GLENRIDDING, LAKE DISTRICT NATIONAL PARK, CUMBRIA

DESK-BASED ASSESSMENT AND WALKOVER SURVEY

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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 NP Archaeology Ltd on the preparation of reports.

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SUMMARY

In September 2011, NP Archaeology Ltd was commissioned by United Utilities to undertake an archaeological desk-based assessment and walkover survey on land at Glenridding, Lake District, Cumbria (NGR NY 3808 1703). This work was undertaken in advance of groundworks associated with the laying of a new pipeline route from Rake Cottages to Browfield Close.

The course of the proposed pipeline route is within the immediate vicinity of the Scheduled Greenside Mine (SAM No. 27751) and Top Power House Station (SAM No. 35017) as well as the purpose built miners' cottages at Rake Field and Halton Terrace.

As a result of this, and in accordance with guidance given in Planning Policy Statement 5 (Planning for the Historic Environment), the Lake District National Park Authority recommended that an archaeological walkover survey be carried out in order to determine if the proposed water pipeline route would have any impact on sub-surface archaeological features and to locate and confirm recorded sites in relation to the proposed route. An archaeological desk-based assessment was also recommended in order to inform the walkover survey.

The desk-based assessment involved the examination of all pertinent documents and cartographic sources in the Kendal Record Office, and the consultation of the Lake District National Park Authority Historic Environment Record (HER) held at Kendal. The HER includes the locations and settings of Scheduled Ancient Monuments, Listed Buildings, Conservation Areas and other, non-designated archaeological remains. In addition, a number of published sources and several relevant web sites were also consulted to provide background information.

The desk-based assessment has shown that the area around Glenridding consisted of mostly arable farmland until the mine was established in the area. The Greenside Mine was essential in altering the landscape of the area. In order to provide accommodation for the miners, houses were built on what was once the open farmland. These included Rake Cottages, one of the terminus points of the route and Halton Terrace, immediately north of the proposed route as well as Low Glenridding, to the south of the proposed route.

The archaeological walkover survey noted a series of linear earthworks that appeared to form two rectilinear areas in a field annotated as Tentherhow on modern Ordnance Survey maps. The origin of these earthworks was not known; however the place name of the field could possibly be a derivation of *tenters* or *tenterhooks* used in relation to the fulling mill located to the south of this field. A fulling mill was not shown on the First Edition Ordnance Survey mapping and would therefore predate 1860.

ACKNOWLEDGEMENTS

NP Archaeology Ltd would like to thank United Utilities, for commissioning the project, and for all assistance throughout the work.

NP Archaeology Ltd would also like to extend their thanks to John Hodgson, Senior Archaeologist with the Lake District National Park Authority and staff at the Kendal Record Office and Kendal Local Studies Library for all their assistance throughout the project.

The desk-based assessment was undertaken by Jocelyn Strickland. The archaeological walkover survey was conducted by Jocelyn Strickland. The report was written, and the drawings were produced, by Jocelyn Strickland. The project was managed by Frank Giecco, Technical Director for NPA Ltd, who also edited the report.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 This archaeological desk-based assessment has been prepared by NP Archaeology Ltd (NPA) in advance of groundworks associated with the laying of a new pipeline route from Rake Cottages to Browfield Close.

1.1.2 The project comprised two distinct phases of investigation: a search of both published and unpublished records and an archaeological walkover survey. A search was made of records held by the Lake District National Park Authority (HER) housed at Kendal, and the Kendal Record Office and Local Studies Library holding local historical information. The aims of the walkover survey were to identify any previously unrecorded surface archaeological features and to make an assessment of the condition of individual historic features.

1.1.3 The principal objective of this assessment was to undertake sufficient work in order to identify and characterise the archaeological constraints associated with the development area. This report sets out the results of the work in the form of a short document outlining the findings, followed by a statement of the archaeological potential of the area.

2 METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 NP Archaeology Ltd was commissioned by the client to undertake a desk-based assessment and an archaeological walkover survey, on land at Glenridding, Lake District, Cumbria (NGR NY 3808 1703). All work undertaken was consistent with the relevant standards and procedures of the Institute for Archaeologists, as set out in Standard and Guidance For Archaeological Desk-Based Assessments (IfA 2008) and generally accepted best practice.

2.2 DESK-BASED ASSESSMENT

2.2.1 Several sources of information were consulted in order to achieve a full understanding of the nature of the existing resource regarding the geographical, topographical, archaeological and historical context of the site.

2.2.2 The desk-based assessment included the following:

- the collation and assessment of any relevant information held in the Lake District National Park Authority Historic Environment Record (HER), at Kendal, in order to identify important sites and to assess the potential of known sites;
- the consultation of documentary collections including trade directories, miscellaneous records, and histories;
- an assessment of relevant published sources including articles in national, regional and local journals;
- an assessment of relevant unpublished documents including, where appropriate, reports compiled by heritage conservation professionals and student theses;
- collation and assessment of cartographic information relevant to the area in order to identify historical land use, boundaries, trackways and early buildings and to provide as assessment of potential extent of disturbance to the archaeological resource caused by intrusive features;
- an assessment of the topography of the area through maps to assess the archaeological potential of areas not identified through the Historic Environment Record, and to determine any constraints to archaeological site survival;

- the assessment of all available aerial photographs that show the proposed development area.

2.2.3 The study area consisted of a broad overall history of Glenridding, with an additional detailed 1 kilometre radius, centred on the proposed water pipeline route, which was studied in more depth. The principal sources of information were the Historic Environment Record (HER), historical maps and secondary sources. The following resources were consulted:

- *Historic Environment Record*: the HER, a database of archaeological sites within the county was accessed. This was in order to obtain information on the location of all designated sites and areas of historic interest and any other, non-designated sites within the study area, which included monuments, findspots, Listed Buildings and Conservation Areas. A brief record including grid reference and description was obtained for the various sites within the study area, and are listed in *Appendix 1;*
- *Kendal Record Office and Kendal Local Studies Library:* the archives at Kendal Record Office as well as the Kendal Local Studies Library were searched for information on the study area. In particular, the First, Second, Third and Fourth Editions of the Ordnance Survey mapping were checked, and a search was made of the local history books and pamphlets held within their collections;
- *Online Sources:* an online search was undertaken of records held by the Archaeology Data Service (ADS), managed by York University to look at sites within a wider search radius.

2.3 ARCHAEOLOGICAL WALKOVER SURVEY

2.3.1 The objectives of the archaeological walkover survey were to:

- identify and record the nature and extent of any archaeological remains known to exist within the proposed cycleway;
- identify and record any unknown archaeological features that may be encountered during the walkover survey;
- to recommend, in conjunction with the Lake District National Park Authority, further archaeological mitigation, if necessary.

2.4 THE ARCHIVE

2.4.1 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). Copies of the report will be sent to the Lake District National Park Authority HER, where viewing will be available upon request.

2.4.2 NP Archaeology and the Lake District National Park Authority supports 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 NP Archaeology, as a part of this national project under the unique identifier **nparchaeo1-112234**.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 Glenridding is located within the rugged mountain scenery of the Cumbria High Fells, 26 kilometres southeast of Keswick. The Cumbria High Fells form the central core of the Lake District and are bound by the Solway Basin to the north, the Eden Valley and Orton Fells to the east, the West Cumbria Coastal Plain to the west and the South Cumbria Low Fells to the south (Countryside Commission 1998). One of the proposed water pipeline termini is at Rake Cottages then runs in an eastward direction across open fields ending at Browfield Close.

3.1.2 The underlying geology is of rocks of the Borrowdale Volcanic Group. These consist of a sequence of volcanic rocks of Ordovician age and are composed of lavas and volcanic sediment (*ibid*).

3.2 HISTORICAL BACKGROUND

3.2.1 *Introduction:* this historical background is compiled mostly from secondary sources, and is intended only as a brief summary of historical developments specific to the study area. The location of known sites within a one kilometre study area are depicted in Figure 3 and summarised in Appendix 2.

3.2.2 Glenridding largely owes its existence to the Greenside Lead Mine. Prior to the creation of mine, Glenridding was a small collection of farms and standing buildings. Greenside Lead Mine is accredited with altering the landscape of the area and was one of the most important inland mines during the 19th century. The mine together with the surrounding community is an example of social archaeology as the 'works were the heart of a highly specialised miners' settlement with roots in the surrounding region' (Davies-Shiel and Marshall 1969).

3.2.3 In the late 18th century the only mention of Glenridding by Nicolson and Burn was of the gill that flowed into Ullswater. The etymology of the name is from the Scottish word glen meaning a gill or hollow and Ridden, the name of the river that runs into Ullswater (Nicolson and Burn 1777).

3.2.4 The first documentary evidence for mining in Patterdale is from a lease for 21 years of the Hartsop Hall Mine in 1696. The next mining reference is from the parish records recording the death of Margaret Vaizee, a washer of lead ore, in 1713 (Murphy 1996).

3.2.5 In 1789 James Clarke described Patterdale is his *A Survey of the Lakes of Cumberland, Westmorland and Lancashire* as 'Patterdale, though now the

poorest place that I am acquainted with, was once the seat of peace and plenty…This lamentable change tool place about 30 years ago at the time some lead mines were wrought in the dale, and of course a number of miners were brought from different parts for that purpose. These fellows who are in general the most abandoned, wicked, and profligate part of mankind, no sooner settled here, than they immediately began to propagate their vices among the innocent, unsuspecting inhabitants.' Mining was a major activity by Clarke's time. The 1787 census listed 16 miners in Patterdale, out of a total population of 165. A third of them lodged with other miners and in the homes of husbandmen (*ibid*).

3.2.6 It is not known when mining began at Greenside. Postlethwaite stated that mining began in the latter part of the 18th century and Shaw, a mining engineer and historian who worked at the mine in the 1920s, suggested a date a century earlier and stated that the mine was owned by a party of Dutch adventurers by 1690; however, the source of this is unknown. The earliest workings at Greenside mine are no longer accessible. Examination of collapsed levels has found no evidence of coffin levels or other hand-cut levels indicative of early mine workings. The 18th century is generally the accepted date for commencement of works at Greenside Mine until further evidence comes to light (*ibid*).

3.2.7 The first documentary reference of work at Greenside indicates that the mine was worked by Mr. Thompson in 1799 under a lease from the Duke of Norfolk. By the beginning of the 19th century work at the mine was extensive enough to warrant the attention of William Green who noted their existence beside the road from Keswick to Patterdale that were worked by William Sheffield, Esq., the mineral agent to the Duke of Devonshire (*ibid*).

3.2.8 Extensive work was done at the mine in the early 1800s. Prior to this the mine was chiefly worked near the summit of the mountain with the greater part of ore being obtained there. The ore was then carried over the mountain through the vale of St. John's and by Keswick to the smelt mill at Stoney Croft Gill (Postlethwaite 1877).

3.2.9 The vein at Greenside measured 10 fathoms in width in the upper part that decreased to three fathoms in the lower part of the mine. The principal ore was Galena, when smelted, produced 75% lead and 12 ounces of silver per ton. The ore was interspersed throughout the vein stone, as a result the stopes ranged in width from 9 to 18 metres. The entire length of ore-bearing ground was 200 fathoms but there were large areas of dead and poor ground that reduced the working area to 80 fathoms (*ibid*). The mine was described as appearing more like a quarry than a mine!

3.2.10 An 1853 drawing of the mine section shows the workings at Greenside vein. The Top Level was located at 658.6 mOD and was probably the first level to be driven. The entrance to this level was close to the base of the highest collapse hole where an old road crossed the slope of the fell. The Middle Level, known as the High Level by the Greenside Company, at 631.0 mOD was driven to reach the northern ore shoot. Further down at 584.0 mOD were the foundations of a building. The remains of coal, coke, slag and iron suggests that this was a smithy (Murphy 1996). Another flank level known as the Lucy Tongue Level was driven to the vein 83 fathoms below the Middle Level (Postlethwaite 1877). The Lucy level was said to have taken 14 years to drive (Lewis 1978).

3.2.11 There is evidence that the early miners used a hush to locate the vein lower down on the slope. This would have stripped away the glacial clay to reveal the vein underneath. The lowest of the old levels were driven from the bottom of this hush. Gilgower's Level was a long adit driven 200 yards through barren ground to intersect the ore worked by the Top and Middle Levels. The remains of a lodging house were located on a level area made up of waste from the hush, tips from the nearby adits and glacial clay (*ibid*).

3.2.12 Near the end of the 18th century the Greenside Mining Syndicate was formed. They are thought to have driven Gilgowers Level and began High Horse Level. While the High Horse Level was being driven a crushing and washing mill were built on the site of the original washings. The new plant had three sets of crushing rollers that were powered by a waterwheel using water from the nearby manmade Top Dam tarn (Shaw 1970).

3.2.13 A cart road was built from Glenridding up the side of the valley to the foot of Lucy Tongue Gill over which a stone arched bridge was built. The road then zig zagged across the mountainside past the Haystacks to the plateau of the mines (*ibid*).

3.2.14 Shops were located at High Horse Level. Here is where the miners from Keswick and Penrith stayed. At this time Glenridding Village barely existed (*ibid*).

3.2.15 The Greenside Mining Company took over the mine in 1852. The company was comprised of Thomas Cant, William Curll, John Rickerby and Joseph Westmorland. Before they could begin prospecting the old mine workings a take-note had to be obtained from the Lord of the Manor of Deepdale, the Duke of Norfolk. In 1825 the Duke was Henry Howard of Greystoke Castle, an indirect relative of the previous lord of the manor who took possession of the manor in 1819. However, there was dispute over the mineral rights before the Greenside Mining Company could obtain a long-term lease. The Howards previously granted the rights to work Greenside

mine, but in 1824 the manor of Glenridding adjoined that of Deepdale that was purchased by William Marshall who declared that the section of fell land where the mine was located was within his manor, not the Howard's. The boundary problem arose due to the lack of a definitive definition of manorial boundaries. As a result, in 1825 Greenside Mine was situated on a disputed piece of ground also known as an 'overleap.' By 1826 a precise defined region around the mine became jointly owned by the two parties and the royalty payments for the mined ore were split equally. Once the land dispute was resolved the Greenside Mining Company was able to obtain its first lease that was granted by Henry Howard and William Marshall on May 31st, 1827 for 14 years (*ibid*).

3.2.16 The Greenside Lead Mine was hugely successful. In 1872 the amount of pig lead sold from the mine was reported as 1,156 tons worth £26,588 and the silver was 9 cwt, 2qrs, 20 lbs avoirdupois worth £4,335. In the 1877 account of Greenside Mine in *British Lead Mines* it was stated that 60,000 tons of lead ore had been raised that yielded around 40,000 tons of smelted lead and 600,000 ounces of silver worth £800,000 and £150,000 respectively (Postlethwaite 1877).

3.2.17 The lead mined from Greenside was used for pipes, bullets and roofing. Some of the lead from the mine was used to make bullets that were used in the American Civil War. A sunken ship that was discovered off of the coast of South Carolina contained lead ingots that were stamped with Greenside Mine (Arringstoll 2008).

3.2.18 From an early date the Greenside Mining Company had used horses in the horse levels. Provisions were made to provide fodder and grazing for the horses as well as stabling. The company bought some land at Pooley and leased some at Glenridding, most probably for haymaking. The Glenridding land included Sisson Close, Headlands and Brown Howe and was leased from the Rev. John Thompson, the parson of Patterdale. Greenside Lodge was built on part of the Reverend's land. In 1857 the Company paid a rent of £3. 10*s.* for this land. In the same year the Company rented a farm from the parson's son for 60 per year, but let out pieces of the land to Thomas Watson, the company's blacksmith, for £20 per year and John Chapman for 8.15*s.* per year. In 1858 nine houses for the workmen were built on a piece of land beside the road from the main road to the village which was then centred on the Traveller's Rest. Two rows of four houses, now known as Low Glenridding, were built on the south side of the road and had small yards, gardens and outbuildings that fronted onto the road. The houses were originally designed to face away from the road as the coal sheds were put in the front garden. The total cost of the nine houses was 1,316. Ten cottages were built in Glencoynedale at an

earlier date so now the Company owned a total of 19 cottages, but this was still not enough to house the growing number of miners. In 1859 four cottages were rented and a large new lodging shop was built near Low Mill (*ibid*).

3.2.19 There was an increasing need for family accommodation. In 1863 the Company began negotiations with William Marshall for the purchase or lease for the 1.5-acre field at Rake Head in order to build more cottages. The road to the mine consisted of a series of hairpin turns on common land just before Rake Head and passed above Marshall's Field. The Company sought to build a new road *c.* 400 yards in length along the lower boundary of Rake Head Field. Mr Marshall was hesitant to grant some of his profitable land to the Company but was inclined to grant them a lease, as it would benefit both the workers and the Company. William Barratt, for the Greenside Mining Company, met with William Marshall's mineral agent, Thomas E. Forster, in 1864 and came up with an agreement for the land. Marshall insisted that no more than 12 cottages could be built on the field and that these had to be built in groups of three or four in order to prevent quarrels between families. Marshall agreed to a compromise that the cottages be built in two blocks. A portion of the Commons was added to the field and the whole area was staked out for the use of the Company in 1863. The lease of the field and road for 99 years from William Marshall was signed in November 1864 for a rent of £6 and £1 annually respectively (*ibid*)

3.2.20 In 1866 the Company greatly expanded their property by buying the Glenridding Estate from William Whitwell for £2,350. This land consisted of a mansion, known as Glenridding House, near the lake and a large amount of land located between the village and the main road, all of which Whitwell bought the year before on behalf of the Company. The house had originally been built by the Askew family in the early 19th century. By 1860 the house was being used by Robert Bownass as a hotel. In 1862 Bownass built the Ullswater Hotel to the south of Glenridding House and no longer needed the former mansion house. The Company bought Glenridding House in order to house one or more of their mining agents (*ibid*).

3.2.21 By 1870 The Company's land within Gleridding had substantially grown. In 1870 Gleridding House was rented to Robert Bownass as a hotel. The company also extended their farming property by renting Gillside Farm near Rattlebeck from William Marshall and Matterdale End Farm from Matthew Green as well as land and a farm from J.M. Thomson. Gillside Farm came with 68 acres of land. The Matterdale Farm seems to have been rented for its hay or grazing. The main reason for acquiring the farms was to provide adequate feed for the mine horses (*ibid*).

3.2.22 Housing for the mine's workers was still an issue. By 1878 ten of the 12 cottages at Rake Field had been erected and the Company sought permission to build eight more. By 1878 a row of six houses was built at Rake Field by Edward Peel. These cottages were known as High Rake cottages and differed from the earlier cottages in that there were no dormer windows in the bedrooms and were slated in the cheaper blue Welsh slate. Two superior cottages were built around the same time at Row Head for the mining agents. These were built on the site of a farm and smithy owned by Thomas Watson (*ibid*).

3.2.23 In 1881 another row of five cottages was built at the Rake by John and Edward Dixon and William Alcock for £637, now known as Middle Rake cottages. A flat area of ground used as a carpark for High Rake cottages was once the location of a further six cottages (*ibid*).

3.2.24 In 1890 12 cottages known as Stybarrow Terrace were built at Glenridding alongside the road. In 1892 the Company leased the land below the Rake from Henry J. Halton for 99 years. Two rows of cottages were built here called Halton Terrace and were completed in 1896. Each cottage had its own coal house but only a half share of a closet.

3.2.25 A house for Captain Borlase, the new Chief agent for the mine in 1889, was built on a field called Near Brown Howe, on land on with Greenside Lodge and other buildings had been built. This was land that was leased by the Company in 1877 from John Mounsey Thompson. This included a part share in a barn and byre adjacent to Croft House and fields called Bridge Holme, Mill Crofts and Stoney Butts adjacent to it as well as land at Rowhead on which the company built two cottages and other fields (*ibid*).

3.2.26 Captain Borlase's house was known as Brown Howe and was built by Thomas Abbot. The house was completed in 1891. In 1901 Captain took up residence at Greenside Lodge and Brown Howe was rented to Mr. Bownass in its place. Eventually the Company Secretary, Matthew Place, took up Brown Howe and lived there until 1937 (*ibid*).

3.2.27 Captain Borlase persuaded the Company to modernise all of the mining machinery and put in a hydro-electric plant to supply power for winding and pumping and driving a new compressor in order to compete in a falling lead market. An electric locomotive was installed in the Lucy Level and that could haul 18 mine cars that negated seven horses and their drivers (Shaw 1970).

3.2.28 Borlase was responsible for building the Top Power House in 1890, near where Red Tarn and Kepplecove Beck joined. A deep cut was made into Red Tarn and a low earth dam was constructed. At the same time a water leat was constructed near Kepplecove Tarn outflow along the fell breast at

the foot of Catsycam to Red Tarn beck and along the hillside to the intake tank for the turbine pipeline. Power was first generated at 600 volts D.C. that was taken on overhead power lines to Low Level where it was suspended down Willie Shaft to the Lucy Level. Around 1912 more power was needed so the original plant was replaced by a modern Gilkes impulse turbine direct coupled to an alternator giving 2,200 volts A.C. This was taken by overhead lines to the Lucy Level mouth. In 1928 the power plant was reorganised and improved by installing a new turbine generating set near Rattlebeck with overhead lines to Lucy Level mouth. The water for this plant was collected at the mines on a level with the Lucy and conveyed along the Blea Cove. The head at the turbine was 111 metres and developed around 300 hp (*ibid*).

3.2.29 In 1927 a cloudburst washed away part of the Kepplecove Dam embankment creating a great flood that damaged houses and shops near Glenridding Bridge. The Mining Company paid compensation for the damage. This act nearly closed the mines but the Company was reorganised and the mine remained active (*ibid*). By this time, lead prices were falling. Even with the low demand for lead it was quoted that Greenside Mine was 'one of the most valuable lead propositions in the county, there is undoubtedly plenty of scope for investigations on a large scale…The surrounding country abounds in water, making for cheap power, and should operations be carried on in a sufficiently large scale, there is no reason why a very large output equal to any mine on the continent should not be obtained' (Landless 1979).

3.2.30 In 1936 the population of the parish was 871 individuals of which 150 were employed at the mine. This was the only industrial element in the area. Aside from the mine, the locals were employed in grazing sheep and entertaining tourists. Turnover at the mine was low as the cottages in which the miners lived were the property of the mine authorities. If a man gave up work in the mine he had to also vacate his house and find another place to live (Anonymous 1936).

3.2.31 In 1937 the Greenside Mining Company was taken over by the Basinghall Mining Syndicate Ltd of London and mining work began on a large scale. Electricity was brought in from Pooley Bridge. New dressing plant that used the latest crushing and dressing machinery was erected on the site of the 1871 mill (Shaw 1970).

3.2.32 During WWII a shaft was sunk from a 175 fathom level to the 200 and 217 fathom levels that revealed Skiddaw Slate and ultimately the end of the mine (*ibid*).

3.2.33 In 1959 the Atomic Energy Commission took over the mine in order to conduct a series of underground seismic test explosions. The Atomic Energy Authority Team were to detonate a 1,100 pound charge of TNT 518 metres below ground in order to determine '*if it is possible to detect a nuclear weapon test when an attempt was made to conceal it in a large underground hole*' (*Guardian* 1960).

3.2.34 In 1960 mining was resumed but by 1961 all of the worthwhile ore had been worked. The mine closed in 1962. The site was cleared and all temporary buildings were removed. The levels were destroyed in order to prevent people from entering the now defunct mines. The offices, stores and part of the old smelt mill were used as mountaineering huts and the miners' hostel is now a youth hostel (Shaw 1970).

3.2.35 When production at the mine ceased the site was tidied as much as possible to its original state. However, getting vegetation to grow on the tailings heap proved difficult. A large quantity of sludge was brought from the Penrith Sewage works and spread over the site that kick started the growth of vegetation (*ibid*).

4 ASSESSMENT RESULTS

4.1 INTRODUCTION

4.1.1 The assessment results are based on primary documents, most notably historical maps, and on the secondary sources that are referred to in Section 3.2 above. The results are presented according to the archive from which they were consulted. There were a total of 14 HER records for the study area defined as a 1 kilometre radius around the proposed water pipeline route. A list of the HER sites identified by the assessment is given in Appendix 1 and illustrated in Figure 3.

4.2 HISTORIC ENVIRONMENT RECORD (HER)

4.2.1 *HER:* there were a total of 14 HER records within the study area, the majority of which were related to the mining industry. Of these, ten were from the post-medieval period and the remaining four were of an unknown date.

4.2.2 *Listed Buildings:* there were two Listed Buildings within one kilometre of the proposed pipeline route. Eagle Farmhouse was located 190 metres southeast of the eastern extent of the proposed pipeline route. Rattlebeck Cottage was located 196 metres south of the midpoint of the proposed pipeline route. Both of these were Grade II Listed Buildings and were both present at the time of the First Edition Ordnance Survey (1860).

4.2.3 *Conservation Areas:* the proposed water pipeline route is not located within a Conservation Area.

4.2.4 *Scheduled Ancient Monuments (SAM):* there were two Scheduled Ancient Monuments within one kilometre of the proposed pipeline route both of which were related to the mining industry. Greenside Lead Mine itself is a Scheduled Ancient Monument. This includes the associated buildings, water management systems, trackways, tramways and dressing areas (SAM No. 27751). Top Power House Station is the other Scheduled Ancient Monument (No. 35017). This was constructed in 1890 near the junction of the Red Tarn and Kepplecove Becks in order to generate power for the winding, traction, air compressors for drills and lighting for Greenside Mine.

4.2.5 *Previous Investigations:* in 1979 Greenside Mine was generally explored. The main entrance was found to be blocked so access was gained through the rear emergency exit found at Glencoynedale. The remains of former dams, ladderways as well as numerous pipes and stop valves were still present within the mine at this time (Landless 1979).

4.3 CARTOGRAPHIC SOURCES

4.3.1 A search of maps recording Glenridding was carried out at Kendal Record Office. Only those that reveal the area around the proposed route and of direct relevance have been included (Appendix 2).

4.3.2 *First Edition Ordnance Survey Map, 1860 (Figure 4):* at the time of the First Edition Mapping only the row of miners' cottages, now known as Low Glenridding, had been built by the Greenside Mining Company, to the south of the proposed pipeline route. The proposed water pipeline route would have crossed open fields.

4.3.3 *Second Edition Ordnance Survey Map, 1898 (Figure 5):* by the time of the Second Edition mapping Rake Cottages, one of the termini for the proposed pipeline route, and Halton Terrace had been built. To the south of the newly built cottages was a new road that ran eastward before connecting with the earlier road that went to Glenridding village. The proposed water pipeline would have run to the south of this new road across open fields.

4.3.4 *Third Edition Ordnance Survey Map, 1915 (Figure 6):* the Third Edition mapping retained the same shape as the Second Edition, with the proposed water pipeline route crossing open fields, avoiding any extant buildings or structures.

5 WALKOVER SURVEY

5.1 INTRODUCTION

5.1.1 A walkover survey was undertaken by NP Archaeology Ltd on October 18th, 2011. The route of the proposed pipeline route was systematically walked with a corridor of two metres established on either side of the proposed route in order to determine the survival of any known archaeological features and to determine the presence/absence of any as yet unknown archaeological features. The walkover survey covered the whole of the proposed pipeline route. In addition, any sites lying within the survey area uncovered by the desk-based research were assessed as to their visible survival. A photographic record was made using digital photography.

5.1.2 The proposed pipeline route begins at Rake Cottages crossing a single track road into arable fields to the south of the cottages and terminated at Browfield Close (Plates 1-2). The arable fields were enclosed by dry stone walls, some of which may be impacted upon depending on the construction technique employed (Plate 3). Areas of the dry stone walls had piles of stone located on the southern aspect of the wall, most probably used as revetments.

Plate 1: Westernmost aspect of proposed pipeline route, looking east

Plate 2: Easternmost aspect of proposed pipeline route, looking west/northwest

Plate 3: Drystone wall that could potentially be impacted upon. Located in the area where the proposed pipeline route crosses over Greenside Road, looking west

5.1.3 A raised embankment was noted within the field directly south of Rake Cottages leading to the access gate (Plate 4). This was most probably established to gain easier access into the field as the road was at a higher elevation than the field to the south.

Plate 4: Embankment noted in field directly south of Rake Cottages, looking east

5.1.4 Within the length of the entire proposed pipeline route earthworks were noted within one field. A series of linear earthworks were noted in a field annotated as Tenterhow on modern Ordnance Survey mappings. The linear earthworks formed what appeared to be two rectilinear areas aligned northwest/southeast (Plates 5-6). The origin of these earthworks is unknown; however there may be some indication in the place name. It is possible that Tenterhow was derived from *tenters* or *tenterhooks*. After fulling, cloth was stretched on frames known as *tenters* and attached to the frames by L-shaped metal hooks known as *tenterhooks*. It was once common to see fields full of these frames. A fulling mill of unknown date (Site 12) was located to the south of this field and could have used this area to stretch out the cloth. The First Edition Ordnance Survey Mapping does not show a fulling mill within Glenridding, therefore would predate

Plate 5: Linear earthworks noted within field annotated as Tenterhow, looking southeast

Plate 6: Close-up of linear earthworks

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 ARCHAEOLOGICAL POTENTIAL

6.1.1 There is no direct evidence of prehistoric or Roman activity within the immediate vicinity of the proposed water pipeline route. Therefore the potential for prehistoric or Roman archaeological remains surviving subsurface within the proposed water pipeline route is considered to be low.

6.1.2 Glenridding was not mentioned in the 1777 Nicholson and Burn's *The History and Antiquities of the Counties of Westmorland and Cumberland*. This suggests that there was not much of a village present at this time. Therefore archaeological remains surviving subsurface within the proposed pipeline route from the medieval period are thought to be low.

6.1.3 The mine was established in the latter part of the 18th century with the first documentary reference made in 1799 when the mine was worked under a lease from the Duke of Norfolk. Extensive work at the mine began in the early 1800s. Land in Glenridding was initially bought to provide fodder and grazing for the horses that were used at the mine. By the mid 1800s houses for the workmen were built at an area now known as Low Glenridding. In 1863 Rake Cottages were being built with a further six houses being built in this area in 1878 and 1881. In 1890 cottages known as Stybarrow Terrace were built followed by the cottages known as Halton Terrace. Mining ceased in 1962 with the site being cleared and the temporary buildings removed. The Glenridding Lead Mine is credited with altering the landscape of the area. Therefore the potential for remains surviving sub-surface dating to the post-medieval and modern periods is high.

6.2 RECOMMENDATIONS

6.2.1 The archaeological walkover survey recorded a series of linear earthworks in a field annotated as Tenterhow on modern Ordnance Survey maps. These appeared to form two rectilinear areas. There was no indication as to the origins of these earthworks but could possibly be associated with the preparation of woollen cloth from a nearby fulling mill of unknown date. It is possible that these earthworks predate the First Edition Ordnance Survey map as the First, Second or Third Ordnance Survey maps show only open undeveloped land within this area. It may be recommended that an archaeological watching brief be undertaken while groundworks are ongoing in the field containing the linear earthworks, the level and extent of which is decided by the Lake District National Park Authority.

7 BIBLIOGRAPHIES

7.1 PRIMARY SOURCES

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Second Edition Ordnance Survey Map, 1898

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APPENDIX 1: GAZETTEER OF SITES

Table 1: Known HER events within 1 kilometre of the proposed water pipeline route

ID	HER #	Site Name	Description	NGR (N)	NGR (Y)	Period
1	2979	Gillside/Rattlebeck Cockpit	Possible cockpit of unknown date.	338000	516900	Unknown
2	5384	Greenside Lead Mines, Glenridding	Site of lead mines and associated buildings, water management systems, trackways, tramways and dressing areas. Scheduled Ancient Monument No. 27751.	336000	518000	Post-medieval
3	12062	Wetside Saw Mill, Patterdale	Site of a saw mill shown on the First Edition OS Map	338560	516900	Unknown
4	12063	Rowhead Forge	Site of a forge shown on the First Edition OS Map.	338270	517100	Unknown
5	12692	Wetside Quarry	Site of a quarry shown on the First Edition OS Map. Described as an 'old quarry' by the time of the Second Edition mapping.	338330	516630	Post-medieval
6	12712	Blea Cove Quarry	Site of a quarry shown on the First Edition OS Map. Described as 'old' by the time of the Second Edition mapping.	336500	516750	Post-medieval
7	12713	Rattlebeck Bridge Power Station	Site of a water powered power station shown on the Second Edition OS mapping.	337900	516875	Post-medieval
8	12714	Glenridding Allotments	Site of allotments shown on the Second Edition OS mapping. Now the area is a public car park.	338460	516875	Post-medieval
9	12715	Glenridding Sawmill	Site of a saw mill shown on the First Edition OS Map. Located below a leat on Glenridding Beck, but no building is shown.	338470	516870	Post-medieval

ID	HER #	Site Name	Description	NGR (N)	NGR (Y)	Period
10	12728	The Rake Gravel Pits	Site of gravel pits west of Rake Cottages beside the road to Greenside Mine shown on the Second Edition OS mapping.	337560	517200	Post-medieval
11	12782	Top Power House Station at Greenside Mine	Site of a power station constructed in 1890 near the junction of Red Tram Beck and Kepplecove Beck. Shown on the Second Edition OS mapping. Scheduled Ancient Monument No. 35017	335780	516790	Post-medieval
12	30757	Fulling Mill, Glenridding	Site of a fulling mill with an adjacent weir upstream.	338440	516880	Unknown
13	357/12/145	Rattlebeck Cottage, Glenridding	House of early 17th century date. A Grade II Listed Building.	337951	516914	Post-medieval
14	357/12/146	Eagle Farmhouse, Glenridding	House built in *c.* 1635. A Grade II Listed Building.	338527	516861	Post-medieval

APPENDIX 2: FIGURES