

Greenhow Hill Lead Mines Survey



September 2003

Surveyed by Martin Roe on behalf of the Northern Mine Research Society

Commissioned by the Nidderdale AONB

Funded by English Heritage through the Aggregate Levy Sustainability Fund

Contents

Introduction

1.1 Introduction	1
1.2 Report Layout	1
1.3 Survey Area	1
1.4 Project Outcomes	3
1.5 Historic Background	4
1.6 Geology	5
1.7 Survey Methodology	6

Survey Data

2.1 Introduction	7
2.2 Coldstones Quarry	9
2.3 Greenhow Moss	14
2.4 Village Centre	20
2.5 North Coldstones	26
2.6 Toft Gate	34
2.7 Farside	42
2.8 Prim Gap	51
2.9 Cockhill	57
2.10 High View	65
2.11 Galloway Pasture	82
2.12 Forest Moor	99

Interpretation

3.1 Introduction	107
3.2 Extraction	107
3.2.1 Shaft Haulage	111
3.3 Ore Dressing	111
3.4 Smelting	114
3.5 Water Management	115
3.6 Buildings & Miscellaneous Features	116
3.7 Recommendations For Future Work	117

Bibliography	118
--------------	-----

Appendix 1 List of Site Components Used For GPS Surveys	119
---	-----

Figures

Fig.1 Location	2
Fig.2 Survey area (OS Explorer sheet 298 Nidderdale)	3
Fig.3 Geology of Greenhow Hill (After Dunham (1985))	5
Fig.4. Survey areas	7
Fig.5 Survey Conventions	8
Fig.6 Coldstones Quarry	10
Fig.7 Hope Shaft (feature 9)	13
Fig.8 Buddles (feature 17)	13
Fig.9 Greenhow Moss	15
Fig.10 East Engine Shaft (feature 2)	18
Fig.11 Possible climbing shaft: East Engine Shaft	18
Fig.12 Smithy (feature 19)	18
Fig.13 Water Leat (feature 12)	19
Fig. 14 Village Centre	21
Fig.15 Closely spaced shaft mounds	25
Fig.16 Dressing waste (feature 57)	25
Fig.17 North Coldstones West	27
Fig.18 North Coldstones East	28
Fig.19 Cow Grooves Shaft (feature 23)	33
Fig.20 Earth and Stone Dam (feature 2)	33
Fig.21 Buddle on water leat (feature 11)	33
Fig.22 Toft Gate East	35
Fig.23 Toft Gate West	36
Fig.24 Toft Gate Lime Kiln (feature 9)	41
Fig.25 Line of shaft mounds (feature 17-21)	41
Fig.26 Far Side	44
Fig.27 Entrance to Sam Oon Level (feature 40)	48
Fig.28 Chimney Shaft (feature 25)	48
Fig.29 Filled ground over Greenhow Rake Vein (feature 28)	48
Fig.30 Shaft mounds The Virgins Vein (feature 1)	49
Fig.31 Climbing shaft Jervis Waygate Shaft (feature 5)	49
Fig.32 Panty Oon Stone (feature 39)	49
Fig.33 Possible shaft onto Jackass Level (feature 63)	50
Fig.34 Head carved onto boulder near Sam Oon Level (feature 41)	50
Fig.35 Quarryman's shelter (feature 64)	50
Fig.36 Prim Gap	52
Fig.37 Shaft on The Virgins Vein (features 14-15)	55
Fig.38 Large opencut (feature 39)	55
Fig.39 Earth and stone dam (feature 44)	56
Fig.40 Cockhill	59
Fig.41 Entrance to Jackass Level	62
Fig.42 Entrance to Cockhill Level	62
Fig.43 Entrance to Gillfield Level	62
Fig.44 Cockhill smelt mill	63
Fig.45 Gillfield smelt mill	63

Fig.46 Providence smelt mill	63
Fig.47 Possible explosive store	64
Fig.48 Carved stone near Jackass Level	64
Fig.49 Carved stone near Jackass Level	64
Fig.50 High View West	67
Fig.51 High View East	68
Fig.52 Line of shafts and pits marking the course of Prim Gap Vein (features 77-80)	77
Fig.53 Shallow pits (features 118-9)	77
Fig.54 Backfilled opencut (feature 38)	77
Fig.55 Opencut Greenhow Rake Vein (feature 204)	78
Fig.56 Opencut Greenhow Rake Vein (feature 200)	78
Fig.57 Coe near PrimGap Vein (feature 121)	78
Fig.58 Coe on the side of Greenhow Rake Vein (feature 189)	79
Fig.59 Rock cut water leat (feature 11)	79
Fig.60 Holloway with wall on one side (feature 96)	79
Fig.61 Greenhow Rake Vein Out cropping in the side of Duck Street Quarry (feature 217)	80
Fig.62 Level driven into Greenhow Rake Vein (feature 218)	80
Fig.63 Open stope Greenhow Rake Vein (feature 218)	81
Fig.64 Section of a pre gunpowder shaft in the side of Greenhow Rake Vein (feature 218)	81
Fig.65 Galloway Pasture North	84
Fig.66 Galloway Pasture South	85
Fig.67 Galloway Pasture West	86
Fig.68 Engine Shaft (feature 143)	96
Fig.69 Closely spaced shaft mounds (feature 221)	96
Fig.70 Closely spaced shaft mounds (feature 221)	96
Fig.71 Buddles (feature 263)	97
Fig.72 Buddles (feature 263)	97
Fig.73 Buddles (feature 263)	97
Fig.74 Galloway Gulf (feature 54)	98
Fig.75 Dumped material from fluorspar processing (feature 53)	98
Fig.76 Dumped material from fluorspar processing (feature 53)	98
Fig.77 Forest Moor North	101
Fig.78 Forest Moor South	102
Fig.79 Remains of horse gin circle (feature 20)	105
Fig.80 Shaft mound (feature 45)	105
Fig.81 Ditch and bank	106
Fig.82 Areas showing evidence of meer working	108
Fig.83 Levels under Greenhow Village (principle levels only) (after Gill 1998)	110
Fig.84 Horse Gin Typology (Cossons 1975)	111
Fig.85 Ore dressing areas	113
Fig.86 Smelting sites	114
Fig.87 Water management features	115
Fig.88 Buildings	116
Fig.89 High View West	123

Fig. 90 Village Centre 124

Tables

1	Coldstones Quarry	11
2	Greenhow Moss	16
3	Village centre	22
4	North Coldstones	29
5	Toft Gate	37
6	Farside	45
7	Prim Gap	53
8	Cockhill	60
9	High View	69
10	Galloway Pasture	87
11	Forest Moor	103
12	Heights above sea level and depths of levels.	109

1.1 Introduction

This project has comprised an archaeological evaluation to assess the nature and scope of mining remains around Greenhow Hill village and identify sites requiring further action, i.e. further detailed survey, consolidation work, statutory protection. This comprised a rapid GPS (Global Positioning System) mapping of shafts and other excavation features, dressing areas, buildings, spoil tips, and water management features, a brief text description of features (i.e. shaft mound 4m diameter 1m, dressing area 10m x 6m), and a photographic survey of key features in order to produce a RCHME level 2 survey.

The survey has been undertaken by Martin Roe on behalf of the Northern Mine Research Society commissioned by the Nidderdale AONB using money from the Aggregate Levy Sustainability Fund, administered by English Heritage.

The Northern Mine Research Society (NMRS) is the leading mining history organisation in the north of England and has been involved in the recording and preservation of mining history since the late 1950s. The society has long standing connections with the Greenhow area having revised and republished its Greenhow Mines monograph three times between 1970 and 1998. As well as an accumulated knowledge of the area a considerable amount of documentary material has been collected and is held in the society records. In the last few years society members have developed new fieldwork strategies which have been applied very successfully to lead mining landscapes in the Yorkshire region, the result of which have been deposited in the North Yorkshire and Yorkshire Dales National Park Sites and Monuments Registers (SMRs)

1.2 Report Layout

This report is divided into three main sections. Following this introduction the main body of the report comprises the survey data followed by the final interpretation section. For convenience the survey area has been divided up into eleven individual units, each treated as a separate survey. For each survey a description of the main features present is followed by an annotated plan of the area, together with a gazetteer of features, followed by photographs of key features.

1.3 Survey Area

This survey has recorded multi-period lead extraction, ore dressing and smelting sites around the village of Greenhow Hill, in the parish of Bewerley, North Yorkshire centred on N.G.R. SE113 642. The land is currently used for agricultural purposes ranging from enclosed pasture to unenclosed moorland. Part of the survey area is an active limestone quarry. The area surveyed is under multiple ownership and determining who owned what and then obtaining permission to carryout the survey was at times difficult as not all the landowners live in the village.

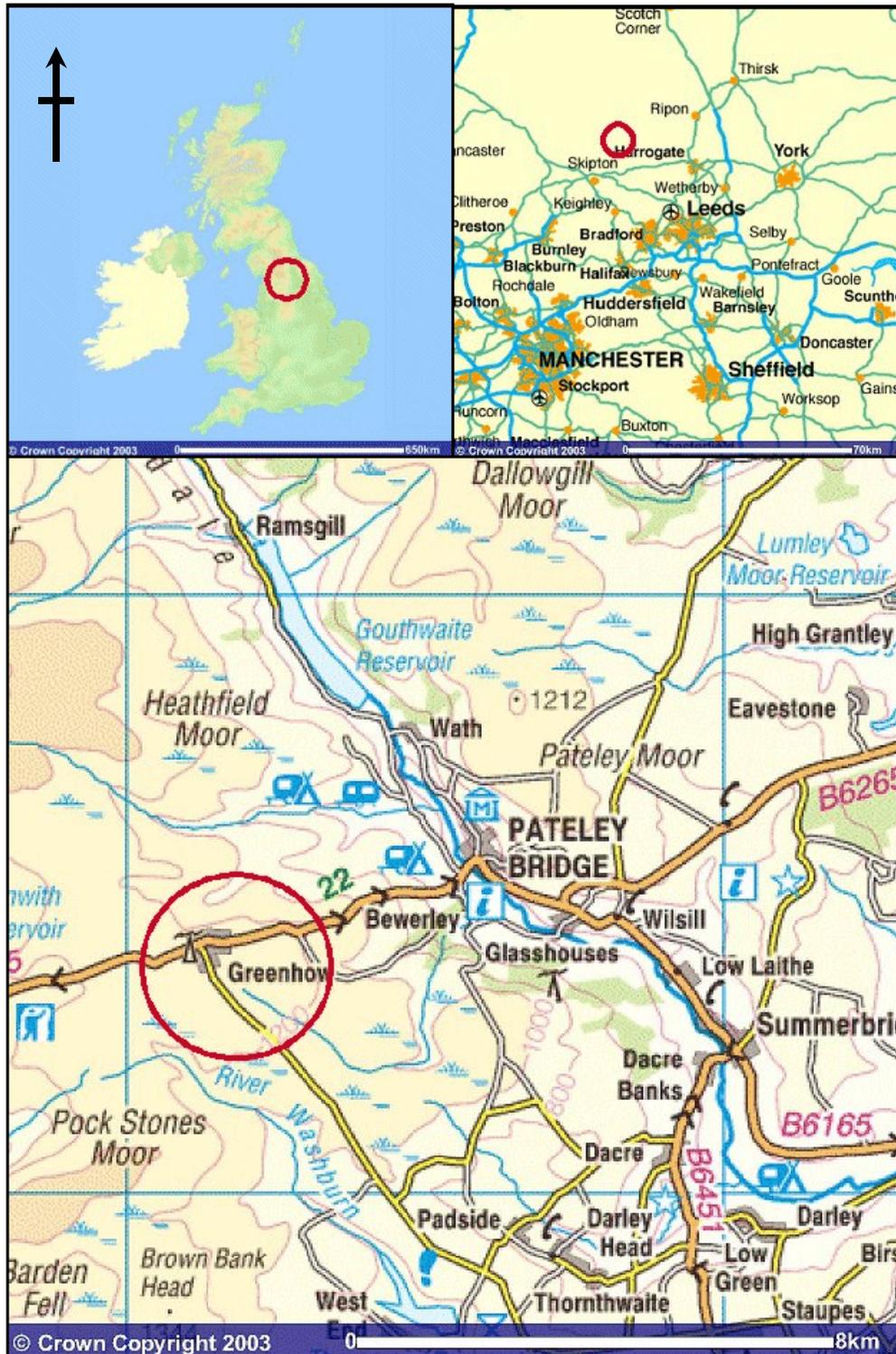


Fig.1 Location

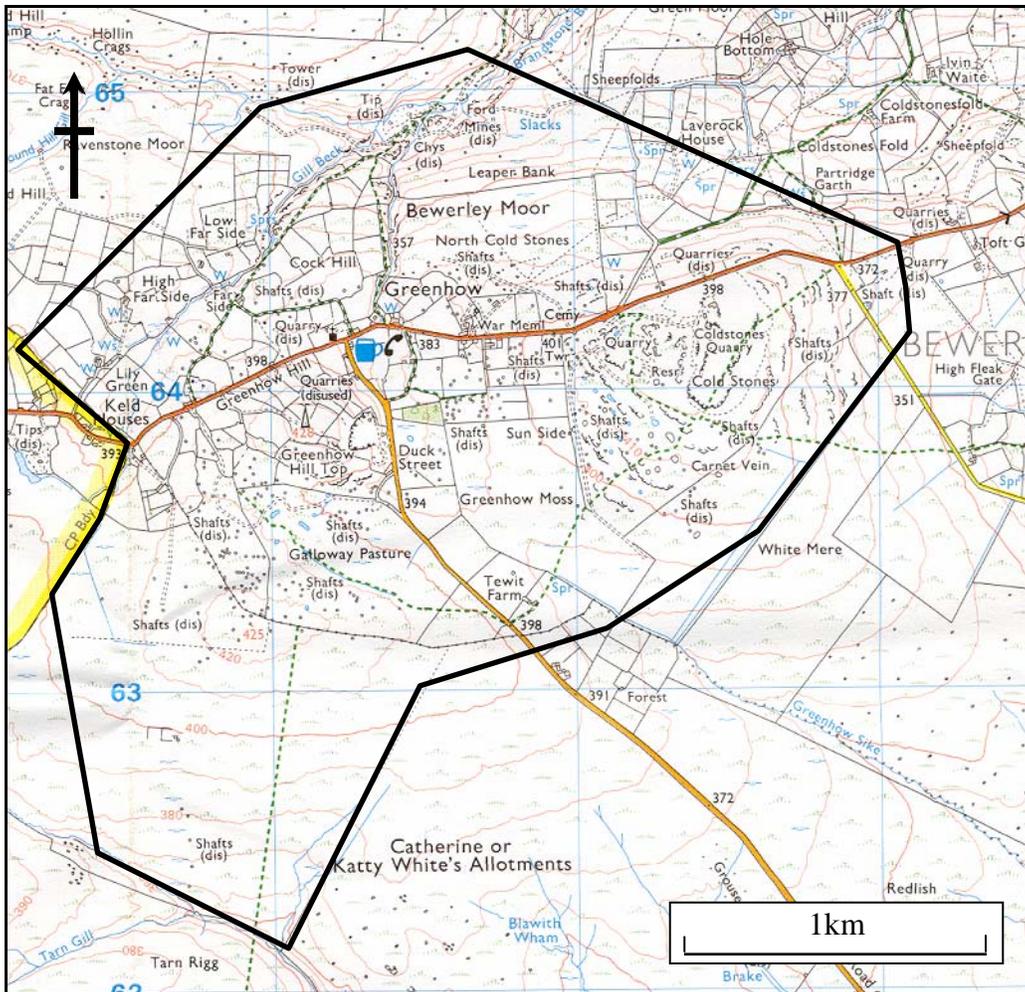


Fig.2 Survey area (OS Explorer sheet 298 Nidderdale)

1.4 Project Outcomes

This project has:

- Defined the mining remains around Greenhow village.
- Substantially enhanced the coverage of this area in the North Yorkshire SMR.
- Identified sites at risk.
- Identified areas requiring further survey.
- Identified sites requiring consolidation work.
- Identified areas that would benefit from statutory protection.
- Identified areas and features that could be incorporated into guided walks and other heritage interpretation projects.
- Produced a record of any open shafts and other features that may be perceived as a danger to the public.
- By making the survey results available to local people it has improved local awareness and understanding of the history and heritage of Greenhow.
- Created a useful archive for researchers.

1.5 Historical Background

Lead mining at Greenhow Hill is documented back to the early medieval period, but two finds of lead ingots bearing Roman inscriptions suggest an earlier origin. Although not proof of mining and smelting in the area these Roman ingots form a very significant portion of the evidence for Roman mining in Yorkshire and make the area regionally significant.

The first written reference to mining in Nidderdale dates from 1151 when Roger de Mowbray granted Fountains Abbey "***All copper, iron, lead and every kind of metal and stone in his forest of Nidderdale in whatsoever place found, below ground or above...in shafts, mines, and minerals***" This grant included the township of Bewerley which includes the area which would become the village of Greenhow Hill. A further grant gave land in the dale to Bylands Abbey and included "***iron ore and a 10th of my lead house, through all my forest of Nidderdale***" It therefore appears that both Abbeys were granted the same right to mine lead over an ill defined area and this led to a number of disputes which generated much of the surviving documentation from this period and provide glimpses into the scale and nature of medieval mining.

A legal document from 1225 mentions lead mines at Kaldstanes and le Feldberg. Kaldestanes is interpreted as Coldstones Hill and le Feldberg (an unenclosed low hill) as Greenhow Hill, these are also prominent topographic features in Greenhow Hill village. A later document states that around 1600 mining was confined to the summits of Greenhow and Coldstones Hills, which suggests that the early mining was confined to the outcropping limestone that forms these hills. Lead from the area was used on prestigious medieval buildings such as Windsor Castle, which was supplied with 168 pigs of lead weighing a total of 20 fothers in 1363. Although there are variations in the weight of a fother it was commonly equal to 22cwt (Gill 1988). This gives a total of 22.4 tons, which would represent a respectable yearly output for a small 19th century mine.

As with the medieval period the early post medieval period is poorly documented however at the end of the 17th century just less than 3000 tons of lead from Greenhow passed through York between 1692 and 1699. It is likely that most of this was mined from outcropping veins of Coldstones and Greenhow Hills but it is possible that by this date the miners had begun to follow the veins where they disappear under drift and had probably therefore discovered the important Cockhill / Waterhole Vein system. This is confirmed by a set of accounts from Sir Thomas Whites mines in 1707 that mention mining at Galloways (south of Greenhow Hill), Lumb (part of the Cockhill Vein west of Greenhow Rake), as well as Coldstones.

From the mid 18th century a series of deeper shafts were sunk, and name evidence suggests that some were equipped with horse powered winding engines, known by various names such as whim, gin, and engine. These shafts mainly accessed veins in the limestone beneath shale cover, sometimes by crosscuts driven through barren rock from the foot of the shafts.

The Cockhill and Gillfield Levels were driven in the 1780s from Brandstone Beck to the north of the village initially to the Cockhill and Water Hole Veins but both were continued so that they eventually drained most of the veins under the village. These levels were driven as horse levels and equipped with rails to enable ore mainly, but not exclusively from stopes above the levels to be taken directly to mechanised dressing floors adjacent to smelt mills. Both Cockhill and Gillfield levels have branches that run under Coldstones Hill and continued in use throughout the 19th century and during twentieth century fluorspar mining operations.

1.6 Geology

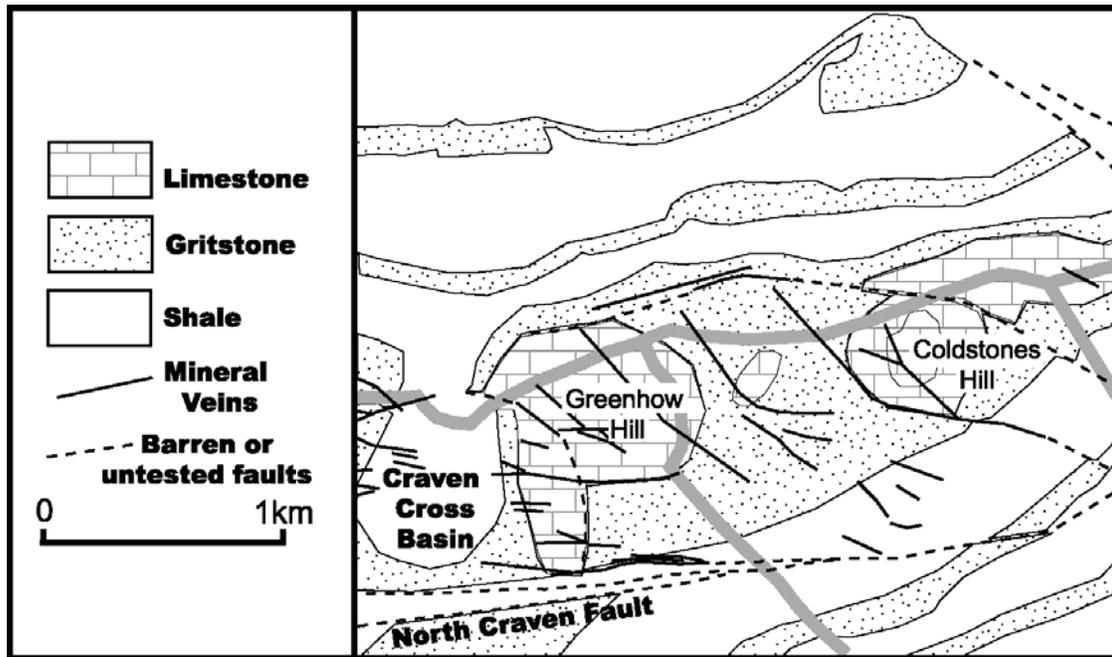


Fig.3 Geology of Greenhow Hill (After Dunham (1985))

The Greenhow mining field consists of limestones overlain by the shales and gritstone of the Millstone Grit Series. In this respect the Greenhow area is similar to other mining areas of the Yorkshire Dales, however here, the beds are not found in nice regular horizontal bed but have instead been distorted by an east to west anticlinal fold known as the Greenhow Anticline. This has resulted in two outcropping islands of limestone, Greenhow Hill and Coldstones Hill, surrounded by gritstone and shale beds.

The geology is further disrupted by the North Craven Fault which throws the limestone down as much as 228m on the south side of the fault which results in the Millstone Grit Series outcropping. The beds of limestone are of the Yoredale series, but here the intervening beds of grits and shales are thinner than elsewhere, which Dunham considers is a direct result of the thickening of the limestone beds. This has left an almost continuous bed of limestone where oreshoots have been proved over a height 500ft. Several deep basins of shale and gritstone are also found in this area, such as that at Craven Cross, and veins passing into these areas have proven to be barren. Oreshoots are mainly confined to the limestone with a little ore in the gritstone where the veins

approach the North Craven Fault. The area is therefore defined by the Craven Cross Basin to the west and the North Craven Fault to the south. To the north the edge of the mineralisation is marked by the Waterhole Vein, and to the east the veins die out beyond Coldstones Hill.

1.7 Survey Methodology

This survey used a Garmin Etrex Global Positioning System receiver (GPS) to record lead mining features. Features recorded were either point features, linear features or areas. Small shaft mounds under 5m diameter were treated as points, as were small pit features. Linear features such as open cut trenches, and water leats were recorded as a series of points. Area features such as dams; areas of dressing spoil, and the perimeter of larger shafts mounds were recorded with points taken every few metres. A brief text description of each feature was recorded on a pre-printed sheet as well as the number of the point or points defining the feature. Descriptions were based on a typology of site components developed from a list of components included in the Monument Protection Programme Lead Industry Step One Report and are included as appendix 1. The header of the survey sheet includes details of the survey location, date, instrument used, accuracy of the readings (as quoted by the GPS, usually 5-6m), and the name of the surveyor.

After collecting the information in the field the data from the GPS receiver was downloaded using Gartrip, a GPS utility. The recorded waypoints were then printed off and filed with the descriptions of the features. The points were also plotted and then exported into Adobe Illustrator where the points were assigned suitable symbols and produced as a scaled vector drawing. Field boundaries have been taken from available OS mapping and may not be representative due to recent changes to boundaries. It was not possible to resurvey all field boundaries however some adjustment was made where obvious changes have been made. The scale of 1:2500 was adopted to allow integration with existing desktop mapping. A copy of the Gartrip plot and the vector drawing were added to the filed data to form a survey archive. Vector drawings were combined to produce a larger plan, which has been used to produce individual drawings for interpretation drawings.

From the vector drawings a new set of waypoints was produced assigning a single grid reference for each individual feature. These waypoints were exported as a text file and added to an excel spreadsheet together with information from the record sheet in order to produce a gazetteer of features, accompanied by annotated maps of each survey area. This method has inbuilt inaccuracy due to the limitations of the equipment and data used, but at the chosen plot scale of 1:2500 this should not have resulted in any loss of archaeological information, although where present it has not been possible to record fine detail, however this problem has been addressed by photographing and writing a short description of key features. The amount and type of information collected makes the data suitable for input into a geographic information system.

2.1 Survey Data

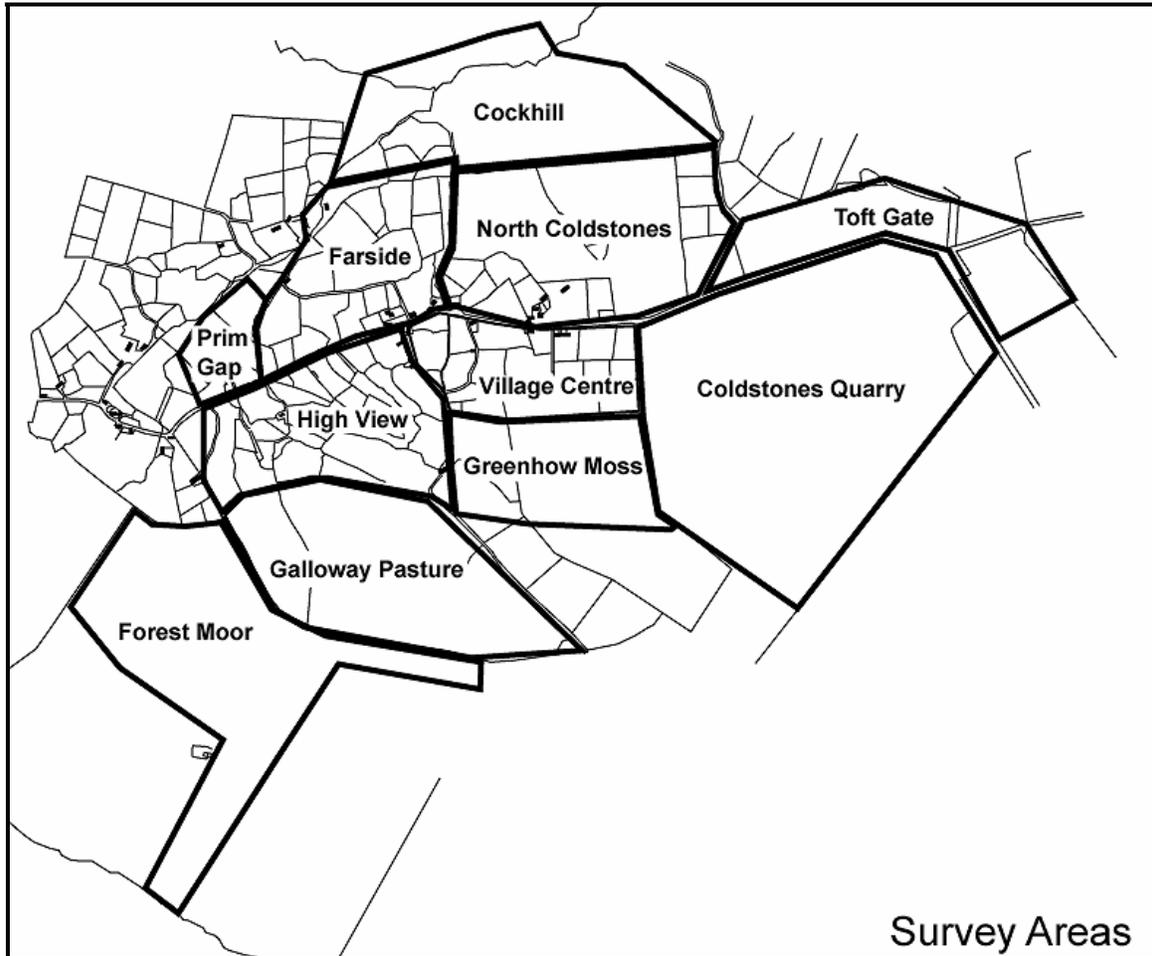


Fig.4 Survey areas

Shaft Mound	
Shafts (less than 5m dia)	
Pits (less than 5m dia)	
Trenches	
Level	
Ore dressing area	
Water leat and dam	
Shakehole	
Holloway / trackway	
Building platform	

Fig.5. Survey Conventions

2.2 Coldstones Quarry

This area is dominated by the deep excavation of the active Coldstones limestone quarry, which has removed the summit of Coldstones Hill and all surface evidence of mining. Overburden from the site forms a large bank or bund around the quarry and covers a further area of natural ground surface. Outside the bund fragments of mining and quarrying activities have survived and these represent the margins of mining activity on Coldstones Hill.

A number of shafts have been recorded in this area of which two have associated dressing areas. Hope Shaft (4), which predates 1782 has a very disturbed dressing area alongside, which may have been turned over during fluorspar recovery operations removing all traces of earlier activities on the site. This dressing area has also been cut in half by a modern road out of the quarry. A similar dressing area associated with Hazel Shaft (9), is grassed over and appears to have been disturbed by mechanical plant. Feature no 2 is a large depression partly surrounded by a drystone wall. This has the appearance of a shakehole; and has been identified as Shakehole Shaft, which as the name suggests is probably a shaft sunk into a natural shakehole.

On the eastern side of the quarry is an area of shallow pits, trenches and indistinct excavations (18-35). This probably marks an area of prospection or trial features possibly searching for a vein, which formerly ran through the quarry although some of the features appear to be small shakeholes. On the north side close to the quarry entrance is a discontinuous opencut trench feature 4m wide by 40m long, which probably represents Garnet Vein.

In addition to the dressing areas associated with Hope and Hazel shafts feature 17, to the east of the quarry, is an area of very slight earthworks, which appear to be a series of tanks connected by channels. This suggests that they may be buddles although evidence that they may be part of a bigger ore dressing operation has been buried under the quarry bund.

There is very little evidence of water management surviving in this area other than features 6,7, and 8, which consist of two dams and a fragment of a water leat alongside Hazel Shaft. The water leat (8) appears to run from underneath the quarry bund and is well placed to supply the eastern most dam (7) and the dressing floor associated with Hazel Shaft (10). A linear earthwork (5), 4m wide at the base, 0.75m wide at the top, and 0.5m high, which is cut by the road but continues on the other side, running through the boundary wall and into the adjoining enclosure may represent a raised section of water leat: however it may alternately mark the course of a narrow gauge railway.

Alongside Hazel Shaft a linear feature approximately 3m wide runs south. This feature is not raised above the surrounding ground level but is a drier and firmer surface suggesting a road surface. A slight ditch on the east side supports this interpretation. This feature is probably the 18th century Rolls Lime Road. Feature 36 is a fragment of a 2m wide holloway, which runs from Coldstones quarry towards Toft Gate Lime Kiln.

Located on the east side of the quarry are two areas (14 & 15) where gritstone boulders have been extracted from drift deposits and superficial quarries. The stone here is very friable and appears to be unsuitable for building or wall building. It would however be ideal for crushing to make sand. Near the main entrance to the quarry a large top loading lime kiln (38) is partly buried in the bund. No other structures or buildings were found in this area.

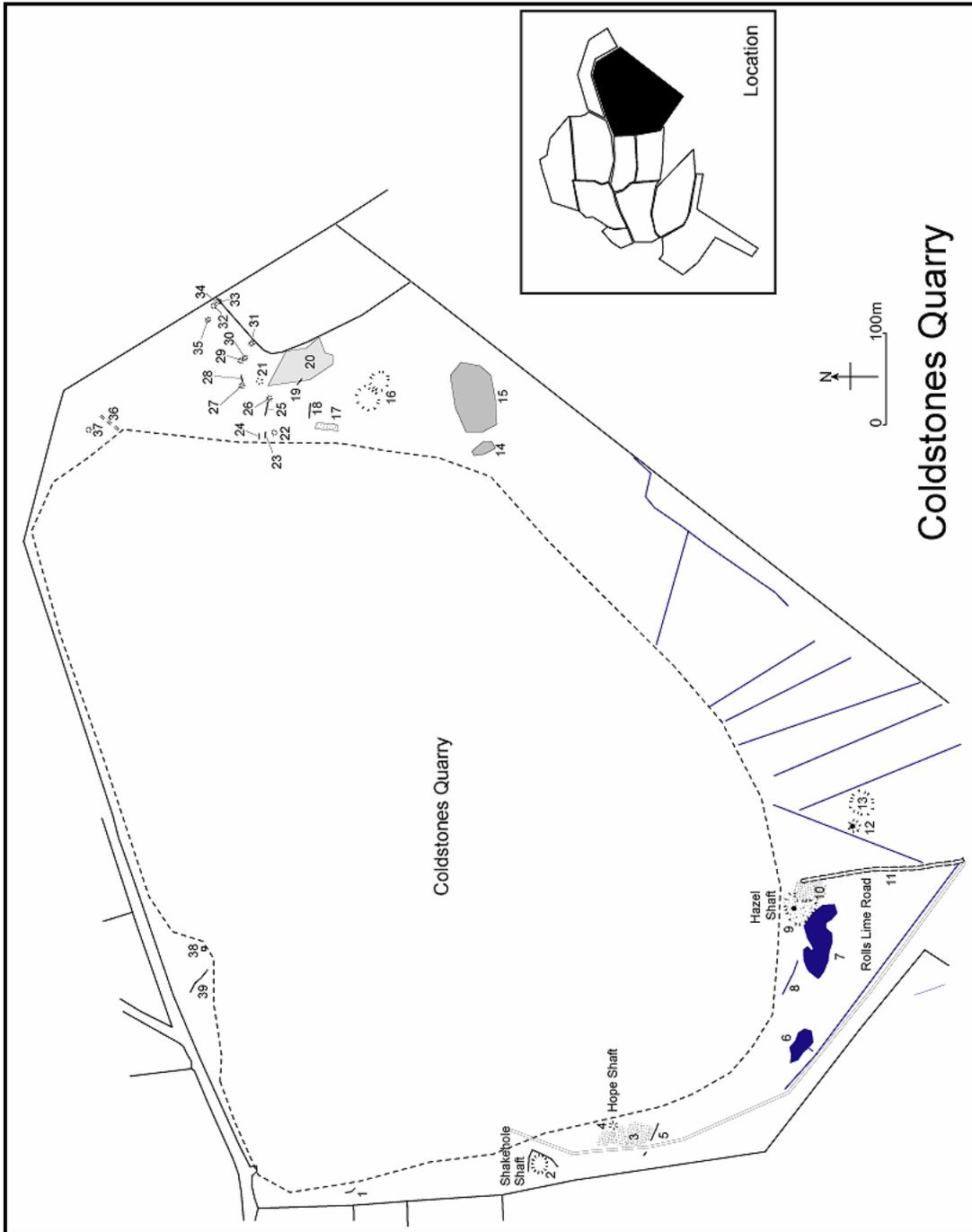


Fig.6 Coldstones Quarry

Table1 Coldstones Quarry				
Feature Number	Description	Zone	Northing	Easting
1	Possible remains of shaft mound c.8m dia buried by quarry bund	SE	11968	64087
2	Large depression c.20m dia resembling a shakehole, surrounded by drystone wall, probable shaft	SE	11996	63880
3	Grassed over area of ore dressing 65m x 35m much disturbed partly cut by quarry road	SE	12027	63785
4	Depression / possible shakehole / shaft. May have covered shaft in centre.	SE	12039	63798
5	Earthwork 4m wide at base 0.75m wide at top. Possible tramway. Feature is cut by road	SE	12030	63752
6	Earth and stone constructed dam 40m x 20m outlet on SW side	SE	12128	63588
7	Earth and stone constructed dam 80m x 20m - may have been partly filled in for wildlife	SE	12243	63568
8	Water leat	SE	12203	63599
9	Shaft mound 20m x 40m with depression marking shaft in an off centre position suggesting that this was a gin shaft.	SE	12277	63583
10	Grassed over ore dressing area 30m x 20m the form of this area suggests that dressing waste has been mechanically removed.	SE	12300	63578
11	Linear feature c.3m wide drier than the surrounding area, slight ditch on east side. Probably Rolls Lime Road.	SE	12319	63533
12	Shaft mound 15m dia, depression in centre marks position of shaft.	SE	12370	63532
13	Large depression c.30m dia probable shakehole.	SE	12396	63520
14	Probable area of gritstone working 80m x 40m	SE	12789	63940
15	Probable area of gritstone working 25m x 10m	SE	12838	63952
16	Two shakeholes next to one another 30m x 20m and 20m x 20m	SE	12856	64062
17	Grassed over area of very slight earthworks which appear to be small tanks with outlets and channels suggesting that they are buddles	SE	12814	64114
18	Trial trench 1m x 18m	SE	12831	64133
19	Trial trench / pits 2m x 8m	SE	12863	64145
20	Area affected by trials - confused area of indistinct pits and trenches	SE	12885	64142
21	Pit 10m dia 1m deep	SE	12864	64190
22	Trial pit	SE	12807	64174
23	Trench	SE	12805	64185
24	Trench	SE	12805	64190
25	Trench 2m wide	SE	12836	64180

26	Pit 1m dia	SE	12846	64178
27	Pit 2m dia	SE	12858	64209
28	Trench / pit 2m across	SE	12868	64209
29	Pit 3m dia	SE	12887	64210
30	Pit 2m dia	SE	12891	64205
31	Possible pit 3m dia	SE	12906	64198
32	Probable shakehole 3m dia	SE	12948	64241
33	Probable shakehole 3m dia	SE	12953	64235
34	Probable shakehole 3m dia	SE	12962	64237
35	Probable shakehole 3m dia	SE	12933	64247
36	Holloway 2m wide	SE	12821	64358
37	Probable Shakehole 2m dia	SE	12811	64379
38	Large limekiln partly within the quarry bund.	SE	12237	64252
39	Discontinuous open cut trench 4m x 40m	SE	12202	64257



Fig.7 Hope Shaft (feature 9)



Fig.8 Buddles (feature 17)

2.3 Greenhow Moss

This area is composed of fairly flat topography between Duck Street and Coldstones Quarry. The main features are a series of large shaft mounds dating from the mid 18th century, which in general follow a similar form. Many of the shafts have been identified. Likeley Shaft (11), Newboulds Shaft (18), Blue Joke Engine Shaft (29), and East Engine Shaft (2), all display a flat topped shaft mound with an off centre shaft which suggests the use of horse gins for haulage. This is confirmed by the naming of Blue Joke Engine and East Engine shafts but in every case there is no distinct physical evidence for the form and size of the gins. The shaft mound at East Engine Shaft contains evidence of a second shaft represented as a hollow towards the edge of the tip; its position could suggest that it is a climbing shaft.

Only three shafts have associated dressing areas, 11 (Likely), 21 (unnamed), and 29 (Blue Joke Engine). These dressing areas are all grassed over and contain no clearly defined features, but their form suggests non-mechanical disturbance, possibly to recover fluorspar. Two dressing areas (6 and 10) are cut by boundary walls, indicating that they predate building of the enclosure wall, which occurred after 1850. To the west of the area features 35 and 40 are piles of fine sandy material suggesting 20th century fluorspar recovery operations.

Two shafts Newboulds (18), and East Engine (2) are open and therefore hold some potential for underground recording work.

Feature 5 is raised bank, which was also identified through the boundary wall on Coldstones Quarry. Its narrow top suggests that it may have been part of a narrow gauge railway, possibly connected to tip reworking, however as a raised feature there is also a possibility that a water leat ran on the top and that this is raised in order to control the gradient of a watercourse.

Only one building has been identified in this area (19) and the presence of blacksmiths waste nearby suggests that it was a smithy.

Watercourses in this area appear to be a mixture of natural (4, 46) and manmade (7, 12, 14, 17, 25, 20, 33, 38). 13 is a dam cut by the boundary wall and feature 37 is a large boggy area, which may have been modified to convert it into a dam. 30 is a 4m wide bank running along one edge of a boggy area. This may have acted as a catch water to divert water into the natural watercourse 46. Two shafts Likely (11), and Newbould's (18), both have leats crossing the shaft mound. In addition two leats join and fade near shaft 21. All these leats appear to be bringing water to the shafts but the purpose is unclear, although it could logically be used to wash clay and loose material off the ore brought up the shaft to aid sorting.

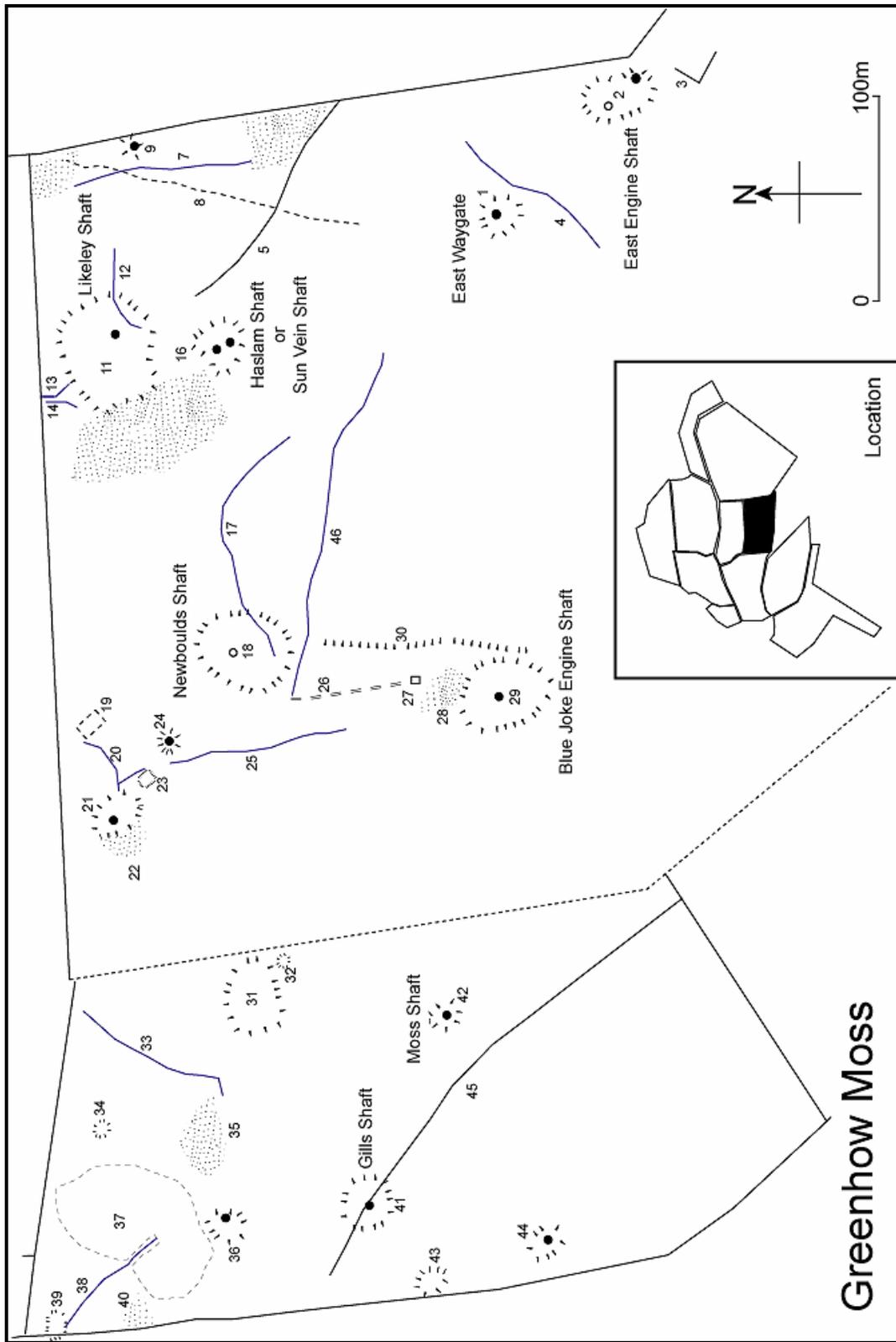


Fig.9 Greenhow Moss

	Table2 Greenhow Moss	Zone	Easting	Northing
1	Shaft mound 20m x 25m	SE	11953	63682
2	Shaft mound 20m x 38m contains two shafts one open and fenced, one on the edge of the tip run in	SE	12013	63622
3	Drystone walls probable bield style sheep shelter	SE	12025	63582
4	Natural water course	SE	11966	63669
5	Raised bank previously recorded across the boundary wall, possible railway or leat	SE	11966	63792
6	Disturbed area suggesting ore dressing	SE	11992	63794
7	Leat	SE	11976	63847
8	Intermittent stone alignment suggesting former wall	SE	11964	63824
9	Shaft mound 10m dia	SE	11987	63866
10	Grassed over disturbed area suggesting ore dressing area	SE	11973	63907
11	Shaft mound 50m x 50m some disturbance evident, shaft location unclear	SE	11885	63885
12	Leat	SE	11925	63877
13	Dam wall, earth with rubble core, runs under enclosure wall	SE	11867	63902
14	Leat	SE	11860	63901
15	Area affected by ore dressing very disturbed with no clearly defined features but clear vegetation changes	SE	11844	63862
16	Shaft mound 30m x 30m	SE	11890	63822
17	Leat	SE	11798	63823
18	Shaft mound 40m x 50m, shaft open but not fenced c.14m deep	SE	11737	63813
19	2 celled building c.13m x 5m limestone rubble walls only surviving as footings, evidence of stone slate roof, debris nearby suggests that this building was a smithy	SE	11699	63889
20	Leat	SE	11682	63879
21	Shaft mound 30m x 30m, location of shaft unclear	SE	11656	63874
22	Disturbed grassed over area suggesting ore dressing no clear features.	SE	11640	63870
23	Square Pit / shakehole 10m x 10m	SE	11673	63861
24	Shaft mound 14m dia	SE	11694	63848
25	Leat	SE	11685	63811
26	Raised track way / causeway 3m wide	SE	11716	63759
27	Pile of grassed over spoil with evidence of a stone platform, possible knockstone?	SE	11721	63725
28	Disturbed grassed over area suggesting ore dressing no clear features.	SE	11719	63710
29	Shaft mound 35 x 50m possible evidence of gin circle	SE	11716	63678
30	Bank 4m wide running along edge of boggy ground probably a catch water	SE	11739	63728

31	Very disturbed shaft mound no evidence of shaft	SE	11561	63809
32	Pit / possible shaft	SE	11582	63791
33	Leat, earth and stone bank on one side	SE	11537	63867
34	Possible shaft/shakehole	SE	11498	63883
35	Disturbed area mainly grassed over sandy/clay debris suggesting fluorspar working	SE	11491	63831
36	Shaft mound 18m x 20m	SE	11449	63822
37	Boggy area / possible dam	SE	11455	63866
38	Leat	SE	11415	63889
39	Shakehole	SE	11402	63907
40	Pile of grassed over sandy/clay debris suggesting spoil from fluorspar working	SE	11406	63864
41	Shaft mound 30m dia, drystone wall crossed the centre of the shaft.	SE	11463	63755
42	Shaft mound 20m dia	SE	11556	63714
43	Shaft mound 14m x 20m tree growing in middle	SE	11422	63719
44	Shaft mound 15m x 20m	SE	11441	63662
45	Former boundary present as a ditch and bank, and wall runs over shaft	SE	11551	63674
46	Leat, may be natural watercourse	SE	11798	63772



Fig.10 East Engine Shaft (feature 2)



Fig. 11 Possible climbing shaft: East Engine Shaft (feature 20)



Fig.12 Smithy (feature 19)



Fig.13 Water Leat (feature 12)

2.4 Village Centre

Located to the north of Greenhow Moss and between Coldstones Quarry and Duck Street this area comprises an area of small fields and a wood. The main features are a complex group of shafts all confined to a single enclosure, together with further shafts scattered across the area.

Shafts vary from closely spaced shaft mounds typical of meer working to larger shafts. In the area of small shaft mounds there is little evidence of the usual alignment defining the course of veins (with the exception of feature 38). The area is also unusual as large shaft mounds are found within the area of small shaft mounds. This may indicate the complexity of the geology here, a fact, which is confirmed by the number of shakeholes also present. North of the central complex of shafts there are further areas of shakeholes (not recorded) but no evidence of mining.

Water management in the area is fragmentary, however the leats present appear to represent continuations of leats recorded on Greenhow Moss.

Two areas of ore dressing have been identified (35 and 57). The first (35) is associated with a small dam and probably predates the 20th century. The second area is a scatter of sandy / clay material mixed with pieces of fluorspar, which suggests that this site was connected with 20th century recovery of fluorspar from dump material.

One trackway (54) is present crossing the area and heading to a building identified as a smithy on Greenhow Moss. No buildings have been identified in this area.

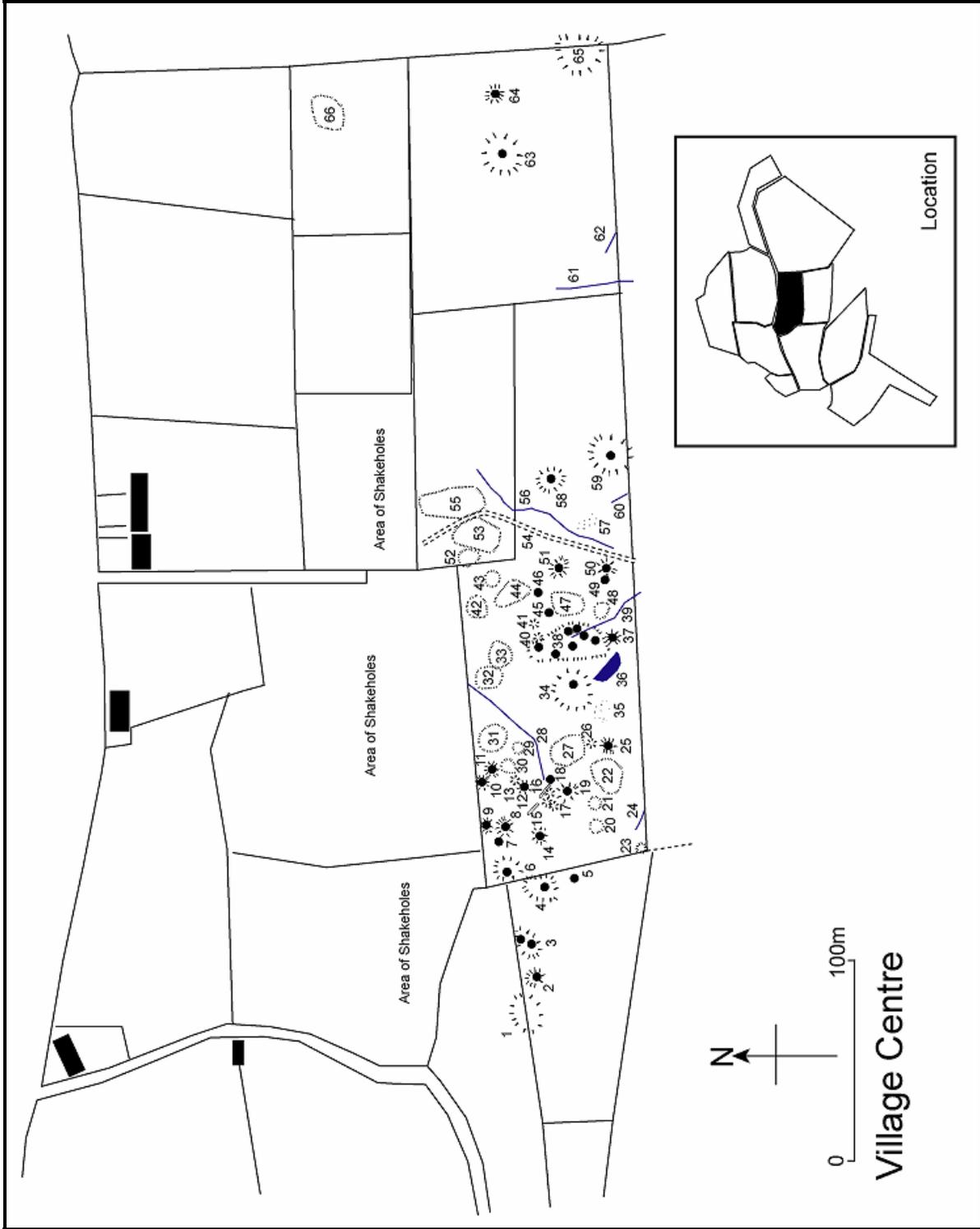


Fig.114 Village Centre

Table3 Village Centre				
Feature Number	Description	Zone	Northing	Easting
1	Shaft Mound cut by boundary wall	SE	11489	63955
2	Shaft mound	SE	11508	63950
3	Shaft mound	SE	11525	63955
4	Shaft mound	SE	11553	63947
5	Possible shaft mound	SE	11558	63931
6	Shaft Mound cut by boundary wall	SE	11562	63965
7	Shaft 5m dia	SE	11577	63969
8	Shaft mound	SE	11584	63966
9	Shaft mound	SE	11585	63976
10	Shaft mound	SE	11606	63978
11	Shaft mound	SE	11613	63973
12	Shaft mound	SE	11605	63956
13	Pit 2m dia	SE	11608	63961
14	Shaft mound	SE	11579	63948
15	Trench 2m wide	SE	11593	63952
16	Trench 2m wide	SE	11603	63946
17	Group of pits 2m dia	SE	11596	63942
18	Shaft mound 5m dia	SE	11608	63943
19	Shaft mound	SE	11603	63935
20	Shaft mound	SE	11585	63920
21	Shaft mound	SE	11596	63921
22	Shakehole	SE	11610	63915
23	Mound purpose unclear	SE	11574	63897
24	Possible leat	SE	11589	63897
25	Shaft mound	SE	11626	63914
26	Pit 2m dia	SE	11626	63923
27	Shakehole	SE	11623	63934
28	Leat	SE	11620	63949
29	Shakehole	SE	11624	63959

30	Shakehole	SE	11615	63964
31	Shakehole	SE	11628	63972
32	Shakehole	SE	11660	63975
33	Shakehole	SE	11670	63969
34	Shaft mound	SE	11653	63934
35	Possible ore dressing area	SE	11643	63917
36	Possible dam wall	SE	11663	63914
37	Shaft mound	SE	11680	63912
38	Area of closely space shaft mounds	SE	11677	63933
39	Leat	SE	11691	63910
40	Pit 2m dia	SE	11680	63950
41	Pit 2m dia	SE	11687	63951
42	Shakehole	SE	11695	63981
43	Shakehole	SE	11709	63973
44	Shakehole	SE	11702	63963
45	Shaft 5m dia	SE	11693	63944
46	Shaft 5m dia	SE	11702	63950
47	Shakehole	SE	11697	63935
48	Shakehole	SE	11694	63917
49	Shaft 5m dia	SE	11709	63916
50	Shaft mound	SE	11716	63915
51	Shaft mound	SE	11715	63939
52	Shakehole	SE	11720	63985
53	Shakehole	SE	11732	63980
54	Trackway	SE	11734	63954
55	Shakehole	SE	11748	63992
56	Leat - represented by a bank up to 1m high	SE	11744	63952
57	Area of clay / sandy spoil probably indicates fluorspar washing	SE	11738	63923
58	Shaft mound	SE	11759	63944
59	Shaft mound	SE	11772	63914
60	Possible leat, very slight feature	SE	11751	63908
61	Dam wall cut by wall	SE	11858	63922

62	Bank - purpose unclear	SE	11880	63914
63	Shaft mound	SE	11925	63969
64	Shaft mound	SE	11955	63972
65	Disturbed shaft mound which runs under boundary, shaft position unclear	SE	11976	63929
66	Shakehole	SE	11944	64057



Fig. 15 Closely spaced shaft mounds



Fig.16 Dressing waste (feature 57)

2.5 North Coldstones

Situated on the north side of the Pateley Bridge to Grassington road the main part of this area consists on a large enclosure split into two part, which slopes down to the adjoining Cockhill area. The main features are shafts developed in the second half of the 18th century on the Waterhole and Sun Veins, and water management features associated with ore dressing operations.

Most of the shafts are roughly round with a depression in the centre marking the position of the shaft. Several shafts (38, 38, 65, 26, and 14) have off centre shafts suggesting that horse gins were used for winding. 67 identified as Random Gin consist of a shaft mound with two depressions marking the position of shafts but no evidence of a gin platform.

Water management in this area is extensive consisting of a series of dams and fragments of water leats. There is evidence water was brought into the area from the Coldstones area. Leats 1 and 5/16 appear to be feeding water from different locations and as they cross could suggest different phases of use. 1 feeds a dam (2) with a leat (11) taking the water to a small dressing area (9) and possibly continuing to a complex dressing area (21). The second system comprising leats 5 and 16 probably fed dam 28. From here it is possible that there was a connection to a large dressing area, which includes dams 57 and 96. From here water may have been fed into Sand Beck, but another leat (97) run through the boundary wall to fade close to the tip from Gillfield level. A further system may run from dam 28 west along the line of shafts on waterhole vein to feed dams 40 and 47 before either sending the water into Sand Beck or returning it back across the hill slope and into dam 57.

Ore dressing has been carried out on several sites. 27 has been cleared by mechanical equipment, which suggests that dressing waste here may have been removed in the 20th century for fluorspar recovery. Area 21 contains a complex set of earthworks symptomatic of large-scale ore processing and indistinct earthworks suggest tank features associated with buddling. A well-defined buddle was found on leat 11 close to shaft 8. Fine sandy spoil thrown out from rabbit holes on the ore dressing area crossed by leat 59 indicates buddling operations in this area. These areas are probably associated with waste dressing operations, which became involved in a court case in the 1780s, when water from the operations caused damage to a number of shafts in the area (Gill 1998).

A number of holloways and trackways cross this area and a number of stone alignments suggesting old enclosure walls have also been identified. Several areas of small scale gritstone quarrying have also been identified, at the south of the area (75 and 78), and in a group around 81. Associated with this latter group is a stone alignment suggesting a building (82).

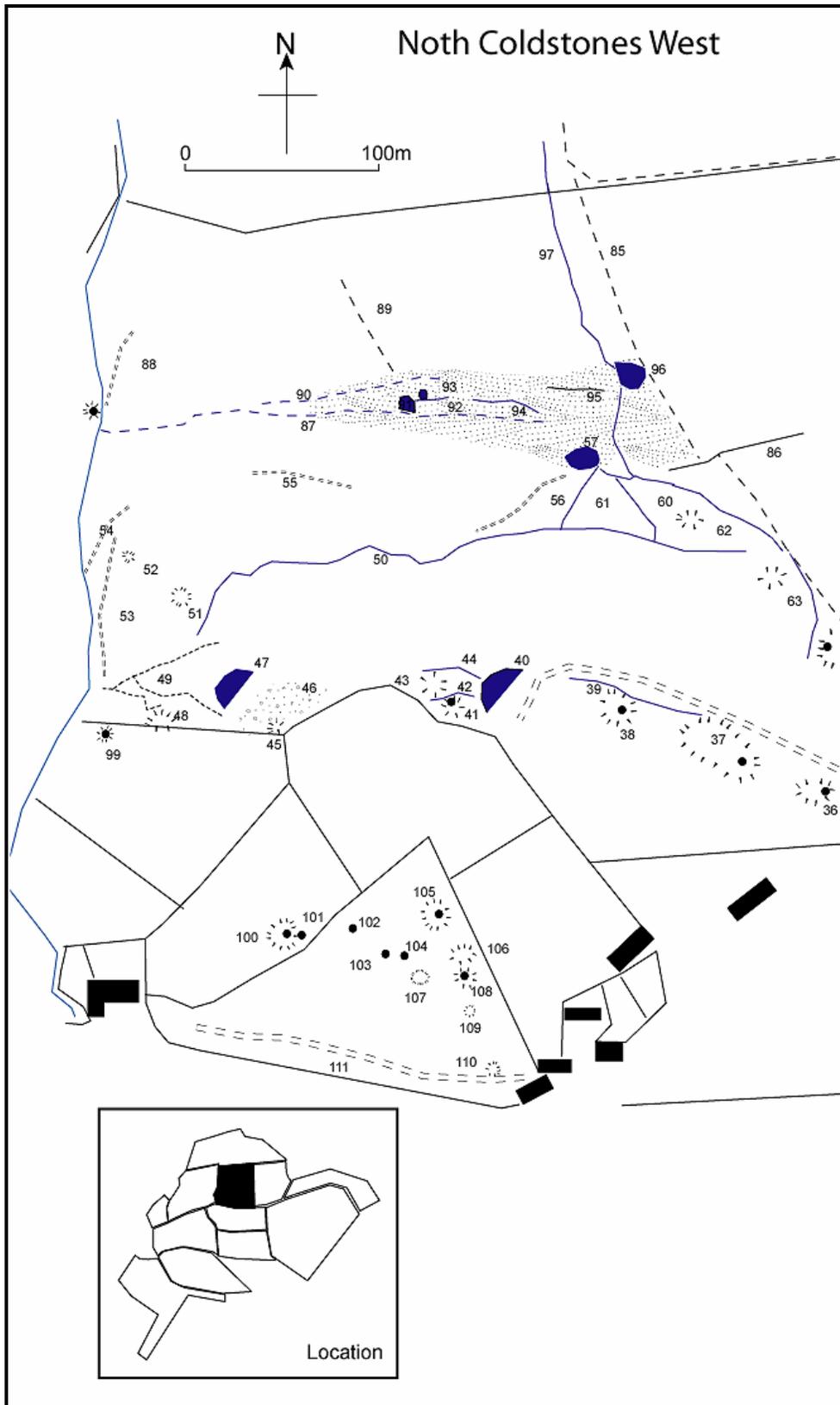


Fig.17 North Coldstones West

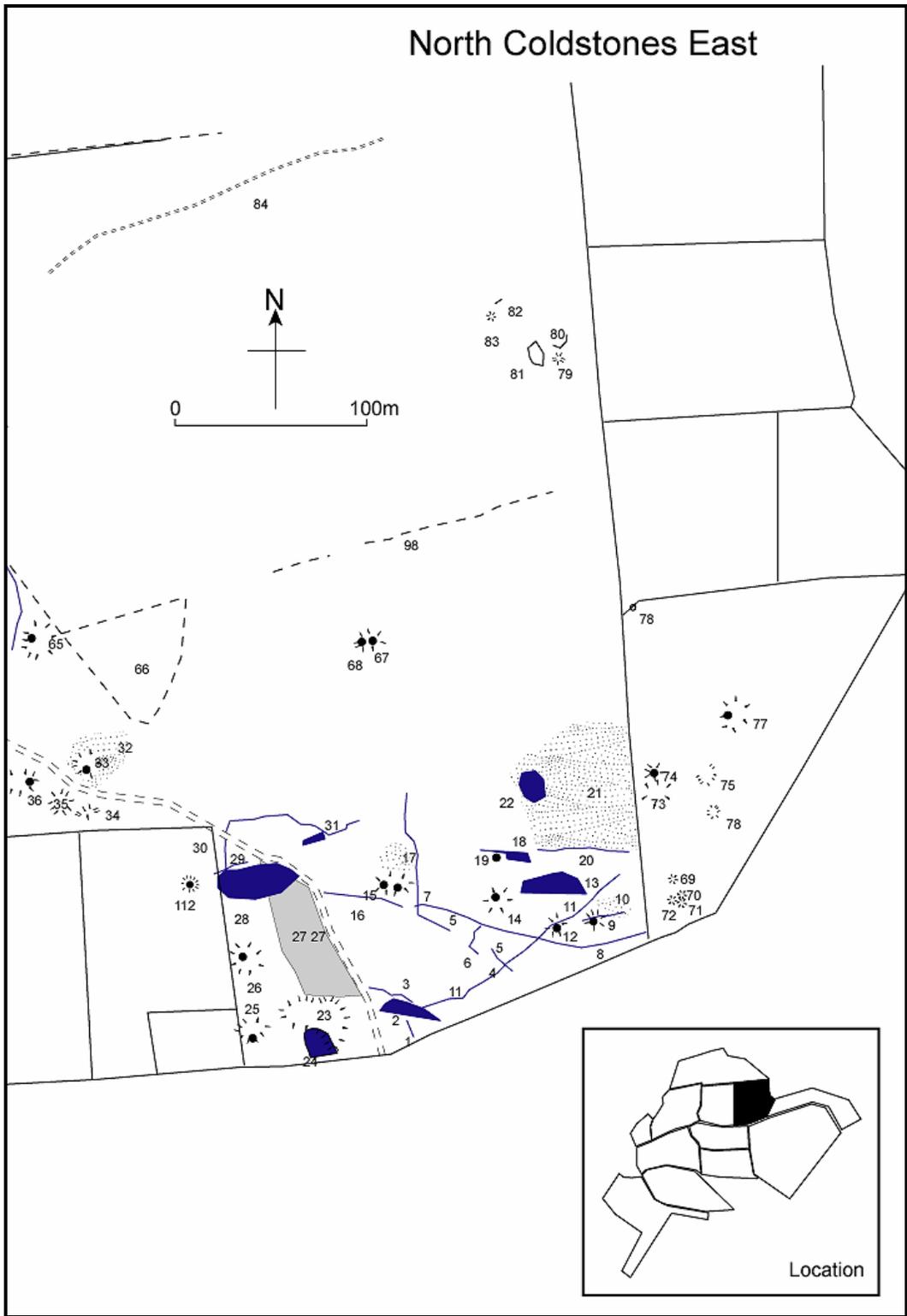


Fig.18 North Coldstones East

Table 4 North Coldstones				
Feature Number	Description	Zone	Northing	Easting
1	Trench 3m wide by 10m long upcast bank on both sides	SE	11989	64215
2	Dam wall 3m wide 30m long	SE	11985	64229
3	Leat	SE	11976	64234
4	Possible leat / trench 1m wide 0.25m deep	SE	12036	64251
5	Leat	SE	12045	64265
6	Small leat	SE	12023	64263
7	Leat possibly cutting 5	SE	11993	64287
8	Shaft mound 12m dia	SE	12087	64271
9	Disturbed area / possible dressing area	SE	12097	64278
10	Leat crossing shaft mound	SE	12091	64273
11	Leat 0.25m wide	SE	12077	64275
12	Shaft mound 12m dia	SE	12067	64267
13	Dam 34m x 20m	SE	12066	64291
14	Shaft mound 14m dia	SE	12036	64282
15	Shaft mound 24m x 12m double shaft	SE	11980	64290
16	Leat	SE	11962	64284
17	Probable dressing floor	SE	11982	64305
18	Dam 20m x 10m	SE	12045	64305
19	Possible shaft	SE	12035	64305
20	Leat	SE	12078	64310
21	Ore dressing area well grassed over with indistinct earthworks indicating tanks / buddles	SE	12082	64343
22	Flooded shakehole may have been used as a dam	SE	12054	64342
23	Tip of development waste no sign of shaft	SE	11941	64220
24	Dam 20m x 20m	SE	11936	64206
25	Shaft mound 20m x 14m possible capped shaft	SE	11899	64214
26	Shaft mound 20m dia	SE	11898	64251

27	Area of cleared ground, probable site of dressing waste	SE	11934	64262
28	Dam 40m x 20m, wall breached	SE	11893	64292
29	Fragment of earlier dam wall	SE	11890	64299
30	Leat which crossed track	SE	11879	64311
31	Possible small dam 10m x 4m	SE	11939	64315
32	Area of ore dressing waste	SE	11831	64364
33	Shaft mound 14m dia	SE	11819	64356
34	Shaft mound 12m dia cut by wall	SE	11820	64328
35	Possible shaft mound, disturbed tip with no sign of shaft	SE	11805	64334
36	Shaft mound 20m x 14m	SE	11782	64346
37	Shaft mound 50m x 20m, shaft filled with modern rubble	SE	11731	64368
38	Shaft mound 20m x25m	SE	11679	64389
39	Leat	SE	11699	64391
40	Dam 30m x 15m	SE	11616	64399
41	Shaft mound 14m dia	SE	11594	64390
42	Leat	SE	11594	64397
43	Depression 14m dia probable run in shaft	SE	11584	64402
44	Leat	SE	11594	64411
45	Shaft mound 10m dia cut by wall	SE	11501	64379
46	Area of development waste not grassed over.	SE	11501	64392
47	Dam 25m x 10m	SE	11477	64401
48	Shaft Mound 14m dia against wall	SE	11441	64382
49	Branched gully feature running down hillside similar to a very small hush.	SE	11427	64406
50	Leat	SE	11547	64473
51	Possible trial pit	SE	11451	64448
52	Possible trial pit	SE	11424	64469
53	Track 2m wide	SE	11411	64448
54	Track 2m wide	SE	11409	64479
55	Track 2m wide	SE	11517	64511

56	Track 2m wide	SE	11633	64498
57	Dam 20m x 12m	SE	11662	64519
58	Leat	SE	11710	64506
59	Leat	SE	11679	64537
60	Leat	SE	11689	64497
61	Leat	SE	11659	64500
62	Shakehole 16m x 10m	SE	11718	64488
63	Shakeholes 20m x 10m	SE	11760	64457
64	Leat running down side of robbed out wall	SE	11781	64448
65	Shaft mound 20m dia	SE	11795	64419
66	Enclosure - wall footing only	SE	11826	64416
67	Shaft mound 20m x 10m double shaft	SE	11968	64419
68	Pit 2m dia 0.5m deep	SE	11961	64417
69	Pit 2m dia	SE	12128	64293
70	Possible shaft mound 2m dia	SE	12133	64285
71	Possible shaft mound 2m dia	SE	12133	64279
72	Possible shaft mound 4m dia	SE	12128	64282
73	Shakehole 20m dia filled with rubble	SE	12120	64338
74	Shaft mound 10m dia in side of shakehole	SE	12119	64349
75	Gritstone quarry 15m x 10m	SE	12147	64348
76	Closed pit feature possible shaft or gritstone quarry 3m dia	SE	12152	64328
77	Shaft mound 18m dia	SE	12162	64379
78	Slight pit feature 4m dia with a slightly raised rim of spoil 0.25m high may represent a former shaft	SE	12107	64435
79	Shaft mound 6m dia shaft full of stone	SE	12069	64568
80	Pit possibly for sand 10m x 3m	SE	12070	64576
81	Pit possibly for sand 10m x 8m	SE	12056	64570
82	Stone alignment c.5m suggesting building	SE	12036	64598
83	Pit 3m dia	SE	12033	64590
84	Holloway 2m wide	SE	11937	64675

85	Wall footings	SE	11679	64607
86	Possible built up track with bank on one side	SE	11742	64525
87	Leat - Runs to gate in fence and on down to sand beck has also been partly used as a trackway	SE	11547	64545
88	Track 2m wide	SE	11418	64571
89	Possible former field boundary present as stone alignment	SE	11547	64592
90	Leat with stone bank/wall on north side	SE	11547	64557
91	Circular tank/dam 8m dia	SE	11569	64548
92	Leat feeding 91	SE	11585	64552
93	Circular tank/dam 5m dia	SE	11578	64554
94	Leat	SE	11620	64550
95	Leat with stone bank/wall on north side	SE	11660	64556
96	Possible dam	SE	11688	64564
97	Leat	SE	11655	64615
98	Wall footings indicating former enclosure wall	SE	11988	64476
99	Shaft mound	SE	11412	64376
100	Shaft mound against wall	SE	11506	64271
101	Possible shaft mound 5m dia	SE	11515	64270
102	Possible shaft mound 5m dia	SE	11541	64273
103	Possible shaft mound 5m dia	SE	11558	64260
104	Possible shaft mound 5m dia	SE	11569	64258
105	Shaft mound	SE	11585	64280
106	Shaft mound cut by wall	SE	11598	64259
107	Shakehole	SE	11576	64247
108	Shaft Mound	SE	11600	64248
109	Shakehole	SE	11602	64230
110	Shakehole	SE	11614	64199
111	Holloway	SE	11543	64206
112	Shaft mound	SE	11872	64290



Fig.19 Cow Grooves Shaft (feature 23)



Fig.20 Earth and Stone Dam (feature 2)



Fig.21 Buddle on water leat (feature 11)

2.6 Toft Gate

This area comprises the land surrounding the Toft Gate Lime Kiln, and the fields on the north side of the Grassington to Pateley Bridge Road between Toft Gate and the Cockhill Road. South of the road the land slopes gently, with the slope increasing alongside Peat Lane. North of the road the ground quickly drops away before levelling out.

The area has been extensively quarried for both limestone and gritstone. The main area of limestone quarrying is around Toft Gate Kiln (9) and mainly takes the form of shallow pits and wide trenches, with deeper quarries near the kiln. The lower parts of the slopes are pockmarked with shallow gritstone quarries, which have occasionally been developed into wide pit and trench features.

Intermingled with the limestone quarries on the south side of the road is an area of lead mining represented by two intersecting lines of slight shaft mounds, pits and opencut trenches (10, 14, 17-20, 26-27, 31). The linear relationship of these features distinguishes them from the limestone workings. As on other areas these features are close together and only affect a narrow strip of ground reminiscent of meer working and proving or chasing veins along the length of a meer grant. A similar set of features (66-74, 82-84, 88-92, 94-95) was found on the north side of the road in an area with many shallow pits resulting from gritstone quarrying. Again it is the linear relationship between the features, which suggests the presence of veins. Here the features represent fragmented small-scale excavations, which may suggest trial rather than full-blown extraction. The presence of a larger shaft (99) at the western edge of the area may represent workings on the Waterhole Vein before it turns and runs across the road and through Coldstones Quarry.

The only structure in this area is Toft Gate Lime Kiln (9) and the only water management feature is a dam associated with the kiln (62), which is fed by a leat running under Peat Lane. Several sections of holloway were noted of which the longest located to the western edge of the area may represent an early path from Coldstones Fold to Coldstones Hill.

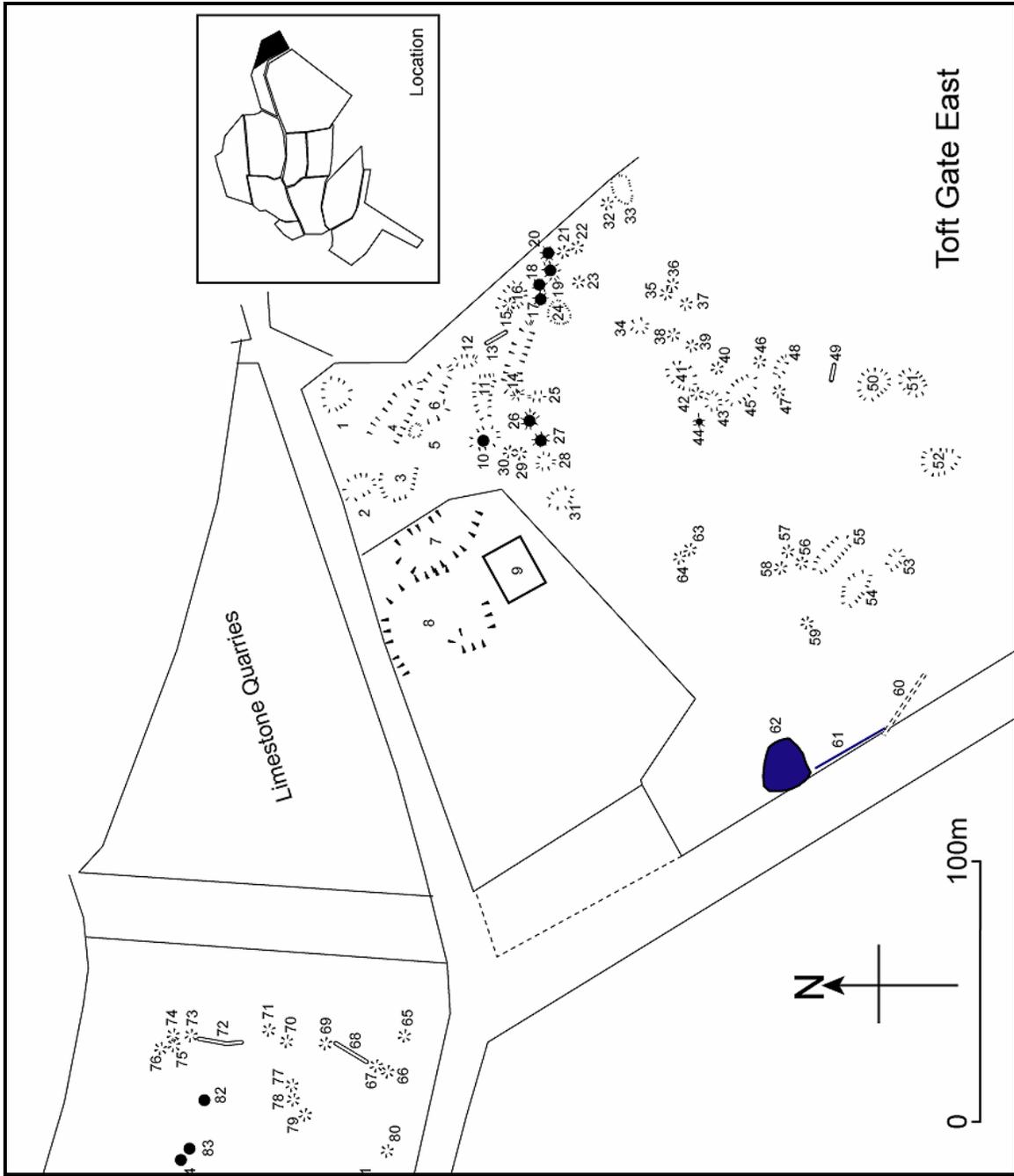


Fig.22 Toft Gate East

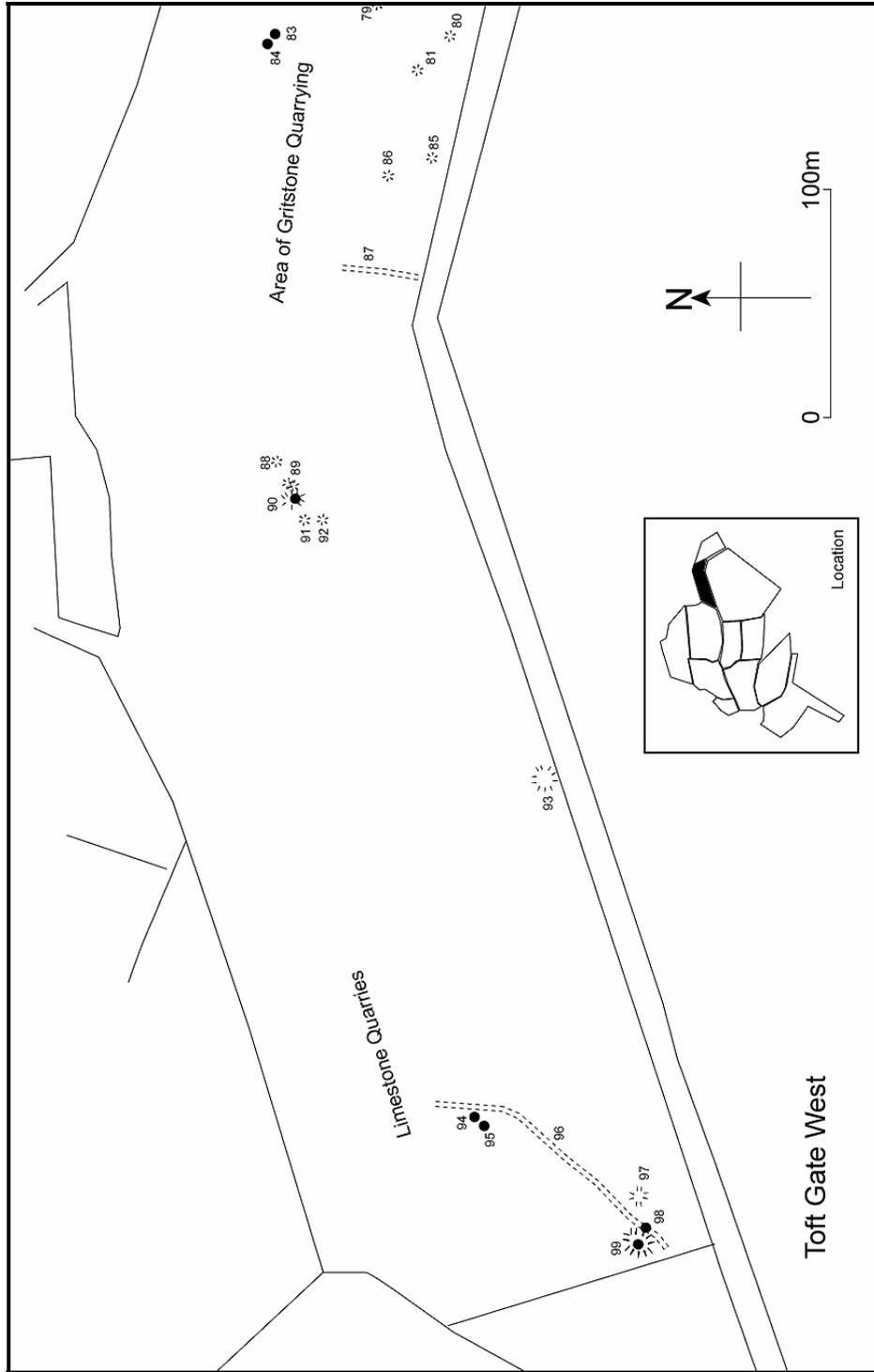


Fig.23 Toft Gate West

Table 5 Toft Gate				
1	Shallow limestone quarry	SE	13099	64462
2	Shallow limestone quarry	SE	13063	64453
3	Shallow limestone quarry	SE	13064	64439
4	Shallow limestone quarry	SE	13089	64442
5	Pit	SE	13085	64431
6	Shallow limestone quarry	SE	13099	64425
7	Quarry open fronted	SE	13041	64424
8	Quarry open fronted next to Kiln	SE	13008	64425
9	Lime Kiln	SE	13031	64392
10	Probable shaft mound very low tip	SE	13081	64404
11	Large pit/quarry filled with farm debris	SE	13101	64404
12	Shallow excavation purpose unclear	SE	13112	64412
13	Trench 3m wide	SE	13121	64399
14	Trench pits/shafts discontinuous feature	SE	13114	64391
15	Pit 3m diameter	SE	13134	64394
16	Shallow excavation	SE	13138	64392
17	Shaft mound	SE	13136	64382
18	Shaft mound	SE	13142	64382
19	Shaft mound	SE	13148	64378
20	Shaft mound	SE	13154	64379
21	Shaft 3m diameter	SE	13155	64374
22	Pit 3m diameter	SE	13157	64368
23	Pit 3m diameter	SE	13142	64367
24	Possible quarried area	SE	13131	64374
25	Shaft mound on side of trench	SE	13098	64383
26	Shaft mound	SE	13088	64386
27	Shaft mound	SE	13080	64382

28	Low shaft mound no obvious shaft	SE	13072	64380
29	Shaft 3m diameter	SE	13075	64390
30	Pit 3m diameter	SE	13076	64396
31	Part shaft mound	SE	13058	64374
32	Pit 3m diameter	SE	13174	64355
33	Gritstone quarry	SE	13179	64350
34	Gritstone quarry	SE	13126	64343
35	Pit 3m diameter gritstone	SE	13138	64332
36	Pit 3m diameter gritstone	SE	13142	64330
37	Pit 3m diameter gritstone	SE	13135	64324
38	Pit 3m diameter gritstone	SE	13122	64329
39	Pit 3m diameter gritstone	SE	13118	64322
40	Pit 3m diameter gritstone	SE	13109	64312
41	Quarry limestone	SE	13107	64326
42	Pit 5m diameter	SE	13100	64320
43	Quarry/shaft gritstone present	SE	13096	64314
44	Shaft mound	SE	13088	64319
45	Quarry/opencut	SE	13101	64302
46	Pit 3m diameter	SE	13112	64296
47	Pit 3m diameter	SE	13100	64288
48	Pit/quarry	SE	13110	64287
49	Trench 3m wide	SE	13108	64267
50	Gritstone quarry	SE	13104	64251
51	Gritstone quarry	SE	13103	64236
52	Gritstone quarry	SE	13072	64225
53	Trench/quarry on hillslope	SE	13034	64243
54	Trench/quarry on hillslope	SE	13024	64258
55	Trench/quarry on hillslope	SE	13037	64267
56	Hollow possible shakehole 3-5m diameter	SE	13033	64278

57	Hollow possible shakehole 3-5m diameter	SE	13037	64284
58	Hollow possible shakehole 3-5m diameter	SE	13031	64287
59	Pile of stones purpose unclear	SE	13009	64277
60	Holloway to large are of shallow quarrying	SE	12979	64238
61	Leat runs parallel to wall	SE	12957	64264
62	Circular dam inside lined with stone fed by stone lined leat	SE	12952	64286
63	Hollow possible shakehole 3-5m diameter	SE	13039	64323
64	Hollow possible shakehole 3-5m diameter	SE	13034	64328
65	Possible shaft / pi 2m dia	SE	12846	64435
66	Pit 2-3m dia filled with modern rubble	SE	12833	64442
67	Pit 2-3m dia filled with modern rubble	SE	12834	64446
68	Trench	SE	12839	64455
69	Pit 2m dia	SE	12843	64466
70	Pit 2m dia	SE	12844	64481
71	Pit 2m dia	SE	12849	64489
72	Shallow trench 2m wide	SE	12844	64509
73	Pit 4m dia	SE	12846	64519
74	Pit 2m dia	SE	12847	64527
75	Pit 2m dia	SE	12842	64525
76	Pit 2m dia	SE	12841	64531
77	Shallow pit feature 1-2m wide	SE	12827	64480
78	Shallow pit feature 1-2m wide	SE	12822	64479
79	Shallow pit feature 1-2m wide	SE	12815	64474
80	Pit 3m dia	SE	12800	64442
81	Pit 4m dia	SE	12785	64456
82	Possible shaft	SE	12821	64514
83	Possible shaft	SE	12802	64520
84	Possible shaft	SE	12798	64524
85	Shallow pit 2m dia	SE	12747	64450

86	Pit 3m x 2m	SE	12739	64469
87	Holloway	SE	12696	64474
88	Pit 2m dia	SE	12611	64518
89	Pit 2m dia	SE	12600	64513
90	Shaft mound	SE	12593	64512
91	Pit 2m dia	SE	12585	64506
92	Pit 2m dia	SE	12585	64498
93	Possible shaft mound against wall, has spring running through it.	SE	12469	64398
94	Possible shaft mound 2m dia	SE	12317	64430
95	Shaft mound 5m dia	SE	12313	64426
96	Holloway	SE	12303	64394
97	Shaft mound - no obvious shaft	SE	12280	64357
98	Shaft mound 5m dia	SE	12267	64354
99	Shaft mound - centre filled with limestone.	SE	12259	64357



Fig.24 Toft Gate Lime Kiln (feature 9)



Fig.25 Line of shaft mounds (feature17-21)

2.7 Far Side

Situate north of the main road through the village and adjoining Prim Gap Farm to the west and Sand Beck to the east, this area slopes gently away from the road.

A line of substantial shaft mounds marks the course of the Cockhill Vein, many of which show signs of disturbance. To the west several shafts have been bulldozed leaving slight evidence other than a scatter of spoil and changes in vegetation marking their former position. A line of smaller shaft mounds marks the presumed course of Sam Oon Level, which is driven from the west bank of Gill Beck. The opening to this level is obscured by vegetation but reveals a small square level with a flat roof, which is half full of water. Several shafts on the line of the level close to the Cockhill Vein have been bulldozed.

Returning to the Cockhill Vein a modest shaft mound capped with railway sleepers and concrete has been identified as Chimney Shaft, which connects to an underground boiler house on Greenhow Rake vein. No features could be recorded on Greenhow Rake Vein, which runs from the Cockhill Vein, across the main road and up onto Greenhow Hill, as a large amount of builders rubble and topsoil has been dumped on this area in recent years obscuring a potentially significant area of archaeology.

To the west of the area a scatter of shaft mounds mark the courses of several veins, which cross from Prim Gap Farm. Of particular note is a run of small adjoining shaft mounds marking the course of "The Virgins Vein". These mark a strong contrast with the larger shaft mounds in the area and suggests that the vein may have been worked in meer lengths, which suggests that name of the vein may be misleading, and that rather than being a virgin vein when the area was first mapped at beginning of the 19th century this vein had been worked much earlier. A large shaft mound identified as Jarvis Waygate contains evidence of two shafts, with one located in the side of the shaft mound which would suggest that it was a climbing shaft alongside the main shaft.

Several small shafts close to Sand Beck probably mark the course of Jackass Level and represent air shafts.

There is little hard evidence of ore dressing in this area other than small areas of spoil between the shafts on Cockhill Vein, where a possible small knocking floor was identified. Close to the Sam Oon Level is a large gritstone boulder known as the Panty Oon Stone. This has a deep bowl shaped depression cut into its top with a slot cut out at the front. The edges of the bowl display signs of pick marks, but the bottom is smooth. Around the stone is evidence that gritstone has been quarried. Many of the stones in the area have initials carved on them and one stone across the stream from the Sam Oon Level has an indistinct carving of a head on it. More defined gritstone quarries are located down hill from the shafts on Cockhill Vein. Further small scale gritstone quarrying has been identified on the side of Sand Beck and includes a makeshift shelter under an overhanging outcrop of gritstone, which contains several drill holes.

Only one structure was found in the area. This is a three sided building built of gritstone boulders measuring approximately 5m x 3m. This may be modern and may have served as a small garage or shelter for a vehicle.

Very little water management was apparent other than a possible dam alongside the shafts on Cockhill Vein and a water leat running from Sand Beck before disappearing near the shelter mentioned above. It is possible that this leat may have run to an air shaft onto Cockhill Level and was part of a waterblast ventilation system.

Several sections of trackways / holloways were identified but with the exception of feature 29 which runs from Stripe Lane to the former position of Greenhow Rake Vein their purpose is unclear.

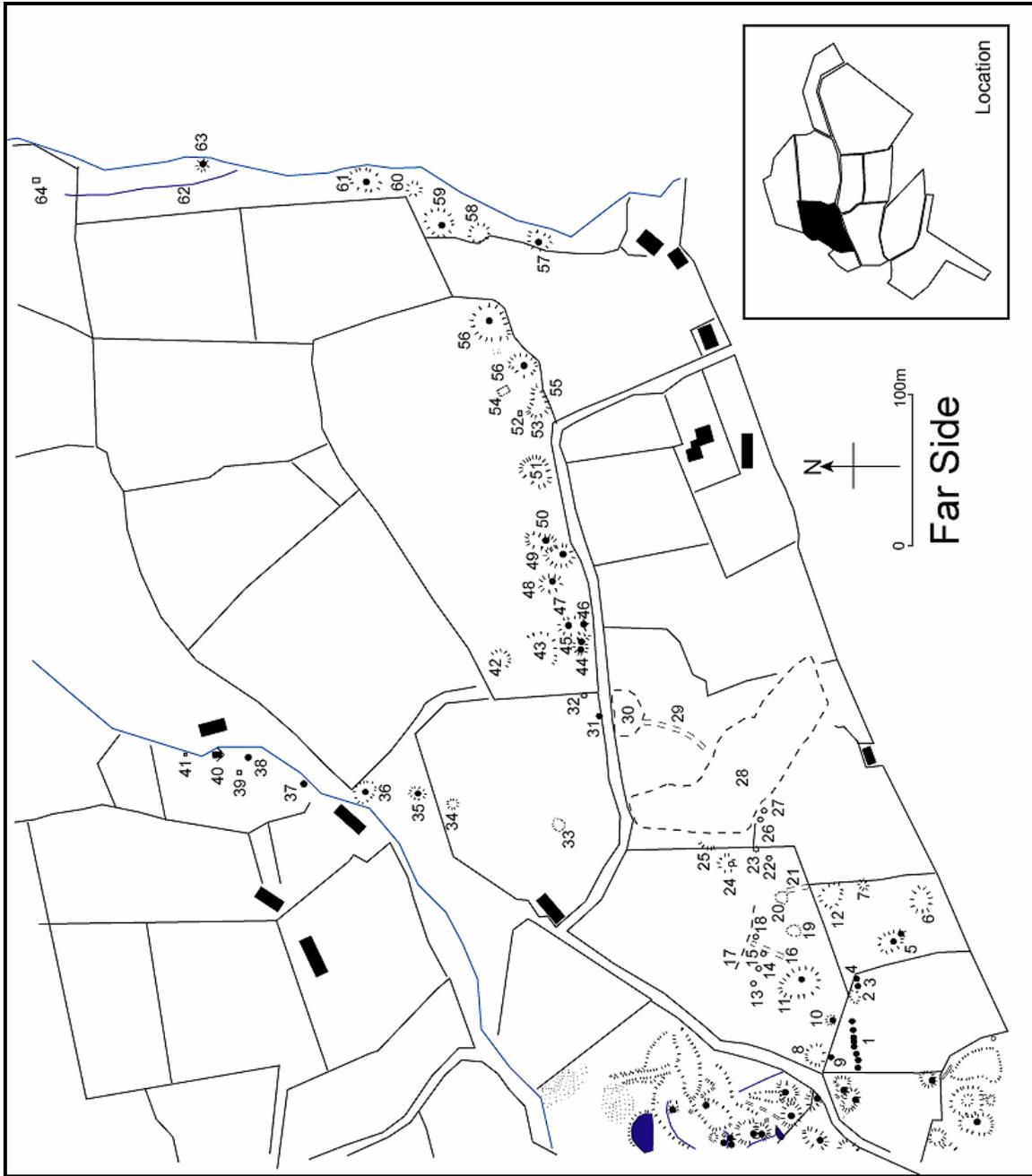


Fig.26 Far Side

Table 6 Farside				
Feature Number	Description	Zone	Northing	Easting
1	Line of shafts /pits 5m dia	SE	10805	64106
2	Shaft mound 8m dia	SE	10836	64105
3	Possible shaft 5m dia	SE	10845	64104
4	Possible shaft 5m dia	SE	10850	64104
5	Shaft mound 20m x 12m, one central shaft one to side	SE	10875	64082
6	Shaft mound 16m dia disturbed	SE	10900	64060
7	Shaft mound 8m dia disturbed	SE	10911	64099
8	Shaft mound 12m dia against wall	SE	10798	64133
9	Shaft against wall possibly part of 8	SE	10795	64123
10	Shaft mound 8m dia	SE	10820	64122
11	Shaft mound 20m x 28m	SE	10848	64142
12	Shaft mound 18m dia disturbed	SE	10906	64122
13	Shaft 3m dia	SE	10846	64175
14	Pit 3m dia	SE	10855	64171
15	Pit 3m dia	SE	10866	64168
16	Holloway	SE	10867	64160
17	Ditch and bank, possible former boundary	SE	10865	64182
18	Slight shaft 5m dia	SE	10877	64174
19	Shakehole filled with water	SE	10881	64147
20	Possible former shaft mound	SE	10904	64157
21	Holloway to former gate?	SE	10909	64146
22	Hollow possible shaft	SE	10931	64164
23	Hollow possible shaft	SE	10937	64172
24	Chimney shaft, capped with concrete & railway sleepers	SE	10927	64190
25	Shaft mound cut by wall	SE	10940	64205
26	Pit 2m dia	SE	10956	64170
27	Possible shaft	SE	10963	64166
28	Filled ground, former position of Greenhow Rake Vein	SE	10997	64178

29	Holloway from gate to site of Greenhow Rake	SE	11019	64226
30	Filled ground, former site of shaft?	SE	11029	64263
31	Possible shaft under wall	SE	11028	64275
32	Pit cut into hillside 5m dia possible gritstone quarry	SE	11042	64289
33	Possible former shaft mound	SE	10954	64306
34	Shaft mound 8m dia no obvious shaft	SE	10968	64378
35	Shaft mound 10m dia	SE	10977	64401
36	Shaft mound 14m dia	SE	10978	64437
37	Possible shaft	SE	10983	64479
38	Possible shaft	SE	11002	64516
39	Panty Oon Stone	SE	10992	64523
40	Sam Oon Level	SE	11004	64538
41	Face on stone	SE	11005	64560
42	Gritstone quarry	SE	11068	64344
43	Gritstone quarry	SE	11075	64314
44	Double shaft mound	SE	11073	64291
45	Shaft	SE	11080	64290
46	Shaft in side of tip possible climbing shaft?	SE	11091	64288
47	Shaft mound 14m dia	SE	11089	64299
48	Shaft mound 10m dia	SE	11119	64312
49	Shaft mound 20m dia	SE	11136	64303
50	Shaft mound 20m x 12m joins with last	SE	11148	64319
51	Shaft mound 20m dia very disturbed	SE	11196	64320
52	Knocking floor	SE	11235	64331
53	Shaft mound cut by wall 20m dia shaft position unclear	SE	11240	64318
54	Building? 5m x 3m probably modern	SE	11250	64341
55	Shaft mound 12-14m dia little vegetation	SE	11268	64328
56	Shaft mound 25m dia with adjacent ore dressing area	SE	11297	64352
57	Shaft mound 16m dia	SE	11352	64315
58	Possible shaft mound 14m dia cut in half	SE	11357	64357

59	Shaft mound 20m dia	SE	11363	64384
60	Shaft mound 12m dia	SE	11387	64401
61	Shaft mound 18m dia	SE	11395	64434
62	Water leat fades	SE	11394	64543
63	Shaft mound 10m dia	SE	11405	64545



Fig.27 Entrance to Sam Oon Level (feature 40)



Fig.28 Chimney Shaft (feature 25)



Fig.29 Filled ground over Greenhow Rake Vein (feature28)



Fig.30 Shaft mounds The Virgins Vein (feature 1)



Fig.31 Climbing shaft Jervis Waygate Shaft (feature 5)



Fig.32 Possible shaft onto Jackass Level (feature 63)



Fig.33 Panty Oon Stone (feature 39)



Fig.34 Head carved onto boulder near Sam Oon Level (feature 41)



Fig.35 Quarryman's shelter (feature 64)

2.8 Prim Gap

This compact area sits on gently sloping ground either side of a footpath running from the main road to Stripe Lane. Features in this area mark the western edge of the mineralisation.

The first group of features at the south of the area are a series of shafts associated with the end of the Prim Gap Vein. A shallow quarry like feature 3 may also be connected with working this vein. Shafts 6, 8, and 19 have flat tops and an off centre shaft suggesting the use of a horse gin, but as with other area no evidence remains. Moving north 14 and 15 are closely spaced shaft mounds typical of meer working, the line of which continues through the boundary.

The main area of activity is within the northern most enclosure and consists of a number of shafts and large opencuts where the topography drops off. Associated is a large dam and two distinct ore dressing areas. The main open cut 39 is a large open fronted trench on two levels, which suggests two phases of operation. The sides of the trench are marked by large spoil heaps, the scale of which may suggest a modern origin, although there is currently no evidence of the use of mechanised plant. The foot of the trench is cut by a smaller feature 42, which has probably been excavated by hand and may be contemporary with the higher part of 39.

There is some evidence that water has been collected and led to the top of the main trench, however it is unlikely that this represents evidence of hushing as the topography is too slight to provide the required head of water. The orientation of the dams (29 and 31) also suggests that this is not the case.

To one side of this area is a large earth and stone dam fed by a water leat, which probably extended from Gill Beck. In front is an area of ore dressing, which contains grassed over heaps of spoil and a series of connected small shallow tanks. These appear to be simple buddles. A further dressing area against the boundary displays similar but less well-defined features.

This area contains a variety of features many of which probably date from an expansion of the mines at the end of the 18th century. Some features such as 14 and 15 suggest an earlier phase of working, as does the name Prim Gap but this name evidence needs to be treated cautiously. Under customary mining law a prim gap is a space between two sets of meers which is less than a meer long. The main workings on the Prim Gap Vein are further east and in the 19th century High View Farm was called Prim Gap.

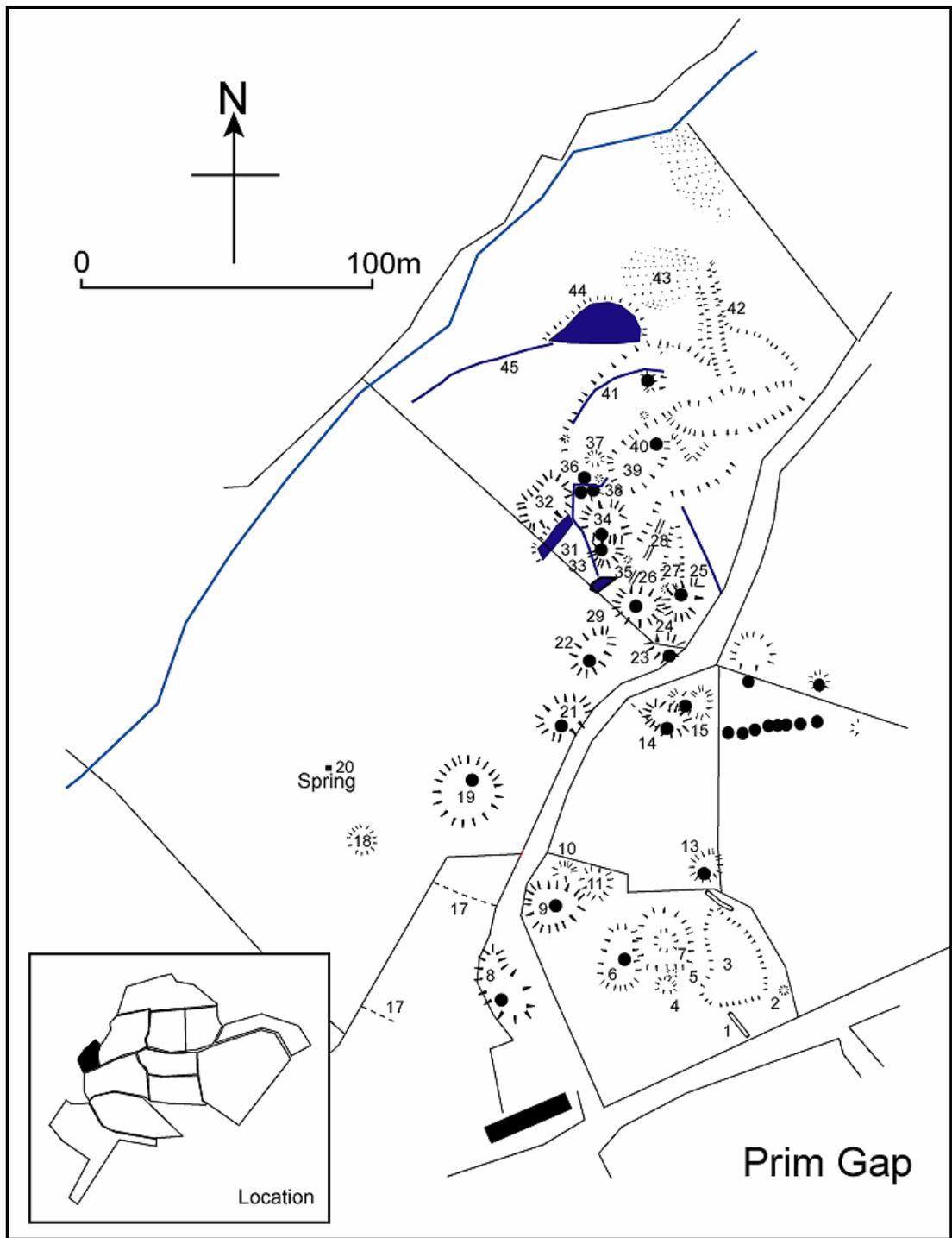


Fig.36 Prim Gap

Table 7 Prim Gap				
Feature Number	Description	Zone	Northing	Easting
1	Trench 10m long 2m wide	SE	10805	63998
2	Pit / shaft 3m dia	SE	10821	64010
3	Open cut / quarry 30m x 20m	SE	10802	64022
4	Shaft mound 10m dia no obvious shaft	SE	10779	64012
5	Pit square 4m x 2m, 1m deep	SE	10781	64016
6	Shaft mound 12m x 10m possible gin site	SE	10763	64022
7	Shaft mound 20m dia large slumped area in centre	SE	10778	64027
8	Shaft mound 15m x 30m possible gin	SE	10722	64010
9	Shaft mound 22m x 18m	SE	10738	64040
10	Low shaft mound 10m x 6m damaged	SE	10743	64052
11	Low shaft mound 10m dia damaged	SE	10755	64048
12	Trench / holloway 1m wide x 12m	SE	10795	64043
13	Shaft mound 12m dia	SE	10794	64054
14	Shaft mound 18m x 10m tip partly runs over wall footings	SE	10778	64106
15	Double shaft mound 14m x 10m includes a possible covered shaft c.3m dia	SE	10789	64111
16	Wall footings 14m long	SE	10679	64001
17	Wall footings 24m long	SE	10711	64042
18	Possible shaft mound 10m dia	SE	10672	64062
19	Shaft mound 24m dia possible gin site	SE	10709	64079
20	Spring enclosed on three sides by stone wall	SE	10661	64088
21	Shaft mound 20m x 16m possible gin shaft	SE	10743	64107
22	Shaft mound 20m x 12m possible gin shaft	SE	10754	64130
23	Shaft mound 10m x 14m mound crossed by enclosure wall	SE	10779	64130
24	Shaft mound 18m x 16m	SE	10771	64145
25	Shaft mound 16m x 14m	SE	10785	64146
26	Pit 2m x 1m	SE	10779	64151
27	Open cut trench 8m x 20m up to 2m deep	SE	10781	64160

28	Holloway 2m wide 26m long	SE	10774	64166
29	Dam wall earth construction fragmentary	SE	10756	64152
30	Water leat runs from dam to edge of opencut	SE	10752	64167
31	Bank 3m wide 20m long possible dam wall crossed by enclosure wall	SE	10737	64171
32	Shaft mound / tip 24m x 16m no obvious shaft	SE	10737	64182
33	Shaft mound 10m dia	SE	10757	64163
34	Shaft mound 18 x 14 possible gin shaft	SE	10757	64176
35	Shaft hollow overlain by spoil from opencut	SE	10766	64161
36	Shaft	SE	10749	64185
37	Shaft	SE	10750	64190
38	Pit / shaft	SE	10756	64190
39	Large complex opencut feature 80m x 50m organised on two levels, wide bank on both sides, bank contains pits and shafts	SE	10771	64201
40	Stone lined shaft in base of opencut filled.	SE	10776	64202
41	Water leat fades and disappears	SE	10761	64225
42	Trench 10m wide x 40m long upcast banks on both sides, this feature is cut by the main opencut and therefore predates it.	SE	10796	64246
43	Area of dressing activity 25 x 20m grassed, over earthworks suggest buddles and heaps of waste	SE	10776	64261
44	Dam wall earth and stone construction 4m wide 1.5m high	SE	10757	64253
45	Water leat	SE	10718	64231
46	Disturbed area suggesting ore dressing and buddles	SE	10788	64297
47	Leat 1m wide upcast bank on both sides	SE	10792	64165



Fig.37 Shaft on The Virgins Vein (features 14-15)



Fig.38 Large open-cut (feature 39)



Fig.39 Earth and stone dam (feature 44)

2.9 Cockhill

Situated in the valley below the village this area contains a range of features dating from the mid 18th to the 20th century. The main features are associated with levels driven to work lead veins under the village including Jackass Level (5), Gillfield Level (17), and Cockhill Level (23). Both Gillfield and Cockhill levels have extensive tips typical of long level networks driven in the late 18th early 19th century. Cockhill tip is directly in front of the level, however the tip from Gillfield is to one side and above the entrance to the level. This unusual arrangement may be because there was insufficient space available for tipping in front of the level as Sand Beck, which runs between the two sites was a boundary between the two mines. Near the entrance to Cockhill are the remains of a dressing floor including the remains of bouse teams for ore storage and a water powered ore crusher (26). A nearby flat area built over a culvert is the probable location of further dressing equipment. No such defined areas have survived at Gillfield. Cockhill and Gillfield Levels are arched with stone at the entrance. Jackass level is driven in solid rock and is approached by a cutting in outcropping gritstone and appears to have been driven by pick only.

This area contains the remains of three smelt mills; Cockhill Mill (14), Gillfield Mill (10), and Providence Mill (33). Cockhill Mill consists of wall footings and with some fragments of standing wall. Of interest are a series of cast iron columns, which formerly supported arches over the ore hearths. The remains of flues run up the slope behind the mill to the base of a chimney (13). Gillfield Mill survives as footings and rubble spreads, although the rear wall cut into the hillside stands to a height of approximately 2m. Providence Mill consists of walls standing to a height of several metres and a fine arch carries the remains of a flue across a possible track to run up the hillside. Each of the mills are served by water leats. Cockhill Mill by a leat (25), which begins in Thieveshaw Gill, crosses the line of the tramway / drain from Cockhill Level and continues as a culvert (24) to the mill. Gillfield Mill is fed by a leat (7) coming from Sand Beck and Jackass Level and Prosperous mill by a large leat (32) running from Branstone Beck.

A water leat (2) runs down the hillside from the adjacent North Coldstones area towards Gillfield Level. A further leat (6) begins in Sand Beck possibly just above Jackass Level and runs to a depression, which probably represents a shallow shaft onto Gillfield Level. It is likely that this was part of a water blast ventilation system.

There is evidence of a number of structures, which survive mainly as building platforms. 9 appears to be a two-celled building on the side of Sand Beck, 11 is a stone and concrete platform suggesting a 20th century structure, as is 15 with wall footings and a concrete engine mounting. 22 is a stone built structure, which suggests an 18th or 19th century origin but fragments of machinery indicates 20th century reuse. 20 is a two-celled building which contains a wooden box / cistern in one corner. 29 is a small stone built structure resembling a grouse butt, however there are no other butts in the area, which suggests another function. Its location tucked away in a hollow in the tip and facing away from all the other building suggests that it may have served as an explosives store. 16 is a modern prefabricated concrete building belonging to Leeds University. A final structure

is located in the side of the tip from Gillfield Level, however it is fragmentary and partly buried by tip material, which obscures its function.

Other features in the area include an extensive area of shallow gritstone quarries (1). Another quarry (31) is associated with a track leading down to Cockhill Level, which suggest that it may have provided stone for underground arching in the mine. Naturally outcropping gritstone above Jackass Level may have also been quarried (4). Many boulders in this area have been carved with dates and initials.

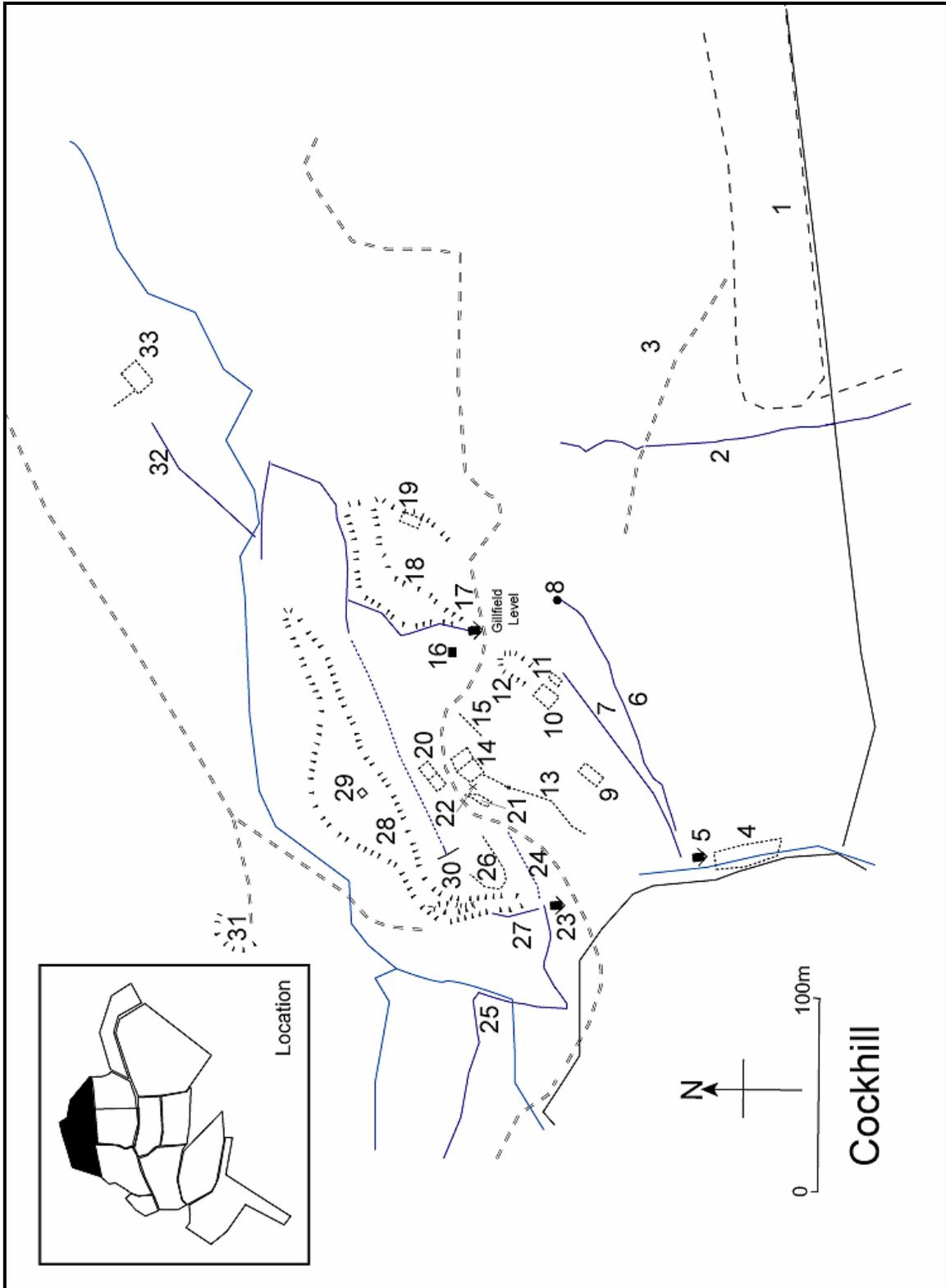


Fig.40 Cockhill

Table 8 Cockhill				
Feature Number	Description	Zone	Northing	Easting
1	Area of shallow gritstone quarries	SE	11850	64711
2	Water leat which fades.	SE	11626	64724
3	Trackway	SE	11652	64760
4	Natural gritstone outcrop which may have been quarried, many boulders with initials carved on.	SE	11409	64716
5	Thornhill or Jackass Level	SE	11407	64740
6	Water leat which begins slightly above Jackass Level	SE	11487	64779
7	Leat which fades close to Gillfield smelt mill	SE	11468	64784
8	Waterblast shaft onto Gillfield Level served by feature 6	SE	11542	64815
9	Possible 2 celled building	SE	11451	64797
10	Gillfield Smelt Mill, building platform with fragments of upstanding walls.	SE	11492	64820
11	Platform, stone and concrete possible site of 20th century building	SE	11500	64815
12	Possible tip of shale material	SE	11507	64835
13	Line of smelt mill flue including base of chimney	SE	11443	64832
14	Cockhill Smelt Mill, wall footings and fragmentary walls.	SE	11457	64862
15	Stone alignment marking one side of a building containing concrete engine mountings.	SE	11476	64859
16	Modern flat roofed building	SE	11515	64870
17	Entrance to Gillfield level	SE	11526	64857
18	Tip from Gillfield Level appears to be two phase with an upper and lower portion. Much disturbed by recent activities.	SE	11558	64879
19	Possible structure on edge of tip, some modern material present which suggests 20th century origin.	SE	11584	64891
20	2 celled building, footings and fragmentary walls, wooden box in one corner	SE	11452	64881
21	Remains of 20th century ore sorting jig	SE	11444	64858
22	Stone built structure showing evidence of 20th century reuse.	SE	11437	64854
23	Entrance to Cockhill Level	SE	11382	64814
24	Course of culverted water leat	SE	11403	64830
25	Water leat	SE	11352	64820
26	Site of bouse teems and ore crusher, some recent damage to bouse teems apparent.	SE	11394	64841
27	Watercourse from Cockhill level which take water to a culvert under the tip.	SE	11377	64839

28	Tip from Cockhill Level	SE	11420	64903
29	Small stone three sided structure. Looks similar to a grouse butt, however there are no others in the area. Form and location suggests that the structure could have been a 20th century explosives store.	SE	11441	64916
30	Ore dressing area behind a retaining wall, culvert carrying water from Cockhill level emerges at foot of wall.	SE	11409	64871
31	Gritstone quarry, The location suggests that this quarry may have produced stone for underground drystone arching.	SE	11366	64983
32	Feature which could be a water leat or trackway. In places this is cut into the hillside which is supported by a retaining wall.	SE	11604	65006
33	Providence Smelt mill, footings, standing walls and an arched flue running up the hillside.	SE	11658	65036



Fig.41 Entrance to Jackass Level
(feature 5)



Fig.42 Entrance to Cockhill Level
(feature 23)



Fig.43 Entrance to Gillfield Level (feature 17)



Fig.44 Cockhill smelt mill (feature 14)



Fig.45 Gillfield smelt mill (feature 10)



Fig.46 Providence smelt mill (feature 33)



Fig.47 Possible explosive store (feature 29)



Fig.48 Carved stone near Jackass Level (feature 4)



Fig.49 Carved stone near Jackass Level (feature 4)

2.10 High View

This area is located south of the Grassington to Pateley Bridge Road, west of Duck Street. Greenhow Hill forms high ground to the east of High View Farm. Two main areas of activity are present; the first marks the course of Greenhow Rake Vein running up the north side of the hill and the second, Prim Gap Vein, which runs along its southern flank.

The course of Prim Gap Vein is marked by a series of closely spaced shaft mounds, pits and trench features. These are confined to a narrow strip of ground suggesting that the ground was worked in meer blocks, suggesting that they probably predate the late 18th century. A number of smaller veins which appear to be fractures off the Prim Gap Vein run across the steeper hill slope just below the summit of the hill. These are marked by small shaft mounds and discontinuous shallow trench features (e.g. features 38-46). Superficially these trenches appear to be very shallow excavations to prospect veins but in several locations where the hill slope changes, it is apparent that they represent the top of deeper backfilled trenches. A lack of spoil on the sides of the excavations suggests this filling is probably composed of development waste.

Greenhow Rake Vein is present as a series of large opencuts with some shaft mounds (188, 193, 195, etc). This indicates that the vein outcrops and would suggest that the vein may have been exploited at an early date. Once again the mining activity is confined to a narrow strip of ground suggesting possible meer working. Two forms of opencut are present: in the first the bottom of the open cut appears to be composed of several overlapping pits; in the second only a single floor level is present. An area of ore dressing alongside the opencut suggests a phase of working after the abandonment of meer working and the presence of a track way leading from the road into one of the sections of opencut may suggest a further phase of working in the 20th century. To the southeast Greenhow Rake Vein crosses Duck Street Quarry. A large section of the vein has been left standing proud of the quarry floor exposing much evidence of mining activities. Here the vein is split into two by a block of the limestone country rock (known as a *horse*). The hanging wall of the southern part of the vein has been removed exposing evidence of stoped ground. A small section of a former shaft survives and its form suggests that it predates the use of gunpowder. The northern section has suffered less from the quarrying activities although it appears that the original ground surface has been removed. This has exposed the top of several sections of stoped ground. A short level has been driven into the south side of the vein and connects to an underground shaft. This is believed to be connected with modern fluorspar workings.

To the south and west of Prim Gap Vein larger, wider spaced, shaft mounds suggest that the veins in this area are located under drift.

Only two mining related buildings have been identified. Both are small square buildings in the style of a miner's coe. Feature 189 is partly buried in the spoil from the Greenhow Rake opencut and if the vein has been worked by the meer system would be located within the quarter cord. This suggests that the coe could be contemporary with meer working. The second 121 has a similar relationship to a fracture off the Prim Gap Vein.

Water management features in this area are confined to the southern flank of Greenhow Hill and are extension of the systems recorded on Galloway Pasture. Of note is leat 11 which is partly rock cut where it runs around a limestone quarry (10). A levelled survey may reveal that it was taking water across the boundary wall to Duck Street Quarry although there is now no sign of its continuation.

This area contains several holloways, 178 and 96 are walled although in the case of the latter this mainly a single wall down one side. This single wall separates the holloway from the workings on Prim Gap Vein. A single shaft 82 blocks the holloway, which indicates that the path was not in use when the shaft was sunk. The alignment of wall boundaries suggest that this holloway continued past High View farmhouse to join the Grassington Pateley Bridge Road. Feature 206 is a slight holloway which crosses wall boundaries and may have given access to the higher part of Greenhow Rake Vein. As previously mentioned a trackway 190 runs from the road into a section of opencut.

A number of areas of limestone quarrying have been identified. Many are simple small pits but in several areas larger quarries are present. Duck Street Quarry is the largest and probably the most modern.

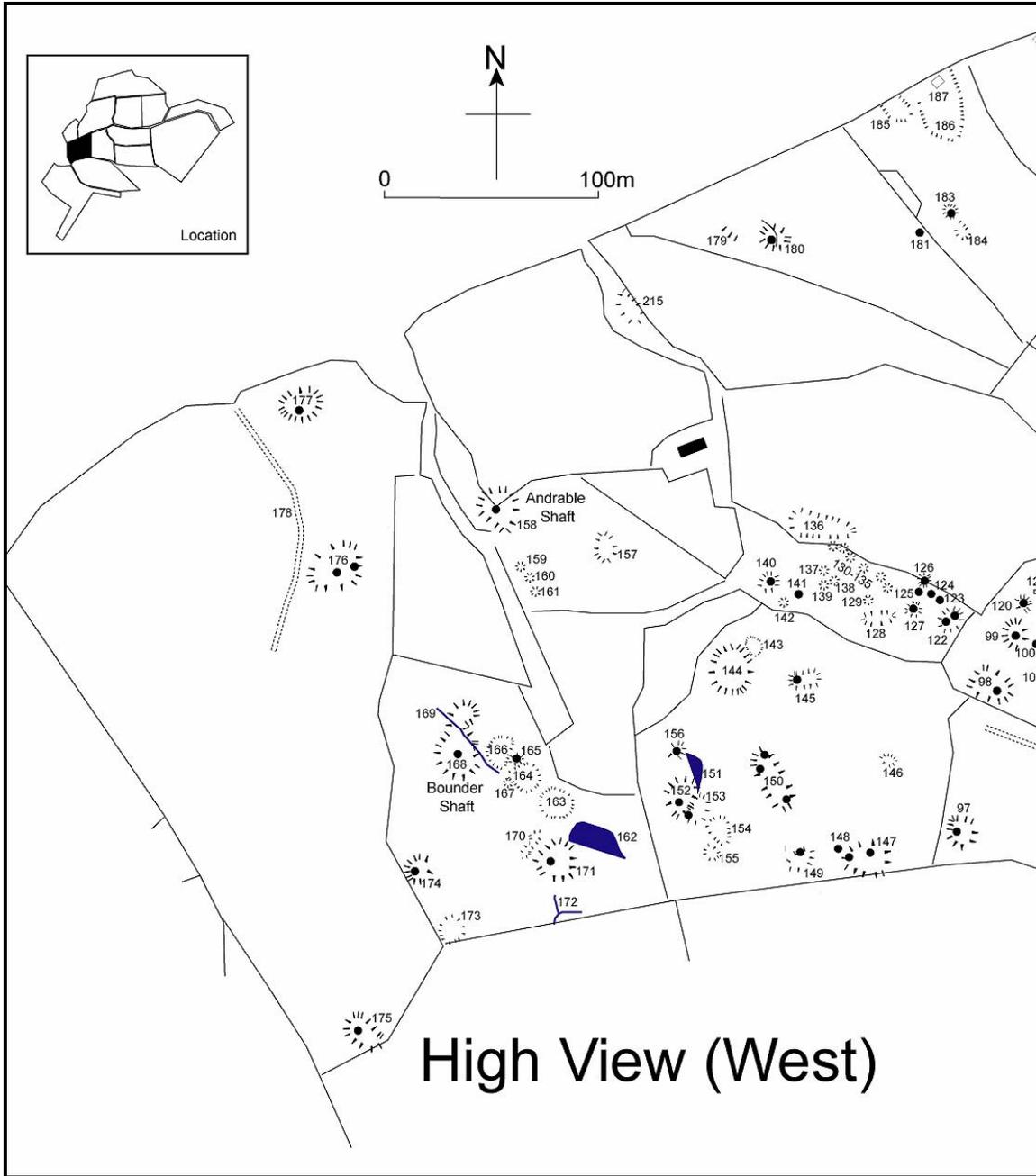


Fig.50 High View West

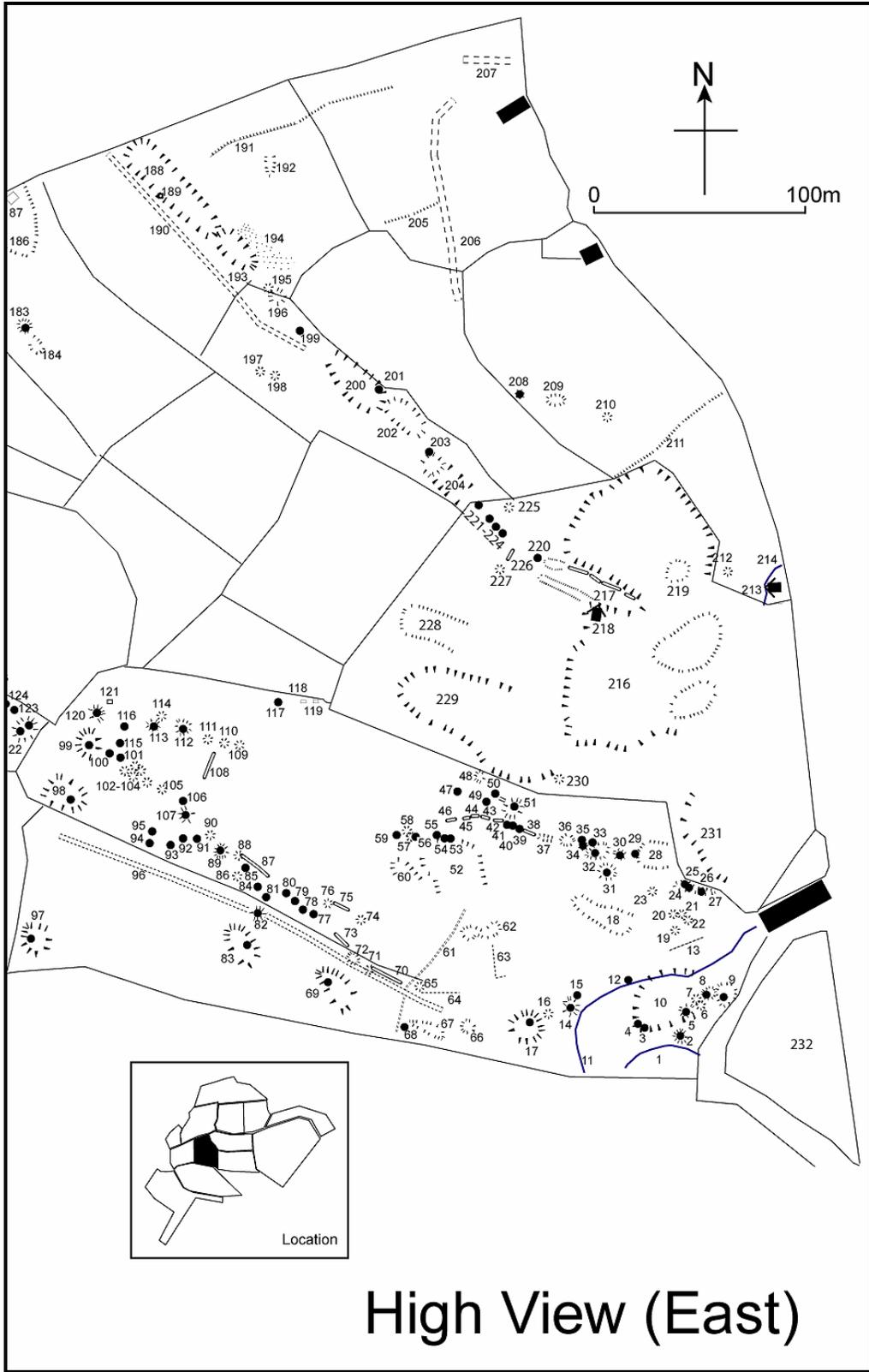


Fig.51 High View East

Table 9 High View				
Feature Number	Description	Zone	Northing	Easting
1	Leat, crosses boundary wall at both ends	SE	11314	63670
2	Shaft mound 8m dia	SE	11324	63675
3	Shaft 3m dia	SE	11308	63679
4	Shaft 3m dia	SE	11305	63682
5	Shaft mound 8m dia	SE	11328	63688
6	Pit / shaft 2m dia	SE	11335	63691
7	Pit / shaft 3m dia	SE	11332	63693
8	Shaft mound 6m dia	SE	11339	63696
9	Shaft mound 10m dia	SE	11348	63696
10	Limestone Quarry Some shaft in side suggesting that they are later features	SE	11318	63692
11	Water Leat part ditch and bank feature part rock cut where it runs along side of quarry.	SE	11287	63695
12	Shaft 3m dia	SE	11300	63702
13	Wall footings 20m long	SE	11329	63721
14	Shaft mound 5m dia	SE	11272	63690
15	Shaft mound 3m dia	SE	11275	63694
16	Shaft 3m dia	SE	11261	63687
17	Shaft mound 18m dia	SE	11253	63680
18	Indistinct linear excavation	SE	11290	63732
19	Pit 2m dia possibly for limestone extraction	SE	11323	63726
20	Pit 2m dia possibly for limestone extraction	SE	11322	63735
21	Pit 2m dia possibly for limestone extraction	SE	11326	63735
22	Pit 2m dia possibly for limestone extraction	SE	11329	63731
23	Pit 3m dia	SE	11312	63745
24	Line of pits / shafts	SE	11326	63747
25	Shaft	SE	11328	63748
26	Shaft	SE	11330	63746
27	Shaft	SE	11335	63744
28	Opencut probably modern	SE	11311	63763

29	Shaft, little or no mound 3m dia	SE	11303	63763
30	Shaft Mound 4m dia	SE	11296	63762
31	Shaft mound 8m dia	SE	11290	63754
32	Shaft mound 10m x 8m	SE	11286	63764
33	Possible shaft	SE	11283	63769
34	Possible shaft	SE	11279	63767
35	Possible shaft	SE	11278	63770
36	Tip from nearby opencut, no evidence of transport method	SE	11270	63770
37	Backfilled opencut	SE	11260	63771
38	Opencut continues as shallow trench	SE	11252	63774
39	Possible shaft 3m dia	SE	11248	63775
40	Possible shaft 3m dia	SE	11245	63777
41	Possible shaft 3m dia	SE	11242	63778
42	Backfilled opencut 3m wide, underground continuation visible	SE	11238	63779
43	Trench 2m x 1m wide	SE	11232	63782
44	Trench 2m x 1m wide	SE	11228	63782
45	Trench 2m x 1m wide	SE	11222	63781
46	Trench 2m x 1m wide	SE	11215	63780
47	Possible shaft 3m dia	SE	11218	63793
48	Shaft mound 6m dia cut by wall	SE	11229	63801
49	Pit 3m dia	SE	11232	63788
50	Pit 3m dia	SE	11236	63793
51	Shaft mound 10 m dia	SE	11244	63785
52	Limestone Quarry	SE	11216	63757
53	Shafts 3m dia	SE	11215	63770
54	Shafts 3m dia	SE	11212	63771
55	Shafts 3m dia	SE	11208	63773
56	Shafts 3m dia	SE	11198	63772
57	Pit 2m dia	SE	11196	63772
58	Pit 3m dia	SE	11195	63775

59	Shaft 3m dia	SE	11189	63773
60	Small limestone quarry	SE	11191	63756
61	Road from quarry	SE	11212	63720
62	Mound of spoil - origin unclear	SE	11233	63726
63	Wall footings, possibly part of an earlier enclosure.	SE	11236	63712
64	Wall footings	SE	11211	63697
65	Hollow 4m dia purpose unclear	SE	11200	63700
66	Shakehole	SE	11224	63681
67	Shakehole	SE	11205	63679
68	Shaft 3m dia	SE	11193	63680
69	Shaft mound 24m x 10m	SE	11161	63699
70	Pit / trench 3m wide	SE	11184	63705
71	Pit 3m dia	SE	11176	63708
72	Pit/ shakehole	SE	11168	63714
73	Pit/ trench	SE	11164	63722
74	Pit 3m dia	SE	11172	63732
75	Pit / trench 4m wide	SE	11164	63738
76	Pit 2m dia	SE	11157	63739
77	Shaft 4m dia	SE	11149	63735
78	Shafts	SE	11144	63737
79	Shafts	SE	11141	63741
80	Shafts	SE	11136	63745
81	Shafts	SE	11127	63743
82	Shaft mound 6m dia	SE	11122	63734
83	Shaft mound 24m x 10m	SE	11115	63719
84	Shaft	SE	11123	63749
85	Shaft	SE	11118	63758
86	Pit 2m dia	SE	11113	63753
87	Pit / trench 6-8m wide	SE	11124	63755
88	Pit 2m dia	SE	11113	63762

89	Shaft mound 6m dia	SE	11105	63765
90	Pit 2m dia	SE	11100	63772
91	Pit 4m dia	SE	11094	63771
92	Pits / shaft 3m dia	SE	11087	63772
93	Pits / shaft 3m dia	SE	11081	63767
94	Pits / shaft 3m dia	SE	11071	63768
95	Pits / shaft 3m dia	SE	11071	63775
96	Holloway with wall on top of bank along north side	SE	11065	63759
97	Shaft Mound 14m dia	SE	11019	63722
98	Shaft mound 20m x 18m	SE	11031	63793
99	Shaft mound 12m dia	SE	11041	63816
100	Shaft 3m dia	SE	11051	63812
101	Shaft 3m dia	SE	11057	63810
102	Pits 2m dia	SE	11059	63804
103	Pits 2m dia	SE	11062	63801
104	Pits 2m dia	SE	11070	63798
105	Pits 2m dia	SE	11077	63794
106	Shaft 2m dia	SE	11087	63789
107	Shaft mound 8m dia	SE	11088	63782
108	Trench 3m wide - fades at ends	SE	11100	63806
109	Pit 2m dia	SE	11114	63816
110	Pit 3m dia one side is exposed limestone, possible downward continuation visible.	SE	11107	63817
111	Shallow pit 4m dia	SE	11099	63819
112	Shaft mound 8m dia	SE	11087	63824
113	Shaft mound 6m dia	SE	11073	63825
114	Pit 3m dia possible small limestone quarry	SE	11077	63830
115	Shaft 3m dia	SE	11057	63816
116	Shaft 4m dia	SE	11060	63825
117	Possible shaft 2m dia	SE	11132	63837
118	Square pit 2m x 3m	SE	11145	63837

119	Square pit 2m x 3m	SE	11152	63836
120	Shaft mound 6m dia	SE	11045	63832
121	Coe? Small building with wall footings 4m x 4m	SE	11051	63836
122	Shaft mound 10m dia - two shafts	SE	11011	63824
123	Pit 3m dia	SE	11006	63833
124	Pit 3m dia	SE	11002	63836
125	Shaft 3m dia	SE	10995	63837
126	Shaft mound 6m dia	SE	10998	63843
127	Shaft mound 6m dia	SE	10993	63829
128	Trench	SE	10977	63824
129	Pit 3m dia	SE	10973	63833
130	Pits 3m dia	SE	10980	63839
131	Pits 3m dia	SE	10978	63845
132	Pits 3m dia	SE	10970	63848
133	Pits 3m dia	SE	10964	63853
134	Pits 3m dia	SE	10960	63858
135	Pits 3m dia	SE	10955	63858
136	Linear limestone quarry	SE	10946	63868
137	Pits 3m dia	SE	10951	63847
138	Pits 3m dia	SE	10955	63842
139	Pits 3m dia	SE	10950	63839
140	Shaft mound 10m dia	SE	10925	63842
141	Shaft 3m dia	SE	10939	63836
142	Pit 3m dia	SE	10932	63832
143	Shakehole	SE	10918	63811
144	Shaft mound 20m dia shaft location unclear	SE	10908	63798
145	Shaft mound 16m x 10m	SE	10941	63796
146	Shakehole	SE	10982	63758
147	Shaft mound 20m x 14m	SE	10970	63710
148	Shaft	SE	10957	63715

149	Part shaft mound 12m dia	SE	10941	63710
150	3 shaft mounds all running together	SE	10926	63746
151	Dam alongside shaft mound	SE	10890	63754
152	Shaft mound	SE	10884	63740
153	Shaft mound	SE	10892	63734
154	Shakehole	SE	10901	63723
155	Shakehole	SE	10897	63712
156	Shaft mound	SE	10881	63762
157	Earthwork probably modern	SE	10848	63859
158	Shaft mound 18m dia crossed by boundary walls (Andrable Shaft)	SE	10799	63875
159	Pit / shaft 5m dia	SE	10806	63849
160	Pit / shaft 5m dia	SE	10811	63843
161	Pit / shaft 5m dia	SE	10815	63837
162	Earth and stone dam	SE	10842	63720
163	Shakehole	SE	10824	63737
164	Shakehole	SE	10809	63749
165	Shaft	SE	10805	63757
166	Shakehole	SE	10798	63762
167	Pit / shakehole 3m dia	SE	10800	63747
168	Shaft mound 24m x 14m may be two shaft mounds together (Bouder Shaft)	SE	10776	63762
169	Water leat - fades	SE	10770	63779
170	Part of shaft mound	SE	10815	63721
171	Shaft mound cut by road 20m	SE	10825	63710
172	Water leat	SE	10825	63685
173	Shakehole	SE	10774	63678
174	Shaft mound 12m dia	SE	10759	63705
175	Shaft mound 10m dia	SE	10732	63628
176	Shaft mound 30m x 20m two shafts	SE	10718	63850
177	Shaft mound 20m dia	SE	10704	63926
178	Walled holloway	SE	10702	63873

179	Quarried outcrop of limestone	SE	10906	64006
180	Shaft mound with wall running over the top.	SE	10927	64005
181	Indistinct shaft	SE	10997	64007
182	Indistinct shaft	SE	10996	64008
183	Shaft	SE	11011	64016
184	Small open fronted limestone quarry	SE	11017	64007
185	Small limestone quarry	SE	10986	64066
186	Small limestone quarry	SE	11008	64067
187	Small building	SE	11004	64079
188	Opencut	SE	11073	64094
189	Coe partly buried in spoil	SE	11077	64079
190	Trackway	SE	11085	64062
191	Earthwork bank possibly former enclosure wall	SE	11125	64110
192	Small open fronted limestone quarry	SE	11130	64096
193	Opencut	SE	11112	64054
194	Ore dressing area no clear features	SE	11127	64051
195	Pit 2m dia	SE	11128	64035
196	Large hollow	SE	11132	64030
197	Shaft	SE	11124	63996
198	Pit / shaft 3m dia	SE	11131	63993
199	Shaft	SE	11144	64014
200	Opencut	SE	11167	63992
201	Pit/ shaft 5m dia	SE	11181	63987
202	Opencut	SE	11193	63973
203	Shaft	SE	11206	63957
204	Opencut	SE	11213	63943
205	Earthwork bank possibly former enclosure wall	SE	11204	64075
206	Holloway	SE	11216	64065
207	Holloway	SE	11236	64147
208	Possible shaft	SE	11250	63987

209	Possible small limestone quarry	SE	11267	63984
210	Pit 2m dia	SE	11292	63976
211	Bank and ditch - possible old boundary wall	SE	11329	63974
212	Pit 2m dia	SE	11350	63902
213	Water leat	SE	11371	63901
214	Level	SE	11369	63895
215	Possible shaft mound- no obvious shaft	SE	10860	63969
216	Duck Street Limestone Quarry (main floor)	SE	11298	63841
217	Outcropping section of Greenhow Rake Vein, on north side exposing the top of several Sections of stope, on south side hanging wall removed exposing evidence of stoping, and at least one shaft which may have been fireset.	SE	11284	63889
218	Short level driven into stope on Greenhow Rake Vein	SE	11286	63877
219	Unworked section of limestone cut by a section of vein	SE	11325	63897
220	Possible shaft	SE	11258	63904
221	Shaft 4m dia	SE	11241	63916
222	Shaft 4m dia	SE	11238	63919
223	Shaft 4m dia	SE	11235	63923
224	Shaft 4m dia	SE	11229	63929
225	Pit 2m dia	SE	11244	63928
226	Trench 2m wide	SE	11244	63905
227	Pit 2m dia	SE	11239	63898
228	Shallow area of limestone quarrying	SE	11207	63871
229	Quarry bench above main floor	SE	11228	63827
230	Pit 5m dia	SE	11267	63798
231	Quarry bench above main floor	SE	11337	63770
232	Shaft	SE	11378	63672



Fig.52 Line of shafts and pits marking the course of Prim Gap Vein (features 77-80)



Fig.53 Shallow pits (features 118-9)



Fig.54 Backfilled open-cut (feature 38)



Fig.55 Opencut Greenhow Rake Vein (feature 204)



Fig.56 Opencut Greenhow Rake Vein (feature 200)



Fig.57 Coe near PrimGap Vein (feature 121)



Fig.58 Coe on the side of Greenhow Rake Vein (feature 189)



Fig.59 Rock cut water leat (feature 11)



Fig.60 Holloway with wall on one side (feature 96)



Fig.61 Greenhow Rake Vein Out cropping in the side of Duck Street Quarry (feature 217)



Fig.62 Level driven into Greenhow Rake Vein (feature 218)



Fig.63 Open stope Greenhow Rake Vein (feature 218)



Fig.64 Section of a pre gunpowder shaft in the side of Greenhow Rake Vein (feature 218)

2.11 Galloway Pasture

This large area is split into two enclosures. The land is fairly flat rising gently to the southwest corner. The southern boundary is marked by a line of nine shafts dating from the late 18th early 19th century on the course of Blue Rigg Vein, each around 20m diameter, the eastern most have been identified as Woodhouse Shaft (158), Little Shaft (156), Deep Shaft (149), Marshalls Shaft (146), Engine Shaft (143), and Covenant Shaft (142). The shafts show no evidence of the haulage method used but the use of the name “engine” suggests the use of horse gins. Several dressing areas have been identified closely related to the shafts (182, 154, 148, and 144), however no defined features are present. Only one dressing area has evidence of water management including a leat (155) and possible dam (153). The dressing areas are all located between the shafts therefore confining activities to a narrow strip of ground. This is reminiscent of the practice of dividing ground up into meer blocks, long narrow strips of ground with a defined width. This is usually $\frac{1}{4}$ of a meer either side of a vein, and is therefore known as a quarter cord. In this case it appears that if the activity was confined to a quarter cord it is wider than a standard quarter cord in Yorkshire Dales, which is usually around 7-8 yards either side of the vein. An isolated dressing area (147) may represent pre 20th century waste redressing.

Further north another line of shafts (173, 164, and 151) marks the course of North Forest Moor Vein. To the west shafts become so densely spaced that shaft mounds all merge together (203). This is common where veins outcrop or are very close to the surface, although several defined shaft mounds on top of this area of spoil suggests a second phase of working with existing shafts being deepened. The presence of two distinct lines of shaft here suggests two veins were worked. The wider spacing of shafts to the east indicates that the beds are dipping taking the limestone beds below drift.

Several other veins have been worked within the western enclosure and display common characteristics. Areas 221, 235 and 259 are typical of shallow working with closely spaced depressions representing shafts and are mainly confined to narrow strips of ground suggesting the use of meers. This suggests that they predate the end of the 18th century when larger grants of ground became more usual. It also suggests that in this area the limestone beds are at or near the surface. Area 235 is slightly atypical affecting an area of ground approximately 80m by 38m with a single line of closely spaced shafts and pits across the middle of the area. A series of pit features on the southern part of the tip material may indicate the presence of other veins. None of the veins in this area have been followed onto the eastern enclosure.

Ore dressing activities in this area were not identified as the whole area is grassed over. One exception is adjacent to area 259 where a well-preserved area served by a water leat contains evidence of a series of small tank features (263). The evidence of fine spoil brought up from rabbit holes indicates that these are buddles. The water leat (262) cuts across area 259 suggesting that it is a later feature. Its relationship with the buddles suggests that they are contemporary with the leat. It is probable that area 263 is a site where dressing waste was reprocessed to extract discarded ore and may be from the late 18th or 19th century.

The rest of the western enclosure contains scattered shaft mounds with little evidence of linear alignment. Areas 82 and 88 consists of disturbed linear areas of tip material with little evidence of shafts. The disturbance suggest that they may mark the course of a vein and that the shaft mounds may have been reworked in the 20th century for fluorspar. The presence of a vein is

supported by the alignment of these areas with shaft mound 80, which has a flat area next to the shaft suggesting the former presence of a horse gin. Area 60 may be an associated ore dressing area and has a related water leat and dams. The remaining part of the enclosure contains a group of shake holes (65, 67, 69, 72-78) together with small shallow limestone quarries (66 and 68).

Returning to the eastern enclosure this area is dominated by a large quarry like feature, Galloway Gulf (54). This is a natural shakehole excavated for fluorspar in the second half of the 20th century. The fluorspar was taken for processing at a plant on Grassington Moor. Feature 19 is a similar but smaller feature. Associated with 54 are several piles of excavated material (56, 57, 58, and 113), which appears to be overburden removed before the fluorspar deposit was reached. Areas 53 and 55 contain piles of waste material from the processing of fluorspar. This material was brought back from the plant at Grassington and each pile represents a waggon load (pers com Mr Colin Shepherd).

A slightly staggered line of shaft mounds marks the course of Galloways Old Vein (2-12, 126-128, 124) ending in an area, which may have been worked as an opencut (1). A further group of small shafts (43, 35, 32, 34, 31, 30, 21 and 23) in the northwest corner of the enclosure may represent fractures off West Galloways Vein.

Evidence for a number of buildings has been found in the form of stone alignments platforms and footings. Starting from the south feature 181 is a building platform approximately 8m x 5m; 161 may represent a coe measuring 3m x 3m; 106 a building platform 8m x 5m built against the boundary wall. 40 is a shakehole where rabbit activity has revealed midden deposits containing fragments of domestic pottery and clay pipes suggesting the presence of a post medieval house nearby. 49 is a slight stone alignment, which may be evidence of a building.

Galloway Pasture contains evidence several systems of water leats and dams, collecting and transporting water. Because these systems are fragmentary it is difficult to piece together the whole system, however two trends are visible. One system runs from near the western boundary as a discontinuous line to boundary with High View (262, 84, 83, and 70). The only use of this water appears to be on the small dressing area with buddles (263). The second system is more complex and appears to be gathering water and leading it towards the northeast corner of the area. This system contains dams of various sizes (61, 62, 33, 18, 122, and 129), the final destination and use for this water is unclear.

A number of roads were identified; 14 may be modern and is connected to the working of Galloway Gulf. 116 and 163 are older probably to serve the shafts on Blue Rigg Vein. Feature 64 may be part of the same road system.

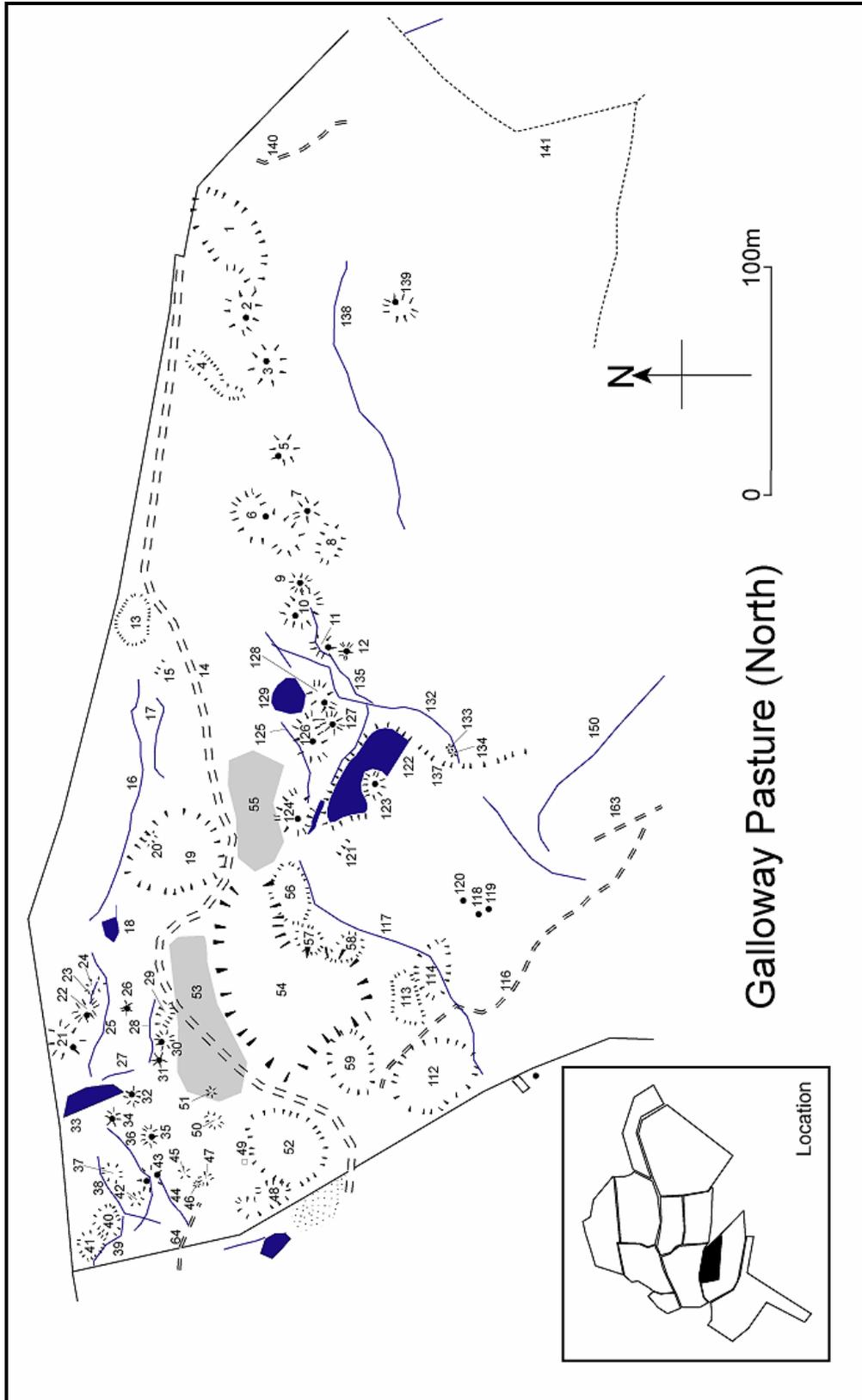


Fig.65 Galloway Pasture North

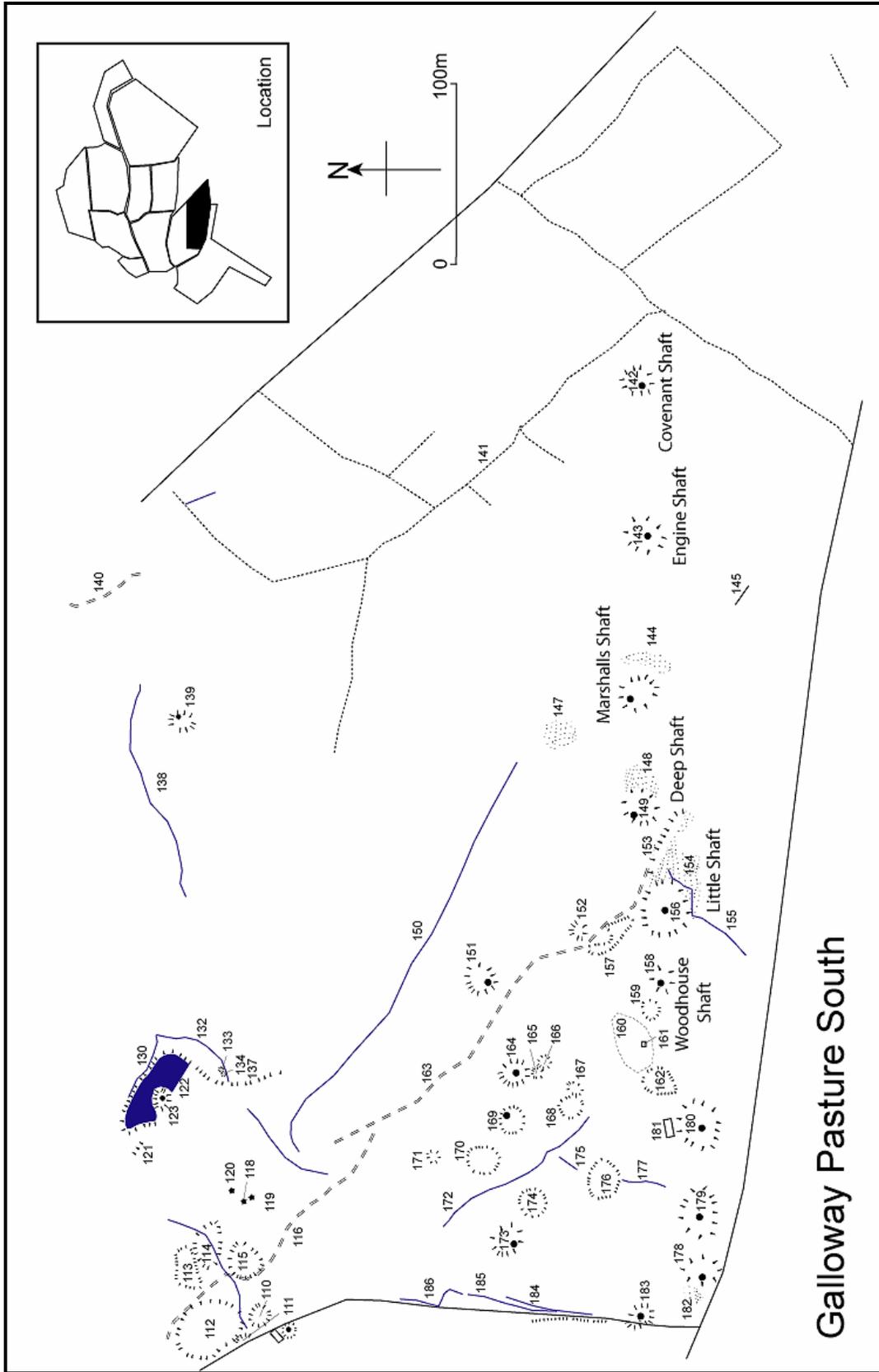


Fig.66 Galloway Pasture South

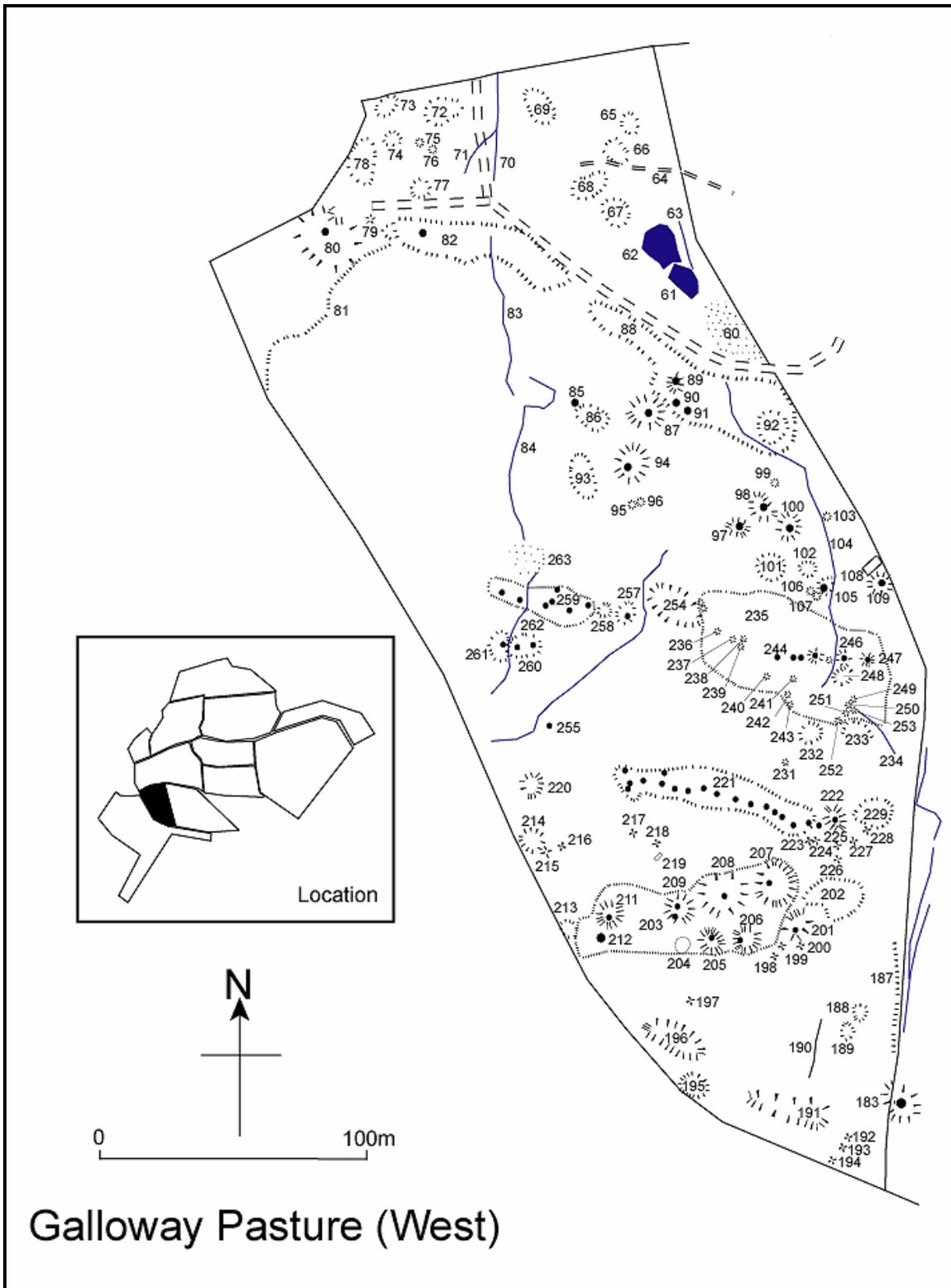


Fig.67 Galloway Pasture West

Table 10 Galloway Pasture				
Feature Number	Description	Zone	Easting	Northing
1	Open cut	SE	11344	63617
2	Shaft mound 20m dia	SE	11313	63612
3	Shaft mound 20m dia	SE	11287	63601
4	Shake hole part filled with modern rubbish	SE	11288	63631
5	Shaft mound 14m	SE	11251	63593
6	Shaft mound 36m x 16m includes possible gin circle	SE	11222	63609
7	Shaft mound 10m	SE	11223	63583
8	Slight mound / disturbed area possible shaft mound	SE	11208	63573
9	Possible shaft mound	SE	11191	63586
10	Shaft mound 22m x 12m	SE	11181	63586
11	Shaft mound 10m dia	SE	11164	63575
12	Shaft mound 8m dia	SE	11160	63566
13	Shake hole north side supported by timber and stone held in place by jubilee rail	SE	11175	63661
14	Road	SE	11150	63634
15	Bank 2m wide 1m high	SE	11154	63649
16	Possible water leat starts as a bank ends as a sheep track	SE	11114	63657
17	Bank 2m wide 1m high fades, probably a water leat	SE	11121	63650
18	Possible small dam	SE	11038	63671
19	Large opencut shake hole 40m x 50m with sink hole in centre	SE	11068	63643
20	Possible shaft or shakehole	SE	11077	63652
21	Shaft mound 14m dia	SE	10989	63691
22	Shaft mound 10m dia	SE	11001	63681
23	Leat around shaft mound fades	SE	11007	63679
24	Disturbed mound of deads, cut through by machine	SE	11013	63678
25	Water leat fades	SE	11002	63663
26	Shaft mound 6m dia	SE	10996	63673
27	Water leat fades	SE	10972	63670

28	Water leat fades near disturbed area / possible dressing floor	SE	10995	63653
29	Shaft / shake hole	SE	10999	63646
30	Shaft mound 6m dia	SE	10988	63646
31	Slight shaft mound	SE	10979	63649
32	Shaft mound 10m dia	SE	10962	63661
33	Dam wall 3m wide 1.5m high	SE	10962	63679
34	Shaft mound 8m dia	SE	10952	63670
35	Shaft mound 1m dia	SE	10946	63652
36	Water leat	SE	10936	63660
37	Shake hole possible dam	SE	10928	63670
38	Water leat	SE	10920	63670
39	Water leat	SE	10898	63670
40	Shake hole, some evidence of pits, midden deposit containing domestic pottery and clay pipe fragments indicates nearby post medieval house	SE	10907	63672
41	Shake hole	SE	10897	63679
42	Shake hole	SE	10917	63659
43	Shaft mound with two shafts cut by water leat	SE	10927	63652
44	Water leat	SE	10917	63644
45	Shake hole	SE	10929	63638
46	Pit 4m dia	SE	10924	63632
47	Possible shakehole	SE	10926	63628
48	Shakehole / quarry part backfilled	SE	10917	63603
49	Stone alignment suggesting a building	SE	10934	63611
50	Pile of spoil probably modern	SE	10952	63625
51	Pile of spoil probably modern	SE	10965	63626
52	Area used to tip modern debris	SE	10940	63592
53	Area containing distinct piles of modern dumped fluorspar dressing waste	SE	11001	63631
54	Galloway Gulf large opencut shakehole 80m x 60m	SE	11009	63597
55	Area containing distinct piles of modern dumped fluorspar dressing waste	SE	11088	63606
56	Pile of spoil dug out of Galloway Gulf	SE	11053	63592

57	Pile of spoil dug out of Galloway Gulf	SE	11032	63583
58	Pile of spoil dug out of Galloway Gulf	SE	11030	63565
59	Large closed depression probably part of Galloway Gulf	SE	10978	63562
60	Disturbed area probable dressing floor	SE	10913	63578
61	Dam	SE	10896	63598
62	Dam possibly part of last	SE	10887	63610
63	Water leat	SE	10897	63612
64	Dam 17m x 10m	SE	10883	63640
65	Shake hole	SE	10876	63658
66	Shallow limestone quarry 10m x 10m	SE	10870	63647
67	Shake hole	SE	10871	63624
68	Limestone Quarry 14m x 10m	SE	10861	63634
69	Shake hole	SE	10842	63664
70	Water leat	SE	10826	63667
71	Water leat	SE	10816	63645
72	Shake hole	SE	10804	63663
73	Shake hole	SE	10784	63665
74	Shake hole	SE	10786	63652
75	Shake hole	SE	10796	63650
76	Shake hole	SE	10801	63648
77	Shake hole	SE	10796	63633
78	Shake hole	SE	10774	63644
79	Pile of Stone 2m dia - possible covered shaft?	SE	10777	63621
80	Shaft mound 25mx 10m flat almost square area next to shaft may be gin platform	SE	10762	63614
81	Bank 2-3m wide cuts enclosure wall to west and shaft mound to east.	SE	10762	63593
82	Heap of tip material / disturbed ground 70m x 14m with little sign of shafts may have been turned over for spar.	SE	10813	63614
83	Water leat	SE	10828	63582
84	Water leat	SE	10832	63532
85	Shaft full of water slight shaft mound c.5m	SE	10855	63552
86	Shake hole full of water	SE	10861	63546

87	Shaft mound 12m dia much disturbed (by hand)	SE	10882	63548
88	Heap of tip material / disturbed ground 90m x 20m with little sign of shafts may have been turned over for spar.	SE	10887	63570
89	Shaft mound 8m dia	SE	10893	63559
90	Shaft no ring mound	SE	10893	63551
91	Shaft slight ring mound 5m dia	SE	10897	63548
92	Shake hole	SE	10930	63543
93	Shake hole	SE	10856	63524
94	Shaft mound 12m x 16m	SE	10875	63528
95	Slight shaft mound 16m dia	SE	10876	63512
96	Shaft mound 10m dia disturbed crescent shaped one side missing	SE	10880	63513
97	Pit 3m dia	SE	10917	63503
98	Shaft mound 10m dia disturbed crescent shaped one side missing	SE	10924	63512
99	Shake hole	SE	10930	63521
100	Shake hole	SE	10936	63504
101	Pit 3 dia	SE	10929	63489
102	Water leat	SE	10943	63488
103	Shaft mound 6m dia	SE	10951	63508
104	Pit 1m dia	SE	10951	63499
105	Shaft	SE	10951	63482
106	Building platform up against boundary wall 8m x4m	SE	10945	63479
107	Shaft mound 8m dia	SE	10946	63477
108	Shake hole	SE	10967	63489
109	Shake hole against wall	SE	10971	63482
110	Shake hole	SE	10979	63499
111	Shake hole against boundary wall	SE	10965	63509
112	Big hollow / shake hole contains some modern dumping	SE	10972	63528
113	Pile of spoil dug out of Galloway Gulf	SE	11006	63539
114	Shake hole	SE	11016	63529
115	Shake hole with water possible dam?	SE	11008	63507
116	Track way	SE	10996	63526

117	Possible water leat, fades	SE	11031	63545
118	Possible shaft mound / disturbed area	SE	11043	63508
119	Possible shaft mound 5m dia	SE	11046	63503
120	Shaft mound 5m dia	SE	11049	63514
121	Bank 2m wide 0.5m high	SE	11073	63567
122	Earth and stone bank up to 3m wide 1.5m high probable dam wall	SE	11097	63566
123	Shaft mound 12m dia	SE	11100	63554
124	Shaft mound 20m dia	SE	11087	63588
125	Water leat	SE	11108	63583
126	Shaft mound disturbed 22 x 14m	SE	11120	63582
127	Shaft mound 12m dia disturbed	SE	11128	63573
128	Shaft mound 16 x 12m	SE	11140	63577
129	Dam earth and stone wall possible modified shake hole. Large iron plate on side of dam may be a partly buried ore waggon.	SE	11139	63592
130	Water leat	SE	11128	63558
131	Dam wall abuts bigger dam	SE	11086	63579
132	Water leat	SE	11133	63532
133	Shaft	SE	11117	63520
134	Pit 2m dia	SE	11115	63518
135	Water leat	SE	11150	63567
136	Water leat	SE	11157	63593
137	Earth and stone bank up to 3m wide 1.5m high	SE	11108	63511
138	Water leat	SE	11279	63563
139	Shaft mound 12m x 16m	SE	11311	63542
140	Holloway fades	SE	11381	63587
141	Ditch and bank system representing old enclosure walls	SE	11439	63387
142	Shaft mound 14m Covenant shaft	SE	11502	63284
143	Shaft mound 20m dia (engine shaft) shaft fenced but not open	SE	11415	63283
144	Ore dressing area	SE	11345	63277
145	Wall foundations, possible bield	SE	11381	63227

146	Shaft mound 22m dia (Marshall's shaft)	SE	11326	63285
147	Ore dressing area	SE	11304	63329
148	Ore dressing area	SE	11278	63285
149	Shaft mound 20m dia (deep shaft)	SE	11262	63284
150	Bank and ditch fades both ends	SE	11179	63411
151	Shaft mound 16m dia	SE	11168	63375
152	Possible shaft	SE	11194	63319
153	Bank probably a dam wall, disturbed	SE	11252	63267
154	Area of ore dressing	SE	11229	63259
155	Water leat fades at both ends	SE	11215	63255
156	Shaft Mound 22m dia (Little Shaft)	SE	11207	63273
157	Shake holes / possible quarries	SE	11191	63298
158	Shaft mound 18m dia (Woodhouse Shaft)	SE	11168	63271
159	Shake hole with water in bottom	SE	11150	63278
160	Possible area of shallow quarrying	SE	11139	63294
161	Possible coe 3m x 3m only footings remain	SE	11131	63283
162	Shake hole with water in bottom	SE	11109	63275
163	Stone and earth causeway 3m wide fades at ends	SE	11129	63377
164	Shaft mound 16m dia	SE	11115	63354
165	Shake hole	SE	11114	63342
166	Shake hole	SE	11121	63338
167	Shake hole	SE	11106	63322
168	Shake hole	SE	11095	63324
169	Shake hole with shaft in bottom	SE	11087	63356
170	Shake hole	SE	11065	63373
171	Possible trial shaft	SE	11066	63401
172	Possible water leat	SE	11049	63368
173	Shaft mound 22m dia	SE	11023	63358
174	Shake hole	SE	11042	63345
175	Trench 2m wide upcast bank on both sides, possible water leat	SE	11064	63326

176	Shake hole / possible dam no water	SE	11055	63305
177	Possible water leat	SE	11054	63282
178	Shaft mound 14m x 24m	SE	11006	63250
179	Shaft mound 26m dia	SE	11038	63251
180	Shaft mound 28m dia	SE	11085	63252
181	Building platform 8m x 5m	SE	11084	63268
182	Small dressing area	SE	10990	63256
183	Shaft mound 14m dia, crossed by boundary wall	SE	10978	63284
184	Ditch / holloway (possible leat) 2-3m wide fades	SE	10985	63346
185	Ditch / holloway (possible leat) 2-3m wide fades	SE	10987	63364
186	Water leat fades	SE	10987	63407
187	Bank possible former boundary	SE	10977	63336
188	Shake hole	SE	10963	63319
189	Shake hole	SE	10958	63312
190	Trench 24m by 1m deep x 2m wide upcast bank on east side	SE	10946	63307
191	Shallow opencut trench 30 x 10m	SE	10939	63282
192	Pit / shake hole 3m dia	SE	10958	63272
193	Pit / shake hole 2m dia	SE	10956	63268
194	Pit / shake hole 2m dia	SE	10952	63263
195	Shaft / shakehole no obvious shaft	SE	10899	63292
196	Opencut trench 26 x 12m	SE	10893	63309
197	Pit / shake hole 3m dia	SE	10898	63323
198	Pit 2m dia	SE	10930	63341
199	Pit 2m dia	SE	10933	63345
200	Pit 2m dia	SE	10941	63345
201	Shaft mound 12m dia	SE	10940	63353
202	Dam 20m x 16m	SE	10954	63365
203	Area of shafts and tip material 90m x 25m. Shafts to close together to have separate tips.	SE	10884	63353
204	Slumped shaft little or no ring mound surviving 6m dia	SE	10895	63346
205	Shaft mound 10m dia	SE	10907	63346

206	Shaft mound 10m dia	SE	10920	63347
207	Shaft mound 16m dia	SE	10932	63368
208	Shaft mound 20m dia	SE	10911	63366
209	Shaft mound 12m dia	SE	10895	63360
210	Shaft	SE	10893	63356
211	Shaft mound 12m	SE	10868	63357
212	Shaft mound 4m dia	SE	10865	63348
213	Shaft / shake hole	SE	10851	63351
214	Shake hole	SE	10838	63385
215	Shake hole	SE	10844	63380
216	Shake hole	SE	10850	63382
217	Pit 2m dia	SE	10876	63388
218	Pit 2m dia	SE	10886	63383
219	Trench 3m x 1m	SE	10886	63378
220	Shake hole	SE	10838	63406
221	Area of shafts and tip material 80m x 14m. Shafts to close together to have separate tips.	SE	10913	63405
222	Shaft mound 8m dia	SE	10953	63392
223	Pit 2m dia	SE	10943	63384
224	Pit 2m dia	SE	10947	63384
225	Pit 2m dia	SE	10955	63382
226	Pit 2m dia	SE	10955	63377
227	Pit 3m dia slight ring mound of spoil	SE	10961	63384
228	Pit 2m dia	SE	10966	63388
229	Flooded shake hole may have been used as a dam	SE	10969	63395
230	Pit 2m dia	SE	10948	63390
231	Pit / shakehole 3m dia	SE	10934	63414
232	Shake hole	SE	10943	63425
233	Curved bank possible shaft mound 12m dia	SE	10962	63426
234	Water leat	SE	10971	63424
235	Area of shafts and tip material 80 x 38m. Shafts to close together to have separate tips.	SE	10936	63461

236	Pit 2m dia	SE	10909	63464
237	Shaft / pit	SE	10914	63461
238	Shaft / pit	SE	10919	63461
239	Shaft / pit	SE	10918	63458
240	Pit 2m dia	SE	10927	63447
241	Pit 2m dia	SE	10938	63445
242	Pit 2m dia	SE	10936	63440
243	Pit 2m dia	SE	10937	63436
244	Shaft mound 6m dia	SE	10946	63455
245	Pit 2m dia	SE	10952	63453
246	Shaft mound	SE	10957	63454
247	Shaft mound 6m dia	SE	10966	63453
248	Shaft mound	SE	10957	63446
249	Pit 2m dia	SE	10961	63438
250	Pit 2m dia	SE	10958	63436
251	Pit 2m dia	SE	10957	63432
252	Pit 2m dia	SE	10955	63430
253	Pit 2m dia	SE	10961	63434
254	Shake hole with sink hole in corner	SE	10892	63474
255	Possible shaft	SE	10845	63428
256	Water leat	SE	10874	63459
257	Shaft mound 8m dia	SE	10875	63472
258	Shaft flooded	SE	10866	63472
259	Area of shafts and tip material 44 x 10m. Shafts to close together to have separate tips.	SE	10852	63477
260	Shaft mound 14m x 8m double shaft	SE	10835	63459
261	Shaft mound 10m dia	SE	10825	63459
262	Water leat	SE	10833	63468
263	Area of ore dressing with evidence of tanks (buddles), crossed by a water leat	SE	10839	63492



Fig.68 Engine Shaft (feature143)



Fig.69 Closely spaced shaft mounds (feature 221)



Fig.70 Closely spaced shaft mounds (feature 221)



Fig.71 Buddles (feature 263)



Fig.72 Buddles (feature 263)



Fig.73 Buddles (feature 263)



Fig.74 Galloway Gulf (feature 54)



Fig.75 Dumped material from fluorspar processing (feature 53)



Fig.76 Dumped material from fluorspar processing (feature 53)

2.12 Forest Moor

Located to the south west of the village, this large area of unenclosed moorland slopes gently down to the Washburn valley. Near the village the vegetation is composed of rough grasses and sedges, with areas of heather covered peat on the slopes running into the valley, which changes to a thick cover of bracken.

The main features are located on the high ground, which marks the watershed between the Washburn and Nidd. These consist of a group of shafts that mainly represent the courses of veins worked on the adjacent Galloway Pasture. Most of the shaft mounds are fairly large, indicating that the ore bodies in this area are located at depth, but there is also a scatter of smaller shaft mounds, which would normally suggest shallow workings. Unlike areas like Galloway Pasture and High View these smaller shaft mounds are not found in compact linear groups. These may therefore represent trial shafts.

The largest shafts (32, 20, 44) are all connected by causeways running from the enclosures near Craven Keld. This would suggest that they may all date from the same period. Feature 20 is a very large but disturbed site representing a shaft mound and ore dressing area. The shaft mound is flat topped and displays evidence of a low circular turf wall adjacent to the slumped shaft. This is the only definite evidence of a horse gin found during the course of this survey.

A separate group of shaft runs up from the Washburn Valley. Their alignment suggests that they may mark the course of a level, however as the lower slope is covered by thick bracken no level was located.

A number of ore dressing areas have been located and these are closely associated with shaft mounds and are generally very disturbed. Two exceptions are features 12 and 40 which both display evidence of tank features suggesting buddling. With feature 12 this is supported by the presence of a water leat (15) and a fragment of a dam (14).

Fragments of water leat in this area suggest that water was collected here and taken onto Galloway Pasture to the east. Feature (23) corresponds with a leat system found in the adjoining enclosure. Leats 15 and 16 appear to represent a more local system associated with ore dressing. These leats pass through an area of dressing activity (12) but it is unclear where they start and where their final destination was, however it would appear that the water was used elsewhere. A small fragment of leat crossing a shaft mound (32) may have been connected with the first stage of ore preparation, washing clay and mud of the ore brought up the shaft.

Little evidence of mining related buildings was found in this area.

The most enigmatic feature discovered in this area is feature 4 which consists of a bank and ditch 1-2m wide, that runs away from the boundary with Galloway Pasture for 110m before turning 90 degrees and running for another 170m before turning 90 degrees again and ending after another 10m. Its purpose is unclear and it appears to be unfinished and

any relationship that it may or may not have with the mining remains is ambiguous. There is no evidence that the feature continues on Galloway Pasture and it is therefore unlikely to predate the enclosure wall, which was in place in the 1760s.

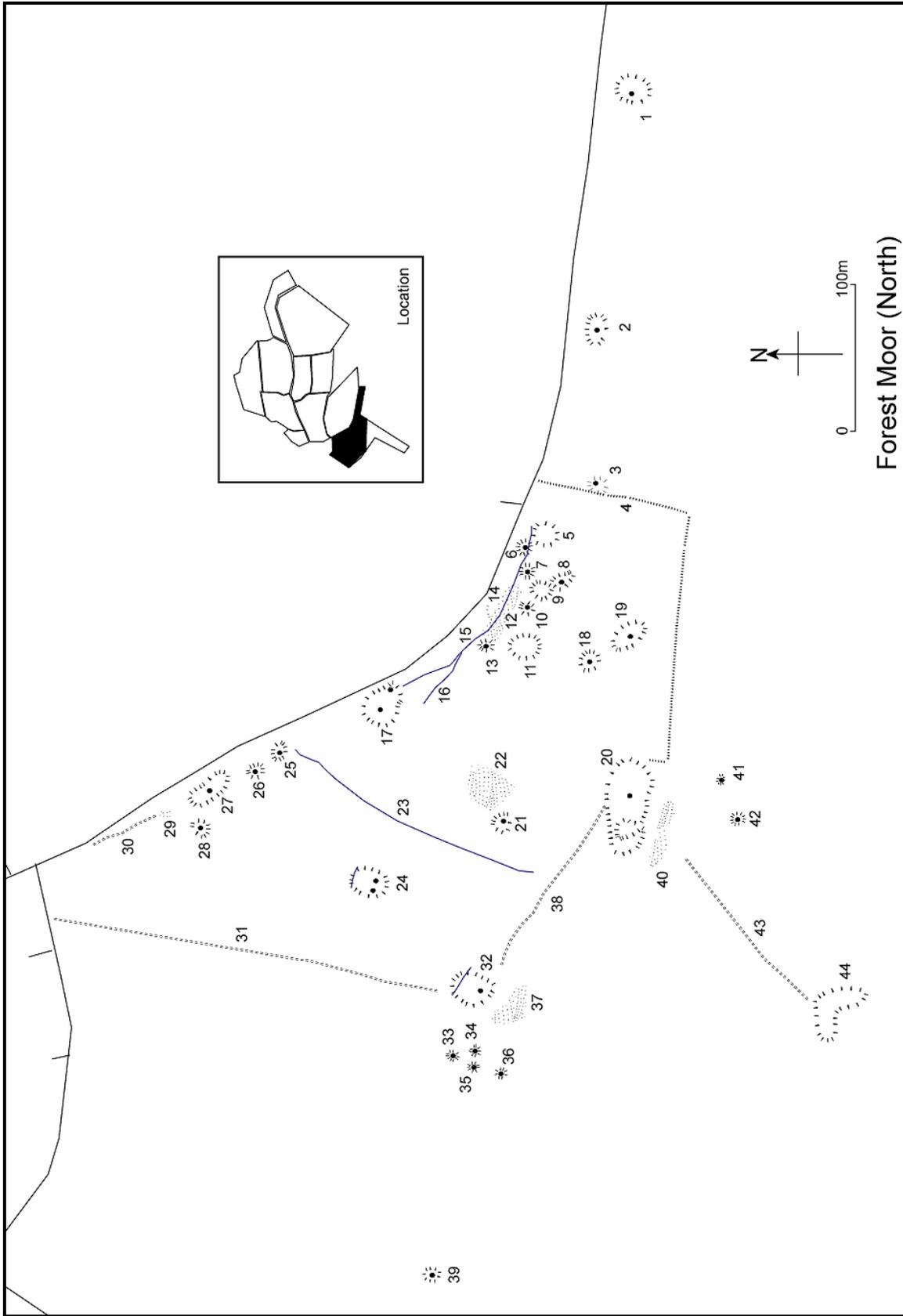


Fig.77 Forest Moor North

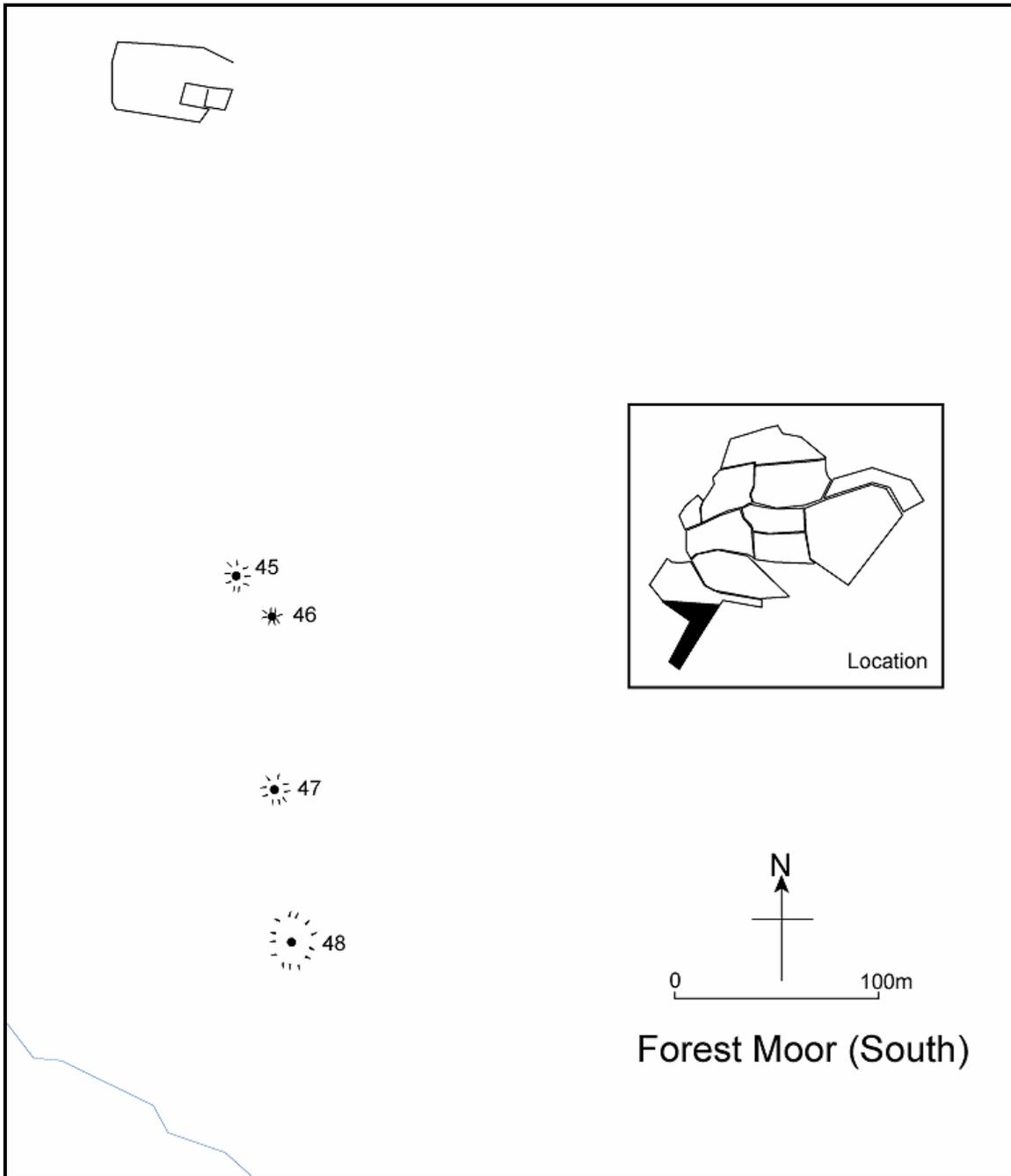


Fig.78 Forest Moor South

Table 11 Forest Moor				
Feature Number	Description	Zone	Easting	Northing
1	Shaft mound 20m dia with shaft in centre	SE	11261	63182
2	Shaft mound 20m x 12m with shaft in centre	SE	11094	63207
3	Shaft mound 10m with shaft in centre	SE	10986	63205
4	Bank and ditch 1-2m wide	SE	10978	63185
5	Shaft mound 20m dia no obvious shaft	SE	10951	63242
6	Shaft mound 10m dia with shaft in centre	SE	10943	63257
7	Shaft mound 10m dia with shaft in centre	SE	10927	63255
8	Shaft mound 10m x 18m	SE	10920	63232
9	Disturbed shaft mound 16m dia no obvious shaft	SE	10913	63245
10	Shaft mound in shake hole	SE	10901	63255
11	Shaft mound 18m dia no obvious shaft	SE	10874	63256
12	Ore dressing area containing fragments of buddles	SE	10895	63271
13	Shaft mound 8m dia	SE	10875	63284
14	Possible fragment of dam wall	SE	10900	63281
15	Water leat	SE	10876	63295
16	Water leat	SE	10850	63314
17	Shaft mound 30m x 24m dia containing two shafts, evidence of a possible bouse teem / structure in side	SE	10834	63354
18	Shaft mound 14m dia	SE	10865	63211
19	Shaft mound 28 x 14m dia	SE	10882	63184
20	Disturbed area 70m x 30m comprising a shaft mound and ore dressing area, evidence of a horse gin circle with a turf wall	SE	10763	63184
21	Shaft mound 12m dia	SE	10752	63271
22	Ore dressing area disturbed	SE	10776	63281
23	Water leat	SE	10757	63350
24	Shaft mound 12m x 20m with main shaft and possible climbing shaft, fragment of leat crosses tip.	SE	10710	63363
25	Shaft mound 14m dia sits on water leat	SE	10801	63426
26	Shaft mound 12m dia	SE	10788	63443

27	Shaft mound 34m x 12m	SE	10773	63474
28	Shaft mound 12m dia	SE	10747	63480
29	Small ore dressing area	SE	10757	63504
30	Causeway	SE	10747	63532
31	Possible track, fades	SE	10665	63459
32	Shaft mound 24m dia, fragment of leat crosses tip	SE	10637	63293
33	Shaft mound 6m dia	SE	10591	63305
34	Shaft mound 6m dia	SE	10593	63290
35	Shaft mound 6m dia	SE	10582	63291
36	Shaft mound 6m dia	SE	10578	63272
37	Area of ore dressing, probably disturbed	SE	10623	63262
38	Causeway	SE	10707	63239
39	Shaft mound 10m dia with shaft in centre	SE	10439	63320
40	Ore dressing area with some evidence of buddles.	SE	10744	63161
41	Shaft mound 6m dia	SE	10782	63120
42	Shaft mound 10m dia	SE	10756	63108
43	Causeway	SE	10674	63103
44	Disturbed area suggesting shaft mound and ore dressing area.	SE	10624	63045
45	Shaft mound 14m dia with shaft in centre - shale on tips	SE	10701	62620
46	Shaft mound 10m dia with shaft in centre	SE	10715	62599
47	Shaft mound 14m dia with shaft in centre	SE	10719	62511
48	Shaft mound 20m dia with shaft in centre	SE	10729	62428



Fig.79 Remains of horse gin circle (feature 20)



Fig.80 Shaft mound (feature 45)



Fig.81 Ditch and bank (feature 4)

Interpretation

3.1 Introduction

The landscape around Greenhow Hill represents a long and complex history of lead mining. It is very difficult to date lead mining features simply from their form, however it is possible to recognise certain themes, which can be used to broadly identify different phases of activity. Unlike some former lead mining areas most of the shaft mounds and spoil heaps at Greenhow are grassed over and this places restrictions on the inferences that can be made from examining the type of waste present on different sites.

3.2 Extraction

Where limestone beds outcrop, veins also outcrop or are very close to the surface. Workings are present as lines of shallow pit features with little / no associated spoil or closely spaced shaft mounds; often so close that the ring mound of spoil from one overlaps with the next. There is evidence that the lines of shallow pits are not pits but the top of backfilled opencut trenches (e.g. fig.51 feature 37), which suggests that any spoil from the excavation was used to backfill the trench on abandonment. One key characteristic of such lines of pits and shafts is that they only affect a narrow strip of ground in which all development and dressing waste is dumped. This suggests that mining was carried out under a form of customary mining law where the ground along each vein is divided into rectangular blocks of ground called meers.

It is thought that meer working was carried out at Greenhow but documentary information is sparse and often inferred rather than proven. An early 19th century plan shows that at that time a meer of 21yards was in use but by then was used to define square blocks of ground. A meer usually consists of a length of ground along a single vein with a space either side known as a quarter cord, which equals $\frac{1}{4}$ of the length of the meer. In the case of a 21yard meer the quarter cord would therefore be 5.25 yards either side of the vein or a total width of 10.5 yards. Grants usually consist of blocks of meers and once established the position of meers remain even if the ownership changes (Gill 2000). Surviving mining laws from elsewhere suggest that miners were expected to confine all their activities within the quarter cord and were allowed to use this ground to stack their waste, dress ore, and construct buildings. Recent work at Grassington where the working of meers is well documented and sets of customary mining laws survive, has shown that this is probably the case even when not specifically mentioned in the laws (Roe 2003).

Meer working is known to have been practiced from the medieval period and at Greenhow a legal document from 1225 refers to “exploring” a pit “to the bounds of the mine”(Gill 1998). This suggests another custom of chasing or proving the vein along the length of one meer before moving on to another. This explains the close spacing of shafts and pits. Further evidence of a customary form of mining survives in the form of place name evidence. Prim-Gap was formerly the name for High View Farm, and is now the name of the property across the road, both of which are close to the Prim Gap Vein. A Prim Gap is “a length of vein less than half a meer between two mine titles or separate

jurisdictions” (Rieuwerts 1998) . The boundaries of meer grants were often marked by stones bearing the initials of the owners but no such stones have been found in the course of this survey.

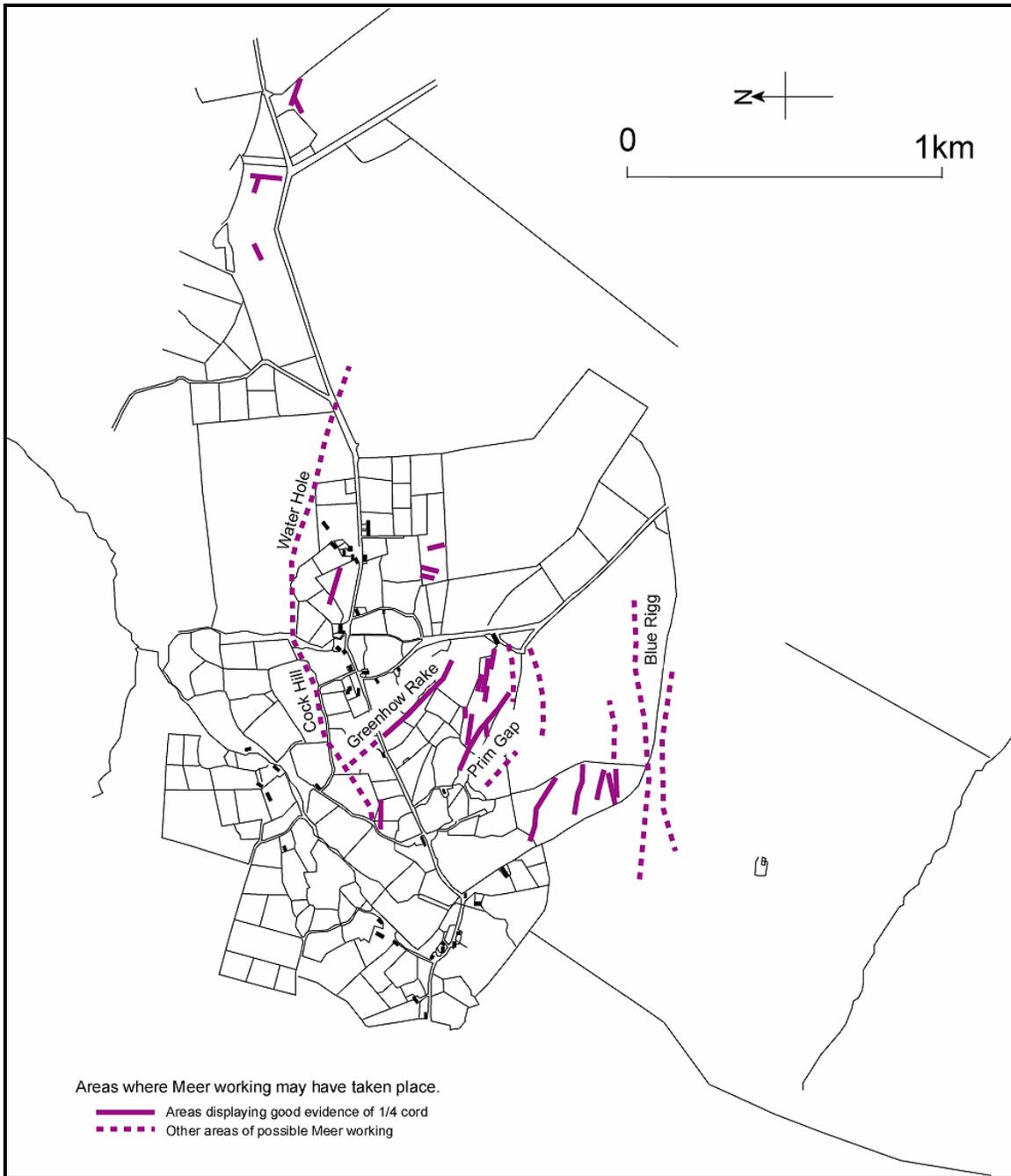


Fig.82 Areas showing evidence of meer working

Along the Cockhill / Water Hole Vein system and on Blue Rigg Vein a slightly different arrangement of shafts is present. Here the alignment of the shafts still marks the line of the veins and activity is confined to a narrow strip of ground, however this strip is wider than a standard quarter cord. This may indicate that the shafts were initially sunk during a

period when meer working was still in use. The wider spacing of the shafts suggests that the veins probably do not outcrop and that deeper shaft were required to reach the ore bodies and so evidence of chasing the vein along a meer length is not present at the surface. Evidence from elsewhere in the Yorkshire Dales suggests that even when customary mining law was abandoned the meer was retained to define the length of a mining grant but the quarter cord was expanded sideways. Although no longer required the miners custom of confining tip material and ore dressing to a narrow strip of ground appears to continue.

These veins have been worked to a considerable depth from the shafts and in the case of the Cockhill / Water Hole Veins at a later date from levels. Before the driving of the Cockhill and Gillfield levels the shafts may have been deepened which would have resulted in an enlarging of the shaft mounds. It is probable that both the Sam Oon Level (fig.25 feature 40) and Jackass Level (fig.40 feature 5) were driven to drain the ground worked by the shafts and both levels acted as adits only. Both levels have in the past been considered as ancient, possibly medieval or even Roman. This has since been challenged and although Sam Oon Level is still undated Jackass Level has been shown to date from the 1740s (Gill 1998). At the end of the 18th century Sand Beck was the boundary between Cockhill Mine and Sunside Mine. Jackass drains the workings of Sunside and Sam Oon, Cockhill. This relationship suggests that this boundary may be earlier and the levels may be broadly contemporary with it and their driving could have been the catalyst, which led to the deepening of the shafts. The Cockhill and Gillfield Levels (fig.40 features 25 & 17) were driven in the 1780s initially to the Cockhill and Water Hole Veins but both were continued so that they eventually drained most of the veins under the village. These levels were driven as horse levels and equipped with rails to enable ore mainly from stopes above the levels to be taken directly to mechanised dressing floors adjacent to smelt mills.

Level	Approximate height of entrance AOD		Approximate depth at Cockhill / Water Hole Vein	
Gillfield	900ft	274.32m	350ft	106.68m
Cockhill	950ft	289.56m	300ft	91.44m
Jack Ass	1000ft	304.80m	250ft	76.2m
Sam Oon	1150ft	350.52m	100ft	30.48m

Table 12. Heights above sea level and depths of levels.

Both Cockhill and Gillfield levels were used during twentieth century fluorspar mining operations, but as this activity took place underground it has had little discernable affect on the surface archaeology. The situation is different on Greenhow Hill and Galloway Pasture. Greenhow Rake Vein, which runs over the summit of Greenhow Hill has been worked by both shafts and open cuts (fig.51). The form of the open cuts strongly suggests 20th century working both on the north side of the hill and where the vein crosses Duck Street Quarry. On Galloway Pasture, Galloway Gulf (fig.65 feature 54) represents a shakehole excavated in the early 1960s (Gill 1998).

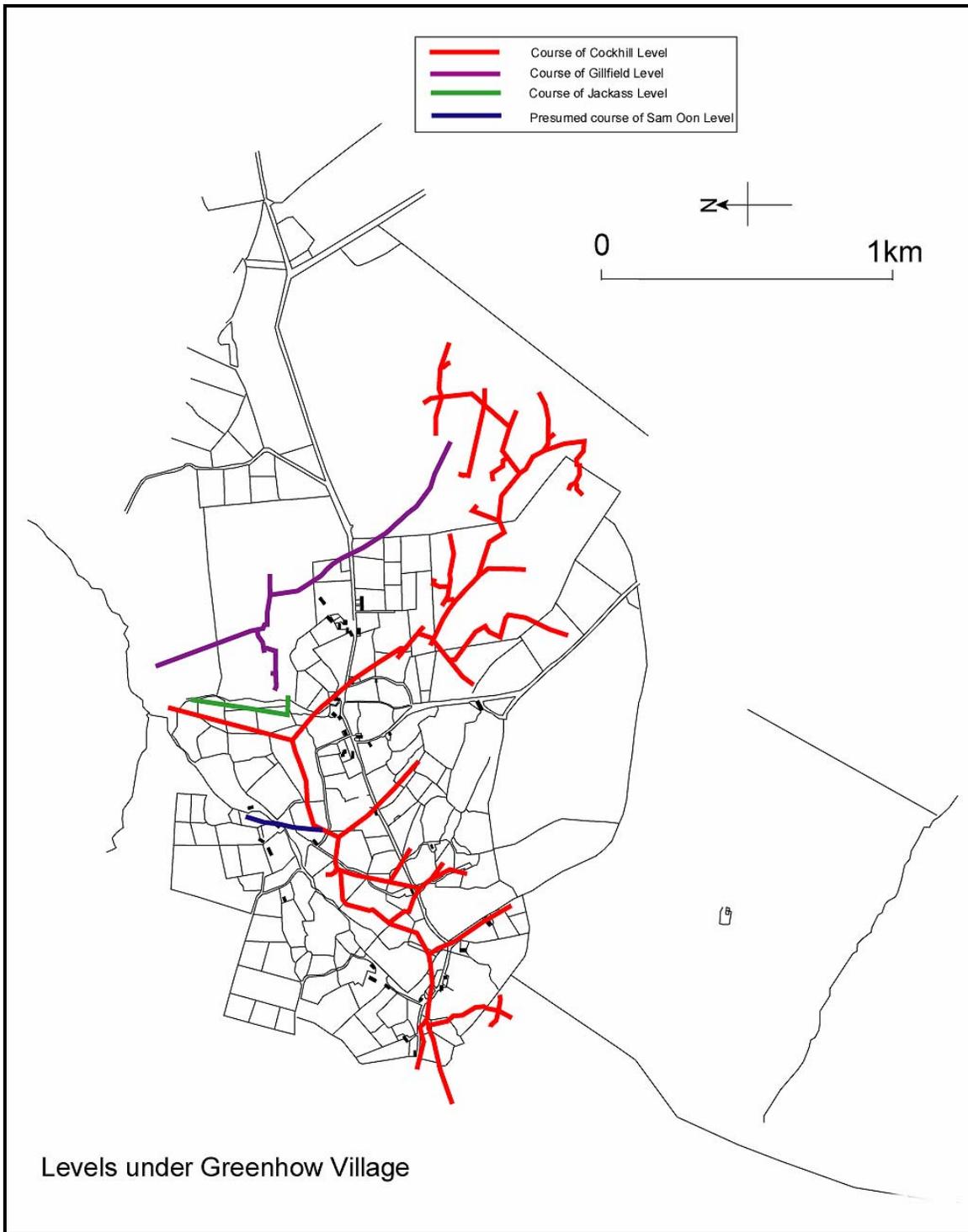


Fig. 83 Levels under Greenhow Village (principal levels only) (after Gill 1998)

3.2.1 Shaft Haulage

Although most of the smaller shafts would have used a simple roller for haulage, many of the larger shaft mounds include the element “engine” or “gin” in their name. This indicates that they had horse powered winding engines, however the diagnostic flat topped shaft mound with an off centre shaft usually associated with gins is rarely present and only one example was found with the classic stone or turf wall defining the horse walk (fig.77 feature 20). This leads to several possibilities; firstly as most of the shafts are present as a large slumped feature all traces of a gin may have disappeared. Secondly, and perhaps more realistically, as many of the shafts appear to be almost in the centre of the shaft mound it is possible that rather than a “whim gin” many of the shaft may have used the older style cog and rung gin.

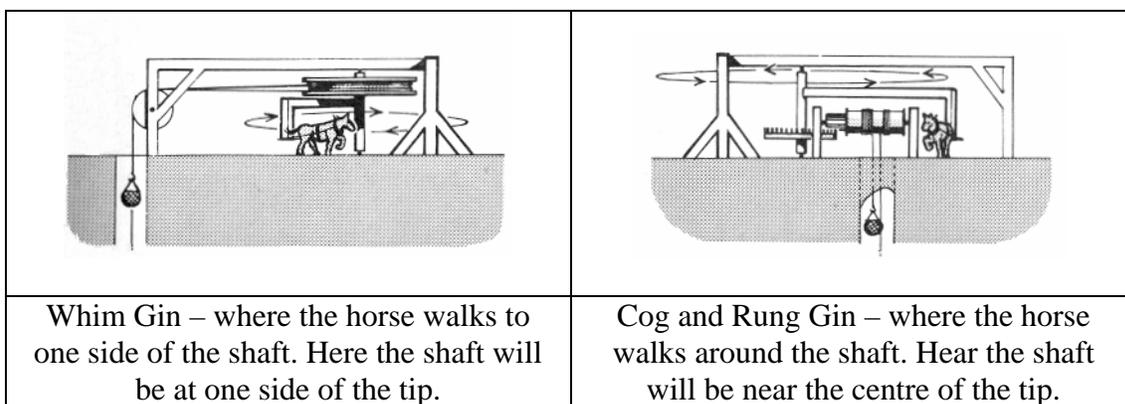


Fig.84 Horse Gin Typology (Cossons 1975)

3.3 Ore Dressing

Ore dressing activity has been more difficult to identify and categorise due to sites being grassed over. In areas where meer working can be identified the remains of ore dressing would have been confined to the quarter cord and is currently archaeologically invisible, however detailed earthwork survey may help separate heaps of development waste / shaft mound material from ore dressing waste. In other areas distinct zones of ore dressing have been identified, usually closely related to large shaft mounds. These all show evidence of disturbance, which has removed all traces of the original equipment and organisation of the dressing process.

At a few isolated sites evidence of small ore dressing areas known as “knocking floors” have been found. These are in the form of usually square flat areas approximately 2m across with evidence of a small stone kerb around three sides. One feature that has been described as a medieval “crushing mortar” is the Panty Oon Stone (fig.26 feature39). Making assumptions that this was used for ore dressing are without grounds and further investigation may reveal another more plausible explanation. It is unlikely that medieval miners would want to crush ore so finely as without the aid of sophisticated buddles, and smelting techniques, fine crushing is a very wasteful method of ore dressing. Around the

stone is evidence that a course-grained gritstone has been quarried. It may be possible that the site has been used to crush this stone to make sand.

Adjacent to Cockhill Level (fig. 40) are the remains of a dressing floor which includes the ruins of a range of bouse teams and a water wheel case, suggesting the location of a water powered ore crusher. A flat area nearby suggests the location of further ore dressing plant. The layout of this site is typical of late 18th-19th century mechanised dressing floor. There should be evidence of a similar layout at Gillfield Level, but this has not survived. It is apparent that this site has been much disturbed, most recently when a large section of the spoil heap was removed for road repairs.

The disturbance of ore dressing areas throughout the village is indicative of operations to recover discarded lead ore, fluorspar and barites. The recovery of lead ore at Greenhow is documented from the later part of the 18th century when waste redressing was leased separately to mining. These operations appear to have left considerable remains particularly at North Coldstones (fig.17 & 18) where waste dressers were active in the 1780. These activities led to damage to various watercourses plus the construction of new leats and dams. Sludge from these operations was allowed to run into several shafts and causing them to collapse, disrupting the miners working in Gillfield Level (Gill 1998). These areas, which are not associated with shafts or levels, are represented by low-lying complex earthworks, usually served by leats and close to dams. Very little identifiable structure is present in these areas but at a number of locations simple buddles have been found (e.g. fig.18 feature 11, fig.36 feature 43, fig.67 feature 263). These are commonly sets of small-interconnected sub-rectangular tanks up to 2m across, usually closely associated with water leats. These buddles are very rare survivors and as such should be considered as suitable for statutory protection.

The mining and recovery of gangue minerals such as fluorspar and barites began in the 1920s and continued at a small scale for around 50 years. Close to Galloway Gulf are numerous piles of waste from the processing of fluorspar and barites (fig.65 feature 53). This waste was not produced at Greenhow but at the Dales Chemical Company plant at Grassington which operated between 1957 and 1964, and was supplied with material from Greenhow from 1962 (Gill 1998). The Duke of Devonshire was not happy about waste produced from the processing of the Greenhow mineral being dumped at Grassington and so returning wagons brought it back to Galloway Pasture (pers com Mr Colin Shepherd). Each pile of material therefore represents one lorry load. Further dumps of fine clay spoil are found on Galloway Moss and these mark the location of small scale reprocessing operations (fig.9 feature 35). Very little remains, other than a concrete engine mounting and a fragment of wall, of a gravity mill (fig.40 feature 15) built close to the Cockhill Smelt Mill around 1933 by the Caldbeck Mining Company who worked underground in both Cockhill and Gillfield levels.

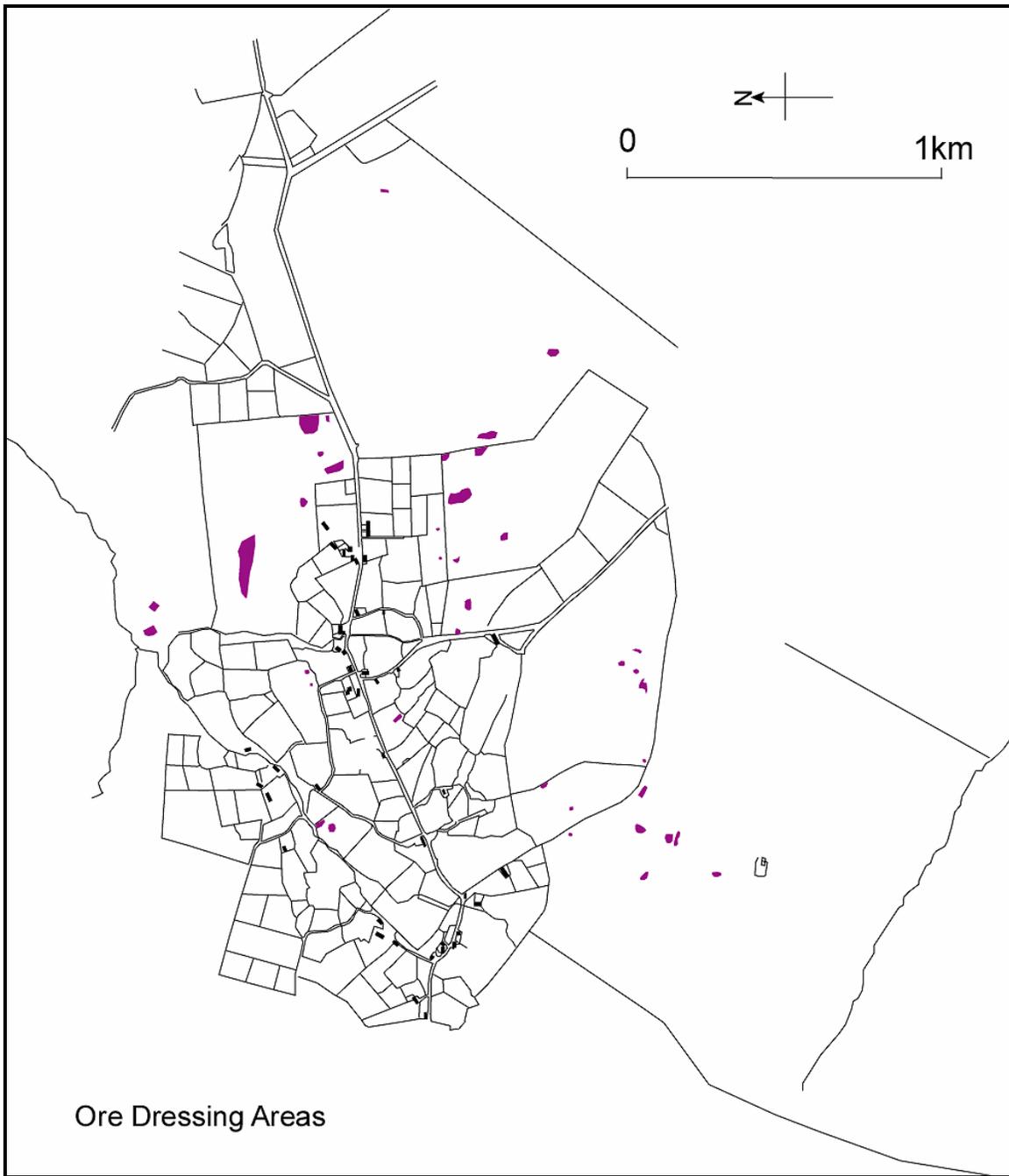


Fig.85 Ore dressing areas

3.4 Smelting

Three smelt mills are located in the Cockhill area and two, Cockhill (fig.40 feature 14) and Providence (fig.40 feature 33), have previously been recorded and interpreted. The third Gillfield mill (fig.40 feature 10) has not but sufficient structure of this small mill survives to allow a basic interpretation of the buildings layout, although some clearance of vegetation may be required. All three mills have surviving evidence of water supply to power a waterwheel.

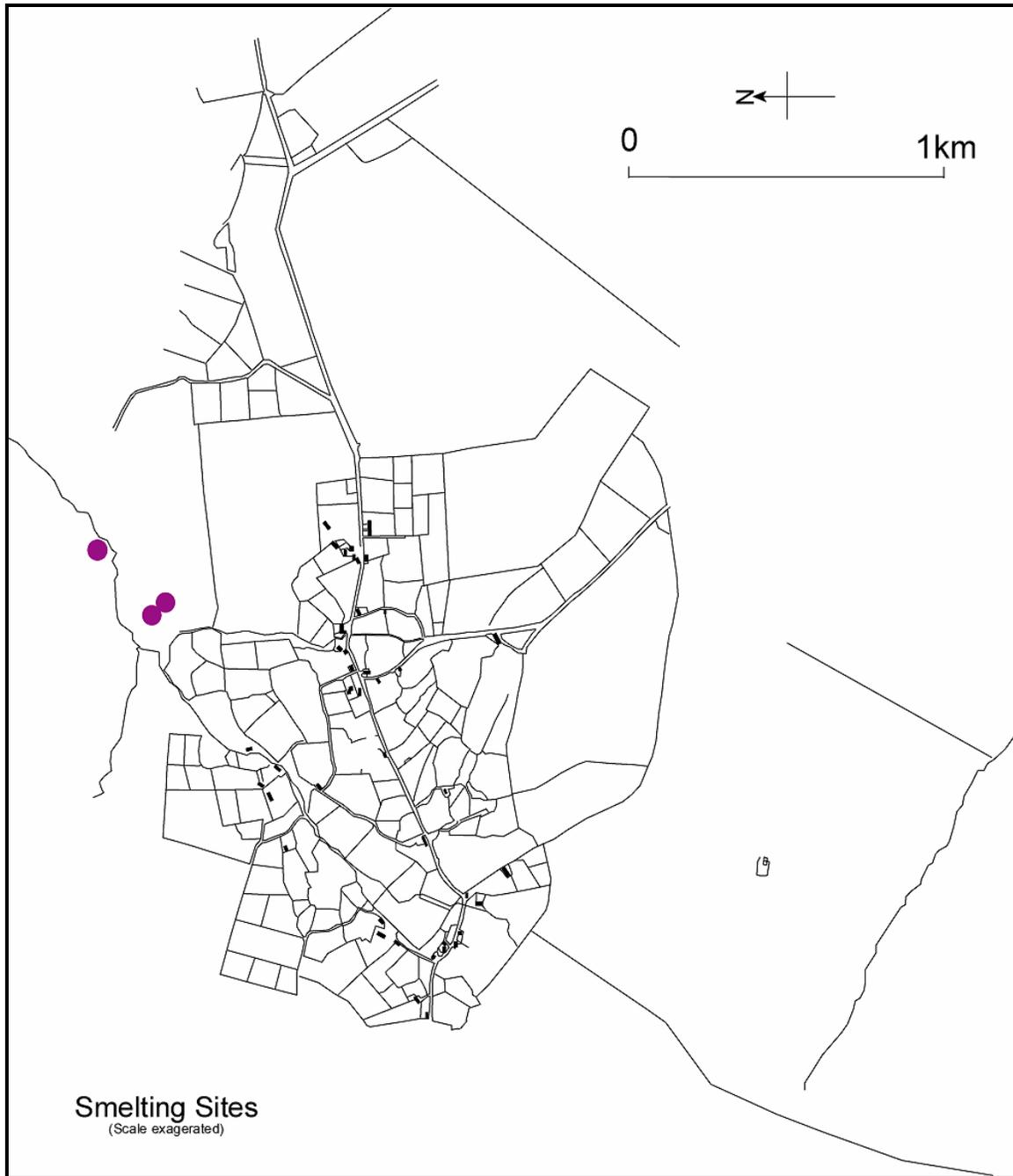


Fig.86 Smelting sites

Evidence of earlier bale smelting has not been found during the course of this survey. As the survey has concentrated on the areas where extraction and ore dressing have taken place the evidence of early smelting which is often very ephemeral may have been missed.

3.5 Water management

Perhaps the most significant discovery made during this survey was the complex water management features. Although now fragmentary, enough evidence survives to suggest that water was collected, stored and brought to a number of ore processing sites.

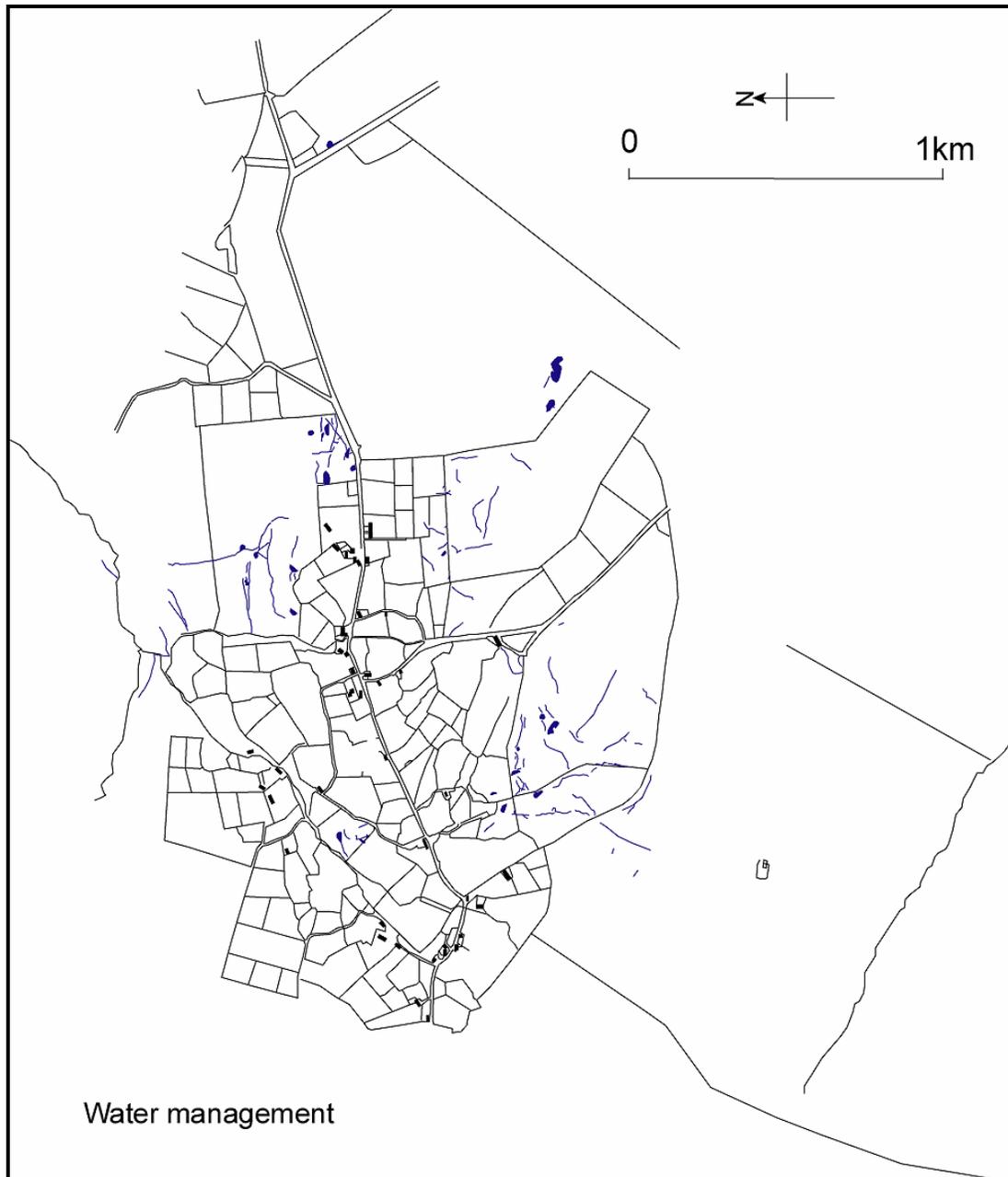


Fig.87 Water management features

3.6 Buildings and Miscellaneous features

The remains of nineteen mining related buildings have been found, of which eleven are located in the Cockhill area. Two buildings (fig.51 features 121 & 189) are in the style of a traditional miners coe which are usually associated with meer working. Such buildings are unusual in the Yorkshire Dales and therefore highly significant.

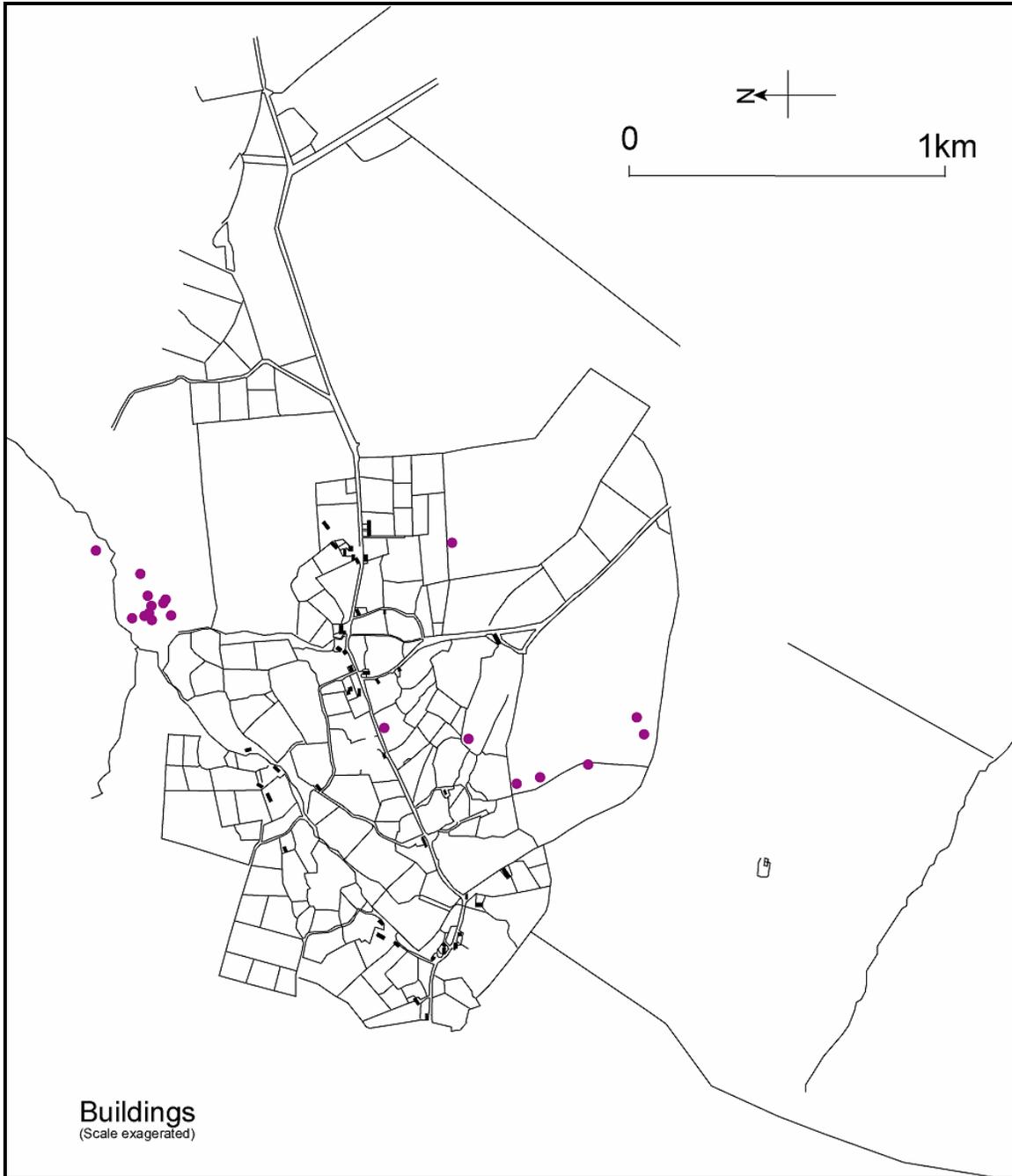


Fig.88 Buildings

A number of trackways and holloways have been identified and recorded. The significance of these features will require further study, but there are interesting relationships between the tracks and mining and quarrying activities. A study of other tracks may give clues to the development of the village.

Quarrying is an activity, that exerts a strong visual impact on the modern village and the active Coldstones quarry become a major landscape feature. This survey has found evidence that both gritstone and limestone have been extensively quarried at a small scale

right around the village and although it may not have had the same impact on the historic development of the village as lead mining, it has been significant and would benefit from further study.

3.7 Recommendations for future work

1. During the course of conducting this survey and speaking to the landowners and residents of Greenhow Hill it is clear that some are not aware of the historic significance of mining features in the village and how to best to manage their land and at the same time respect the archaeology. Even the more informed landowners would benefit for some guidance about good land management practice. It is clear that many areas of mining remains have been destroyed without record. A comparison with previous desktop mapping and air photographs in the NMRS records show that a large area of workings comparable to those recorded at High View existed on Coldstones Hill and have now been quarried away. The section of Greenhow Rake Vein north of the main road has been filled and shafts here and at Farside have been flattened. A number of shaft mounds have also disappeared from North Coldstones and the Village Centre areas. The most important recommendation that this report can make is that an information leaflet should be produced for distribution throughout the village giving guidance about living in an historic landscape.
2. A number of areas would benefit from more detailed survey work. Detailed survey of areas indicating meer working should produce evidence of ore dressing in these areas, which will help to understand how the veins were divided up into individual mining grants. The areas where waste redressing has been indicated may show how these operations were organised and the type of technology employed. Of particular importance are the remains of buddles. A detailed archaeological survey of the Cockhill area will help in the understanding of the organisation of this area in the 19th century and how this changed during the 20th century. A simple levelled survey of the mapped water leats will help to prove which direction the water was flowing and an examination of the junctions between leats may show alterations, which would suggest the relocation of dressing activities.
3. Any further survey work should also consider the recording of any accessible underground workings. Most of the levels are open and offer potential for underground recording, particularly Gillfield Level, which is leased by Leeds University and gives access to workings on the Waterhole Vein. Two open shafts on Greenhow Moss, which may be fenced or capped by the farmer due to worries over liability when open access takes effect, should be recorded before such work takes place. Chimney Shaft at Farside is currently capped but gives access to an underground boiler house, which was recorded by NMRS members in the 1970s, but which may benefit from resurveying. Stopped ground exposed in Duck Street Quarry indicates the presence of pre-gunpowder workings and offers a rare recording opportunity.

4. Most of the remaining structures in the Cockhill area would benefit from some consolidation work to slow down their rate of decay and at the same time stabilise structures, which may be perceived as a danger to the public.
5. Currently there are only four scheduled sites in the survey area. Providence Smelt Mill, the area around the Panty Oon Stone, the entrance to Jackass Level, and Toft Gate lime kiln. Cockhill and Gillfield dressing floors and smelt mills have a strong group value and should be considered for statutory protection to protect both the remaining fragments of buildings and the spoil heaps. The areas of possible meer working particularly those on the south side of Greenhow Hill where the veins outcrop in the limestone probably represent the earliest surviving working in the village and are likely to contain evidence of medieval, and possibly pre-medieval mining. Again the group value of these working is important. The miners coe's found at High View should also be considered due to their rarity. Finally the buddles found at Coldstones Quarry, Galloway Pasture, North Coldstones and Prim Gap are all rare survivors of fragile structures and as such worthy of statutory protection.

Bibliography

Cossons, N. (1975). The BP Book of Industrial Archaeology. Newton Abbot, David and Charles.

Cranstone, D. (1992). Monument Protection Programme: The Lead Industry, Step 1 Report., English Heritage.

Cranstone, D. (1994). Early Surface Features of Metal mining: Towards a Typology. Mining Before Powder, Historical Metallurgy Society.

Dunham, K. C. and A. A. Wilson (1985). Geology of the Northern Pennine Orefield, Volume 2, Stanmore to Craven. London, British Geological Survey & HMSO.

Gill, M. C. (1988). "Yorkshire Lead Mining -before 1700." British Mining No.37: pp.46-62.

Gill, M. C. (1998). The Greenhow Mines. Keighley, Northern Mines Research Society.

Gill, M. C. (2000). "Recreating Mining Landscapes." British Mining no.67: p.44-51.

Rieuwerts, J. H. (1998). A Glossary of Derbyshire Lead Mining Terms. Matlock Bath, Peak District Mines Historical Society.

Roe, M. (2003). "Lead Mining Archaeology in the Yorkshire Dales." Landscapes 4 Number 1(Spring 2003): 65 - 78.

Appendix 1

List of Components Used For GPS Surveys

This list of components has been compiled from the Monument Protection Programme Lead Industry Step 1 Report (Cranstone 1992 P.15-21); a later paper by Cranstone (1994) and the authors personal experience surveying similar sites. These component descriptions can be enhanced with additional text to produce a more descriptive record of features. Note not all the components listed were present in the survey area.

Prospection and Trial Features

Prospection and trial features can be difficult to identify in the field, as they are similar to extraction features. Where suspected an additional comment was added to the component description to indicate that it may be a prospection or trail feature.

Extraction Features

Adit – Horizontal tunnel into the mine where primary role is drainage, often of a smaller size than a Haulage Level, but occasionally of large dimensions.

Dead Heap – tip composed of development waste produced when sinking a shaft. May be a simple ring of material tipped around the shaft or may display more complex characteristics indicating the use of single wheeled barrows or waggons run on rails. Occasionally the morphology may suggest tipping from handbarrows or buckets. Predominantly composed of sterile rock with no evidence of mineral.

Gin shaft - Larger shaft tips may have a flat circular area offset from the shaft, which indicates the use of a horse powered winding engine or Horse Whim (aka Gin). Can have a stone walled or turf and stone enclosure around the gin circle. Here the term Gin Shaft can be used.

Haulage Level – Horizontal tunnel into the mine equipped with rails and large enough for the use of horses for the haulage of materials and ore (hence the alternative term of **Horse Level**). Later examples may have worked with locomotives. **Haulage Levels** often also serve as adits draining workings.

Hush – groove in a hillside scoured in part by the application of water. May be used for prospection, to investigate or work a mineral vein. In the latter case hushes often resemble linear quarries.

Opencut – Trench feature, which penetrates bedrock and displays evidence of mineral working, may display evidence of earlier working from shafts.

Pit - superficial excavation, which usually do not continue into bedrock, square, rectangular or round with little or no upcast of spoil.

Pit/trench – feature having the properties of both a pit and a trench. Usually rectangular but not long enough to be definitely identified as a trench.

Shaft – vertical entrance into the ground usually surrounded by a tip of waste material produced as it is sunk (development waste or deads see also dead heap). This can be a simple ring around the shaft in which case the term **Shaft Mound** is used. Larger shaft tips may have a flat circular area offset from the shaft, which indicates the use of a horse powered winding engine or Horse Whim (aka Gin). Here the term **Gin Shaft** can be used. Occasionally the remains of a steam engine may be present near the shaft. Note the term **Bell Pit** is to be avoided as it is not considered a suitable term to use on metal mining sites. The term has sometimes been replaced with **Shallow Shaft** but this description is equally misleading.

Shaft / Opencut - feature which appears to be several shafts very close together running one into the other, may in reality be an opencut worked a separate cells each with different floor levels

Trench – linear excavation whose length greatly exceeds its width possibly with upcast of spoil on one or both sides of the trench, this term is only used for superficial excavation, which usually do not continue into bedrock (see also **opencut**).

Ore Dressing Features

Bouse Teem – Stone built ore storage bunker usually located on a dressing floor. This is where ore is stored prior to dressing. Note in the North Pennines the term **Bingstead** is also used but in the Yorkshire Dales this term only appears to be used for storage areas at smelting sites for the storage of dressed ore.

Buddle – area for washing ore and separating lighter waste from heavier ore. These can be a variety of different shapes. Early types present as slight earthworks resembling small tanks with a V notch marking the outlet. Often present as a shallow trench feature, which can have a stepped bottom, which altered the speed of the flow of water. Can sometimes flare from one end to another. Later types can be circular. Buddles often have an associated water leat and are usually filled with fine sediment, which is diagnostic.

Crusher – Mechanised device for crushing ore. Types include **roller** and **jaw** and can be powered by water, steam or other power sources.

Dressing area – ore preparation area. Often displays several different grades of mineral spoil indicating crushing and washing activities, which can be difficult to diagnose if grassed over. May have evidence of paved areas, buddles and other washing apparatus, larger area than a **Knocking Floor** and usually without evidence of a **knockstone**. Pre

19th century examples are often more amorphous comprised of areas of ill-defined earthworks. Can be disturbed by reprocessing operations. Usually served by water leats and may have associated dams. Relationship with extraction site can indicate if a primary dressing site or a **Waste Dressing Site**.

Knocking Floor – small discrete dressing area consisting of a **knocking stone** surrounded by an areas of crushed dressing waste often displaying several grades of spoil. Usually survives as a small area of roughly bedded stone missing the flat “anvil” stone which sat on top.

Knocking stone – flat stone used as an anvil when crushing ore by hand. Often survive as a low rubble platform with the top stone missing.

Waste Dressing Site – ore dressing site used to dress discarded dressing waste. Usually not directly associated with extraction sites. Early examples display evidence of manual handling of material, where as 20th century examples show signs of mechanical handling.

Miscellaneous Features

Building – structure more substantial than a coe, usually multi-celled often not directly associated with excavation features. Can be associated with dressing activities.

Coe – small usually single celled building found closely associated with excavation features. Can be to one side of a vein or built over a shaft, often square and just big enough to store a few tools or a small amount of dressed ore.

Dam – enclosure for storing water. Often associated with water leats.

Explosive store – Small building usually substantially built usually placed on the edge of a site. Usually contains no windows and door may face away from site.

Leat – see water leat.

Meerstone – boundary stone marking out the area of a mining lease. May have initials and numbers.

Water leat – small ditch feature to carry water. May be substantial and stone lined but usually very ephemeral.

Wheel Pit – Pit housing a water wheel.

Addendum - the following corrected maps include shafts missed from the original survey, position estimated from vertical air photograph.

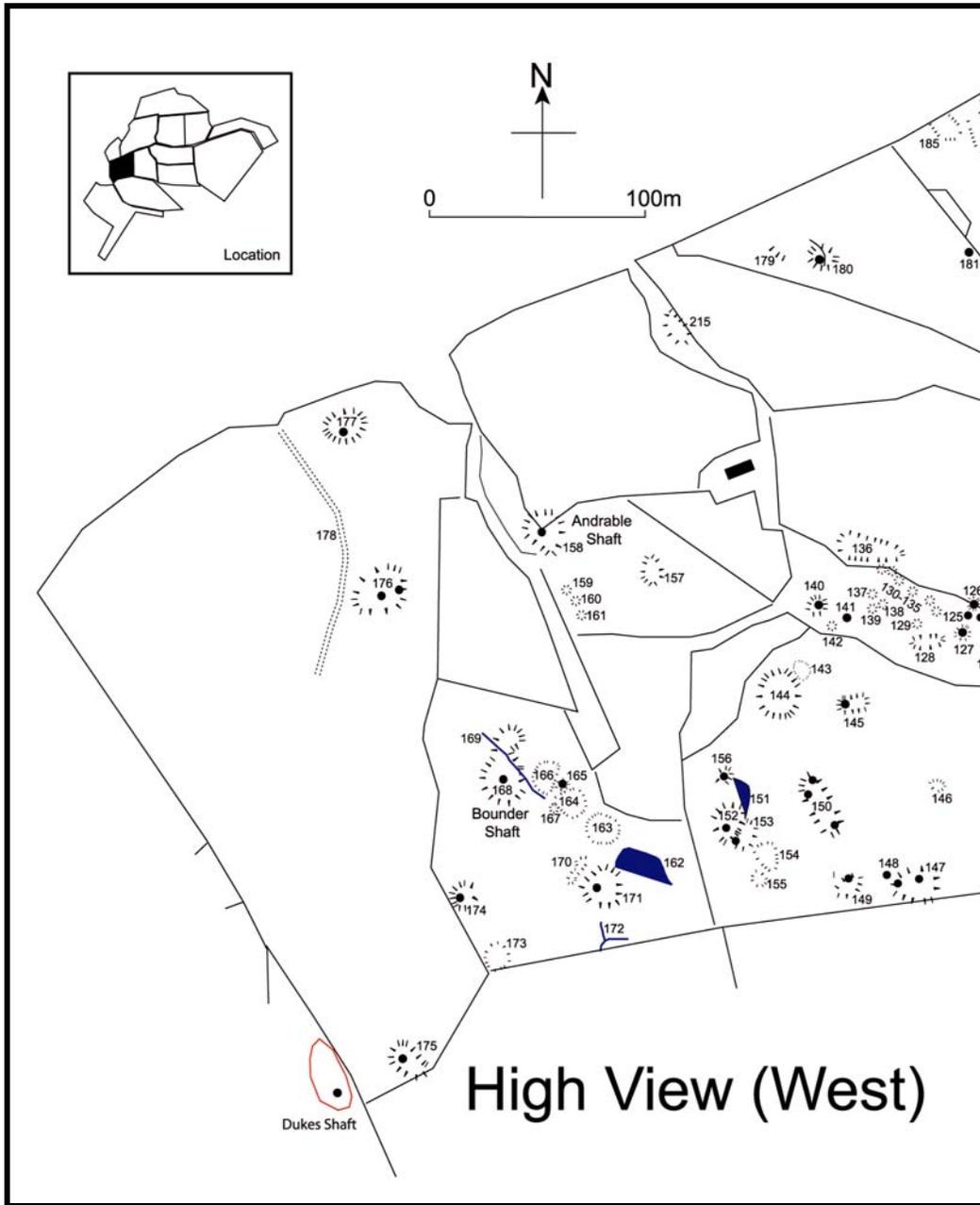


Fig.89 High View West

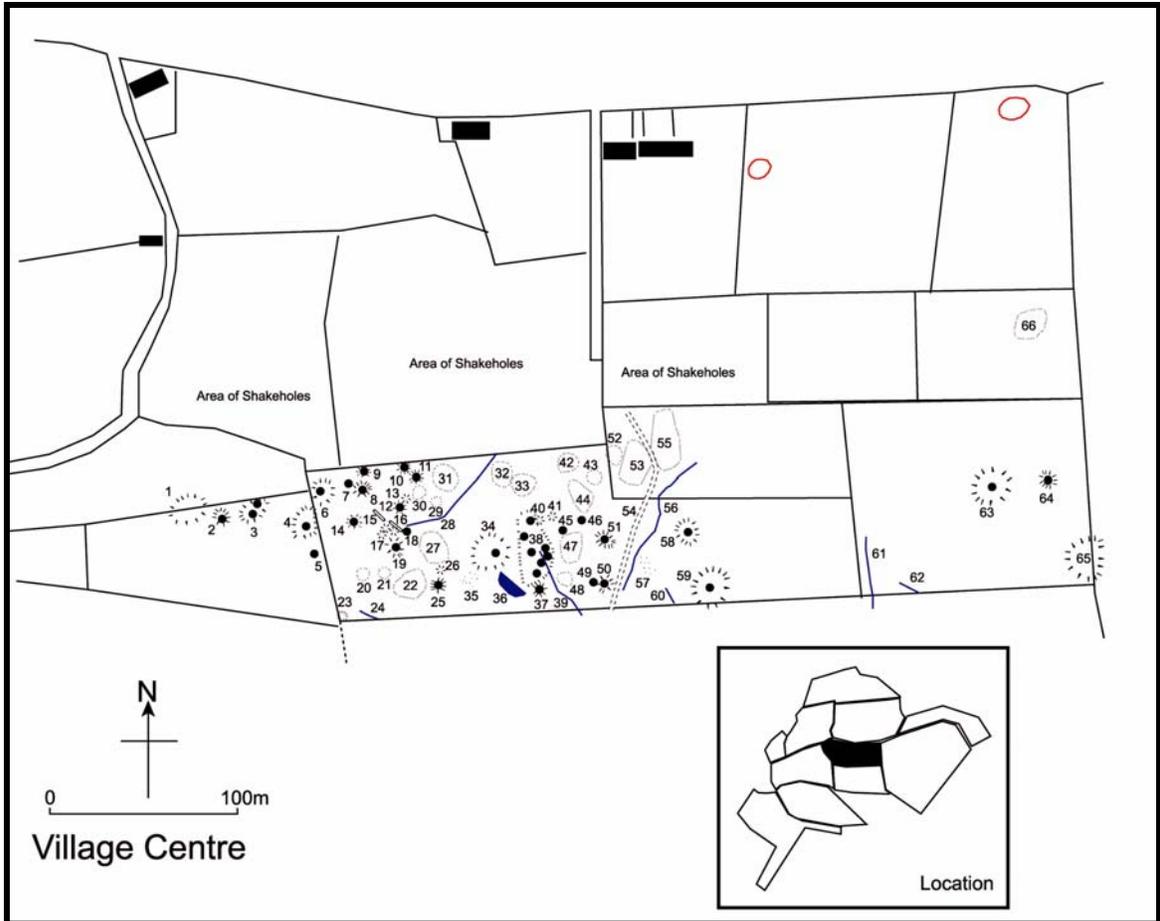


Fig. 90 Village Centre