

EXTRACT FROM ENGLISH HERITAGE'S RECORD OF SCHEDULED MONUMENTS

MONUMENT: Blakethwaite Smelt Mill and dressing floors

PARISH: MELBECKS

DISTRICT: RICHMONDSHIRE

COUNTY: NORTH YORKSHIRE

NATIONAL MONUMENT NO: 28905

NATIONAL GRID REFERENCE(S): NY93690179
NY93810211

DESCRIPTION OF THE MONUMENT

The monument includes the structural, earthwork and buried remains of the Blakethwaite Smelt Mill and dressing floors. The monument, falling within two areas of protection, lies in the upper reaches of Gunnerside Gill, approximately 5.6km north of Gunnerside village, within an area of unenclosed grouse moorland.

The east end of the Blakethwaite mine sett was being worked in 1710 and was recorded as part of the Surrender Grant in the late 1790s. By 1806 the leases were split and the Blakethwaite mine was leased separately until its decline in the later 19th century. The Blakethwaite Level, the principal adit of the 19th century mines, was begun in 1812 by Chippendale and Co.. Around 1818, Robert Clark took over the lease and, after an initial slump in the price of lead, production figures averaged 383 tons of lead per year. The output figures encouraged the company to build a dressing floor near the Blakethwaite Level entrance and a smeltpill. The smeltpill began operations in 1821 and worked, intermittently in later years, until 1878, though it continued to be maintained until the end of the century.

The smeltpill complex lies in the first area of protection, within a small confined area of partly made up ground at the confluence of Blind Gill and Blakethwaite Gill. The mill itself measures approximately 11m by 18.5m with a maximum standing height of 7.5m at the apex of the east wall. Though the internal arrangement of the mill is now mostly obscured by rubble, it is known to have included a bellows house which contained a 5.5m diameter waterwheel, a furnace room containing the hearths, a room containing a calcining furnace, and an office or store room. Archaeological remains associated with these structures are believed to survive beneath the rubble. The cast iron pillar supports for the arches above the hearths survive in situ. The flue, which branched into two some 4m to the north of the mill, is difficult to distinguish near to the mill but enough survives to allow it to be traced to a building 12m to the north that would have housed the condenser. The flue continues a further 200m to the north west (including a vertical climb of c.45m) up to the low remains of a chimney on the limestone crag above. The flue survives intact on the crag and measures approximately 1.1m high by 1.35m wide. The remains of at least four other buildings, which would have originally served as smithy, office, joiners' shop and stores, are visible to the north and west. The peat store for the smeltpill is located on the east side of the beck and was connected to the mill via a stone-built footbridge.

The peat store, which is aligned north-south and measures 42m by 6.6m, has solid south and east walls, a main entrance in the north wall, and an arcaded west wall.

The site also has a well preserved limekiln built to provide mortar during the construction of the complex. The kiln, which stands to the north east of the smeltpill against a steep limestone outcrop, is built of coursed, squared sandstone blocks and has a draw hole in the south east side. It is also the only building within the complex which remains substantially intact.

The dressing floors are within the second area of protection and are situated on the east side of the Blakethwaite Gill, 300m NNE of the Blakethwaite Smelt Mill, and immediately south of the Blakethwaite Level entrance. They lie on a relatively flat, at least partly artificial terrace and include two discrete areas enclosed by low walls. Little is known about the dressing floor though it is recorded that a waterpowered crushing mill was in operation here by 1861. The upstream area contains numerous revetment walls and large areas of dressing waste. The waste is graded across the site and provides evidence for the different stages in ore processing at each location.

The lower walled area is partly paved, though much of the floor of this enclosure is now beneath water. The remains of a former bridge can be seen midway along the retained west side of the floors. This originally led to a terraced trackway on the opposite bank which connected the dressing floor with the smeltpill downstream. The scheduling also includes the remains of a three roomed building to the south east of the dressing floors which served as a smithy and office/stores. The building, which was partly built into the hillside, measures 20m by 6m and stands up to 4m high at its two storey southern end.

ASSESSMENT OF IMPORTANCE

Approximately 10,000 lead industry sites are estimated to survive in England, spanning nearly three millennia of mining history from the later Bronze Age (c.1000 BC) until the present day, though before the Roman period it is likely to have been on a small scale. Two hundred and fifty one lead industry sites, representing approximately 2.5% of the estimated national archaeological resource for the industry, have been identified as being of national importance. This selection of nationally important monuments, compiled and assessed through a comprehensive survey of the lead industry, is designed to represent the industry's chronological depth, technological breadth and regional diversity.

Ore hearth smelt mills were introduced in the 16th century and continued to develop until the late 19th century. They were the normal type of lead smelter until the 18th century, when they were partially replaced by the reverberatory smelt mill. The ore hearth itself consisted of a low open hearth, in which lead ore was mixed with fuel (initially dried wood, later a mixture of peat and coal). An air blast was supplied by bellows, normally operated by a waterwheel; more sophisticated arrangements were used at some 19th century sites. The slags from the ore hearth still contained some lead. This was extracted by resmelting the slags at a higher temperature using charcoal or (later) coke fuel, normally in a separate slag hearth. This was typically within the ore hearth smelt mill, though separate slag mills are known.

Early sites were typically small and simple buildings with one or two hearths, whereas late 18th and 19th century smelt mills were often large complexes containing several ore and slag hearths, roasting furnaces for preparing the ore, refining furnaces for extracting silver from the lead by a process known as cupellation, and reducing furnaces for recovering lead from the residue or litharge produced by cupellation, together with sometimes complex systems of flues, condensers and chimneys for recovering lead from the fumes given off by the various hearths and furnaces. The ore hearth smelt mill site will also contain fuel stores and other ancillary buildings.

Ore hearth smelt mills have existed in and near all the lead mining fields of

England, though late 18th and 19th century examples were virtually confined to the Pennines from Yorkshire northwards (and surviving evidence is strongly concentrated in North Yorkshire). It is believed that several hundred examples existed nationally. The sample identified as meriting protection includes: all sites with surviving evidence of hearths; sites with intact slag tips of importance for understanding the development of smelting technology; all 16th-17th century sites with appreciable standing structural remains; 16th-17th century sites with well preserved earthwork remains; and a more selective sample of 18th and 19th century sites to include the best surviving evidence for smelt mill structures, and flue/condenser/chimney systems.

The lead mining remains of Gunnerside Gill represent an exceptionally well preserved lead mining landscape, containing a wide range of lead industry sites and individual features. It is well documented historically from the 17th century onwards and a phased programme of archaeological survey further contributes to the understanding of the remains. The Gill is accessible to the public and the archaeological remains form an important educational resource and public amenity. Core areas of the landscape that are the best preserved and which illustrate the full historical and technological range of the various features are the subject of a series of schedulings.

The Blakethwaite Smelt Mill and dressing floor are good examples of 19th century ore hearth and ore processing technology with a wide range of well preserved and unusual features. In addition, no subsequent developments have taken place at either site, thus presenting a valuable opportunity for studying the technology of the period.

The ore works were an essential part of the lead mining site, where the mixture of ore and waste rock extracted from the ground were separated ('dressed') to form a smeltable concentrate. The range of processes involved can be summarised as: picking out of clean lumps of ore and waste; breaking down of lumps to smaller size (either by manual hammering or by mechanical crushing); sorting of broken material by size; separation of gravel sized material by shaking on a sieve in a tub of water ('jigging'); and separation of finer material by washing away the lighter waste in a current of water ('buddling').

The remains of ore works include the remains of crushing devices, separating structures and tanks, tips of distinctive waste from the various processes, together with associated water supply and power installations, such as wheelpits and, more rarely, steam engine houses.

Simple ore dressing devices had been developed by the 16th century, but the large majority of separate ore works sites date from the 18th and 19th centuries, during which period the technology used evolved rapidly.

Ore works represent an essential stage in the production of metallic lead, an industry in which Britain was a world leader in the 18th and 19th centuries. Sites are common in all lead mining areas and a sample of the best preserved sites merit protection.

MONUMENT INCLUDED IN THE SCHEDULE ON 03rd July 1997