



Hallthwaites WwTW, Hallthwaites, Millom Without, Cumbria

Rapid Desk-Based Research and Walkover Survey



Oxford Archaeology North

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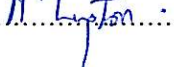
Prepared by: Vicki Bullock
Position: Supervisor
Date: April 2009

Will Gardner
Acting Supervisor
April 2009

Checked by: Alison Plummer
Position: Project Manager
Date: April 2009

Signed.....

Approved by: Alan Lupton
Position: Operations Manager
Date: April 2009

Signed.....

Oxford Archaeology North

Mill 3
Moor Lane Mills, Moor Lane
Lancaster
LA1 1GF
t: (0044) 01524 848666
f: (0044) 01524 848606

© Oxford Archaeological Unit Ltd (2009)

Janus House
Osney Mead
Oxford
OX2 0EA
t: (0044) 01865 263800
f: (0044) 01865 793496

w: www.oxfordarch.co.uk
e: info@oxfordarch.co.uk

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CONTENTS

SUMMARY	3
ACKNOWLEDGEMENTS	4
1. INTRODUCTION	5
1.1 Circumstances of Project.....	5
1.2 Location, Topography and Geology	5
2. METHODOLOGY	6
2.1 Project Brief.....	6
2.2 Rapid Desk-based research	6
2.3 Walkover Survey	6
2.4 Archive.....	7
3. HISTORICAL BACKGROUND	8
3.1 Introduction	8
3.2 Documentary Research	8
3.3 Historic Map Regression.....	10
3.4 Previous Archaeological Work.....	12
4. WALKOVER.....	13
4.1 Introduction	13
4.2 Results.....	13
5. GAZETTEER OF SITES	14
6. IMPACT AND RECOMMENDATIONS.....	20
6.1 Recommendations.....	20
7. BIBLIOGRAPHY	21
7.1 Cartographic Sources	21
7.2 Secondary Sources.....	21

8. ILLUSTRATIONS.....23

8.1 List of Figures.....23

8.2 List of Plates23

SUMMARY

United Utilities have proposed to construct a pipeline in the highway from Hallthwaite, Cumbria (NGR 318239, 485397) through The Green and onto Strands, with three pumping stations along the route and a new Wastewater Treatment Works near Strands (NGR 18186, 484443; Fig 1). The pumping stations will comprise an underground well and above ground kiosk with landscaping and access required. The treatment works (NGR 318667, 483809) are likely to comprise a combination of above and below ground structures with access and landscaping. Following recommendations made by the Cumbria County Council Historic Environment Officer, United Utilities commissioned Oxford Archaeology North (OA North) to undertake rapid archaeological desk-based research and a walkover survey of the proposed pipeline route.

In total, 12 sites were identified after consultation of the Cumbria Historic Environment Record. A further five sites were identified during consultation of the historic maps and aerial images, all of which were added to the gazetteer. The walkover survey visited those sites likely to be affected by the proposed development, it also recorded a further two sites. One site (Site **01**) was medieval in date, the remaining sites were post-medieval, industrial or modern or of unknown date.

None of the sites identified should be directly affected by the proposed pipeline route as the entire route is within the highway. However, a watching brief is recommended on any sections that extend beyond these limits.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank United Utilities Ltd for commissioning the project. Thanks are also due to Jeremy Parsons and Jo Mackintosh of Cumbria County Council Historic Environment Service (CCCHES), Kendal, and all the staff of the County Record Office in Barrow for their assistance with this project.

The rapid desk-based research was undertaken by Vicki Bullock, Will Gardner carried out the walkover survey, and Mark Tidmarsh produced the drawings. The project was managed by Alison Plummer, who also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 United Utilities have proposed to construct a pipeline in the highway from Hallthwaites, Cumbria (NGR SD 18242 85418) through The Green and onto Strands, with three pumping stations along the route and a new Wastewater Treatment Works near Strands (NGR SD 18643 83845; Fig 1). The pumping stations will comprise an underground well and above ground kiosk with landscaping and access required. The treatment works are likely to comprise a combination of above and below ground structures with access and landscaping. Following recommendations made by the Cumbria County Council Historic Environment Officer, United Utilities commissioned Oxford Archaeology North (OA North) to undertake rapid archaeological desk-based research and a walkover survey of the proposed pipeline route.
- 1.1.2 The rapid desk-based research comprised a search of both published and unpublished records held by the Historic Environment Record (HER) in Kendal, the County Record Office in Barrow, and the archives and library held at OA North. In addition to this, a walkover was carried out on the site of the proposed development, in order to relate the landscape and surroundings to the results of the rapid desk-based research. This report sets out the results in the form of a short document, outlining the results which includes a gazetteer of sites (Fig 2).

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

- 1.2.1 The pipeline will be constructed within the highway from Hallthwaite, Cumbria through The Green and onto Strands. Hallthwaites is approximately 5km north of Millom, Cumbria. The study area lies within the West Cumbria Coastal Plain (Countryside Commission 1998), characterised by the extensive Duddon estuary. Areas of lowland mire are located at the head of the estuary and mosslands occur within the lower Duddon and Esk estuaries. The majority of the inland area is a pastoral landscape of undulating or gently rolling topography with medium to large sized fields of improved pasture.
- 1.2.2 The solid geology of the area comprises Palaeozoic undifferentiated andesitic lavas and tuffs. The drift deposits are predominately boulder clay (British Geological Survey 1979).

2. METHODOLOGY

2.1 PROJECT BRIEF

2.1.1 A verbal brief was issued by Jeremy Parsons, Cumbria County Council Historic Environment Officer (CCCHES) in response to a planning request by United Utilities for a wastewater treatment works and pipeline in Hallthwaites, Cumbria. The project brief 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 (IFA 2001; English Heritage 2006).

2.2 RAPID DESK-BASED RESEARCH

2.2.1 A study area that extended 0.25km to each side of the proposed pipeline and treatment sites, to form a corridor 0.5km wide, was examined.

2.2.2 *Cumbria County Council Historic Environment Record (CCCHER)*: the Historic Environment Record held in Kendal was consulted to establish the presence of sites of cultural heritage interest already known within a 0.25km radius centred on the proposed pipeline route.

2.2.3 *County Record Office (CRO), Barrow-in-Furness, Cumbria*: the Record Office holds Ordnance Survey (OS) maps and other cartographic and documentary sources relating to the study area

2.2.4 *Oxford Archaeology North*: OA North has an extensive archive of secondary sources relevant to the study area, as well as numerous unpublished client reports on work carried out both as OA North and in its former guise of Lancaster University Archaeological Unit (LUAU). These were consulted where necessary.

2.2.5 *Aerial Photographs*: recent aerial photographs covering the pipeline route and development sites were consulted leading to the identification of man-made features of a considerable size in a field adjacent to the proposed site of the treatment works (NGR SD 18563 83729).

2.3 WALKOVER SURVEY

2.3.1 Following the rapid desk-based research, a Level I-type survey (*Section 4*) was undertaken to relate the existing landscape to research findings. This encompassed a one hundred metre corridor along either side of the pipeline, walked in a systematic fashion. Archaeological features identified within the landscape were recorded using the relevant OA North *pro forma*, and the features located using differential GPS survey, which can achieve an accuracy of +/- 5m with respect to the OS national grid.

2.4 ARCHIVE

- 2.4.1 A full professional archive has been compiled in accordance with current IFA and English Heritage guidelines (English Heritage 2006). The paper and digital archive will be deposited in the Cumbria Record Office in Barrow-in-Furness on completion of the project. A copy of the report will be deposited with the CCCHER.

3. HISTORICAL BACKGROUND

3.1 INTRODUCTION

3.1.1 Hallthwaites is an outlying hamlet of Millom in what was formerly south Cumberland. The general area has evidence of human activity from at least the Mesolithic period onwards (Young 2002), although there is little specific information regarding the study area prior to the medieval period. Hallthwaites formed part of the chapelry of Thwaites, which was held under the lords of Millom until the seventeenth century, when it passed to the Lowthers and then the Earls of Lonsdale (Whellan 1860, 408). The earliest reference to Hallthwaites is from 1449, and it is thought that the name derives from the prefix 'hall' attached to the earlier (Norse) 'thwaites' meaning clearing (Armstrong *et al* 1950, 417). A medieval bloomery (Site 01) at 'Dyehouse' is known, and survives as an earthwork. During the post-medieval period it became a local centre of industry with slate pencil making and a blacking mill being active in the area (Warriner 1932, 48), besides the woollen mill, with its associated walk mill and Dye House, and two corn mills. Industrial activity continued to play an important part in this otherwise rural location into the early twentieth century (OA North 2007).

3.2 DOCUMENTARY RESEARCH

3.2.1 The origins of the Dye House (Site 03; Plate 1) at Hallthwaites are obscure, but it is evident that it was part of a complex of buildings making and finishing woollen cloth. Dyeing associated with blanket manufacture was possibly carried out at Hallthwaites from at least 1829. There are a few specific references to the buildings making up the complex, such as one which states that between the 5th and 6th of December 1879, the cold weather stopped the walk mill wheel from turning (DH 322/2).

3.2.2 During the late nineteenth century at least, the Dye House was evidently operated by a small number of people, probably only a single family, with Mr John Moore doing much of the work, including maintenance, deliveries and collecting bills, himself. The business evidently supplied a large area, however, as mention is made of trips as far north as Whitehaven, as far south as Barrow-in-Furness and Ulverston, all along the Cumberland coast, and even east into Yorkshire.

3.2.3 The complex, including the Dye House, is known to have ceased production in 1935, with many of the original fittings still intact (Marshall and Davies-Shiel 1971, 16). Many of the buildings within the complex were subsequently used by a poultry farmer (*ibid*), who appears to have purchased much of the estate, including the Dye House in 1939 (BD/HJ/131/16/6 1939; BD/HJ/131/16/7 1939). Even at this date, the Dye House came with its own tenter ground and the right to erect tenter frames upon it (BD/HJ/131/16/7 1939).

- 3.2.4 Further south along the A5093 at The Green, is High Beckstones Mill (Site **06**) a corn mill of the smaller bank-type mill (Davies-Shiel 1978, 62). Also within The Green, Arnaby Mill (Site **07**) was situated along the banks of a second mill race to the east of that associated with High Beckstones Mill. These are early mills and were usually situated on the township trackways that often lie away from modern roads. The bank mill was often placed on the side of a major valley where the head race of a lateral beck could supply ample water for a small, powerful overshot wheel. In addition, they were specifically built into the hillside so that carts full of grain could be driven up around the back of the mill to the level of the drying kiln floor. This eliminated the need for complex hoisting equipment and could be worked efficiently by the miller alone (*op cit*, 63).
- 3.2.5 The basic drying kiln pattern allows the mill to be dated. The earliest drying kilns to be incorporated into mills date from the late seventeenth century (*ibid*). Few such mills were constructed after the larger corn mills were built in the 1820s. Most would appear to have been built by 1730 and are often still standing. Bank mills are particularly common in the area that was Cumberland, along the fringes of better grain lands. Internally, the structures are similar. The arrangement runs from bankside outwards and downhill: kiln, waterwheel and stones, stable, cottage. Most bank mills had layshaft arrangements and ran at the most three pairs of stones per waterwheel (*ibid*).
- 3.2.6 Although few mills carry datestones deliberately put in place by the builder, it is often possible to find dates inscribed in various locations by the mill tenants. Datestones will sometimes occur on the main doorway but can also be found within the building on beams or on planks of mill machinery. Another source of information can be the millstones. It was common practice to mark the bedstones with a cross, initials and a date (Davies-Shiel 1978, 48).
- 3.2.7 To the south-east of Arnaby Mill, at Stile Hill the Ordnance Survey map of 1860 marks the location of an 'Old Lime Kiln' (Site **08**). It was during the agrarian revolution of the eighteenth century, when vast areas were enclosed for farm land, that an enormous demand for lime was created. Lime was applied to reduce the acidity of the soil and make it more fertile. Vast numbers of lime kilns were built and many farmers had their own. Elsewhere, large blocks of kilns were built and run commercially so that farmers could buy their lime. There are many surviving examples of small farm or individual kilns, loaded from the top, with a grate at the bottom from which the lime could be extracted (Ashmore 1982, 10). In Cumbria, the majority of these kilns were all based on the simple draw-type kiln in which the fuel and limestone are placed in the kiln in alternate layers. As the fire moves up the kiln burnt lime is drawn out at the bottom. Examples of this type of kiln can be found throughout the county, most dating from the late eighteenth to mid nineteenth century. Stile Hill was also the location of two gravel pits (Site **09**) and at one time, as shown on the Ordnance Survey 1860 map, a 'Saw Pit'.
- 3.2.8 The hamlet of Arnaby, to the north of Stile Hill has two properties listed in the Historic Environment Record, Cumbria. New Arnaby Farm (Site **10**; Plate 2) is a late nineteenth/early twentieth century house but the garden wall contains

bee boles dated to the eighteenth century. These may belong to an earlier property or may be associated with Tarn Bank to the south. Bee boles comprised a row of recesses, often in a south-facing garden wall. Each recess was big enough to hold a skep, the coiled-straw hive, used by beekeepers in Britain before the introduction of the modern wooden hive in the late nineteenth century (www.ibra.org.uk).

- 3.2.9 At New Arnaby, (Bee Boles Register number 1278) there are two external recesses of rectangular shape within the stone, south-facing garden wall. The back of the recesses is flat and they are 0.29m apart (Plate 2). At Fellgate, Strands (Site **12**; Bee Boles Register number 1250), a house constructed in the seventeenth century has a stone/cobble south-west-facing garden wall containing two rectangle-shaped recesses. The recesses have a flat back and are 0.96m apart, the base is slate and the lintel is sandstone; they are of unknown date (Plate 3)

3.3 HISTORIC MAP REGRESSION

- 3.3.1 *Ordnance Survey 6" First Edition map, 1860*: the map shows The Woollen Mill (Site **04**) adjacent to an Endowed School, St Annes Church and a pair of workers cottages (Site **02**; Plate 4) in Hallthwaites. The Dye House (Site **03**) is shown with the field immediately to the north marked as 'Tenters'. The Dye House complex includes three rows of tenter frames to the north which are clearly shown. Walk Mill (Site **05**; Plate 5) is shown and marked as a Woollen mill. The associated mill race flows down towards High Beckstones Mill (Site **06**), which is marked as a corn mill. Across the Stramon Roanlands Brow, opposite Bridge End a 'Ruin' (Site **17**) is marked. Arnaby Mill (Site **07**) is also marked as a corn mill. At Stile Hill an 'Old Lime Kiln' (Site **08**) is marked, adjacent to a 'Saw Pit'. To the north-east along the track leading to Arnaby, are Arnaby Tarns (Site **13**), one either side of the track. Arnaby farmstead is marked on the map (Sites **10** and **11**). At Greenroad Station, on the 'Whitehaven and Furness Junction Railway', a viaduct and signal post are present. To the west of the railway line the field pattern comprises regular, enclosed, rectangular fields presumably dating from around the time of Enclosure during the mid-nineteenth century. However, to the east of the railway line, around Strand, Arnaby and Hallthwaites, the fields are enclosed but the pattern is more irregular and radiating from the nucleated settlements, suggesting an earlier date.

- 3.3.2 *Ordnance Survey 25" First Edition map, 1865*: in Hallthwaites the Woollen Mill (Site **04**), with associated weir and mill race are marked at the end of Chapel Brow. The workers cottages (Site **02**), although not named, are visible adjacent to the mill. The Dye House (Site **03**) and associated tenter field are shown, again with three frames marked. The 'Ruins' are shown (Site **17**). Walk Mill is present, as is High Beckstones Mill (Sites **05** and **06**). At Stile Hill an 'Old Lime Kiln' (Site **08**) is marked situated at the north-west corner of the field, in-between a triangle of lanes. The 'Saw pit' is still depicted, but not the gravel pit (Site **09**). To the north, Arnaby Tarns (Site **13**) are marked

and the complex of buildings at Arnaby appear to be unchanged (Sites **10** and **11**).

- 3.3.3 **Ordnance Survey 6" Second Edition map, 1900:** the Dye house and Tenter field are still shown on the map (Site **03**) as are Walk Mill, High Beckstones Mill and Arnaby Mill (Sites **05**, **06** and **07**). The ruined building adjacent to Bridge End is shown (Site **17**). The 'old limekiln' (Site **08**) is not marked, but the Gravel Pit (Site **09**) is marked. Arnaby Tarns (Site **13**) are shown and again the building complex at Arnaby appears little changed. Strands Bridge is marked on this map, which was not shown on the previous two maps. There is a goods shed and viaduct at Green Road Station over the railway, shown here as the 'Furness Railway'. A smithy (Site **15**) is marked situated at Rising Hill to the south of The Green.
- 3.3.4 **Ordnance Survey 6" Third Edition map, 1927:** the weir, mill race, Woollen Mill (Site **04**), Dye House (Site **03**) and Tenters are all marked on the map at Hallthwaites. The workers cottages are still present, as is the ruined building (Sites **02** and **17**). The remaining mills are all named, although the Smithy is not noted (Site **15**). At Stile Hill, There are two gravel pits marked (Site **09**), one on either side of the farm track leading to Arnaby. Arnaby Tarns (Site **13**) are no longer present. Strands Bridge is shown and there is a Pumping Station (Site **14**) marked adjacent to the bridge. The railway on this map is marked as the London, Midland and Scottish Railway; Carnforth and Whitehaven line. Several drainage channels or small streams can be seen on the map flowing from the Haws Wood area, into Black Beck around Greenroad Station.
- 3.3.5 **Ordnance Survey 6" map, 1956:** an immediately noticeable difference between this and the earlier maps is the Woollen Mill (Site **04**) being marked as 'disused', although the Dye House (Site **03**) and tenters are still marked. The workers cottages appear to remain (Site **02**) and Walk Mill (Site **05**), High Beckstones Mill (Site **06**) and Arnaby Mill (Site **07**) are all present. Both gravel pits (Site **09**) are shown but not named.
- 3.3.6 **Ordnance Survey 1980:** the buildings of the Woollen Mill (Site **04**), workers cottages (Site **02**), Dye House (Site **03**) and 'ruin' (Site **17**) are all shown but not named. High Beckstones Mill (Site **06**) is simply marked as 'The Mill'. Arnaby Mill (Site **07**) is marked as 'Mill House', where a small sewage works has been constructed. There is still a small structure in the position where the Smithy (Site **15**) was formerly marked. No gravel pits are marked, although there is still a structure in the north-west corner of the site. Arnaby is now shown as comprising Bottom Arnaby Farm (Site **11**) and New Arnaby (Site **10**) and High Arnaby. The Pumping Station (Site **14**) is no longer marked. The field systems on the 1867 map actually change remarkably little throughout the years, illustrated by the map sequence. Fellgate House (Site **12**) is shown, but not named on any of the maps consulted.

3.4 PREVIOUS ARCHAEOLOGICAL WORK

- 3.4.1 In 2005 OA North conducted a Level-III building survey of the Dye House, complex at Hallthwaite following rapid desk-based research in advance of its grant-aided restoration. The former Dye House was in a ruinous state, however six phases of building and alteration were identified. Initially, a small two-storey building constructed sometime between 1771 and 1829, the structure was continually expanded throughout the century and formed part of a complex making and finishing woollen cloth in the village. The Dye House ceased production in 1939, when it was sold to a poultry farmer. Further work was recommended during any groundworks (OA North 2005).
- 3.4.2 In 2007 OA North maintained a watching brief during the clearance of building debris from the ruinous Dye House, following the earlier building survey. The cobble and flagstone floors were observed, together with structures that would have facilitated the dyeing process. This included two large sandstone blocks set into the floor, possibly for supporting a tank or large item of equipment, a semi-circular pit or tank with a flagstone lid possibly used for soaking or washing wool, and a pad-stone that may have supported a column for a roof truss. A total of 68 finds was retrieved from the debris, the most significant being an oval stamped sheet for an early washing machine patented in 1868. Investigation of the surviving tenter bases, in the field to the north of the dye house, revealed that there were nine visible and eleven (including the outlying base) buried bases, all of fairly uniform size. It is possible that there were originally 34 bases if it is assumed that bases were once present in the gap. No further evidence of the tenter frames survives (OA North 2007).

4. WALKOVER

4.1 INTRODUCTION

4.1.1 The walkover survey carried out in December 2008 aimed to determine both the survival of above ground remains of sites recorded during the rapid desk-based research and also to identify previously unrecorded sites along the proposed pipeline route. The visit also provided an understanding of the impact of the proposed pipeline and the presence of any immediately visible constraints to the undertaking of intrusive investigation works.

4.1.2 All of the fields adjacent to the proposed pipeline route were walked systematically and the ground conditions were generally good for identifying sites; all the fields inspected were under pasture and had a covering of short grass.

4.2 RESULTS

4.2.1 The walkover survey identified a further two sites (Sites **18** and **19**), which have been added to the gazetteer (*Section 5*). The extensive complex of earthworks (Plates 7 and 8) within the field adjacent to Black Beck (Site **18**) are most probably relict water channels. The field in which they are located is also heavily waterlogged. The gatepost (Site **19**; Plate 9), comprises a large upright worked stone at the south-eastern corner of the field.

4.2.2 The Lime Kiln (Site **08**; Plates 10 and 11) was as described in the HER entry (*Section 5*), although it should be noted that the density of trees growing on the kiln has increased, increasing the potential for damage caused by root action. The site of the disused gravel pit (Site **09**; Plate 12) was not detected by the walkover and presumably lies beneath the road.

4.2.3 The pumping station (Site **14**; Plates 13 and 14) at the southern limit of the development would appear to have been incorporated into a current dwelling. Any activity in the immediate vicinity could disturb the foundations of earlier phases.

5. GAZETTEER OF SITES

Site number	01
Site name	Hallthwaites Green Bloomery Site, Millom Without
NGR	318170 485410
HER No	15952
Statutory Designation	None
Site type	Bloomery
Period	Medieval
Sources	CCCHER
Description	A medieval bloomery at 'Dyehouse', surviving as an earthwork.
Assessment	The site is within the study area, but is unlikely to be affected.

Site number	02
Site name	Hallthwaites Workers Cottages, Millom Without
NGR	318087 485426
HER No	40446
Statutory Designation	None
Site type	Workers Cottages
Period	Post-medieval/Industrial
Sources	OS 6" First Edition Map
Description	A pair of workers cottages, shown on the Ordnance Survey First Edition map of 1867, located on a plot of land to the south of The Woollen Mill (HER 12295) and possibly providing accommodations for its workers. Externally, the buildings are in a good state of repair, though disused in 2004.
Assessment	The cottages are within the study area but are unlikely to be affected by the proposed scheme.

Site number	03
Site name	Hallthwaites Dye House, Millom Without
NGR	318195 485383
HER No	12294
Statutory Designation	None
Site type	Dye House
Period	Post-medieval/Industrial
Sources	OS 6" First Edition map
Description	Site of a ruined buildings marked 'Dye House' on the Ordnance Survey First Edition map, 1867. The two-storey west wing still retained its roof in 2004, whereas the eastern wing and attached north-south range have fallen into a state of complete disrepair. In 2005 a Level III building survey was conducted following a rapid desk-based research in advance of its grant-aided restoration. Six phases of building and alteration were identified. Initially, a small, two-storey building constructed between 1771 and 1829, the structure was continually expanded throughout the nineteenth century and formed part of a complex making and finishing woollen cloth in the village. The Dye House ceased production in 1939 when it was sold to poultry farmer (OA North 2005). A watching brief was maintained during the clearance of building debris from the ruinous Dye House. The original cobble and flagstone floors were observed together with structures that would have facilitated the dyeing process. This included two large sandstone blocks set into the floor, possible for supporting a tank or large item of equipment., a semi-circular pit or tank with a flagstone lid possible used for soaking or washing wool and a pad-stone that may have supported a column for a roof truss. A total of 68 finds was recovered from the debris, the most significant being an oval stamped sheet label for an early washing machine patented in 1868 (OA North 2007).

Assessment The site lies adjacent to the development area but is unlikely to be directly affected although there will be a visual impact.

Site number 04
Site name The Woollen Mill, Hallthwaites, Millom Without
NGR 318065 485443
HER No 12295
Statutory Designation None
Site type Woollen Mill and Mill race
Period Post-medieval
Sources OS 6" First Edition map
Description The site of a stone-built woollen mill, formerly two-storeys, working until the 1930s. The mill was powered by water channelled from Black Beck to the north. The building has been converted to residential use.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 05
Site name Walk Mill, Hallthwaites, Millom Without
NGR 318120 485254
HER No 40444
Statutory Designation None
Site type Mill Race, Tail Race and Woollen Mill
Period Post-medieval
Sources OS 6" First Edition map, CCC Images 78-79/2004
Description The site of a ruined building marked 'Walk Woollen Mill' on the Ordnance Survey map of 1867. The mill was powered by water channelled from The Woollen Mill (HER 12295) to the north and emptied back into Black Beck to the south. These channels survive as dry earthworks. The mill has lost its roof and all of its internal fixtures and fittings.
Assessment This site lies within the study area and may potentially be affected by the proposed scheme.

Site number 06
Site name High Beckstones Mill, The Green Millom Without
NGR 317850 484730
HER No 12245
Statutory Designation None
Site type Mill and Mill Race
Period Post-medieval
Sources OS Second Edition 25" map 1900
Description Site of a corn mill and associated race.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 07
Site name Arnaby Mill, The Green, Millom Without
NGR 317960 484600
HER No 12247
Statutory Designation None
Site type Watermill and mill race
Period Post-medieval
Sources OS 25" Second Edition map
Description Site of Arnaby Mill and associated mill race. On the Ordnance Survey 25" Second Edition map of 1900 the watermill is shown as a corn mill.

Assessment The site lies within the study area but is unlikely to be affected by the development.

Site number 08
Site name Stile Hill Lime Kiln, Arnaby, The Green, Millom Without
NGR 318175 484465
HER No 41747
Statutory Designation None
Site type Lime Kiln
Period Post-medieval
Sources CCCHER
Description A single chambered lime kiln of local stone built into the natural slope of the ground at the road junction and now hidden by trees. The structure measures 5m wide x 3.2m high and is approximately 12m in length. The kiln top is 2m in diameter with two trees growing inside which had not, in 2006, disturbed the stonework. The frontal chamber, half-ovoid in shape is 2m high x 1.6m wide x 2.1m in length at its base. The top forms a level platform with the Arnaby road and the frontal chamber is level with the lower road to the railway station.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 09
Site name Stile Hill Gravel Pit, The Green, Millom Without
NGR 318200 484450
HER No 12246
Statutory Designation None
Site type Gravel Pit
Period Post-medieval
Sources OS 25" Second Edition map
Description The site of a disused gravel pit shown on the Ordnance Survey 25" Second Edition map, 1900.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 10
Site name New Arnaby, Arnaby, Millom Without
NGR 318317 484642
HER No 41920
Statutory Designation None
Site type House and Bee Bole
Period Bee Bole- Post-medieval/Industrial; House- Modern
Sources IBRA Bee Bole Register: New Arnaby No. 1278 (<http://www.ibra.co.uk>); OS 6" First Edition map; OS 6" Second Edition map
Description New Arnaby appears to be a modern/twentieth century house. The bee boles may belong to an earlier property or Tarn Bank to the south, as the two bee boles in the wall are of eighteenth century date.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 11
Site name Bottom Arnaby Farm, Arnaby, Millom Without
NGR 318360 484760
HER No 41885
Statutory Designation None
Site type Farmstead
Period Industrial
Sources OS 6" First Edition map
Description A farmstead shown on the Ordnance Survey 6" First Edition map, 1867.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 12
Site name Fellgate, Strands, Millom Without
NGR 318430 484230
HER No 41921
Statutory Designation None
Site type House and Bee Hole
Period Late medieval/Post-medieval
Sources The IBRA Bee Boles Register; Fellgate Strands No. 1250 www.ibra.co.uk
Description The house was built in the 1600s and was in a poor condition in 1998. The garden wall contains two bee boles of unknown date.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 13
Site name Arnaby Tarns
NGR 318250 484535
HER No None
Statutory Designation None
Site type Tarns
Period Unknown
Sources OS First Edition map
Description The site of two tarns, one on either side of the farm track leading to Arnaby.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 14
Site name Pumping Station, Strands, Millom Without
NGR 318697 484049
HER No None
Statutory Designation None
Site type Pumping station
Period Modern
Sources OS 6" Third Edition map
Description The site of a pumping station shown on the Ordnance Survey 6" Third Edition map, 1927. The pumping station was still present on the OS 6" Provisional Edition map, 1956.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 15
Site name **Smithy, The Green, Millom Without**
NGR 317890 484488
HER No None
Statutory Designation None
Site type **Smithy**
Period Post-medieval/Industrial
Sources OS map 6" Second Edition
Description The site of a smithy adjacent to Rising Hill, The Green, shown on the Ordnance Survey 6" Second Edition map, 1900 but not marked on later OS maps.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 16
Site name **Palaeochannels/ditch and rectilinear feature**
NGR 318725 483700
HER No None
Statutory Designation None
Site type **Palaeochannels/ditch and rectilinear feature**
Period Unknown
Sources Aerial image
Description A series of palaeochannels in a field to the west of the railway. The field also contains a large, possible ditch and a recti-linear feature which appear to be man-made.
Assessment The site lies within the study area but is unlikely to be affected by the proposed scheme.

Site number 17
Site name **Ruined Building**
NGR 318245 484234
HER No None
Statutory Designation None
Site type **Building**
Period Unknown
Sources OS First Edition 1865
Description A ruined building marked as 'ruin' on the 1860 First Edition, on Roanlands Brow, opposite Bridge End, Hallthwaites.
Assessment The site lies within the study area but will not be affected by the proposed scheme.

Site number 18
Site name **Earthwork Complex**
NGR 318650 483959
HER No None
Statutory Designation None
Site type **Earthworks**
Period Unknown
Sources Walkover
Description Probable derelict water channels can be seen across the extent of the field, which was heavily waterlogged when visited.
Assessment The site lies within the study area but will not be affected by the proposed scheme.

Site number	19
Site name	Gate Post
NGR	318231 485370
HER No	None
Statutory Designation	None
Site type	Gate Post
Period	Post-medieval
Sources	Walkover
Description	Limestone gate post, standing 1m high and with obvious signs of working. Similar structures of this type are clearly visible in the surrounding landscape.
Assessment	The site lies within the study area but is unlikely to be affected by the proposed scheme.

6. IMPACT AND RECOMMENDATIONS

6.1 RECOMMENDATIONS

- 6.1.1 In terms of further archaeological investigation and mitigation, it is necessary to consider only those sites that will be affected by the proposed development. Current legislation draws a distinction between archaeological remains of national importance and other remains considered to be of lesser significance. Those perceived to be of national importance may require preservation *in situ*, whilst those of lesser significance may undergo preservation by record, where regional or high local significance can be demonstrated.
- 6.1.2 It is likely that the necessary groundworks will be within the highway and no further work is necessary, however, it is recommended a watching brief be undertaken during all ground disturbing activities should the route of the pipeline extend beyond the limits of the highway.

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8. ILLUSTRATIONS

8.1 LIST OF FIGURES

Figure 1: Site Location Map

Figure 2: Plan of Gazetteer Sites

Figure 3: Proposed route superimposed upon extract from the Ordnance Survey second edition 6" to 1 mile map, 1900

Figure 4: Proposed route superimposed upon extract from the Ordnance Survey third edition 6" to 1 mile map, 1927

Figure 5: Proposed route superimposed upon extract from the Ordnance Survey 1: 10,000 map 1956

8.2 LIST OF PLATES

Plate 1: The Dye House, Hallthwaites

Plate 2: The Bee Boles in the garden wall of New Arnaby House, Hallthwaites

Plate 3: A Bee Bole in the garden wall at Fellgate, Strands

Plate 4: The workers cottages, Hallthwaites

Plate 5: Earthworks at Walk Mill, Hallthwaites

Plate 6: A recent aerial image of palaeochannels in a field adjacent to the development site

Plate 7: Earthwork complex (Site **18**), facing south-west.

Plate 8: Earthwork complex (Site **18**), facing west.

Plate 9: Limestone Gatepost (Site **19**), facing north-west.

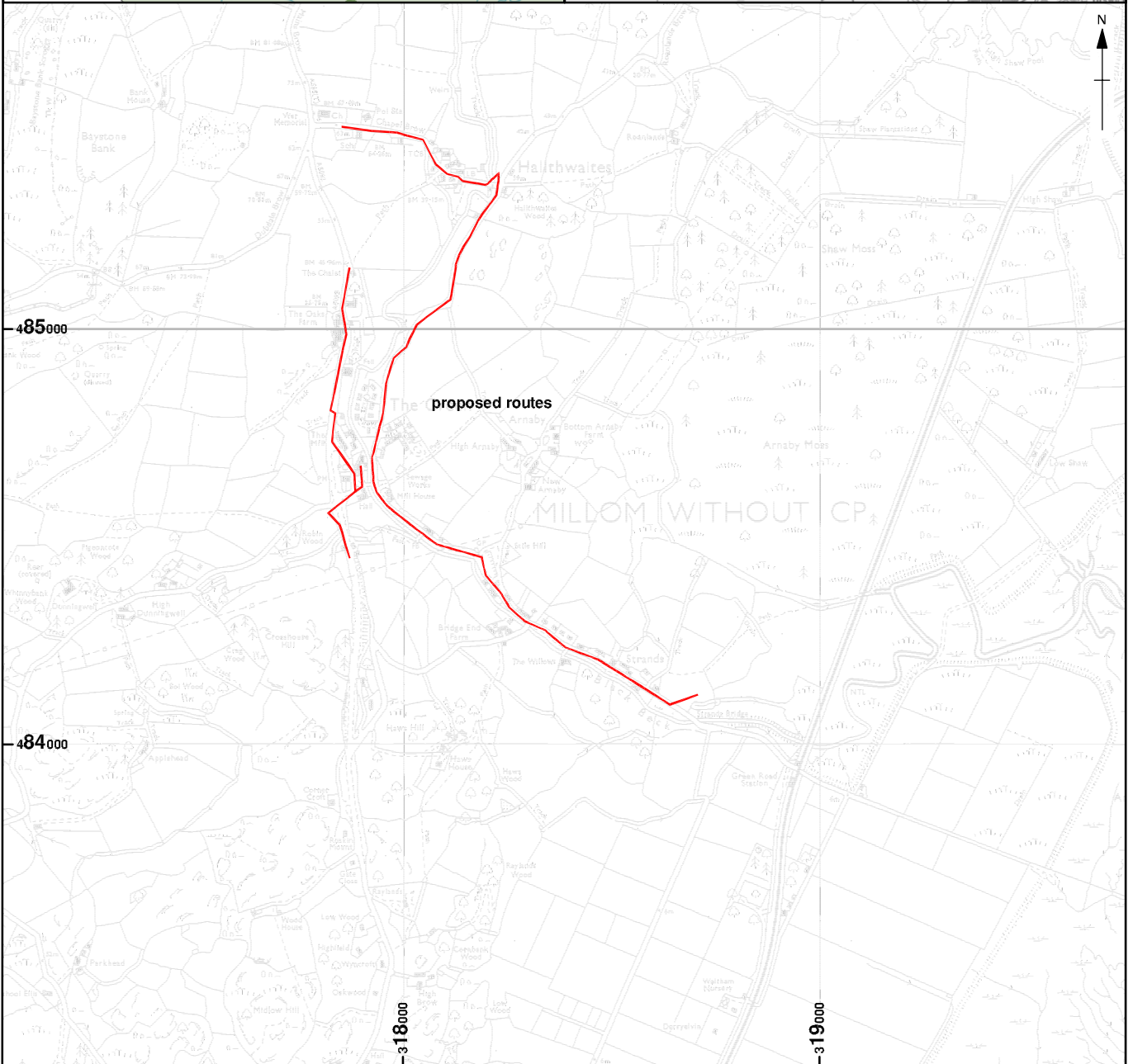
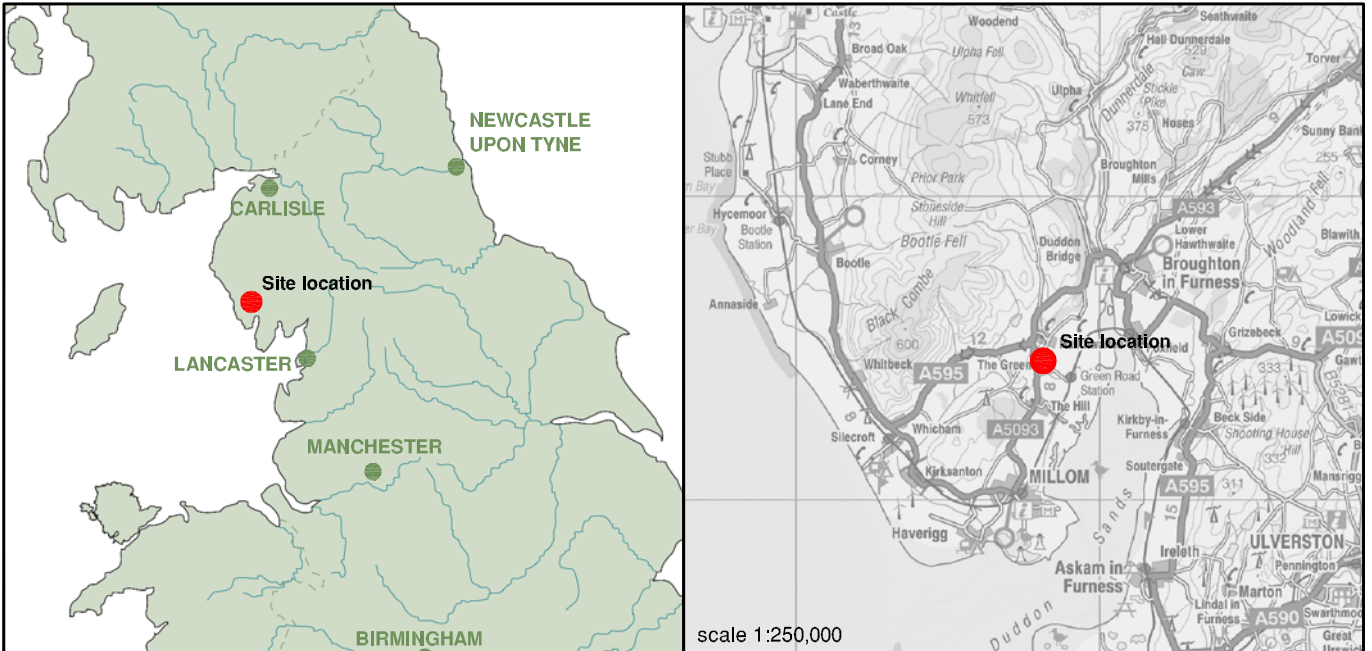
Plate 10: Limekiln (Site **08**), facing north-east.

Plate 11: Top of Limekiln (Site **08**), facing north-west

Plate 12: Probable location of Gravel pit (Site **09**)

Plate 13: Probable location of Pump House (Site **14**), facing east.

Plate 14: Residential building with slate plaque engraved "Pump House", facing north-east.



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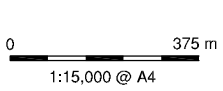


Figure 1: Site location

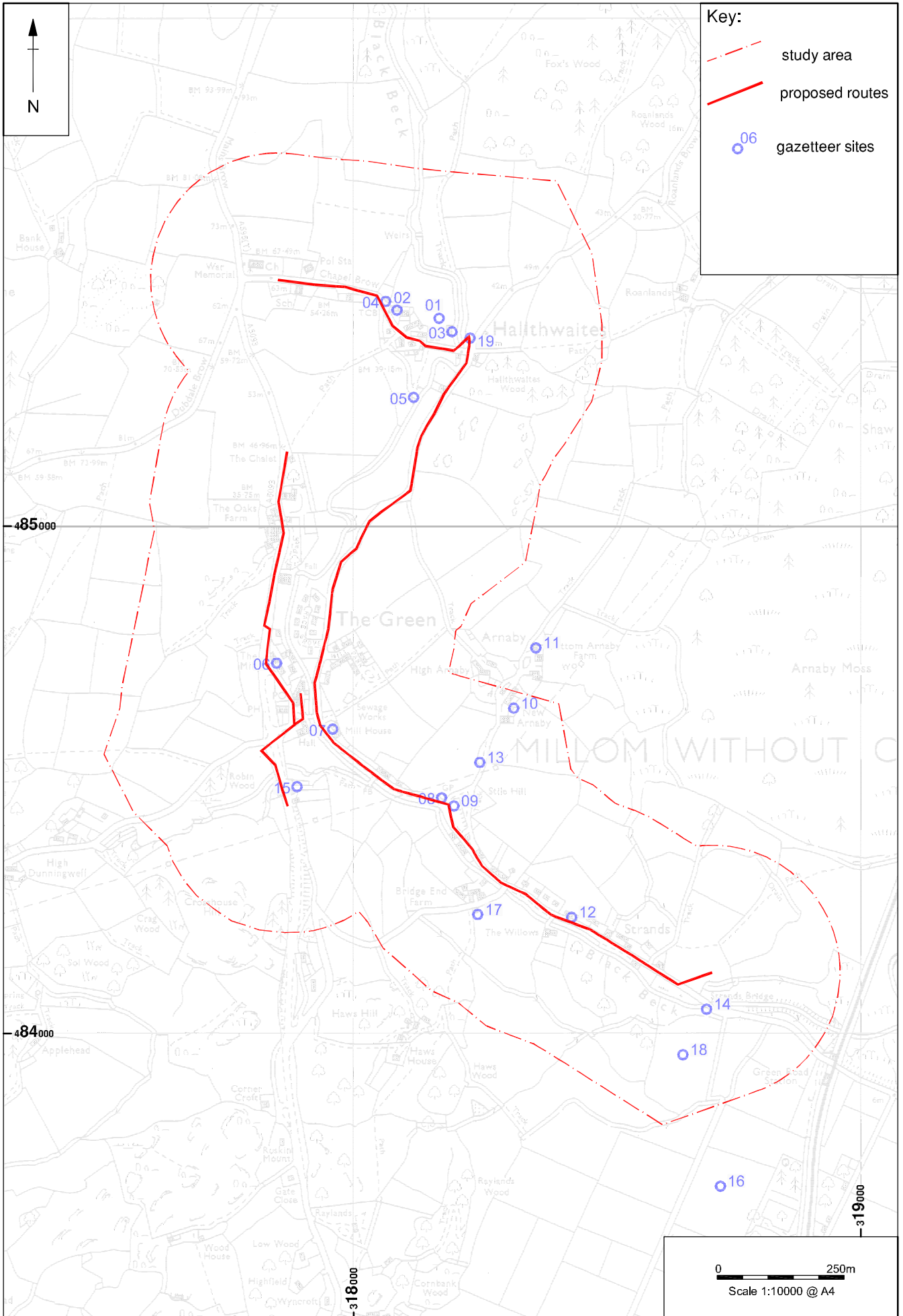


Figure 2: Gazetteer sites plan

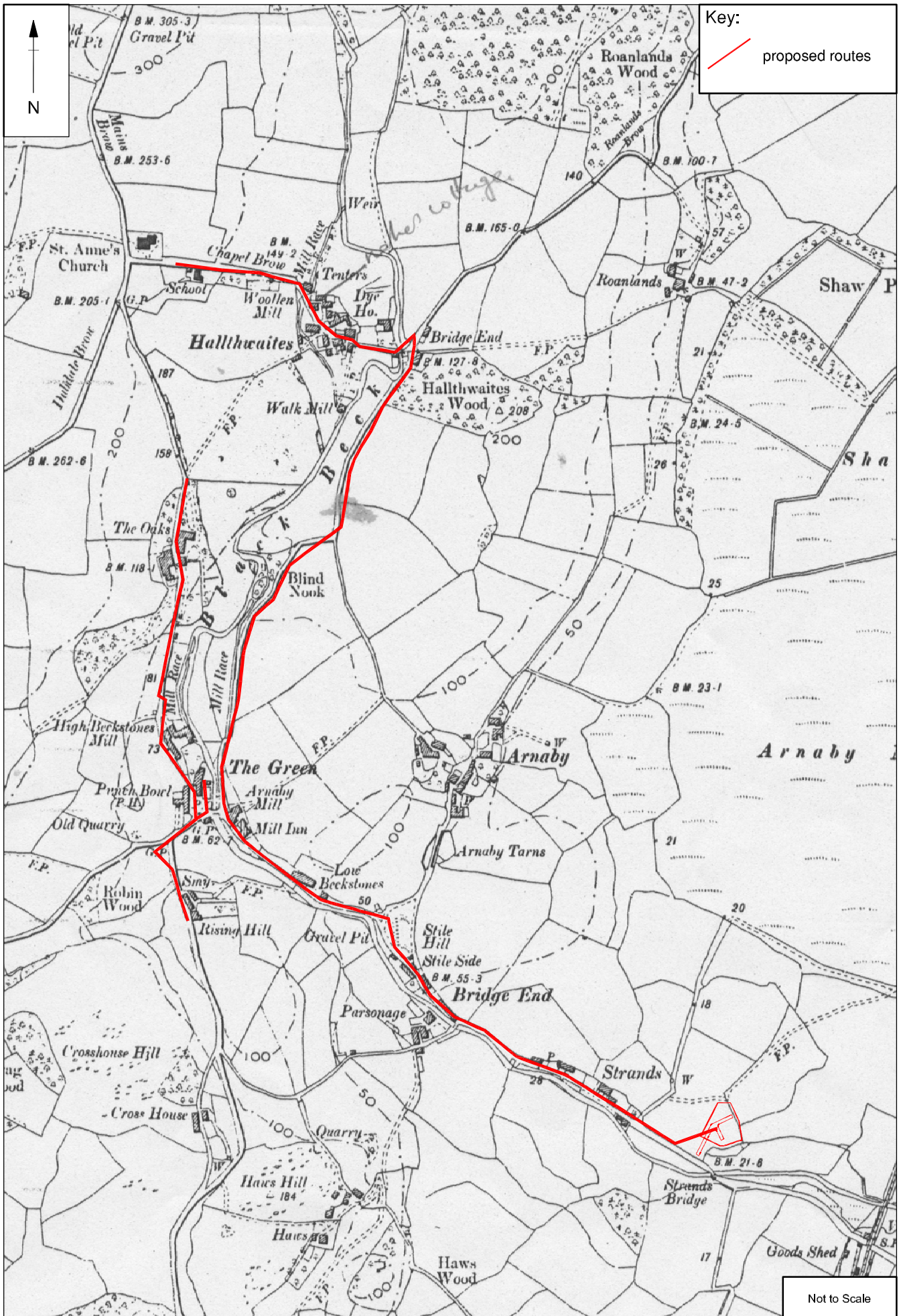


Figure 3: Development area superimposed upon extract from the Ordnance Survey second edition 6" to 1 mile map, 1900

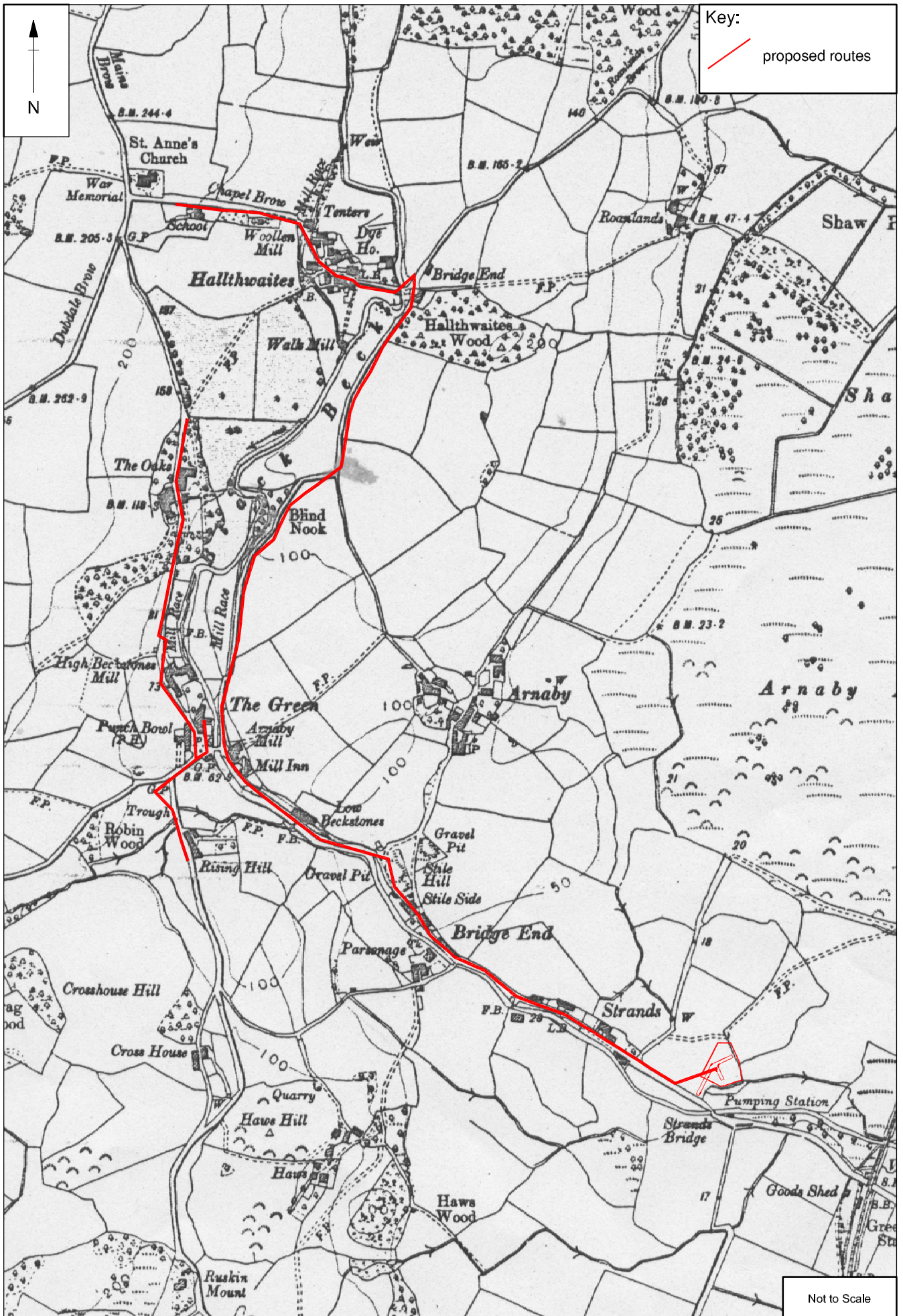


Figure 4: Development area superimposed upon extract from the Ordnance Survey third edition 6" to 1 mile map, 1927

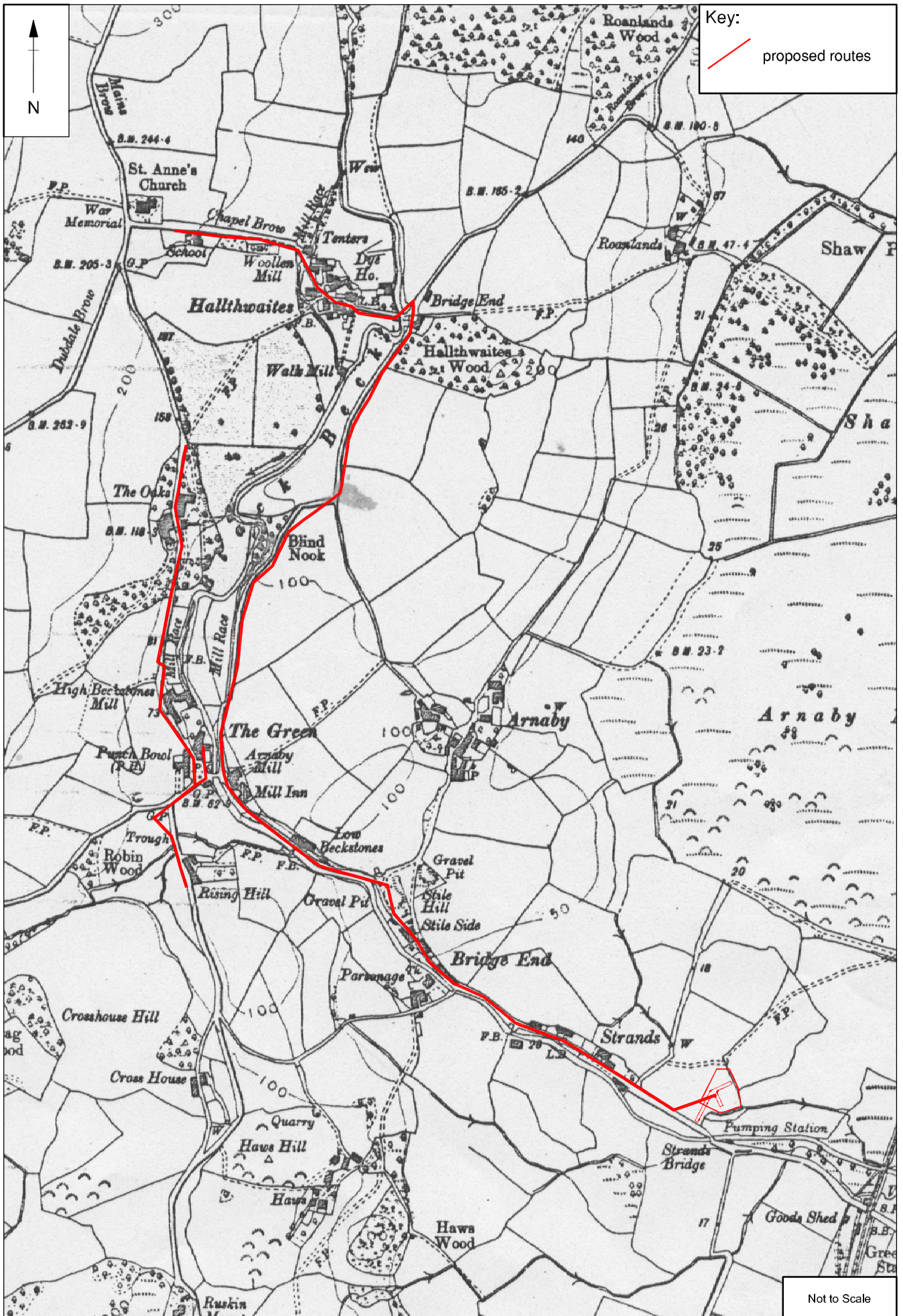


Figure 5: Development area superimposed upon extract from the Ordnance Survey 1:10,000 map, 1956

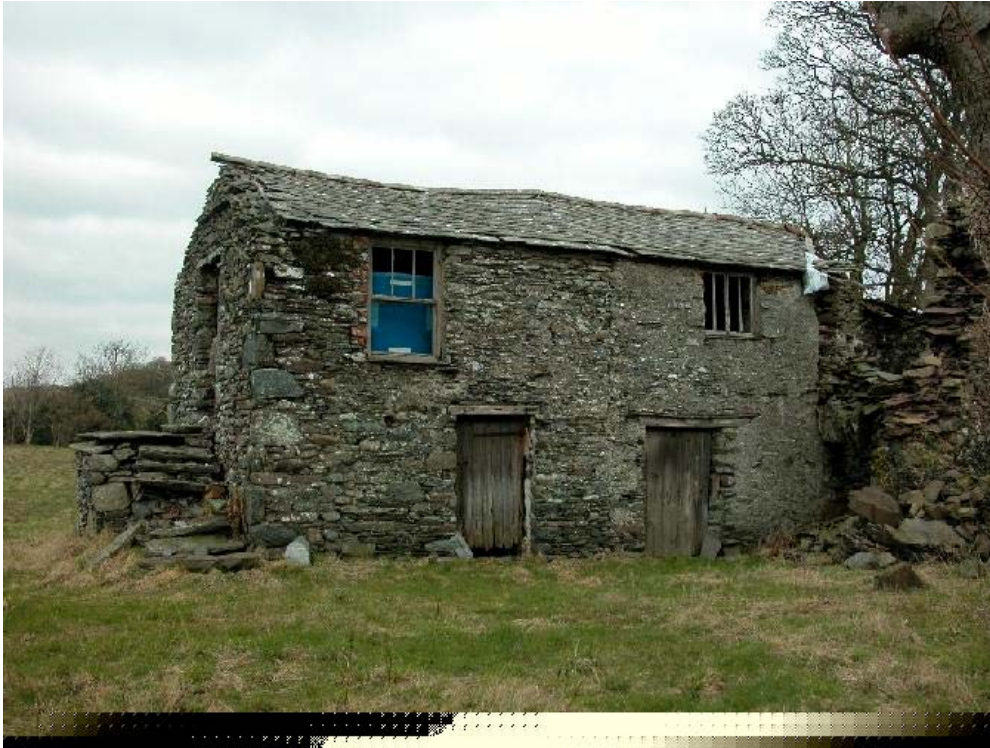


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