

**An Archaeological Watching Brief of Phase 2 works
at Bolton Hill Quarry, Tiers Cross,
Haverfordwest, Pembrokeshire**



Overview of site at start of archaeological works, looking south

ARS Ltd Report No. 2018/114

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Archaeological Research
Services Ltd

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ARS Ltd Report No. 2018/114

July 2018



Archaeological Research Services Ltd

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Executive Summary

Project Name: Bolton Hill Quarry (Phase 2), Tiers Cross, Haverfordwest, Pembrokeshire

Site Code: BHQ18

Planning Authority: Pembrokeshire County Council

Planning Reference: 07/0705/MN

NGR: SM 92230 10867 (centred)

Date of Attendance: 30th April – 31st May 2018

Date of Report: 27th June 2018

Archaeological Research Services Ltd was commissioned by G. D. Harries & Sons Ltd, to undertake a watching brief during the stripping of overburden in preparation for a quarry extension at Bolton Hill Quarry, Tiers Cross, Haverfordwest, Pembrokeshire. Previous archaeological works, undertaken during Phase 1 of the quarry extension, revealed evidence of prehistoric activity on the site, dating from the early Neolithic to the Late Bronze Age. As a result, an archaeological condition was included in the planning permission. In consultation with Mike Ings, Senior Planning Archaeologist, Dyfed Archaeological Trust, a scheme of works was agreed, including a geophysical survey, followed by a watching brief of the soil stripping.

This report comprises the results of the archaeological watching brief which took place between 30th April and 31st May 2018. The fieldwork project officer was Dr Rebecca Trow, Assistant Projects Officer at Archaeological Research Services Ltd, and the project was managed by Tony Brennan, Operations Manager at Archaeological Research Services Ltd.

A total area of 4.38 ha was stripped, with the topsoil and subsoil being removed down to natural substrate to a maximum depth of 0.3 m beneath the ground level. A small number of archaeological features were encountered, including six isolated fire pits, and three Post-Medieval field boundaries. A small assemblage of late 19th-early 20th century pottery and glass was recovered from the topsoil and field boundaries. No finds were recovered from the pits.

Crynodeb Gweithredol

Enw'r Prosiect: Chwarel Bolton Hill (Cam 2), Tiers Cross, Hwlfordd, Sir Benfro

Cod Safle: BHQ18

Awdurdod Cynllunio: Cyngor Sir Penfro

Cyfeirnod Cynllunio: 07/0705/MN

Cyfeirnod Grid Cenedlaethol: SM 92230 10867 (canolwyd)

Dyddiad Mynychu: 30 Ebrill – 31 Mai 2018

Dyddiad yr Adroddiad: 27 Mehefin 2018

Comisiynwyd Archaeological Research Services Ltd gan GD Harries & Sons Ltd i ymgymryd â briff gwylio yn ystod tynnu gorlwyth wrth baratoi ar gyfer estyn Chwarel Bolton Hill, Tiers Cross, Hwlfordd, Sir Benfro. Roedd gwaith archaeolegol blaenorol, a gynhaliwyd yn ystod Cam 1 estyn y chwarel, wedi datgelu tystiolaeth o weithgarwch cynhanesyddol ar y safle, yn dyddio o'r cyfnod Neolithig cynnar i'r Oes Efydd Hwyr. O ganlyniad, cafodd amod archaeolegol ei gynnwys yn y caniatâd cynllunio. Mewn ymgynghoriad â Mike Ings, Uwch Archaeolegydd Cynllunio, Ymddiriedolaeth Archaeolegol Dyfed, cytunwyd ar gynllun gwaith, gan gynnwys arolwg geoffisegol, gyda briff gwylio i ddilyn wrth dynnu pridd.

Mae'r adroddiad hwn yn cynnwys canlyniadau'r briff gwylio archaeolegol a gynhaliwyd rhwng 30 Ebrill a 31 Mai 2018. Y swyddog prosiect gwaith maes oedd Dr Rebecca Trow, Swyddog Prosiectau Cynorthwyol gydag Archaeological Research Services Ltd, a rheolwyd y prosiect gan Tony Brennan, Rheolwr Gweithrediadau gydag Archaeological Research Services Ltd.

Tynnwyd pridd o gyfanswm arwynebedd o 4.38 ha, gyda'r uwchbridd a'r isbridd yn cael eu tynnu i lawr i swbstrad naturiol hyd at uchafswm dyfnder o 0.3 m o dan lefel y ddaear. Cafwyd nifer fach o nodweddion archaeolegol, gan gynnwys chwe phwll tân ar wahân, a thri therfyn cae ôl-ganoloesol. Cafwyd casgliad bach o grochenwaith a gwydr o ddiwedd y 19eg ganrif a dechrau'r 20fed ganrif yn yr uwchbridd a'r terfynau cae. Ni chafwyd unrhyw ddarganfyddiadau yn y pyllau.

1. Introduction

1.1. Circumstances of the Project

1.1.1. Planning permission (07/0705/MN) for the extension of Bolton Hill Quarry to the east was granted in April 2009 by Pembrokeshire County Council subject to conditions. Condition 40 of the planning application states that:

Prior to the commencement of soil stripping operations at the site, the applicant, or their agents or successors in title, shall secure the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the Local Planning Authority.

Reason: to protect historic environment interests whilst enabling development (PCC 2009)

1.1.2. Archaeological Research Services Ltd (ARS Ltd) was commissioned by G. D. Harries and Sons Ltd to undertake the archaeological works associated with the extension to Bolton Hill Quarry.

1.1.3. Phase 1 of the quarry extension commenced in April 2009 with an archaeological strip, map, and sample excavation which encountered evidence of prehistoric activity on the site (Johnson & Tinsley 2010).

1.1.4. In consultation with Mike Ings, Senior Planning Archaeologist, Dyfed Archaeological Trust in his role as advisor to Pembrokeshire County Council, a scheme of archaeological works for Phase 2 of the quarry extension was developed, including a geophysical survey followed by an archaeological watching brief during the soil stripping activities.

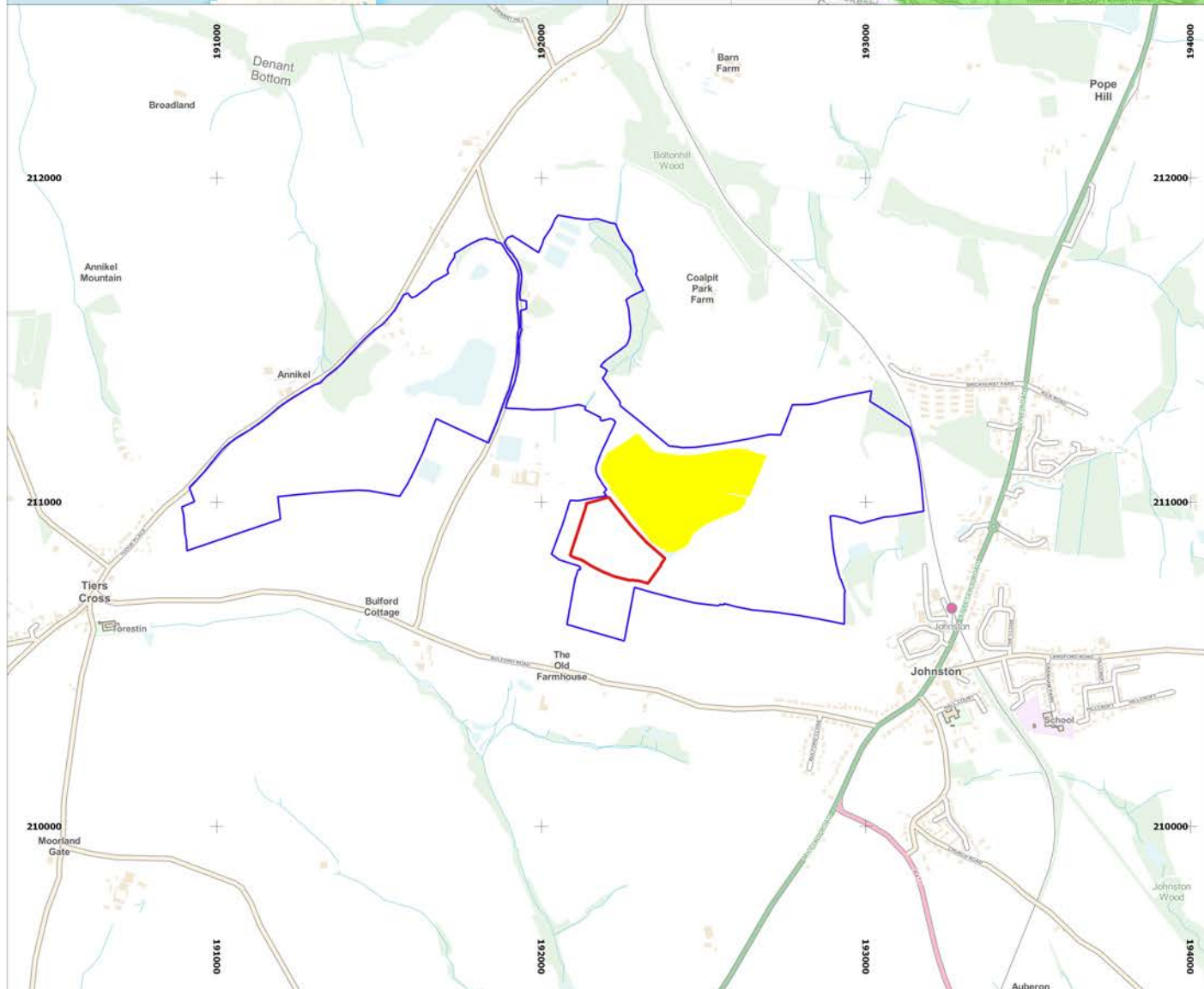
1.1.5. The geophysical survey for Phase 2 of the extension was completed by Richard Durkin of ARS Ltd in January 2018 (Durkin 2018).

1.1.6. The present report details the results of the archaeological watching brief. The fieldwork project officer was Dr Rebecca Trow, Assistant Projects Officer at ARS Ltd and the project manager was Tony Brennan, Operations Manager at ARS Ltd.

1.2. Site Location, Land use, and Geology

1.2.1. The present development area (PDA) is situated c. 4.8 km south-west of Haverfordwest, c. 1 km north-east of Tiers Cross, and c. 1.1 km to the west of Johnston. The field that forms Phase 2 of the quarry extension is located on the top of Bolton Hill, the second highest hilltop in Pembrokeshire, with unrestricted view towards the Preseli Mountains to the north and to Milford Haven and the Daugleddau Estuary to the south.

1.2.2. The site slopes gently towards the south and east and is bounded on its north-eastern edge by the working quarry (Phase 1), and on its western and southern sides by a public footpath.



Site name: Bolton Hill Quarry
Date: March 2018
Drawn by: AB
Scale: Varies

 Pembrokeshire
 Landholdings boundary

 Phase I works
 Phase II works



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**Figure 1:
Site location**

The site was most recently used as pasture but has apparently been used for potato crop in living memory.

1.2.3. The site sits above the Johnston Intrusive Complex of Diorite, Granodiorite and, Granite, an outcrop within the wider mudstone and sandstone geology of south-west Pembrokeshire (BGS 2018). The bedrock is overlain by superficial deposits of freely draining acidic loamy soils (LandIS 2018).

1.3. Archaeological and Historical Background

Previous Archaeological Work

1.3.1. An article by Cantril & Jones (1911) recorded four burnt mounds within the entirety of the quarry site. However, numerous subsequent projects failed to find any trace of burnt mounds and it has been deemed likely that the recorded location of the mounds was erroneous.

1.3.2. Cambria Archaeology was commissioned to undertake a desk-based assessment in 1999 in advance of the construction of a haul road, which established that the current field system and tracks had been established by 1773 (Page & Wilson 1999).

1.3.3. A scheme of archaeological evaluation trenching comprising nine 10 x 1.6 m trenches was completed by Cambria Archaeology following the desk-based assessment. This uncovered no features of archaeological significance with the exception of some linear features that were likely post medieval in date (Page & Wilson 1999).

1.3.4. In 2004, Cambria Archaeology also conducted a watching brief of a number test pits which again did not encounter any remains of archaeological significance (Crane 2004).

1.3.5. In 2009, ARS Ltd completed a strip, map, and sample excavation as part of the Phase 1 quarry extension. This was situated immediately north of the Phase 2 site. The Phase 1 excavations encountered six phases of activity on the site, predominantly prehistoric in date. This included pits from the Mesolithic-Neolithic transition, midden pits from the mid-Neolithic, Chalcolithic pits and postholes which possibly represented a building, and some early and late Bronze Age pits. A post-medieval enclosure of unknown function was also encountered (Johnson & Tinsley 2010).

General history of the area

1.3.6. There is evidence of human occupation in Pembrokeshire from at least the Mesolithic period, with activity apparently largely focused in the coastal areas, probably due to the abundance of easily accessible food resources (Ward 2004, 29). There is also evidence of prehistoric settlement in the area immediately surrounding the site. The Phase 1 excavations revealed prehistoric activity from as early as the late Neolithic period through to the Late Bronze Age (Johnson & Tinsley). There have also been a number of chance finds of prehistoric date including a Bronze Age hoard of gold close to the site. It is also likely that the hill on which Haverfordwest Castle sits was previously occupied by an Iron Age or earlier settlement (HTC 2018).

1.3.7. By c. 70 AD, there seems to have been Roman occupation in west Wales, with a regional capital at modern Carmarthen. Although Pembrokeshire is believed to have been relatively untouched by Roman activity, there is evidence of Roman influence in the area and despite the identification of a Roman fort (2012-13) at Whiston, to the east of Haverfordwest although there is no evidence of a large military presence in the region (Ward 2004, 35)

1.3.8. After the Roman departure from Wales, Pembrokeshire came under the control of Irish chieftains for a short time until local groups rebelled and regained control of the land. In the late 11th century, the Normans gained control of the area, with their stronghold at Pembroke Castle (Lloyd *et al* 2004, 37).

1.3.9. By the early 12th century there was a community of Flemish settlers in Haverfordwest. These were refugees who, following a series of floods in their homeland, sought asylum in Britain. Henry I removed many of the refugees to a settlement in south-west Pembrokeshire where they built a series of strongholds and castles to protect themselves from the Welsh population who had been forced into the hills by the new settlers (BBC 2014).

1.3.10. The medieval town of Haverfordwest began to develop around the castle. The castle and town walls were rebuilt in stone probably around the 14th century, at which time Haverfordwest also overtook Pembroke as the county town (Lloyd *et al* 2004, 38). Haverfordwest was originally held by the Royalists during the Civil War, although it changed hands numerous times during the conflict. The castle would later be reused as a prison during the 18th and 19th centuries.

1.3.11. The villages of Tiers Cross and Johnston, both close to the site, also likely have medieval origins, developing as small farming communities. During the 19th century, there was a coal mine close to the village of Johnston which employed a large proportion of its inhabitants (Edwards 1963, 33).

1.3.12. The present site is shown as open fields on historic mapping. A small quarry pit was marked in the area now occupied by the original quarry (now a lake) from the earliest ordnance survey maps (shown in Figure 1 to the north-west of the PDA). The maps show largely the same field layout that is visible today. The early 19th century Ordnance Survey maps show the present field as being covered with furze (gorse), up until 1908. The map from this year shows the field as clear, although other fields in the area are still shown as covered in furze, suggesting that the field had been cleared and it was not a stylistic change in the map production. Gorse is highly nutritious and was often intentionally grown and harvested to use as fodder for animals in winter (Elly 1845). It is possible that this field was intentionally maintained as a gorse field.

2. Aims & Objectives

2.1. The aims and objectives of the archaeological watching brief are outlined in detail in the Written Scheme of Investigation in Appendix III, however they can be summarised as follows:

- To Identify the nature, date, and extent of any below-ground archaeological remains which may be impacted upon by the proposed development
- Specifically, to identify any remains associated with Prehistoric activity in the area, in particular remains associated with the Mesolithic/Neolithic Transition which would enable greater understanding of this period in the region
- To produce a full written, drawn, and photographic record of any such remains and to produce dating and phasing for them
- To make recommendations for the management of the resource including further archaeological works if necessary
- To provide sufficient, publicly accessible results, so that the archaeological impact of the proposed development can be assessed and mitigated if necessary

3. Methodology

3.1. All work was undertaken in accordance with the Written Scheme of Investigation (see Appendix III), and the guidance laid out in the Chartered Institute for Archaeologists' (CIfA's) *Code of Conduct* (2014a) and *Standards and guidance for an archaeological watching brief* (2014b).

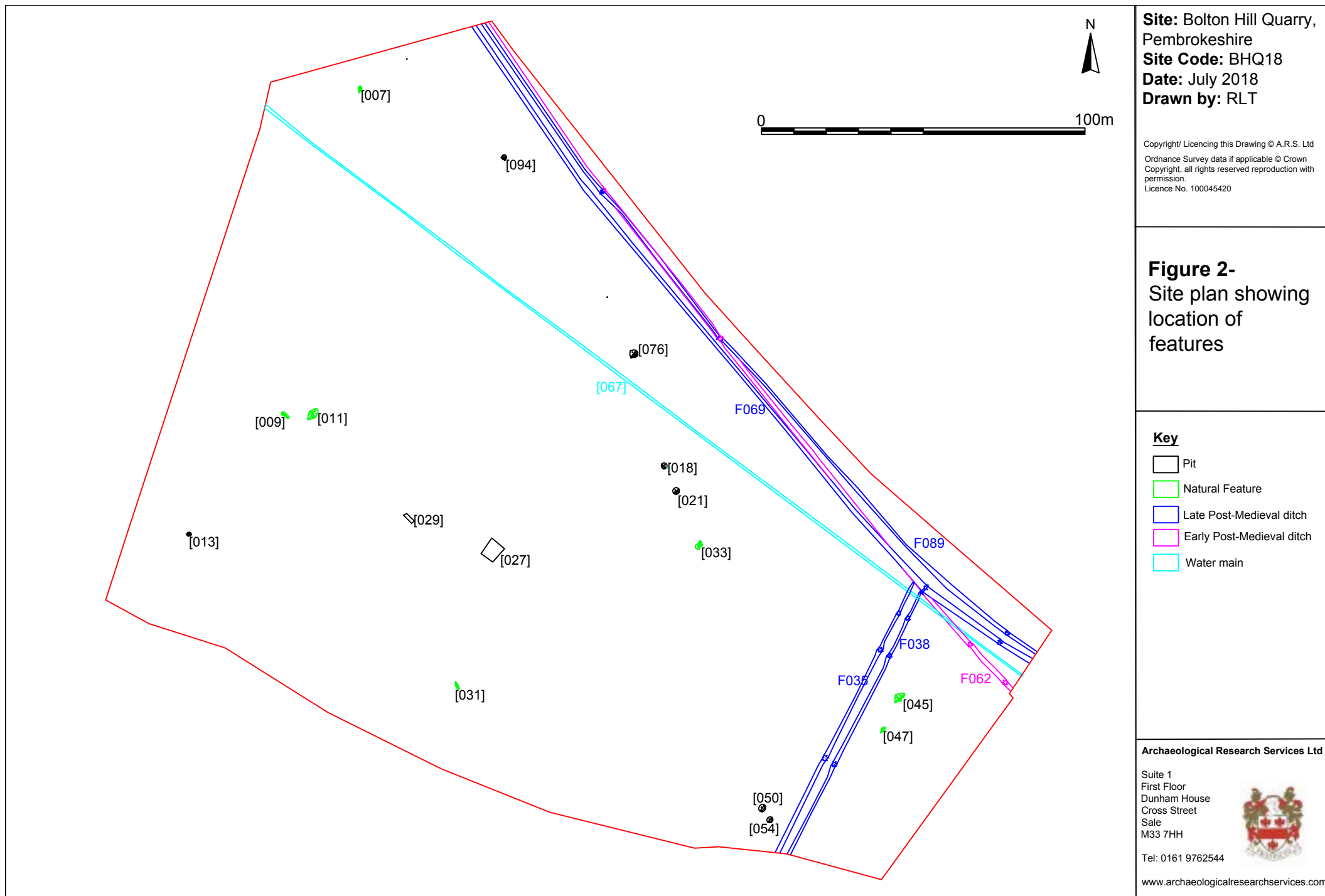
3.2. A risk assessment was produced before work commenced and all site operations were undertaken in accordance with the ARS Ltd Health and Safety Policy and current Health and Safety legislation.

3.3. A total area of 4.38 ha was monitored. All excavation was completed by a 38 tonne, 360°, mechanical excavator equipped with a toothless bucket.

3.4. A full written, drawn, and photographic record was kept and all monitored areas were tied to the National Grid using a survey-grade Leica GPS.

4. Results

4.1. A site plan showing the stripped area with the encountered features marked is presented in Figure 2. The encountered contexts are summarised in the table in Appendix I and the Harris Matrix is presented in Appendix II. A total of six pits and three post-medieval field boundaries were encountered, along with a number of natural features.



4.2. The site was sealed with a layer of topsoil (001); varying in depth between 0.15 m and 0.30 m. Finds from the topsoil were very scarce, comprising a small number of very abraded 19th and early 20th century pottery sherds. This is in keeping with the low level of post-medieval domestic activity in the immediate vicinity of the site. It is possible that the sherds recovered from the topsoil derived from manure brought from elsewhere to fertilise the fields. The topsoil was truncated by two modern machine dug trenches, possibly related to farming activities on the site, and by the recently decommissioned water main which cut across the site.

4.3. The subsoil across the site was very shallow and barely distinguishable from the topsoil except that it was slightly paler in colour and had a higher proportion of sand in its makeup.

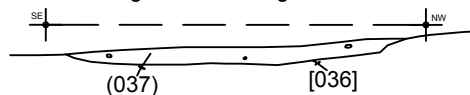
4.4. The subsoil was cut by three post-medieval field boundaries. The earliest of these was a steep sided, flat-bottomed ditch, F062, which was aligned north-west-south-east close to the north-eastern boundary of the site (shown in magenta on Figure 2). This ditch produced a piece of abraded Post-Medieval bottle glass. The fill of ditch F062 was poorly sorted and compact indicating deliberate backfilling.

4.5. Ditch F062 was truncated by the double ditched field boundary F069/F089. This boundary comprised two parallel shallow ditches on either side of a hedgerow planted on a central bank. The hedgerow had been grubbed out immediately prior to the commencement of the archaeological watching brief and had until that time formed the northern boundary of the site. The continuation of the double ditched hedgerow was still extant to the east and west of the PDA, the ditches being largely filled in and represented only by a slight depression in the topsoil. The double ditched boundary curved slightly although it followed a broadly north-west to south-east alignment. Both of the ditches truncated ditch F062 and followed roughly the same alignment as it. It is likely therefore, that ditch F062 was the original field boundary, which was replaced, probably during the late 18th century, by the double ditched boundary.

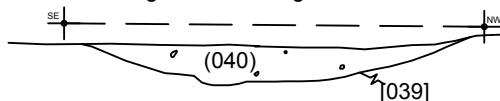


Figure 3. Top left: Overview of ditch F062 cut by boundary F069/F089; Top right: View along boundary F035/F038;
Bottom: Slot through ditch F062

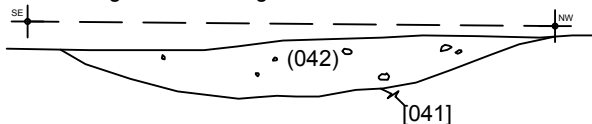
NE facing section through ditch F035



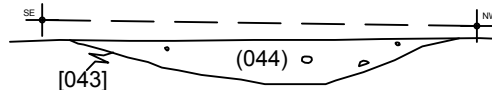
NE facing section through ditch F038



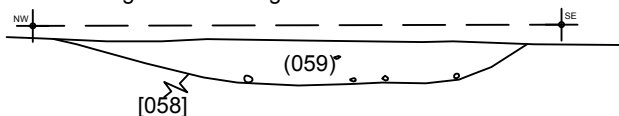
NE facing section through ditch F035



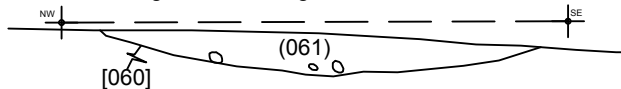
NE facing section through ditch F038



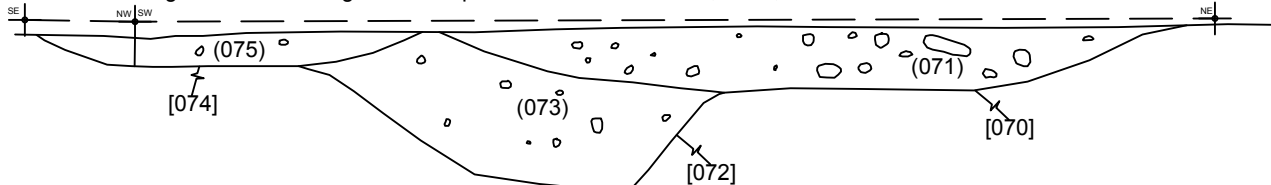
SW facing section through ditch F035



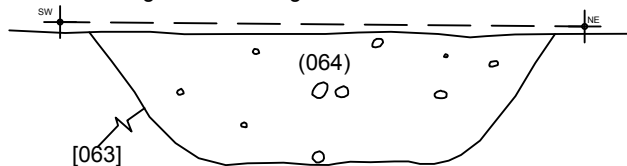
SW facing section through ditch F038



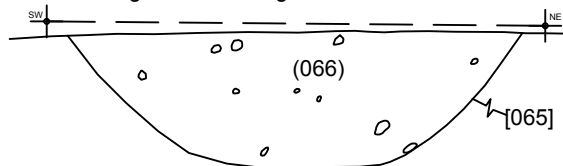
NE & SE facing sections showing relationships between ditches F038, F062, & F069



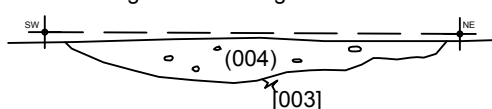
SE facing section through ditch F062



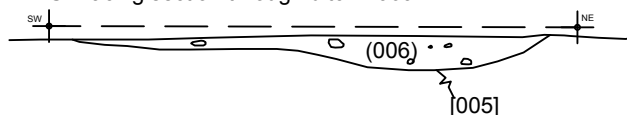
SE facing section through ditch F062



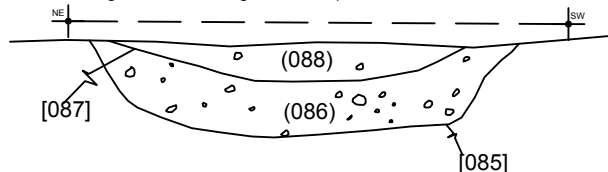
SE facing section through ditch F089



SE facing section through ditch F069



SE facing section showing relationship between ditches F062 & F089



SE facing section showing relationship between ditches F062 & F089



0 2m

Site: Bolton Hill Quarry,
Pembrokeshire
Site Code: BHQ18
Date: July 2018
Drawn by: RLT

Figure 4:
Post-Medieval field boundary
sections



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4.6. Perpendicular to the north-west to south-east aligned double ditched hedgerow was another double ditched boundary, probably also with a central bank and hedgerow. This boundary, F035/F038, ran north-east to south-west, terminating immediately south of field boundary F069/F089 and respecting it. This suggests that the two boundaries were broadly contemporary but that ditches F035/F038 were dug slightly later. Boundary F035/F038 had been removed by the time of the Ordnance Survey map of 1874, presumably to create a larger field. Pottery recovered from ditch F038 was of 19th century date, which together with the mapping information would suggest that the field boundary had been around the middle of the 19th century.

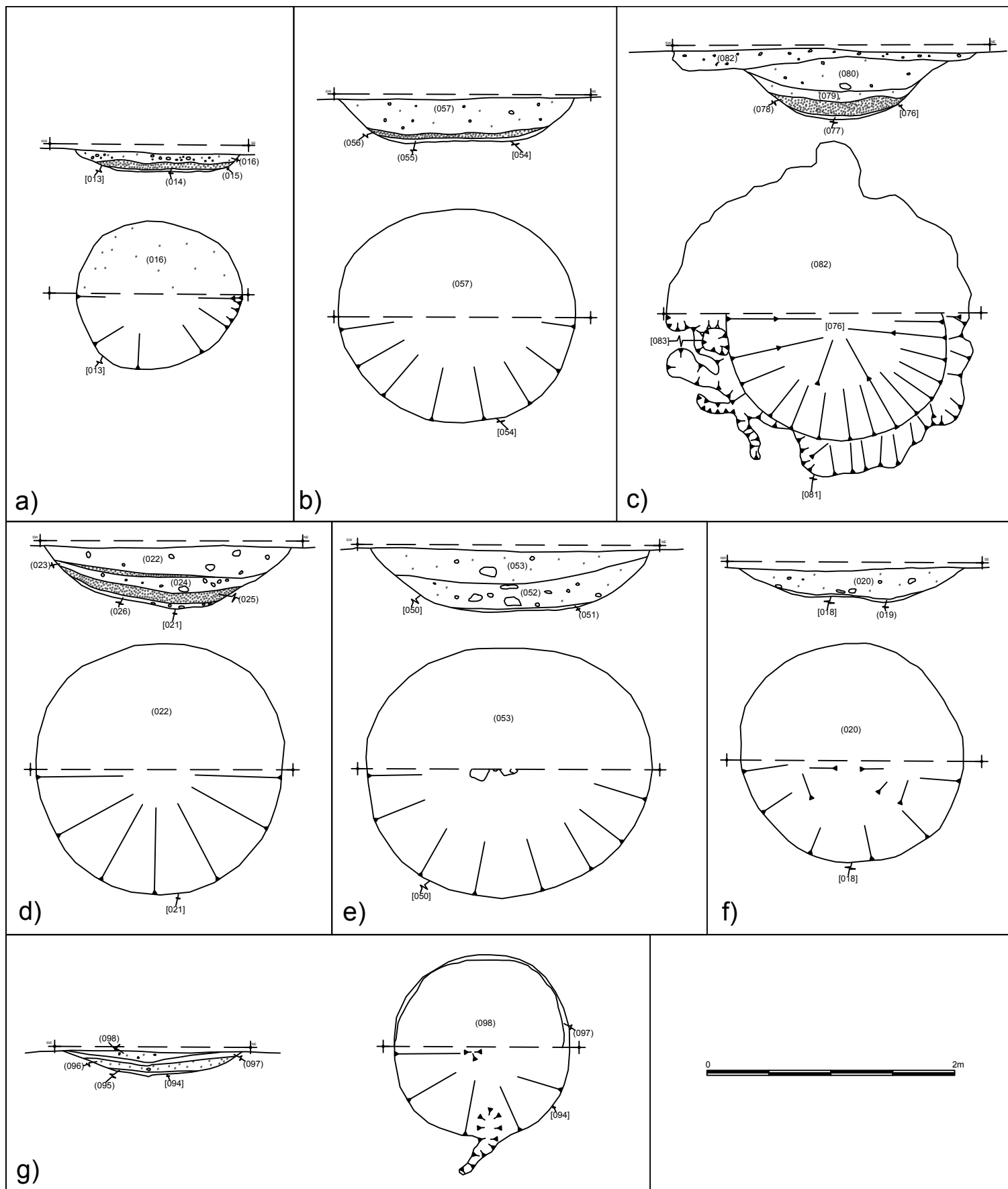
4.7. The six fire pits were all of a similar type. All were subcircular and had discoloured, heat affected natural earth in their bases. Some of them ([013], [054], & [076]) had charcoal remains *in situ* in the base of the pit (see Figures 5 & 6a-6c). In these cases the layer of *in situ* charcoal was capped by slightly heat affected redeposited natural dirt which had likely been thrown on top of the fire in order to extinguish it. The pits were then filled with well sorted silty material with moderate to frequent small charcoal inclusions; likely the result of wind borne siltation after the pits had been abandoned.



Figure 5. Fire pits. Top (left-right): [013], [054], [076]; Bottom (left-right): [021], [050], [018], scale 1 x 1m (0.5m graduations)

4.8. Pit [021] was unique in that it had clear evidence of two burning events (Figures 5 & 6d). An initial layer of charcoal in the base, capped by heat affected redeposited natural to extinguish it, over which there was another layer of charcoal, evidence of a second burning event, capped by another layer of redeposited natural and finally filled with a well sorted, naturally deposited fill.

4.9. Pits [018] and [050] (Figures 5, 6e, & 6f) had no *in situ* charcoal deposits, despite having clear heat affected earth in their bases, suggesting that the fires had been raked out to extinguish them. These pits had a single well sorted fill deriving from wind borne siltation.



Site: Bolton Hill Quarry,
Pembrokeshire
Site Code: BHQ18
Date: July 2018
Drawn by: RLT

Figure 6:
Plans and sections of fire pits



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4.10. Another burnt feature, [094], was possibly in fact a burnt root bole since it was different to the other fire pits (see Figures 5 & 6g). It had an uneven shape and large pieces of charred roots, seemingly in situ. It was also much shallower than the other pits.

4.11. Several natural features were excavated (see Figure 7). These were of two types: small irregular shaped discrete features, shallow in nature, which likely represent the *in situ* rotting of roots of shrubs or small trees; and larger oval features, shallow, with irregular base and root trails leading beyond the limits of the feature, representing tree throws. Other smaller patches of rooting were observed across the site but having no discernible form and barely penetrating the natural substrate, these were not recorded.



Figure 7. Examples of natural features

5. Specialist Reports

5.1. Finds Assessment

Dr Rebecca L. Trow ACIfA

Introduction

5.1.1. A small quantity of abraded pottery and glass were recovered from the site. The material was cleaned, counted, and weighted, then individually examined to identify diagnostic pieces.

Pottery

5.1.2. A total of 25 sherds were recovered as summarised in Table 1 below. The pottery dates from the late 18th to the early 20th century, the majority probably dating to the mid-19th century. A single piece of hand painted, tin glazed pottery was recovered from the topsoil, which potentially dates to the late 18th century. The assemblage represents largely finewares (i.e. plain and transfer printed whitewares) and a single piece of retail stoneware (marmalade jar). Most of the pottery was therefore associated with food consumption. The pottery was largely derived from topsoil (001), with the exception of two very small and abraded whiteware sherds from ditch F038, a single sherd from modern pit [027], and a sherd from shrub bole [031]. The latter two sherds were probably topsoil derived.

Table 1. Pottery

Context	Type	No.	Wt (g)	ENV	Part	Form	Decoration	Date Range	Notes
028	Whiteware	1	3	1	Body	Flatware	-	LC19th-EC20th	-
032	Whiteware	1	1	1	Body	UID	Red hand painted lines	EC20th	Sherd too small to identify form
040	TP Whiteware	1	1	1	Body	UID	Blue print	MC19th-EC20th	Sherd too small to identify form
061	Whiteware	1	1	1	Body	UID	-	LC19th-EC20th	Sherd too small to identify form
101	TP Whiteware	1	1	1	Rim	UID	Blue printed Chinoiserie	MC19th-EC20th	Sherd too small to identify form
101	TP Whiteware	1	8	1	Body	Server	Blue printed Chinoiserie	MC19th-EC20th	-
101	TP Whiteware	1	3	1	Body	Jug?	Blue printed Chinoiserie	MC19th-EC20th	-

Context	Type	No.	Wt (g)	ENV	Part	Form	Decoration	Date Range	Notes
101	TP Whiteware	1	1	1	Body	UID	Blue printed Chinoiserie	MC19th-EC20th	Sherd too small to identify form
101	TP Whiteware	1	4	1	Rim	Plate	Blue printed floral	EC19th	Crazed glaze
101	TP Whiteware	1	7	1	Rim	Server/tureen	Blue printed floral	EC19th	Crazed glaze
101	TP Whiteware	1	6	1	Body	Dish	Blue printed floral	EC19th	Carinated
101	Tin Glaze	2	5	2	Body	Hollow ware	hand painted blue floral design	LC18th-EC19th	-
101	Stoneware	1	19	1	Rim	Jar	-	LC19th-EC20th	Marmalade Jar
101	Porcelain	1	2	1	Rim	Cup?	-	LC19th-EC20th	-
101	Whiteware	6	15	6	Body	Flatware	-	LC19th-EC20th	Assorted flatware sherds
101	Whiteware	2	10	2	Base	Hollow ware	-	LC19th-EC20th	Bowl/cup bases
101	Whiteware	2	4	2	Rim	Cup/Sugar bowl?	-	LC19th-EC20th	-

Glass

5.1.3. Two abraded shards of glass were recovered from two of the Post-Medieval field boundary ditches. One, from ditch F038, was too small to allow identification, but was green and likely from a bottle. The other, from ditch F062, was a small, green, body shard from a rounded vessel, most likely a bottle.

Archive Recommendations

5.1.4. The Post-Medieval finds recovered during the watching brief are by no means unusual in any respect for a rural site of this nature. All finds were likely residual and secondary, the majority deriving from topsoil. Therefore the finds have no potential for further research and thus could be returned to the landowner, retained in a teaching collection, archived, or discarded.

5.2. Palaeoenvironmental Assessment Luke Parker PCIfA

Introduction

5.2.1. The fills of seven pits and two Post-Medieval field boundaries have been excavated and sampled for palaeoenvironmental analysis. These pits contained observably high concentrations of charred material and were viewed as having a high potential for revealing

insights into past human activity and land-use regime. The pits are viewed as likely being fire pits, due to their extremely high charcoal content as well as heat-affected substrate.

5.2.2. A minimum sample size of 40L of any selected archaeological deposit was taken for palaeoenvironmental assessment, unless the volume of the context was less than 40L; in this case the entirety of the excavated context was sampled.

Methods

5.2.3. Bulk samples were processed via water flotation through graduated sieves, the smallest being 500 µm. Flots were air dried, weighed, and scanned using a low-power binocular microscope (x40).

5.2.4. The flots were dry-sieved through a 4mm mesh sieve, and quantifications of the quantity of charred remains which are of the >4mm and <4mm size fractions made. Charred botanical macrofossils were separated from wood charcoal and identified using a low-power binocular microscope (x40). For the purposes of assessment, five fragments were identified to species level from each sample. Charcoal with a size of >2mm was fractured to obtain clean sections on the tangential, transverse, and radial planes. These were then examined and identified using a high power Leica GXML3030 binocular microscope (up to x600) with reference to Schoch *et al.* (2004).

5.2.5. Plant macrofossil identification was undertaken with reference to Martin and Barkley (2000) and Cappers *et al.* (2006); these identifications were supplemented by examples of known species in the Archaeological Research Services Ltd library archive. Plant macrofossil nomenclature follows Stace (1997). All plant macrofossils present were assessed. No waterlogging or mineralisation was identified on site; therefore non-charred macrofossils were discounted as being modern contamination and were excluded from this assessment.

Results

5.2.6. The palaeoenvironmental remains are summarised in Table 2 below. Significant quantities of charcoal were recovered from all sampled archaeological features. Particularly high concentrations were present within the sampled pit contexts ([013], [018], [021], [050], [054], [076], and [094]). All pit charcoal assemblages were composed of oak (*Quercus sp.*) roundwood. This roundwood varied in size from >1cm thick twigs up to moderately sized (5-10cm) thick branches. The only exception to this was three fragments of hazel (*Corylus avellana L.*) charcoal within the fill (020) of pit [018]. The fills (061) and (044) of ditch F038 also contained fragments of similar oak charcoal. Sampled pit fills (016), (020), (052) and (057) all contained seeds from the cabbage genus (*Brassica sp.*), as did the fills (044) and (061) of ditch F038.

5.2.7. The fills (042) and (059) of ditch F035, as well as the fill (064) of field boundary [063] contained numerous small fragments of gorse roundwood (*Ulex europaeus*), along with five fragments of oak roundwood in ditch fill (042). Five seeds of the *Solanum* family which were tentatively identified as potato (*Solanum c.f. tuberosum*), one gorse seed, and one fat hen (*Chenopodium album*) seed were also present in the fill (059) of ditch F035.

Table 2. Identified palaeoenvironmental remains. N.B. asterisk indicates material suitable for 14C radiocarbon dating

	Sample No.	1	2	3	5	7	6	4	11	10	13	12	8	14	15	9	16	18	19
	Context No.	16	15	14	20	25	23	22	52	53	56	57	42	59	61	44	64	78	96
	Description	Upper fill of fire pit [013]	Prim. fill of fire pit [013]	Burnt lining of fire pit [013]	Fill of pit [018]	Lower fill of pit [021]	Mid. fill of pit [021]	Upper fill of pit [021]	Lower fill of fire pit [050]	Upper fill of fire pit [050]	Fill of pit [054]	Upper fill of fire pit [054]	Fill of ditch F035	Fill of ditch F035	Fill of ditch F038	Fill of ditch F038	Fill of ditch [063]	Lower fill of fire pit [076]	Lower fill of fire pit [094]
Charcoal	Hazel (<i>Corylus avellana</i> L.)				3														
	Oak (<i>Quercus</i> sp.)	20	20	11	17	20	20	20	20	1	20	20	5		20	20		20	20
	Gorse (<i>Ulex europaeus</i>)												7	6			2		
Plant Macrofossils	Gorse (<i>Ulex europaeus</i>)													1					
	c.f. potato (<i>Solanum</i> c.f. <i>tuberosum</i>)													5					
	Fat hen (<i>Chenopodium album</i>)							1						1					
	<i>Brassica</i> sp.	32*			1				13*			3			5*	20*			
	Indet. seeds				3														
	Indet. germinated seed									1									

Discussion

5.2.8. The fills (042) and (059) of ditch F035, as well as the fill (064) of field boundary [063] all reflect the former field landscape. As revealed by maps, for much of the 19th century the field was covered in gorse bushes which are reflected by the gorse charcoal. Comments by the landowner mentioned that the location was ploughed for potato farming during the 20th century. As both potato, and gorse seeds and charcoal were present within fill (059) of ditch F035 the gorse charcoal may represent attempts of gorse clearance in order to provide further agricultural land.

5.2.9. The *Brassica* seeds may represent a different phase of agriculture on the site. Though it was not possible to identify the seeds to the species level, this genus of plants contains many cultivated species including (but not limited to) cabbage, turnip, rapeseed, and cauliflower. It is likely that these represent cultivation of leafy or root vegetables. It is probable that the seeds were already pre-existing in the location, accidentally charred along with the intentionally-burned wood material and subsequently deposited in pit fills (016), (020), (052) and (057), and ditch fills (061) and (044).

5.2.10. The oak roundwood charcoal suggests that easily accessible twigs and branches were preferentially selected. Studies on charcoal assemblages have interpreted uniform assemblages such as these as potentially being sourced from a single tree (i.e. Thompson, 1998). For the oak charcoal assemblages present here the fuel used for each burning event may have been taken from a single source each time. The age of these fire pits and possible associated agriculture is unknown.

6. Discussion and Conclusions

6.1. The archaeological watching brief of the Phase II extension at Bolton Hill Quarry, Tiers Cross, Haverfordwest, Pembrokeshire monitored 4.38ha of overburden stripping prior to the commencement of quarrying activities. Three Post-Medieval field boundaries were uncovered, representing two phases of enclosure during this Period on the site. The earliest phase comprised a north-west-south-east aligned ditch which was later replaced by a double ditched hedgerow (that remained in use until the commencement of the present works).

6.2. Also of this second phase was a broadly contemporaneous double ditched boundary, perpendicular to the north-west-south-east boundary, which must have been created after the latter, but probably shortly after. This had been removed at some point prior to the 1874 Ordnance Survey map, but during the 19th century according to the finds, so likely around the middle of the 19th century. This ditch also produced some fragments of oak and gorse charcoal pieces as well as potato and brassica seeds, potentially attesting to the agricultural practices in the immediate vicinity of the ditches. Interestingly, ditch F038, the easternmost of the ditches produced brassica seeds, while ditch F035, the westernmost, produced potato seeds, perhaps evidence of different crops in the fields either side of the hedgerow.

6.3. The six pits were isolated and it is difficult to relate them to any particular phase of activity. They were grouped largely into two types, those with *in situ* charcoal remains which

had been capped by a layer of redeposited natural, likely used to extinguish the fire; and those with no *in situ* charcoal, which were probably raked out in order to extinguish the fire. All of the pits had bright red, heat affected natural earth lining their bases and were of a similar size and shape suggesting that they served a similar function. It is possible that they are contemporary with some of the phases of prehistoric activity encountered during the Phase 1 excavations, perhaps representing activities which were important to keep away and isolated from the main settlement.

6.4. The natural features are unsurprising in a site of this nature and are potentially of various dates. It is known from the historic mapping that the field was likely covered in gorse for at least the latter part of the 19th century and it is likely that a large number of the root boles represent gorse bushes. The two larger root boles are more likely to be tree throws given the shallow but broad nature of the features.

6.5. All of the recovered artefactual material was 19th century or later in date and largely derived from topsoil. The palaeoenvironmental results confirm the mapping and anecdotal evidence that suggest the PDA was at one time covered in gorse and at another time had been used for potato cultivation. The presence of brassica seeds perhaps points to the diversity of agricultural produce in the area.

6.6. The archaeological watching brief successfully recorded all the archaeological features within the footprint of the quarry extension and therefore no further archaeological remains will be impacted by the present development. The sparsity of archaeological remains in the PDA suggests that the Prehistoric activity encountered in the Phase 1 excavations was largely restricted to the north of the PDA, slightly further down the slope and more sheltered from the prevailing westerly and south-westerly winds.

7. Archive Deposition

7.1. One bound copy of the final report with an attached PDF/A copy on disc will be deposited at the Dyfed Archaeological Trust HER. The disc will also include a digital archive, consisting of the relevant CAD files, to facilitate the updating of the HER database.

8. Publicity, Confidentiality, and Copyright

8.1. Any publicity will be handled by the client.

8.2. Archaeological Research Services Ltd will retain the copyright of all documentary and photographic material under the Copyright, Designs and Patents Acts (1988)

9. Statement of Indemnity

9.1. All statements and opinions contained within this report arising from the works undertaken are offered in good faith and compiled according to professional standards. No responsibility can be accepted by the author of the report for any errors of fact or opinion resulting from data supplied by any third party, or for loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in any such report(s), howsoever such facts and opinions may have been derived.

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Appendix I: Context Register

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
001	Deposit	Dark brown (7.5YR3/4) sandy clayey silt with occasional subangular stones	Topsoil	0.15-0.3m (d)	84.253-88.910m	Pottery	-
002	Deposit	Dark yellowish brown sandy clayey silt with occasional small subangular stones	Subsoil	0.15-0.2m (d)	83.753-88.632m	-	-
003	Cut	Cut of slot within ditch F089. Gradual breaks of slope, concave sides and uneven base, shallow and heavily rooted.	Post medieval double ditched field boundary	>1.00m (l), 1.18m (w), 0.14m (d)	83.790m	-	-
004	Fill	Well sorted fill of ditch [003]. Mid greyish brown clayey sandy silt with moderate small stone inclusions.	Post medieval double ditched field boundary	>1.00m (l), 1.18m (w), 0.14m (d)	83.790m	-	-
005	Cut	Cut of slot within ditch F069. Gradual breaks of slope, concave sides and uneven base. Heavily rooted	Post medieval double ditched field boundary	>1.00m (l), 1.38m (w), 0.12m (d)	83.737m	-	-
006	Fill	Mid greyish brown, clayey sandy silt fill of ditch slot [005]. Fill has moderate small and large rounded and subrounded stones.	Fill of post medieval double ditched field boundary	>1.00m (l), 1.38m (w), 0.12m (d)	83.737m	-	-
007	Cut	Irregular cut with barely perceptible breaks of slope, irregular edges and uneven base with root holes continuing beyond feature	Cut of shrub bole	1.9m (l), 1.06m (w), 0.22m (d)	88.403m	-	-
008	Fill	Mid yellowish brown, sandy clayey silt fill of cut [007]	Fill of shrub bole	1.9m (l), 1.06m (w), 0.22m (d)	88.403m	-	-
009	Cut	Irregular cut, shallow and undercutting sides with root trails continuing beyond feature	Cut of root bole	2.4m (l), 1.2m (w), 0.17m (d)	89.248m	-	-

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
010	Fill	Mid greyish brown sandy clayey silt fill of cut [009], with occasional small sub angular stones	Fill of root bole	2.4m (l), 1.2m (w), 0.17m (d)	89.248m	-	-
011	Cut	Oval, slightly irregular cut of probable tree bole, uneven base and sides and shallow	Cut of tree bole	4.2m (l), 2.8m (w), 0.22m (d)	89.159m	-	-
012	Fill	Mid greyish brown, sandy silt fill of cut [011] with occasional small sub angular stones	Fill of tree bole	4.2m (l), 2.8m (w), 0.22m (d)	89.159m	-	-
013	Cut	Cut of sub circular pit with sharp breaks of slope, concave sides and flat base	Cut of fire pit	1.34m (l), 1.20m (w), 0.16m (d)	90.064m	-	-
014	Fill	Light yellowish red, sandy clayey silt lining cut of pit [013]. Not a true fill but heat affected natural evidencing in situ burning	Heat affected natural in base of fire pit [013]	0.02m (d)	89.886m	-	3
015	Fill	Dark blueish grey/black charcoal deposit within fire pit [013]	Charcoal/ash remains in situ in fire pit [013]	0.08m (d)	89.961	-	2
016	Fill	Dark greyish brown sandy clayey silt fill of fire pit [013], with frequent charcoal and moderate small stones	Capping fill, possibly used to extinguish fire or simply to back fill pit [013]	0.10m (d)	90.064m	-	1
017	Deposit	Strong brown mottled with reddish yellow (7.5YR5/6, 7.5YR6/6), clayey sandy silt with occasional pieces of weathered granite	Natural loamy substrate	-	84.505-88.436m	-	-
018	Cut	Sub circular cut of fire pit with sharp break of slope at top, concave sides, gradual break of slope at bottom and uneven base	Cut for fire pit	1.8m (l), 1.78m (w), 0.24m (d)	87.052m	-	-

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
019	Fill	Mid yellowish red sandy silty clay lowest fill of fire pit [018]. Not true fill but heat affected natural in base of pit	Heat affected natural in base of fire pit [018]	0.04m (d)	86.837m	-	-
020	Fill	Dark greyish brown sandy clayey silt fill of fire pit [018], with frequent charcoal and moderate small stones	Main fill of fire pit [018], backfill of pit after embers removed	0.22m (d)	87.052m	-	5
021	Cut	Sub circular cut of fire pit with sharp break of slope at top, concave sides, gradual break if slope at bottom and flat base. Pit is deep and evidence of two burning events	Cut for fire pit	1.02m (l), 1.00m (w), 0.52m (d)	86.878m	-	-
022	Fill	Dark greyish brown, clayey sandy silt upper capping fill of fire pit [021]	Backfill used to seal fire pit [018] after use	0.26m (d)	86.878m	-	4
023	Fill	Dark blueish grey/black charcoal deposit within fire pit [021]	Secondary in situ burning event in pit [021]	0.02m (d)	86.615m	-	6
024	Fill	Mid reddish yellow silty sand deposit with frequent charcoal inclusions. Redeposited natural used to seal primary burning event (025). Heat affected by secondary burning event evidenced by charcoal deposit (023)	Primary disuse deposit, sealing/extinguishing fire (025)	0.14m (d)	86.591m	-	-
025	Fill	Dark blueish grey/black charcoal deposit within fire pit [021]. Lowest burning event	Primary burning remains within fire pit [021]	0.08m (d)	86.452m	-	7

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
026	Fill	Mid reddish yellow silty sand deposit. Heat affected by primary burning event evidenced by charcoal deposit (025)	Heat affected natural lining base of fire pit [021]	0.04m (d)	86.373m	-	-
027	Cut	Cut of large rectilinear machine dug pit with machine bucket teeth marks in base	Modern machine excavated pit/trench	6.2m (l), 5.2m (w), 0.15m (d)	88.040m	-	-
028	Fill	Dark greyish brown fill mottled with lenses of lighter brown and redeposited natural.	Topsoil, subsoil and natural derived backfill of pit [027]	6.2m (l), 5.2m (w), 0.15m (d)	88.040m	Pottery	-
029	Cut	Cut of rectilinear, vertical sided pit.	Modern test pit	2.00m (l), 0.8m (w), 0.1m (d)	88.735m	-	-
030	Fill	Dark greyish brown fill mottled with lenses of lighter brown and redeposited natural.	Fill of test pit [029]	2.00m (l), 0.8m (w), 0.1m (d)	88.735m	-	-
031	Cut	Irregular cut, shallow with barely perceptible edges and uneven base	Cut of shrub bole	2.38m (l), 0.76m (w), 0.1m (d)	88.290m	-	-
032	Fill	Dark greyish brown topsoil derived fill containing one small abraded whiteware sherd	Fill of shrub bole [031]	2.38m (l), 0.76m (w), 0.1m (d)	88.290m	Pottery	-
033	Cut	Irregular cut, shallow with uneven base	Cut of shrub bole	2.4m (l), 2.1m (w), 0.15m (d)	88.698m	-	-
034	Fill	Dark greyish brown topsoil derived fill	Fill of shrub bole [033]	2.4m (l), 2.1m (w), 0.15m (d)	88.698m	-	-

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
F035	Feature Group	Group for westernmost of double ditched field boundary running NE-SW across site. Ditch F038 runs parallel to it to the east. A hedgerow was probably located between F035 and F038. Probably removed late 19th-early 20th century. Terminates respecting perpendicular boundary F069	Post medieval double ditched field boundary	>91m (l), 1.50m (w), 0.20m (d)	84.815-84.838m	-	8, 14
036	Cut	Cut of ditch slot within ditch F035. Ditch has gradual breaks of slope and concave sides with a largely flat base. Ditch is probably cut through subsoil hence shallow depth at this level	Post medieval double ditched field boundary	>1m (l), 1.04m (w), 0.08m (d)	84.838m	-	-
037	Fill	Mid greyish brown, clayey sandy silt fill of ditch slot [036]. Fill has moderate numbers of small sub angular stones and is well sorted and loose indicating formation by wind borne siltation over extended period	Fill of post medieval double ditched field boundary	>1m (l), 1.04m (w), 0.08m (d)	84.838m	-	-
F038	Feature Group	Group for easternmost of double ditched field boundary running NE-SW across site. Ditch F035 runs parallel to it to the west. A hedgerow was probably located between F035 and F038. Probably removed late 19th-early 20th century. Terminates respecting perpendicular boundary F069	Post medieval double ditched field boundary	>91m (l), 1.34m (w), 0.12m (d)	84.672-84.679m	Pottery, Glass	9, 15

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
039	Cut	Cut of ditch slot within ditch F038. Ditch has gradual breaks of slope and concave sides with a largely flat base. Ditch is probably cut through subsoil hence shallow depth at this level	Post medieval double ditched field boundary	>1m (l), 1.16m (w), 0.12m (d)	84.679m	-	-
040	Fill	Mid greyish brown, clayey sandy silt fill of ditch slot [039]. Fill has moderate numbers of small sub angular stones and is well sorted and loose indicating formation by wind borne siltation over extended period. 1 very small abraded piece of whiteware recovered	Fill of post medieval double ditched field boundary	>1m (l), 1.16m (w), 0.12m (d)	84.679m	Pottery	-
041	Cut	Cut of ditch slot within ditch F035. Ditch has gradual breaks of slope and concave sides with a largely flat base. Ditch is probably cut through subsoil hence shallow depth at this level	Post medieval double ditched field boundary	>1m (l), 1.5m (w), 0.2m (d)	84.772m	-	-
042	Fill	Mid greyish brown, clayey sandy silt fill of ditch slot [041]. Fill has moderate numbers of small sub angular stones and is well sorted and loose indicating formation by wind borne siltation over extended period	Fill of post medieval double ditched field boundary	>1m (l), 1.5m (w), 0.2m (d)	84.772m	-	8

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
043	Cut	Cut of ditch slot within ditch F038. Ditch has gradual breaks of slope and concave sides with a largely flat base. Ditch is probably cut through subsoil hence shallow depth at this level	Post medieval double ditched field boundary	>1m (l), 1.16m (w), 0.14m (d)	84.628m	-	-
044	Fill	Mid greyish brown, clayey sandy silt fill of ditch slot [043]. Fill has moderate numbers of small sub angular stones and is well sorted and loose indicating formation by wind borne siltation over extended period. 1 very small abraded piece of whiteware recovered	Fill of post medieval double ditched field boundary	>1m (l), 1.16m (w), 0.14m (d)	84.628m	-	9
045	Cut	Broadly oval, irregular cut of tree bole. Irregular sides and base with root trails continuing beyond feature.	Cut of tree bole	3.64m (l), 2.30m (w), 0.18m (d)	84.478m	-	-
046	Fill	Dark yellowish brown, clayey, sandy silt fill of tree bole [045], with occasional small sub angular stone inclusions.	Fill of tree bole	3.64m (l), 2.30m (w), 0.18m (d)	84.478m	-	-
047	Cut	Irregular shaped feature with near vertical and undercutting sides. Base is uneven and heavily rooted. Deeper towards the north probably indicating that tree fell towards the north causing deeper disturbance in this part of the feature	Cut of tree throw	1.82m (l), 0.98m (w), 0.44m (d)	84.514m	-	-

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
048	Fill	Lowest fill of tree throw [047]. Fill comprises brownish yellow redeposited natural with occasional charcoal flecks and small stones. Probably represents material that fell of roots after tree was thrown	Lowest fill of tree throw	0.26m (d)	84.258m	-	-
049	Fill	Mid greyish brown fill of tree throw. Fill comprises sandy silt with occasional flecks of charcoal and small stones. Fill is well sorted, represents wind borne siltation	Upper fill of tree throw	0.24m (d)	84.514m	-	-
050	Cut	Sub circular pit with sharp break of slope (top), concave sides, gradual break of slope (bottom) and flat base. Contains fills (051)-(053)	Cut of fire pit	2.34m (l), 2.08m (w), 0.52m (d)	85.190m	-	-
051	Fill	Mid yellowish red sandy silty clay lowest fill of fire pit [050]. Not true fill but heat affected natural in base of pit	Heat affected natural in base of fire pit [050]	0.02m (d)	84.751m	-	-
052	Fill	Light yellowish brown, clayey sandy silt, initial fill of pit [050]. Poorly sorted and comprised mainly of redeposited natural. Likely that fire was raked out and this material dumped after	Primary disuse deposit in pit [050]	0.22m (d)	84.976m	-	11
053	Fill	Upper fill of pit [050]. Fill is dark yellowish brown, clayey sandy silt with occasional small stones, well sorted indicating slow siltation event after abandonment of pit	Secondary disuse in pit [050]	0.28m (d)	85.190m	-	10

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
054	Cut	Sub circular pit with sharp break of slope (top), concave sides, gradual break of slope (bottom) and flat base. Contains fills (055)-(057)	Cut of fire pit	1.96m (l), 1.65m (w), 0.34m (d)	85.120m	-	-
055	Fill	Mid yellowish red sandy silty clay lowest fill of fire pit [054]. Not true fill but heat affected natural in base of pit	Heat affected natural in base of fire pit [054]	0.04m (d)	84.781m	-	-
056	Fill	Dark blueish grey/black charcoal deposit within fire pit [054]	Charcoal/ash remains in situ in fire pit [054]	0.06m (d)	84.847m	-	13
057	Fill	Upper fill of pit [054], well sorted, dark yellowish brown, clayey sandy silt fill with occasional small stones. Likely slow siltation after abandonment of pit	Primary disuse of pit [054]	0.28m (d)	85.120m	-	12
058	Cut	Cut of ditch slot within ditch F035. Ditch has gradual breaks of slope and concave sides with a largely flat base. Ditch is probably cut through subsoil hence shallow depth at this level	Post medieval double ditched field boundary	>1.31m (l), 1.46m (w), 0.22m (d)	84.815m	-	-
059	Fill	Mid greyish brown, clayey sandy silt fill of ditch slot [058]. Fill has moderate numbers of small sub angular stones and is well sorted and loose indicating formation by wind borne siltation over extended period	Fill of post medieval double ditched field boundary	>1.31m (l), 1.46m (w), 0.22m (d)	84.815m	-	14

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
060	Cut	Cut of ditch slot within ditch F038. Ditch has gradual breaks of slope and concave sides with a largely flat base. Ditch is probably cut through subsoil hence shallow depth at this level	Post medieval double ditched field boundary	>1.02m (l), 1.34m (w), 0.12m (d)	84.672m	-	-
061	Fill	Mid greyish brown, clayey sandy silt fill of ditch slot [060]. Fill has moderate numbers of small sub angular stones and is well sorted and loose indicating formation by wind borne siltation over extended period. 1 very small abraded piece of whiteware recovered	Fill of post medieval double ditched field boundary	>1.02m (l), 1.34m (w), 0.12m (d)	84.672m	Pottery	15
F062	Feature Group	Group for linear ditch aligned NW-SE. Ditch is truncated by the later double ditched boundary (F069/F089), which appears to be a recut along broadly the same alignment. Continues beyond LOE to east and west	Post medieval field boundary/drainage ditch	>263m (l), 1.46m (w), 0.44m (d)	83.444- 88.614m	Glass	16
063	Cut	Cut of ditch slot within ditch F062. Sharp breaks of slope, steep sides and flat base. Filled by (064).	Post medieval field boundary/drainage ditch	>1.00m (l), 1.46m (w), 0.42m (d)	83.444m	-	-

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
064	Fill	Mid greyish-brown, clayey sandy silt fill of ditch [063]. Fill is poorly sorted with frequent small and medium sub angular and subrounded stones and occasional large stones. 1 piece of post medieval glass recovered from base of fill.	Fill of post medieval field boundary/drainage ditch	>1.00m (l), 1.46m (w), 0.42m (d)	83.444m	Glass	16
065	Cut	Cut of ditch slot within ditch F062. Sharp breaks of slope (top) gradual break of slope (base), steep sides and flat base. Filled by (066).	Post medieval field boundary/drainage ditch	>1.00m (l), 1.42m (w), 0.44m (d)	83.979m	-	-
066	Fill	Mid greyish-brown, clayey sandy silt fill of ditch [065]. Fill is poorly sorted with frequent small and medium sub angular and subrounded stones and occasional large stones.	Fill of post medieval field boundary/drainage ditch	>1.00m (l), 1.42m (w), 0.44m (d)	83.979m	-	-
067	Cut	Cut of mid-late 20th century service trench running NW-SE across site. Not excavated	Water main	>292m (l), 0.66m (w)	83.938- 88.495m	-	-
068	Fill	Fill of service trench [067]	Water main	>292m (l), 0.66m (w)	83.938- 88.495m	-	-
F069	Feature Group	Group for southernmost of double ditched field boundary running the length of the northern edge of site. Ditch F089 runs parallel to it to the north. A hedgerow was located between F069 and F089 which was removed April 2018.	Post medieval double ditched field boundary	>262m (l), 1.38m (w), 0.20m (d)	83.737- 88.730m	-	-

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
070	Cut	Cut of slot within ditch F069, in relationship slot with ditches F038 & F062. Gradual breaks of slope, concave sides and uneven base. Truncates ditch F062. Respected by ditch F038	Post medieval double ditched field boundary	>0.56m (l), 1.30m (w), 0.20m (d)	84.647m	-	-
071	Fill	Mid greyish brown, clayey sandy silt fill of ditch slot [070]. Fill has moderate small and large rounded and subrounded stones.	Fill of post medieval double ditched field boundary	>0.56m (l), 1.30m (w), 0.20m (d)	84.647m	-	-
072	Cut	Cut of ditch slot within ditch F062. Sharp breaks of slope (top) gradual break of slope (base), steep sides and flat base. Filled by (073). Truncated by [070] & [074]	Post medieval field boundary/drainage ditch	>0.56m (l), 1.32m (w), 0.38m (d)	84.641m	-	-
073	Fill	Mid greyish-brown, clayey sandy silt fill of ditch [072]. Fill is poorly sorted with frequent small and medium sub angular and subrounded stones and occasional large stones. Truncated by [070] & [074]	Fill of post medieval field boundary/drainage ditch	>0.56m (l), 1.32m (w), 0.38m (d)	84.641m	-	-
074	Cut	Cut of ditch terminus slot within ditch F038. Gradual breaks of slope, concave sides and uneven base. Truncates ditch F062, respects ditch F069	Post medieval double ditched field boundary	>0.86m (l), 0.54m (w), 0.10m (d)	84.643m	-	-
075	Fill	Mid greyish brown clayey sandy silt fill of ditch terminus [074]. Fill is well sorted with occasional small subrounded stones.	Fill of post medieval double ditched field boundary	>0.86m (l), 0.54m (w), 0.10m (d)	84.643m	-	-

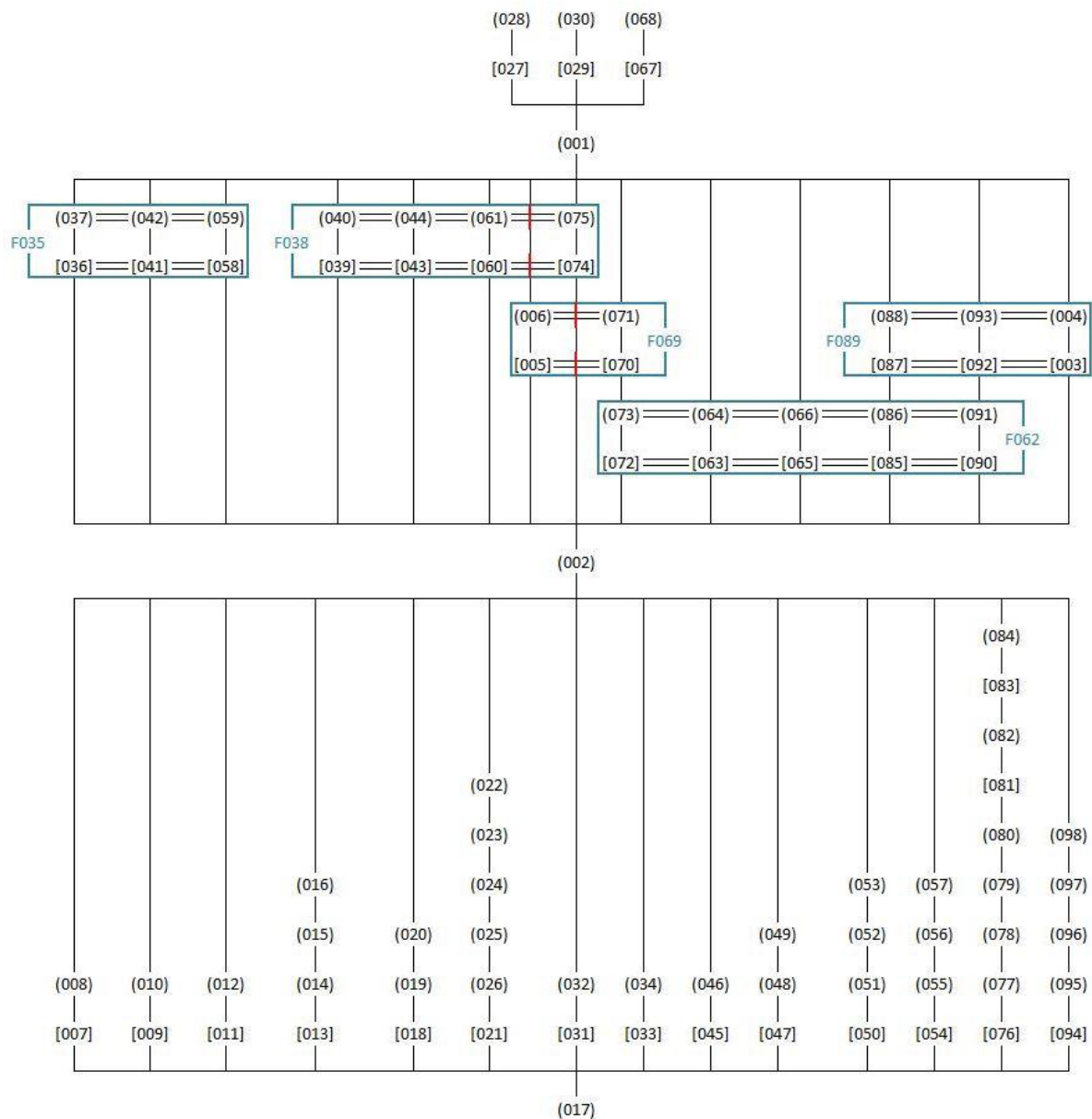
Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
076	Cut	Subcircular pit with steep sides and concave base. Entire upper part has been truncated by a shrub bole.	Cut of fire pit	>1.80m (l), >1.74m (w), >0.52m (d)	88.259m	-	-
077	Fill	Lowest deposit in pit [076]. Heat affected natural clayey sandy silt lining base of pit. Heat has turned the dirt bright yellowish red, indicates burning event within pit.	Heat affected natural in base of pit [076]	0.04m (d)	88.204m	-	-
078	Fill	Dark blueish grey/black charcoal and ash deposit. Primary fill of pit [076]. Represents in situ remains of fire which caused formation of (077)	Charcoal/ash deposit in pit [076]	0.12m (d)	88.217m	-	18
079	Fill	Light reddish yellow clayey sandy silt deposit, with rare charcoal flecks. Dirt is slightly heat affected and redeposited natural, likely that thrown over the fire to extinguish embers, hence slight heat affectation. Partially truncated by burrow [083]	Redeposited natural, primary disuse of pit [076]	0.08m (d)	88.226m	-	-
080	Fill	Mid greyish brown, sandy silt, upper fill of fire pit [076]. Well sorted with occasional charcoal flecks and small stone inclusions. Likely formed through low energy event such as natural wind borne siltation. Truncated by shrub bole [081] and burrow [083]	Upper tertiary fill of pit [076]	>0.31m (d)	88.259m	-	17

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
081	Cut	Irregular shaped feature with concave sides and varying sharp and gradual breaks of slope and uneven base. Truncates fire pit [076]. Truncated by burrow [083]	Cut of shrub bole	2.80m (l), 2.50m (w), 0.15m (d)	87.752m	-	-
082	Fill	Mid yellowish brown, clayey sandy silt fill of [081]. Fill is well sorted with moderate inclusions of small stones. Low energy formation process	Fill of shrub bole	2.80m (l), 2.50m (w), 0.15m (d)	87.752m	-	-
083	Cut	Irregular shaped linear feature with undercutting sides forming tunnel shape, and irregular base. Truncates shrub bole [081] and fire pit [076] and continues beyond these features.	Cut of burrow	0.22m (diam)	87.748m	-	-
084	Fill	Light greyish brown sandy silt fill of [083]. Fill is loose and well sorted.	Fill of burrow	0.22m (diam)	87.748m	-	-
085	Cut	Cut of ditch slot within F062 in relationship with F089. Sharp breaks of slope, steep sides and flat base. Aligned NW-SE. Truncated by F089	Post medieval field boundary/drainage ditch	>1.04m (l), 1.34m (w), 0.32m (d)	87.487m	-	-
086	Fill	Poorly sorted, compact fill of ditch [085]. Fill is mid greyish brown, clayey sandy silt with frequent small and medium stones and occasional large stones. High energy formation process, probably backfill	Post medieval field boundary/drainage ditch	>1.04m (l), 1.34m (w), 0.32m (d)	87.487m	-	-

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
087	Cut	Cut of slot within ditch F089. Gradual breaks of slope, concave sides and uneven base, shallow and heavily rooted. Truncates ditch F062	Post medieval double ditched field boundary	>1.04m (l), 1.12m (w), 0.12m (d)	87.481m	-	-
088	Fill	Well sorted fill of ditch [087]. Mid greyish brown clayey sandy silt with moderate small stone inclusions.	Post medieval double ditched field boundary	>1.04m (l), 1.12m (w), 0.12m (d)	87.481m	-	-
F089	Feature Group	Group for northernmost of double ditched field boundary running the length of the northern edge of site. Ditch F069 runs parallel to it to the south. A hedgerow was located between F069 and F089 which was removed April 2018.	Post medieval double ditched field boundary	>262m (l), 1.40m (w), 0.22m (d)	83.790- 88.832m	-	-
090	Cut	Cut of ditch slot within F062 in relationship with F089. Sharp breaks of slope, steep sides and flat base. Aligned NW-SE. Truncated by F089	Post medieval field boundary/drainage ditch	>0.50m (l), 1.16m (w), 0.31m (d)	88.614m	-	-
091	Fill	Poorly sorted, compact fill of ditch [090]. Fill is mid greyish brown, clayey sandy silt with frequent small and medium stones. High energy formation process, probably backfill	Post medieval field boundary/drainage ditch	>0.50m (l), 1.16m (w), 0.31m (d)	88.614m	-	-
092	Cut	Cut of slot within ditch F089. Gradual breaks of slope, concave sides and uneven base, shallow and heavily rooted. Truncates ditch F062	Post medieval double ditched field boundary	>0.50m (l), 1.40m (w), 0.22m (d)	88.598m	-	-

Context No.	Type	Description	Interpretation	Dimensions	Height aOD to top of context	Finds	Enviro. Sample No.
093	Fill	Well sorted fill of ditch [092]. Mid greyish brown clayey sandy silt with moderate small stone inclusions.	Post medieval double ditched field boundary	>0.50m (l), 1.40m (w), 0.22m (d)	88.598m	-	-
094	Cut	Sub circular shaped pit with gradual breaks of slope, concave sides and flat base.	Cut of fire pit	1.42m (l), 1.38m (w), 0.20m (d)	88.755m	-	-
095	Fill	Bright yellowish red heat affected natural lining base of fire pit [094]	Heat affected natural in base of fire pit [094]	0.02m (d)	88.584m	-	-
096	Fill	Dark yellowish brown clayey sandy silt fill of fire pit [094]. Fill is poorly sorted with frequent charcoal	Primary fill of fire pit [094]	0.08m (d)	88.609m	-	19
097	Fill	Mid yellowish red heat affected redeposited natural covering charcoal rich fill (096).	Redeposited heat affected natural in fire pit [094]	0.04m (d)	88.651m	-	-
098	Fill	Tertiary fill of fire pit [094]. Well sorted, mid greyish brown, sandy silt fill formed through low energy process, likely wind borne siltation filling slump of backfilled pit	Tertiary fill of fire pit [094]	0.10m (d)	88.755m	-	-

Appendix II: Harris Matrix



Appendix III: Written Scheme of Investigation

Bolton Hill Quarry, Pembrokeshire

Phase 2

Written Scheme of Investigation for Geophysical Survey, Watching Brief and Strip, Map and Record.

July 2017



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1 INTRODUCTION

1.1 Project and Planning Background

1.1.1 This Written Scheme of Investigation (WSI) has been prepared by Archaeological Research Services Ltd (ARS Ltd) on behalf of G D Harries & Sons Ltd. It details a scheme of works for geophysical survey and a scalable archaeological watching brief which has been designed to be scalable up to strip, map and record excavation, as appropriate to the nature of the archaeological remains encountered, in satisfaction of planning consent 07/0705/MN and with regard to Condition 40 of the consent for the extension of Bolton Hill Quarry granted 24th April 2009.

1.1.2 The aim of the programme of works is, in line with the National Planning Policy Framework (NPPF) paragraph 141 (DCLG 2012), to record and enhance understanding of the significance of any heritage assets to be lost during the proposed development in a manner proportionate to their importance, and to make this evidence (and any archived generated) publicly accessible.

1.1.3 Planning permission has been granted for development of the site subject to Condition 40, which requires archaeological work prior to development and states that:

Prior to the commencement of soil stripping operations at the site the applicant, or their agents or successors in title, shall secure the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the Local Planning Authority

Reason: to protect historic environment interests whilst enabling development

1.1.4 This WSI has been prepared following consultation with, and under the guidance of, Mike Ings, Senior Planning Archaeologist, Dyfed Archaeological Trust in his role as advisor to Pembrokeshire County Council.

1.1.5 This WSI describes the objectives and the methods to be employed during archaeological works which comprise geophysical survey as well as archaeological watching brief and, where necessary and appropriate, scalable strip, map and record excavations. In its final, issued, form this WSI has been recommended by Mike Ings, Senior Planning Archaeologist, Dyfed Archaeological Trust for approval by Pembrokeshire County Council.

1.2 Site Location

1.2.1 The site lies approximately 4.8km south-west of Haverfordwest and occupies a prominent hill top, the second highest in Pembrokeshire, with unrestricted views along the northern scarp towards the Preseli Mountains.



1.3 Site Description, Landform, Topography and Soils

1.3.1 The 'red line boundary' of the PDA (Proposed Development Area) is outlined in Figure 1. It encompasses an area of approximately 3.6ha.

1.3.2 The site comprises farmland, used for pasture, subdivided by hedgerows into irregularly shaped fields.

1.3.3 The land falls gently from 90m above Ordnance Datum (aOD) in the north-west, to 80m aOD in the south-east, beyond which the land falls away more steeply towards the village of Johnston.

1.3.4 Land use prior to quarrying consisted of open pasture, although cultivation of deep plough crops, such as potatoes, as well as other forms of agriculture had been practiced across the site in recent history.

1.3.5 The south-western area of the site is crossed by public footpath PF84/7, which links with bridleway 84/8 on its northern side, and then runs south-westwards, via footpath 33/10 to Johnston.

1.3.6 The underlying solid geology of the site comprises a granitic outcrop within the wider South Wales Lower and Middle coal measures with overlying till deposits (BGS 2017).

2 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

2.1.1 As part of the Phase 1 works (Figure 1) Archaeological Research Services Ltd were commissioned in 2010 by F.H. Gilman and Co to undertake an archaeological strip, map and sample excavations.

2.1.2 Previous chance finds in the area and on the site indicated the presence of archaeological deposits and features of probable prehistoric date. The presence of several possible burnt mounds had been mooted as being present on the site. The site is also located close to the find spot of a Bronze Age hoard of gold. However, neither gold hoard nor burnt mound was found during the excavation.

2.1.3 The excavations in advance of the Phase 1 works however revealed evidence of six phases of activity (Johnson and Tinsley. 2010), that date predominantly from the prehistoric period and include Mesolithic-Neolithic transition pit digging (Johnson and Tinsley. 2010. 14-16), midden pits from the mid-Neolithic (Ibid 17-22), pits and postholes dating to the Chalcolithic (Beaker/early Bronze Age) possibly representing a building (ibid, 22-27), as well as isolated pits and a cluster of late Bronze Age pits and postholes, which may also represent the heavily truncated remains of a building (Ibid, 28-34).

2.1.4 An important assemblage of mid-Neolithic ceramics was also recovered from the site. This material comprised Impressed Ware, sometimes referred to as 'Peterborough Ware', which came from the fills of isolated 'midden' pits. Some Neolithic-derivative, Beaker and late Bronze Age ceramics were also recovered from the site, along with 38 worked flints.



2.1.6 A post-medieval enclosure was also excavated on the site, although the lack of any structural evidence or material culture associated with this feature makes ascribing a function to this feature impossible (Johnson and Tinsley. 2010, 35-38).

3 AIMS AND OBJECTIVES

3.1 Regional Research Aims and Objectives

3.1.1 The results of the Phase 1 excavations are significant to the research of the Neolithic and Bronze Age periods in Wales in particular, and in Britain more widely. This is especially true given the radiometric dating associated with the Impressed Ware ceramics, as well as the evidence for activity during the Mesolithic - Neolithic transition, and the possible buildings dating to the Chalcolithic (Beaker) and later Bronze Age (Johnson and Tinsley. 2010).

3.1.2 Potentially, the results of further archaeological works at the site will enable the further development of our understanding of Middle and Later Neolithic landscape occupation, as the tradition of burial of domestic midden material shown at Bolton Hill is in keeping with other sites in Wales.

3.1.3 The aims and objectives of the phase of work proposed here would be to:

- ♦ Identify further phases of Prehistoric activity locally.
- ♦ Add to the Regional understanding of Mesolithic/Neolithic Transition, Agriculture, Landscape Use and Material Culture within this area of Pembrokeshire.
- ♦ Identify potential areas of burnt mounds.
- ♦ Identify and quantify additional ceramic evidence within features revealed in Phase 2.

3.2 Project Objectives

3.2.1 The aims of the programme of work are to gather sufficient evidence to establish, supplement, improve and make available information about any archaeological remains existing within the area of investigation, and to provide an appropriate post-excavation assessment, analysis, reporting, archiving and dissemination.

3.2.2 The objectives are as follows.

- ♦ To produce an appropriately scaled geophysical survey of potential features across the site.
- ♦ To produce a photographic, drawn and descriptive record of any surviving below-ground archaeological remains.
- ♦ To produce dating and phasing for archaeological deposits recorded on the site.
- ♦ To establish the character and delimit the extent of archaeological deposits in order to define functional areas on the site, e.g. industrial and domestic.



- ♦ To produce information on the economy and local environment.

4 METHOD STATEMENTS

4.1 General Statement of Practice

4.1 An overarching methodology is set out for the scheme of archaeological mitigation for the site. This represents an integrated programme of works and comprises:

- Geophysical survey (Section 4.3 below)
- Scalable archaeological watching brief including strip, map and sample excavations, as required, appropriate to the scale and nature of any archaeological remains encountered (Section 4.4 below).

4.1.2 All works covered under this specification will be undertaken in accordance with best practice and will conform to the letter and in spirit with Chartered Institute for Archaeologists (CIfA) standards and guidance, to wit: Code of Conduct (2014a), Standards and Guidance for Geophysical Survey (2014b), Standards and Guidance for Archaeological Excavations (2014c), Standards and Guidance for Archaeological Watching Briefs (2014d).

4.1.3 All staff employed on the project will be suitably qualified for their respective project roles and have substantial experience of the work they are being asked to undertake.

4.1.4 All staff will be made aware of the archaeological importance of the area surrounding the site and will be fully briefed on the work required by this specification.

4.1.5 All ground works covered under this specification will be undertaken either by hand or by a suitable mechanical excavator fitted with a toothless ditching bucket working in plan and under archaeological supervision.

4.1.6 ARS Ltd will ensure that plant or machinery will not be operated in the immediate vicinity of any archaeological remains until they have been recorded.

4.1.7 Contractors and plant operators will be notified that any observations of archaeological remains must be reported immediately to the archaeologist on site.

4.1.8 Regular contact will be ensured between ARS Ltd and the site project manager to ensure that ARS Ltd is kept up to date with site works and given the change to respond appropriately and in line with Mike Ings, Senior Planning Archaeologist, Dyfed Archaeological Trust for Pembrokeshire County Council.

4.1.9 All site operations will be carried out in a safe manner in accordance with ARS Ltd's health and safety policy. A risk assessment will be prepared before commencement on site.



4.2 Coverage

4.2.1 The area subject to additional mineral extraction for Phase 2 is approximately 3.6 ha in size with 3.3ha reserved for extraction.

4.3 Geophysical Survey

4.3.1 Geomagnetic survey is considered to be an appropriate geophysical technique, given the non-igneous environment, and the expected presence of archaeological features at depths of no more than 1.5m.

4.3.2 This technique involves the use of hand-held gradiometers, which measure variations in the vertical component of the earth's magnetic field. These variations can be due to the presence of sub-surface archaeological features. Geomagnetic measurements will be determined using a Bartington Grad601-2 dual gradiometer system, with twin sensors set 1m apart.

4.3.3 A 30m grid will be established over the survey area, and tied-in to known Ordnance Survey points using a Trimble M3 total station with datalogger.

4.3.4 The survey will be undertaken using a zig-zag traverse scheme, with data being logged in 30m grid units. A sample interval of 0.25m will be used, with a traverse interval of 1m, providing 3,600 sample measurements per grid unit. The data will be downloaded onto a laptop computer for data processing and storage in the field using specialist software.

4.3.5 Geophysical survey data will be processed using Terra Surveyor software, to produce 'grey-scale' images of the raw data. Positive magnetic anomalies will be displayed as dark grey, and negative magnetic anomalies are displayed as light grey. A palette will show the relationship between the grey shades and geomagnetic values in nT.

4.3.6 Raw data will be processed in order to further define and highlight the archaeological features detected. The resulting grey-scale images will be combined with site survey data and Ordnance Survey data to produce geophysical survey plans.

4.3.7 Colour-coded geophysical interpretation diagrams will be provided, showing the locations and extent of positive, negative, dipolar, and diffuse magnetic anomalies.

4.3.8 Archaeological interpretation diagrams will also be provided, which will be based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

4.3.9 A detailed report will be provided, and will include the following:

A location plan showing the location of the study area, related to the national grid, and an eight figure Ordnance Survey grid reference.

- ♦ The dates on which the project was undertaken
- ♦ A concise, non-technical summary of the results
- ♦ A summary of the historical and archaeological background of the site



- ♦ A description of the methodology employed, work undertaken and results obtained
- ♦ A description of any geophysical anomalies detected within the study area
- ♦ Greyscale plans at an appropriate scale showing the location and extent of any geophysical anomalies (raw and processed data)
- ♦ Interpretation of the geophysical survey results in light of the archaeological and historical background of the site
- ♦ Geophysical and archaeological interpretation diagrams
- ♦ Plots of raw data will be included in the Appendix

4.3.10 The geophysical report will inform the subsequent archaeological process by highlighting areas suitable for strip, map and record excavations and those areas where it is considered that a watching brief would be a more suitable method of evaluation. Such a judgement would be taken under the guidance and with the agreement of Mike Ings, Senior Planning Archaeologist, Dyfed Archaeological Trust for Pembrokeshire County Council.

4.4 Watching Brief

4.4.1 All elements of the archaeological watching brief will be carried out in accordance with the relevant ClfA Codes of Conduct (see Section 4.1 above).

4.4.2 The watching brief will be carried out during all groundworks.

4.4.3 All excavated spoil will be scanned visually to recover small finds. Finds so recovered will be recorded with their location of origin ascribed. Finds will be retained and recorded.

4.4.5 Where archaeological features and/or deposits are identified during the watching brief, then a sufficient quantity of the said features will be investigated by hand to allow their date, nature and degree of survival to be ascribed.

4.4.6 If significant archaeological features are identified during these works Dyfed Archaeological Trust: Development Management (DAT DM) will be notified and a decision made as how to proceed.

4.5 Strip, Map and Record

4.5.1 All elements of the archaeological strip, map and record exercise will be carried out in accordance with ClfA Codes of Conduct (see Section 4.1 above).

4.5.2 The strip, map and record will be carried out during the preliminary groundworks associated with topsoil stripping.

4.5.3 The topsoil will be removed mechanically by a suitable mechanical excavator fitted with a toothless ditching bucket, under continuous archaeological supervision. The topsoil or recent overburden will be removed down to the first significant archaeological horizon in successive level spits.



4.5.4 The stripped areas will be appropriately cleaned using hand tools in order to expose the full nature and extent of archaeological features and deposits.

4.5.5 Once the area has been stripped, cleaned and mapped as outlined above, consultation will take place with Mike Ings, Senior Planning Archaeologist, Dyfed Archaeological Trust for Pembrokeshire County Council.

4.5.6 All excavated spoil will be scanned visually to recover small finds. Finds so recovered will be recorded with their location of origin ascribed. Finds will be retained and recorded.

4.5.7 Isolated, discrete features such as pits not belonging to structures or industrial activities will be 50% sampled, although if they produce artefacts then provision is made for full excavation.

4.5.8 Limited representative samples of bricks from brick-built structures, and selective products of the brick working process will be retained for specialist analysis where appropriate.

4.6 Sampling, Faunal Remains and Treasure

4.6.1 This section outlines sampling methodologies to be utilised in all excavation types.

4.6.2 For sealed and stratigraphically secure deposits that have the potential to provide environmental evidence relating to diet and economy, dating evidence or land use regime, a minimum of 40 litres of sample will be taken, or 100% of the sample if smaller. This material will be floated and passed through graduated sieves, the smallest being a 500µ mesh.

4.6.3 In the case of waterlogged or anaerobic deposits, a minimum sample size of 20 litres will be taken.

4.6.4 Should a sequence of superimposed deposits of note be present column sampling may be considered.

4.6.5 In all instances, sampling strategies will be in accordance with guidelines issued by Historic England's Environmental Archaeology: A Guide to the Theory and Practice Methods, from sampling and recovery to post-excavation (Campbell et al. 2011) and will be targeted in order to explore the levels and types of preservation present.

4.6.6 Should other types of environmental deposits be encountered, appropriate specialist advice will be sought and appropriate sampling strategy devised. Samples will be assessed by a suitable specialist with provision for further analysis as required. Advice from the Historic England Scientific Advisor will be taken as appropriate.

4.6.7 Any human remains will initially be left in-situ and, if deemed necessary, removal will be undertaken following once a Coroners licence has been obtained in accordance with the relevant Ministry of Justice regulations and in discussion with the Dyfed Archaeological Trust: Development Management (DAT DM).



4.6.8 Finds of 'treasure' will be reported to the Coroner in accordance with the Treasure Act (DCMS 2008). The Portable Antiquities Liaison officer will also be notified.

4.7 Recording

4.7.1 Site recording will follow standard conventions outlined in the Site Recording Manual of Museum of London Archaeology Services (MoLAS) (2002).

4.7.2 The site will be accurately tied into the National Grid and located on a 1:2500 or 1:1250 map of the area. The site will be recorded using a single context planning system in accordance with the ARS Ltd field recording manual.

4.7.3 A full and proper record (written, graphic and photographic as appropriate) will be made for all work, using pro-forma record sheets and text descriptions appropriate to the work. Accurate measured scale plans and section/elevations will be drawn where required at the appropriate scale and in accordance with best practice. In addition to relevant illustrations, provision for rectified photographic recording shall be made, if deemed necessary.

4.7.4 A plan of the excavated areas will be maintained, features notes and section lines recorded. All drawings will be carried out at an appropriate scale and all contexts will be recorded using a single context recording system.

4.7.5 Sample representative levels will be taken to record the maximum depth of the archaeology or natural should no archaeological features be uncovered.

4.7.6 The stratigraphy of the site will be recorded even where no archaeological deposits have been identified.

4.7.7 All heights above sea level will be recorded for all deposits and features in metres above Ordnance Datum (aOD).

4.7.8 A full photographic record will be compiled using a digital camera, a Fuji XP90 with a 16.4 MP resolution, and a register of all photographs will be kept. The photographic record will encompass all encountered archaeological entities. In addition, key relationships between entities, where these help demonstrate sequence or form, will also be photographed. A clearly visible, graduated metric scale will be included in all record shots. A supplementary record of working images will be taken to demonstrate how the site was investigated and what the prevailing conditions were like during excavation.

4.7.9 A stratigraphic matrix will be compiled for all trenches where superimposed archaeological deposits, features or structures are encountered.

5 FINDS PROCESSING AND STORAGE

5.1.1 All finds processing, conservation work and storage of finds will be carried out in accordance with the ClfA (2014e) Standard and Guidance for the collection, documentation, conservation and research of archaeological materials and the UKIC (1990) Guidelines for the Preparation of Archives for Long-Term Storage.



5.1.2 Artefact collection and discard policies will be appropriate for the defined purpose.

5.1.3 Bulk finds which are not discarded will be washed and, with the exception of animal bone, marked. Marking and labelling will be indelible and irremovable by abrasion. Bulk finds will be appropriately bagged, boxed and recorded. This process will be carried out no later than two months after the end of the excavation.

5.1.4 All small finds will be recorded as individual items and appropriately packaged (e.g. lithics in self-sealing plastic bags and ceramic in acid-free tissue paper). Vulnerable objects will be specially packaged and textile, painted glass and coins stored in appropriate specialist systems. This process will be carried out within two days of the small find being excavated.

5.1.5 During and after the excavation all objects will be stored in appropriate materials and storage conditions to ensure minimal deterioration and loss of information (including controlled storage, correct packaging, and regular monitoring, immediate selection for conservation of vulnerable material). All storage will have appropriate security provision.

5.1.6 The deposition and disposal of artefacts will be agreed with the legal owner and Scolton Manor Museum prior to the work taking place. All finds except treasure trove are the property of the landowner.

5.1.7 All retained artefacts and ecofacts will be cleaned and packaged in accordance with the requirements of the recipient museum.

6 MONITORING ARRANGEMENTS

6.1.1 At least one week prior notice of the commencement of the ground works will be given to:

*Senior Planning Archaeologist
Mike Ings,
Dyfed Archaeological Trust
Corner House
6 Carmarthen Street, Llandeilo,
Carmarthenshire, SA19 6AE
Tel: 01558 825987 ext 210*

6.1.2 ARS Ltd will liaise with Dyfed Archaeological Trust: Development Management (DAT DM) at regular intervals throughout the course of the work.

6.1.3 The client will afford reasonable access to the Development Control Archaeologist, or his / her representative, Dyfed Archaeological Trust, for the purposes of monitoring the archaeological mitigation.

7 STAFFING

7.1.1 The Project Manager for the archaeological fieldwork will be Reuben Thorpe, FSA, MCIfA, Projects Manager at ARS Ltd. The Fieldwork Project Officer will be Tom Parker Assistant Projects Officer at ARS Ltd.



7.1.2 Finds analysis will be carried out by appropriately qualified specialists as detailed subject to availability:

♦ Flint and prehistoric pottery:	Dr Clive Waddington MCIfA / Robin Holgate MCIfA
♦ Romano-British pottery:	Dr Jeremy Evans
♦ Samian ware:	Gwladys Monteil
♦ Medieval and post-medieval pottery:	Dr Chris Cumberpatch
♦ Clay pipes:	Mike Wood MCIfA
♦ Industrial Remains:	Chris Scott MCIfA
♦ Plant macrofossils and charcoals:	Luke Parker
♦ Molluscs:	Dr Andy McWilliams
♦ Human and animal bone:	Milena Grzybowska
♦ Radiocarbon dating:	SUERC
♦ Finds conservation:	Dr Jenny Jones, Durham University

8 REPORT

8.1.1 Following completion of the work, Archaeological Research Services Ltd will produce a report which will include,

- ♦ Non-technical summary
- ♦ Introductory statement
- ♦ Aims and purpose of the project
- ♦ Methodology
- ♦ A location plan showing all excavated areas and any archaeological features with respect to nearby fixed structures and roads
- ♦ Illustrations of all archaeological features with appropriately scaled hachured plans and sections
- ♦ An objective summary statement of results
- ♦ Conclusions
- ♦ Supporting data – tabulated or in appendices
- ♦ Index to archive and details of archive location
- ♦ References
- ♦ Statement of intent regarding publication



- ♦ Confirmation of archive transfer arrangements
- ♦ A copy of the OASIS form

8.1.2 One bound copy of the final report with a digital copy of the report in PDF/A format on disk will be deposited with the Dyfed Archaeological Trust Historic Environment Record (HER). A copy of the report should be uploaded as part of the OASIS record.

9 ARCHIVE DEPOSITION

9.1.1 Should the project produce no archaeologically significant finds, then it is not necessary to deposit an archive with the repository museum, which in this case is the Scolton Manor Museum, Spittal, Haverfordwest, Pembrokeshire, SA62 5QL.

9.1.2 If the project produces archaeologically significant finds, then the Development Control Archaeologist, or his representative, Dyfed Archaeological Trust and Museum Curator will be notified at the earliest opportunity, and an accession number will be produced for the site. In addition, a digital, paper and artefactual archive will be prepared by ARS Ltd, consisting of all primary written documents, plans, sections, photographs and electronic data (in a format to be agreed by the recipient Museum).

9.1.3 The archive will be deposited in line with the ClfA (2013f) Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives, Society of Museum Archaeologists (1993) Selection, Retention and Dispersal of Archaeological Collections and the National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales 2017 and will be deposited within two months of the completion of the report.

9.1.4 The Dyfed Archaeological Trust Development Control Archaeologist and Museum Curator will be notified in writing on completion of the fieldwork with projected dates for the completion of the report and deposition of the archive. The date for deposition of the archive will be confirmed in the report and the Development Control Archaeologist informed in writing on final deposition of the archive.

9.1.5 All artefacts and associated material will be cleaned, recorded, properly stored and deposited in the archive.

9.1.6 A full set of annotated, illustrative pictures of the site, excavation, features, layers and selected artefacts will be deposited with the archive as digital images on a CD ROM.

9.1.7 The final report should be submitted to the regional HER and the HER staff will create an event record to upload, together with a pdf of the report, to OASIS.

9.1.8 A summary of the work will be submitted to the editor of Archaeology in Wales for publication, dependant on the quality and quantity of the archaeology the Local Planning Authority (LPA) may become involved in the final scope of the article submitted



10 GENERAL ITEMS

10.1 Health and Safety

10.1.1 All work will be carried out in accordance with The Health and Safety at Work Act 1974. Specific health and safety policies exist for all out workplaces and all staff employed will be made aware of the policy and any relevant issues. The particular risks involved with this project will be assessed, recorded and relevant mitigation measures put in place as part of a full risk assessment, which will be compiled in advance of fieldwork. ARS Ltd retains Peninsula as its expert health and safety consultants.

10.2 Insurance Cover

10.2.1 ARS Ltd has full insurance cover for employee liability (£10 million) public liability (£5 million), professional indemnity (£2 million) and all-risks cover.

10.3 Changes to the Written Scheme of Investigation

10.3.1 Changes to the approved methodology or programme of works will only be made with prior written approval of Dyfed Archaeological Trust and Local Planning Authority.

10.4 Publication

10.4.1 If significant archaeological remains are recorded, a summary of the project with, if appropriate, selected drawings, illustrations and photographs will be submitted within 2 years of the completion of the project to the editor Archaeology Wales for publication. ARS Ltd has full insurance cover for employee liability public liability, professional indemnity.

10.5 Community Engagement and Outreach

10.5.1 Any opportunities for engaging the local community in any archaeological findings should be sought, for example a guided site tour and/or dissemination of information via ARS Ltd's website and local media.

10.6 Copyright

10.6.1 Any publicity will be handled by the client. ARS Ltd will retain the copyright of all documentary and photographic material under the Copyright, Designs and Patent Act (1988).



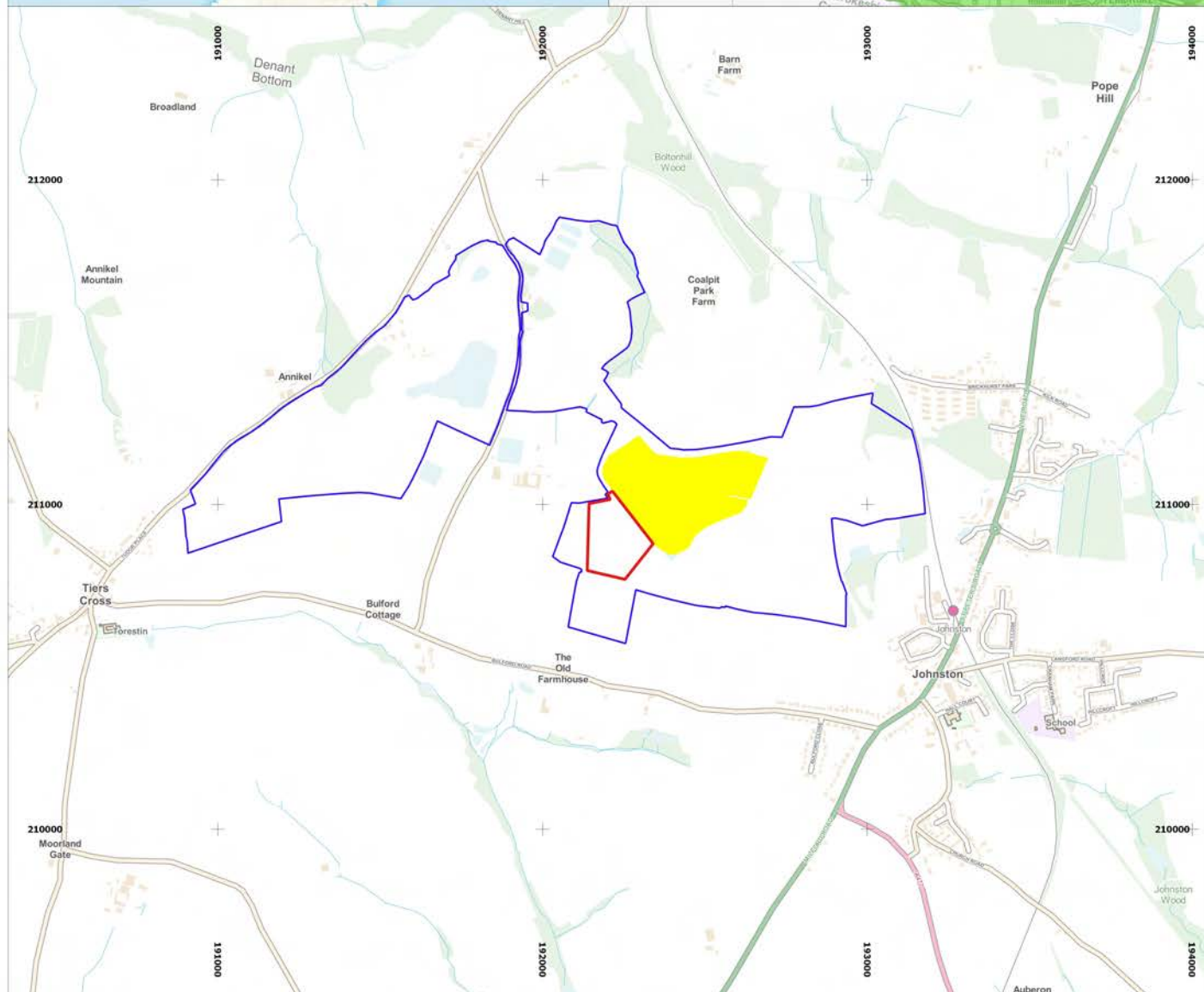
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FIGURES





Site name: Bolton Hill Quarry
Date: July 2017
Drawn by: AB
Scale: Varies

■ Pembrokeshire
■ Landholdings boundary

■ Phase I works
■ Phase II works



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**Figure 1:
Site location**