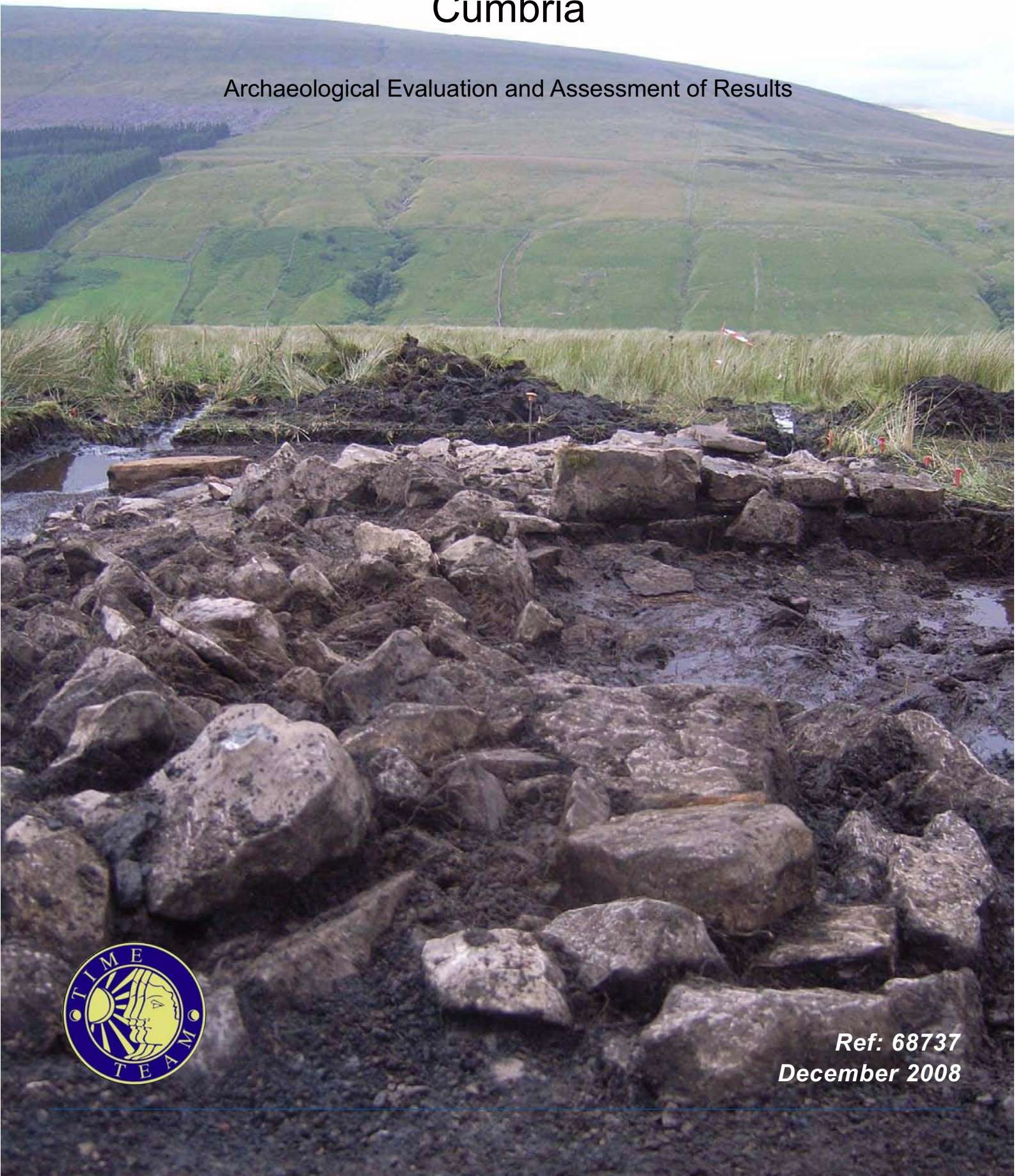




Risehill Tunnel Navvy Camp Cumbria

Archaeological Evaluation and Assessment of Results



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December 2008

Risehill Tunnel Navy Camp, Cumbria
Archaeological Evaluation and Assessment of Results

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Summary

In July 2008 an archaeological evaluation was undertaken by Channel 4's 'Time Team' at the site of Risehill, Raygill Farm, Cumbria (NGR 376676 489354). An evaluation comprising eight trenches sought to locate and characterise the navvy settlement and activity associated with the construction of the airshafts for the Risehill Tunnel, part of the Settle to Carlisle line. The evaluation highlighted the generally good preservation of the Site, although many of the buildings appear to have been of timber with only rough stone foundations. Specialisation and division of different parts of the Site between settlement and working areas was seen.

Trenches 1 and 5 were positioned to locate what appears to have been a residential hut. The bedding for a tramway that ran down the hillside to Raygill was seen in Trench 2. The excavation also uncovered a structure in Trench 3 that may have been the engine or boiler house. Trench 4 was situated on the southern edge of the square reservoir still visible as an earthwork just to the north of the trench. Excavation of this trench also revealed the presence of a leat running parallel to the edge of the reservoir, suggesting that there was probably a network of water channels to direct water to the boilers, in order to create the steam needed to power the engines. Trenches 6 and 7 appeared to relate to the workshops noted at the Site, and possibly located the site of the blacksmith's shop.

The evaluation results are of at least local significance, adding further depth to our understanding of the construction of the Settle to Carlisle railway line. A short summary of the results will be offered to the *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society* for inclusion in the annual round-up of archaeology in the county.

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The geophysical survey was undertaken by John Gater, Jon Tanner and Emma Wood of GSB Prospection. The field survey was undertaken by Henry Chapman, University of Birmingham. The excavation strategy was devised by Francis Pryor. The on-site recording was co-ordinated by Naomi Hall, and on-site finds processing was carried out by Hannah Spieler, both of Wessex Archaeology.

The excavations were undertaken by Time Team's retained archaeologists, Phil Harding (Wessex Archaeology), Matt Williams, Raksha Dave, Ian Powlesland, Faye Simpson, and Tracey Smith, assisted by Naomi Sewpaul, Brendon Wilkins, Chris Healey, Cassie Newland, Damien Ronan and Deborah Anderson. The metal detector survey was carried out by Peter Smith and Phil Dunning.

The archive was collated and all post-excavation assessment and analysis undertaken by Wessex Archaeology. This report was compiled by Naomi Hall with specialist reports prepared by Lorraine Mephram (finds). The illustrations were prepared by Kenneth Lymer. The post-excavation project was managed on behalf of Wessex Archaeology by Lorraine Mephram.

Wessex Archaeology would also like to thank Paul Smith (Environment Agency - Geomatics Group) for access and assistance with LIDAR data.

Finally thanks are extended to the owner, Thomas Metcalfe, for allowing access to the Site for geophysical survey and archaeological evaluation and for sharing his invaluable local knowledge of the site.

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Archaeological Evaluation and Assessment of Results

1 BACKGROUND

1.1 Introduction

1.1.1 Wessex Archaeology was commissioned by Videotext Communications Ltd to undertake a programme of archaeological recording and post-excavation work on an archaeological evaluation undertaken by Channel 4's 'Time Team' at the site of a navvy camp associated with the construction of Risehill Tunnel (also called Black Moss) and situated on land belonging to Raygill Farm, Cumbria (hereafter the 'Site') (**Figure 1**).

1.1.2 This report documents the results of archaeological survey and evaluation undertaken by Time Team, and presents an assessment of the results of these works.

1.2 Site Location, Topography and Geology

1.2.1 The Site consisted of an area around the extant spoil heap associated with Airshaft 2 of the Risehill Tunnel, centred on NGR 376676 489354, and is located within the parish of Garsdale (**Figure 1**). Although in the administrative area of Cumbria, the Site was historically part of the West Riding of Yorkshire and lies within the Yorkshire Dales. The Site is approximately 12km to the south-east of the town of Sedbergh. Less than 2km to the north-west is the village of Garsdale, and 2.6km to the south-west is the small village of Cowgill.

1.2.2 Airshaft 1 lies some 340m to the south of Airshaft 2 (**Figure 2, Plates 1-5**). Just to the west of the Site is the high east-west ridge of Rise Hill. The Site itself occupies an elevation of around 398m aOD. The ground was extremely irregular but in general the field to the north-west of the airshaft sloped steeply away to the north and west. The ground to the west of the spoil heap sloped away to the west and the ground to the east of the spoil heap sloped gently to the east, the airshaft and its spoil heap thereby occupying a ridge of higher ground. The spoil heap was up to 7m high and banked around the airshaft. Spoil, mostly large blocks of stone, fans out to both the north and south in long, flat topped 'fingers'. Drainage channels (or gripping) had been cut to the west of the modern field boundary bisecting the site, obscuring the visible earthworks.

1.2.3 The land is currently used for rough grazing but consists of blanket bog. The underlying geology is mudstone and sandstone (British Geological Survey, sheet 50).

1.3 Archaeological Background

Prehistoric to medieval

1.3.1 In general there seems to be little evidence for early activity in the area. Some of this is undoubtedly a reflection of the inhospitable conditions, but is

also likely to be the result of very little modern development and, therefore, little commercial archaeological investigation.

1.3.2 Around Gawthrop, just to the north-west of Dent (approximately 2km to the south of the Site), there is a reference to a 'British tumulus, eighty yards in circumference... on the Gate-house estate; it was walled about five feet high with thin flat stones, and had three passages from the outside... where the ashes of the dead were deposited', there is also a reference to finding two stone coffins on the Raw-Riding estate, although little indication of date is given (Lewis 1848, 28-32). Lewis also mentions a former monastic cell owned by Coverham Abbey in Garsdale, converted into a farmhouse (1848, 279-82).

1.3.3 The derivations of the surrounding place-names are dominated by references to topographical features and have their origins in Old English or Old Norse words. 'Dent' probably derives from *dinn* or *dind* (a hill) while Garsdale simply means '*grass valley*' (Ekwall 1960, 142, 192). The 'gill' suffix in Cowgill and Raygill derives from the Old Norse *gil* meaning a narrow valley or ravine (Ekwall 1960, 195). 'Moss' derives either from the Old English *mos* or the Old Norse *mosi* for bog, swamp or morass (Ekwall 1960, 332). 'Rise' probably derives from the Old English *hris* meaning brushwood (Ekwall 1960, 388-9).

Post-medieval

1.3.4 In 1865 the Midland Railway Company began to consider opening its own rail route into Scotland to rival those of the London and North Western Company and the Great Northern Company (Williams 1875, 208-9). Without their own route they were forced to use the London and North Western Company's route, who seem to have been particularly obstructive to the movement of Midland passengers and freight over their line (Williams 1875, 208-11). Accordingly, when a line from Settle to Hawes was proposed by number of local landowners, the Midland Company intervened to get the bill withdrawn on the understanding that they would then apply for a line from Settle to Carlisle (Williams 1875, 213-14). The bill mostly met with approval except for the almost inevitable objections from the London and North Western Company. These were overturned and the bill passed in 1866 (Williams 1875, 214-18).

1.3.5 In 1866, however, there were changes in the economic climatic. Railway finances became problematic, as demonstrated by contemporary pamphlets such as *A Financial Scheme for the Relief of Railway Companies* (Livesey 1866). The Midland Company therefore sought an abandonment bill for the Settle to Carlisle line, but this was rejected and the work re-tendered for (Baughan 1966, 167).

1.3.6 The construction of the Settle to Carlisle line was divided up into five contracts and put out to tender. Risehill Tunnel, also known as Black Moss, formed part of Contract 2, the section from Dent Head to Smardale, which was awarded to Benton & Woodwiss. Work began on the tunnel in 1870 and was completed in 1875. The tunnel was excavated by the means of two airshafts as well as excavation from the tunnel mouths (Baughan 1966, 167, 187, 432).

1.3.7 During the excavation of the tunnel several temporary settlements sprung up including one at each of the airshafts. These appear to have been

dismantled when the work finished. The settlement above the Risehill Tunnel was the highest along the line, at a height of around 398m aOD (Mitchell 1975, 5).

1.4 Previous Archaeological Work

1.4.1 In 1998 an earthwork survey of Airshaft 1 was undertaken by Ed Dennison Archaeological Services (EDAS) on behalf of Scottish Woodlands Limited prior to a proposed scheme of spoil removal.

1.4.2 Although a large proportion of the spoil heap had already been removed by 1998, nine separate 'fingers' of spoil could still be seen running north from the airshaft. The tops of the spoil heaps were generally flat, but no evidence for any tramways to transport excavated material from the shaft to the tipping fronts could be identified. However, a number of building platforms were identified to the north and west of the spoil heaps, and these were thought to represent traces of the navy camp associated with this shaft; other possible structures lay to the south-east. A partially terraced trackway could be seen to link the camp at Airshaft 1 with that at Airshaft 2. The report notes the better preserved spoil heap and related features at Airshaft 2, including a square water reservoir (EDAS 1998, 4-7).

2 AIMS AND OBJECTIVES

2.1.1 A project design for the work was compiled (Videotext Communications 2008), providing full details of the research aims and methods. A brief summary is provided here.

2.1.2 The aim of the project was to characterise the nature and date of the Site and place it within its historical, geographical and archaeological context. It was hoped to establish the state of preservation of the remains and to illustrate the life and working conditions of the navy camp.

3 METHODS

3.1 Geophysical Survey

3.1.1 Prior to the excavation of evaluation trenches, a geophysical survey was carried out across the Site using a combination of resistance and magnetic survey. The survey grid was set out by Dr Henry Chapman and tied in to the Ordnance Survey grid using a Trimble Real Time Differential GPS system.

3.2 LIDAR survey

3.2.1 A LIDAR survey of the Site was conducted shortly before the evaluation; selected results (primarily representing probably structures) have been incorporated into this report (see **Figure 3**) by kind permission of the Environment Agency.

3.3 Evaluation Trenches

3.3.1 Eight trenches of varying sizes were excavated, their locations determined in order to investigate and to clarify geophysical anomalies (**Figures 1 & 3**).

- 3.3.2 The trenches and archaeological deposits were all hand excavated. At various stages during excavation the deposits were scanned by a metal detector and signals marked in order to facilitate investigation. The excavated up-cast was scanned by metal detector.
- 3.3.3 All archaeological deposits were recorded using Wessex Archaeology's *pro forma* record sheets with a unique numbering system for individual contexts. Trenches were located using a Trimble Real Time Differential GPS survey system. All archaeological features and deposits were planned at a scale of 1:20 with sections drawn at 1:10. All principal strata and features were related to the Ordnance Survey datum.
- 3.3.4 A full photographic record of the investigations and individual features was maintained, utilising digital images. The photographic record illustrated both the detail and general context of the archaeology revealed and the Site as a whole.
- 3.3.5 A unique Site code (RHT 08) was issued prior to the commencement of works. The work was carried out on the 8th – 12th July 2008. The archive and all artefacts were subsequently transported to the offices of Wessex Archaeology in Salisbury where they were processed and assessed for this report.

4 RESULTS

4.1 Introduction

- 4.1.1 Details of individual excavated contexts and features, the full geophysical report (GSB 2008) and details of the artefactual assessment are retained in the archive. Summaries of the excavated sequences can be found in **Appendix 1**.

4.2 Geophysical Survey

- 4.2.1 Geophysical survey was carried out over a total area of 0.8ha, mainly using a magnetometer. Three areas were surveyed. Area 1, the largest area, was just to the north-west of Airshaft 2. Area 2 was a thin strip just the west of the modern field boundary, and Area 3 was to the south-west of the airshaft (**Figure 3**). A small sample area of resistance survey (0.024ha) was also attempted to the east of the airshaft and associated spoil heap. Unfortunately the ground conditions proved to be totally waterlogged, which badly affected the data quality and made it impossible to complete the survey.

Area 1

- 4.2.2 Here the results were dominated by an area of magnetic disturbance. This contrasted sharply with the surrounding undisturbed areas and could therefore be interpreted as representing the extent of the 'navvy camp'. However, the strength and density of the responses prevented identification of individual features within the disturbed area.
- 4.2.3 A positive linear anomaly (A) corresponded to an earthwork within the field. It is thought that this was a terraced track leading to the 'navvy camp'. A similar response could be seen in Area 3.

- 4.2.4 Ferrous responses at the western limits were caused by a wire boundary fence.

Area 2

- 4.2.5 This small survey area was positioned in order to see if the camp extended westwards; results from the data indicated that this was not the case. Natural responses within the data are likely to represent small gullies and natural drainage.

Area 3

- 4.2.6 Magnetic disturbance was visible across most of Area 3, and as at Area 1 this probably represented the extent of the 'navvy camp'.
- 4.2.7 A strong positive anomaly at (B) may be due to a structure. A positive linear anomaly at (C) could be caused by the remains of a trackway; it is similar to (A) in Area 1.

4.3 Evaluation Trenches

Introduction (Figures 1 & 3)

- 4.3.1 Trenches 1, 2, 5 and 8 were positioned within the field to the north-west of Airshaft 2 where domestic activity was believed to have been concentrated. Trenches 3 and 4 were located to the immediate south-east of Airshaft 2 where a steam engine and associated structures were believed to have been located. Trenches 6 and 7 were in an area thought to be connected with industrial activity to the south-west of Airshaft 2. The size and shape of the trenches varied to account for the varying potential targets that they were sited on and the archaeology subsequently uncovered. Any substantial remains were left *in situ*. Trenches 3 and 4 occupied the summit of the hill at a height of approximately 398m aOD. Trench 8 was situated the furthest north and at the lowest elevation at a height of 389.30m aOD.
- 4.3.2 Each trench saw the removal of between 0.14m and 0.18m of overlying topsoil and, in some places, a thin humic deposit (<0.1m thick) in order to expose the archaeology. Where encountered, the natural subsoil was peat, exposed in places below archaeological deposits.
- 4.3.3 During late afternoon of the first day heavy rain set in. This bad weather continued throughout the excavation, leading to poor light and waterlogged conditions.

Trench 1 (Figure 4)

- 4.3.4 Trench 1 was located towards the north-east end of what was believed to be a residential hut to the north-west of Airshaft 2 and the associated spoil heap. Of particular interest here was the distribution of finds since the block was potentially divided up between single communal quarters, family quarters and supervisors' accommodation. It was hoped that the finds, thought to have fallen through the (?planked) floor, would reflect this. In consequence the trench was divided into 1m squares, each given a dual letter (AA, AB etc) to follow the appropriate context number (full details can be found in the project archive).
- 4.3.5 After the topsoil was removed a number of different deposits were encountered. Towards the southern end of the trench a north-east – south-west band of stone rubble (107) could be seen. Two fairly humic deposits lay

over most of the trench, (102) in the northern half, (103) in the southern part. However, to the south of (107) a distinct clinker-rich deposit (105) was encountered. The outlines of a fireplace could be seen in the eastern part of the trench, but these were largely obscured by rubble deposits (104), (106) and (115) that were derived from the partial collapse of this structure (**Figure 4, Plates 6 & 7**).

- 4.3.6 Removal of some of this rubble revealed a back-to-back fireplace structure (114) (**Figure 4, Plate 7**). This well-built stone structure, aligned north-east – south-west, clearly indicated an internal division within the block, but no other definite traces of this division could be found.
- 4.3.7 The two hearth areas were investigated and these revealed two very similar silty deposits, (108) and (109), beneath the rubble. These deposits were not fully excavated.
- 4.3.8 Where a greater depth of humic deposit (102) and rubble (115) were removed, a pale, clay-rich deposit (110) was seen. This was similar to the deposits found in Trenches 2, 3, 4, 5, 7 and 8, in each case suggesting made ground or a deliberately laid surface.
- 4.3.9 A sondage in the south-eastern part of the trench through (107) and (105) showed (107) to be a rubble wall foundation contained within a construction cut (116). Layer (105) was seen to be a possible path or yard surface bedded on a stony layer (112). This directly overlay the natural peat (113). The high clinker component in (105) made it extremely well-draining.
- 4.3.10 In the north-western part of the trench was a north-east – south-west aligned linear stony 'bank' (111). Running parallel and approximately 6m to the north of (107), this may represent the opposing wall foundation.
- 4.3.11 In general, the finds recovered from this trench seemed to be fairly evenly distributed with a slight concentration within (102) immediately to the north-west of the fireplace. Distribution of different material types also appeared to be fairly even.

Trench 2 (Figure 5)

- 4.3.12 Trench 2 was positioned just to the west of the spoil heap associated with Airshaft 2, across a grass track running northwards down the hillside. This was believed to be the position of a track used to transport people and materials up and down the hillside in carts attached to a winding mechanism.
- 4.3.13 Removal of the topsoil (201) revealed a 4m wide compact stony layer (204), which formed the bedding for the trackway (**Figure 5, Plate 8**). Rough lines of stones (205) appeared to form a kerbing or revetting for this material. This was bounded on both sides by fine rubble layers, (206) to the east and (202) to the west, both of which appeared to be largely composed of eroded material. At the far eastern end of the trench (206) was overlaid by a fan of loose blocky rubble (203), which could be either tumble from the nearby spoil heap or collapsed material from a structure.
- 4.3.14 Two sondages were dug, one on each side of the trackway. The trackway material (204) appeared to be bedded on (209), a layer containing abundant large angular stones. This is thought to have acted as a consolidation layer

to provide a firm and well drained base for the trackway, and overlay natural peat (210). A third small sondage in the extreme north-east corner of the trench exposed a thin, iron-rich layer (207) overlying a layer of clay (208), which in turn overlay natural peat (210). Layer (208) was also seen in the sondage to the western end of the trench. The presence of a high proportion of iron within (207) suggests contamination from nearby industrial activity, since no natural iron oxide staining was encountered elsewhere on the site.

- 4.3.15 Layer (208) appeared to be equivalent to (110) in Trench 1, and to similar material in Trenches 1, 3, 4, 5, 7 and 8, all interpreted as made ground or a deliberately laid surface.

Trench 3 (Figure 6)

- 4.3.16 Trench 3 was targeted on the eastern side of the spoil heap associated with Airshaft 2, in order to locate the structure which contained steam-powered machinery used to help excavate the shaft.
- 4.3.17 After topsoil removal, two parallel east – west aligned walls (309) and (311) were exposed (**Figure 6, Plate 10**). These lay just over 3m apart and both appeared to be of similar construction, being made of a single line of rough stone blocks bonded by lime mortar. The contemporary ground level between the walls was lower, and excavation of the intervening deposits had to be halted when the water table was reached. A spread of wall tumble (307) associated with wall (311) overlay a mortar-rich layer (302), showing that the collapse post-dates the major demolition phase.
- 4.3.18 Trench 3 was later extended to the south, revealing a series of dumps of industrial waste (304), (305) and (306). These layers contained predominantly ash, abundant clinker, coal and coke. Within (304), the largest deposit, a series of tip-lines could be seen, showing that the material was dumped from the south. Within (304), an east – west aligned linear bank of loose stones, fired brick and cinder (303) was found (**Figure 6, Plate 11**). This was also visible as a ridge on the ground surface (**Figure 6, Plate 9**). Although originally believed to be a wall, the lack of ‘structure’ to this deposit showed it to be merely a dump of spoil. A cinder-rich dump (310) was also found to be banked up against the south side of wall (309).
- 4.3.19 A thin layer of clay (308), interpreted as made ground, was uncovered directly beneath spoil dumps (303-306) and (310). This overlay the natural peat (312).

Trench 4 (Figure 7)

- 4.3.20 Trench 4 was targeted on the eastern side of the spoil heap associated with Airshaft 2; as Trench 3, it was placed in order to locate remains associated with the steam-powered machinery used to help excavate the shaft.
- 4.3.21 At the north-east end of the trench a linear area of rubble (402) was encountered (**Figure 7, Plate 12**). Removal of the loose stone revealed north-west – south-east aligned wall (409), a stone wall which appeared to be built up against a clay bank (404) (**Figure 7, Plate 13**). These two deposits could be seen as visible earthworks and appeared to enclose an area to the north-east, thought to be a reservoir associated with the steam engine.

- 4.3.22 Parallel to wall (409) was a linear feature believed to be a leat (405) (**Figure 7, Plate 13**). This was overlain by a layer of tumble (403) which also overlay rubble (402). The leat contained two deposits, (406) and (407), which appeared to have derived from a combination of silting and tumbled material. The upper deposit (407) contained some iron oxide staining and coal fragments suggesting contamination from industrial activity. The leat itself was cut through a compact layer of clay and stone (408) which formed a possible surface, similar to the clay deposits encountered in the other trenches. This layer appeared to be a floor or consolidation layer. It was banked up against the wall (409) making it later than this structure, though their use is likely to have been broadly contemporary.

Trench 5 (Figure 8)

- 4.3.23 Trench 5 was, as Trench 1, positioned on a probable residential hut, towards its south-west end, and the same grid system devised for the excavation of Trench 1 was utilised (full details can be found in the project archive).
- 4.3.24 After topsoil removal a north-east –south-west linear band of stone rubble (504) was uncovered, most likely the remains of a wall (**Figure 8, Plate 15**). Banked up against and overlying this was a stony but humic deposit (502) and, beneath (502), was deposit (503) (**Figure 8, Plate 14**). The latter contained a high number of artefacts and was thought to be a deliberate dump of rubbish, probably within the postulated residential hut.
- 4.3.25 Beneath these layers, and also banked up against wall (504), was a clinker-rich deposit (505), similar to (105) in Trench 1. Through this, occasional glimpses of a clay layer (506) could be seen, probably made ground, as encountered in other trenches.
- 4.3.26 While most of the finds, particularly the pottery, were concentrated in layer (503), there were also a number of finds within (502) overlying wall (504). It was also from this trench that six copper alloy spoons were recovered. In common with Trench 1, the finds from Trench 5 appear to be mostly domestic, supporting the idea that these two trenches were situated within a residential hut.

Trench 6 (Figure 9)

- 4.3.27 Trench 6 was located to the south-east of Airshaft 2, a little to the east of the spoil heap and just to the north of Trench 7. This trench was only exposed in plan, and no further excavation below topsoil took place. Trenches 6 and 7 were both located within a probable structure
- 4.3.28 Below the topsoil was a roughly north-south aligned wall (603) (**Figure 9, Plate 16**), and visible earthworks showed the western return of this just to the north of the trench. This drystone wall was built of uncoursed stone rubble and appears to have functioned as a rubble foundation rather than a standing wall.
- 4.3.29 Immediately to the north-west of the trench the ground is substantially higher, the vegetation overlying a mass of rubble the edge of which (605) was seen in the trench (**Figure 9, Plate 16**). This concentration of rubble may be a collapsed chimney stack or part of the hearth arrangements.

4.3.30 There was a suggestion that rubble deposit (602) in the centre of the trench may represent disturbed paving, but it seems more likely that this was in fact tumble from (603) and (605). It overlay a silty deposit (606).

4.3.31 A small area of deposit (604) was revealed, adjacent to wall (603). This area of stone fragments and burnt clay may represent a disturbed floor surface.

Trench 7 (Figure 9)

4.3.32 Trench 7 was located just to the south of Trench 6. Originally of a similar size to Trench 6, it was later extended northwards at its western end.

4.3.33 At the eastern end of the trench a stone wall foundation (702) similar to that found in Trench 6 was uncovered (**Figure 9, Plate 17**). This wall was on almost the same alignment and of similar construction. While a fairly mixed deposit (703) lay to the east of this wall, to the west a mortar surface (707) could be seen. Overlying this to the north-west was a possible area of cobbles (706). These stones are distinctly different from the majority of the stone used on Site as they are much more rounded; they also exhibited colour changes associated with heating.

4.3.34 Two other possible structural features were seen in the trench. Just to the west of wall (702) a possible posthole (705) was found, but this was fairly shallow. A distinctly sub-rectangular slab (710) was also exposed, laid horizontally – perhaps a post pad, approximately 2m to the west of possible posthole (705).

4.3.35 A small sondage was dug just to the west of wall (702) and a deeper sondage within this. This showed the mortar surface (707) to be a fairly substantial layer (0.15m thick). Beneath this was a clay deposit (708), the upper surface of which was heat affected; this directly overlay the natural peat (709). This clay deposit may be similar to clay layers found in Trenches 1, 2, 3, 4, 5 and 8.

Trench 8 (Figure 10)

4.3.36 Trench 8 was the mostly northerly trench excavated. Located to the north-west of Trench 1, it was intended to locate a latrine.

4.3.37 Removal of the topsoil revealed part of a north-west – south-east aligned drain (805) running downslope to the north. Pungent stains suggested that this was associated with a latrine. The drain appeared to be cut through a man-made clay layer (803), which was similar to the clay deposits encountered in 1, 2, 3, 4, 5 and 7. Wooden elements (802) (**Figure 10, Plate 18**) seem to be the *in situ* or disturbed remains of the drain lining, broadly contemporary with clay layer (803). The high proportion of sand within the fill of the drain (804) suggested a reasonably fast flow of material, and the topography and naturally boggy conditions would have probably led to a natural, reasonably constant flow of water. The exposed deposits were unexcavated.

5 FINDS

5.1 Introduction

- 5.1.1 Finds were recovered from all eight of the trenches excavated, although the majority came from Trenches 1 and 5 (a probable residential hut), with relatively small quantities from other trenches. All of the material appears to belong to the modern period (19th/20th century), and all could be accommodated within the known period of activity at Risehill in the latter part of the 19th century.
- 5.1.2 All finds have been quantified by material type within each context, and totals by material type are given in **Table 1**. All finds have subsequently been scanned in order to ascertain details of their nature, range and dating. The interest here lies in how much the finds can tell us about the living conditions of the population at Risehill, including the navvies working on the airshafts and tunnel. The finds are discussed by functional group below.
- 5.1.3 The condition of the assemblage is extremely fragmentary – ceramic material (pottery, brick, clay pipe) and glass has been broken into small pieces. Whether this occurred during (or immediately after) their period of use or during subsequent demolition of the camp is uncertain.

5.2 Structural Material

- 5.2.1 Judging by the foundations uncovered, all of the buildings within the camp had stone footings (none of this material was collected on site), but were otherwise probably built largely of timber. Ceramic building materials, however, were employed in small quantities. A small number of brick fragments from Trenches 1, 3 and 5 are in a pale-firing (cream/yellow), chalk-rich clay. These bricks have sharp edges and appear to have been machine-made. They have a shallow frog, into which has been stamped the letters –EASE (the whole stamp does not survive on any fragment, although others have one or more of the same letters). These bricks may have had a decorative function. Red bricks are represented by a larger quantity (although still sparse) of fragments, nearly all small. Many of these appear to have been overfired, and joining fragments from layer (304), a dump of industrial waste, are cracked and distorted. Their use in the camp construction is uncertain; they could have been employed solely as hard core or similar.
- 5.2.2 Evidence for roofing is almost completely absent; there is a single piece of roofing slate. The buildings were presumably either stone-tiled or thatched.
- 5.2.3 Other structural material survived in the form of window glass, and iron nails and other structural fittings.

5.3 Domestic Equipment

- 5.3.1 This category is represented by pottery and glass vessels, and a few other objects. The pottery assemblage is dominated by factory-produced refined whitewares, which appear to have supplied much of the food/drink preparation, serving and consumption requirements (jugs, bowls and dishes, plates, cups and saucers). These are in a variety of styles, including

transfer-printed, hand-painted, sponged and banded decoration (**Figure 11, Plate 22**); in other words, there does not seem to have been a 'standard issue' of crockery, nor is it possible to discern 'sets' of tableware. Alongside these are a few stoneware bottles and jars, and some white-slipped redwares, all bowls.

- 5.3.2 The copper alloy spoons, on the other hand, do seem to follow a standard pattern and five of the six recovered are so similar as to possibly form part of a 'set'; all are fiddle pattern teaspoons and were probably plated; two carry an illegible maker's mark on the underside of the handle. All six came from Trench 5. The sixth (from Trench 4) is of slightly different pattern and carries a different mark on the top of the handle: the letters –N-ERRY and [?T]OROS within a cross device.

5.4 Personal Items

- 5.4.1 These comprise clothing and personal accessories, and clay tobacco pipes. Buttons were recovered in copper alloy (one stamped A. Hall / Doncaster), mother-of-pearl, glass and jet (**Figure 11, Plate 21**). A hair comb and a hair ornament appear to be in some form of early plastic (celluloid, for example was patented in 1869) (**Figure 11, Plate 21**). Both came from the living quarters (Trenches 1 and 5).
- 5.4.2 The clay pipes are of interest in including four unusual decorated bowls. Two carry floral motifs (**Figure 11, Plate 20**), one has a large beetle on either side of the bowl (**Figure 11, Plate 19**), and the fourth shows a fragment of what is probably a harp. On all of these bowls the moulded decoration has been painted in different colours, and all four bowls have a deep band around the top of the bowl which also appears to have been coated or painted – in three cases this looks like a white enamel, while the fourth example is brown and looks burnt. Three other pipes carry makers' marks: one bowl stamped DUB[LIN]/PO[...], one stem stamped MINERS, and a second stem with an illegible stamp ending in –CK.

5.5 Miscellaneous Finds

- 5.5.1 Miscellaneous finds include two slate pencils, and a small quantity of cinder (mainly from one layer in Trench 3). The small amount of animal bone (16 pieces), nearly all of which came from the living quarters (Trenches 1 and 5), includes cattle, sheep/goat, goose, chicken and rabbit. Butchery and gnawing marks were visible; all appears to be consumption waste.

5.6 Conclusions

- 5.6.1 The conclusions that can be drawn from the finds assemblage are perhaps at odds with what we know from other sources about the living conditions of the navvies working on the 19th century railway construction projects. The living quarters at Risehill were undoubtedly simple, largely timber-built, and probably spartan in their furnishing, but the ceramic and glass vessels give at least a slight air of gentility, and ornaments were clearly not entirely absent. Evidence for the hard-drinking navvy is scarce – a few glass wine bottles, wine goblets and tumblers, and stoneware bottles. Personal items are divided between the presumed feminine (decorative glass buttons, hair ornament) and masculine (clay pipes).

- 5.6.2 However, it must be accepted that the assemblage recovered may not be representative. There are obvious omissions from the range of objects present – cooking vessels (metal or otherwise) and sanitary wares (chamber pots), for example. There is very little animal bone, or any other evidence of food residues. Domestic refuse may well have been disposed of in other areas of the camp.

6 PALAEO-ENVIRONMENTAL EVIDENCE

- 6.1.1 No deposits were encountered during the course of the evaluation that were considered suitable for environmental sampling; consequently, there were no environmental samples taken during the course of this evaluation.

7 DISCUSSION

7.1 Introduction

- 7.1.1 In the period from the 1830s to the 1880s there was a huge boom in railway construction with an estimated navvy population at work on the railways in 1846 of around 100,000 declining to around 40,000 by 1875 (Morris 1994, 574).
- 7.1.2 The Settle to Carlisle railway was the last great work in Britain to be constructed by navvy labour (Cardwell *et al.* 2004, 195). A Select Committee appointed by the House of Commons some 20 years earlier had highlighted the dangerous and harsh conditions under which railway construction often took place and had recommended many changes (Select Committee of the House Commons (SCHC) 1846). A subject of particular criticism was the truck system whereby employees were not directly paid in cash but in credit or tokens often only valid in a company-owned store. Although forbidden by the Truck Act of 1831, railway labourers were not specifically included under this Act and the Committee heard testimony about a number of railway lines where this took place. Often the payment of wages appeared to have been deliberately delayed so workers would have to take out an advance in the form of a ticket. Even where not directly run by the company the stores often took a percentage of the takings; in general prices were artificially high and the quality of goods poor and the whole system caused unrest (SCHC 1846, 7-10). This Act was amended in 1887.
- 7.1.3 The housing conditions of the workers also came under scrutiny. The housing described by the Select Committee (SCHC 1846, 14-15) was basic in the extreme, wood or turf huts with a mutual gable with a fireplace either side and providing accommodation for 20-30 people. The beds were arranged in tiers and often had multiple occupants; they were described as '*wet and unhealthy*' and '*insalubrious and fetid*' (SCHC 1846, 15-16).
- 7.1.4 Elements of the Committee's recommendations on housing and facilities were put into place during the construction of the Forth Rail Bridge (1883-90) and the Manchester Ship Canal (1887-1894), and gradually became accepted practice (Bevan 2006, 109). The Settle to Carlisle line falls between these dates and it would therefore be interesting to see whether the conditions and criticisms voiced by the Committee still existed by the time of the construction of the Risehill Tunnel.

- 7.1.5 The Time Team evaluation, although limited in its extent, was successful in confirming the location of the navy camp around Airshaft 2 and highlighted its generally good preservation. Specialisation and division of different areas of the Site between settlement and working areas could clearly be seen. The inclement weather conditions during the evaluation served to highlight the extremely inhospitable conditions in which the navvies would have both lived and worked. It also showed the access difficulties that must have been present in transporting machinery and equipment to such an isolated location.
- 7.1.6 Seven of the trenches (all except Trench 6) encountered a distinct clay layer. With the exception of the layer in Trench 4, which appeared to have a deliberate rubble component, these layers had few if any inclusions and were fairly homogeneous. Where excavated, the clay was found to lie directly above the natural peat. In their natural state the ground conditions at Risehill are waterlogged and boggy. Once the overlying grass and reeds are removed the soft peat is easily eroded. Contemporary reports note the presence of boulder clay along the course of the line (Pick 1986, 111). The clay deposits encountered may derive from this source and represent a deliberate attempt to provide a made ground surface more suited to occupation and industrial activity.

7.2 Working Conditions

- 7.2.1 Risehill Tunnel appears to have been excavated by four labour gangs, one at each of the airshafts and one at each of the tunnel mouths. The two airshaft gangs began excavating in May 1870, excavating down to the level of the tunnel and then along. Airshaft 1 was down to tunnel level by November 1870 but Airshaft 2 did not reach tunnel level until 1871. The two gangs then excavated towards each other, the gang working south from Shaft 2 met the gang working north from Shaft 1 in March 1873. The gang working from the south end of the tunnel reached the gang from Shaft 1 in January 1874. The other gang working from the northern mouth of the tunnel met the gang working from Shaft 2 in October 1874 (Baughan 1966, 432). This means that the only access to the central part of the tunnel from May 1870 until January 1874 was via the airshafts.
- 7.2.2 In 1873 about 120 miners were employed in the tunnel (Mitchell 1993, 82). An article in the Lancaster Guardian in 1873 describes *'dimly burning candles, uncouth-looking wagons standings on the rails or moving to and fro, men at the facings, some above and some below, with their numerous lights like twinkling stars in a hazy night, the noise of the twirling drills beneath the terrible force of big hammers wielded by stalwart men, the hac-hac or half-sepulchral groan at each stroke, the murky vapour, the chilling damp and the thick breathing'* (Mitchell 1993, 82). Williams on his visit to the Risehill Tunnel workings gained access to the tunnel down Shaft 1 via an iron 'skep' suspended by a chain. He observed *'30 or 40 miners hard at work, whose occupation consists of drilling holes into the rock, which are afterwards charged with gunpowder and exploded'* (Williams 1875, 506-7). Another observer in 1872 commented that *'some idea may be formed of the hardness of the rock when it is stated that thirty-five drills have been blunted with 18 inch boring'*, further noting that *'the atmosphere is so close in the tunnel that the men have to strip to their flannels'* (Lancaster Guardian, 15th August 1874). Indeed, Williams commented how the air within the tunnel

had been quite poor, and that this had only just been alleviated by the recent opening into the workings from Shaft 2 (1875, 507).

7.2.3 In June 1870 heavy rain meant that the work on the tunnel had to be stopped until pumping engines were installed (Minutes of the Settle to Carlisle Construction Committee June 1870). By July 30th 1870 the shaft excavations were deep enough to be ready for the steam engines to be installed (Minutes of the Settle to Carlisle Construction Committee 30th September 1870). In October the engines were at work at both shafts (Minutes of the Settle to Carlisle Construction Committee 31st October 1870), but further problems were ahead. A severe winter at the beginning of 1871 temporarily halted work. Turnover of men was high, especially as the summer of 1871 saw more wet weather; in such conditions work hours were often limited and this reduced the wages (Baughan 1966, 172-3). In total the turnover in labour on Contract 2 was 36,000 and it is claimed that because of the difficulties in keeping labour Benton & Woodwiss endeavoured to provide a higher level of accommodation and services than on other parts of the line (Mitchell 1975, 5). Due to the heavy rainfall excavated hillside material was little more than slush in places and adhered to the tools *'like treacle'* and needed grafting tools and water buckets to remove it (Mitchell 1993, 81). One engineer on the line commented *'I have known men blast the shoulder [sic?] clay like rock, and within a few hours have to ladle out the same stuff from the same spot like soup in buckets. Or a man strikes a blow with his pick at what he thinks is clay, but there is a great boulder underneath almost as hard as iron, and the man's wrists, arms and body are so shaken by the shock that, disgusted, he flings down his tools, asks for his money, and is off'* (Pick 1986, 111).

7.2.4 In 1872, 92 inches of rain fell at Dent Head compared to the average of 68 inches (Baughan 1966, 179). When blasting there was the risk of being hit by rock debris; pieces weighting over 750kg had been known to fly over 18m (Mitchell and Mussett 1976, 26). In 1875 the rock was suddenly less firm than expected, causing further problems, and the excavation was still proving difficult in early 1875 (Baughan 1966, 185-7). The tunnel, although cut through solid rock, had to be lined with masonry for much of its length to prevent any falls of rock onto the track (Williams 1875, 508). In other places wrought iron ribs had to be fitted to support the horizontally bedded limestone strata (Thompson 1879, 86).

7.3 The Buildings

7.3.1 Today Airshaft 1 appears to stand much higher than Airshaft 2, being over 2.5m tall above the ground surface (**Figure 2, Plate 1**), but this is a result of the spoil around it having been cleared away. The construction of both is the same, English bond brickwork with an upper course of stone. A view down Airshaft 2 shows that this brickwork continues down the shaft as far as is visible (**Figure 2, Plate 5**).

7.3.2 The buildings noted in 1874 at Airshaft 2 included a blacksmith's workshop, a general store house, a mortar mill and five huts. There was a steam engine of twenty-five horse power for blowing air into the tunnel and lifting excavated debris, as well as another of twelve horse power for operating the tramway. The settlement at Airshaft 1 appears to have been slightly larger with eight huts mentioned, although with a slightly less powerful steam engine. Numerous huts, a weighing machine, stabling and a blacksmith's

workshop were also noted at the bottom of the hill near Raygill (Lancaster Guardian 15th August 1874).

- 7.3.3 Trenches 3 and 4 appear to relate to a building (c. 5m by 4m) associated with the steam engine at Airshaft 2, Trench 4 being situated on the southern edge of the square (50m²) reservoir still visible as an earthwork. The excavation also revealed the presence of a leat running parallel to the edge of the reservoir, suggesting that there was probably a network of water channels to direct water to the boilers in order to create the steam needed to power the engines.
- 7.3.4 From the contemporary newspaper articles (Lancaster Guardian 15th August 1874) we know that there were two engines on the Site, one to lift spoil from the shaft and a smaller one to operate the tramway. The evidence suggests that the larger engine or its boiler house was situated at the location of Trench 3. The smaller, winding engine is likely to have been situated at the top of the tramway incline and may therefore be represented by the possible structure (c. 2.5m by 2.5m) seen on the LIDAR data just to the north of Trench 2 (**Figure 3**). An article in the Leeds Mercury (4th September 1873) described the tramway that ran down the hillside to Raygill some 7 km to the north. The bedding for this track was seen in Trench 2, and the geophysical survey revealed the course of the trackway at the north end of the Site (see **Figure 3**). Some of the track from this can still be seen lying forgotten in nearby barns (T. Metcalfe *pers. comm.*).
- 7.3.5 Another possible small building is visible on the LIDAR data just to the north-west of the shaft (**Figure 3**). Its location next to the trackway and at the base of the spoil heap suggests that it may be related to the movement of materials between the airshaft and the trackway. At the southern end of the Site the geophysical survey revealed the course of the trackway between the settlements around Airshaft 1 and Airshaft 2. In this area it ran over relatively level ground and the carts may have been manually operated rather than winched, perhaps (given the presence of stabling in Raygill) assisted or largely drawn by horses.
- 7.3.6 Trenches 6 and 7 appear to relate to the workshops listed in the Lancaster Guardian (15th August 1874), apparently situated adjacent to the trackway. The incidence of heat-affected materials, particularly in Trench 7, suggests a possible location for the blacksmith's workshop. A probable building platform (measuring approximately 10m by 5m) can be seen here in both the geophysical results and the LIDAR data, although the responses are in slightly different locations (**Figure 3**). The results from Trenches 6 and 7 suggest a line of buildings at this point. Another possible geophysical/LIDAR feature (c. 13m by 8m) can be seen just to the north-west of Trenches 6 and 7 (**Figure 2**), representing a possible building or row of buildings facing onto the track-way.
- 7.3.7 A mortar mill is one of the buildings listed in the newspaper account (Lancaster Guardian 15th August 1874), but the evidence from the Site is that many of the buildings did not use mortar in their construction. Mortared walls were found only in Trenches 1 and 3 and a mortar surface in Trench 7. The likelihood therefore is that the mortar was being produced almost solely for use in the lining of the airshaft and tunnel.

7.4 The Workforce

- 7.4.1 Occupations listed in the census returns for the Shaft Huts are predominantly railway miners but a carpenter, joiner, two blacksmiths, stone masons and a sawyer are also listed as well as two engine drivers, two firemen and a stoker. Only a couple listed their occupation as labourer. The wages varied between the different contractors. Benton & Woodwiss are recorded as paying Miners 6/6, Navigators and Labourers 4/- and Boys 2/- (Baughan 1966, 430). Most of the workers were in their earlier twenties and older but a few younger boys of 15 years and above are listed as labourers; one 15-year-old boy living in the Shaft Huts was obviously serving a blacksmith's apprenticeship with his father. Some of the younger teenage girls listed servant as their occupation.
- 7.4.2 In common with other parts of the line Benton & Woodwiss appointed clergymen to educate and to provide a sobering influence on the workforce. In July 1870, William Fletcher from the Bradford Town Mission was appointed as a scripture reader for Contract 2 (Minutes of the Settle to Carlisle Construction Committee 4th July 1870). An article in the Lancaster Guardian (?20th June 1872) mentions his hard work along the line, including his distribution of *British Workmen* and other publications '*supplied gratis by the company for the use and benefit of their men*'.
- 7.4.3 There seems to be no evidence that the truck system operated during the construction of this line, but sub-tickets were issued when men wished an advance on their wages. Court records list a number of men charged with tampering with the amount shown on these (Mitchell 1989, 23).

7.5 Living conditions

- 7.5.1 There were four huts listed at Airshaft 2 in the 1871 census, each with between nine and 19 occupants. All the hut settlements appeared to follow the same pattern of a married couple and dependents (or occasionally their married children and grandchildren) and a number of unmarried lodgers. There were, however, instances where married lodgers and dependents are listed, and in some cases the wife appears to be resident elsewhere. Most of the railway workers along this stretch of the line appear to have been resident in the hut settlements, and only a few seem to have lodged in nearby villages. Despite the reputation for large numbers of Irish navvies (and one clay pipe stamped 'Dublin' was found on the Site), the overwhelming majority of the workers were English and many were fairly local.
- 7.5.2 Trenches 1 and 5 were located over what appears to have been a residential hut. The navvy settlements at Ribblehead, further south along the line, are recorded as having wooden walls and tarred felt roofs, and were described by a resident as 'comfortable' (Thompson 1879, 71-72). A typical hut appears to have been divided into three areas; one for the family, one for the lodgers and a central area as a combined kitchen and dining space (Cardwell *et al.* 2004, 197). An evaluation of the earthworks of the Ribblehead settlements revealed that the houses were generally built in terraces and were mostly constructed of timber. Stone foundations appear to have been primarily used for the civic and industrial buildings and only one building appears to have been entirely constructed from stone, despite the readily available supply. Much of the housing may well have been

prefabricated and built to a standard design to be later dismantled when no longer needed (Cardwell *et al.* 2004, 197, 202).

- 7.5.3 All this accords well with what was found in Trenches 1 and 5, despite the Ribblehead viaduct belonging to a different contract. At Risehill more use appears to have made of stone to form rough foundations. This may be due partly to geology and partly to the topography; the ground slopes significantly downhill within Trench 1 necessitating the raising of the northern foundation in order to create a level building. Given this it seems likely that suspended wooden floors were utilised as there is no evidence for terracing of the ground. The back-to-back fireplace supports the idea that there were internal divisions within a single hut or within a terrace, although these may have been at floor rather than foundation level. Two relatively large structures (each approximately 30m by 7m), parallel to each other and approximately 10m apart, can be seen on the LIDAR data, suggesting possibly two residential huts or terraces (**Figure 3**).
- 7.5.4 Very little animal bone was recovered from the site suggesting that the main refuse deposits were situated elsewhere. Furthermore, the finds appear to be largely (although not exclusively) associated with consumption rather than preparation, perhaps indicating that the kitchen area was located beyond the boundary of the trenches. The quality of some of the finds is, however, a little surprising, suggesting a modicum of gentility not perhaps expected in a navy camp.
- 7.5.5 Despite the condemnation of the House of Commons report the death rate was still extreme. On the whole workings there was an average of nearly one death a week, whether through accidents or in-fighting (Baughan 1966, 182). In 1873 the vicar of Cowgill, the Rev. D. Adams was obliged to write to the Committee asking for a subscription to enlarge the churchyard (Baughan 1966, 181-2; WPR 69/1/4/29).
- 7.5.6 An accident one evening, reported in the Leeds Mercury (4th September 1873) concerned 11 men and women who were riding in three of the tramway carts that were transporting a load down the hillside. The pin connecting the train to the wire rope on which they were winched broke and the carts hurtled down the hillside. One of the men in the carts managed to slow the vehicle sufficiently, enabling nine of the people to escape, but three women remained. The cart derailed and they were flung out, two of them to their deaths. Another time, a man walking drunk up the hill had laid his head upon the rail and was instantly killed when the carts came down, nearly decapitating him. The Public Health Record for Sedburgh in November of that year recorded the accident as well as mentioning that several similar incidents had occurred, although without fatal consequences.
- 7.5.7 Navvies had a reputation for hard drinking and brawling. The Committee report (SCHC 1846, 21) heard testimony from a surgeon working on the Sheffield and Manchester railway about the number of minor injuries caused by drinking and fighting. Junction Inn in Garsdale gained a notorious reputation during the construction of the line and was frequently fined for operating outside licensing hours and permitting drunkenness (Mitchell 1989, 27-8). Violence between the men was noted by contemporary writers as *'such a common occurrence that no notice is taken of them and it is found easier for these rough men to 'fight it out''* (Leeds Mercury 30th October 1874). A local woman recalls her grandfather *'coming over from*

Dentdale to take part in the fights arranged for the entertainment of the navvies. He did it for some time and used to get paid well (Tyler 2002, 35).

- 7.5.8 The Public Health Records recorded one of *'the chief difficulties... in certain parts of the district is the erection of navy settlements'*. The Medical Officer noted the overcrowding within the huts and the lack of division between the sexes as well as *'the pollution of numerous mountain streams in the valley of Dent and Garsdale'* (The Public Health Records of Sedburgh 19th November 1873). It raised concerns about the spread of infectious diseases, recommending limiting the number of lodgers in each hut and lime-washing the huts as well as improving drainage. Eyewitness descriptions of the settlements concerned with Blea Moor tunnel and the Ribbleshead viaduct to the south vividly describe the boggy conditions, refuse and free ranging domestic animals (Mitchell 1975, 7).
- 7.5.9 Cowgill School Log Book for May 23rd 1871 includes a reference to prohibiting the children from *'the huts and Dent Head'* coming to school on account of the outbreak of small-pox. The school was closed again on June 12th of the same year (Cowgill School Log Book). The Cowgill School Log Book noted on November 14th 1873 that the attendance that week had been affected by the presence of typhus amongst the railway workers. The Sedburgh Public Health Records from June 1874 noted that nine of the deaths that quarter were of the navy hut residents, including one from typhoid fever. Conditions at the hut settlements do not seem to have substantially improved despite criticism, although the Public Health Record from 1875 noted the *'satisfactory'* absence of epidemic disease, but also that *'the surrounding of the huts might be kept much more cleanly than at present they are, ashes, slops and refuse of every description being thrown out and left to accumulate in trenches at the doors'*.
- 7.5.10 The Lancaster Guardian (?7th May 1874) recorded the apparent suicide of one of the navvies; Robert Nicolson. After some weeks of depression and despite attempts at supervision he managed to cut his own throat while in the water closet. As well as another grim statistic of the lives claimed by the line this report also confirms that the toilets were situated away from the huts themselves rather than being adjoining outhouses. Trench 8 was the only area of excavation that gave any clues to the sanitary arrangements of the settlement. It does seem to indicate that there was an effort to direct waste away from the settlement.

8 RECOMMENDATIONS

- 8.1.1 The results from this evaluation should be incorporated into any further discussions of navy settlements along the Settle to Carlisle railway. The excavation shows that the archaeology, although ephemeral, is well preserved. The Site is not under threat of development.
- 8.1.2 A short summary of the results of the evaluation, based on the information presented in this report, will be submitted to the *Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society*, for the annual round-up of archaeology in the county. A copy of this assessment report will be submitted to the county Sites and Monuments Record.

9 ARCHIVE

- 9.1.1 The excavated material and archive, including plans, photographs and written records, are currently held at the Wessex Archaeology offices under the project code 68737 and site code RHT 08. It is intended that the archive will ultimately be deposited with the Dales Countryside Museum, Hawes, North Yorkshire.

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Newspapers

- Lancaster Guardian
- Leeds Mercury

Websites

- The National Archives: <http://www.nationalarchives.gov.uk/A2A/>

Table 1: All finds by material type and by trench (number / weight in grammes)

Material	Tr 1	Tr 2	Tr 3	Tr 4	Tr 5	Tr 6	Tr 7	Tr 8	TOTAL
Pottery	132/1037	4/11	1/13	4/30	579/2594	10/42	32/189	70/320	832/4236
Ceramic Building Material	18/4643	7/31	7/3266	2/152	108/806	-	-	-	142/8898
Clay Pipe	27/98	2/3	13/51	2/3	17/56	3/8	-	-	64/219
Glass	33/369	1/4	1/1	-	87/622	-	-	5/141	127/1137
Stone	9/50	-	-	-	1/1	-	-	-	10/51
Jet (no. objects)	1	-	-	-	-	-	-	-	1
Shell (no. objects)	-	-	-	-	-	1	-	-	1
Plastic (no. objects)	1	-	-	-	1	-	-	-	2
Slag/cinder	-	1/6	17/1622	-	5/114	-	-	-	23/1742
Metalwork (no. objects)	144	16	18	40	89	7	2	9	325
Copper Alloy	6	-	1	-	10	2	-	-	19
Iron	138	16	17	40	79	5	2	9	306
Animal Bone	13/82	-	-	-	2/2	-	-	1/4	16/88

Appendix 1: Trench Summaries

bgl = below ground level

TRENCH 1			Type:	Hand Excavated	
Dimensions: 10.00x4.89m		Max. depth: 0.52m	Ground level: 394.44-392.92m aOD		
context	description			depth	
101	Topsoil	Modern topsoil. Dark brown silt. Fine and friable. 1% stone, angular, <10-20mm. Heavily bioturbated. Homogeneous. Occasional coal flecks and fragments. Peaty. Directly under turf and reeds.			0.00-0.15m bgl
102	Layer	Layer beneath topsoil located to the west and north of the fireplace. Dark grey silt loam. <1% inclusions. Heavily bioturbated. Fairly friable. Homogenous. Similar to (103), (104) and (106). Occupies grid squares AA-BA, except squares AX, AT and AY.			0.08m+ deep
103	Layer	Layer beneath topsoil located to the south of the fireplace. Dark grey silt loam. <1% inclusions. Heavily bioturbated. Fairly friable. Homogenous. Similar to (102), (104) and (106). Occupies grid squares BB-BP.			0.08m+ deep
104	Layer	Layer beneath topsoil located within the eastern area of the fireplace. Dark grey silt loam. 30% stone, angular, 20-200mm. Heavily bioturbated. Fairly friable. Homogenous. Similar to (102), (103) and (106). Occupies grid squares AT and AY. Overlies (109).			0.20m deep
105	Layer	Path surfacing material. Mid black-grey black silt loam. Clinker rich deposit. 1.72m+ wide. Compact. Homogeneous. Overlies (112). Later than foundation cut (116) .			0.15m deep
106	Layer	Layer beneath topsoil overlying the western part of the fireplace. Dark grey silt loam. 30% stone, angular, 20-200mm. Heavily bioturbated. Fairly friable. Homogenous. Similar to (102), (103) and (104). Occupies grid square AW. Overlies (108).			0.20m deep
107	Structure	Rubble wall foundation. Mid grey black silt. 90% stone rubble, angular, 80-400mm. Occasional clinker. North-east – south-west aligned. Fill of (116) .			0.28m deep
108	Layer	Layer beneath (106) within the western part of the fireplace. Dark grey silt loam. <1% stone, sub-angular, <10-40mm. Occasional clinker and mortar flecks. Some bioturbation. Fairly friable. Fairly homogenous. Occupies grid square AW. Partly excavated.			0.15m+ deep
109	Layer	Layer beneath (104) within the eastern part of the fireplace. Dark grey silt loam. <1% stone, sub-angular, <10-40mm. Occasional clinker and mortar flecks. Some bioturbation. Fairly friable. Fairly homogenous. Occupies grid square AT and AY. Partly excavated.			0.15m+ deep
110	Layer	Pale grey clay. <1% stone, sub-angular, <10-20mm. Compact. Some bioturbation. Unexcavated.			-
111	Layer	Linear stony bank. North-east – south-west aligned. Dark grey black silty clay loam. 40% stone, sub-angular – angular, <10-30mm. Unexcavated.			-
112	Layer	Bedding for path layer (105). Dark grey black silt. 60% stone, sub-angular – angular, 0.2-0.4m. Compact. Overlies natural peat. Banked up against foundation cut (116) .			0.09m deep
113	Natural	Natural peat; dark brown; waterlogged; humic; homogeneous; bioturbated.			0.22-0.35m bgl
114	Structure	'H' shaped back-to-back fireplace. Stone built. Roughly squared blocks- length 0.10-0.43m, width 0.08-0.36m, depth 0.07-0.21m. Mid yellow grey mortar with black flecks. Random coursed. Irregular jointing. Thin rubble core. Width 2.20m.			0.52m+high
115	Layer	Tumble associated with the collapse of the upper portion of the fireplace (114) and the wall foundation (107).			0.15m+
116	Cut	Construction cut for rubble wall foundation. North-east – south-west aligned. Shallow, concave sides, concave base. 1.02m			0.28m deep

		wide. Filled with (107).	
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TRENCH 2			Type:	Hand Excavated	
Dimensions: 9.08x1.06m		Max. depth: 0.47m	Ground level: 398.27-398.48m aOD		
context	description			depth	
201	Topsoil	Modern topsoil. Dark brown silt loam. Fine and friable. 1% stone, angular, <10-30mm. Heavily bioturbated. Homogeneous. Directly under turf. Overlies (202).			0.00-0.14m bgl
202	Layer	Eroded material from trackway and spoil heaps found at western end of the trench. Mid grey silt. 20% stone, angular, <10-40mm. Moderately compact. Heavily bioturbated. Overlies (205)			0.11m deep
203	Layer	Tumbled stone at the east end of the trench. Dark brown silt loam. Fine and friable. 80% stone, blocky and angular, 0.10-0.32m. Fan shaped, 0.9m wide, 1.9m long. Overlies (206)			0.12m deep
204	Layer	Made up ground, mound constructed for trackway. Mid grey brown silt. 80% stone slabs and smaller fragments, angular, <10-30mm, 80-150mm. Compact. Bioturbated. Largely unexcavated. 3.48m wide. Overlies (209).			0.15m deep
205	Structure	Kerbing/revetment for trackway. Rough unshaped blocky stones. Single line of stones, irregular. Clearest on western side of the trackway but some traces on east side. Overlies (204).			0.12m deep
206	Layer	Eroded material on the eastern side of the trench. Mid grey silt. 60% stone, sub-angular – angular, <10-40mm. Scree like material. Moderately loose. Bioturbated. Overlies (207) and (209).			0.10m deep
207	Layer	Accumulated/contaminated material. Mid yellow grey silty clay. <1% stone, angular, <10-20mm. Slightly mixed. Frequent iron oxide staining. Found at the east end of the trench. Overlies (208).			0.02m deep
208	Layer	Made ground. Pale grey clay. No visible inclusions. Slightly mixed. Compact. Overlies (210).			0.10m deep
209	Layer	Consolidation layer. Mid grey silt. 60% stone, blocky and angular, 30-200mm. Bioturbated. Fairly compact. Overlies (208).			0.16m deep
210	Natural	Natural peat. Dark brown. Waterlogged. Humic. Homogeneous. Bioturbated.			0.37-0.40m+ bgl

TRENCH 3			Type:	Hand Excavated	
Dimensions: 8.10x0.92m		Max. depth: 0.75m	Ground level: 397.99-398.49m aOD		
context	Description			depth	
301	Topsoil	Modern topsoil. Dark brown silt loam. Fine and friable. 1% stone, angular, <10-40mm. Heavily bioturbated. Homogeneous. Peaty. Directly under turf and reeds.			0.00-0.15m bgl
302	Layer	Demolition debris. Pale brown silt. 2% stone, angular, <10-100mm. Abundant pink mortar fragments. Occasional coal fragments. Fairly friable. Mixed. Mortar fragments identical to mortar used in walls (309) and (311). Overlies (304) and (311).			0.12m deep
303	Layer	East – west aligned linear bank of loose rubble. Visible as ridge. Composed of stones, fired brick and cinder. 0.66m wide. Overlies (305).			0.20m deep
304	Layer	Large dump of industrial waste. Dark grey black silt. 75% clinker (ash, coal, coke). 5% mid grey mortar fragments. Contained internal tip-lines and sub-layers but effectively same related series of events. Overlies and banked up against (303).			0.36m deep
305	Layer	Clinker rich layer. Dump of industrial waste. Dark grey black silt. 80% clinker, <10-30mm. Fairly well compacted. Overlies (306).			0.12m deep
306	Layer	Clinker rich layer. Dump of industrial waste. Dark grey black silt. 80% clinker, <10-20mm. Compact. Similar to (305). Overlies (308) and (309).			0.13m deep
307	Layer	Wall tumble to the south of wall (311), associated with (311) but			0.08m deep

		position above (302) suggests that it post-dates the major demolition phase. Spread of angular stone blocks 6-30cm. Overlies (302).	
308	Layer	Made ground. Mid blue grey clay. No visible inclusions. Thin layer. Fairly homogeneous. Compact. Overlies (312).	0.02m deep
309	Structure	Stone built wall. East – west aligned. Mid pink lime mortar with crushed CBM inclusions. Irregular jointing. Single line of stones. Only one course uncovered. 0.54m wide.	0.23m high
310	Layer	Dump of cinder-rich waste. Mid red brown silt loam. 1% stone, angular, <10-20mm. 40% slag, angular, 20-40mm. Abundant iron oxide staining.	0.13m deep
311	Structure	Stone built wall. East – west aligned. Mid pink lime mortar with crushed CBM inclusions. Irregular jointing. Full width not fully exposed. Only one course uncovered. At least 0.56m wide.	0.02m+ high
312	Natural	Natural peat; dark brown; waterlogged; humic; homogeneous; bioturbated.	0.73-0.75m + bgl

TRENCH 4			Type:	Hand excavated
Dimensions: 4.42x1.06m		Max. depth: 0.66m	Ground level: 398.47-398.85m aOD	
context	Description			depth
401	Topsoil	Modern topsoil. Dark brown silt loam. Fine and friable. 1% stone, angular, <10-40mm. Heavily bioturbated. Homogeneous. Peaty. Directly under turf and reeds. Overlies (403).		0.00-0.18m bgl
402	Layer	Tumble associated with wall (409). Dark brown silt loam. Fine and friable. 80% angular stone blocks, 0.08-0.34m. Moderately loose. Overlies (407).		0.34m deep
403	Layer	Accumulated eroded and tumbled material, derives from the spoil heaps to the south-west. Mid grey silt loam. 20% stone, angular, <10-40mm and occasional larger stones 0.08-0.50m. Fairly homogenous. Moderately loose. Overlies (402).		0.21m deep
404	Layer	Deliberate deposit, clay core for wall (409). Pale grey clay. <1% stone, sub-angular – sub-rounded, <10-20mm. Linear in plan. Fairly homogeneous. Compact. Bioturbated.		0.11m+ deep
405	Cut	Cut of leat. Filled with (406) and (407). North-west – south-east aligned, runs parallel to wall (409). 1.12m wide. Cuts (408), lower portion cuts through the natural peat. Steep, concave sides, slightly concave base.		0.39m deep
406	Deposit	Lower fill of leat (405). Dark grey silt. 1% stone, angular, 80-100mm. Waterlogged. Moderately compact. Combination of silting and tumbled stones. Diffuse interface with (407).		0.09m deep
407	Deposit	Upper fill of leat (405). Dark grey silt loam. 40% stone fragments, <10-40mm, 5% stone blocks, angular, 0.08-0.15m. Rare coal fragments. Rare iron oxide stains. Fairly compact. Combination of silting and tumbled stones. Diffuse interface with (406).		0.35m deep
408	Layer	Possible surface or consolidation layer. Mid grey clay. 20% stone, angular, 80-200mm. Compact. Unexcavated. Partly banked up against (409).		-
409	Structure	Stone built wall. North-east wall of reservoir. North-west – south-east aligned. North-east face lies beyond the trench can be seen in the ground. Width of wall 1.20m. Stone faced with unshaped blocks (length 0.08-0.26m, width 0.08-0.22m, depth 0.06-0.14m). Facing poor and irregular but this may be due to the amount of stones that have been dislodged (402). Coursing random uncoursed, roughly three courses seen, jointing irregular. Core of the wall and the bonding is the clay deposit (404) into which (409) is pressed.		0.36m+ high
410	Natural	Natural peat; dark brown; waterlogged; humic; homogeneous; bioturbated.		-

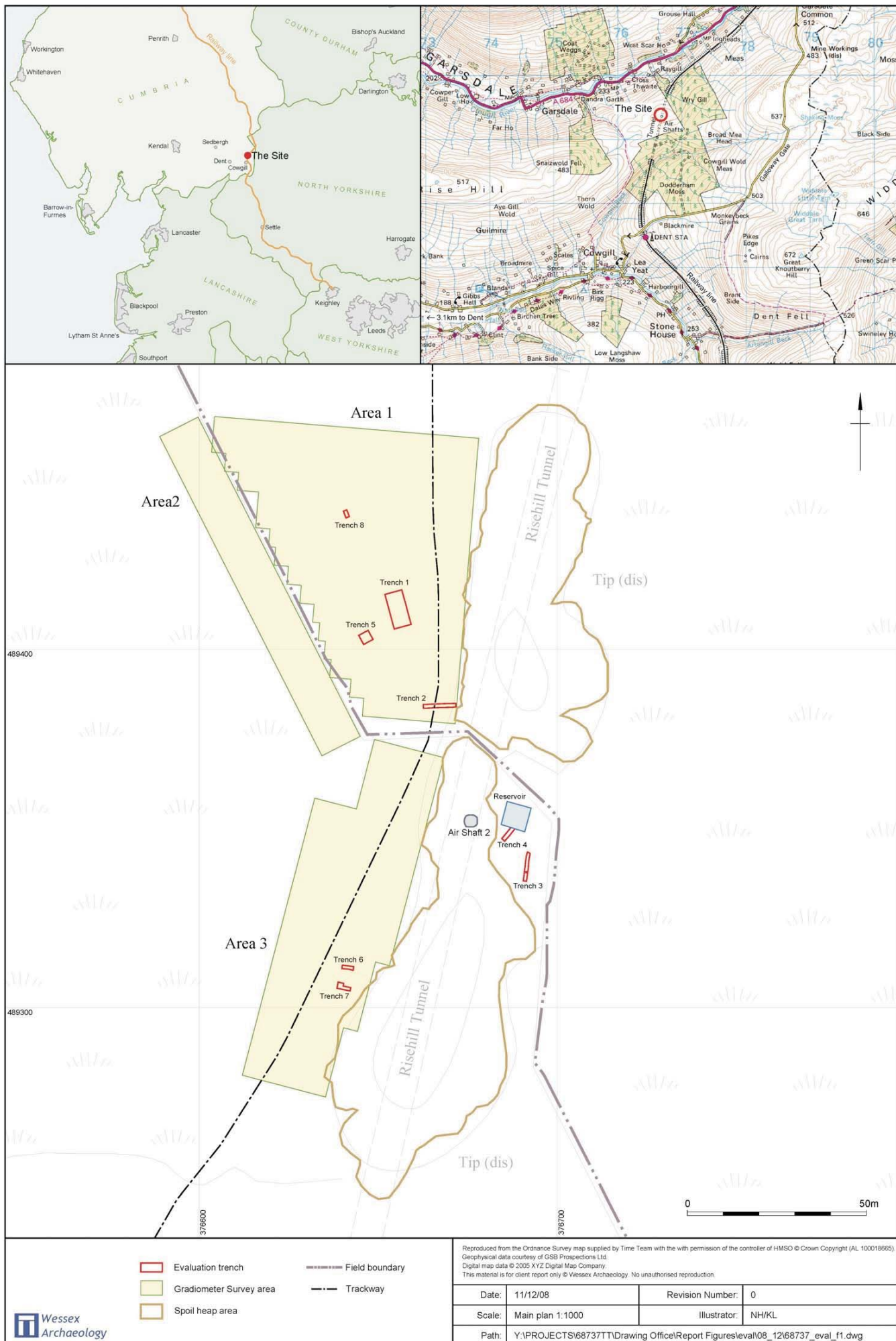
TRENCH 5			Type:	Hand excavated
Dimensions: 2.97x2.87m		Max. depth: 0.12m	Ground level: 394.31-393.64m aOD	
context	Description			depth
501	Topsoil	Modern topsoil. Dark brown silt. Fine and friable. 1% stone, angular, <10-20mm. Heavily bioturbated. Homogeneous. Occasional coal flecks and fragments. Peaty. Directly under turf and reeds. Overlies (502) and (504).		0.00-0.10m bgl
502	Layer	Dark grey brown silty clay loam. 40% stone, angular, <10-40mm. Very humic peaty deposit. Moderately compact. Overlies (503).		0.04m deep
503	Layer	Finds rich spread. Dark grey brown silt loam. 10% stone, angular, <10-20mm. Fairly homogeneous. Moderately compact. Overlies (505).		0.06m deep
504	Layer	Linear spread of rubble, north-east – south-west aligned, wall tumble. 80% stone, angular, 0.04-0.55m. Occasional firebrick fragments. Unexcavated.		-
505	Layer	Dark grey black silt loam. 2% stone, sub-angular – angular, 20-80mm. Frequent clinker. Moderately compact. Slightly humic. Mostly unexcavated but occasional glimpses of (506) beneath.		-
506	Layer	Mid grey clay. Compact. Unexcavated.		-

TRENCH 6			Type:	Hand excavated
Dimensions: 3.18x0.97m		Max. depth: 0.23m	Ground level: 396.91-396.61m aOD	
context	Description			depth
601	Topsoil	Modern topsoil. Dark brown silt loam. Fine and friable. 1% stone, sub-angular - angular, <10-60mm. Heavily bioturbated. Homogeneous. Peaty. Directly under turf and reeds.		0.00-0.18m bgl
602	Layer	Wall tumble. Spread of angular stone blocks 0.10-0.34m. Associated with (603) and (605). Unexcavated.		-
603	Structure	North-north-east – south-south-west aligned wall, north-north-west return visible in the ground just to the north of the trench. Stone built, angular – sub-angular rubble, 0.14-0.34m. No distinct facing, random uncoursed, irregular jointing. Unexcavated.		-
604	Layer	Possible disturbed floor surface. Mid grey silty clay. 5% stone, sub-angular – sub-rounded, <10-30mm. Frequent burnt clay, possible mortar flecks. Compact. Unexcavated.		-
605	Structure	Stone rubble spread southern part of a distinct mound/heap seen just to the north of the trench. Possible collapsed chimney stack.		-
606	Layer	Dark grey silt. <1% stone, sub-angular, <10-20mm. Moderately compact. Fairly homogenous. Unexcavated.		-

TRENCH 7			Type:	Hand excavated
Dimensions 3.73x1.78m		Max. depth: 0.39m	Ground level: 396.17-396.39m aOD	
context	Description			depth
701	Topsoil	Modern topsoil. Dark brown silt loam. Fine and friable. 1% stone, sub-angular - angular, <10-60mm. Heavily bioturbated. Homogeneous. Peaty. Directly under turf and reeds.		0.00-0.14m bgl
702	Structure	North-north-east – south-south-west aligned wall. Stone built, angular – sub-angular rubble, 0.10-0.30m. No distinct facing, random uncoursed, irregular jointing. Left in situ. Thought to be overlying (708).		0.17m+ high

703	<i>Layer</i>	Dark brown silty clay loam. 15% stone, angular, <10-100mm. Occasional fragments of brick. Banked up against the east face of (702). Unexcavated.	0.11m+ deep
704	<i>Deposit</i>	Mid black clay. Abundant clinker. Moderately loose. Fill of (705).	0.11m deep
705	<i>Cut</i>	Possible post-hole. Sub-oval in plan. Concave, moderate sides, concave base. 0.40m long, 0.26m wide. Fairly shallow. Filled with (704). Cuts (707).	0.11m deep
706	<i>Layer</i>	Possible cobbled surface within building. Sub-rounded, water-worn cobbles, slightly heat affected. Unexcavated. Overlies (707).	-
707	<i>Layer</i>	Mortar surfacing, possible bedding for (706). Pale red. Mortar and crushed brick. Compact. Overlies (708).	0.15m deep
708	<i>Layer</i>	Mid grey clay. Heat affected on upper surface (pink-orange). Compact. Overlies (709).	0.11m deep
709	<i>Natural</i>	Natural peat; dark brown; waterlogged; humic; homogeneous; bioturbated.	0.39m+ bgl
710	<i>Structure</i>	Possible slate post-pad. Large sub-rectangular, 30x26cm. Laid horizontally. Overlies (707). Left <i>in situ</i> .	0.06m deep

TRENCH 8			Type:	Hand excavated
Dimensions 2.00x1.00m		Max. depth: 0.16m	Ground level: 389.29-389.47m aOD	
context	Description			depth
801	<i>Topsoil</i>	Modern topsoil. Dark brown silt. Fine and friable. 1% stone, angular, <10-20mm. Heavily bioturbated. Homogeneous. Rare coal flecks. Peaty. Directly under turf and reeds.		0.00-0.16m bgl
802	<i>Structure</i>	Wooden structural elements incorporated into (803) that appear to form a wooden structure/lining for latrine drain (805). Three timber items seen. East – west aligned plank, laid flat across (804), 0.10m wide, over 0.32m long (extends into eastern section). North-west – south-east orientated plank, laid almost vertical (top tilted westwards), 0.8m long, 0.04m wide. North – west – south-east orientated plank, partially obscured by (803), 0.10m wide, over 0.18m long. Left <i>in situ</i> . Partially incorporated into (803) but principally lines drain cut (805).		-
803	<i>Layer</i>	Probable made ground. Pale grey sandy clay. <2% stone, angular, <10-20mm. Inclusions poorly sorted. Firm and compact. Bioturbated. Unexcavated. Cut by (805).		-
804	<i>Deposit</i>	Fill of latrine drain (805). Dark brown silty sand. <2% stone, angular, <10-20mm. One larger angular stone, 80x60x100mm. Staining believed to be human faeces/cess. Mixed deposit. Unexcavated. Overlies (802).		-
805	<i>Cut</i>	Cut of latrine drain. Filled with (804). North-east – south-west aligned linear feature. Wooden elements (802) appear to be part of the structure of this feature. Cuts (803).		-



Site and trench location plan

Figure 1

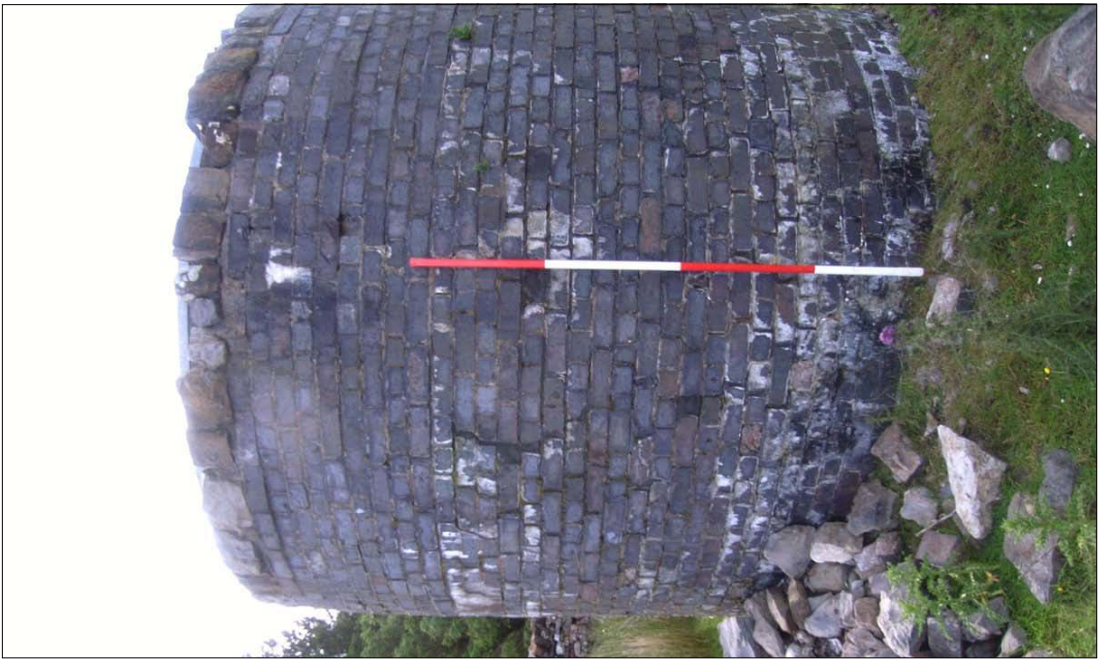


Plate 1: Airshaft 1



Plate 2: View from Airshaft 1 to Airshaft 2 arrowed (from the south)



Plate 3: View along spoil heaps, Airshaft 2 (from the north)

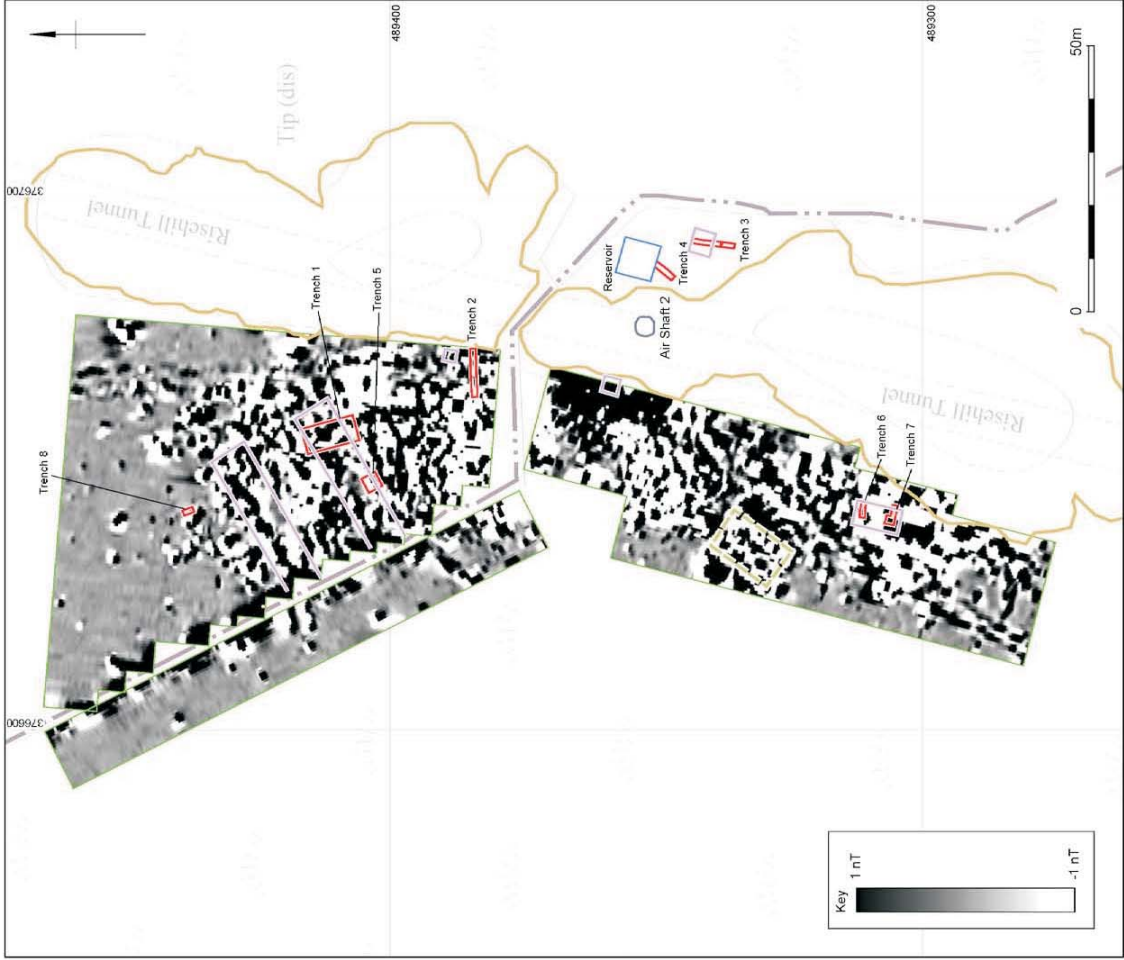


Plate 4: View of spoil heaps from Trenches 6 and 7 (from the south-west)

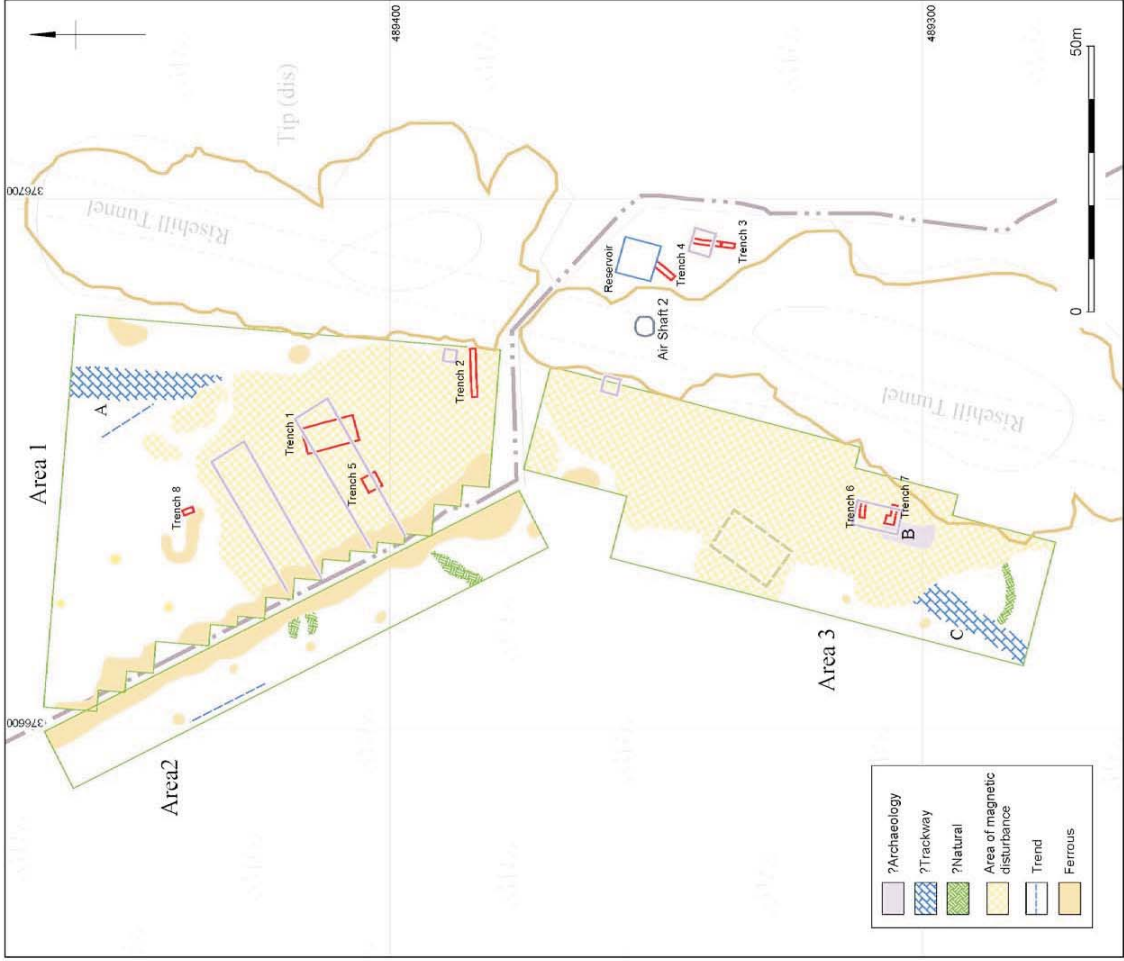


Plate 5: View into Airshaft 2

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Greyscale plot



Interpretation

- Evaluation trench
- Gradiometer Survey area
- Spoil heap area
- Field boundary
- Possible feature from LIDAR data
- Possible feature from geophysics data

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Geophysical data courtesy of GSB Prospection Ltd

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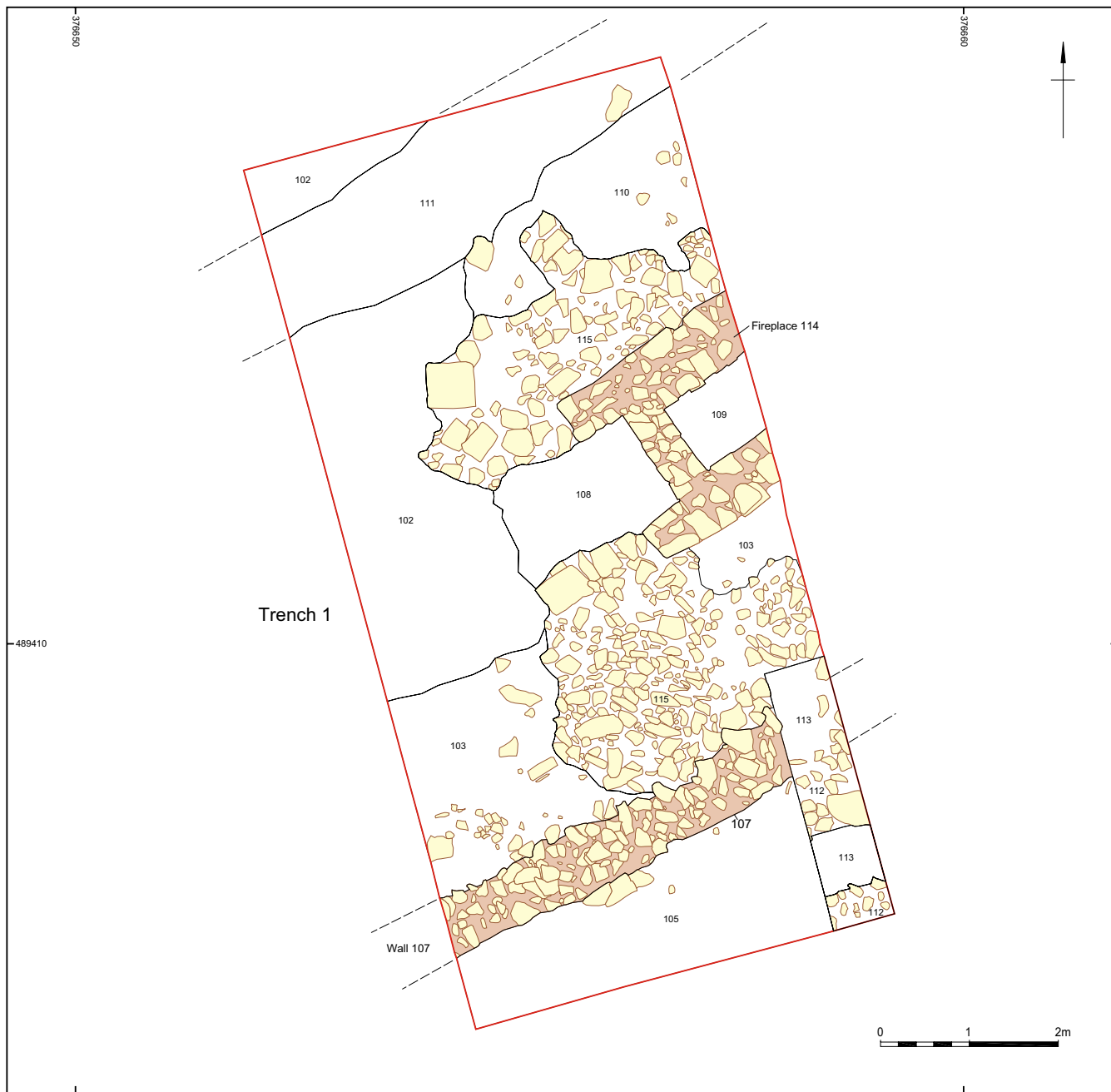

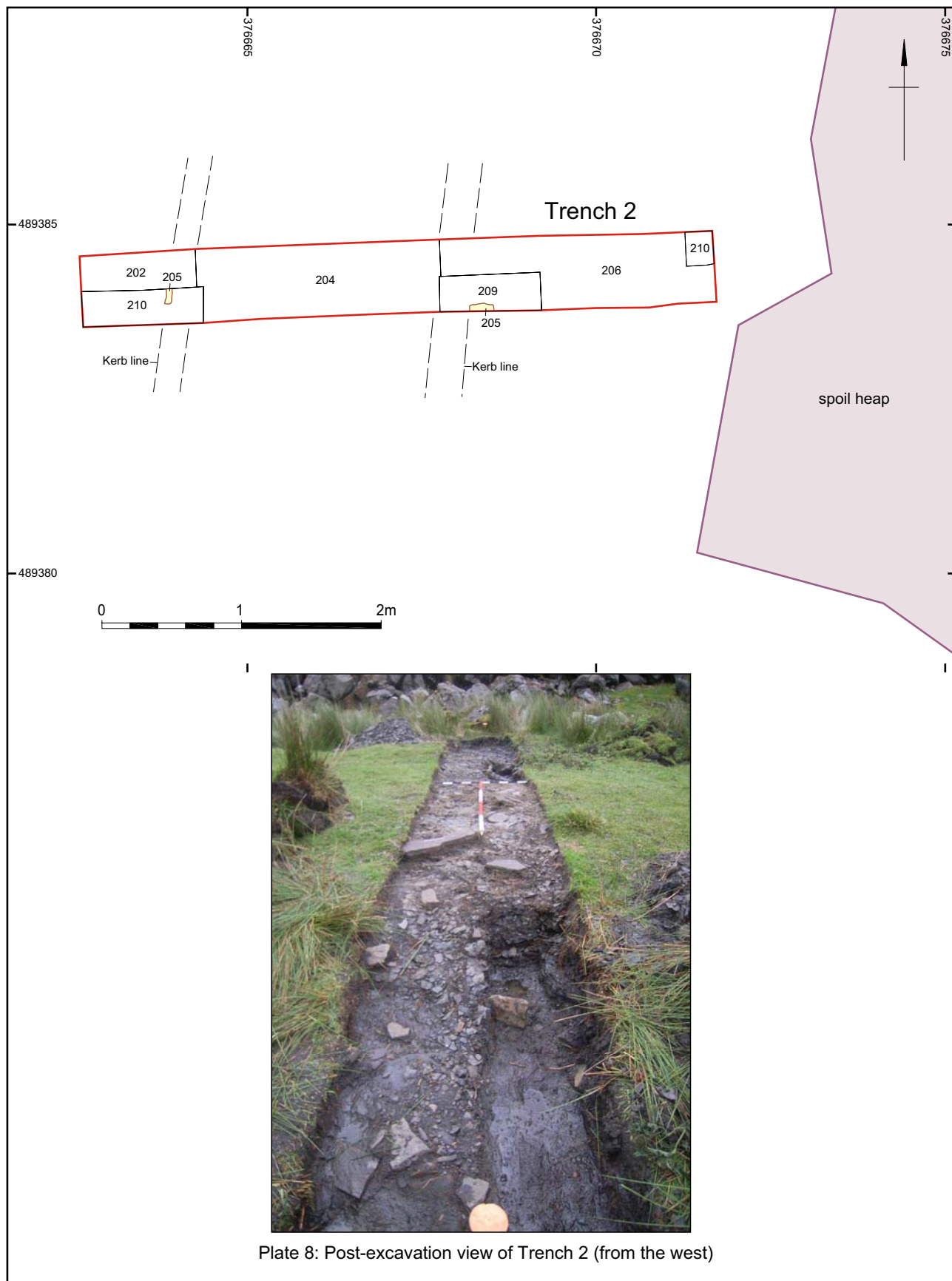


Plate 6: Pre-excavation view of Trench 1 (from the north)



Plate 7: Post-excavation view of Trench 1 (from the north)

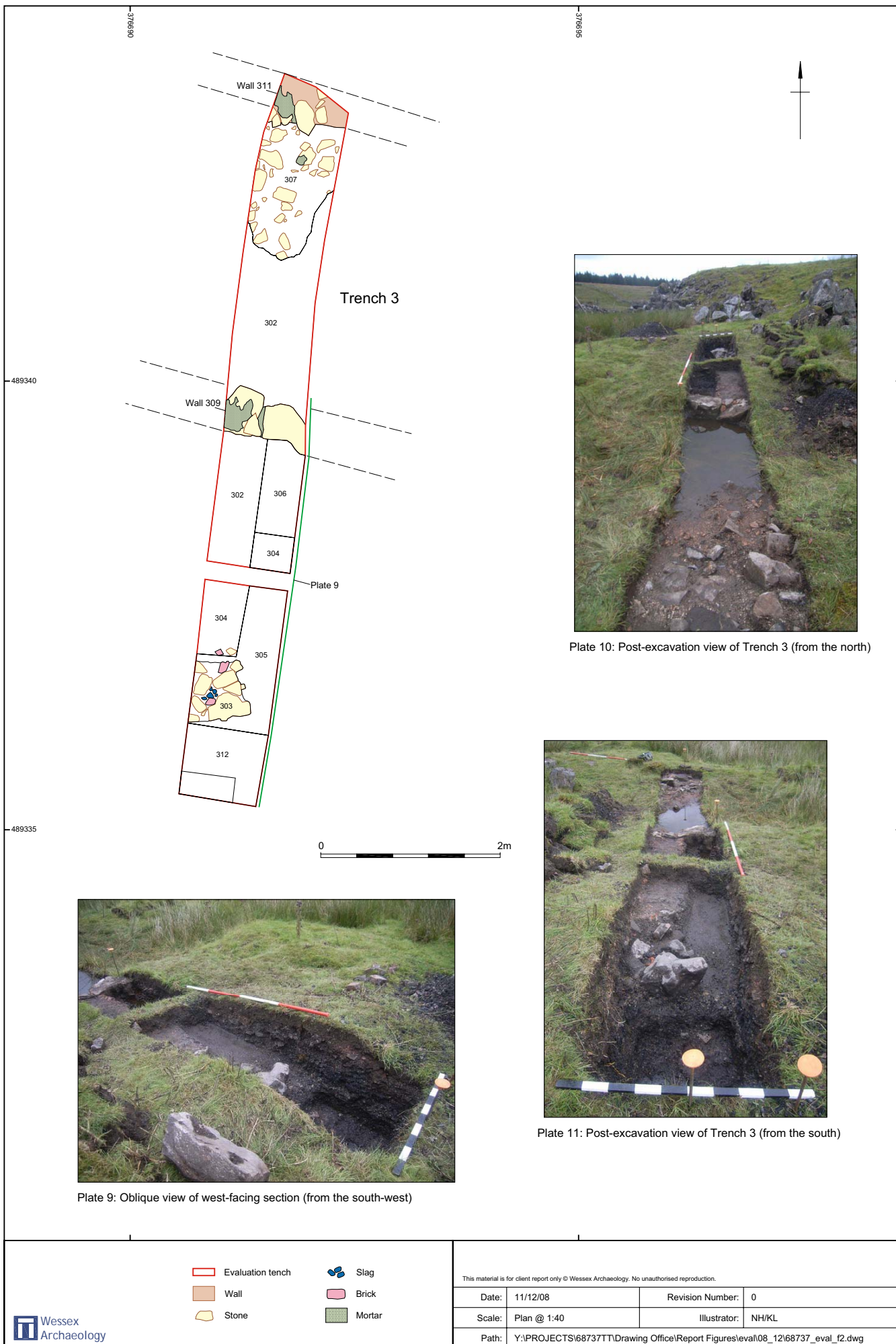
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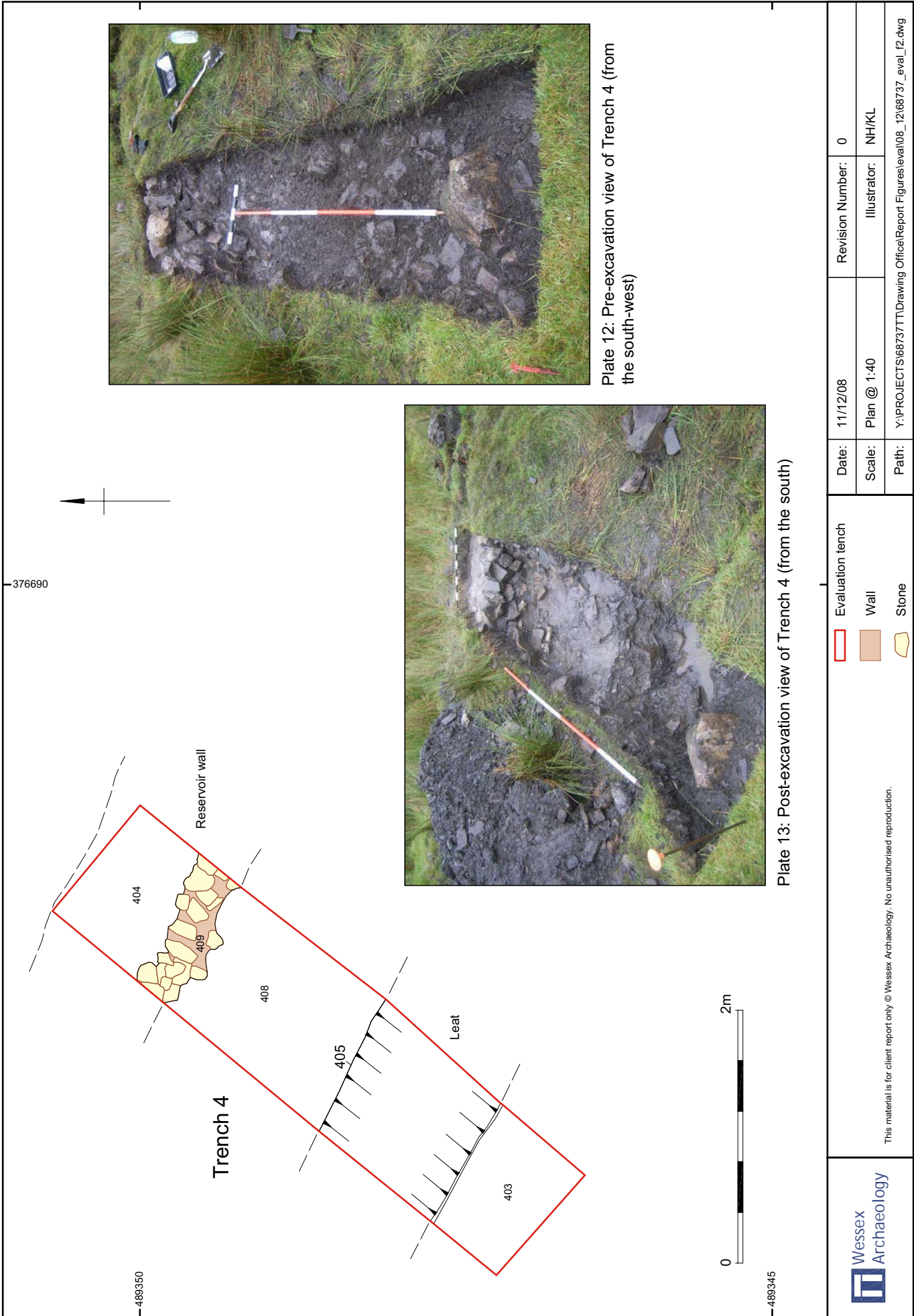
Trench 2: plan and photographs

Figure 5

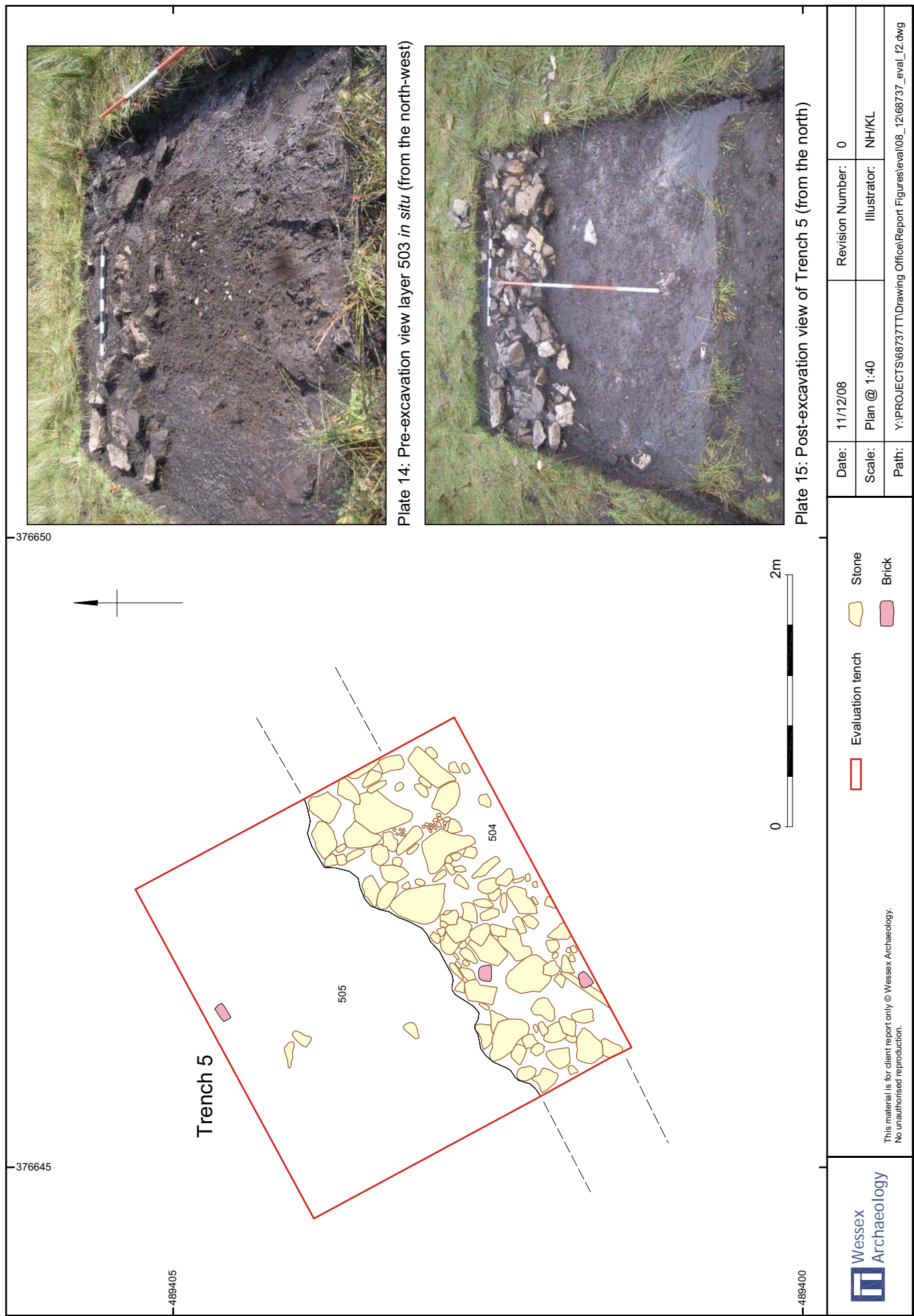


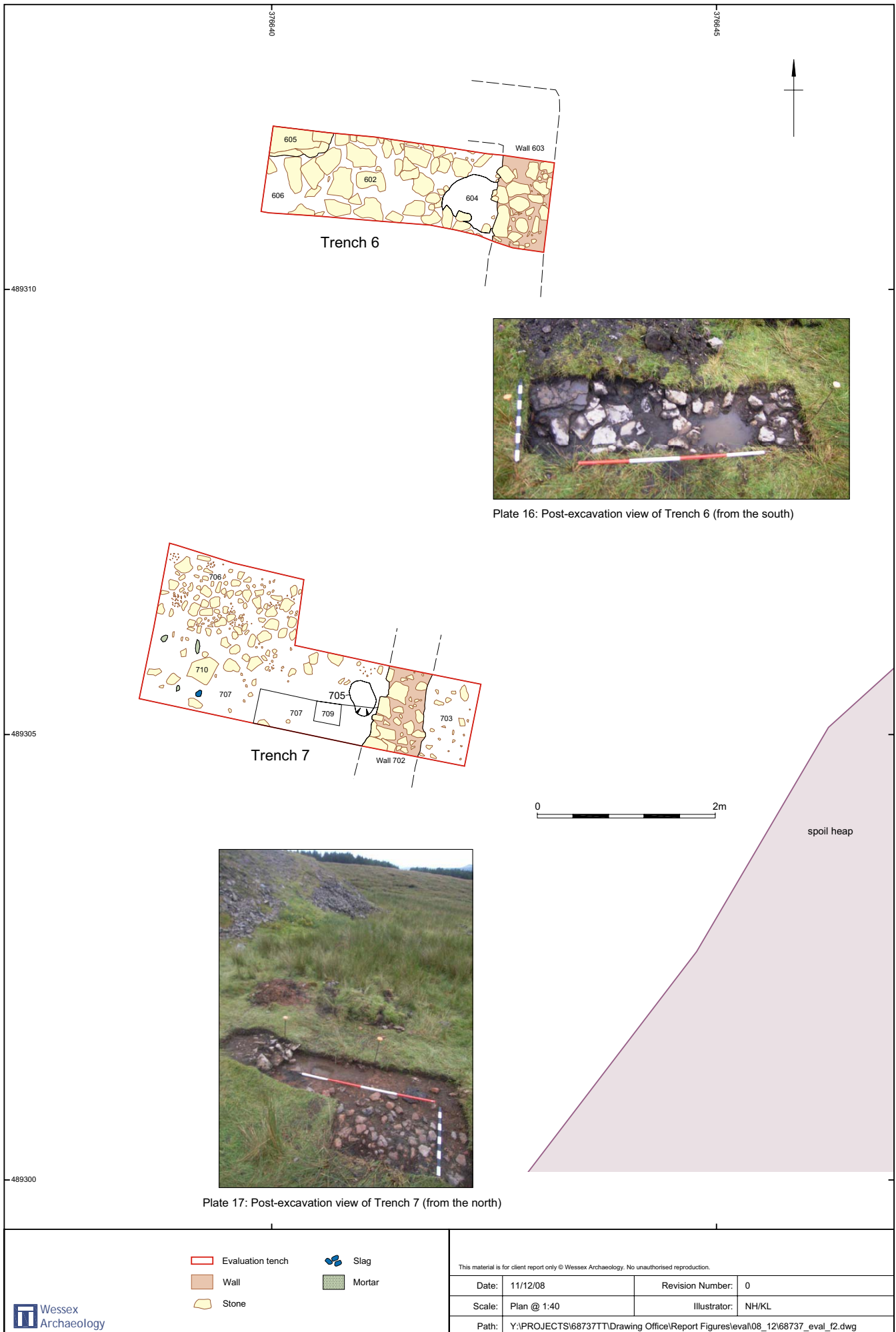
Trench 3: plan and photographs

Figure 6



Trench 4: plan and photographs Figure 7





Trenches 6 and 7: plan and photographs

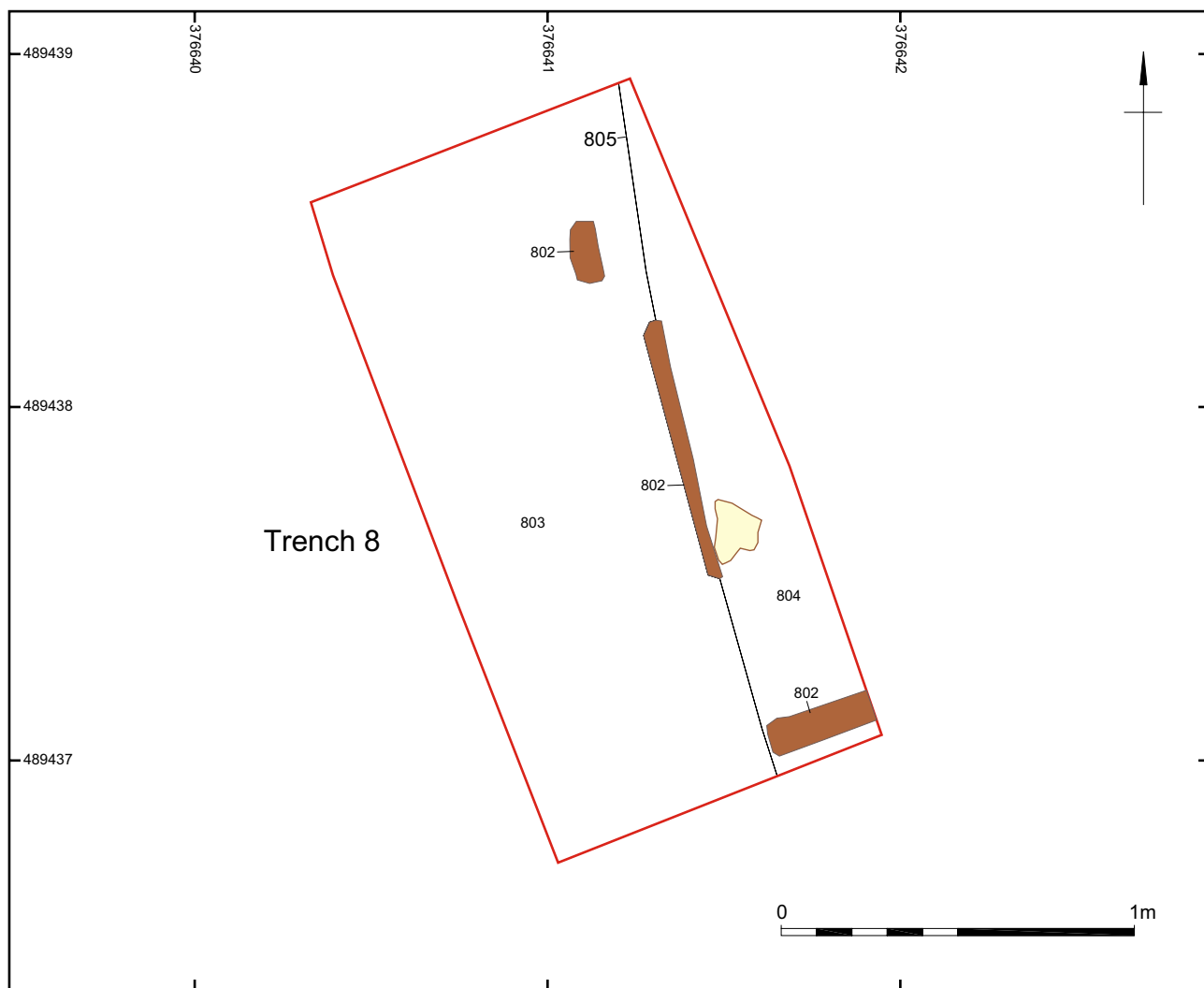


Plate 18: Detail of wooden structure 802 (part of north west - south east aligned fragment)

<div> <div></div> Evaluation trench </div> <div> <div></div> Stone </div> <div> <div></div> Wood </div> <div> </div>	This material is for client report only © Wessex Archaeology. No unauthorised reproduction.		
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	Scale:	Plan @ 1:20	Illustrator: NH/KL
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Plate 19: Decorated clay pipe bowl from Trench 1



Plate 20: Decorated clay pipe bowl from Trench 3



Plate 21: Plastic hair combs, glass and jet buttons from Trenches 1 and 5



Plate 22: Selection of pottery from context 503



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