GUARD ARCHAEOLOGY

Douglasmuir Quarry, Milngavie – Phase 2
Data Structure Report
Project 4006

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Douglasmuir Quarry, Milngavie – Phase 2

Data Structure Report

On behalf of:	LaFarge Tarmac Limited
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Project Number:	4006
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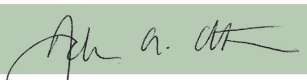
Approved by:	
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This document has been prepared in accordance with GUARD Archaeology Limited standard operating procedures.

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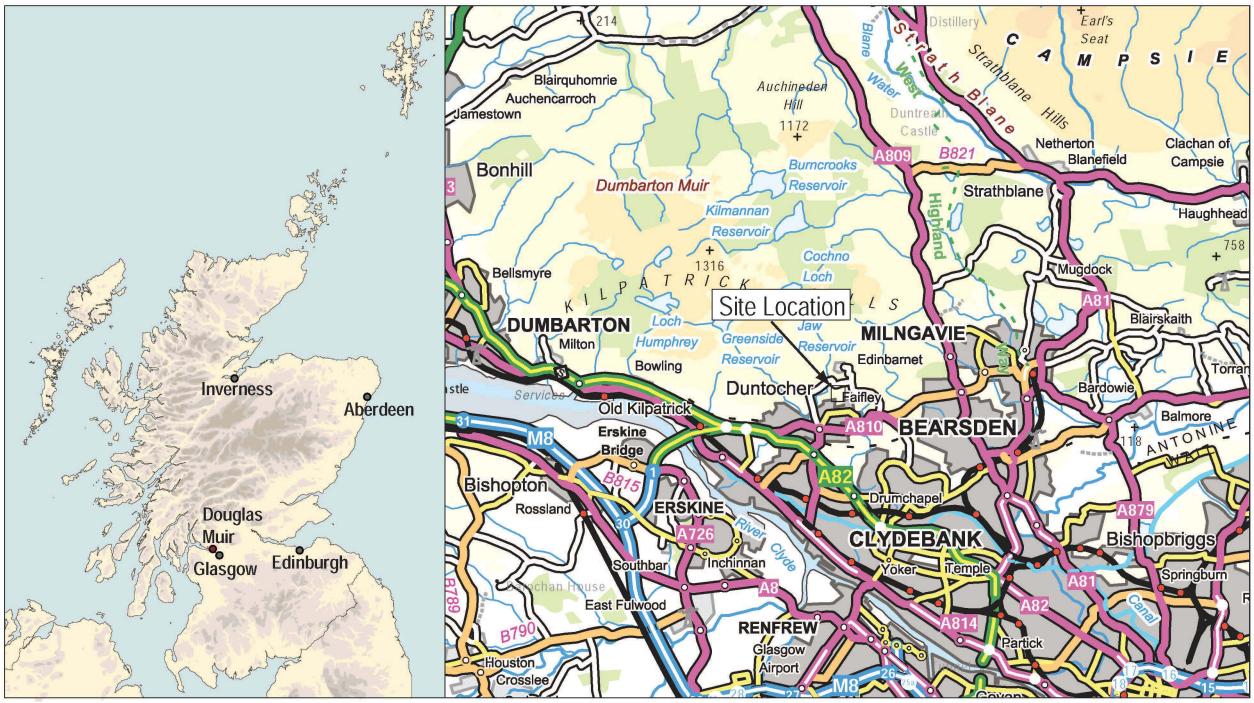
Contents

List of Figures

List of Plates



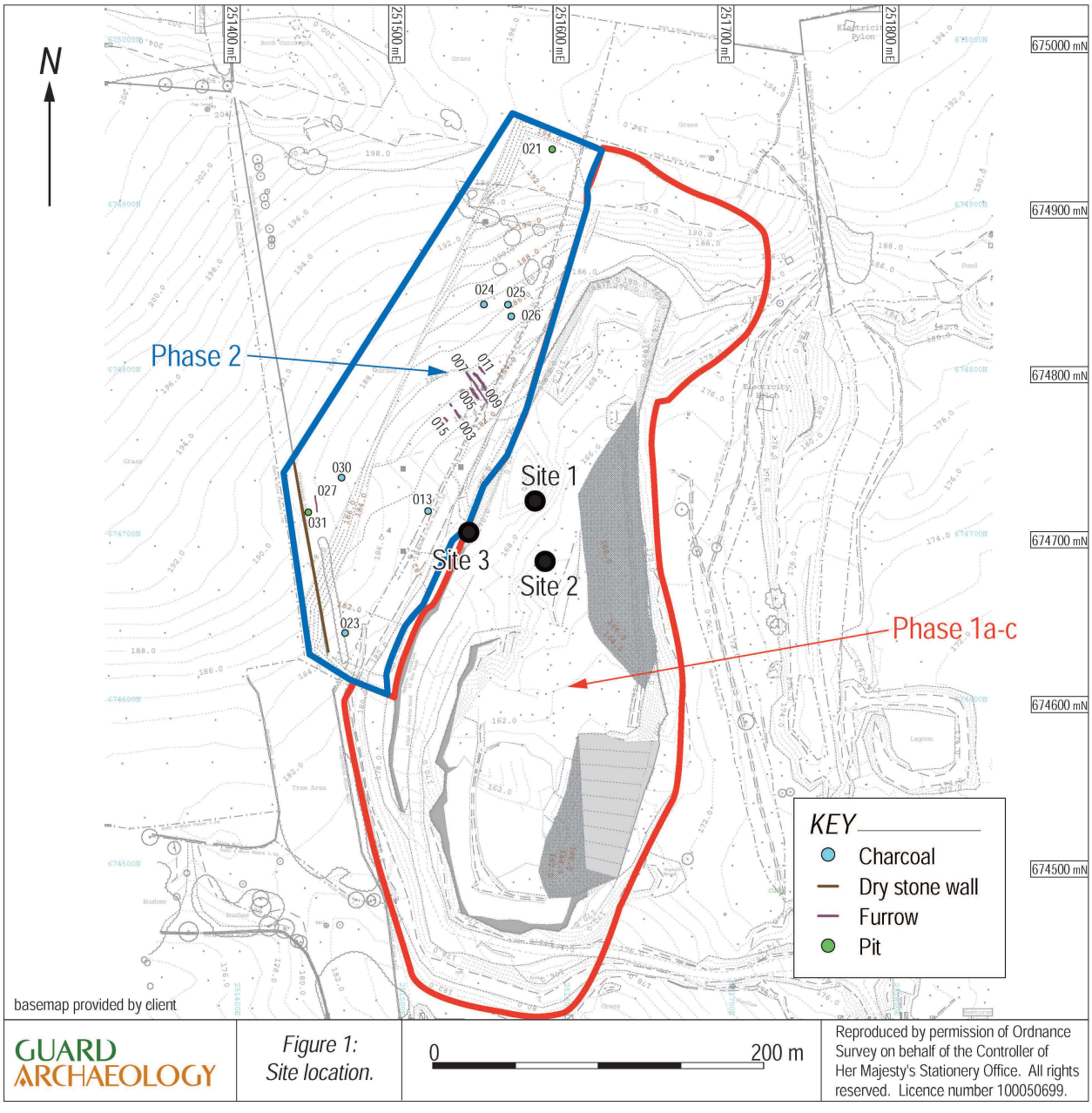


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Figure 1: Site location.

0 200 m

Executive Summary

1.1 Guard Archaeology Limited were commissioned by LaFarge Tarmac Limited to undertake an archaeological strip, map and record excavation on an area of ground due to be developed at Douglasmuir Quarry, near Milngavie. This work was undertaken in addendum to the existing written scheme of investigation (WSI) associated with the mitigation works required in support of the proposed extension of the quarry. Previous work at the proposed development site including an archaeological strip, map and sample in 2010 and a walkover survey in advance of these works revealed the presence of potentially significant archaeological remains on the site including evidence for early Neolithic occupation (Becket, 2010) as well as areas of rig and furrow on the site. This second phase of work focussed on the area immediately to the west of the current quarry operations and revealed the presence of seven furrows indicating the past agricultural use of the site and two pits which may be related to the previously discovered early Neolithic occupation. Finds including a fragment of worked lithic, an intact modern glass bottle, a fragment of horseshoe and modern pottery were recovered from the site.

Introduction

2.1 This report sets out the results of an archaeological strip, map and record excavation which was undertaken by Guard Archaeology Limited, on behalf of LaFarge Tarmac Limited on an area of ground to be developed at Douglasmuir Quarry, Milngavie. Previous archaeological work in the quarry (Becket 2010) had revealed the presence of significant archaeological features in the south-west area of the site indicating a site of early Neolithic activity. The present work revealed seven furrows six of which were roughly aligned north-west/south-east, the seventh being aligned north/south and two pits potentially relating to the early Neolithic activity revealed in 2010. Finds included a fragment of worked lithic found in one of the pits and an intact glass bottle, which was recovered from one of the furrows as well as a fragment of a horseshoe and a fragment of modern pottery that may be indicative of more recent agricultural activity in the area. GUARD Archaeology Limited undertook this fieldwork between 27th October 2014 and 28th November 2014.

Site Location, Topography and Geology

3.1 The site of the proposed quarry extension lies west of Milngavie, adjacent to the existing LaFarge Tarmac Quarry at Douglasmuir, centred at *c.* NGR: NS 515 747. It comprises an irregular area, mainly of rough grassland, roughly half of which is bordered by trees. The proposed quarry extension has been divided into a series of phases, numbered 1 – 4, related to the order in which the work will be conducted. With Area 1 being the earliest phase (conducted in 2010) and the work carried out this year being the second phase.

3.2 The quarry sits in the foothills of the Kilpatrick Hills at *c.* 200 m AOD and the land encompassed drains toward the south-east by means of a small ditch at the eastern boundary of the proposed extension area, and this water course eventually becomes the Manse Burn. The area of works in Phase 2 is bounded by the existing quarry to the east and by trees and a dry stone wall to the south and south-west. To the north and west are fields used as pasture for sheep although in many places they are boggy, particularly in low-lying areas.

3.3 The solid geology consists of Douglas Muir Quartz conglomerate (British Geological Survey: Geology of Britain Viewer – accessed 11 December 2014). The underlying superficial deposits consisted of clay and peat.

Archaeological Background

4.1 A review of desk-based sources and a walkover assessment were undertaken prior to the work carried out in 2010 but they found no sites of of archaeological significance known within the phase 1 area of work, although a quarry scoop was identified in Area 2 (Becket 2010).

4.2 Prior to the work undertaken in 2014, the areas proposed for quarry extension, together with the wider surrounding landscape, were subjected to an environmental impact assessment, one

chapter of which dealt with the archaeology and cultural heritage. The desk-based component of the EIA established that only one previously recorded archaeological site, the remains of a farmstead named Muirlees and known to have been in a ruinous condition at the time of the OS survey for the first edition 1:10560 series of maps of the mid nineteenth century, potentially lay within the proposed extension area. The walkover survey component of the EIA confirmed the existence of this site and demonstrated that the remains of the farm may still be seen on the ground as a low mound. The walkover survey also identified a small number of other, relatively low significance archaeological remains, including traces of rig and furrow, two mounds which may represent clearance cairns and a series of old quarries.

4.3 Following the work undertaken in 2010 at Douglasmuir Quarry a Post-Excavation Research Design was created to set out a programme of specialist analysis on samples recovered from the fieldwork. From this, specialist reports were produced to deal with the botanical remains, ceramic assemblage and lithic assemblage recovered.

4.4 The results of the botanical remains analysis showed that charcoal assemblages, which have been dated to the Neolithic period, were recorded in most features and that hazel was the most abundant type present although alder, birch and oak were also present. This is in keeping with what would have grown in local woodlands during the Neolithic period. Hazel nutshell fragments were also abundant and this is also a common occurrence on Scottish Neolithic sites. What was found to be unusual, however, was the presence of the large number of cultivated flax seeds which were recovered. Only two Neolithic sites in Scotland had previously yielded significant numbers of flax seeds, the timbered halls of Balbridie and Lockerbie, and in both cases less than 50 seeds were found. The excavation at Douglasmuir Quarry in 2010 revealed a spread, which contained over 600 flax seeds making it possibly the largest deposit of these seeds from a Neolithic site in Scotland. Because such seeds have only been recovered previously from sites linked with large timbered halls there is reason to believe there may have been a similar structure situated in the area of Douglasmuir Quarry but the shallow nature of the topsoil has resulted in its destruction. Flax may have been a luxury commodity during the Neolithic period and as such would only have been available to those of high status in the community (Ramsey unpublished).

4.5 The analysis of the ceramic assemblage from the 2010 work at Douglasmuir Quarry indicated the fragmentary remains of two similar Neolithic vessels found in separately excavated areas of the site, in close association with a possible structure and several pits and spreads/deposits. The fabric of the two vessels was found to be almost identical although the manufacture and firing was slightly different resulting in one vessel surviving less well than the other, although this may have been a result of burialfactors and damage prior to burial. The first vessel, typical of those dating to the early Neolithic, was a carinated bowl with a rolled over rim and flattened base. It was undecorated and the surface finish of burnishing was largely removed from use and burial conditions. The second vessel had no diagnostic features but its fabric and thinness was similar to that of the first vessel which suggests it was also an early Neolithic bowl. A single piece of daub was also recovered and was likely used for constructional purposes. It was recovered from a preserved ground surface along with pottery, and presents evidence of there having been a structure present on the site (Ballin Smith unpublished).

4.6 The report which relates to the lithic assemblage from Douglasmuir Quarry's 2010 excavation reveals that of the 215 lithic artefacts recovered, flint makes up 3% while quartz comprises the other 97%. Of this total, 93% was found to be debitage, 3% cores and 4% tools. There was difficulty in dating the lithic assemblage as it contained no diagnostic artefact types and dating the assemblage by the technology used is often inconclusive. However, the technological perspective shows almost exclusively the exploitation of small quartz pebbles while early Neolithic assemblages from the inner Clyde Basin would often include flint and Arran pitchstone in addition to quartz. It also showed that no attempt to produce blades or microblades was made. This could possibly date the site to a later period than the early Neolithic, although the report points out that the recovery of early Neolithic carinated pottery and the recovery of quartz artefacts from the same contexts may indicate the reuse of, or separate visits to, the site (Ballin 2012).

Project Objectives

5.1 The project objectives were:

- to establish whether or not significant remains survived within the proposed development site boundaries

and, if present:

- to plan and selectively sample those remains, followed by full excavation of selected sites, in line with the strip, map and sample method outlined in the document Mineral Extraction and Archaeology: A Practice Guide (2008).

Methodology

6.1 The area proposed for development will be extracted in four phases, broadly speaking working in slices from east to west. Phase 1, which is sub-divided into phases 1A, 1B and 1C, contained no known archaeological remains prior to works commencing. Phase 2 contained one quarry site identified during the EIA walkover survey. Phase 3 contained no known archaeological remains. Phase 4 contained evidence of rig and furrow and two quarries (which may in fact lie beyond the extraction zone), all identified during the EIA walkover survey. A series of mitigation measures have been agreed to meet the planning conditions imposed on the development and include the following:

Pre-development Work

Review of DBA

6.2 A rapid review of the existing archaeological assessment of the proposed development area was undertaken prior to entering the field. This comprised checking information held by the National Monuments Record for Scotland and local Sites and Monuments Records, for any pertinent changes, such as newly discovered archaeological sites, which may have occurred since the EIA was compiled.

Review of Development Plans and Site Investigation Works Records

6.3 A review of all relevant finalised development plans, which indicated the precise areas where ground disturbance would occur during the development, was also undertaken prior to entering the field. This work was enhanced by a pre-works site visit and meeting between the client, contractor and archaeologists. This meeting reviewed site investigation works records for the development.

Site Walkover

6.4 A site walkover ahead of this phase of development work was undertaken by the lead archaeologist to identify any upstanding remains and allow them to be fenced off before stripping commenced. No remains were identified.

Strip, Map & Sample

6.5 The strip, map and sample method involved the stripping of the areas due for extraction by mechanical excavators operating under the instruction and constant supervision of suitably qualified archaeologists.

6.6 The mechanical excavators were fitted with flat-bladed ditching buckets during all topsoil removal operations.

6.7 All areas, features and deposits of potential archaeological interest exposed were cleaned by hand, then photographed and mapped. Sample excavation was conducted on potentially significant archaeological features/deposits present.

6.8 A written record of all archaeological features, deposits and finds was produced on proforma sheets. Scaled hand-drawn plans were also made at 1:20 and sections at 1:10 scales. Digital images were captured of all features/deposits.

6.9 Archaeological fieldwork was undertaken will in all respects be compliant with the 'Archaeological Standards of the East Dunbartonshire Council Archaeology Service' and in line with the standards and guidelines of the Chartered Institute for Archaeologists (CIfA).

Results

7.1 The area was stripped of overburden in two halves, north and south, to reveal at the north end of the site soft reddish-brown clay subsoil with frequent pebbles and cobbles (002) and to the south end of the site was wet blue-grey clay subsoil with frequent pebbles and cobbles (033). Across the entire site below the clay is Douglas Muir Quartz conglomerate, the bedrock (034). In the centre of the site between layers 002 and 033 was a large outcropping of the bedrock (034) directly beneath the overburden. A number of features of archaeological interest truncated the subsoils across the site including six furrows, a pit containing a worked lithic and a number of field drains in layer 002 and a furrow, which contained a glass bottle and a pit which may be early Neolithic in age truncated subsoil 033.

Furrows

7.2 Across the site seven furrows were located, six of which run in an approximate north-west/south-east orientation while one, furrow 027, was aligned north/south. The group of six were parallel and spaced evenly at around 4 m distance from each other. Furrow 027 was located in the southern half of the site truncating clay subsoil 033. It measured approximately 20 m in length from the south terminus until it reached the edge of the trench at its northern end, which it continued beyond. It was a relatively uniform 0.6 m in width across its length and was found to have a depth of 0.12 m when excavated. The break of slope at the top of the furrow was sharp but the sides were gently sloping and led to a gradual break of slope at the bottom and a flat base. The fill (028), was a firm, wet grey-black peaty clay which contained occasional stones and gravel and occasional charcoal flecks. This furrow contained one find; a fully intact glass bottle with a screw-top (SF 002). This suggests that this furrow, at least, may be quite modern in date.

Plate 1: Furrow 027 before excavation.

Plate 2: South-east facing section of Furrow 027.

7.3 Furrows 003, 005, 007, 009, and 011 were all located in the northern half of the site truncating reddish-brown clay subsoil 002 and were all aligned roughly north-west/south-east. Furrow 003 was the most southerly of these five furrows. It was linear in plan and measured around 3 m in length, with a width of 0.85 m and a depth of 0.1 m. The furrow was found to be poorly preserved leading to an indistinct shape. At the top the break of slope was indistinct with shallow sides, a non perceptible break of slope at the bottom and a flat base. It contained a moderately firm, wet orange-brown clay fill with no inclusions recorded which was given number 004. Furrow 005 was a similar linear shape measuring approximately 1 m in width with a depth of 50 mm and its length was 2.5 m. This furrow was also poorly preserved with indistinct breaks of slope at both the top and the base and shallow sides and the base itself was flat. This furrow contained

fill 006, a similar loose to moderately firm orange-brown clay fill to 004 found in furrow 003, again without any inclusions or finds recorded. Furrow 007 was another linear furrow located to the north of 005. It measured 6 m in length, 0.65 m in width and had a depth of 70 mm. The break of slope at the top of this furrow was gradual. The sides were gently sloping and led to a flat, but slightly rounded, base. This furrow contained a moderately compact mid to dark brown silty fill (008), which contained very frequent roots. Furrow 009 was located just north of furrow 007, was linear, and measured an approximate 3 m with a width of 0.7 m and a depth of 0.1 m. This furrow was indistinct with both the top and base break of slopes being barely perceptible and shallow sides with a flat base. The fill was similar to its surrounding furrows, being loose to moderately firm light brown orange clay (010), which was not found to contain any inclusions or finds. Furrow 011 was located to the north of furrow 009 was linear in plan and measured 1.5 m in length, 0.59 m wide and had a depth of 90 mm. In shape, this furrow was linear and had a gradual break of slope at the top, steep sloping sides and a flat base. The fill of furrow 011 was a moderately compact light brown organic rich loam and was found to contain occasional sub-angular pebbles. The fill was context 012.

7.4 The final furrow recorded during this phase of work was 015 and contained fill 016. With a north/south orientation, furrow 015 was linear in plan and measured 1 m in length, 0.6 m in width and 50 mm in depth. The break of slope at the top was gradual and the sides sloped to a gradual break of slope and flat base. Fill 016 was a firm orange-brown hard clay fill with no inclusions or material culture recovered during excavation.

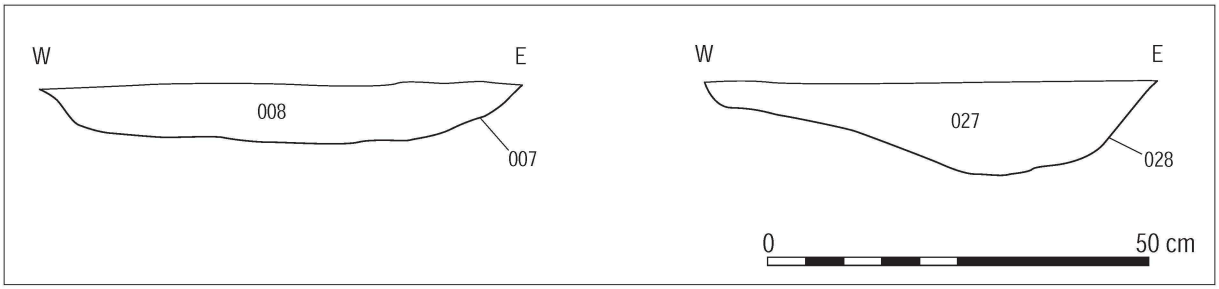

Figure 2: Sections of furrows 007 and 028.

Pits

7.5 A pit feature (021/020) was located at the northern extent of the site. The pit was a sub-oval shape in plan, measuring 0.62 m in length, 0.42 m in width and 0.25 m in depth and it was oriented north/south. The break of slope at the north, south and east sides was sharp but it was gradual to the west. The sides were near vertical at the top of the cut but they became more gradual as they went down leading to a rounded, concave base. The pit contained a single fill (020), which was very firm and light brown to orange in colour. It consisted of hard clay and contained occasional charcoal and occasional quartz fragments. One find was recovered from the pit; a fragment of worked flint (SF 001).

7.6 A second pit (031/032) was located in the southern half of the site. This pit was sub-circular in shape and measured 0.8 m in length, 0.75 m in width and 0.13 m in depth. The break of slope at the top of the cut was gradual, with gentle sloping sides and a gradual break of slope at the base of the cut which led to a concave base. The pit contained fill 032, which was firm in compaction and mid blue-grey in colour. It consisted of slightly silty clay and included occasional gravel. No material culture was recovered from this pit and no charcoal was recorded.

Plate 3: Pit 031 prior to excavation.

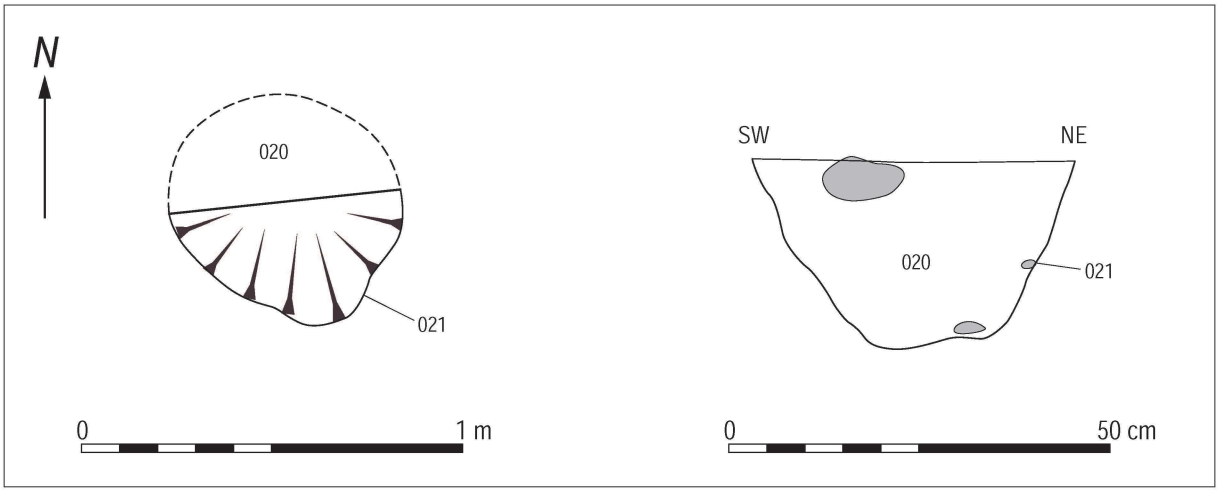

Figure 3: Plan and section of pit 021.

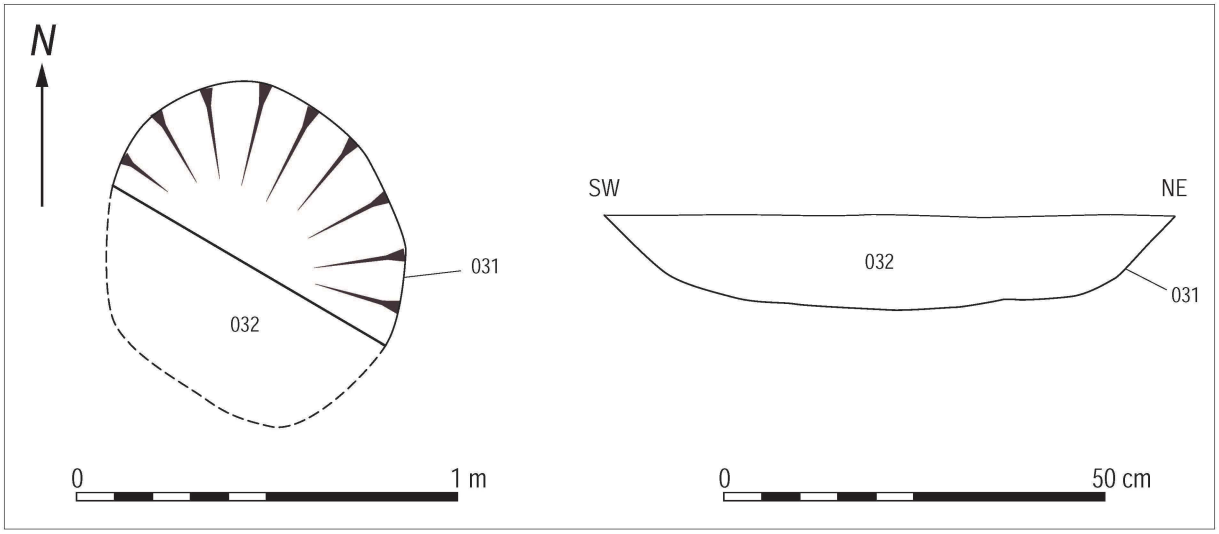

Figure 4: Plan and section of pit 031.

Spreads/Deposits

7.7 A number of small charcoal spreads/deposits of possible archaeological origin were located across the site. Deposit 013 consisted of several linear charcoal deposits covering an area of around 0.6 m by 0.6 m with a depth of approximately 0.1 m. No cut could be discerned and it was interpreted as a spread, possibly the result of branches being burnt. The second spread was 014, a small patch of charcoal with the measurements 0.17 m long, 0.11 m wide and 70 mm deep and was located 5 m north from furrow 015. Spread 024 was located in the northern area of the site and comprised a number of charcoal fragments ranging in size from 3 mm to 10 mm situated within an area of compacted subsoil (002). This spread covered an area measuring 0.32 m by 0.28 m. Another spread numbered 025 was also located in the north area and consisted of charcoal fragments covering an area measuring 90 mm by 50 mm in subsoil 002. Another spread in the north area of the site was 026. Again this comprised of charcoal fragments within 002 covering a sub circular area measuring around 0.4 m in diameter. The final spread found was 030, this time located in the south area of the site. This spread consisted of charcoal flecks within the blue-grey clay subsoil and measured 0.7 m in diameter, with a depth of 0.1 m.

Discussion

8.1 The archaeological strip, map and sample carried out in Douglasmuir Quarry identified a number of features which show the land has been used in the past for agricultural activities as recently as the mid-twentieth century as well as potential evidence for early prehistoric activity to compliment the findings from the 2010 excavations at the site.

8.2 One furrow in particular, 027, which was located down slope in the southern half of the site, shows that agricultural activity was taking place in the recent past as its fill contained a fully intact modern glass bottle with a screw top (SF 002), probably dating from around the middle of the twentieth century.

8.3 The six furrows located slightly up slope in the northern half of the site appear to be unrelated to 027 but may indicate another, possibly earlier phase of agricultural activity in the landscape. These furrows were all aligned north-west/south-east and lay in close proximity to each other. Despite a lack of material culture recovered directly from these furrows, they were all of a similar shape and size and it seems likely that they were created and in use at the same time and could indicate the remains of an old field system.

8.4 The two pits exposed during this phase of work in Douglasmuir Quarry may be indicative of the early Neolithic activity, which was found to have taken place in the area by the work carried out in 2010. Pit 021, located near the top of the slope in the northern area of the site contained a fragment of worked lithic (SF 001) as well as burnt material. Pit 031 was positioned at the lower end of the slope in the south area of the site, relatively close to the area of early Neolithic activity previously identified in 2010.

8.5 The other artefacts recovered, both unstratified, show evidence again of agricultural activity. A fragment from an iron horseshoe (SF 003) was found in the south area of the site and may show relatively recent use of the area for farming activity although it was relatively small in size and thin so it is unclear whether it would have come from a working farm horse. Finally, a sherd of modern glazed white ceramic (SF 004) was recovered from the north area of the site. These finds may both be related to the remains of the farmstead named Muirlees which is known to have existed within the area proposed for the quarry's expansion.

Recommendations

9.1 The discovery of a number of furrows at Douglasmuir Quarry may provide important information regarding the methods of their creation, it may reveal differences that could be indicative of social and/or chronological factors and it may indicate the scale and possibly the duration of land use in the area, with implications for patterns of land tenure, etc. The pits discovered during these excavations may relate to the early Neolithic sites recorded in the previous phase of work. Further analysis, which should include analysis of soil samples and botanical remains retrieved from the pit fills and charcoal spreads will aid interpretation of these features and their possible association with the nearby early Neolithic pits and spreads.

9.2 In addition it is recommended that a further phase of strip, map, sample excavation is conducted prior to the stripping of phases 3 and 4 of the development.

9.3 These recommendations are provided for guidance only. Final decisions on the nature and extent of any future archaeological work rest with Rathmell Archaeology in their capacity as advisers to East Dunbartonshire Council.

Acknowledgements

10.1 GUARD Archaeology would like to thank LaFarge Tarmac Ltd. and the staff at Douglasmuir Quarry for their assistance. Plant and drivers were supplied by RTS Ltd and Malcolm Construction Ltd. through LaFarge Tarmac Ltd. Administrative and technical support was provided by Jen Cochrane, Aileen Maule and John Kiely. Fiona Jackson produced the illustrations for this report. The report was desk top published by Gillian McSwan. The project was managed for GUARD by John Atkinson. Assistance on site was provided by Richard Campbell, Clark Innes, Kevin Mooney and Rowena Thomson.

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Section 2: Appendices

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Appendices

Appendix A: Bibliography

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Appendix B: List of Contexts

Context No.	Area	Description	Interpretation
1	Phase 2	Loosely compact mid-dark brown clay-loam. Machine excavated in extremely poor conditions - waterlogged and poor visibility	Natural topsoil
2	Phase 2	Soft reddish brown clay with frequent pebbles and cobbles. 0.1-0.3m deep. Machine excavated in extremely poor conditions, very wet and poor visibility	Natural boulder clay
3	Phase 2	Linear shaped with no corners. 130 x 85 x 10cm. Indistinct top break of slope with shallow sides and indistinct break of slope at base. Flat base. Oriented NW-SE. Fill is (004).	Part of rig and furrow, mostly indistinct and poorly preserved.
4	Phase 2	Loose to moderate firm light brown orange waterlogged clay measuring 130 x 85 x 10cm. Excavated by hand using trowel.	Fill of rig and furrow
5	Phase 2	Linear cut with no corners. Measures 130 x 100 x 5cm. Indistinct break of slope at top, shallow sides and indistinct break of slope at base leading to a flat base. NW-SE orientation. Fill is (006)	Part of rig and furrow, poorly preserved.
6	Phase 2	Loose to moderate firm light brown orange waterlogged clay measuring 130 x 100 x 5cm. Hand excavated using hand trowel.	Fill of rig and furrow, indistinct.
7	-	Linear cut with no corners. 1.30m x 0.65m x 0.07m. Gradual break at top, sloping sides and flat, rounded base. NW-SE, vertically truncated, filled by (008)	Furrow
8	-	Moderately compact mid-dark brown silt loam with very frequent roots. 0.63 x 0.07m. For length see survey. Vertically truncated. Hand excavated in misty conditions.	Fill of furrow.
9	Phase 2	Linear cut with no corners measures 70 x 60 x 10cm. Indistinct break of slope at top, shallow sides and indistinct break of slope at base leading to a flat base. NW-SE orientation. Fill is (010)	Part of rig and furrow, indistinct.
10	Phase 2	Loose to moderate firm light brown orange waterlogged clay with no inclusions. Measures 0.60 x 0.70 x 0.10m. Hand excavated with trowel.	Fill of rig and furrow
11	-	Linear with no corners. 0.59 x 0.09m. Full length recorded by survey. Gradual break of slope at top, sloping sides and flat base. NW-SE orientation. Fill is (012).	Furrow.
12	-	Moderate compaction, light brown organic rich loam with occasional sub angular pebbles. 0.59m x 0.04m. Length across field not determined. Hand excavated in misty conditions. Heavily bioturbated with roots.	Fill of furrow
13	Phase 2	Very firm orange brown hard clay containing CV. Measures 0.60 x 0.60 x 0.10m. Heavily machined and excavated by hand with trowel. Machine truncation.	Charcoal spread with several linear deposits of CV. Possible burned branches.
14	-	Moderately compact grey clay with charcoal measuring 0.11 x 0.17 x 0.07m. Hand excavated in misty conditions.	Small patch of charcoal 5m from furrow [015].
15	Phase 2	Linear cut with no corners measuring 0.60 x 0.60 x 0.05m. Break of slope at top is gradual, sloping sides and flat base. Fill is (016)	Cut of furrow
16	Phase 2	Firm orange brown hard clay with no inclusions. Measures 0.60 x 0.60 x 0.05m. Hand excavated by trowel.	Fill of rig and furrow, indistinct

Context No.	Area	Description	Interpretation
17	-	Context void	-
18	-	Strongly compacted / brittle, black charcoal. Measures 0.12 x 0.10m. Not truncated. Hand excavated in dry conditions. Single large piece of charcoal.	Single large piece of charcoal.
19	-	Context void	-
20	Phase 2	Very firm light brown / orange hard clay with charcoal and some quartz and small piece of worked flint. Dimensions not recorded. Hand excavated by trowel. Possible burrowing.	Burnt material, charcoal overlaying approw two square meters, possibly infill from a natural gully which had subsequently been filled by erosion? Possible remains of pit.
21	Phase 2	Sub rounded depression with no corners. Sharp at north end and south end, gradual at west, steep at east. Vertical sides x2 gradual slope x2. Rounded at base. N-S orientation. Heavily truncated.	-
22	Phase 2	Strongly compacted, brittle. Black in colour and composed of charcoal. Measures 0.06m x 0.04m. Hand excavated in dry conditions. Single charcoal frag.	Single charcoal fragment within subsoil (002)
23	Phase 2 South	Firm, grey brown clay with stone and gravel inclusions. Feature voided and dimensions not recorded. Hand excavated in showery conditions. Non archaeological.	Appeared to be a charcoal spread on surface of clay but upon excavation was revealed to be degraded / blackened stone. Non arch – void.
24	Phase 2 North	Loose spread of charcoal frags within strongly compacted subsoil (002). Black colour and composed mainly of charcoal. 0.32m x 0.28m. Hand excavated in dry conditions	Loose spread of charcoal fragments ranging from 3mm to 10mm in size
25	Phase 2 North	Loose compaction, black charcoal spread. 0.09 x 0.05m. Hand excavated in dry conditions. No contamination.	Small charcoal spread within silty clay subsoil
26	Phase 2 North	Loose clay compaction, orange / brown clay with charcoal inclusions. Hand excavated in wet conditions. No contamination.	Charcoal spread within subsoil
27	Phase 2 South	Linear cut without corners measures 20 x 0.60 x 0.12m. Break of slope at top is sharp, sides gradual, break of slope at base is gentle and base is flat. Orientation N-S. Not truncated. Contains fill (028).	Furrow running N-S across S end of the site. Cut into (002), clay subsoil. Appears modern as contained glass bottle, SF#002. Fill is (028)
28	Phase 2 South	Firm, wet, dark black / grey silty / peaty clay with occasional CV, gravel and stones. Measures 20 x 0.60 x 0.12m. Not truncated. Slot excavated by hand, overcast. Fill of furrow. Contained some roots / bioturbation.	Fill of furrow with cut [027].
29	Phase 2 North	Linear cut with no corners measures 0.75 x 0.12m. Gradual top break of slope, slightly sloping sides and concave break of slope at base. Slightly curved base. Not truncated. Fill is (030).	-
30	Phase 2 North	Hard grey clay with no inclusions. Hand excavated with trowel. Measures 0.7 x 0.1m.	-
31	Phase 2 South	Sub circular cut. No corners. Measures 0.80m x 0.75m x 0.13m. Gentle break of slope at top, gradual sloping sides and gentle break of slope at base with concave base. Vertical inclination of axis. Not truncated. Fill is (032). Cut of possible pit.	Cut for possible clay-filled pit with fill (032). Age and function not known. May be related to agricultural features nearby e.g. furrow [027], field drains and dry stone wall. Fill very similar to (002), may be stone hole / non archaeology.
32	Phase 2 South	Firm mid blue grey, slightly silty clay with occasional gravel. Measuring 0.80 x 0.75 x 0.13m. Not truncated. Hand excavated by half section. Fill of possible pit. No contamination.	Fill of possible pit [031]. Had appearance of a sub circular feature in plan but contained no material culture / visible CV. Age and function unclear. Fill very similar to (002) and may be non arch.

Appendix C: List of Finds

Find No.	Context	Area	No. of Pieces	Material	Type	Description
001	020	Phase 2	1	Lithic	Flint	Small piece of worked flint.
002	Unstrat	Phase 2	1	Glass	Bottle	Full intact clear glass bottle
003	Unstrat	Phase 2	1	Metal	Fe.	Horseshoe fragment
004	Unstrat	Phase 2	1	Ceramic	Glazed	White glazed ceramic plate base

Appendix D: List of Samples

Sample No.	Context	Area	No. x Bag Size	Volume	% of deposit	Pot	Lithic	Bone	Botanics	Other	Applications / Comments
001	004	Phase 2	1 x L	5	<5%						Fill of furrow [003]
002	008	Phase 2	1 x L	5	<5%						Fill of furrow [007]
003	012	Phase 2	1 x L	5	<5%						Fill of furrow [011]
004	006	Phase 2	1 x L	5	<5%						Fill of furrow [005]
005	010	Phase 2	1 x L	5	<5%						Fill of furrow [009]
006	013	Phase 2	1 x L	5	<5%						CV spread (013)
007	014	Phase 2	1 x M	1	50%						CV spread (014)
008	016	Phase 2	1 x L	5	<5%						(016)
009	018	Phase 2	1 x M	0.5	100%						Charcoal deposit
010	022	Phase 2	1 x M	0.1	100%						Charcoal deposit
011	024	Phase 2	1 x L	5	100%						Charcoal deposit (024)
012	025	Phase 2	1 x M	1	100%						Charcoal deposit (025)
013	020	Phase 2	1 x L	5	50%						Fill of pit [021]
014	026	Phase 2	1 x M	1	50%						Charcoal deposit (026)
015	029	Phase 2	1 x M	1	50%						Charcoal deposit (029)

Appendix E: List of Photographs

Image No.	Area	Context No.	Details	Taken From
001	Phase 2	-	Gen shot – topsoil removal	S
002	Phase 2	-	Gen shot – topsoil removal	SE
003	Phase 2	-	Gen shot – poor visibility at 16:45	-
004	Phase 2	-	Gen shot	S
005	Phase 2	-	Gen shot	N
006	Phase 2	-	Gen shot	E
007	Phase 2	-	Gen shot – Night excavation	W
008	Phase 2	-	Gen shot – Night excavation	NE
009	Phase 2	-	Gen shot – Night excavation	E
010	Phase 2	-	Group shot of furrows	NW
011	Phase 2	-	Group shot of furrows	N
012	Phase 2	-	Group shot of furrows	W
013	Phase 2	-	Field drain	SE
014	Phase 2	003	Rig and furrow	NW
015	Phase 2	007/008	Furrow – plan	S
016	Phase 2	007/008	Furrow – NW facing section	NW
017	Phase 2	011/012	Furrow – SE facing section	SE
018	Phase 2	005	Rig and furrow	S
019	Phase 2	006	Rig and furrow	NW
020	Phase 2	013	Burnt deposit / possible burnt branch	S
021	Phase 2	009/010	Furrow	SE
022	Phase 2	014	Charcoal spread	N
023	Phase 2	013	Possible burnt branch	N

Image No.	Area	Context No.	Details	Taken From
024	Phase 2	014	Charcoal spread	NE
025	Phase 2	-	Field drain	E
026	Phase 2	020/021	Burnt deposit	E
027	Phase 2	018	Charcoal deposit	E
028	Phase 2	020	Burnt deposit	E
029	Phase 2	020	Burnt deposit furrow	SE
030	Phase 2	020	Section of burnt deposit	E
031	Phase 2	022	Burnt deposit	S
032	Phase 2	-	Gen shot of site conditions	S
033	Phase 2	-	Gen shot of site conditions	E
034	Phase 2	-	Gen shot of site conditions	NW
035	Phase 2	-	Gen shot of site	N
036	Phase 2	-	Gen shot of site	S
037	Phase 2	-	-	-
038	Phase 2	-	Gen shot – stripping and casting	S
039	Phase 2	-	Pre ex of (024) charcoal spread	E
040	Phase 2	-	Pre ex of (025), small spread of charcoal	S
041	Phase 2	-	Charcoal spread	-
042	Phase 2	027	Pre ex of furrow	SE
043	Phase 2	027	Pre ex of furrow	SE
044	Phase 2	027	Post ex of furrow	SE
045	Phase 2	027	Post ex of furrow	SE
046	Phase 2	029	Pre ex of black spread (029)	NE
047	Phase 2	029	Post ex of black spread (029)	NE
048	Phase 2	027/028	Bottle in situ	SE
049	Phase 2	031/032	Pre ex of possible pit	S
050	Phase 2	031/032	Post ex of pit	W

Appendix F: Discovery And Excavation Scotland Entry

LOCAL AUTHORITY:	East Dunbartonshire Council
PROJECT TITLE/SITE NAME:	Douglasmuir Quarry, Milngavie
PROJECT CODE:	4006
PARISH:	East Dunbartonshire
NAME OF CONTRIBUTOR(S):	Kenneth H Green
NAME OF ORGANISATION:	Guard Archaeology Limited
TYPE(S) OF PROJECT:	Archaeological Strip, Map, Sample & Record
NMRS NO(S):	guardarc1-197855
SITE/MONUMENT TYPE(S):	Pits, agricultural features
SIGNIFICANT FINDS:	None
NGR (2 letters, 6 figures)	NS 515 747
START DATE (this season)	27th October 2014
END DATE (this season)	28th November 2014
PREVIOUS WORK (incl. *DES* ref.)	--
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	Guard Archaeology Limited were commissioned to undertake an archaeological strip, map and sample excavation in advance of sand and gravel quarrying at Douglasmuir Quarry, East Dunbartonshire, near Milngavie. A previous phase of work in the area now occupied by the quarry revealed the presence of potentially significant archaeological remains including several pits and spread/deposit features which date to the early Neolithic period. This second phase of work focused on the area immediately west of the current quarry site and revealed the presence of seven furrows indicating agricultural use of the landscape and two pits and burnt spreads which may be related to the early Neolithic activity already known to be present.
PROPOSED FUTURE WORK:	Post-excavation analysis and publication
SPONSOR OR FUNDING BODY:	LaFarge Tarmac Limited
CAPTION(S) FOR ILLUSTRS:	--
ADDRESS OF MAIN CONTRIBUTOR:	Guard Archaeology Limited, 52 Elderpark Workspace, 100 Elderpark Street, Glasgow, G51 3TR
EMAIL ADDRESS:	john.atkinson@guard-archaeology.co.uk
ARCHIVE LOCATION (intended/deposited)	RCAHMS (Intended)

Appendix G: Written Scheme of Investigation

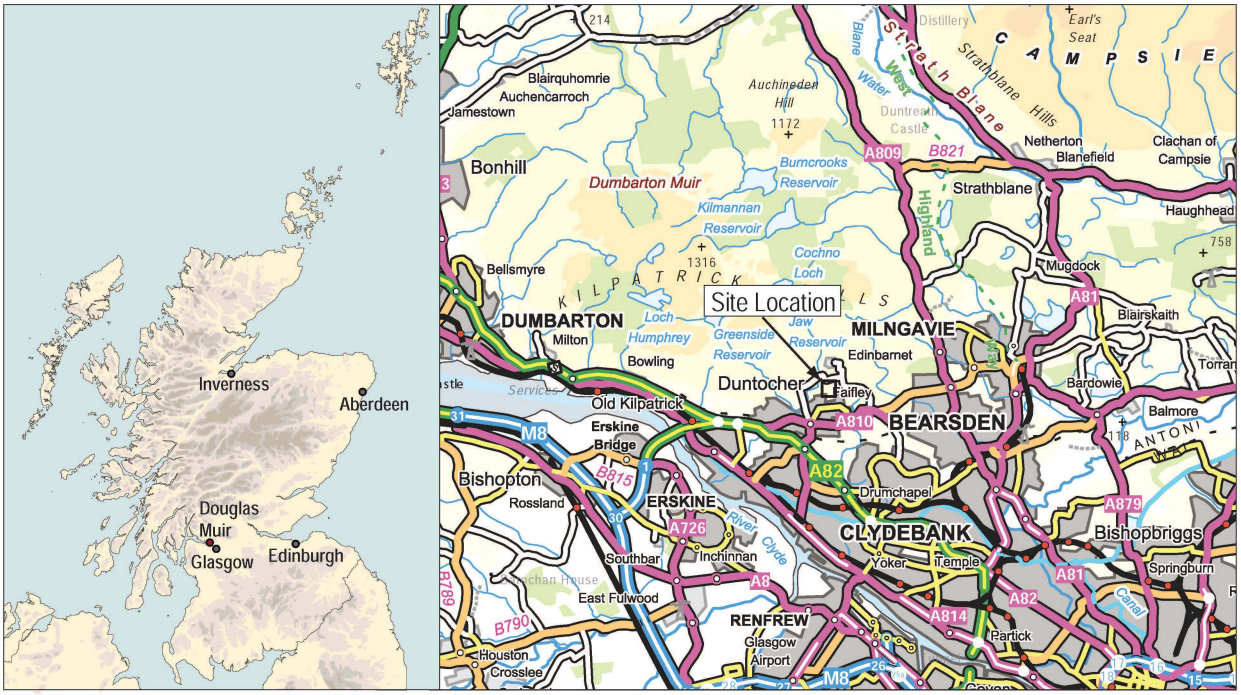
DOUGLASMUIR QUARRY, MILNGAVIE

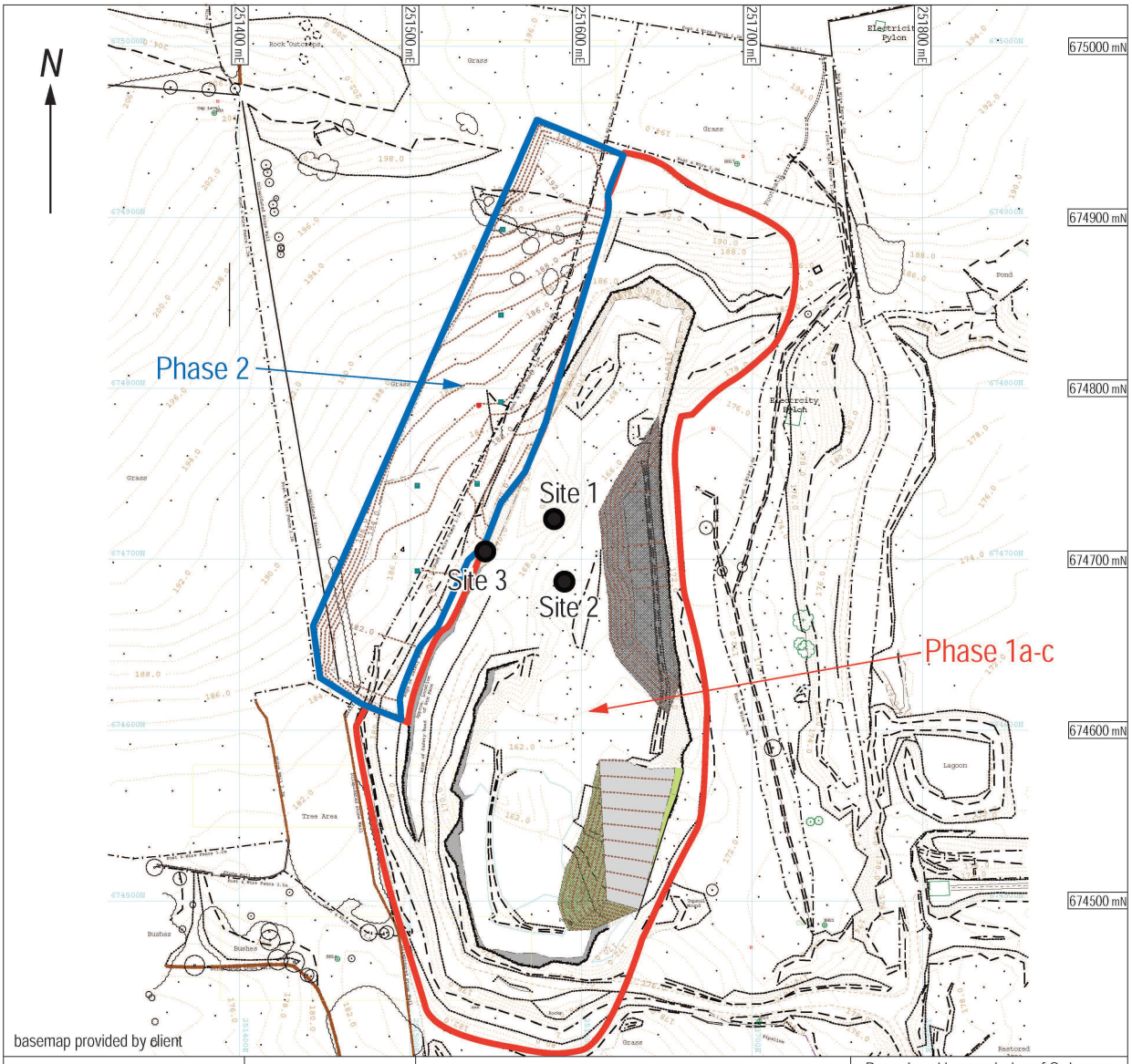
DRAFT WRITTEN SCHEME OF INVESTIGATION

PROJECT 4006

GUARD ARCHAEOLOGY

REGISTERED ORGANISATION IfA





GUARD ARCHAEOLOGY

Figure 1: Site location.

0 200 m

Non-Technical Summary

1.1 This document sets out a scheme to effect archaeological works on land proposed for development at Douglasmuir Quarry near Milngavie, East Dunbartonshire, as part of a mitigation strategy to deal with any archaeological resources which might survive within the boundaries of the area, into which it is proposed the existing quarry will be extended, and meet the condition imposed on development specified by the East Dunbartonshire Council.

1.2 This document establishes actions and products required to achieve Stage 1 of a potentially two-stage process, both of which may be required to fulfil the archaeological planning condition, Stage 2 being the further analysis of any materials recovered during the field work in either or both Stages 1 and 2 and/or the preparation of a final report on all works constituting preservation by record for publication, as appropriate. It is unlikely that the Planning Authority will formally discharge the archaeological condition on Planning Consent until it is satisfied that the appropriate and necessary scope of work has been secured.

Site Location and Description

2.1 The site of the proposed quarry extension lies west of Milngavie, adjacent to the existing Tarmac Quarry at Douglasmuir, centred at *c* NGR: NS 512 747. It comprises an irregular area, mainly of rough grassland, roughly half of which is bordered by trees, but including a narrow strip of heather-covered outcropping rock, which marches with and sits immediately west of the existing quarry. The proposed quarry extension has been divided into a series of phases, numbered 1 - 4, related to the order in which work will be conducted, Area 1 being the earliest phase. Area 1 has been further subdivided into three sub-phases, Area 1A, 1B and 1C. Area 1A is the heather covered outcropping rock noted above.

2.2 The quarry sits in the foothills of the Kilpatrick Hills at *c* 200 m AOD and the land encompassed drains toward the SE by means of a small ditch at the eastern boundary of the proposed extension area, which water course eventually becomes the Manse Burn.

Archaeological and Historical Background

3.1 The areas proposed for quarry extension, together with the wider surrounding landscape, have been the subject of an environmental impact assessment, one chapter of which dealt with the archaeology and cultural heritage. The desk-based component of the EIA established that only one previously recorded archaeological site, the remains of a farmstead named Muirlees and known to have been in a ruinous condition at the time of the OS survey for their first edition 1:10560 series maps of the mid-nineteenth century, potentially lay within the proposed extension area. The walkover survey component of the EIA confirmed the existence of this site and demonstrated that the remains of the farm may still be seen on the ground as a low mound. The walkover survey also identified a small number of other, relatively low significance archaeological remains, including traces of rig and furrow, two mounds which may represent clearance cairns and a series of old quarries.

Project Objectives

4.1 The project objectives are:

- to establish whether or not significant remains survive within the proposed development site boundaries

and, if present:

- to plan and selectively sample those remains, followed by full excavation of selected sites, in line with the strip, map and sample method outlined in the document Mineral Extraction and Archaeology: A Practice Guide (2008).

Methodology

5.1 The area proposed for development will be extracted in four phases, broadly speaking working in slices from east to west. Phase 1, which is sub-divided into phases 1A, 1B and 1C, contains no known archaeological remains. Phase 2 contains one quarry site identified during the EIA walkover survey. Phase 3 contains no known archaeological remains. Phase 4 contains evidence of rig and furrow and two quarries (which may in fact lie beyond the extraction zone), all identified during the EIA walkover survey, and Muirlees farmstead, the core of which again may lie beyond the proposed extraction zone. A series of mitigation measures will be required to meet the planning conditions imposed on the development. The methodologies for these various mitigation measures are as follows:

Pre-development Work

Review of DBA

5.2 A rapid review of the existing archaeological assessment of the proposed development area will be undertaken prior to entering the field. This will comprise checking information held by the National Monuments Record for Scotland and local Sites and Monuments Records, for any pertinent changes, such as newly discovered archaeological sites, which may have occurred since the EIA was compiled. Should it prove necessary, in the event of major and significant changes in the records, an updated desk-based assessment for the area should be produced.

Review of Development Plans and Site Investigation Works Records

5.3 A review of all relevant finalised development plans, which indicate the precise areas where ground disturbance will occur during the development, will also be undertaken prior to entering the field. This work will assist in identifying precise areas and locations where archaeological activity will be required. A review of site investigation works records, where available and appropriate, will also be undertaken. The finalised proposed phasing of the quarry extension operations will be itemised and this document will be updated to take this information into account. The revised document will require to be approved in writing by East Dunbartonshire Council Archaeology Service, acting in their capacity as advisers to East Dunbartonshire Council, prior to the implementation of works on the ground.

Site Walkover

5.4 A site walkover ahead of each phase of development work starting will be undertaken by an archaeologist to allow:

Marking Off & Photography of Archaeological Sites on the Ground

5.5 Any/all archaeological site(s) identified as lying outwith but close to the development area, together with any other newly discovered and archaeologically significant sites identified during the rapid DBA, will be marked off on the ground, to ensure avoidance of inadvertent disturbance from construction activity, site traffic, etc. A photographic record of the current condition of all such archaeological sites will be made during the walkover survey, to comprise digital photographs of each site prior to and after marking off. The key site where this requirement exists is Muirlees farmstead, identified in the ES as a site of some archaeological significance (WALM 8). Here, an archaeological survey will be conducted first, to ensure the identification of all relevant archaeological remains (those clearly related to the farmstead) on the ground, followed by the marking out of the full extent of the farmstead based on a combination of the recorded mapped information from the OS first edition and field observations. This site will then be fenced off on the ground, to enclose all pertinent archaeological features/sensitive areas which formed part of the mapped farmstead plus a five metre buffer, prior to any construction work commencing (work in the vicinity of the farmstead is due to take place in Phase 4). The details of the fencing to be used for this purpose will be cleared in advance with East Dunbartonshire Council Archaeology Service, in their capacity as advisers to East Dunbartonshire Council.

Recording of Rig and Furrow

5.6 The areas of rig and furrow identified in the ES as of archaeological significance (i.e. WALM 9 & 10) will be mapped by archaeologists prior to any construction work commencing (work in the vicinity of the rig and furrow is due to take place in Phase 4). Mapping will be conducted in such a way as to ensure that the precise direction and dimensions of the rigs and furrows are recorded, and in a manner which is fully geo-referenced. Once the mapping has been conducted to the necessary standard, a trench will be opened across the rig and furrow in order to allow the excavation and recording (preservation by record) of a suitable sample. Details of the standards to which the work will be conducted are expressed in Appendix 1, an extract from the document: Guidelines for the preservation of areas of rig and furrow in Scotland, compiled by John Barber and published in 2001 by the Scottish Trust for Archaeological Research.

Strip, Map & Sample

5.7 The strip, map and sample method involves the stripping of the areas due for extraction by mechanical excavator(s) operating under the instruction and constant supervision of a suitably qualified archaeologist or archaeologists. It differs from excavation insofar as not all archaeology exposed is excavated but rather all archaeology exposed is planned in full then selectively sample excavated to answer specific questions. The process is thus one where constant monitoring of developments on site during the stripping operations is critical, allied to an initially coherent and rigorous sampling strategy which is flexible and capable of revision at short notice in the light of new discoveries.

5.8 The mechanical excavator(s) will remove the topsoil and any other modern made-ground deposits to the level of the natural subsoil or the first significant archaeological horizon, whichever is encountered first. Each machine will be monitored constantly by a suitably qualified archaeologist. A ratio of one archaeologist per machine is essential, except in rare cases, such as where two machines may be operating side by side. Even in such a case, multiple machine monitoring would only be possible if a justified, written scheme for such activity is submitted to the local authority archaeologist and approved by them in writing prior to work on site commencing. All mechanical excavators will be fitted with flat-bladed ditching buckets during all topsoil removal operations.

5.9 This process will be applied to all areas where extraction or any other ground-breaking activity is proposed, taking place in advance of each phase of quarrying as planned. All areas, features and deposits of potential archaeological interest exposed will be cleaned by hand, then photographed and mapped. Should significant archaeological remains be encountered, sample excavation would be conducted on a proportion of the potentially significant archaeological features/deposits present, including sampling for artefactual and/or palaeobotanical evidence. The percentage of features and deposits exposed requiring to be excavated, and the level of excavation and the level and character of sampling required in each case, will be determined in conjunction with the local authority archaeologist.

5.10 The written record of all archaeological features, deposits and finds will be by means of conventional proforma sheets. Scaled hand-drawn plans will also be made at 1:20 and sections at 1:10. Black and white and colour record photographs will also be taken, along with digital images. By the close of the evaluation the locations and dimensions of all trenches will be recorded in such a way as to tie them to the OS grid.

5.11 Archaeological fieldwork undertaken will in all respects be compliant with the 'Archaeological Standards of the East Dunbartonshire Council Archaeology Service'.

5.12 If features of archaeological significance are found within the development area, then further phases of work to mitigate the archaeologically adverse effects of the development may be required to fully comply with the terms of the condition. East Dunbartonshire Council will determine the need for implementation of further stages of the proposed archaeological programme.

5.13 Should significant archaeological remains be identified during the strip, map and sample fieldwork (which may be termed Stage 1), Stage 2 will involve the implementation of appropriate archaeological post excavation analysis, reporting, and publication of discovered archaeological remains, if appropriate.

5.14 Further details of any second stage of the work programme cannot be developed until such time as the Stage 1 fieldwork has taken place.

5.15 This document details the methodology to be employed in implementing the Stage 1 strip, map and sample exercise. The detailed methodology to be employed during any Stage 2 post excavation analysis and publication, would if required be specified in an addendum to this document, to be called a post-excavation research design. This addendum, if required, will be submitted by the applicant for the agreement of East Dunbartonshire Council, prior to the commencement of any archaeological work, which may be specified in the addendum document. East Dunbartonshire Council will not discharge any planning condition which requires the programme of archaeological work, until such time as it is satisfied that all Stages of archaeological fieldwork have been completed (in the case of Stage 1), or secured by contract (in the case of Stage 2).

Human Remains

5.16 Though there is nothing to suggest their discovery is likely, should human remains be encountered, GUARD will notify the local police immediately and thereafter follow prescribed procedure for their treatment, in accordance with legal requirements.

Monitoring

5.17 East Dunbartonshire Council will have a formal monitoring role. GUARD will appoint a dedicated project manager for all the works outlined above and the manager will be the first point of contact for any project-related liaison with East Dunbartonshire Council and the developer or the developer's agent for all formal logistical, administrative and financial aspects of the project. The on-site project team will be happy to accommodate monitoring visits to the site during fieldwork, whether pre-arranged or otherwise, but it is important that all formal communication, requests (including amendments to on-site strategies) and contacts be made, ultimately in writing and in the first instance to the project manager (as opposed to the site director or other members of the site team), to ensure organisational, administrative and financial efficiency. Any site visitors will also be expected to conform to the health and safety regime in place during the project.

Long-term Management of the Archaeological Resource

5.18 The proposed work at Douglasmuir involves the fencing off and protection of the site of MuirleesFarmstead (as noted above at 5.1.3.1) prior to extraction work commencing. Potential also exists for further, currently unknown archaeological sites to be identified during the topsoil stripping and for the decision to be taken to deal with any such site or sites uncovered through preservation in situ. In this or these cases, the preparation and implementation of long-term management plans will be required, including details of how Muirlees farmstead, and any other sites which might be preserved in situ, will be integrated into the overall restoration plan following completion of extraction works at the quarry. To this end, the developer will ensure that a written scheme explaining how preserved archaeological site management will be achieved is prepared and submitted to East Dunbartonshire Council Archaeology Service for approval, by means of an addendum to this document, in the case of plans for management of Muirlees farmstead, and any other archaeology identified during the topsoil stripping and preserved in situ, for the duration of the extraction period prior to extraction work commencing, and by means of the integration of proposals for preserved archaeology into the overall restoration plan, with respect to the period following the completion of extraction work.

Reporting, Archive & Small Finds Arrangements

6.1 Following completion of each phase of the archaeological fieldwork, GUARD will prepare a composite report comprising photographic survey and evaluation reports, outlining the main results of the fieldwork and including lists of all features, finds, samples, photographs and drawings. This report will be produced in-house by GUARD as a desk-top published document. The report will also include recommendations for any further mitigation measures appropriate to any remains encountered. A short report detailing the results will also be submitted for publication in Discovery and Excavation in Scotland. In the event of a need further (Stage 3) analysis of materials and the generation of a report

for publication, the report will also be accompanied by a costed assessment specifying any work deemed necessary in order to complete the project to the satisfaction of the Planning Authority and thus to fulfil the planning condition.

6.2 Publication, where required, would normally be sought in a suitable academic journal acceptable to East Dunbartonshire Council.

6.3 Copies of the survey and evaluation report will be provided to the client and their agent(s), to East Dunbartonshire Council, to East Dunbartonshire Council Archaeology Service and to the National Monuments Record for Scotland. Further copies can be distributed to other recipients if requested and specified.

6.4 The archaeological fieldwork report will be prepared to the standard of a Data Structure Report as defined by Historic Scotland, in their "Project Design, Implementation and Archiving" document (Historic Scotland Archaeological Procedure Paper 2, 1996). The reports will provide "a structure or organisation to the primary records" of the fieldwork, in the case of the evaluations forming "a basis for further work". It will be "essentially, an initial organisation on paper of the information retrieved from the site" and consist "of a narrative account of the contexts…discovered, including field interpretations and a set of lists. It is not intended for publication, but will itself be archived." The appointed archaeologist will also ensure that the project archive is prepared and ready for submission within six months of the completion of all fieldwork or post-excavation work (as appropriate). The resultant site archive will be deposited with the National Monuments Records for Scotland.

6.5 Archaeological reporting and archiving will in all respects be compliant with the 'Archaeological Standards of the East Dunbartonshire Council Archaeology Service'.

6.6 The laws relating to Treasure Trove and Bona Vacantia in Scotland apply to all finds where the original owner cannot be identified. This includes all material recovered during archaeological fieldwork. Accordingly, all assemblages recovered from archaeological fieldwork are claimed automatically by the Crown and must be reported to the Scottish Archaeological Finds Allocation Panel through its secretariat, the Treasure Trove Unit. In the event of the discovery of small finds at Douglasmuir, a filled-out copy of the form "Declaration of an Archaeological Assemblage from Fieldwork" and two copies of the pertinent Data Structure Report will be submitted to the Panel at the conclusion of the fieldwork. The Panel will then be responsible for recommending to the Queen's and Lord Treasurer's Remembrancer (QLTR) which museum should be allocated the finds.

6.7 All artefacts will be stored temporarily by the appointed archaeologist until a decision has been made by the Panel regarding the museum which will be allocated the finds for permanent curation. All finds will be transferred to the appropriate museum within six months of completion of the fieldwork, if no post-excavation work is required, or at the end of the latest finishing post-excavation programme.

6.8 In the event that unallocated finds recovered from Douglasmuir require to be removed from Scotland, for the purposes of post-excavation analysis, the appointed archaeologist will be legally required to obtain the consent of the QLTR, in the form of a loan agreement. Initially, an indication of intent would be registered with the Treasure Trove Secretariat at the National Museums of Scotland, after which formal consent would be applied for using the form "Application for authority to borrow unallocated Treasure Trove for research purposes". A consent form, signed by the QLTR and specifying conditions (such as the period during which finds may be held outside Scotland) would then be issued. The appointed archaeologist will require to be in receipt of this signed consent form before items may be removed from the country.

Timetable

7.1 The planned extraction work at Douglasmuir will take place on a phased basis over a number of years, the full details of which have yet to be established. Phase 1 will take place first, followed sequentially by Phases 2, 3 and 4 in that order.

7.2 The developer will notify the planning authority, through GUARD notifying the local authority's archaeological adviser East Dunbartonshire Council Archaeology Service a minimum of three weeks in advance of the proposed start date for soil stripping work on each phase or sub-phase of the site,

to allow monitoring arrangements to be put in place. At that time a specific timetable for each sub-phase of work, detailing anticipated duration of fieldwork and timetable for reporting will also be submitted to East Dunbartonshire Council Archaeology Service for their approval, on behalf of the local authority. This timetable does not include any provision for any Stage 2 work which might be required.

Personnel

8.1 The planned extraction work at Douglasmuir will take place on a phased basis over a number of years, the full details of which have yet to be established. Phase 1 will take place first, followed sequentially by Phases 2, 3 and 4 in that order.

8.2 The developer will notify the planning authority, through GUARD notifying the local authority's archaeological adviser East Dunbartonshire Council Archaeology Service a minimum of three weeks in advance of the proposed start date for soil stripping work on each phase or sub-phase of the site, the names of the key archaeological personnel i.e. site director, project manager and any other key specialists. All other archaeological team members must be suitably qualified and experienced for the roles they perform. CVs for all archaeological personnel will be supplied in advance of site work if required.

Health and Safety

9.1 The project will be conducted in line with all current legislation and with the IFA approved SCAUM document "Health and Safety in Field Archaeology". Prior to fieldwork commencing a risk assessment of the project, collectively or as separate project components, as appropriate would be undertaken, giving rise to a project-specific safety plan or project component-specific safety plans.

Appendices

Recording Rig and Furrow in Advance of Destruction: Minimum Standards Survey

The work of Dyson-Bruce and Halliday has shown that patterns of rig and furrow:

- Inform us of the methods of their creation
- Reveal regional differences that may be indicative of social and/or chronological factors
- Indicate the scale and possibly the duration of land use in the area, with implications for patterns of land tenure, etc.

If, therefore, areas of rig and furrow are to be destroyed by development, a gross morphology survey (GMS) of the area/s affected should be undertaken. Large areas, for example areas proposed for afforestation, may initially be surveyed by aerial photographic (AP) transcription. Smaller areas should be ground-surveyed and transcribed AP surveys should be ground-checked.

Field Observation

For each discrete area of roughly parallel rig and furrow, i.e. for each field, identified in the GMS, a topographic survey should be undertaken and the following should be recorded where possible:

i) The boundaries of the field should be checked on the ground and specific boundary features noted and recorded;

ii) The areas of contact between adjacent field boundaries should be examined for evidence of sequence, surface characteristics should be recorded and an explicit interpretation, testable by invasive fieldwork; devised;

iii) The widths, heights and depths of rigs and furrows should be measured and the raw data preserved while ranges or means and standard deviations, where these are truly representative, should also be recorded.

iv) It is not possible to provide a definitive list of additional, relevant field observations because areas of rig and furrow are so variable. However, the following should be observed and recorded where possible:

   a) The size (ha) and shape of each .field. or group of roughly parallel rigs and furrows

   b) The relationship between the field and its topographical setting, e.g. observe and record the altitude, aspect and slope of the field. If rigs run along contours or at right angles to them or if at some other angle, then quote this as the smallest angle, in degrees, made between rigs and contours

   c) Details of characteristic rig morphology in three dimensions should be observed and recorded. Are rigs:

      - Straight or curved?
      - If curved, are they reversed-S in plan?
      - Are rigs and/or furrows steep-sided or rounded?

   d) Are there distinguishing regional or local characteristics? e.g.

      - Is there a slight trough along the spine of each rig?
      - Do the rigs in each field seem to radiate from some single point?

   e) Relationships with other monuments should be observed and recorded:

      - between fields and other monuments
      - between rigs and/or furrows and other monuments.

Excavation

Where excavation is required, it will be necessary to undertake some excavation in each field and to ensure that more than one rig and furrow is examined in every instance. The bulk of the observable evidence will be most easily seen in a section but small cuttings, e.g. 2 m by 2 m, may also reveal multi-periodicity by revealing ard-marks or the bottoms of plough furrows. Thus, a small cutting with a trench running along one side and projecting beyond it might prove ideal.

Sectioning: a machine cut section running through at least three rig and furrow pairs will provide access to the ploughsoil and to any relict features underlying it. An archaeologist and a trained soil scientist should record the sections and the soils they contain. Soil descriptions by persons other than soil scientists will prove wholly inadequate in any subsequent analyses.

Sampling: Plough soil within the superficial rig should be sampled as should soil from earlier A-, or B-horizon features, like relict rigs, deepened plough soil beneath the superficial rigs and from the C-horizon. The emphasis should be placed on gathering contrasting samples that facilitate comparative studies.

Analyses

Carter and Simpson have shown that currently available analytical techniques yield little definitive information about the cultivation practices fossilised in rig and furrow. This is partly a reflection of the available methodologies and partly of inherent problems in resolving palimpsest deposits. For this reason, analyses should be restricted for now to simple tests, for example, of soil fertility or for the identification of introduced materials, and even these tests may not be justified in all instances.

Soil micro morphology: this is a relatively new technique, whose application to archaeological problems only over the past two decades is beginning to bear fruit (e.g. Alcott 1993; Crystal 1998; Carter 1998). In a study sponsored by AOC (Scotland) Ltd and NERC, Guttman is currently using micromorphological and other analyses to compare the evidence from a field system on Papa Stour (Shetland) with the known historical and ethnographic evidence for its use, particularly for its manuring over the past two or more centuries. While micromorphology has problems of chronological resolution, caused by the palimpsest nature of the evidence, it has certain attractions for the heritage manager:

- sample collection in the field is cheap and easy
- impregnation of the samples is similarly cheap
- the impregnated samples have an indefinite shelf life.

Thus many sites could be sampled, relatively cheaply, at the developers' expense, and the impregnated samples stored in an accessible archive. As noted above, the retained samples would then, at five yearly intervals, become the subject of a research driven project aimed at determining local and regional variations and improvements in methodology. The impregnated blocks, properly identified and documented, should be held at a central locus and cross-referenced with the site record sheets (below). This process would allow for recording in advance of destruction at the developers' expense while methodological improvements could be pursued, pro-actively, in research programmes. It is essential that the impregnated blocks and the prepared slides are accessible to all scholars. The National Museums of Scotland are willing to house both the blocks and the prepared slides and to furnish access to them for all interested scholars.

Reporting

Reportage on cultivation remains tends to be heavily reliant on raw data and .hard. science and unpopular with traditional journals of .cultural archaeology. This will be particularly true with the reports from the survey and excavation exercises described above because these are mainly data collecting exercises from which larger studies should be made at five-year intervals. The latter are more likely to be appropriate for traditional archaeological journals. The emphasis in reporting should therefore be placed on the creation of a high level of consistency in recording, using standard record formats, and these records should be compiled by archaeologists with soil science training or with the assistance of qualified soil scientists. A special archive of copies of the record should be maintained at one locus, in addition to the normal archiving with the NMRS. The archive of record sheets should be cross-referenced to the archive of

impregnated soil blocks. This archive of site records should meet the standards set by RCAHMS (see H S 1996, 13.16, for details). If these recommendations are adopted, the reporting of each survey or excavation recording exercise could be restricted to a D&ES report cross-referenced to both archives. The approach advocated here is that of creating an active archive with ensured review and revision at predetermined intervals. This bears some similarity to the Norwegian practice, for example, of archiving excavations for an indefinite future in the anticipation that scholars will one day find the time and funds to analyse and interpret them. However, this is not an advocacy of this process but merely an acknowledgement of the poverty of the methodologies currently available for the evaluation, management and study of areas of rig and furrow.

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