequent/common identifiable fragments greater than 2mm in size. These were dominated by short-lived taxa, including heather/heath (*Calluna vulgaris/Erica* sp), Leguminosae (includes gorse and broom), alder (*Alnus glutinosa*) or hazel (*Corylus avellana*). What appears to be a single uncharred (mineralised?) blackthorn/cherry (*Prunus* sp) endocarp was recovered from grave ***49*** (sample 46). which, given its context, could represent an *in-situ* item (possible from stomach content?) preserved either by the human burial environment, or by contact with metal.

2.1.2 As well as modern roots, the majority of the samples contained rare waterlogged seeds as well as earthworm eggs, and small fragments of coal. These are all likely to be modern and intrusive.

2.2 OSTEOLOGICAL ASSESSMENT

2.2.1 ***Completeness of skeletal remains:*** the skeletal remains were all less than 25% complete, mostly less than 5% complete. Most of the graves were empty, the bodies having decayed as a result of the silty clay nature of the soil that they were buried in. Graves ***16***, ***21*** and ***45*** yielded small fragments of bone still *in situ* in the burial position, suggesting that they had not been previously disturbed, and it was the general ground conditions that contributed to the surviving level of completeness. Fragments found in a further five graves within the soil samples were so small that they could not be given a completeness rating.

2.2.2 ***Condition of skeletal remains:*** the condition of the remains ranges from poor to destroyed. Grave ***45*** only had skull fragments surviving and was in a poor condition, at Grade 4 (*Section 1.3.4*). Although graves ***16*** and ***21*** had slightly more surviving elements, the condition of the bone was classed as destroyed, given the high level of erosion. All other fragments have been classified as destroyed.

2.2.3 ***Estimation of biological age:*** due to the high level of erosion and lack of completeness of the skeletal remains, there are not enough relevant indicators surviving to provide an estimate of biological age for any of the individuals. However, the surviving teeth fragments from graves ***16***, ***21*** and ***37*** suggest that these individuals were adults.

2.2.4 ***Estimation of biological sex:*** none of the skeletal fragments had enough features surviving to determine biological sex.

2.2.5 ***Metrical analysis:*** the potential for metrical analysis, both cranial and post-cranial, is non-existent within the assemblage. None of the skeletal remains have complete bones to allow measurements to be taken.

2.2.6 ***Non-metrical analysis:*** the potential for non-metric analysis is nil within this assemblage, as the skeletons were in a highly degraded state of preservation.

2.2.7 ***Potential to yield palaeopathological data:*** of the surviving skeletal remains that were preserved enough to allow macroscopic examination of pathological conditions, none could be determined, as a result of the erosion of the cortical bone. Therefore, none of the skeletal remains could contribute to an understanding of the health status of this particular population. Within grave 16, an adult upper third molar was identified with moderate wear. Five adult teeth, all from the mandible, were recovered from grave 21, which had very little wear on them, suggesting a young adult. Grave 37 yielded a lower left adult second molar with moderate wear upon it. No dental pathology, such as caries, calculus or dental enamel hypoplasia, was observed on any of the surviving teeth.

2.3 ARCHIVING

2.3.1 All paperwork generated during the palaeoenvironmental and osteological assessments will be lodged with the main site archive produced by Gwynedd Archaeological Trust.

2.4 DISCUSSION AND RECOMMENDATIONS

2.4.1 ***The palaeoenvironmental remains:*** as is often the case with sites of this nature, the assessment showed that palaeoenvironmental remains were sparse. Very little material was recovered from the graves, which potentially could have contained stomach contents, funerary items, or clothing and personal adornment. Where charred material was present, it was mostly observed in small quantities, and probably represented either redeposited material, or debris originating from the surface through which the graves were cut. The presence of charred rhizome/tuber fragments may indicate the burning of turves. In addition, the presence of heathgrass seeds and heather/heath wood charcoal suggests the burning of heathland vegetation. Given the context of the charred material, however, it is not clear whether the material stems from *in-situ* vegetation, or from heathland resouces being brought onto the site.

2.4.2 The single mineralised? fruit endocarp from grave ***49*** is of interest. Given its context, it could represent an *in-situ* item (possible from stomach content?) preserved either by the burial environment, or by contact with metal.

2.4.3 Given the paucity of the charred remains from the site, no further work is warranted. In addition, although much of the charred material would provide adequate material for radiocarbon dating (*Appendix 2*), their uncertain taphonomy means that any dating may be tenuous. The single uncharred fruit endocarp may be suitable for radiocarbon dating, but the fact that it appears to be mineralised means that its carbon content may be reduced.

2.4.4 ***The osteological remains:*** the remains assessed are fragments of a small assemblage that is potentially significant for this location, given the early medieval date of the site. However, the highly fragmented nature and the degradation of the bone has meant that it has not been possible to provide any significant information about these particular individuals. No further work in terms of analysis is recommended, as they could not yield the required data for comparison with other similar assemblages, or within their own local population. Radiocarbon dating could be attempted on fragments from graves ***16*** and ***21***, but the destructive nature of these tests means that only one attempt from each grave would be possible and the fragments may not contain enough carbon to date. Strontium analysis could be conducted on the teeth from graves ***16***, ***21*** and ***37***, but without any other biological information the results would be of limited value.

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APPENDIX 1: PALAEOENVIRONMENTAL ASSESSMENT RESULTS, GRAVE ***21***

Sample no	Context Details (*04*)	Flot Vol (ml)	Charred Plant Remains	>2mm Charcoal	Potential for analysis	Radiocarbon Dating Potential
01	Leg, east section	<5	(1) indeterminate cereal grain fragment and weed seed	(1) indeterminate	None	No
01	Middle section	<5	(1) cf *Triticum aestivum*-type grain	(1) indeterminate	None	Yes
01	Middle section	<5	-	(1) poorly preserved, but includes *Alnus/Corylus*	None	Yes
01	-	<5	-	(1) includes short-lived taxa	None	Yes
01	Western end	<5	-	-	None	No
01	Left upper body	<5	-	(1) includes roundwood (small)	None	No
01	Right upper body	<5	-	(1) includes *Alnus/Corylus*	None	Yes
01	West end	<5	(1) *Triticum aestivum*-type and cf *Avena* grain	(1) indeterminate	None	Yes

Remains are scored on a scale of 1 to 4, where (1) = <5 items, (2) = 6-25, (3) = 26-100, and (4) = >100 items.

APPENDIX 2: PALAEOENVIRONMENTAL ASSESSMENT RESULTS

Sample no	Context no	Sample Vol (l)	Context Details	Flot Vol (ml)	Charred Plant Remains	>2mm Charcoal	Other Remains	Potential for further analysis	Radiocarbon Dating Potential
1	***04***	78.4	Grave ***21***	<5	(1) small culm node	(2) *Alnus/Corylus*	-	None	Yes
2	***10***	6	Grave ***45***	<5	(1) indeterminate cereal grain	(1) indeterminate	-	None	Yes
3	***12***	7.5	-	<5	(1) stem fragments	(1) includes *Calluna/Erica* sp roundwood	-	None	Yes
4	***10***	7	Mortuary enclosure (east end/entrance)	<5	-	(1) indeterminate	-	None	No
5	***10***	4	Feature ***45***	<5	-	(1) indeterminate	-	None	No
6	***17***	9	Grave ***41***	<5	(1) *Danthonia decumbens*, stem/ rhizome fragments	(1) includes small roundwood	-	None	Yes
7	***17***	7	Grave ***41***	<5	-	(1) includes small roundwood	-	None	Yes
8	***23***	19	Grave ***19***	<5	-	-	-	None	No
9	***19***	4.5	-	<5	(1) stem/rhizome fragments	(1) indeterminate	-	None	No
10	***32***	8	-	<5	-	-	-	None	No
11	***21***	36	Grave ***19***	<5	-	(1) *Alnus/Corylus*	-	None	Yes
12	***26***	19	Grave ***46***	<5	-	-	-	None	No
13	***35***	very small bag	Grave ***46*** – northern stakehole	<5	-	-	-	None	No
14	***36***	very small bag	Grave **46** – southern stakehole	<5	-	-	-	None	No
15	***37***	8	-	<5	-	-	-	None	No
16	***45***	9	Pit ***44***	<5	(1) *Hordeum* sp and cf *Avena* sp grain grains	(2) *Alnus/Corylus*	-	None	Yes
17	***46***	9	Grave ***36***	<5	-	-	-	None	No

Sample no	Context no	Sample Vol (l)	Context Details	Flot Vol (ml)	Charred Plant Remains	>2mm Charcoal	Other Remains	Potential for further analysis	Radiocarbon Dating Potential
18	***30***	7	Grave ***35***	<5	-	-	-	None	No
19	***46***	8	Grave ***36***	<5	-	-	-	None	No
20	***50***	9	-	<5	-	(1) cf Leguminosae	-	None	Yes
21	***47***	8.5	-	<5	-	-	-	None	No
22	***52***	16	Grave ***37***	<5	(1) stem/rhizome fragments	(1) cf *Calluna/Erica* sp	-	None	Yes
23	***52***	9	Grave ***37***	<5		(1) indeterminate	-	None	No
24	***54***	9	-	<5	(1) cf cereal grain	(1) indeterminate	-	None	No
25	***58***	7	Grave ***34***	<5		-	-	None	No
26	***55***	17	Grave ***44***	<5	(1) *Hordeum* sp grain, indeterminate fruit/seed, stem fragments	(1) includes short-lived taxa	-	None	Yes
27	***62***	9	Grave ***42***	<5	-	(1) roundwood (small)	-	None	No
29	***62***	7	Grave ***42***	<5	-	(1) roundwood (small)	-	None	No
30	***63***	11	Grave ***40***	<5	(1) *Triticum* sp grain	(2) includes *Calluna/Erica* sp, and Leguminosae	-	None	Yes
31	***70***	9	Grave ***16***	<5	-	(1) roundwood (small)	-	None	No
32	***73***	19	Grave ***20***	<5	-	(1) roundwood (small)	-	None	No
33	***75***	8	Grave ***16***	<5	(1) indeterminate cereal grain	(1) includes roundwood and cf *Alnus/Corylus*	-	None	Yes
34	***76***	5.5	Grave ***20***	<5	-	(1) roundwood (small)	-	None	No

Sample no	Context no	Sample Vol (l)	Context Details	Flot Vol (ml)	Charred Plant Remains	>2mm Charcoal	Other Remains	Potential for further analysis	Radiocarbon Dating Potential
35	***77***	11	Grave ***18***	<5	-	(2) includes Leguminosae, *Quercus* sp, and *Calluna/Erica* sp	-	None	Yes
36	***75***	17	Grave ***16***	<5	-	(2) includes small roundwood and short-lived taxa	-	None	Yes
37	***80***	9	Grave ***16***	<5	-	(1) includes *Calluna/Erica* sp roundwood	-	None	Yes
38	***82***	22	Grave ***56***	<5	-	(1) includes Leguminosae roundwood	-	None	Yes
39	***84***	17	Grave ***57***	<5	(1) indeterminate cereal grain	(2) includes short-lived taxa	-	None	Yes
40	***93***	15.5	Grave ***47***	<5	-	(2) includes *Calluna/Erica* sp	-	None	Yes
41	***95***	6	Grave ***47***	<5	-	-	-	None	No
42	***90***	16	Grave ***48***	<5	(1) indeterminate cereal grain, *Danthonia decumbens*	(1) includes Leguminosae roundwood	-	None	Yes
43	***96***	9	Grave ***48***	<5	-	(1) roundwood (small)	-	None	No
44	***104***	25	Grave ***60***	<5	(1) indeterminate tuber/rhizome fragments	(1) indeterminate	-	None	No
45	***101***	13	Grave ***58***	<5	-	(1) indeterminate	-	None	No
46	***106***	19	Grave ***49***	<5	-	(1) indeterminate	(1) cf mineralised *Prunus* sp endocarp	None	Yes
47	***108***	1 bag	-	<5	-	-	-	None	No
48	***109***	16	Grave ***51***	<5	(1) Poaceae seeds, indeterminate tuber fragments	-	-	None	No

Remains are scored on a scale of 1 to 4, where (1) = <5 items, (2) = 6-25, (3) = 26-100, and (4) = >100 items.

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