GLASSON PUMPING STATION, GLASSON, CUMBRIA

WATCHING BRIEF REPORT

CP. NO: 744/09

06/11/2009

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SUMMARY

North Pennines Archaeology Ltd were commissioned by United Utilities to undertake an archaeological watching brief within the vicinity of the projected line of Hadrian's Wall near Glasson, Cumbria (NGR NY 325814 560245), during groundworks for a new electricity supply associated with the Glasson pumping station. Hadrian's Wall and much of the surrounding land is protected as a Scheduled Monument (SM no 26121). The proposed works were within the buffer zone of the Hadrian's Wall World Heritage Site. As a result, Mike Collins, Hadrian's Wall Archaeologist for English Heritage, recommended that a programme of archaeological works be undertaken in accordance with a written scheme of investigation submitted to and approved by the aforementioned. The current works followed an archaeological investigation of the study area, conducted by North Pennines Archaeology Ltd in July 2009, in order to better inform the depth and route of the proposed underground electricity cable.

The Archaeological Watching Brief was undertaken over four days between the 19th October and the 23rd October 2009. The watching brief monitored the excavation of a *c*.60m trench associated with the Glasson pumping station within the immediate vicinity of the Hadrian's Wall World Heritage Site. No archaeological finds or obvious archaeological remains were observed during the watching brief, the trench largely being comprised of modern disturbance deposits.

As this archaeological watching brief was conducted as part of a recommendation to observe groundworks for a new electricity supply associated with the Glasson pumping station, no further work is deemed necessary. However, given the high archaeological potential of the area, it is recommended that any future work be subject to a programme of archaeological investigation.

ACKNOWLEDGEMENTS

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The archaeological watching brief was undertaken by David Jackson. The report was written by David Jackson, who also produced the drawings. The project was managed by Frank Giecco, Technical Director of NPA Ltd. The report was edited by Matt Town, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In October 2009, North Pennines Archaeology were invited by Linda Young of United Utilities to maintain an archaeological watching brief at Glasson, Cumbria (NGR NY 325814 560245, Figure 1), during groundworks associated with a new electricity supply to the Glasson pumping station. The proposed works lie within the immediate vicinity of Hadrian's Wall (SM no 26121) and its associated features, which are classified as a World Heritage Site. As a result, Mike Collins of English Heritage (Hadrian's Wall Archaeologist) requested that all ground reduction be subject to a programme of archaeological observation and investigation. This is in line with government advice as set out in the DoE Planning Policy Guidance on Archaeology and Planning (PPG 16).

1.1.2 The current works followed an archaeological investigation of the study area, conducted by North Pennines Archaeology Ltd in July 2009, in order to better inform the depth and route of the proposed underground electricity cable (Jackson 2009).

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1.1.4 This report outlines the monitoring works undertaken on-site, the subsequent programme of post-fieldwork analysis, and the results of this scheme of archaeological works.

2 METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 A project design was submitted by North Pennines Archaeology Ltd in response to a request by Linda Young of United Utilities, for an archaeological watching brief of the study area. Following acceptance of the project design, North Pennines Archaeology Ltd was commissioned by the client to undertake the work. The project design conformed to the requirements set out by Mike Collins, Hadrian's Wall Archaeologist, which was adhered to in full. The work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 THE WATCHING BRIEF

2.2.1 The works involved a structured watching brief to observe, record and excavate any archaeological deposits from the development site. A watching brief is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons, on a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed (IfA 2008).

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2.2.4 The test-pits were excavated by hand under close archaeological supervision. The test-pits were subsequently investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the Excavation Manual (Giecco 2003).

2.2.5 All deposits encountered were deemed unsuitable for environmental sampling, and therefore no samples were retained.

2.2.6 A summary of the findings of the watching brief is included within this report.

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2.3.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive will be deposited within the Senhouse Museum, Maryport, with copies of the report sent to the County Historic Environment Record at Kendal, available upon request. The archive can be accessed under the unique project identifier **NPA09**, **GCE-B**, **CP/744/09**.

2.3.2 North Pennines Archaeology, and English Heritage, support the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, as a part of this national project.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The study area is located southeast of Glasson, approximately 13km west of Carlisle, Cumbria (NY 325814 5602451). The site is situated immediately northwest of Bombadil Cottage, alongside a section of the Carlisle to Bowness on Solway road, between Drumburgh and Port Carlisle (Figure 1), at a height of approximately 8.5m OD.

3.1.2 The broader area of the site is known as the Solway Basin and is a broad, lowland plain landscape fringed by the low, rugged, relatively remote coastline of the Solway Firth and Irish Sea (Countryside Commission 1998). The Solway Plain is open and exposed to the prevailing southwesterly winds and tree cover is limited. This area is characterised by dairy cattle grazing on fields of improved pasture, which are variously defined by drainage ditches, small streams, low wind-sheared hedgerows and stone-faced hedgebanks or 'kests'. The area to the east of the site includes flat marshland where the rivers Eden, Esk and Lyne flow into the Solway (*ibid*).

3.1.3 The underlying geology of the study area is mainly comprised of mudstones and sandstones of Permo-Triassic age ('New Red Sandstone'). A small pocket of poorly exposed Liassic mudstones and limestones of Jurassic age overlie the Permo-Triassic rocks to the southeast, and Coal Measures, mudstones, sandstones and a few coals of Carboniferous age lie beneath the Permo-Triassic rocks, forming a restricted belt along the southern margin of the Solway Basin (Countryside Commission 1998). The underlying geology of the area is largely covered by large quantities of boulder clay, sand and gravel, deposited by thick ice-sheets and glacial meltwaters during the last glaciation (*ibid*).

3.2 HISTORICAL CONTEXT

3.2.1 This section is intended as a brief summary only, detailing the main periods of occupation within the immediate area of the site.

3.2.2 Hadrian's Wall was designated as a World Heritage Site in 1987 and forms the most complex and best preserved of the frontiers of the Roman Empire. (English Heritage 2002b). The World Heritage Site (WHS) comprises a visual envelope between 1km and 6km from the site in order to serve as a buffer zone to protect the site and its immediate landscape from development detrimental to the visual amenity of the site (*ibid*).

3.2.3 The WHS is centred on the military installations constructed from AD 122 on the orders of the Emperor Hadrian. The WHS also includes other Roman sites and structures which predate Hadrian's Wall, such as the arrangement of forts along the Cumbrian Coast between Bowness-on-Solway and Ravenglass, and incorporates a wealth of pre-Roman and post-Roman sites and landscapes (*op.cit.*). Hadrian's Wall was constructed in the early 2nd century on a line connecting the Tyne and the Solway and represented at various times the northern frontier of Roman Britain.

3.2.4 The Wall was a composite military barrier, which in its final form comprised several separate elements; a stone wall fronted by a V-shaped ditch, and a number of purpose-built stone garrison fortifications such as forts, milecastles and turrets, a large earthwork and ditch, built parallel with and to the south of the Wall, known as the Vallum, and a metalled supply road linking the garrison forts, which is known as the 'Roman Military Way'. The Wall begins in the east at Wallsend in Tyneside and continues to the west, terminating at Bowness-on-Solway, to the west of the study area, a distance of 80 Roman miles (73.5 English miles or 117 kilometres). The Wall, conceived by Hadrian was to be ten feet wide and about fifteen feet high. The front face of the wall most likely sported a crenulated parapet, behind which the soldiers patrolled along a paved rampart-walk (Bedoyere 1998). The more detailed history of Hadrian's Wall is well documented and is summarised in numerous publications (Breeze and Dobson 2000; Daniels 1978 and Birley 1961).

3.2.5 Apart from Hadrian's Wall, there does not appear to have been any significant activity within the study area until the 19th century. In 1819, work began on the construction of the Carlisle Canal which was eventually opened in 1823. The canal extended from a new port at Port Carlisle on the west coast to a basin in Carlisle, passing through the study area. The canal was in use for *c*.30 years, until it was converted into the Port Carlisle railway line 1853 (Perriam 1992: 56). The Port Carlisle line did not prove overly successful, and was largely used for horse-drawn carriages until its closure in 1914 (Towill 1991: 111).

3.3 PREVIOUS WORK

3.3.1 In July 2009, North Pennines Archaeology Ltd undertook an archaeological evaluation of the study area in advance of the current works. The archaeological work comprised the excavation of five strategically located test-pits within the study area in order to better inform the route of the proposed electricity cable. No evidence of Hadrian's Wall or other archaeological remains were observed during the investigation. The

archaeological evaluation concluded that it would be unlikely that any significant archaeological remains would be disturbed at the proposed depth of 0.7m during the excavation of the electricity cable trench associated with the current works. However, it was also recommended that any future invasive work in the vicinity be subject to a programme of archaeological monitoring, given the high archaeological sensitivity of the area (Jackson 2009).

3.3.2 Further work within the vicinity of the study area include;

- archaeological work undertaken by Carlisle Archaeology Ltd in 1999, and;
- an archaeological watching brief undertaken by North Pennines Archaeology Ltd (Giecco and Denham 2003).

3.3.3 Both of these archaeological investigations were conducted within the village of Glasson immediately northwest of the study area. Both investigations successfully located remains of the Vallum ditch in different areas of the village.

3.3.4 Most other recent investigations have largely been concentrated around the Burgh-by-Sands area to the east of the study area (e.g. Jackson and Wooler 2008, Mounsey *et al* 2008, Noakes 2008, and Sowerby 2008).

4 ARCHAEOLOGICAL WATCHING BRIEF

4.1 INTRODUCTION

4.1.1 The archaeological watching brief took place between the 19th October and the 23rd October 2009, and comprised the observation and investigation of groundworks for a new underground electricity cable associated with the Glasson pumping station. A service trench measuring approximately 60m in length was excavated to a maximum depth of 0.7m with a Kubota KX36-3 mechanical excavator using a *c*.0.25m wide ditching bucket.

4.1.2 The trench was located to the southeast of Glasson, immediately west of Bombadil Cottage on the Carlisle to Bowness-on-Solway road (Figure 2). The results of the watching brief are summarised below.

4.2 RESULTS

4.2.1 The first section of the service trench was located within a grass verge, immediately east of the main road in order to connect the service trench with an existing underground service pipe (Figure 2). This section of the trench was aligned north-northwest to south-southeast, and was excavated to a width of *c*.0.3m and a maximum depth of 0.7m, exposing a deposit of firm red clayey sand **(103)** which measured over 0.1m in depth. The red clayey sand **(103)** was below a deposit of orange/light brown clayey sand subsoil **(102)**, which measured *c*.0.4m in depth, and a deposit of dark brown silty sand topsoil **(100)**, which measured *c*.0.21m in depth (Plate 1). The deposits were consistent throughout this section of the trench.

4.2.2 The north-northwest to south-southeast aligned section of the service trench was excavated in a south-easterly direction for *c*.35m, at which point the trench turned eastwards in order to cross the main road (Plate 2, Figure 2). The trench was excavated in a westerly direction, across the road and the western grass verge for *c*.7.5m. At this point, the service trench measured *c*.0.8m in width and *c*.0.7m in depth, exposing *c*.0.02m of firm red clayey sand **(103)** below *c*.0.3m of red/orange clayey sand backfill for an existing service pipe **(106)**. The clayey sand backfill **(106)** was below *c*.0.34m of hardcore packing **(105)** and *c*.0.06m of tarmac road surface **(104)** (Plate 3). The *c*.2m section of the trench through the western grass verge was excavated to a depth of *c*.0.6m, revealing a light brown/red clayey sand disturbance layer **(108)**, which measured over 0.4m in depth. The disturbance layer **(108)** was below a *c*.0.2m deposit of mid-brown silty sand topsoil **(107)**, and was associated with an existing electric cable and BT pole.

4.2.3 Following the excavation through the road, the service trench was extended into a field further west, in order to connect the trench to an existing electricity pole (No. 013203, Figure 2). The trench was further extended in a westerly direction for *c*.15m through the field, at an average width of *c*.0.7m and an average depth of *c*.0.6m, exposing *c*.0.05m of firm red clayey sand **(103)** (Plate 4). The clayey sand deposit **(103)** was below *c*.0.4m of the light brown/red clayey sand disturbance layer **(108)** and *c*.0.2m of topsoil **(107)** (Plate 5). An additional length of trench was also excavated in a northerly direction for *c*.3.3m in order to connect the service trench to the electricity pole (Figure 2). This small section of trench was located approximately 11m west along the main service trench within the field, and measured *c*.0.3m in width and *c*.0.7m in depth, exposing a deposit of grey/brown silty clay **(109)** which measured over 0.4m in depth. The silty clay deposit **(109)** was below a *c*.0.15m deposit of the clayey sand disturbance layer **(108)** and *c*.0.12m of topsoil **(107)** (Plate 6).

Plate 1: View north-northwest of service trench through grass verge

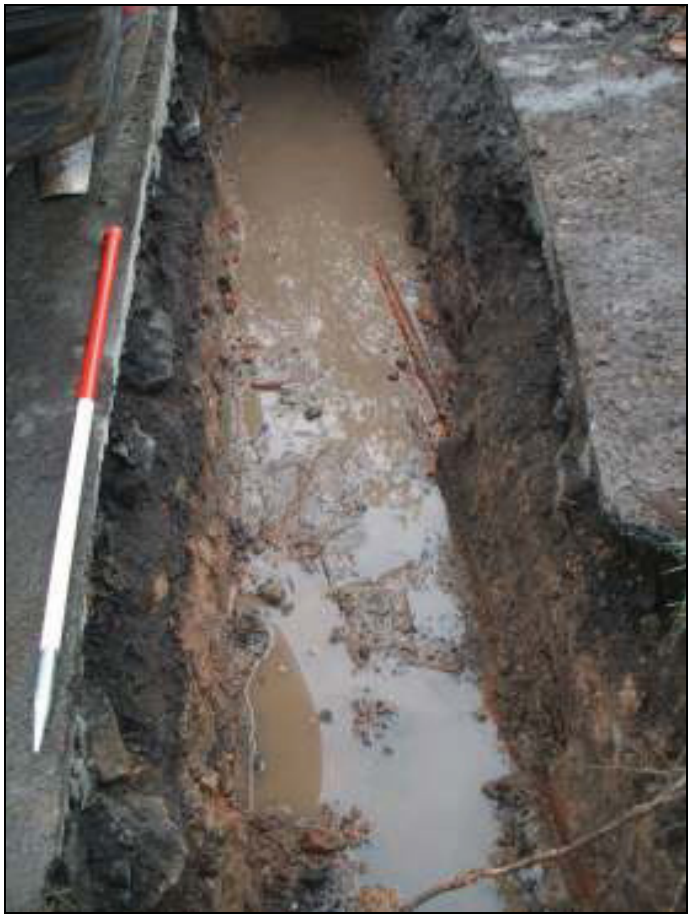

Plate 2: View west of service trench through road

Plate 3: North facing section of service trench through road

Plate 4: View east of service trench within field

Plate 5: North facing section of service trench within field

Plate 6: View north of additional section of service trench within field

4.3 ARCHAEOLOGICAL FINDS AND ENVIRONMENTAL SAMPLING

4.3.1 No archaeological finds were recovered, and no environmental samples were retained during the groundworks.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The archaeological watching brief monitored the excavation of groundworks associated with the Glasson pumping station, within the immediate vicinity of Hadrian's Wall. The work comprised the excavation of a *c*.60m service trench to a maximum depth of 0.7m.

5.1.2 During the archaeological evaluation, no evidence of Hadrian's Wall or any other significant archaeological features were observed. Most of the recorded deposits up to the maximum excavated depth of 0.7m related modern activities.

5.2 RECOMMENDATIONS

5.2.1 As this watching brief was conducted as a condition of groundworks associated with the Glasson pumping station, no further archaeological work is deemed necessary. However, given the site's location in relation to the Hadrian's Wall World Heritage Site, it is recommended that any work conducted in the future be subject to a similar programme of archaeological investigation.

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APPENDIX 1: CONTEXT TABLE

Context Number	Context Type	Description
100	Deposit	Topsoil (East Verge)
101	Geological	Natural Substrate
102	Deposit	Clay/Sand Subsoil
103	Deposit	Red Clay/Sand
104	Deposit	Tarmac Road Surface
105	Deposit	Hardcore
106	Deposit	Backfill Deposit
107	Deposit	Topsoil (Field)
108	Deposit	Clay/Sand Disturbance Layer
109	Deposit	Grey/Brown Silty Clay

Table 2: List of Contexts issued during Watching Brief

APPENDIX 2: FIGURES

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3.1.1 The study area is located southeast of Glasson, approximately 13km west of Carlisle, Cumbria (NY 325814 5602451). The site is situated immediately northwest of Bombadil Cottage, alongside a section of the Carlisle to Bowness on Solway road, between Drumburgh and Port Carlisle (Figure 1), at a height of approximately 8.5m OD.

3.1.2 The broader area of the site is known as the Solway Basin and is a broad, lowland plain landscape fringed by the low, rugged, relatively remote coastline of the Solway Firth and Irish Sea (Countryside Commission 1998). The Solway Plain is open and exposed to the prevailing southwesterly winds and tree cover is limited. This area is characterised by dairy cattle grazing on fields of improved pasture, which are variously defined by drainage ditches, small streams, low wind-sheared hedgerows and stone-faced hedgebanks or 'kests'. The area to the east of the site includes flat marshland where the rivers Eden, Esk and Lyne flow into the Solway (*ibid*).

3.1.3 The underlying geology of the study area is mainly comprised of mudstones and sandstones of Permo-Triassic age ('New Red Sandstone'). A small pocket of poorly exposed Liassic mudstones and limestones of Jurassic age overlie the Permo-Triassic rocks to the southeast, and Coal Measures, mudstones, sandstones and a few coals of Carboniferous age lie beneath the Permo-Triassic rocks, forming a restricted belt along the southern margin of the Solway Basin (Countryside Commission 1998). The underlying geology of the area is largely covered by large quantities of boulder clay, sand and gravel, deposited by thick ice-sheets and glacial meltwaters during the last glaciation (*ibid*).

3.2 HISTORICAL CONTEXT

3.2.1 This section is intended as a brief summary only, detailing the main periods of occupation within the immediate area of the site.

3.2.2 Hadrian's Wall was designated as a World Heritage Site in 1987 and forms the most complex and best preserved of the frontiers of the Roman Empire. (English Heritage 2002b). The World Heritage Site (WHS) comprises a visual envelope between 1km and 6km from the site in order to serve as a buffer zone to protect the site and its immediate landscape from development detrimental to the visual amenity of the site (*ibid*).

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archaeological evaluation concluded that it would be unlikely that any significant archaeological remains would be disturbed at the proposed depth of 0.7m during the excavation of the electricity cable trench associated with the current works. However, it was also recommended that any future invasive work in the vicinity be subject to a programme of archaeological monitoring, given the high archaeological sensitivity of the area (Jackson 2009).

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4 ARCHAEOLOGICAL WATCHING BRIEF

4.1 INTRODUCTION

4.1.1 The archaeological watching brief took place between the 19th October and the 23rd October 2009, and comprised the observation and investigation of groundworks for a new underground electricity cable associated with the Glasson pumping station. A service trench measuring approximately 60m in length was excavated to a maximum depth of 0.7m with a Kubota KX36-3 mechanical excavator using a *c*.0.25m wide ditching bucket.

4.1.2 The trench was located to the southeast of Glasson, immediately west of Bombadil Cottage on the Carlisle to Bowness-on-Solway road (Figure 2). The results of the watching brief are summarised below.

4.2 RESULTS

4.2.1 The first section of the service trench was located within a grass verge, immediately east of the main road in order to connect the service trench with an existing underground service pipe (Figure 2). This section of the trench was aligned north-northwest to south-southeast, and was excavated to a width of *c*.0.3m and a maximum depth of 0.7m, exposing a deposit of firm red clayey sand **(103)** which measured over 0.1m in depth. The red clayey sand **(103)** was below a deposit of orange/light brown clayey sand subsoil **(102)**, which measured *c*.0.4m in depth, and a deposit of dark brown silty sand topsoil **(100)**, which measured *c*.0.21m in depth (Plate 1). The deposits were consistent throughout this section of the trench.

4.2.2 The north-northwest to south-southeast aligned section of the service trench was excavated in a south-easterly direction for *c*.35m, at which point the trench turned eastwards in order to cross the main road (Plate 2, Figure 2). The trench was excavated in a westerly direction, across the road and the western grass verge for *c*.7.5m. At this point, the service trench measured *c*.0.8m in width and *c*.0.7m in depth, exposing *c*.0.02m of firm red clayey sand **(103)** below *c*.0.3m of red/orange clayey sand backfill for an existing service pipe **(106)**. The clayey sand backfill **(106)** was below *c*.0.34m of hardcore packing **(105)** and *c*.0.06m of tarmac road surface **(104)** (Plate 3). The *c*.2m section of the trench through the western grass verge was excavated to a depth of *c*.0.6m, revealing a light brown/red clayey sand disturbance layer **(108)**, which measured over 0.4m in depth. The disturbance layer **(108)** was below a *c*.0.2m deposit of mid-brown silty sand topsoil **(107)**, and was associated with an existing electric cable and BT pole.

4.2.3 Following the excavation through the road, the service trench was extended into a field further west, in order to connect the trench to an existing electricity pole (No. 013203, Figure 2). The trench was further extended in a westerly direction for *c*.15m through the field, at an average width of *c*.0.7m and an average depth of *c*.0.6m, exposing *c*.0.05m of firm red clayey sand **(103)** (Plate 4). The clayey sand deposit **(103)** was below *c*.0.4m of the light brown/red clayey sand disturbance layer **(108)** and *c*.0.2m of topsoil **(107)** (Plate 5). An additional length of trench was also excavated in a northerly direction for *c*.3.3m in order to connect the service trench to the electricity pole (Figure 2). This small section of trench was located approximately 11m west along the main service trench within the field, and measured *c*.0.3m in width and *c*.0.7m in depth, exposing a deposit of grey/brown silty clay **(109)** which measured over 0.4m in depth. The silty clay deposit **(109)** was below a *c*.0.15m deposit of the clayey sand disturbance layer **(108)** and *c*.0.12m of topsoil **(107)** (Plate 6).

Plate 1: View north-northwest of service trench through grass verge

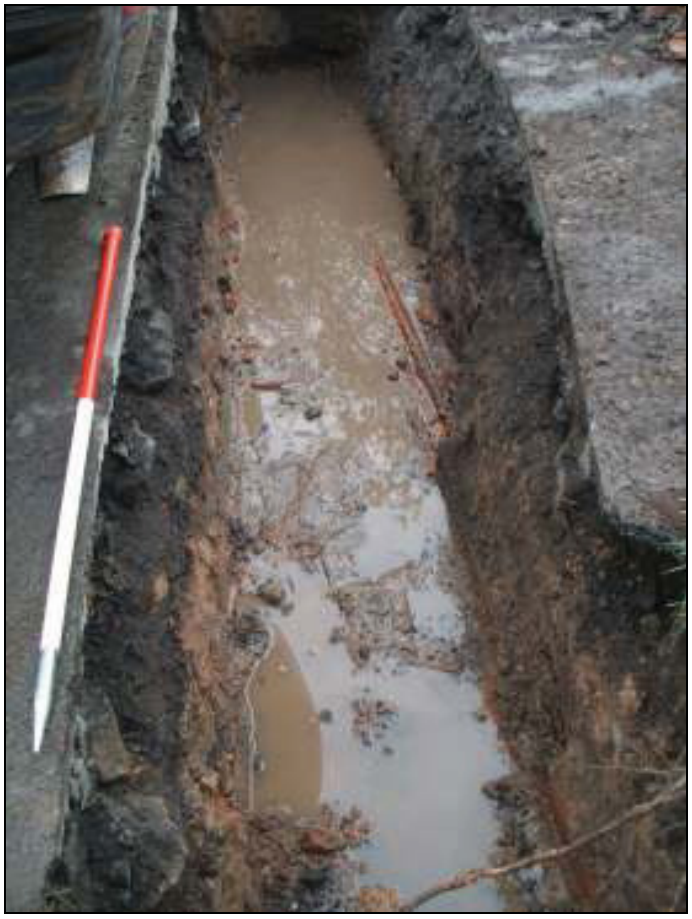

Plate 2: View west of service trench through road

Plate 3: North facing section of service trench through road

Plate 4: View east of service trench within field

Plate 5: North facing section of service trench within field

Plate 6: View north of additional section of service trench within field

4.3 ARCHAEOLOGICAL FINDS AND ENVIRONMENTAL SAMPLING

4.3.1 No archaeological finds were recovered, and no environmental samples were retained during the groundworks.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The archaeological watching brief monitored the excavation of groundworks associated with the Glasson pumping station, within the immediate vicinity of Hadrian's Wall. The work comprised the excavation of a *c*.60m service trench to a maximum depth of 0.7m.

5.1.2 During the archaeological evaluation, no evidence of Hadrian's Wall or any other significant archaeological features were observed. Most of the recorded deposits up to the maximum excavated depth of 0.7m related modern activities.

5.2 RECOMMENDATIONS

5.2.1 As this watching brief was conducted as a condition of groundworks associated with the Glasson pumping station, no further archaeological work is deemed necessary. However, given the site's location in relation to the Hadrian's Wall World Heritage Site, it is recommended that any work conducted in the future be subject to a similar programme of archaeological investigation.

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APPENDIX 1: CONTEXT TABLE

Context Number	Context Type	Description
100	Deposit	Topsoil (East Verge)
101	Geological	Natural Substrate
102	Deposit	Clay/Sand Subsoil
103	Deposit	Red Clay/Sand
104	Deposit	Tarmac Road Surface
105	Deposit	Hardcore
106	Deposit	Backfill Deposit
107	Deposit	Topsoil (Field)
108	Deposit	Clay/Sand Disturbance Layer
109	Deposit	Grey/Brown Silty Clay

Table 2: List of Contexts issued during Watching Brief

APPENDIX 2: FIGURES

GLASSON PUMPING STATION, GLASSON, CUMBRIA

WATCHING BRIEF REPORT

CP. NO: 744/09

06/11/2009

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DOCUMENT TITLE:	Glasson Pumping Station, Glasson, Cumbria
DOCUMENT TYPE:	Watching Brief Report
CLIENT:	United Utilities
CP NUMBER:	744/09
SITE CODE:	GCE/B
PLANNING APP. NO:	' – '
OASIS REFERENCE:	northpen3-66857
PRINT DATE:	06/11/2009
GRID REFERENCE:	NY 325814 560245

Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

	01
PREPARED BY:	David Jackson
POSITION:	Assistant Supervisor
DATE:	05/11/09
EDITED BY:	Frank Giecco
POSITION:	Technical Director
DATE:	06/11/09
APPROVED BY:	Frank Giecco
POSITION:	Technical Director
DATE:	06/11/09

CONTENTS

ILLUSTRATIONS

FIGURES (APPENDIX 2)

PLATES

SUMMARY

North Pennines Archaeology Ltd were commissioned by United Utilities to undertake an archaeological watching brief within the vicinity of the projected line of Hadrian's Wall near Glasson, Cumbria (NGR NY 325814 560245), during groundworks for a new electricity supply associated with the Glasson pumping station. Hadrian's Wall and much of the surrounding land is protected as a Scheduled Monument (SM no 26121). The proposed works were within the buffer zone of the Hadrian's Wall World Heritage Site. As a result, Mike Collins, Hadrian's Wall Archaeologist for English Heritage, recommended that a programme of archaeological works be undertaken in accordance with a written scheme of investigation submitted to and approved by the aforementioned. The current works followed an archaeological investigation of the study area, conducted by North Pennines Archaeology Ltd in July 2009, in order to better inform the depth and route of the proposed underground electricity cable.

The Archaeological Watching Brief was undertaken over four days between the 19th October and the 23rd October 2009. The watching brief monitored the excavation of a *c*.60m trench associated with the Glasson pumping station within the immediate vicinity of the Hadrian's Wall World Heritage Site. No archaeological finds or obvious archaeological remains were observed during the watching brief, the trench largely being comprised of modern disturbance deposits.

As this archaeological watching brief was conducted as part of a recommendation to observe groundworks for a new electricity supply associated with the Glasson pumping station, no further work is deemed necessary. However, given the high archaeological potential of the area, it is recommended that any future work be subject to a programme of archaeological investigation.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank Linda Young of United Utilities for commissioning the project. Thanks are also due to Mike Collins of English Heritage. NPA Ltd would also like to thank the staff of United Utilities and Bethell Power Services for their assistance during the project.

The archaeological watching brief was undertaken by David Jackson. The report was written by David Jackson, who also produced the drawings. The project was managed by Frank Giecco, Technical Director of NPA Ltd. The report was edited by Matt Town, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In October 2009, North Pennines Archaeology were invited by Linda Young of United Utilities to maintain an archaeological watching brief at Glasson, Cumbria (NGR NY 325814 560245, Figure 1), during groundworks associated with a new electricity supply to the Glasson pumping station. The proposed works lie within the immediate vicinity of Hadrian's Wall (SM no 26121) and its associated features, which are classified as a World Heritage Site. As a result, Mike Collins of English Heritage (Hadrian's Wall Archaeologist) requested that all ground reduction be subject to a programme of archaeological observation and investigation. This is in line with government advice as set out in the DoE Planning Policy Guidance on Archaeology and Planning (PPG 16).

1.1.2 The current works followed an archaeological investigation of the study area, conducted by North Pennines Archaeology Ltd in July 2009, in order to better inform the depth and route of the proposed underground electricity cable (Jackson 2009).

1.1.3 All groundworks associated with the new electricity supply had to be excavated under full archaeological supervision and all stages of the archaeological work were undertaken following approved statutory guidelines (IfA 2008), and were consistent with the specification provided by NPA Ltd (Giecco 2009) and generally accepted best practice.

1.1.4 This report outlines the monitoring works undertaken on-site, the subsequent programme of post-fieldwork analysis, and the results of this scheme of archaeological works.

2 METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 A project design was submitted by North Pennines Archaeology Ltd in response to a request by Linda Young of United Utilities, for an archaeological watching brief of the study area. Following acceptance of the project design, North Pennines Archaeology Ltd was commissioned by the client to undertake the work. The project design conformed to the requirements set out by Mike Collins, Hadrian's Wall Archaeologist, which was adhered to in full. The work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 THE WATCHING BRIEF

2.2.1 The works involved a structured watching brief to observe, record and excavate any archaeological deposits from the development site. A watching brief is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons, on a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed (IfA 2008).

2.2.2 The aims and principal methodology of the watching brief can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record them;
- to carry out further excavation and recording work in adequate time, if intact archaeological remains are uncovered during the project;
- to accurately tie the area watched by the archaeologist into the National Grid at an appropriate scale, with any archaeological deposits and features adequately levelled;
- to sample environmental deposits encountered as required, in line with English Heritage (2002a) guidelines;
- to produce a photographic record of all contexts using colour digital, 35mm colour print and monochrome formats as applicable, each photograph including a graduated metric scale;
- to recover artefactual material, especially that useful of dating purposes;

- to produce a site archive in accordance with MAP2 (English Heritage 1991) and MoRPHE standards (English Heritage 2006).

2.2.3 Archaeological monitoring and supervision of groundworks associated with a new electricity supply associated with the Glasson pumping station was undertaken intermittently over four days between the 19th October and the 23rd October 2009.

2.2.4 The test-pits were excavated by hand under close archaeological supervision. The test-pits were subsequently investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the Excavation Manual (Giecco 2003).

2.2.5 All deposits encountered were deemed unsuitable for environmental sampling, and therefore no samples were retained.

2.2.6 A summary of the findings of the watching brief is included within this report.

2.3 THE ARCHIVE

2.3.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive will be deposited within the Senhouse Museum, Maryport, with copies of the report sent to the County Historic Environment Record at Kendal, available upon request. The archive can be accessed under the unique project identifier **NPA09**, **GCE-B**, **CP/744/09**.

2.3.2 North Pennines Archaeology, and English Heritage, support the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, as a part of this national project.

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4.2.3 Following the excavation through the road, the service trench was extended into a field further west, in order to connect the trench to an existing electricity pole (No. 013203, Figure 2). The trench was further extended in a westerly direction for *c*.15m through the field, at an average width of *c*.0.7m and an average depth of *c*.0.6m, exposing *c*.0.05m of firm red clayey sand **(103)** (Plate 4). The clayey sand deposit **(103)** was below *c*.0.4m of the light brown/red clayey sand disturbance layer **(108)** and *c*.0.2m of topsoil **(107)** (Plate 5). An additional length of trench was also excavated in a northerly direction for *c*.3.3m in order to connect the service trench to the electricity pole (Figure 2). This small section of trench was located approximately 11m west along the main service trench within the field, and measured *c*.0.3m in width and *c*.0.7m in depth, exposing a deposit of grey/brown silty clay **(109)** which measured over 0.4m in depth. The silty clay deposit **(109)** was below a *c*.0.15m deposit of the clayey sand disturbance layer **(108)** and *c*.0.12m of topsoil **(107)** (Plate 6).

Plate 1: View north-northwest of service trench through grass verge

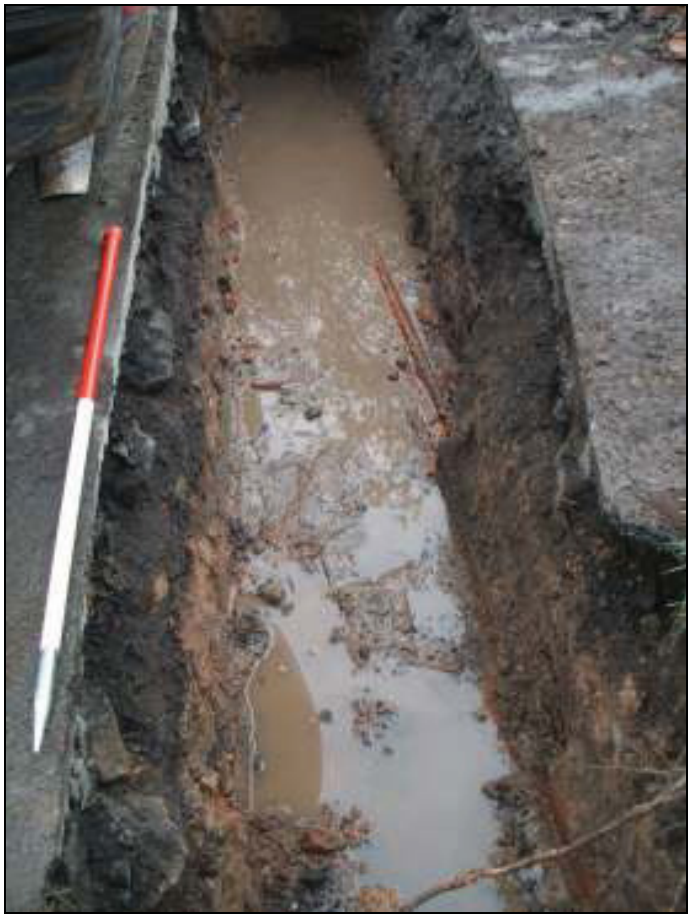

Plate 2: View west of service trench through road

Plate 3: North facing section of service trench through road

Plate 4: View east of service trench within field

Plate 5: North facing section of service trench within field

Plate 6: View north of additional section of service trench within field

4.3 ARCHAEOLOGICAL FINDS AND ENVIRONMENTAL SAMPLING

4.3.1 No archaeological finds were recovered, and no environmental samples were retained during the groundworks.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The archaeological watching brief monitored the excavation of groundworks associated with the Glasson pumping station, within the immediate vicinity of Hadrian's Wall. The work comprised the excavation of a *c*.60m service trench to a maximum depth of 0.7m.

5.1.2 During the archaeological evaluation, no evidence of Hadrian's Wall or any other significant archaeological features were observed. Most of the recorded deposits up to the maximum excavated depth of 0.7m related modern activities.

5.2 RECOMMENDATIONS

5.2.1 As this watching brief was conducted as a condition of groundworks associated with the Glasson pumping station, no further archaeological work is deemed necessary. However, given the site's location in relation to the Hadrian's Wall World Heritage Site, it is recommended that any work conducted in the future be subject to a similar programme of archaeological investigation.

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APPENDIX 1: CONTEXT TABLE

Context Number	Context Type	Description
100	Deposit	Topsoil (East Verge)
101	Geological	Natural Substrate
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105	Deposit	Hardcore
106	Deposit	Backfill Deposit
107	Deposit	Topsoil (Field)
108	Deposit	Clay/Sand Disturbance Layer
109	Deposit	Grey/Brown Silty Clay

Table 2: List of Contexts issued during Watching Brief

APPENDIX 2: FIGURES

GLASSON PUMPING STATION, GLASSON, CUMBRIA

WATCHING BRIEF REPORT

CP. NO: 744/09

06/11/2009

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DOCUMENT TITLE:	Glasson Pumping Station, Glasson, Cumbria
DOCUMENT TYPE:	Watching Brief Report
CLIENT:	United Utilities
CP NUMBER:	744/09
SITE CODE:	GCE/B
PLANNING APP. NO:	' – '
OASIS REFERENCE:	northpen3-66857
PRINT DATE:	06/11/2009
GRID REFERENCE:	NY 325814 560245

Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

	01
PREPARED BY:	David Jackson
POSITION:	Assistant Supervisor
DATE:	05/11/09
EDITED BY:	Frank Giecco
POSITION:	Technical Director
DATE:	06/11/09
APPROVED BY:	Frank Giecco
POSITION:	Technical Director
DATE:	06/11/09

CONTENTS

ILLUSTRATIONS

FIGURES (APPENDIX 2)

PLATES

SUMMARY

North Pennines Archaeology Ltd were commissioned by United Utilities to undertake an archaeological watching brief within the vicinity of the projected line of Hadrian's Wall near Glasson, Cumbria (NGR NY 325814 560245), during groundworks for a new electricity supply associated with the Glasson pumping station. Hadrian's Wall and much of the surrounding land is protected as a Scheduled Monument (SM no 26121). The proposed works were within the buffer zone of the Hadrian's Wall World Heritage Site. As a result, Mike Collins, Hadrian's Wall Archaeologist for English Heritage, recommended that a programme of archaeological works be undertaken in accordance with a written scheme of investigation submitted to and approved by the aforementioned. The current works followed an archaeological investigation of the study area, conducted by North Pennines Archaeology Ltd in July 2009, in order to better inform the depth and route of the proposed underground electricity cable.

The Archaeological Watching Brief was undertaken over four days between the 19th October and the 23rd October 2009. The watching brief monitored the excavation of a *c*.60m trench associated with the Glasson pumping station within the immediate vicinity of the Hadrian's Wall World Heritage Site. No archaeological finds or obvious archaeological remains were observed during the watching brief, the trench largely being comprised of modern disturbance deposits.

As this archaeological watching brief was conducted as part of a recommendation to observe groundworks for a new electricity supply associated with the Glasson pumping station, no further work is deemed necessary. However, given the high archaeological potential of the area, it is recommended that any future work be subject to a programme of archaeological investigation.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank Linda Young of United Utilities for commissioning the project. Thanks are also due to Mike Collins of English Heritage. NPA Ltd would also like to thank the staff of United Utilities and Bethell Power Services for their assistance during the project.

The archaeological watching brief was undertaken by David Jackson. The report was written by David Jackson, who also produced the drawings. The project was managed by Frank Giecco, Technical Director of NPA Ltd. The report was edited by Matt Town, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In October 2009, North Pennines Archaeology were invited by Linda Young of United Utilities to maintain an archaeological watching brief at Glasson, Cumbria (NGR NY 325814 560245, Figure 1), during groundworks associated with a new electricity supply to the Glasson pumping station. The proposed works lie within the immediate vicinity of Hadrian's Wall (SM no 26121) and its associated features, which are classified as a World Heritage Site. As a result, Mike Collins of English Heritage (Hadrian's Wall Archaeologist) requested that all ground reduction be subject to a programme of archaeological observation and investigation. This is in line with government advice as set out in the DoE Planning Policy Guidance on Archaeology and Planning (PPG 16).

1.1.2 The current works followed an archaeological investigation of the study area, conducted by North Pennines Archaeology Ltd in July 2009, in order to better inform the depth and route of the proposed underground electricity cable (Jackson 2009).

1.1.3 All groundworks associated with the new electricity supply had to be excavated under full archaeological supervision and all stages of the archaeological work were undertaken following approved statutory guidelines (IfA 2008), and were consistent with the specification provided by NPA Ltd (Giecco 2009) and generally accepted best practice.

1.1.4 This report outlines the monitoring works undertaken on-site, the subsequent programme of post-fieldwork analysis, and the results of this scheme of archaeological works.

2 METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 A project design was submitted by North Pennines Archaeology Ltd in response to a request by Linda Young of United Utilities, for an archaeological watching brief of the study area. Following acceptance of the project design, North Pennines Archaeology Ltd was commissioned by the client to undertake the work. The project design conformed to the requirements set out by Mike Collins, Hadrian's Wall Archaeologist, which was adhered to in full. The work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 THE WATCHING BRIEF

2.2.1 The works involved a structured watching brief to observe, record and excavate any archaeological deposits from the development site. A watching brief is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons, on a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed (IfA 2008).

2.2.2 The aims and principal methodology of the watching brief can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record them;
- to carry out further excavation and recording work in adequate time, if intact archaeological remains are uncovered during the project;
- to accurately tie the area watched by the archaeologist into the National Grid at an appropriate scale, with any archaeological deposits and features adequately levelled;
- to sample environmental deposits encountered as required, in line with English Heritage (2002a) guidelines;
- to produce a photographic record of all contexts using colour digital, 35mm colour print and monochrome formats as applicable, each photograph including a graduated metric scale;
- to recover artefactual material, especially that useful of dating purposes;

- to produce a site archive in accordance with MAP2 (English Heritage 1991) and MoRPHE standards (English Heritage 2006).

2.2.3 Archaeological monitoring and supervision of groundworks associated with a new electricity supply associated with the Glasson pumping station was undertaken intermittently over four days between the 19th October and the 23rd October 2009.

2.2.4 The test-pits were excavated by hand under close archaeological supervision. The test-pits were subsequently investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the Excavation Manual (Giecco 2003).

2.2.5 All deposits encountered were deemed unsuitable for environmental sampling, and therefore no samples were retained.

2.2.6 A summary of the findings of the watching brief is included within this report.

2.3 THE ARCHIVE

2.3.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive will be deposited within the Senhouse Museum, Maryport, with copies of the report sent to the County Historic Environment Record at Kendal, available upon request. The archive can be accessed under the unique project identifier **NPA09**, **GCE-B**, **CP/744/09**.

2.3.2 North Pennines Archaeology, and English Heritage, support the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, as a part of this national project.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The study area is located southeast of Glasson, approximately 13km west of Carlisle, Cumbria (NY 325814 5602451). The site is situated immediately northwest of Bombadil Cottage, alongside a section of the Carlisle to Bowness on Solway road, between Drumburgh and Port Carlisle (Figure 1), at a height of approximately 8.5m OD.

3.1.2 The broader area of the site is known as the Solway Basin and is a broad, lowland plain landscape fringed by the low, rugged, relatively remote coastline of the Solway Firth and Irish Sea (Countryside Commission 1998). The Solway Plain is open and exposed to the prevailing southwesterly winds and tree cover is limited. This area is characterised by dairy cattle grazing on fields of improved pasture, which are variously defined by drainage ditches, small streams, low wind-sheared hedgerows and stone-faced hedgebanks or 'kests'. The area to the east of the site includes flat marshland where the rivers Eden, Esk and Lyne flow into the Solway (*ibid*).

3.1.3 The underlying geology of the study area is mainly comprised of mudstones and sandstones of Permo-Triassic age ('New Red Sandstone'). A small pocket of poorly exposed Liassic mudstones and limestones of Jurassic age overlie the Permo-Triassic rocks to the southeast, and Coal Measures, mudstones, sandstones and a few coals of Carboniferous age lie beneath the Permo-Triassic rocks, forming a restricted belt along the southern margin of the Solway Basin (Countryside Commission 1998). The underlying geology of the area is largely covered by large quantities of boulder clay, sand and gravel, deposited by thick ice-sheets and glacial meltwaters during the last glaciation (*ibid*).

3.2 HISTORICAL CONTEXT

3.2.1 This section is intended as a brief summary only, detailing the main periods of occupation within the immediate area of the site.

3.2.2 Hadrian's Wall was designated as a World Heritage Site in 1987 and forms the most complex and best preserved of the frontiers of the Roman Empire. (English Heritage 2002b). The World Heritage Site (WHS) comprises a visual envelope between 1km and 6km from the site in order to serve as a buffer zone to protect the site and its immediate landscape from development detrimental to the visual amenity of the site (*ibid*).

3.2.3 The WHS is centred on the military installations constructed from AD 122 on the orders of the Emperor Hadrian. The WHS also includes other Roman sites and structures which predate Hadrian's Wall, such as the arrangement of forts along the Cumbrian Coast between Bowness-on-Solway and Ravenglass, and incorporates a wealth of pre-Roman and post-Roman sites and landscapes (*op.cit.*). Hadrian's Wall was constructed in the early 2nd century on a line connecting the Tyne and the Solway and represented at various times the northern frontier of Roman Britain.

3.2.4 The Wall was a composite military barrier, which in its final form comprised several separate elements; a stone wall fronted by a V-shaped ditch, and a number of purpose-built stone garrison fortifications such as forts, milecastles and turrets, a large earthwork and ditch, built parallel with and to the south of the Wall, known as the Vallum, and a metalled supply road linking the garrison forts, which is known as the 'Roman Military Way'. The Wall begins in the east at Wallsend in Tyneside and continues to the west, terminating at Bowness-on-Solway, to the west of the study area, a distance of 80 Roman miles (73.5 English miles or 117 kilometres). The Wall, conceived by Hadrian was to be ten feet wide and about fifteen feet high. The front face of the wall most likely sported a crenulated parapet, behind which the soldiers patrolled along a paved rampart-walk (Bedoyere 1998). The more detailed history of Hadrian's Wall is well documented and is summarised in numerous publications (Breeze and Dobson 2000; Daniels 1978 and Birley 1961).

3.2.5 Apart from Hadrian's Wall, there does not appear to have been any significant activity within the study area until the 19th century. In 1819, work began on the construction of the Carlisle Canal which was eventually opened in 1823. The canal extended from a new port at Port Carlisle on the west coast to a basin in Carlisle, passing through the study area. The canal was in use for *c*.30 years, until it was converted into the Port Carlisle railway line 1853 (Perriam 1992: 56). The Port Carlisle line did not prove overly successful, and was largely used for horse-drawn carriages until its closure in 1914 (Towill 1991: 111).

3.3 PREVIOUS WORK

3.3.1 In July 2009, North Pennines Archaeology Ltd undertook an archaeological evaluation of the study area in advance of the current works. The archaeological work comprised the excavation of five strategically located test-pits within the study area in order to better inform the route of the proposed electricity cable. No evidence of Hadrian's Wall or other archaeological remains were observed during the investigation. The

archaeological evaluation concluded that it would be unlikely that any significant archaeological remains would be disturbed at the proposed depth of 0.7m during the excavation of the electricity cable trench associated with the current works. However, it was also recommended that any future invasive work in the vicinity be subject to a programme of archaeological monitoring, given the high archaeological sensitivity of the area (Jackson 2009).

3.3.2 Further work within the vicinity of the study area include;

- archaeological work undertaken by Carlisle Archaeology Ltd in 1999, and;
- an archaeological watching brief undertaken by North Pennines Archaeology Ltd (Giecco and Denham 2003).

3.3.3 Both of these archaeological investigations were conducted within the village of Glasson immediately northwest of the study area. Both investigations successfully located remains of the Vallum ditch in different areas of the village.

3.3.4 Most other recent investigations have largely been concentrated around the Burgh-by-Sands area to the east of the study area (e.g. Jackson and Wooler 2008, Mounsey *et al* 2008, Noakes 2008, and Sowerby 2008).

4 ARCHAEOLOGICAL WATCHING BRIEF

4.1 INTRODUCTION

4.1.1 The archaeological watching brief took place between the 19th October and the 23rd October 2009, and comprised the observation and investigation of groundworks for a new underground electricity cable associated with the Glasson pumping station. A service trench measuring approximately 60m in length was excavated to a maximum depth of 0.7m with a Kubota KX36-3 mechanical excavator using a *c*.0.25m wide ditching bucket.

4.1.2 The trench was located to the southeast of Glasson, immediately west of Bombadil Cottage on the Carlisle to Bowness-on-Solway road (Figure 2). The results of the watching brief are summarised below.

4.2 RESULTS

4.2.1 The first section of the service trench was located within a grass verge, immediately east of the main road in order to connect the service trench with an existing underground service pipe (Figure 2). This section of the trench was aligned north-northwest to south-southeast, and was excavated to a width of *c*.0.3m and a maximum depth of 0.7m, exposing a deposit of firm red clayey sand **(103)** which measured over 0.1m in depth. The red clayey sand **(103)** was below a deposit of orange/light brown clayey sand subsoil **(102)**, which measured *c*.0.4m in depth, and a deposit of dark brown silty sand topsoil **(100)**, which measured *c*.0.21m in depth (Plate 1). The deposits were consistent throughout this section of the trench.

4.2.2 The north-northwest to south-southeast aligned section of the service trench was excavated in a south-easterly direction for *c*.35m, at which point the trench turned eastwards in order to cross the main road (Plate 2, Figure 2). The trench was excavated in a westerly direction, across the road and the western grass verge for *c*.7.5m. At this point, the service trench measured *c*.0.8m in width and *c*.0.7m in depth, exposing *c*.0.02m of firm red clayey sand **(103)** below *c*.0.3m of red/orange clayey sand backfill for an existing service pipe **(106)**. The clayey sand backfill **(106)** was below *c*.0.34m of hardcore packing **(105)** and *c*.0.06m of tarmac road surface **(104)** (Plate 3). The *c*.2m section of the trench through the western grass verge was excavated to a depth of *c*.0.6m, revealing a light brown/red clayey sand disturbance layer **(108)**, which measured over 0.4m in depth. The disturbance layer **(108)** was below a *c*.0.2m deposit of mid-brown silty sand topsoil **(107)**, and was associated with an existing electric cable and BT pole.

4.2.3 Following the excavation through the road, the service trench was extended into a field further west, in order to connect the trench to an existing electricity pole (No. 013203, Figure 2). The trench was further extended in a westerly direction for *c*.15m through the field, at an average width of *c*.0.7m and an average depth of *c*.0.6m, exposing *c*.0.05m of firm red clayey sand **(103)** (Plate 4). The clayey sand deposit **(103)** was below *c*.0.4m of the light brown/red clayey sand disturbance layer **(108)** and *c*.0.2m of topsoil **(107)** (Plate 5). An additional length of trench was also excavated in a northerly direction for *c*.3.3m in order to connect the service trench to the electricity pole (Figure 2). This small section of trench was located approximately 11m west along the main service trench within the field, and measured *c*.0.3m in width and *c*.0.7m in depth, exposing a deposit of grey/brown silty clay **(109)** which measured over 0.4m in depth. The silty clay deposit **(109)** was below a *c*.0.15m deposit of the clayey sand disturbance layer **(108)** and *c*.0.12m of topsoil **(107)** (Plate 6).

Plate 1: View north-northwest of service trench through grass verge

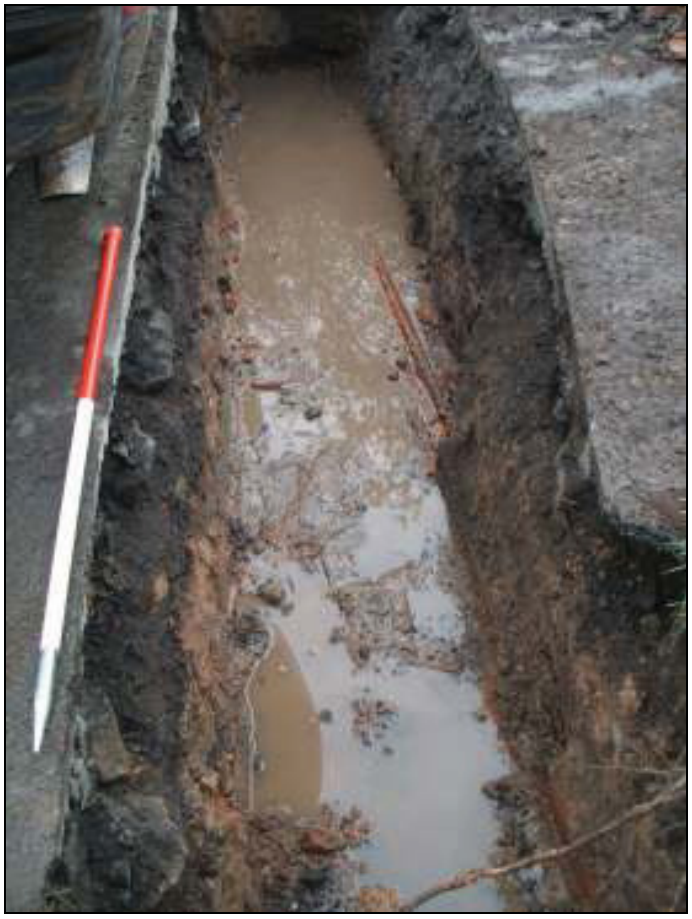

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Plate 3: North facing section of service trench through road

Plate 4: View east of service trench within field

Plate 5: North facing section of service trench within field

Plate 6: View north of additional section of service trench within field

4.3 ARCHAEOLOGICAL FINDS AND ENVIRONMENTAL SAMPLING

4.3.1 No archaeological finds were recovered, and no environmental samples were retained during the groundworks.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The archaeological watching brief monitored the excavation of groundworks associated with the Glasson pumping station, within the immediate vicinity of Hadrian's Wall. The work comprised the excavation of a *c*.60m service trench to a maximum depth of 0.7m.

5.1.2 During the archaeological evaluation, no evidence of Hadrian's Wall or any other significant archaeological features were observed. Most of the recorded deposits up to the maximum excavated depth of 0.7m related modern activities.

5.2 RECOMMENDATIONS

5.2.1 As this watching brief was conducted as a condition of groundworks associated with the Glasson pumping station, no further archaeological work is deemed necessary. However, given the site's location in relation to the Hadrian's Wall World Heritage Site, it is recommended that any work conducted in the future be subject to a similar programme of archaeological investigation.

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Table 2: List of Contexts issued during Watching Brief

APPENDIX 2: FIGURES

GLASSON PUMPING STATION, GLASSON, CUMBRIA

WATCHING BRIEF REPORT

CP. NO: 744/09

06/11/2009

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PREPARED BY:	David Jackson
POSITION:	Assistant Supervisor
DATE:	05/11/09
EDITED BY:	Frank Giecco
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POSITION:	Technical Director
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ILLUSTRATIONS

FIGURES (APPENDIX 2)

PLATES

SUMMARY

North Pennines Archaeology Ltd were commissioned by United Utilities to undertake an archaeological watching brief within the vicinity of the projected line of Hadrian's Wall near Glasson, Cumbria (NGR NY 325814 560245), during groundworks for a new electricity supply associated with the Glasson pumping station. Hadrian's Wall and much of the surrounding land is protected as a Scheduled Monument (SM no 26121). The proposed works were within the buffer zone of the Hadrian's Wall World Heritage Site. As a result, Mike Collins, Hadrian's Wall Archaeologist for English Heritage, recommended that a programme of archaeological works be undertaken in accordance with a written scheme of investigation submitted to and approved by the aforementioned. The current works followed an archaeological investigation of the study area, conducted by North Pennines Archaeology Ltd in July 2009, in order to better inform the depth and route of the proposed underground electricity cable.

The Archaeological Watching Brief was undertaken over four days between the 19th October and the 23rd October 2009. The watching brief monitored the excavation of a *c*.60m trench associated with the Glasson pumping station within the immediate vicinity of the Hadrian's Wall World Heritage Site. No archaeological finds or obvious archaeological remains were observed during the watching brief, the trench largely being comprised of modern disturbance deposits.

As this archaeological watching brief was conducted as part of a recommendation to observe groundworks for a new electricity supply associated with the Glasson pumping station, no further work is deemed necessary. However, given the high archaeological potential of the area, it is recommended that any future work be subject to a programme of archaeological investigation.

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The archaeological watching brief was undertaken by David Jackson. The report was written by David Jackson, who also produced the drawings. The project was managed by Frank Giecco, Technical Director of NPA Ltd. The report was edited by Matt Town, Project Manager for NPA Ltd.

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1.1.1 In October 2009, North Pennines Archaeology were invited by Linda Young of United Utilities to maintain an archaeological watching brief at Glasson, Cumbria (NGR NY 325814 560245, Figure 1), during groundworks associated with a new electricity supply to the Glasson pumping station. The proposed works lie within the immediate vicinity of Hadrian's Wall (SM no 26121) and its associated features, which are classified as a World Heritage Site. As a result, Mike Collins of English Heritage (Hadrian's Wall Archaeologist) requested that all ground reduction be subject to a programme of archaeological observation and investigation. This is in line with government advice as set out in the DoE Planning Policy Guidance on Archaeology and Planning (PPG 16).

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1.1.4 This report outlines the monitoring works undertaken on-site, the subsequent programme of post-fieldwork analysis, and the results of this scheme of archaeological works.

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2.1.1 A project design was submitted by North Pennines Archaeology Ltd in response to a request by Linda Young of United Utilities, for an archaeological watching brief of the study area. Following acceptance of the project design, North Pennines Archaeology Ltd was commissioned by the client to undertake the work. The project design conformed to the requirements set out by Mike Collins, Hadrian's Wall Archaeologist, which was adhered to in full. The work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

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2.3.2 North Pennines Archaeology, and English Heritage, support the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, as a part of this national project.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The study area is located southeast of Glasson, approximately 13km west of Carlisle, Cumbria (NY 325814 5602451). The site is situated immediately northwest of Bombadil Cottage, alongside a section of the Carlisle to Bowness on Solway road, between Drumburgh and Port Carlisle (Figure 1), at a height of approximately 8.5m OD.

3.1.2 The broader area of the site is known as the Solway Basin and is a broad, lowland plain landscape fringed by the low, rugged, relatively remote coastline of the Solway Firth and Irish Sea (Countryside Commission 1998). The Solway Plain is open and exposed to the prevailing southwesterly winds and tree cover is limited. This area is characterised by dairy cattle grazing on fields of improved pasture, which are variously defined by drainage ditches, small streams, low wind-sheared hedgerows and stone-faced hedgebanks or 'kests'. The area to the east of the site includes flat marshland where the rivers Eden, Esk and Lyne flow into the Solway (*ibid*).

3.1.3 The underlying geology of the study area is mainly comprised of mudstones and sandstones of Permo-Triassic age ('New Red Sandstone'). A small pocket of poorly exposed Liassic mudstones and limestones of Jurassic age overlie the Permo-Triassic rocks to the southeast, and Coal Measures, mudstones, sandstones and a few coals of Carboniferous age lie beneath the Permo-Triassic rocks, forming a restricted belt along the southern margin of the Solway Basin (Countryside Commission 1998). The underlying geology of the area is largely covered by large quantities of boulder clay, sand and gravel, deposited by thick ice-sheets and glacial meltwaters during the last glaciation (*ibid*).

3.2 HISTORICAL CONTEXT

3.2.1 This section is intended as a brief summary only, detailing the main periods of occupation within the immediate area of the site.

3.2.2 Hadrian's Wall was designated as a World Heritage Site in 1987 and forms the most complex and best preserved of the frontiers of the Roman Empire. (English Heritage 2002b). The World Heritage Site (WHS) comprises a visual envelope between 1km and 6km from the site in order to serve as a buffer zone to protect the site and its immediate landscape from development detrimental to the visual amenity of the site (*ibid*).

3.2.3 The WHS is centred on the military installations constructed from AD 122 on the orders of the Emperor Hadrian. The WHS also includes other Roman sites and structures which predate Hadrian's Wall, such as the arrangement of forts along the Cumbrian Coast between Bowness-on-Solway and Ravenglass, and incorporates a wealth of pre-Roman and post-Roman sites and landscapes (*op.cit.*). Hadrian's Wall was constructed in the early 2nd century on a line connecting the Tyne and the Solway and represented at various times the northern frontier of Roman Britain.

3.2.4 The Wall was a composite military barrier, which in its final form comprised several separate elements; a stone wall fronted by a V-shaped ditch, and a number of purpose-built stone garrison fortifications such as forts, milecastles and turrets, a large earthwork and ditch, built parallel with and to the south of the Wall, known as the Vallum, and a metalled supply road linking the garrison forts, which is known as the 'Roman Military Way'. The Wall begins in the east at Wallsend in Tyneside and continues to the west, terminating at Bowness-on-Solway, to the west of the study area, a distance of 80 Roman miles (73.5 English miles or 117 kilometres). The Wall, conceived by Hadrian was to be ten feet wide and about fifteen feet high. The front face of the wall most likely sported a crenulated parapet, behind which the soldiers patrolled along a paved rampart-walk (Bedoyere 1998). The more detailed history of Hadrian's Wall is well documented and is summarised in numerous publications (Breeze and Dobson 2000; Daniels 1978 and Birley 1961).

3.2.5 Apart from Hadrian's Wall, there does not appear to have been any significant activity within the study area until the 19th century. In 1819, work began on the construction of the Carlisle Canal which was eventually opened in 1823. The canal extended from a new port at Port Carlisle on the west coast to a basin in Carlisle, passing through the study area. The canal was in use for *c*.30 years, until it was converted into the Port Carlisle railway line 1853 (Perriam 1992: 56). The Port Carlisle line did not prove overly successful, and was largely used for horse-drawn carriages until its closure in 1914 (Towill 1991: 111).

3.3 PREVIOUS WORK

3.3.1 In July 2009, North Pennines Archaeology Ltd undertook an archaeological evaluation of the study area in advance of the current works. The archaeological work comprised the excavation of five strategically located test-pits within the study area in order to better inform the route of the proposed electricity cable. No evidence of Hadrian's Wall or other archaeological remains were observed during the investigation. The

archaeological evaluation concluded that it would be unlikely that any significant archaeological remains would be disturbed at the proposed depth of 0.7m during the excavation of the electricity cable trench associated with the current works. However, it was also recommended that any future invasive work in the vicinity be subject to a programme of archaeological monitoring, given the high archaeological sensitivity of the area (Jackson 2009).

3.3.2 Further work within the vicinity of the study area include;

- archaeological work undertaken by Carlisle Archaeology Ltd in 1999, and;
- an archaeological watching brief undertaken by North Pennines Archaeology Ltd (Giecco and Denham 2003).

3.3.3 Both of these archaeological investigations were conducted within the village of Glasson immediately northwest of the study area. Both investigations successfully located remains of the Vallum ditch in different areas of the village.

3.3.4 Most other recent investigations have largely been concentrated around the Burgh-by-Sands area to the east of the study area (e.g. Jackson and Wooler 2008, Mounsey *et al* 2008, Noakes 2008, and Sowerby 2008).

4 ARCHAEOLOGICAL WATCHING BRIEF

4.1 INTRODUCTION

4.1.1 The archaeological watching brief took place between the 19th October and the 23rd October 2009, and comprised the observation and investigation of groundworks for a new underground electricity cable associated with the Glasson pumping station. A service trench measuring approximately 60m in length was excavated to a maximum depth of 0.7m with a Kubota KX36-3 mechanical excavator using a *c*.0.25m wide ditching bucket.

4.1.2 The trench was located to the southeast of Glasson, immediately west of Bombadil Cottage on the Carlisle to Bowness-on-Solway road (Figure 2). The results of the watching brief are summarised below.

4.2 RESULTS

4.2.1 The first section of the service trench was located within a grass verge, immediately east of the main road in order to connect the service trench with an existing underground service pipe (Figure 2). This section of the trench was aligned north-northwest to south-southeast, and was excavated to a width of *c*.0.3m and a maximum depth of 0.7m, exposing a deposit of firm red clayey sand **(103)** which measured over 0.1m in depth. The red clayey sand **(103)** was below a deposit of orange/light brown clayey sand subsoil **(102)**, which measured *c*.0.4m in depth, and a deposit of dark brown silty sand topsoil **(100)**, which measured *c*.0.21m in depth (Plate 1). The deposits were consistent throughout this section of the trench.

4.2.2 The north-northwest to south-southeast aligned section of the service trench was excavated in a south-easterly direction for *c*.35m, at which point the trench turned eastwards in order to cross the main road (Plate 2, Figure 2). The trench was excavated in a westerly direction, across the road and the western grass verge for *c*.7.5m. At this point, the service trench measured *c*.0.8m in width and *c*.0.7m in depth, exposing *c*.0.02m of firm red clayey sand **(103)** below *c*.0.3m of red/orange clayey sand backfill for an existing service pipe **(106)**. The clayey sand backfill **(106)** was below *c*.0.34m of hardcore packing **(105)** and *c*.0.06m of tarmac road surface **(104)** (Plate 3). The *c*.2m section of the trench through the western grass verge was excavated to a depth of *c*.0.6m, revealing a light brown/red clayey sand disturbance layer **(108)**, which measured over 0.4m in depth. The disturbance layer **(108)** was below a *c*.0.2m deposit of mid-brown silty sand topsoil **(107)**, and was associated with an existing electric cable and BT pole.

4.2.3 Following the excavation through the road, the service trench was extended into a field further west, in order to connect the trench to an existing electricity pole (No. 013203, Figure 2). The trench was further extended in a westerly direction for *c*.15m through the field, at an average width of *c*.0.7m and an average depth of *c*.0.6m, exposing *c*.0.05m of firm red clayey sand **(103)** (Plate 4). The clayey sand deposit **(103)** was below *c*.0.4m of the light brown/red clayey sand disturbance layer **(108)** and *c*.0.2m of topsoil **(107)** (Plate 5). An additional length of trench was also excavated in a northerly direction for *c*.3.3m in order to connect the service trench to the electricity pole (Figure 2). This small section of trench was located approximately 11m west along the main service trench within the field, and measured *c*.0.3m in width and *c*.0.7m in depth, exposing a deposit of grey/brown silty clay **(109)** which measured over 0.4m in depth. The silty clay deposit **(109)** was below a *c*.0.15m deposit of the clayey sand disturbance layer **(108)** and *c*.0.12m of topsoil **(107)** (Plate 6).

Plate 1: View north-northwest of service trench through grass verge

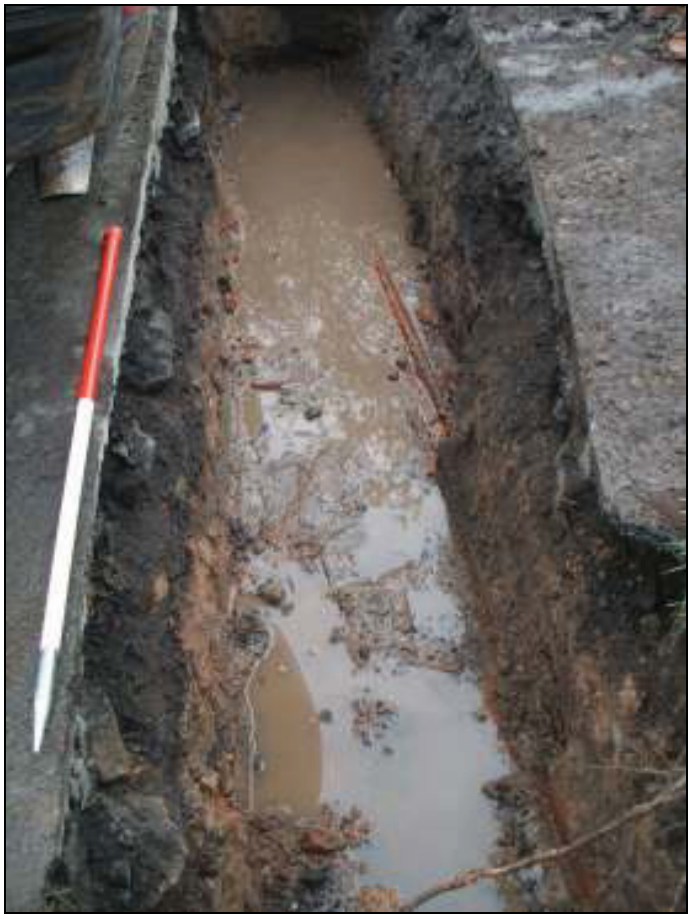

Plate 2: View west of service trench through road

Plate 3: North facing section of service trench through road

Plate 4: View east of service trench within field

Plate 5: North facing section of service trench within field

Plate 6: View north of additional section of service trench within field

4.3 ARCHAEOLOGICAL FINDS AND ENVIRONMENTAL SAMPLING

4.3.1 No archaeological finds were recovered, and no environmental samples were retained during the groundworks.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The archaeological watching brief monitored the excavation of groundworks associated with the Glasson pumping station, within the immediate vicinity of Hadrian's Wall. The work comprised the excavation of a *c*.60m service trench to a maximum depth of 0.7m.

5.1.2 During the archaeological evaluation, no evidence of Hadrian's Wall or any other significant archaeological features were observed. Most of the recorded deposits up to the maximum excavated depth of 0.7m related modern activities.

5.2 RECOMMENDATIONS

5.2.1 As this watching brief was conducted as a condition of groundworks associated with the Glasson pumping station, no further archaeological work is deemed necessary. However, given the site's location in relation to the Hadrian's Wall World Heritage Site, it is recommended that any work conducted in the future be subject to a similar programme of archaeological investigation.

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Context Number	Context Type	Description
100	Deposit	Topsoil (East Verge)
101	Geological	Natural Substrate
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2.3 THE ARCHIVE

2.3.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive will be deposited within the Senhouse Museum, Maryport, with copies of the report sent to the County Historic Environment Record at Kendal, available upon request. The archive can be accessed under the unique project identifier **NPA09**, **GCE-B**, **CP/744/09**.

2.3.2 North Pennines Archaeology, and English Heritage, support the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, as a part of this national project.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The study area is located southeast of Glasson, approximately 13km west of Carlisle, Cumbria (NY 325814 5602451). The site is situated immediately northwest of Bombadil Cottage, alongside a section of the Carlisle to Bowness on Solway road, between Drumburgh and Port Carlisle (Figure 1), at a height of approximately 8.5m OD.

3.1.2 The broader area of the site is known as the Solway Basin and is a broad, lowland plain landscape fringed by the low, rugged, relatively remote coastline of the Solway Firth and Irish Sea (Countryside Commission 1998). The Solway Plain is open and exposed to the prevailing southwesterly winds and tree cover is limited. This area is characterised by dairy cattle grazing on fields of improved pasture, which are variously defined by drainage ditches, small streams, low wind-sheared hedgerows and stone-faced hedgebanks or 'kests'. The area to the east of the site includes flat marshland where the rivers Eden, Esk and Lyne flow into the Solway (*ibid*).

3.1.3 The underlying geology of the study area is mainly comprised of mudstones and sandstones of Permo-Triassic age ('New Red Sandstone'). A small pocket of poorly exposed Liassic mudstones and limestones of Jurassic age overlie the Permo-Triassic rocks to the southeast, and Coal Measures, mudstones, sandstones and a few coals of Carboniferous age lie beneath the Permo-Triassic rocks, forming a restricted belt along the southern margin of the Solway Basin (Countryside Commission 1998). The underlying geology of the area is largely covered by large quantities of boulder clay, sand and gravel, deposited by thick ice-sheets and glacial meltwaters during the last glaciation (*ibid*).

3.2 HISTORICAL CONTEXT

3.2.1 This section is intended as a brief summary only, detailing the main periods of occupation within the immediate area of the site.

3.2.2 Hadrian's Wall was designated as a World Heritage Site in 1987 and forms the most complex and best preserved of the frontiers of the Roman Empire. (English Heritage 2002b). The World Heritage Site (WHS) comprises a visual envelope between 1km and 6km from the site in order to serve as a buffer zone to protect the site and its immediate landscape from development detrimental to the visual amenity of the site (*ibid*).

3.2.3 The WHS is centred on the military installations constructed from AD 122 on the orders of the Emperor Hadrian. The WHS also includes other Roman sites and structures which predate Hadrian's Wall, such as the arrangement of forts along the Cumbrian Coast between Bowness-on-Solway and Ravenglass, and incorporates a wealth of pre-Roman and post-Roman sites and landscapes (*op.cit.*). Hadrian's Wall was constructed in the early 2nd century on a line connecting the Tyne and the Solway and represented at various times the northern frontier of Roman Britain.

3.2.4 The Wall was a composite military barrier, which in its final form comprised several separate elements; a stone wall fronted by a V-shaped ditch, and a number of purpose-built stone garrison fortifications such as forts, milecastles and turrets, a large earthwork and ditch, built parallel with and to the south of the Wall, known as the Vallum, and a metalled supply road linking the garrison forts, which is known as the 'Roman Military Way'. The Wall begins in the east at Wallsend in Tyneside and continues to the west, terminating at Bowness-on-Solway, to the west of the study area, a distance of 80 Roman miles (73.5 English miles or 117 kilometres). The Wall, conceived by Hadrian was to be ten feet wide and about fifteen feet high. The front face of the wall most likely sported a crenulated parapet, behind which the soldiers patrolled along a paved rampart-walk (Bedoyere 1998). The more detailed history of Hadrian's Wall is well documented and is summarised in numerous publications (Breeze and Dobson 2000; Daniels 1978 and Birley 1961).

3.2.5 Apart from Hadrian's Wall, there does not appear to have been any significant activity within the study area until the 19th century. In 1819, work began on the construction of the Carlisle Canal which was eventually opened in 1823. The canal extended from a new port at Port Carlisle on the west coast to a basin in Carlisle, passing through the study area. The canal was in use for *c*.30 years, until it was converted into the Port Carlisle railway line 1853 (Perriam 1992: 56). The Port Carlisle line did not prove overly successful, and was largely used for horse-drawn carriages until its closure in 1914 (Towill 1991: 111).

3.3 PREVIOUS WORK

3.3.1 In July 2009, North Pennines Archaeology Ltd undertook an archaeological evaluation of the study area in advance of the current works. The archaeological work comprised the excavation of five strategically located test-pits within the study area in order to better inform the route of the proposed electricity cable. No evidence of Hadrian's Wall or other archaeological remains were observed during the investigation. The

archaeological evaluation concluded that it would be unlikely that any significant archaeological remains would be disturbed at the proposed depth of 0.7m during the excavation of the electricity cable trench associated with the current works. However, it was also recommended that any future invasive work in the vicinity be subject to a programme of archaeological monitoring, given the high archaeological sensitivity of the area (Jackson 2009).

3.3.2 Further work within the vicinity of the study area include;

- archaeological work undertaken by Carlisle Archaeology Ltd in 1999, and;
- an archaeological watching brief undertaken by North Pennines Archaeology Ltd (Giecco and Denham 2003).

3.3.3 Both of these archaeological investigations were conducted within the village of Glasson immediately northwest of the study area. Both investigations successfully located remains of the Vallum ditch in different areas of the village.

3.3.4 Most other recent investigations have largely been concentrated around the Burgh-by-Sands area to the east of the study area (e.g. Jackson and Wooler 2008, Mounsey *et al* 2008, Noakes 2008, and Sowerby 2008).

4 ARCHAEOLOGICAL WATCHING BRIEF

4.1 INTRODUCTION

4.1.1 The archaeological watching brief took place between the 19th October and the 23rd October 2009, and comprised the observation and investigation of groundworks for a new underground electricity cable associated with the Glasson pumping station. A service trench measuring approximately 60m in length was excavated to a maximum depth of 0.7m with a Kubota KX36-3 mechanical excavator using a *c*.0.25m wide ditching bucket.

4.1.2 The trench was located to the southeast of Glasson, immediately west of Bombadil Cottage on the Carlisle to Bowness-on-Solway road (Figure 2). The results of the watching brief are summarised below.

4.2 RESULTS

4.2.1 The first section of the service trench was located within a grass verge, immediately east of the main road in order to connect the service trench with an existing underground service pipe (Figure 2). This section of the trench was aligned north-northwest to south-southeast, and was excavated to a width of *c*.0.3m and a maximum depth of 0.7m, exposing a deposit of firm red clayey sand **(103)** which measured over 0.1m in depth. The red clayey sand **(103)** was below a deposit of orange/light brown clayey sand subsoil **(102)**, which measured *c*.0.4m in depth, and a deposit of dark brown silty sand topsoil **(100)**, which measured *c*.0.21m in depth (Plate 1). The deposits were consistent throughout this section of the trench.

4.2.2 The north-northwest to south-southeast aligned section of the service trench was excavated in a south-easterly direction for *c*.35m, at which point the trench turned eastwards in order to cross the main road (Plate 2, Figure 2). The trench was excavated in a westerly direction, across the road and the western grass verge for *c*.7.5m. At this point, the service trench measured *c*.0.8m in width and *c*.0.7m in depth, exposing *c*.0.02m of firm red clayey sand **(103)** below *c*.0.3m of red/orange clayey sand backfill for an existing service pipe **(106)**. The clayey sand backfill **(106)** was below *c*.0.34m of hardcore packing **(105)** and *c*.0.06m of tarmac road surface **(104)** (Plate 3). The *c*.2m section of the trench through the western grass verge was excavated to a depth of *c*.0.6m, revealing a light brown/red clayey sand disturbance layer **(108)**, which measured over 0.4m in depth. The disturbance layer **(108)** was below a *c*.0.2m deposit of mid-brown silty sand topsoil **(107)**, and was associated with an existing electric cable and BT pole.

4.2.3 Following the excavation through the road, the service trench was extended into a field further west, in order to connect the trench to an existing electricity pole (No. 013203, Figure 2). The trench was further extended in a westerly direction for *c*.15m through the field, at an average width of *c*.0.7m and an average depth of *c*.0.6m, exposing *c*.0.05m of firm red clayey sand **(103)** (Plate 4). The clayey sand deposit **(103)** was below *c*.0.4m of the light brown/red clayey sand disturbance layer **(108)** and *c*.0.2m of topsoil **(107)** (Plate 5). An additional length of trench was also excavated in a northerly direction for *c*.3.3m in order to connect the service trench to the electricity pole (Figure 2). This small section of trench was located approximately 11m west along the main service trench within the field, and measured *c*.0.3m in width and *c*.0.7m in depth, exposing a deposit of grey/brown silty clay **(109)** which measured over 0.4m in depth. The silty clay deposit **(109)** was below a *c*.0.15m deposit of the clayey sand disturbance layer **(108)** and *c*.0.12m of topsoil **(107)** (Plate 6).

Plate 1: View north-northwest of service trench through grass verge

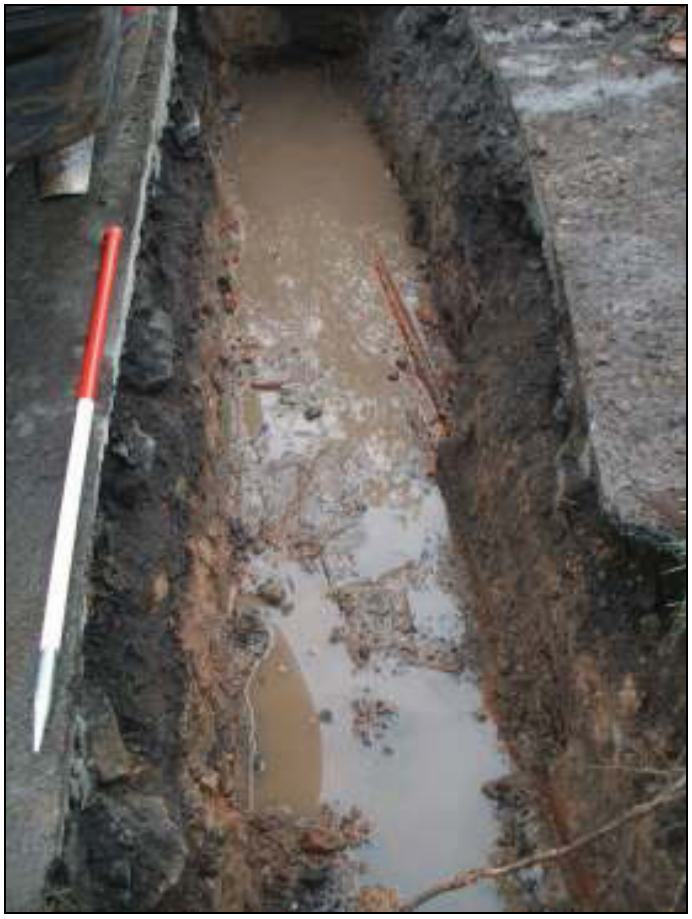

Plate 2: View west of service trench through road

Plate 3: North facing section of service trench through road

Plate 4: View east of service trench within field

Plate 5: North facing section of service trench within field

Plate 6: View north of additional section of service trench within field

4.3 ARCHAEOLOGICAL FINDS AND ENVIRONMENTAL SAMPLING

4.3.1 No archaeological finds were recovered, and no environmental samples were retained during the groundworks.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The archaeological watching brief monitored the excavation of groundworks associated with the Glasson pumping station, within the immediate vicinity of Hadrian's Wall. The work comprised the excavation of a *c*.60m service trench to a maximum depth of 0.7m.

5.1.2 During the archaeological evaluation, no evidence of Hadrian's Wall or any other significant archaeological features were observed. Most of the recorded deposits up to the maximum excavated depth of 0.7m related modern activities.

5.2 RECOMMENDATIONS

5.2.1 As this watching brief was conducted as a condition of groundworks associated with the Glasson pumping station, no further archaeological work is deemed necessary. However, given the site's location in relation to the Hadrian's Wall World Heritage Site, it is recommended that any work conducted in the future be subject to a similar programme of archaeological investigation.

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APPENDIX 1: CONTEXT TABLE

Context Number	Context Type	Description
100	Deposit	Topsoil (East Verge)
101	Geological	Natural Substrate
102	Deposit	Clay/Sand Subsoil
103	Deposit	Red Clay/Sand
104	Deposit	Tarmac Road Surface
105	Deposit	Hardcore
106	Deposit	Backfill Deposit
107	Deposit	Topsoil (Field)
108	Deposit	Clay/Sand Disturbance Layer
109	Deposit	Grey/Brown Silty Clay

Table 2: List of Contexts issued during Watching Brief

APPENDIX 2: FIGURES