

Solway Coast Wastewater Treatment Improvements, Cumbria



Archaeological Evaluation and Topographic Survey



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SUMMARY

Prior to proposed improvement works to wastewater treatment along the Solway Coast from Bowness-on-Solway (NY 2257 6281) to Drumburgh (NY 2672 5980), Cumbria, a number of meetings were held between United Utilities, who are proposing to undertake the work, representatives of Cumbria County Council Archaeology Service and the Hadrian's Wall Archaeologist, at which a program of mitigation was agreed. Part of the mitigation comprised archaeological evaluation in eleven separate areas that would be impacted upon by the proposed scheme, and the topographic survey of Site **81**, identified in a desk-based assessment of the proposed works (OA North 2004).

Three of the areas required to be evaluated were examined during this phase of works, comprising Drumburgh pumping station (NY 2672 5980), Bowness-on-Solway pumping station/septic tank (NY 2278 6278) and the Westfield Marsh pumping station (NY 2467 6136), as well as the topographic survey of Site **81** (NY 2491 6122). Three trenches were placed in each of the three evaluation areas, with the trenches remaining within the constraints of the ground disturbance associated with the proposed development. Trenches 1-3 were located at the site of the proposed Drumburgh pumping station, Trenches 4-6 at Westfield Marsh pumping station and Trenches 7-9 at the Bowness-on-Solway pumping station/septic tank.

Trenches 1-3 illustrated fairly uniform stratigraphy, with post-medieval deposits directly overlying the natural geology, which was only exposed at significant depth. This is highly suggestive of a large-scale truncation in this area, almost certainly dating to the post-medieval period and possibly relating to the current pumping station. It seems likely that the truncation would have removed all but the deepest below-ground remains and that any archaeology in this area has already been destroyed and so will not be affected by the proposed pumping station.

Trench 4 revealed the most significant archaeology found in this evaluation, comprising a rammed gravel surface overlain by two pieces of well-carved sandstone. The only artefacts recovered from the gravel surface were some fragments of oyster shell that were directly on top of it; however, the gravel surface was shown to be earlier than the precursor to the modern Carlisle to Port Carlisle road, showing it to be of some antiquity. Given the nature of the remains, and their location, it seems reasonable to suggest a Roman date for this feature. Trenches 5 and 6 remain unexcavated, for reasons of health and safety, following identification of live services with a Cable Avoidance Tool. It was decided not to move these trenches away from the services as this would have entailed excavating outside the areas of proposed ground disturbance. Trenches 7-9 revealed broadly similar stratigraphy across the Bowness-on-Solway site, with no archaeological features observed, and no artefacts recovered.

The topographic survey supported the idea that the ridge and furrow comprising Site **81** predates the construction of the Carlisle Navigation Canal, completed between 1820 and 1823.

It is recommended that a watching brief is maintained during ground disturbance at the proposed site of the Westfield Marsh pumping station.

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The evaluation was undertaken by Paul Clark and Dave McNicol, the survey by Chris Wild, and the topographic survey by Andy Bates. The report was written by Paul Clark and Andy Bates. The drawings were created by Chris Wild, Christina Clarke and Mark Tidmarsh. The report editing was undertaken by Alison Plummer and Emily Mercer. Alison Plummer managed the project.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 United Utilities are proposing improvements to wastewater treatment along the Solway Coast from Bowness-on-Solway to Drumburgh, Cumbria (Fig 1). The route runs through an area of high archaeological potential and affects a number of known sites including the Hadrian's Wall World Heritage Site (HWWHS). Following discussions between United Utilities, the Cumbria County Council Archaeology Service (CCCAS) and the Hadrian's Wall Archaeologist, it was proposed that the development area be subjected to a desk-based assessment and walkover survey as a first stage of archaeological investigation (OA North 2004). Following the completion of this work, discussions were held with both CCCAS and English Heritage, where it was decided that a further programme of archaeological work would be necessary.
- 1.1.2 The further work to be undertaken comprised archaeological evaluation, topographic survey and watching brief. The evaluation was designed to implement a programme of trial trenching examining the points at which the pipeline will cross Hadrian's Wall, together with the location of septic tanks, pumping stations and so forth and a number of sites identified by the desk-based assessment. This document forms the report on three of the eleven areas designated for evaluation, namely Drumburgh pumping station, Bowness-on-Solway pumping station/septic tank and the Westfield Marsh pumping station, (Fig 2), as well as the topographic survey of Site 81. The remaining eight areas designated for evaluation have yet to be evaluated.

1.2 SITE LOCATION, TOPOGRAPHY AND GEOLOGY

- 1.2.1 Drumburgh pumping station (NY 2672 5980) is located at the eastern end of the proposed scheme, approximately 100m east of the village of Drumburgh, on the northern side of the Carlisle to Bowness-on Solway road. Westfield Marsh pumping station (NY 2467 6136) is located about 1 km south-east of Port Carlisle, on the southern verge of the Carlisle to Bowness-on Solway road. Bowness-on-Solway pumping station/septic tank (NY 2278 6278) is located towards the western end of the scheme, approximately 200m east of Bowness-on-Solway and immediately to the south of the Carlisle to Bowness-on Solway road, within a field under pastoral use.
- 1.2.2 The landscape is typically flat and exposed to the prevailing south-westerly winds (Countryside Commission 1998, 19). It is commonly used for dairy farming with large areas of pasture predominating in many areas as a result of extensive land improvement (*ibid*). Much of this improvement concentrated on the moorlands and wetlands, although elements of this remain in places (*op cit*, 20).
- 1.2.3 The underlying solid geology of the area comprises Triassic Mudstones and siltstones of the Mercia Mudstones Group or Keuper Marls (British Geological

Survey 1982). The drift geology is boulder clay, commonly found across the region, which was deposited in the immediate post-glacial period. In the last 10,000 years, subsequent to the formation of the boulder clays, soils of the Newport I Association have accumulated in the area around Bowness-on-Solway, which are well-drained typical brown soils (Ordnance Survey 1983). The majority of the area is, by contrast, covered by alluvial gley soils of the Rockcliffe Association (*ibid*).

1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

- 1.3.1 **Prehistory:** although evidence for immediate post-glacial activity in the area is severely lacking, sites dating to the late Mesolithic are known from almost the entire length of the Cumbrian coast (Cherry and Cherry 2002; Young 2002). Few actual remains dating to the Mesolithic are known in North Cumbria, although occasional finds have been made (OA North 2002, 6). Such sites are not well known along the south side of the Solway Estuary, but they have been identified on the north side (Morrison 1981, Hodgkinson *et al* 2002, 110). Extensive remains thought to represent all-year settlement, have been investigated on the coast at Eskmeals to the south-west (Bonsall *et al* 1994), and further such sites undoubtedly remain to be found. There is evidence for human impact on the vegetation of the North Cumbrian coast from as early as c6000 BC (Hodgkinson *et al* 2000, 107). A sequence of acute sea-level changes is also known to have affected the area from c5000 BC. This at first resulted in a dramatic rise in relative sea level, before a gradual retreat to current levels (Lloyd *et al* 1999). This resulted in the development of extensive wetlands, which grew out of areas of shallow water held in a number of smaller basins (Hodgkinson *et al* 2000, 99). This sequence of events was also probably responsible for the creation of a sub-merged forest discovered during the nineteenth century between Glasson and Kirkland (*op cit*, 87).
- 1.3.2 Sites of Neolithic date are elusive within the area, although discoveries of artefacts such as axes are not uncommon, and their relationship with wetland environments may be significant (*op cit*, 111). Excavation at Plasketlands, near Mawbray (Bewley 1993) identified a timber structure dated to the mid-fourth millennium BC. This remains a rare discovery, although the large number of stone axes of Neolithic date discovered across the Solway plain would suggest that further settlements existed (Hodgkinson *et al* 2000).
- 1.3.3 Sites dating to the Bronze Age are difficult to recognise; although a number of sub-circular enclosures have been identified through the interpretation of aerial photographs (Bewley 1994), many of which may be Bronze Age or Iron Age. Settlements of this type are unlikely to have surviving aboveground remains in an area of intense agriculture such as the Solway coast (McCarthy 2002, 45). Environmental evidence has identified cereal pollen dating from c2000 cal BC (Hodgkinson *et al* 2000, 113), demonstrating the presence of agriculture by at least the Bronze Age. The remains of timber palisades in the moss at Bowness Common, perhaps dating to the late prehistoric period, have also been discovered (Hodgson 1904), but little can be said with any certainty about these. A small collection of flint artefacts was discovered during excavations at Bowness fort (Potter 1979, 326), one of which is thought to be Bronze Age

in date. Canoes, presumably but not necessarily prehistoric in date, have also apparently been discovered in the mosses at Drumburgh, and Bowness (Neilson 1974).

- 1.3.4 **Roman:** the few sites of late prehistoric date that have been excavated have often been shown to have a long period of use, sometimes lasting well into the Roman occupation (Bewley 1992). Roman activity in the area is, of course, graphically demonstrated by the presence of Hadrian's Wall. Hadrian's wall was created between *c* AD 122 and 130, as part of an attempt to construct a permanent frontier border with the native tribes to the north (Daniels 1978, 5). This had been an ongoing process since the area was taken in the later first century, and was the culmination of several attempts to bring stability to the region (*op cit*, 4-5). Shortly after it was completed the wall was largely abandoned and a new frontier, the Antonine Wall, was constructed between the Forth and the Clyde (*op cit*, 5). The Antonine Wall's period of use was short, however, and by AD 155 it was permanently abandoned and Hadrian's Wall was reoccupied (*ibid*).
- 1.3.5 The section of the wall between Drumburgh and Bowness-on-Solway has been examined in a piecemeal fashion, with little large-scale excavation. In general, the wall and its associated milecastles were initially constructed of turf and timber (although the turrets were stone), which was later replaced with stone, in some cases on a different alignment (*op cit*, 19). Specific details, such as the order in which this happened and the dates, are more difficult to acquire, although there is some evidence to suggest the change was carried out during the mid-second century AD (*op cit*, 253). Excavations at Drumburgh (at the east end of the study area) initially identified a stone fort (Haverfield 1900a), while later work revealed an earlier earth structure aligned with the turf wall (Simpson and Richmond 1952). The associated line of the wall to the east of Drumburgh is not distinct, although it was identified in some places in 1899 (Haverfield 1900a), and elements have been identified even further east since (Bellhouse 1962, 60), although the positions of turrets and milecastles have not been discovered.
- 1.3.6 West of Drumburgh the remains of a number of turrets and milecastles, which are relatively densely concentrated compared to other parts of the wall, have been subject to small-scale excavation (e.g. Wilmott 1999), as have elements of the wall and *vallum*. The exact line of the wall has, however, been disturbed by the development of Port Carlisle (Daniels 1978, 252-3; Lancaster University Archaeological Unit 1995). Some parts of the line of the wall and *vallum* are still visible between Port Carlisle and Bowness-on-Solway, although large parts of it are lost on the approach to Bowness, and there are records of some deliberate, and quite large-scale, destruction (Daniels 1978, 253). At Bowness-on-Solway a fort known as *Maia* was located, the second largest on Hadrian's Wall (*op cit*, 255). Again, piecemeal excavation in a number of areas has identified elements of the fort, including the west gate (Birley 1931) and the west rampart (Mohamed 1971). More extensive excavations inside the fort revealed evidence for internal buildings and the gate towers, with dating evidence for activity into the fourth century AD (Potter 1975; 1979). Evidence for a civilian settlement to the south has also

been identified (Birley 1931; Duff 1939; Carlisle Archaeology Ltd 2000; 2001; OA North 2002), but this has yet to be examined in detail. There are also possible remains outside the fort to the east, tentatively interpreted as part of the *vicus* (Caruana and James 1987).

- 1.3.7 **Early Medieval:** there is a distinct gap in the record following the collapse of Roman administration, both in the written sources and archaeological evidence. Place-name evidence suggests that there was a degree of continuity within the indigenous population, with 'Celtic' name elements surviving in a number of places (Haverfield 1900b; Armstrong *et al* 1950). A sequence of small regional kingdoms was established following Roman rule, although the influence of each fluctuated over time (Rollinson 1996, 33). One of the most significant is that of Rheged, which was probably established some time in the later sixth century AD (McCarthy 2002, 141-2). Over time the Anglian kingdoms of the north-east and Strathclyde to the north also began to exert an influence on the area and the renewed spread of Christianity also made its mark (*op cit*, 149-51). These factors, coupled with Viking settlement during the centuries immediately prior to the Norman invasion, which is commonly seen across the county (Rollinson 1996, 37-8) have had a very mixed affect on the landscape. Place-name evidence tends to be dominated by Norse words (Armstrong *et al* 1950), while physical evidence for continuity of settlement and activity in the early medieval period is not obvious within the study area. It has, however, been identified in Carlisle and at Birdoswald fort in the form of reused late-Roman military buildings (McCarthy 2002, 134). Within Glasson Moss there is evidence for hemp retting thought to date to the seventh century AD (Cox *et al* 2000). Although this is unlikely to extend into the study area it demonstrates that settlement and related infrastructure must have existed at this time.
- 1.3.8 **Medieval:** while the Norman Conquest may have marked a turning point in British history, it was not until 1092, when William Rufus took Carlisle and the surrounding area from Scotland (Rollinson 1996, 43), that its impact was truly felt in the region. Bowness-on-Solway and the neighbouring area formed part of the Barony of Burgh, having passed from the de Moulton family and Barony of Gilsland, which was given to Gamel le Brun, who resided at Drumburgh (Nicolson and Burn 1777; Whellan 1860, 149). Permission was granted to fortify the manor house at Drumburgh in 1307, but the manor was dispersed to various families by the end of the fourteenth century (*op cit*, 149). It was, however, reunited with the Barony of Burgh at a later date (*ibid*). The area was very volatile throughout the medieval period, at first due to continuous cross-border conflict with Scotland (Rollinson 1967, 87-9) and later as a result of general lawlessness associated with the border reivers, although the focus of this conflict tended to be further east (Fraser 1995). This led to the construction of a number of fortified houses in the wider area, which included that at Drumburgh.
- 1.3.9 Medieval remains have been found at Bowness (Potter 1979), and one of the ditches of Bowness fort seems to have been re-cut during the thirteenth century (Daniels 1978, 255). There may also have been a grange at Drumburgh, later attached to the castle (Simpson and Richmond 1952, 12), of

which an L-shaped ditch remains. There is also evidence for a chapel existing at Drumburgh (Dennis Perriam pers comm). Little seems to have changed in the general area throughout the medieval period, however, and most of the settlements remained small until the nineteenth century (Whellan 1860).

- 1.3.10 **Post-medieval:** the rural situation of the study area left it largely unaffected by the changes of the Industrial Revolution. An experimental alum works is thought to have been set up by Peter Spencer, who had taken out a patent for a process using coal waste in 1845, initially near Burgh-by-Sands and later possibly to the south of Drumburgh, (Pickle 2002, 17). However, it was alterations to the transport network brought about because of this that led to major changes in the landscape during the early nineteenth century. Plans to improve Carlisle's connections with the coast had been made as early as the late eighteenth century (Hadfield and Biddle 1970, 336-7). In 1807 moves were made to encourage the construction of a canal from Carlisle to the sea in order to facilitate coal supplies to the city (Ramshaw 1997, 9). At first, despite gaining support, the scheme came to nothing, and it was not until 1817 that the plan was finally put into action (*op cit*, 10). Following meetings between all of the relevant parties and the passing of an Act of Parliament work began in 1820 (*op cit*, 12). The Carlisle Navigation Canal was finally opened in 1823 (*op cit*, 25), reaching the sea at Port Carlisle. The canal was successful, and in 1836 plans were made to expand the capacity of the docks at Port Carlisle, although these were evidently never carried out. It was, however, intended that the canal should ultimately connect with similar schemes that would provide a link all the way to Newcastle-upon-Tyne (Ramshaw 1997, 6).
- 1.3.11 The coming of the canal led to the expansion of many of the adjoining villages. Port Carlisle, formerly known as Fisher's Cross, is recorded as containing only two houses in 1830 (Whellan 1860), which had expanded to its current, albeit relatively small, size 30 years later. In time though, the canal was not considered profitable enough, and railways were being favoured over them. It had never achieved its aim of forming part of a connection to Newcastle, and the coming of the railways had meant that they were now forming the major part of the national transport network (Ramshaw 1997, 135). In 1848 a proposal was put forward to convert the canal into a railway but this was turned down (*op cit*, 123). Nevertheless, the scheme was not forgotten. There were some improvements in the operation of the canal in its final years, largely as a result of the removal of the Ravenbank Jetty, which had caused the canal dock to silt up rather than improve its navigation as intended, but this was not enough to save it. The construction of the railway began in 1853, following the draining of the canal and dismantling of the locks, and the last boats to have used it were sold off or went elsewhere (*op cit*, 135-7).

2. METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 A project design (*Appendix 1*) was submitted by OA North in response to a request from United Utilities for an archaeological evaluation on a number of sites along a proposed wastewater treatment improvement scheme on the Solway Coast (Fig 1). Following its acceptance OA North was commissioned by United Utilities to carry out the work. The project design was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists, and generally accepted best practice.

2.2 EVALUATION

2.2.1 The topsoil was removed by a mechanical excavator (fitted with a toothless ditching bucket, 1.5m in width) under archaeological supervision to the surface of the first significant archaeological deposit. This deposit was cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and inspected for archaeological features. All features of archaeological interest were investigated and recorded.

2.2.2 All trenches were excavated in a stratigraphical manner, whether by machine or by hand. All investigation of intact archaeological deposits was exclusively manual. A minimum sample of 50% of archaeological features were examined by excavation. Selected pits and postholes were half-sectioned, linear features were subjected to no less than a 25% sample, and extensive layers were sampled by partial rather than complete removal. In terms of the vertical stratigraphy, maximum information retrieval was achieved through the examination of sections of cut features. All excavation, whether by machine or by hand, was undertaken with a view to avoiding damage to any archaeological features, which appear worthy of preservation *in situ*. The evaluation trenches were backfilled, with no further reinstatement taking place.

2.3 TOPOGRAPHIC SURVEY

2.3.1 The topographic survey of Site **81** was completed using a Differential Global Positioning System (GPS). GPS instrumentation uses electronic distance measurement along radio frequencies to satellites to enable a positional fix in latitude and longitude, which can be converted mathematically to the National Grid. It uses a post-processed system by comparing a roving station with a similar station on a fixed known point in order to achieve high levels of accuracy, which are typically between $\pm 0.25\text{m}$.

2.4 ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the project design (*Appendix 1*), and in accordance with current IFA and English

Heritage guidelines (English Heritage 1991). The paper and digital archive will be deposited in Carlisle Record Office on completion of the project.

- 2.4.2 The Arts and Humanities Data Service (AHDS) online database *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

3. RESULTS OF THE EVALUATIONS

3.1 TRENCH 1

3.1.1 Trench 1 was the northernmost trench excavated at the site of the proposed Drumburgh pumping station (Fig 3). The trench was aligned north-west/south-east and measured 4m x 3m in plan (Plate 1). The natural geology (**105**) was exposed at a depth of 1.38m below the ground surface, and comprised light grey sands. The natural was overlain by a 0.68m thick layer (**104**) of highly mixed bluish grey sandy-silts, containing large amounts of wood and occasional post-medieval bricks. This layer was overlain by a 0.20m thick layer (**103**) of light grey sandy-silt, containing late post-medieval bricks. Directly above this layer, a 0.20m thick layer (**102**) of light orange gravelly-sand was encountered, which was directly beneath the light yellow sand topsoil (**101**), which contained a high proportion of stones.

3.2 TRENCH 2

3.2.1 Trench 2 was located approximately 1m south-west of Trench 1 and was aligned north-east/south-west (Fig 3). The trench measured 3.5m x 3.0m in plan and was excavated to a maximum depth of 1.43m. The natural geology (**205**) was exposed at a depth of 1.20m below the ground surface and comprised light grey sands. The natural geology contained *c* 40-50 distinct layers in the 0.23m exposed, presumably relating to episodes of deposition from flooding. The natural geology was overlain by a 0.15m thick layer of gravels (**204**), which may also represent a natural deposit. This layer was overlain by a 0.65m thick deposit (**203**) of very mixed sandy-silt, containing two fragments of post-medieval pottery. This layer was sealed by a 0.25m thick layer of orange sand (**202**), which was sealed by the light yellow gravelly sand topsoil (**201**), which had a maximum thickness of 0.15m.

3.3 TRENCH 3

3.3.1 Trench 3 was located approximately 1.5m to the south-west of Trench 2, and was aligned north-west/south-east (Fig 3). The trench measured 3.5m by 3.0 m and was excavated to a maximum depth of 1.26m. The natural geology (**304**) was encountered at a depth of 0.87m below the ground surface and comprised pale grey gravelly sands. This was overlain by a 0.33m thick layer of mid to dark grey sandy-silt (**303**) containing two pieces of post-medieval pottery. This layer contained a 0.1m thick lens containing a high proportion of degraded wood. This layer was sealed by a 0.44m thick highly mixed orange and grey layer of sandy silt (**302**), itself overlain by the 0.10m thick light yellow gravelly sand topsoil (**301**).

3.4 TRENCH 4

3.4.1 This was the southernmost trench located at the proposed Westfield Marsh pumping station (Fig 4), and measured 4.2m x 1.6m in plan. The trench was located across a substantial earthwork, with the depth of the trench varying between 1.67m and 0.75m, on account of the sloping ground (Plates 2 and 3). The earliest layer (**411**) encountered within this trench comprised light grey sandy silt, probably representing a natural estuarine deposit. This was overlain by a 0.13m thick layer (**410**) of mid grey sandy-silt, containing a moderate amount of organic remains. This layer also probably represents a natural estuarine deposit. This layer was sealed by a layer (**409**) of orangey red silty-sand, containing a large number of sub-rounded stones, of average size 60mm x 50mm x 30mm. These stones were set relatively flat and could well represent the make-up layer for the rammed gravel layer above (**408**) (Fig 6). The gravel layer varied in colour, although was predominantly reddish brown. It was extremely compact and consisted mainly of small sub-rounded and rounded stones, of 30mm x 20mm x 10mm maximum, although there were also a few very small fragments of charcoal. A few fragments of oyster shell were found directly on top of the gravel surface. The surface was located throughout the trench and was flat along the north-eastern side of the trench, sloping down towards the south-west, with the lowest point of the slope exposed being *c* 50 mm lower than the flatter part of the surface. Two large stones (**406** and **407**) were situated directly on top of the gravel surface, at the south-eastern end of the trench (Fig 5, Plate 4).

3.4.2 Stone **406** was greater than 0.65m in length, greater than 0.51m wide and 0.27m thick, whilst **407** measured greater than 0.75m in length, greater than 0.36m wide and 0.21m thick. Both of them were well-carved sandstone and presumably were not in their original position. The stones were sealed by a layer of light greyish yellow sandy-silt (**405**), 0.5m thick. This layer was sealed by a 0.3m thick layer of light grey sandy-silt (**404**), which was in turn overlain by a 0.7m thick layer of light yellow silty-sand, **403**, containing occasional small sandstone fragments. In the south-western corner of the trench this layer was overlain by the probable make-up for a road (**402**), comprising blocks of granite, measuring 0.16m x 0.16m x 0.10m maximum, laid together to form a rough surface. Local knowledge has it that this is the road surface for the road predating the modern Carlisle to Port Carlisle road, with it being raised here as it crossed the canal (since filled in) at this point. This layer was overlain by the light grey sandy-silt topsoil (**401**).

3.5 TRENCH 5

3.5.1 This trench was located to the north-east of Trench 4 (Fig 4), but following identification of live services with a Cable Avoidance Tool (CAT), this trench remained unexcavated, for reasons of health and safety. It was decided not to move this trench away from the services as this would have entailed excavating outside the area of proposed ground disturbance.

3.6 TRENCH 6

- 3.6.1 This trench was located to the north-west of Trench 5 (Fig 4), but following identification of live services with a CAT, this trench remained unexcavated, for reasons of health and safety. It was decided not to move this trench away from the services as this would have entailed excavating outside the area of proposed ground disturbance.

3.7 TRENCH 7

- 3.7.1 Trench 7 was the westernmost trench located at the site of the proposed Bowness-on-Solway pumping station/septic tank (Fig 5). The trench was aligned north/south and measured 8.5m x 1.8m in plan. The natural geology (**703**) was located at a depth of 0.51m below the ground surface and comprised blackish grey gravelly silts. The natural was overlain by a 0.34m thick layer of light brown sandy silt (**702**), which was in turn overlain by the greyish brown sandy silt topsoil (**701**). No archaeological features or artefacts were observed.

3.8 TRENCH 8

- 3.8.1 Trench 8 was located to the east of Trench 7 (Fig 5) and measured 5m by 1.8m in plan. The trench was aligned east/west and was excavated to a maximum depth of 0.62m. The earliest layer encountered was the natural geology, **803**, which consisted of mid reddish brown coarse gravels. This layer was overlain by the 0.30m thick light yellow silty sand subsoil (**802**), itself sealed by the 0.32m thick sandy silt topsoil (**801**). No artefacts or archaeological features were observed within this trench.

3.9 TRENCH 9

- 3.9.1 Trench 9 was located to the south of Trench 8 (Fig 5), measured 3.6m by 3.6m in plan and was aligned north/south (Plate 5). The trench was excavated to a maximum depth of 0.89m. The earliest layer encountered, **904**, was a very pale grey natural sand deposit, overlain by natural gravels (**903**) with a maximum depth of 0.10m. This deposit was overlain by the light brownish yellow silty sand subsoil (**902**), which had a maximum thickness of 0.46m. This layer was sealed by the light brown silty sand topsoil (**901**), which was a maximum of 0.33m thick. No archaeological features or artefacts were observed within this trench.

4. RESULTS OF THE TOPOGRAPHIC SURVEY

4.1 INTRODUCTION

4.1.1 One earthwork complex, Site **81** (Plate 6), was surveyed as part of the topographic survey, located south west of Westfield House at NY 2491 6122. Below is presented a brief description and suggested interpretation of the site, with the survey results presented as Figure 8.

4.2 DESCRIPTION

4.2.1 It is evident that the current field boundaries have been altered since the last Ordnance Survey was completed in this area, the current field boundaries being shown in Figure 8. The earthworks, which form the ridge-and-furrow, comprise of a series of 24 low parallel banks. The surveyed strips shown on Figure 8 represent the actual ploughed furrow, rather than the bank of the earthwork. These strips are typically between 4.5m to 5.5m, or an average of 5.0m, apart.

4.2.2 To the north of the now removed field boundary (Fig 8), partially visible as an earthwork, a further three strips were located, although, these are more tenuous. The additional earthworks are located on the projected line of Hadrian's Wall, and are thought to more closely resemble ridge-and-furrow rather than this earlier monument.

4.2.3 It can clearly be seen in Figure 8 that the earthworks have been truncated by the construction of the canal. The earthworks stop at the embankment of the Carlisle Navigation Canal; this embankment is not shown on current Ordnance Survey maps.

4.3 INTERPRETATION

4.3.1 The construction of the Carlisle Navigation Canal between 1820 and 1823 (*see section 1.3*) has clearly truncated the ridge-and-furrow (Fig 8). The dating of ridge-and-furrow by measuring the distance between strips is not a reliable method of dating (Harvey 1980, 51), although 5.0m between strips is typical of ploughing with oxen (Beresford and Joseph 1979, 21-25). No S-shaped curve, also known as an aratral curve, typical of medieval plough teams of oxen (*ibid*), or any headlands where the plough had been turned, were noted at the site; neither do the surviving field boundaries of this enclosure reflect an aratral curve. However, these features may have been visible if the ridge-and-furrow and its original field boundary were visible in its entirety.

4.3.2 It is, therefore, suggested that the ridge-and-furrow is most likely the result of ploughing with oxen. These features may date from either the medieval or the earlier post-medieval period.

5. DISCUSSION

5.1 DRUMBURGH PUMPING STATION

- 5.1.1 The three trenches excavated at this site illustrated fairly uniform stratigraphy, with post-medieval deposits directly overlying the natural geology, which was only exposed at significant depth. This is highly suggestive of a large-scale truncation in this area, almost certainly dating to the post-medieval period and possibly relating to the current pumping station. It seems likely that the truncation would have removed all but the deepest below-ground remains and that any archaeology in this area has already been destroyed and so will not be affected by the proposed pumping station.

5.2 WESTFIELD MARSH PUMPING STATION

- 5.2.1 The single trench in this area that it was possible to excavate revealed the most significant archaeology found in this phase of the evaluation, comprising a rammed gravel surface overlain by two pieces of well carved sandstone. The only artefacts recovered from the gravel surface were some fragments of oyster shell that were directly on top of it, however, the gravel surface was shown to be earlier than the precursor to the modern Carlisle to Port Carlisle road, showing it to be of some antiquity. Given the nature of the remains, and their location, it seems reasonable to suggest a Roman date for this feature.

5.3 BOWNESS-ON-SOLWAY PUMPING STATION/SEPTIC TANK

- 5.3.1 The three trenches excavated here revealed broadly similar stratigraphy to each other, with no archaeological features observed, and no artefacts recovered. This would suggest that there is a genuine lack of archaeology in this area, perhaps because of this site's proximity to the coast, which would have put it under threat of flooding, and so make it a far from ideal site for habitation.

5.4 TOPOGRAPHIC SURVEY

- 5.4.1 Although it can be seen that the ridge-and-furrow at Site **81** predates the Carlisle Navigation Canal, completed in 1823, these features may date from either the medieval or the earlier post-medieval period.

6. IMPACT

6.1 IMPACT AND RECOMMENDATIONS

- 6.1.1 The only identified archaeological site that will be impacted upon by the proposed development is the rammed gravel surface located at Westfield Marsh Pumping Station. It appears that the remains found in Trench 4 will be adversely affected by the works, and if this surface extends into the areas of the proposed Trenches 5 and 6, then it will also be affected in these areas.
- 6.1.2 Despite evidence for modern ground disturbance in the vicinity of Trenches 5 and 6, due to the presence of archaeology in Trench 4, it is recommended that a watching brief is undertaken during all ground disturbing activities.

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8. ILLUSTRATIONS

8.1 FIGURES

Figure 1: Location map

Figure 2: Location plan of evaluations and topographic survey

Figure 3: Plan of Drumburgh Pumping Station

Figure 4: Plan of Westfield Marsh Pumping Station

Figure 5: Plan of Trench 4

Figure 6: Section through probable road surface

Figure 7: Plan of Bowness-on-Solway Pumping Station/Septic Tank

Figure 8: Topographic survey of Site **81**

8.2 PLATES

Plate 1: North-east-facing view of Trench 1

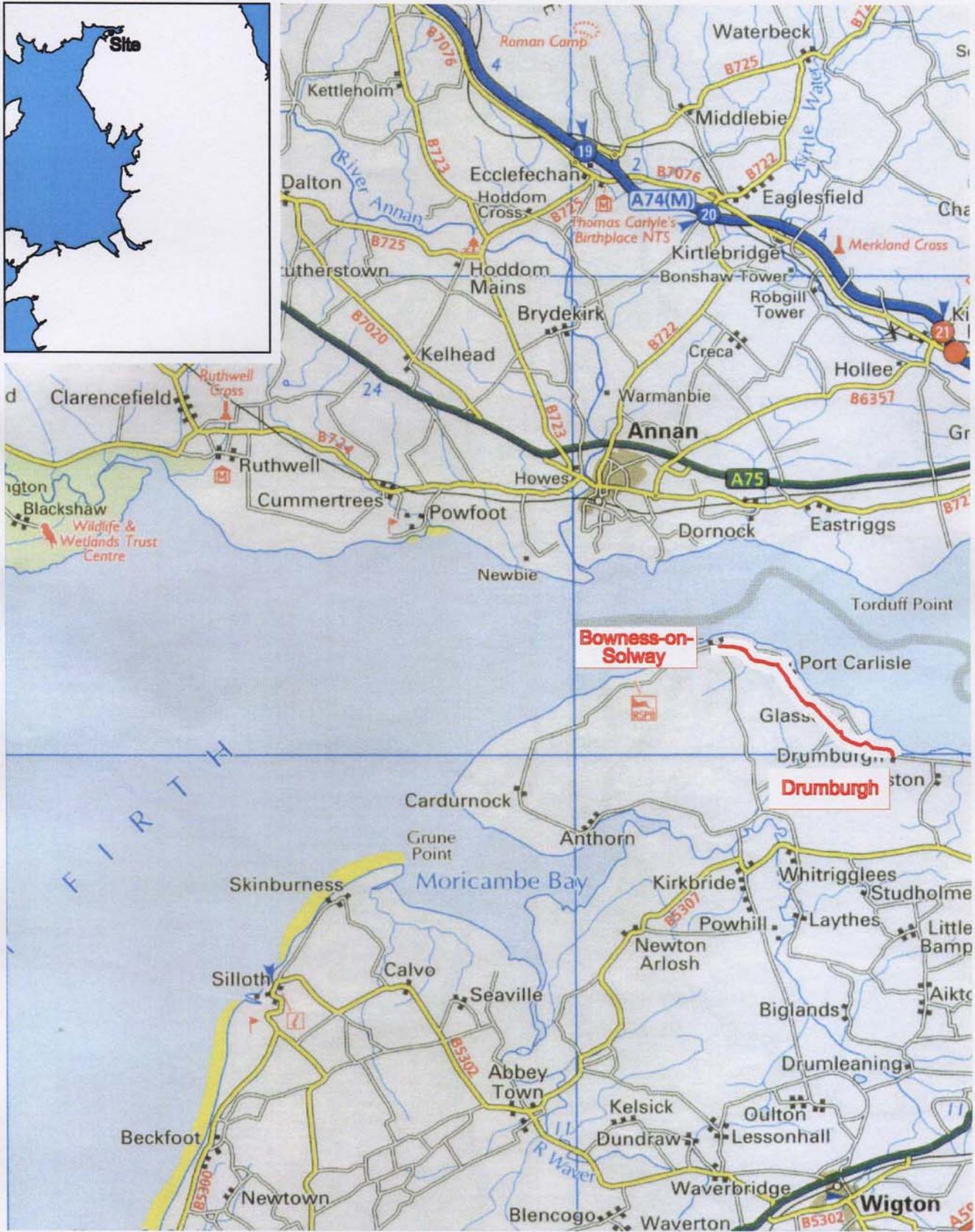
Plate 2: North-west-facing view of Trench 4

Plate 3: South-east-facing view of Trench 4

Plate 4: South-east-facing close-up of stones **406** and **407**, within Trench 4

Plate 5: West-facing working shot of excavation of Trench 9

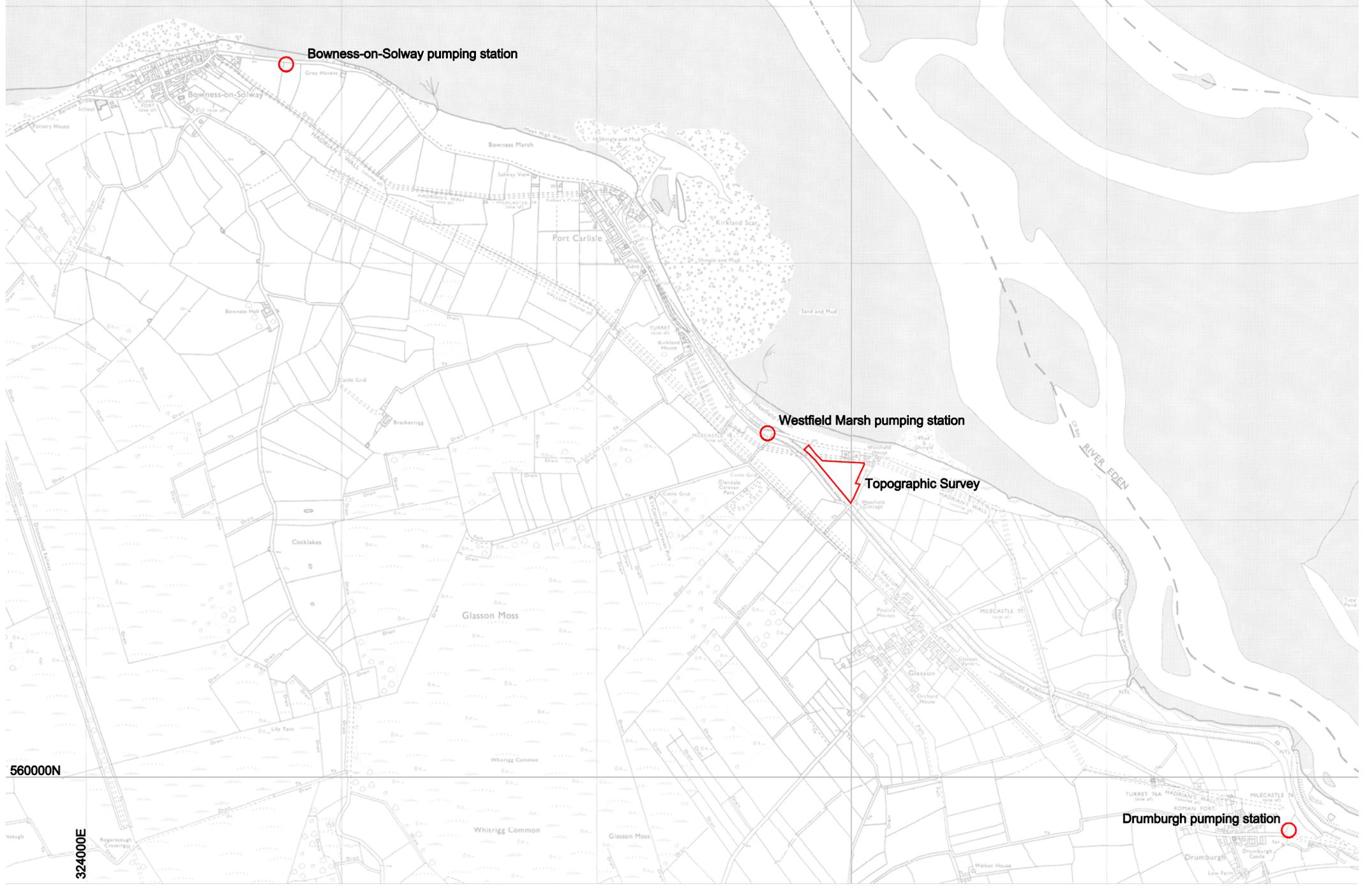
Plate 6: Site **81**, ridge-and-furrow, looking north-east



based upon the Ordnance Survey 1:250,000
 with the permission of the controller of HMSO
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Figure 1: Location map



based upon the Ordnance Survey 1:10000
 with the permission of the controller of HMSO
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0 250m
 Scale 1:15000 at A3



Figure 2 : Location plan of evaluations and topographic survey

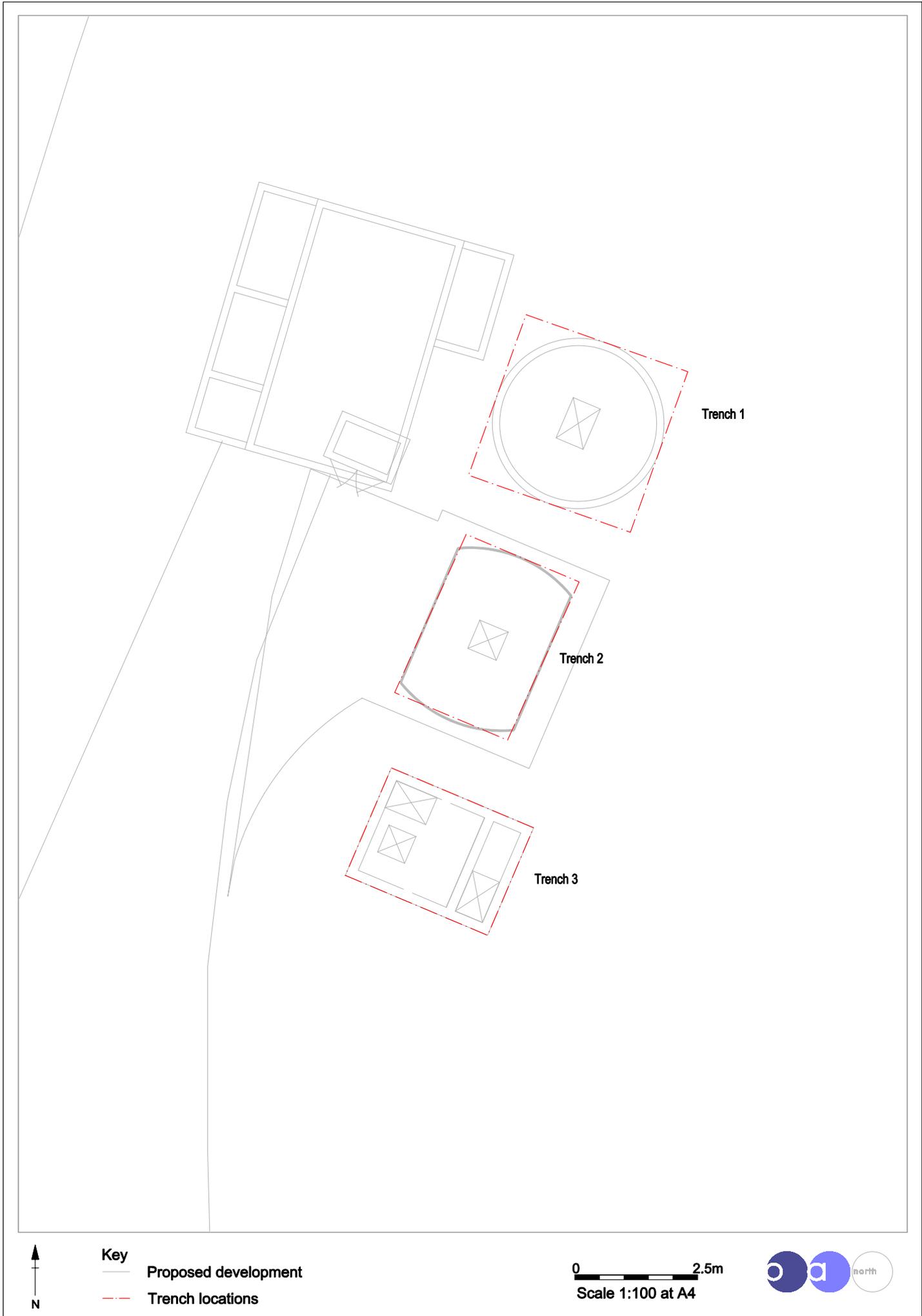


Figure 3 : Plan of Drumburgh Pumping Station



Figure 4 : Plan of Westfield Marsh Pumping Station

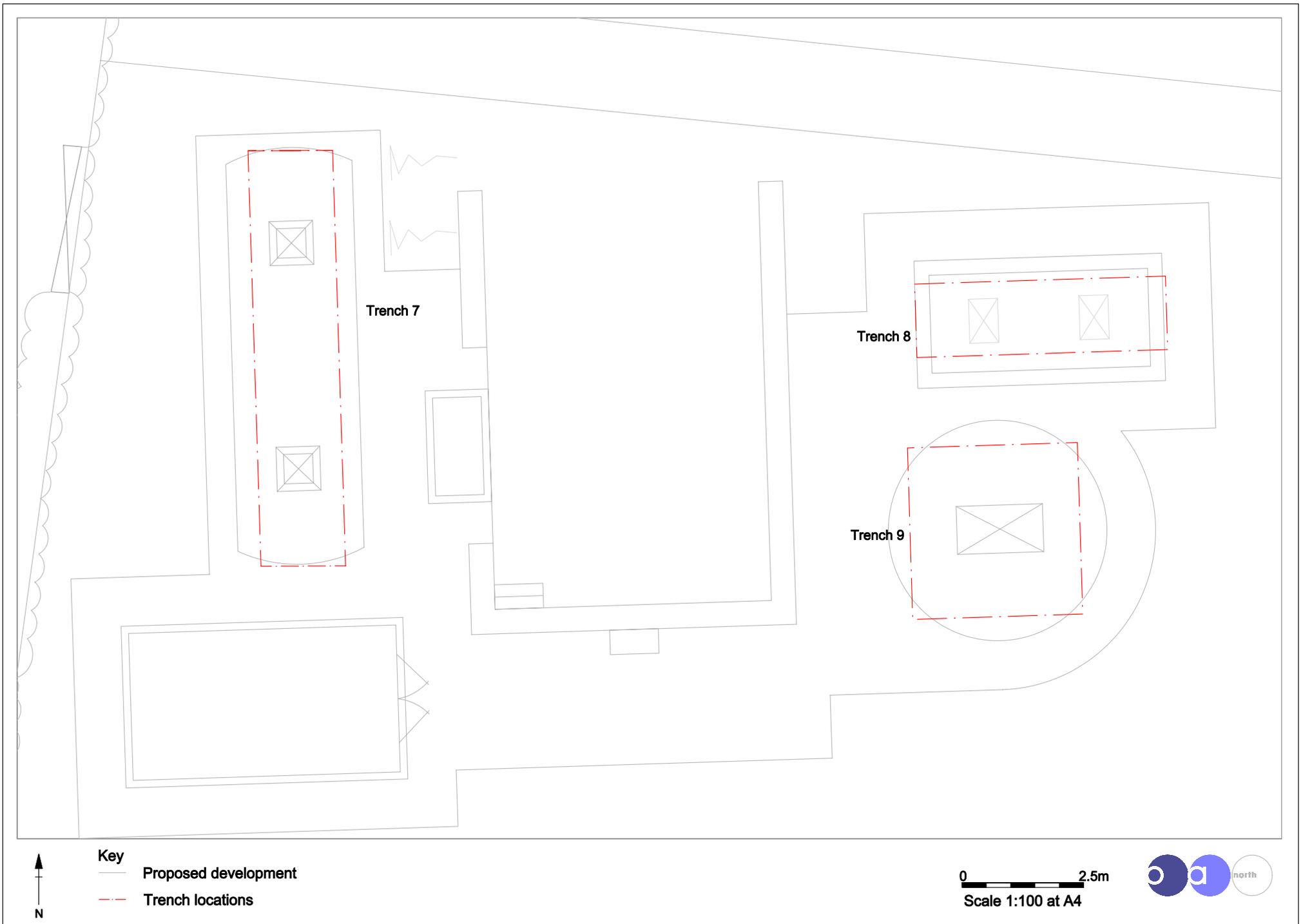


Figure 7: Plan of Bowness-on-Solway Pumping Station/Septic Tank

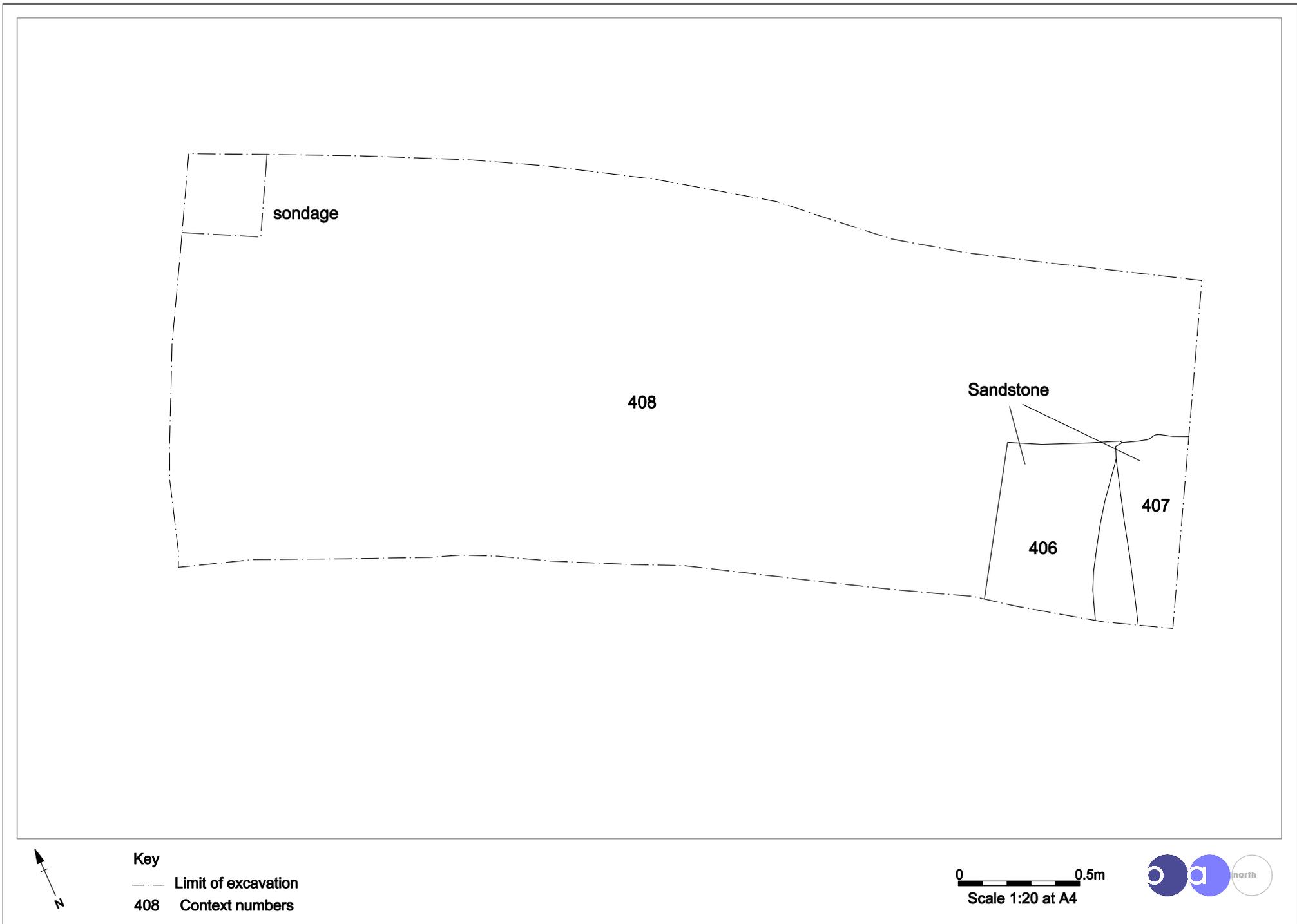
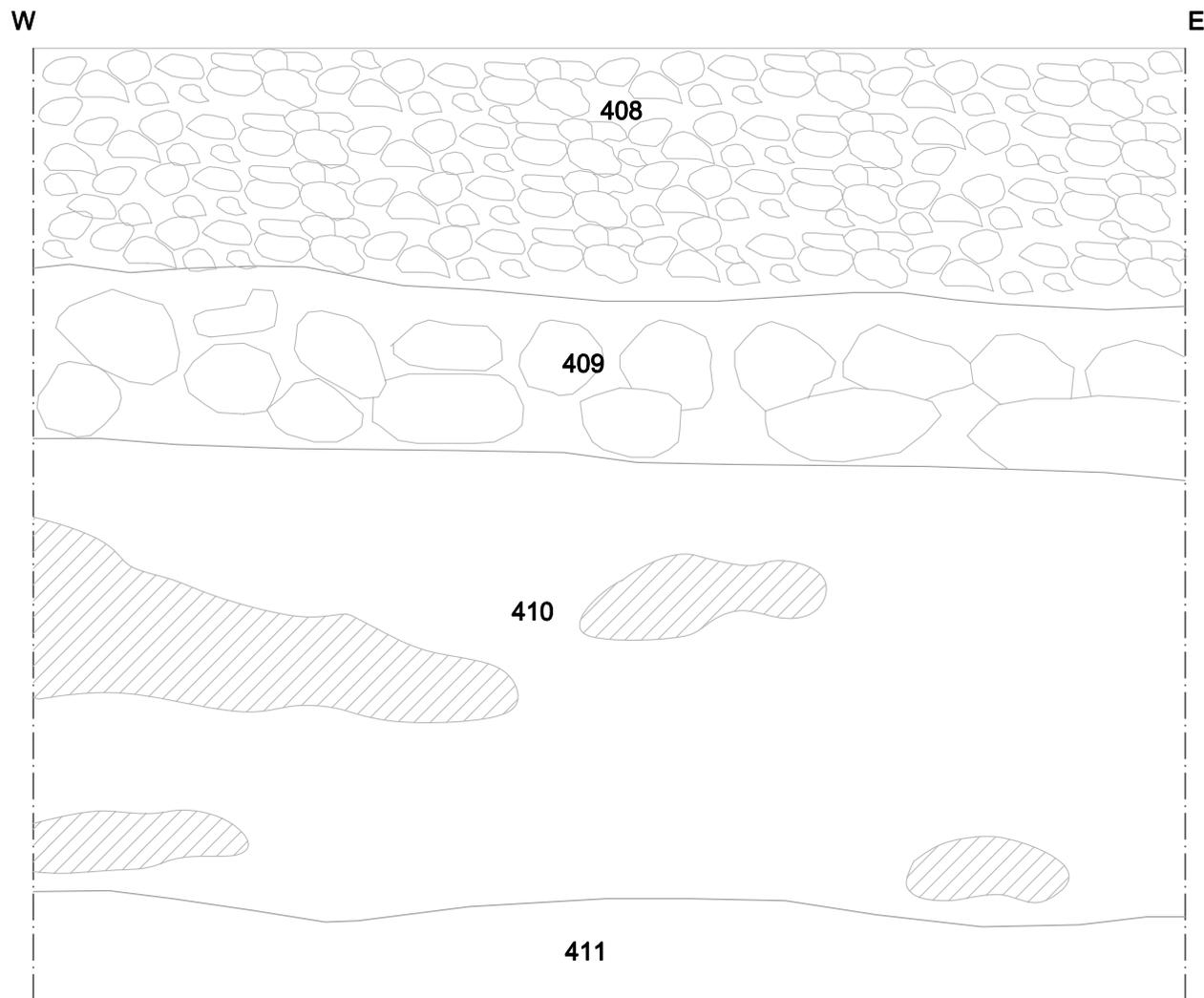


Figure 5: Plan of Trench 4



Key
 Black organic material
 - - - Limit of excavation

411 Context numbers

Scale 1:2 at A4

0 5cm



Figure 6: Section through probable road surface

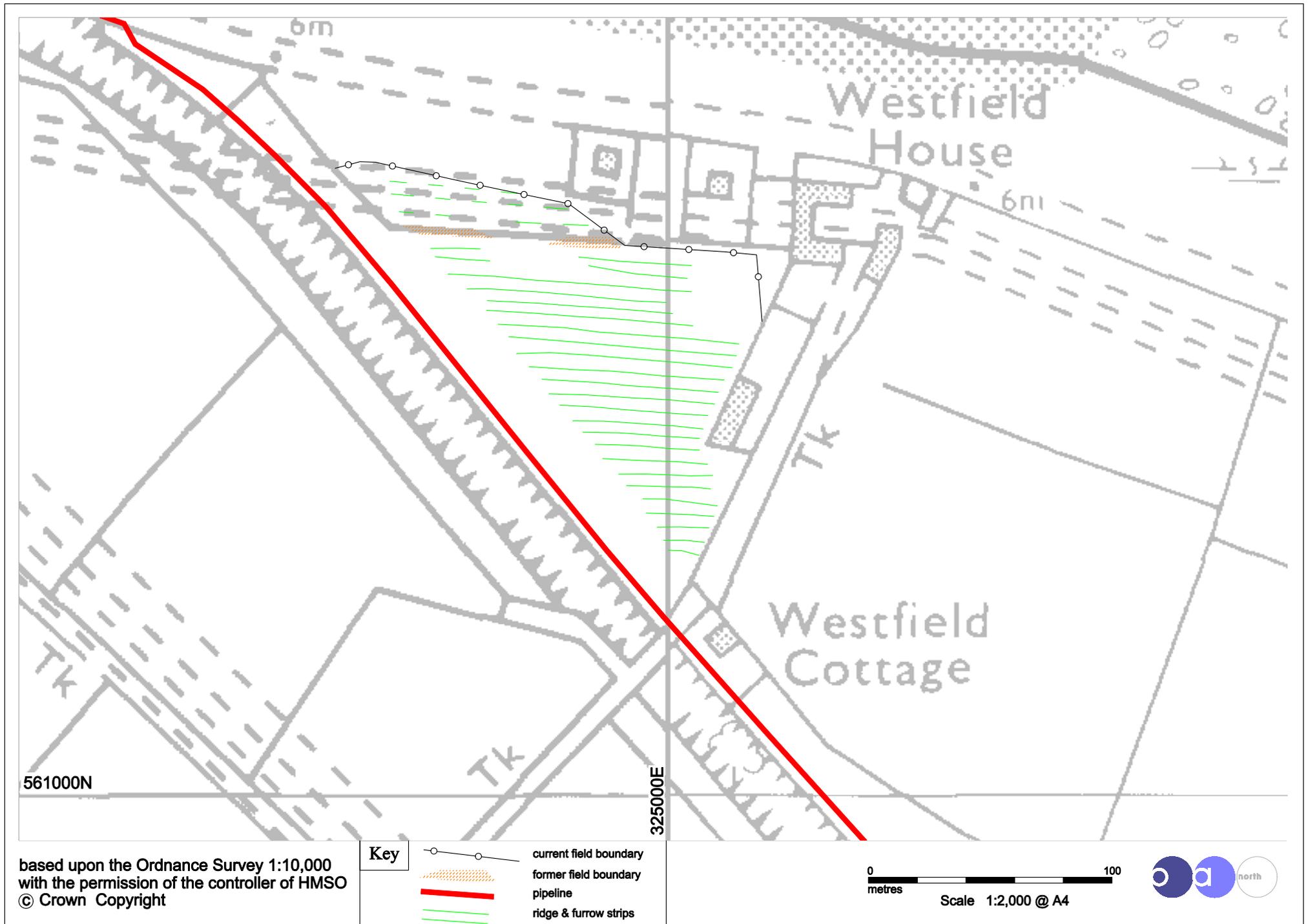


Figure 8 : Topographic survey of Site 81



Plate 1: North-east-facing view of Trench 1



Plate 2: North-west-facing view of Trench 4



Plate 3: South-east-facing view of Trench 4



Plate 4: South-east-facing close-up of stones *406* and *407*, within Trench 4



Plate 5: West-facing working shot of excavation of Trench 9



Plate 6: Site **81**, ridge-and-furrow, looking north-east

APPENDIX 1: PROJECT DESIGN

**Oxford
Archaeology
North**

Revised July 2004

SOLWAY COAST WASTEWATER TREATMENT IMPROVEMENTS

**ARCHAEOLOGICAL EVALUATION, TOPOGRAPHIC SURVEY AND WATCHING
BRIEF
PROJECT DESIGN**

Proposals

The following project design is offered in response to a request by United Utilities for an archaeological evaluation, topographic survey and watching brief in advance of wastewater treatment improvements from Bowness-on-Solway to Drumburg, Cumbria.

1. INTRODUCTION

- 1.1 United Utilities (hereafter the client) are proposing improvements to wastewater treatment along the Solway Coast from Bowness-on-Solway to Drumburgh, Cumbria. The route runs through an area of high archaeological potential and affects a number of known sites including the Hadrian's Wall World Heritage Site (HWWHS). Following discussions between the client, the Cumbria County Archaeology Service (CCAS) and the Hadrian's Wall Archaeologist, it was proposed that the development area be subjected to a desk-based assessment as a first stage of archaeological investigations. This and the subsequent walkover survey were undertaken in April 2004. Following the completion of the first phase, discussions were held with both CCAS and English Heritage, when it decided that a further programme of archaeological work would be necessary. This document details the second phase of archaeological work.
- 1.2 The route of the proposed improvement runs in close proximity to the line of Hadrian's Wall, and crosses it in several locations. It also passes to the north of Knockcross Roman Camp. Other sites of significance are the dis-used railway, the route of the Carlisle canal and the potential for locating Peter Spencers experimental Alum works near Drumburgh.
- 1.3 OA North has considerable experience of the assessment, evaluation and excavation of sites of all periods, having undertaken a great number of small and large-scale projects during the past 20 years. Watching briefs, evaluations and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables.
- 1.4 OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an Institute of Field Archaeologists (IFA) registered organisation, registration number 17, and all its members of staff operate subject to the IFA Code of Conduct.

2. OBJECTIVES

- 2.1 The following programme has been designed to provide an accurate archaeological assessment of the designated area within its broader context. The required stages to achieve these ends are as follows:
- 2.2 **Evaluation:** to implement a programme of trial trenching examining the points at which the pipeline will cross Hadrian's Wall, the location of septic tanks, pumping stations and so forth and a number of sites identified by the desk-based assessment.
- 2.3 **Topographic survey:** an instrument survey will be undertaken to produce a topographic survey of Site 81, an area of ridge and furrow.
- 2.4 **Watching brief:** to undertake a targeted watching brief during topsoil stripping activities and ground disturbance associated with the off-road sections of the proposed works.
- 2.5 **Report and Archive:** an interim report may be issued should there be any further mitigation work necessary. The final report will be produced for the client

within eight weeks of completion. A site archive will be produced to English Heritage guidelines (MAP 2) and in accordance with the *Guidelines for the Preparation of Excavation Archives for Long Term Storage* (UKIC 1990).

3 METHOD STATEMENT

3.1 EVALUATION

3.1.1 The programme of evaluation will require trial trenching to establish the presence or absence of any previously unsuspected archaeological deposits and, if established, will then test their date, nature, depth and quality of preservation. In this way, it will adequately sample the threatened available area.

3.1.2 The evaluation is required to investigate the following sites:

Pumping stations/wastewater treatment

- (i) Drumburgh pumping station;
- (ii) Bowness-on-Solway pumping station/septic tank (Site 17);
- (iii) Glasson Wastewater treatment (location uncertain, awaiting EH decision);
- (iv) Westfield Marsh pumping station;

OA North identified sites

- (v) Site 82, site of Westfield Cottage;
- (vi) Site of Test Pit 1;

Hadrian's Wall crossings

- (viii) Fishers Cross, Port Carlisle (highway);
- (ix) Kirkland House -turret 78a (highway);
- (x) East of Glasson Farm (highway);
- (xi) Westfield Marsh

3.1.3 The trial trenching is required to investigate no less than 5% of the area of the pumping stations/wastewater and OA North sites. For the Hadrian's Wall crossings the area to be evaluated is to be no less than the length/width of Wall to be disturbed. The following table presents an indication of the dimensions of the trial trenches within each site.

Site	Total trial trench dimensions	No. of days on site
Drumburgh pumping station	14m x 2m	2
Bowness-on-Solway pumping station/septic tank	14m x 2m	2
Glasson Wastewater treatment	90m x 2m	3
Westfield Marsh pumping station	15m x 2m	2
Site 82, site of Westfield Cottage	10m x 2m	2
Site of test Pit 1	4m x 2m	1
Fishers Cross (highway)	17m x 1m within verge	2
Kirkland House - turret 78a (highway)	57m x 1m along highway	3
East of Glasson Farm (highway)	15m x 2m within field, 7m x 1m across highway	3
Westfield Marsh	21m x 2m	2

Table 1: Dimensions of trenches including an indication of days required in the field

- 3.1.4 **Highway Sites:** the evaluations across and along the public highway (Fishers Cross, Kirkland House and Glasson Farm - *Sections 3.1.5 to 3.1.7* below) will be undertaken at a time when the construction contractor is present on site. The construction contractor will be responsible for removal and reinstatement of the various sections of road surface. The contractor will also be responsible for all traffic control and health and safety. An archaeologist will be present at all times during the opening up of the trenches, and following removal of the road surface will proceed to treat the trench as an evaluation. The contractor will be asked to make his mechanical excavator available to the archaeologist at the expense of the client.
- 3.1.5 **Fishers Cross:** the investigation of this crossing will take place within the verge to the north of the road. The trench, to be opened by machine as below (*Section 3.1.8*) will run along the verge of the highway for the width of Hadrian's Wall (approximately 17m). The width of the trench will be based on the area required for the installation of new services, which is approximately 800mm out from the edge of the existing services.

- 3.1.6 **Kirkland House - turret 78a:** this evaluation will run for approximately 57m along the public highway, necessitating the closure of the highway (MWH comment).
- 3.1.7 **East of Glasson Farm:** the evaluation of this highway crossing will take place in two halves in order to allow vehicular access along the highway. Both sections will measure approximately 3.5 m x 1m.
- 3.1.8 **Evaluation Methodology:** the topsoil (with the exception of the Westfield Marsh (Hadrian's Wall crossing) site, which will be hand dug) will be removed by machine (fitted with a toothless ditching bucket, approximately 1.6m in width) under archaeological supervision to the surface of the first significant archaeological deposit. This deposit will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and inspected for archaeological features. All features of archaeological interest must be investigated and recorded unless otherwise agreed by the County Archaeology Service. The trenches will not be excavated deeper than 1.20m to accommodate health and safety constraints; any requirements to excavate below this depth will involve recosting.
- 3.1.9 All trenches will be excavated in a stratigraphical manner, whether by machine or by hand. Any investigation of intact archaeological deposits will be exclusively manual. A minimum sample of 50% of archaeological features must be examined by excavation. Selected pits and postholes will normally only be half-sectioned, linear features will be subject to no less than a 25% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal. It is hoped that in terms of the vertical stratigraphy, maximum information retrieval will be achieved through the examination of sections of cut features. All excavation, whether by machine or by hand, will be undertaken with a view to avoiding damage to any archaeological features, which appear worthy of preservation *in situ*.
- 3.1.10 The evaluation trenches will be backfilled (with the exception of the highways crossings) No further reinstatement will take place. The Hadrian's Wall Archaeologist will be notified as to the presence of any significant archaeology on all sites with the exception of the OA North identified sites. No reinstatement will take place until this process has been completed and English Heritage consent obtained.
- 3.1.11 **Environmental Sampling:** environmental samples (bulk samples of 30 litres volume, to be sub-sampled at a later stage) will be collected from stratified undisturbed deposits and will particularly target negative features (gullies, pits and ditches). Subject to the results of the evaluation an assessment of any environmental samples will be undertaken by the in-house palaeoecological specialist, who will examine the potential for further analysis. The assessment would examine the potential for macrofossil, arthropod, palynological and general biological analysis. The costs for the palaeoecological assessment are defined as a contingency and will only be called into effect in agreement with the County Archaeologist, English Heritage, and the Client.
- 3.1.12 Samples will also be collected for technological, pedological and chronological analysis as appropriate. If necessary, access to conservation advice and facilities

can be made available. OA North maintains close relationships with Ancient Monuments Laboratory staff at the Universities of Durham and York and, in addition, employs artefact and palaeozoological specialists with considerable expertise in the investigation, excavation and finds management of sites of all periods and types, who are readily available for consultation.

- 3.1.13 **Recording:** all information identified in the course of the site works will be recorded stratigraphically, with sufficient pictorial record (plans, sections and both black and white and colour photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.
- 3.1.14 Results of the field investigation will be recorded using a paper system, adapted from that used by Centre for Archaeology of English Heritage. The archive will include both a photographic record and accurate large-scale plans and sections at an appropriate scale (1:50, 1:20, and 1:10). Levels will be tied into the Ordnance Datum. All artefacts and ecofacts will be recorded using the same system, and will be handled and stored according to standard practice (following current Institute of Field Archaeologists guidelines) in order to minimise deterioration.
- 3.1.15 **Treatment of finds:** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.
- 3.1.16 **Treasure:** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.
- 3.1.17 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.
- 3.1.18 **Contingency plan:** in the event of significant archaeological features being encountered during the evaluations, discussions will take place with the Archaeological Officer/English Heritage, as to the extent of further works to be carried out, and in agreement with the Client. All further works would be subject to a variation to this project design. In addition, a contingency costing may also be employed for unseen delays caused by prolonged periods of bad weather, vandalism, discovery of unforeseen complex deposits and/or artefacts which require specialist removal, use of shoring to excavate important features close to the excavation sections etc. This has been included in the costing and would be in agreement with the client.

3.2 TOPOGRAPHIC SURVEY

- 3.2.1 The topographic survey will comprise an instrument survey, which will utilise a total station (TST) with portable logger, the data from which will be downloaded into a CAD package (AutoCAD Release 14).
- 3.2.2 The plans produced will show outline detail and hachures only. The final drawings will be produced at a relevant scale (1:1000 to 1:2500). It is

envisaged that where possible, the plans will be dropped onto Ordnance Survey maps.

3.3 WATCHING BRIEF

- 3.3.1 **Methodology:** a programme of field observation will accurately record the location, extent, and character of any surviving archaeological features and/or deposits within the topsoil stripping, trench cutting activities and ground disturbance to be undertaken within the off-road sections of the pipeline. This work will comprise observation during the excavation for these works, the systematic examination of any subsoil horizons exposed during the course of the groundworks, and the accurate recording of all archaeological features and horizons, and any artefacts, identified during observation.
- 3.3.2 During this phase of work, recording will comprise a full description and preliminary classification of features or materials revealed, and their accurate location (either on plan and/or section, and as grid co-ordinates where appropriate). Features will be planned accurately at appropriate scales and annotated on to a large-scale plan provided by the Client. A photographic record will be undertaken simultaneously.
- 3.3.3 A plan will be produced of the areas of groundworks showing the location and extent of the ground disturbance and one or more dimensioned sections will be produced.
- 3.3.4 A watching brief will be conducted of all topsoil stripping activities. Putative archaeological features and/or deposits identified by the machining process, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and where appropriate sections will be studied and drawn. Any such features will be sample excavated (ie. selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).
- 3.3.5 It is assumed that OA North will have the authority to stop the works for a sufficient time period to enable the recording of important deposits. It may also be necessary to call in additional archaeological support if a find of particular importance is identified or a high density of archaeology is discovered, but this would only be called into effect in agreement with the Client and the County Archaeology Service and will require a variation to costing. Also, should evidence of burials be identified, the 1857 Burial Act would apply and a Home Office Licence would be sought. This would involve all work ceasing until the proper authorities were happy for burials to be removed. In normal circumstances, field recording will also include a continual process of analysis, evaluation, and interpretation of the data, in order to establish the necessity for any further more detailed recording that may prove essential.
- 3.3.6 Full regard will, of course, be given to all constraints (services etc.), as well as to all Health and Safety regulations. OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures

are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Unit Managers.

3.3.7 **Human Remains:** any human remains uncovered will be left *in situ*, covered and protected. No further investigation will continue beyond that required to establish the date and character of the burial. English Heritage and the local Coroner will be informed immediately. If removal is essential the exhumation of any funerary remains will require the provision of a Home Office license, under section 25 of the Burial Act of 1857. An application will be made by OA North for the study area on discovery of any such remains and the removal will be carried out with due care and sensitivity under the environmental health regulations, and if appropriate, in compliance with the 'Disused Burial Grounds (Amendment) Act, 1981.

3.4 REPORT/ARCHIVE

3.4.1 **Report:** interim reports will be produced for the pumping station/wastewater treatment sites and the Hadrian's Wall crossings. These will be compiled immediately following the completion of the fieldwork and will be presented to the Hadrian's Wall Archaeologist.

3.4.2 **Final report:** one bound and one unbound copy of a written synthetic report will be submitted to the client, and a further three copies submitted to the Cumbria SMR within eight weeks of completion of fieldwork. The Hadrian's Wall Archaeologist will also receive a copy of the report. The report will include a copy of this project design, and indications of any agreed departure from that design. It will present, summarise, and interpret the results of the programme detailed above and will include a full index of archaeological features identified in the course of the project, with an assessment of the overall stratigraphy, together with appropriate illustrations, including detailed plans and sections indicating the locations of archaeological features. Any finds recovered will be assessed with reference to other local material and any particular or unusual features of the assemblage will be highlighted and the potential of the site for palaeoenvironmental analysis will be considered. The report will also include a complete bibliography of sources from which data has been derived.

3.4.3 This report will identify areas of defined archaeology. An assessment and statement of the actual and potential archaeological significance of the identified archaeology within the broader context of regional and national archaeological priorities will be made. Illustrative material will include a location map, section drawings, and plans. This report will be in the same basic format as this project design; a digital copy of the report can be provided, if required.

3.4.4 Provision will be made for a summary report to be submitted to a suitable regional or national archaeological journal within one year of completion of fieldwork, if relevant results are obtained.

3.4.5 **Confidentiality:** all internal reports to the client are designed as documents for the specific use of the Client, for the particular purpose as defined in the project

brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision.

- 3.4.6 **Archive:** the results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. The deposition of a properly ordered and indexed project archive in an appropriate repository is considered an essential and integral element of all archaeological projects by the IFA in that organisation's code of conduct. OA North conforms to best practice in the preparation of project archives for long-term storage. This archive will be provided in the English Heritage Centre for Archaeology format and a synthesis will be submitted to the CSMR (the index to the archive and a copy of the report). OA North practice is to deposit the original record archive of projects (paper, magnetic and plastic media) with the appropriate County Record Office, and a full copy of the record archive (microform or microfiche) together with the material archive (artefacts, ecofacts, and samples) with an appropriate museum. Wherever possible, OA North recommends the deposition of such material in a local museum approved by the Museums and Galleries Commission, and would make appropriate arrangements with the designated museum at the outset of the project for the proper labelling, packaging, and accessioning of all material recovered.
- 3.4.7 The Arts and Humanities Data Service (AHDS) online database *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

4 PROJECT MONITORING

- 4.1 Monitoring of this project will be undertaken through the auspices of the CCAS Archaeologist and the Hadrian's Wall Archaeologist, both of whom will be informed of the start and end dates of the work.

5 WORK TIMETABLE

- 5.1 It is anticipated that the evaluation will take 30 days. A breakdown by site is presented in Table 1.
- 5.2 The topographic survey will take two days in the field.
- 5.3 The duration of the watching brief will be dependent upon the progress of the contractor.
- 5.4 The client report will be completed within twelve weeks following completion of the fieldwork.

6 STAFFING

- 6.1 The project will be under the direct management of **Alison Plummer BSc (Hons)** (OA North Senior Project Manager) to whom all correspondence should be addressed.
- 6.2 The evaluations will be directed by an OA North supervisor. All OA North's project officers and supervisors are experienced field archaeologists who regularly undertaken supervision of numerous small- and large-scale evaluation and excavation projects.
- 6.3 An archaeological assistant will assist the supervisor.
- 6.4 The processing and analysis of any palaeoenvironmental samples will be carried out under the auspices of **Elizabeth Huckerby BA, MSc** (OA North project officer), who has extensive experience of the palaeoecology of the North West, having been one of the principal palaeoenvironmentalists in the English Heritage-funded North West Wetlands Survey.
- 6.5 Assessment of any finds from the excavation will be undertaken by **Sean McPhillips BA**. Sean has worked as a finds supervisor for English Heritage and MOLAS on a number of occasions and has extensive knowledge concerning finds.

7 INSURANCE

- 7.1 OA North has a professional indemnity cover to a value of £2,000,000; proof of which can be supplied as required.

8 OUTREACH

- 8.1 A presentation of the results of the archaeological programme of work would serve both to allow the local community access to their archaeological resource and to publicise the environmental policy of United Utilities.
- 8.2 It is proposed that a display is housed in the local parish hall. This would comprise a temporary/moveable display panel consisting of text from the report, photographs, copies of historic mapping and relevant reconstruction drawings. An A4 fold-out leaflet dominated by a map of the area, surrounded by photographs and reconstruction drawings would also be produced. OA North would set-up and remove the display and provide an archaeologist to present one talk possibly on the first day of the display, otherwise the display would not be manned.

COSTING

The item is a fixed price cost, inclusive of all management, overheads, and other disbursement costs (travel and expenses), to undertake the programme of work as defined in this project design; the second item is a fixed price day rate. Any other variations from this programme of work at the clients' direction will require recosting. All staff costs are inclusive of holiday entitlement, as well as NI and Superannuation.

Evaluations:

Programme of evaluation (with an allowance for manual excavation but excluding Glasson WwTW)	£14, 058.50
Topographic Survey	£406.00
Watching Brief day rate	£250.00 or
Watching brief weekly rate	£1060.00
Surveyor as required	£ 236 per day (including travel)

Outreach:

Total outreach cost	£ 1,743.00
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Contingency

Assessment and processing of palaeoenvironmental samples (Approximately 8 samples in 3 days)	£ 150.00/day
Faunal Assessment	£ 140.00/day
Dendrochronology dates	£ 275.00 each

Further analysis of the samples will be costed as a variation in accordance with procedures discussed with English Heritage and the client.

NB

Following current IFA guidelines it is recommended that a contingency sum equivalent to 10% of the total sum for the fieldwork costs is put aside for unseen delays caused by prolonged periods of bad weather, vandalism, discovery of unforeseen complex deposits and/or artefacts which require specialist removal, use of shoring to excavate important features close to the excavation sections etc. This sum would only be used following agreement with the client.

Normal OA North working hours are between 9.00am and 5.00pm, Monday to Friday, though adjustments hours maybe made to maximise daylight working time in winter and to meet travel requirements. It is not normal practice for OA North staff to be asked to work weekends or bank holidays and should the client require such time to be worked during the course of a project a contract variation to cover additional costs will be necessary.

Notes:

1. Salaries and wages inclusive of NI, Superannuation and overheads
2. Total costs exclusive of VAT
3. All costs at 2004/2005 prices

APPENDIX 2: CONTEXT LIST

Context Number	Trench	Description
<i>101</i>	1	Light yellow sandy-topsoil
<i>102</i>	1	Light orange gravelly-sand
<i>103</i>	1	Light grey sandy-silt
<i>104</i>	1	Mixed bluish grey sandy-silts
<i>105</i>	1	Natural geology
<i>201</i>	2	Light yellow gravelly-sand topsoil
<i>202</i>	2	Orange sand
<i>203</i>	2	Mixed sandy-silt
<i>204</i>	2	Gravel
<i>205</i>	2	Natural geology
<i>301</i>	3	Light yellow gravelly-sand topsoil
<i>302</i>	3	Mixed orange and grey sandy-silt
<i>303</i>	3	Grey sandy-silt
<i>304</i>	3	Natural geology
<i>401</i>	4	Light grey sandy-silt topsoil
<i>402</i>	4	Make up layer for road
<i>403</i>	4	Light yellow silty sand
<i>404</i>	4	Light grey silty-sand
<i>405</i>	4	Light yellow sandy-silt
<i>406</i>	4	Large stone block
<i>407</i>	4	Large stone block
<i>408</i>	4	Rammed gravel layer
<i>409</i>	4	Make up layer for <i>408</i>
<i>410</i>	4	Probable natural estuarine deposit

411	4	Natural geology
701	7	Brown sandy-silt topsoil
702	7	Brown sandy-silt
703	7	Natural geology
801	8	Sandy-silt topsoil
802	8	Yellow silty-sand
803	8	Natural geology
901	9	Light brown silty-sand topsoil
902	9	Light yellow silty-sand
903	9	Natural gravels
904	9	Natural sands