EXTRACT FROM ENGLISH HERITAGE'S RECORD OF SCHEDULED MONUMENTS

MONUMENT: Gunnerside Gill lead mines and ore works

PARISH: MELBECKS

DISTRICT: RICHMONDSHIRE

COUNTY: NORTH YORKSHIRE

NATIONAL MONUMENT NO: 29007

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DESCRIPTION OF THE MONUMENT

The monument, divided into three seperate areas, is situated in Gunnerside Gill, 3.25km NNW of Gunnerside village, on unenclosed moorland. The largest area includes the earthwork remains of two hush systems, on the west and east sides of the Gill, with part of their related water management features; the structural remains of the Bunton ore works on the east bank of Gunnerside Beck; and the structural remains of a number of mining and ore processing features related to a series of levels on the west bank. To the south two seperate areas include, the well preserved remains of Dolly and Barbara Levels with their associated ore processing features.
The monument forms the core mining areas of an extensive landscape which has a well documented and long history: records from the 1680s for example, show that mines within Lownathwaite ground broke into earlier abandoned workings of the `Old Man' (miners' shorthand for workings of much earlier date) at a depth of 17 fathoms (c.34m). A number of medieval lead boles (wind blown smelting fires) exist on Winterings, the high ground to the south east. The mineral rights were originally owned by the Wharton family from 1544, but from 1787, were owned by a series of joint mineral lords known as the AD Lessors. These later owners, followed a policy of splitting the mines into blocks leased to venture capitalists, normally taking Gunnerside Beck as one of the boundaries. Two smeltmills were built in Gunnerside Gill, one in 1769, just north of Botcher Gill Gate, of which little now survives; and the other, Blakethwaite Mill, in 1820. The latter is the subject of a separate scheduling. The gill retains evidence of a range of mining techniques including shafts, hushes and levels, together with associated ore works. A complex of dams, leats and other water management features were constructed to supply waterpowered machinery both above and below ground. One reservoir and a pair of dams, are the subject of seperate schedulings. In the mid-19th century the mines were reaching the water table, and in 1864 Sir Francis Level, starting nearly 1km to the south of the main mining area, was driven northwards to act as a drainage and exploratory level. The entrance to this level, along with the two associated dressing floors, are the subject of a separate scheduling.
Underground mining was conducted from Sir Francis Level between 1883 and 1906. The monument includes two fine complexes of hushes with the North, South and Sun Hushes on the west side of Gunnerside Beck and the Gorton, Friarfold and Bunton hushes to the east. In Gunnerside, hushing is thought to have been

used mainly in the later 18th and 19th centuries, after the vein had been heavily worked out during the 17th century, and earlier, by shaft mining. The large scale use of water is thought to have ended by 1830 with the driving of Sir George Level close to the flood plain of the beck. However small scale mining by opencast methods is thought to have continued in the hushes on both sides of the beck throughout most of the 19th century.

From around the mid 18th century, most of the output was from whim shafts. Earlier shafts tended to be stepped and irregular, the ore being manually lifted up in stages. Whim shafts however were vertical and continuous, necessitating the use of horse-powered winding gear (a `gin') to lift the ore. From the 1780s, to combat the increasing problem of flooding below ground, drainage levels were driven, both from Gunnerside Gill and from the neighbouring valleys. Bunton Old Level was started c.1800 and in 1828 was linked underground with Hard Level, running to Hard Level Gill, 2.5km to the east of the monument.

Shortly after 1805 (before 1811), an ore works was established at the mouth of a large horse level, Bunton New Level. Bunton ore works was expanded at least once (in the 1850s), and became the main ore processing area on the east side of the gill. Mining and ore processing operations ceased at Bunton before 1888. Other horse levels (with smaller ore works) also existed, for example the Priscilla Level, which was started in 1821 on the west side of the beck. Along with Sir Francis Level, this was the last level being worked, with operations finally ceasing c.1905.

A line of shafts with collars of spoil are visible running west-east from 700m north west of Moss Dam, followed by the course of a shooting road for 450m. These shafts are also surrounded by broad deposits of ore processing wastes(dressing),including some, 1100m north west of Moss Dam, which have been reworked. The line of shafts, forming a band 100m wide, continues eastwards, varying in form from simple circular depressions typically 3m diameter, to mounds of spoil up to 30m in diameter and 2m high with a depression (marking the shaft) at the top. Either side of the main band of workings there are low earthwork remains of small dams and drainage channels feeding into a set of hushes that start approximately 200m east of the sheep pens. These earthworks range from 10cm- 20cm up to 1m high and although some extend for over 200m beyond the northern and southern extents of the mine workings, most of the features are concentrated within 100m of the hushes. Most of the drainage channels lead into a band of three main hushes (North, South and Sun Hushes) which run down the hillside following the veins. At their deepest they are individually up to 30m wide and 20m deep, forming a band approximately 100m north to south. They retain exposed working faces, as well as evidence of occasional shafts in their bases which are thought to date after the ending of the large scale use of water in c.1830. Around the hushes there are also small, undisturbed spreads of dressing wastes. On the north side of the workings the drainage channels all feed into the North Hush before the 510m contour. On the south side, a band of drainage channels at least 100m wide continues all the way down the hillside to feed into leats supplying water to the 19th century waterpowered ore processing features of Priscilla and Sun Hush Levels.

Priscilla Level entrance lies 25m west and approximately 3m above the bed of Gunnerside Beck. It is a horse level (1.55m high with a 0.65m gauge tramline still in situ) and is blocked by stone walling 5m inside the collapsed portal. The tramline leads to a series of low finger tip spoil heaps of mine waste, the western one of which extends 70m south to end at a bank of three wash kilns (storage bays for unprocessed ore).

These stone built structures are well preserved standing to 2.2m. They are cone shaped with curved side and rear walls. Adjoining the southernmost wash kiln there is 1.1m high platform forming a knocking stone where the unprocessed ore was manually broken up with hammers. A spread of waste from this process extends westwards to the beck. The still open Staple Shaft lies 15m to the west of the bouse teams. This 3.7m diameter shaft was sunk in 1880

and contains a 0.28m diameter iron pipe which was the feed pipe for the still in situ underground hydraulic pumping and winding engine installed in Sir Francis level c.38m below ground. At the east end of North Hush, immediately up hill and to the south west of Priscilla level, there is an irregular heap of mine waste 25m-30m in diameter. This is thought to derive from opencasting operations at the eastern end of the hush. Approximately 150m to the south of Priscilla Level lie the mine spoil heaps of Sun Hush Level which was active in 1862, but is thought to have been driven in the early 19th century. The level entrance (marked on the Ordnance Survey 1:10000 as Woodwards Lead Level) lies buried in hill wash and later spoil from opencasting operations in the hushes above, but will survive as a buried feature. On top of the spoil heap is the 10.54m by 5.24m, two storey, twin-celled mineshop. This building is roofless, but stands to eaves level. Both southern rooms were unheated and have been interpreted as store rooms. The upper northern room (entered from the higher ground to the west) is interpreted as the mine office and the lower room, with its evidence for a stove is interpreted as miners' accommodation.

Approximately 60m north of the mine shop are the partly buried remains of a waterwheel pit for a c.9m diameter wheel to power a pair of ore crushers. The crushers themselves have been removed, but stone foundations survive along with a number of timbers, some with iron bolts, together with the large stones used as counterweights.

The band of shafts extending eastwards above Gunnerside Beck splits into three main bands of workings as the Gorton, Friarfold and Old Rake veins diverge. The latter pair continue without a break for c.1.5km into Flincher Gill.

However the dressing wastes around the shafts have been heavily reworked from a shelf in the hillside marked by the 540m contour, eastwards. Below this level to the west the earlier remains are well preserved. The hushes (being from north to south: Gorton, Friarfold, Old Rake and Bunton Hush) survive as deeply incised gullies with working faces, areas of dressing wastes and mine spoil. They also retain a number of well preserved earth and stone dams, typically up to 1m high, built across the bases of the gullies. The more dispersed water management features extending on the east side beyond the limits of the concentrated area of mining are not as well preserved as those found to the west, and have not been included in the scheduling.

Approximately 100m east and 70m above Gunnerside Beck the mouths of the hushes are crossed by a rough pack horse track now used as a public footpath. Immediately adjacent, at the foot of Gorton Hush and opposite Priscilla Level, is the intact portal of Old Bunton Level (also called Gorton Level) driven c.1800. This is only c.0.5m high and was driven as a drainage level. Approximately 300m to the south at the foot of Bunton Hush there is the later Bunton Level. This is also still open and discharging water, it has a typical 1.18m high vaulted portal and in situ 0.55m gauge iron tramline. The portal is contained within the northern room of a single storey 10.4m by 5.6m, twin-celled building, interpreted as a store building controlling access to the level. Three large spoil heaps of mine waste fan out to the north and north west of the level. Sited on the southernmost spoil heap is a 15.1m by 5.6m, three celled, single storey mineshop. This survives to eaves level, but is roofless. The west room was an unheated and windowless store; the centre room has a substantial fire place with a stone lined pit in the middle of the room, and has been interpreted as a smithy; the east (and largest room) has evidence of a stove and is thought to have been miners' accommodation. All three rooms are stone flagged. An 8.9m by 5.9m structure built into the slope lies c.15m north of the mineshop. This contains ramps made out of packed rubble and has been interpreted as a building designed for the transhipment of materials from pack horses to mine tubs. To the south of the mineshop, some 40m south west of the horse level, are the well preserved standing remains of a north-south oriented bank of 17 bouse teams. These storage bays for unprocessed ore are square backed and typically 2.3m wide, 3.1m deep and 1.8m high. They retain a number of in situ and displaced timbers and iron rails, and to the west is a large spread of hand picked waste (resulting from the

initial hand sorting of the ore).
A well preserved wheelpit, supplied by a leat from Water Sikes stream to the south, lies c.3m south of the bouse teams. It used a c.7.4m diameter overshot wheel, to power a pair of crushers to the north and south, which fed a variety of processing units at this mine. The wheel is shown in a 1925 photograph. The platforms for the crushers retain substantial timber framing with bolts. Immediately to the south west and to the north west there are a pair of platforms up to 2.2m high, retaining part of their original planking, which are thought to have been for water powered jiggers (water filled wooden trunks containing sieves in which ore was agitated to separate the heavier lead from the lighter waste). To the north west there are two north-south oriented terraces, the upper being c.22m by 3.5m and revetted by a 1.9m high wall, and 0.7m above the 15m by 3.3m lower terrace. The terrace itself contains a number of timbers up to 0.6m high surrounded by fine dressing waste, the remains of buddles (an ore processing device which used running water to separate finer particles of ore). Downhill and 30m to the west of the wheelpit are two sub circular stone-built tanks which are fed by a stone-built culvert from the terraced buddling area. These are settling tanks (the upper one is c.1.25m diameter and 1.9m deep, and the lower 2.6m diameter and 0.8m deep) to allow the collection of very fine particles of lead from the waste water from the other processing devices.
Approximately 100m to the south west of the Bunton Level wheelpit, on the banks of the beck just to the north of Water Sikes stream, are the remains of Sir George Level and its ore works. This was driven as a trial between 1828 and 1833 and reopened for a few years in the early 1860s. The level entrance itself is buried in later spoil and hill wash. Immediately to the north there are the well preserved remains of a bank of five bouse teams, some retaining waterlogged wooden planking, and a tram rail which runs along their western side. To the north west there are a series of revetted areas containing deposits of dressing wastes with the timber remains of a number of ore processing devices.
Dolly Level, which is sited c.450m south of the North Hush, and is in a seperate area of protection, was driven as a drainage and exploratory level It is first mentioned in 1806, but is thought to date from the late 18th century, being the earliest known drainage level in Gunnerside Gill. It was still worked in the 1870s. The site, is very well preserved, including an intact horse level portal, entering the rear of a two storey 5m by 4m building with a 4m by 3m second room to the north. To the east are a set of mine spoil finger tips which form a scree slope down to Gunnerside Beck. Approximately 30m south east of the level there is a bank of 14 bouse teams surviving as partly collapsed structures. These are unusual because they vary considerably in width (ranging from 1.5m to 3m wide). In front and to the east of these are spreads of knocking and hand picking waste. Around 50m south west of the level, downhill from the bouse teams are the remains of a wheelpit for a c.6m diameter wheel. Immediately to the south there is a revetted terrace containing the foundations for a crusher. Downhill and c.10m to the west there is a second level area with jigger waste forming a scree slope down to the beck, with a further terraced area with dressing waste to the south. The mine is served by two trackways from the south, one leading from the bouse team and one entering the lowest terrace.
Barbara Level , which was driven in the early 19th century and reopened c.1857, is situated on a natural terrace at about the 440m OD contour on the east side of Gunnerside Gill, and is also in a seperate area of protection. Barbara Level includes a pair of adit entrances and a dressing floor. The main adit, which runs east into the hillside, is open and has a drystone corbelled roof and revetted entrance. The remains (two parallel wall stubs) of a small building, 4m by 3m, are situated to the south of the entrance. A linear spoil tip leads from the adit to the west before bifurcating. The remains of a second adit, with rock-cut roof and sides, lies up slope, 40m to the east.

The dressing floor includes the remains of a 17m long bank of four paved bouse teams. The side and rear walls of the bouse teams are tumbled and partly obscured by rubble. A large area of coarse dressing waste, the location of the initial dressing of the ore, lies to the west. To the south, a low revetment wall partly encloses a relatively flat c.9m by 9m dressing floor. This includes the partly buried remains of timber box culverts, a 2m square raised platform (thought to be a knocking stone) and fragments of an iron grate (for sizing the ore) that lies scattered across the floor. A tip of medium grade (jigging) waste lies to the west and a stone built 1.5m by 5m rectangular trunk buddle (in which a gentle flow of water was used to separate fine ore particles from waste), containing and surrounded by fine dressing waste, lies just to the south.
Excluded from the scheduling are all dry stone field walls, modern fencing, shooting tracks and stone built grouse butts, but the ground beneath these features is included.

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.
Nucleated lead mines are a prominent type of field monument produced by lead mining. They consist of a range of features grouped around the adits and/or shafts of a mine. The simplest examples contain merely a shaft or adit with associated spoil tip, but more complex and (in general) later examples may include remains of engine houses for pumping and/or winding from shafts, housing, lodging shops and offices, powder houses for storing gunpowder, power transmission features such as wheel pits, dams and leats. The majority of nucleated lead mines also included ore works, where the mixture of ore and waste rock extracted from the ground was separated ('dressed') to form a smeltable concentrate. The range of processes used can be summarised as: picking out of clean lumps of ore and waste; breaking down of lumps to smaller sizes (either by manual hammering or 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 field remains of ore works vary widely and 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 wheel pits and, more rarely, steam engine houses.
The majority of nucleated lead mines with ore works are of 18th to 20th century date, earlier mining being normally by rake or hush and including scattered ore dressing features (a 'hush' is a gully or ravine partly excavated by use of a controlled torrent of water to reveal or exploit a vein of mineral ore). Nucleated lead mines often illustrate the great advances in industrial technology associated with the period known as the Industrial Revolution and, sometimes, also inform an understanding of the great changes in social conditions which accompanied it. Because of the greatly increased scale of working associated with nucleated mining such features can be a major component of many upland landscapes. It is estimated that several thousand sites exist, the majority being small mines of limited importance, although the important early remains of many larger mines have often been greatly modified or destroyed by continued working or by modern reworking. A sample of

the better preserved sites, illustrating the regional, chronological and technological range of the class, is considered to merit protection.

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 the 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.
The main mining area within Gunnerside Gill was where the Friarfold and Old Rake Veins converged with a number of smaller veins to form the highly mineralised ground of Lownathwaite and Melbecks Moor. This resulted in a long mining history represented by many varied features. On the Lownathwaite plateau, the monument includes a fine set of hush dams and other water management features alongside a number of undisturbed shafts with small scale ore processing areas. Many of these shafts are thought to pre-date the hushes, and are thought to be 18th century and earlier. On the east side, the system of hushes is even more complex (as the veins diverge). The 19th century ore works and horse levels on both sides of the beck retain a wide range of nationally rare features. The Bunton and Sir George washing floors are unusual, retaining well standing remains as well as timber structures partly buried in rubble and dressing waste. On the west side, the remains include the shaft and water feed pipe to the underground hydraulic engine in Sir Francis Level below. This engine is complete and believed to be nationally unique. A similar water feed feature survives at Barbara Level, which also retains a trunk buddle which is a nationally rare survival. Dolly Level, which is one of the earliest horse levels in Gunnerside Gill, retains a complete layout of a small, mainly manual, ore works, providing a very good illustration of the organisation of a simple ore works, which contrasts with the more complex and multi-phased ore works at Bunton.

MONUMENT INCLUDED IN THE SCHEDULE ON 16th May 1997