

RETAINING WALL, OLD GANG SMELT MILL,
SWALEDALE, NORTH YORKSHIRE

ARCHAEOLOGICAL RECORDING

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EXECUTIVE SUMMARY

In June 2011, Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by Mr Robert White, Senior Historic Environment Officer of the Yorkshire Dales National Park Authority (YDNPA) to undertake a programme of archaeological recording prior to repairs to a retaining wall forming part of the Old Gang Lead Smelt Mill complex in Swaledale, North Yorkshire. The retaining wall stands on the south side of the main trackway running through the area, which is used as a public footpath and bridleway, and also provides agricultural and shooting access.

Although limited in extent, the archaeological recording has identified a number of features not covered by a previous 1991 survey, and has raised a number of issues regarding the retaining wall and adjacent early 19th-century dressing floor that might, for example, be confirmed by further documentary research. In the absence of any artefacts, a relative chronology can be suggested for the retaining wall, although it is difficult to put even approximate dates on any of these phases.

The current survey has also identified a number of fragmentary flagstone and timber structures, as well as leats, within the dressing floor area, concentrated to the south and south-east of a waterwheel pit. It is probable that these represent the remains of structures which dressed varying grades of material after it had passed through the crushers. The fine nature of much of the dressing waste means that continuing erosion resulting from rainfall and water flow is likely, and so more information relating to these structures will continue to be exposed over time. However, the proposed repairs to the retaining wall should help to limit run off onto the sensitive parts of the complex, for example limestone chippings from recent track repairs are starting to spread over parts of the dressing floor and bouse teams.

1 INTRODUCTION

- 1.1 In June 2011, Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by Mr Robert White, Senior Historic Environment Officer of the Yorkshire Dales National Park Authority (YDNPA) to undertake a programme of archaeological recording prior to repairs to a retaining wall which forms part of the Old Gang Lead Smelt Mill complex in Swaledale, North Yorkshire (NGR NY 9730 0055). The scope of the work was not defined by a formal project design but was determined following discussions between EDAS and the Senior Historic Environment Officer of the YDNPA.

2 SITE LOCATION AND DESCRIPTION

- 2.1 The Old Gang Smelt Mill is situated on a terrace to the north of Mill Gill, a tributary of the river Swale, c.6.5km to the west of Reeth (see figure 1). Features relating to mining, ore dressing and smelting processes lie on both north and south sides of the beck.
- 2.2 The smelt mill complex consists of the Upper and Lower Mills (see figure 2). The Upper Mill, also known in documents as the New Mill, was built some time before 1770. It started smelting in late January 1797 and had two ore hearths with arched canopies which initially vented directly into a central chimney over them. This system was later replaced by a flue which extended to a chimney on Healaugh Crag, 686m to the north and involving a climb of over 150m above the mill.
- 2.3 The Lower Mill, or Old Gang Mill, was constructed in c.1846 between the Upper Mill and the Mill Gill, and incorporated the existing flue system. This complex worked until at least 1888 and, after the furnace arches had been removed, the site was reused to house machinery for reprocessing the waste tips. The Old Gang Mill was built as a direct replacement for the New Mill, and it uses the same flue system which meant that production was not severely disrupted during the transition. The complex of structures on the site includes the east-west aligned mill building itself, measuring 24m long by 10m wide, which housed four ore hearths; the remains of the masonry hoods still survive above the hearths. The remains of a wheelpit for a 24ft diameter waterwheel used to power the bellows mechanism survive in the west end. A small building to the east, measuring 6m wide and 7m long, housed a slag hearth and is connected to a separate flue. Another building to the east was known as the Silver House – this contains a large chimney in the north wall and was probably the assay house, although it could also have housed a small reverberatory furnace used for softening the smelted lead. Other structures were used for equipment, offices and ore storage (Gill 1992, 121-122; Gill 2004, 91-97).
- 2.4 The section of retaining wall forming the subject of the archaeological recording lies c.130m to the west of the main smelt mill complex, and is c.30m in length. The wall follows a north-west/south-east alignment along the south side of the main trackway which passes through the complex. The trackway now carries the long distance Coast to Coast footpath and is a heavily used vehicular route to Reeth High Moor and the Reeth Estate shooting hut, as well as being used by agricultural traffic. The retaining wall is in poor structural condition, and repairs were therefore needed in order that the trackway could continued to be used. The wall, together with the early 19th-century dressing floor to its south, were previously recorded in 1991 as part of a topographical survey of the site by Northern Archaeological Associates (NAA) (Fraser 1992) (see figure 3). In addition, a watching brief was undertaken on repairs to a culvert immediately to the north of the retaining wall in 2007 (Richardson & Dennison 2008).

- 2.5 The retaining wall lies within the area of a Scheduled Monument (SM 28908), which covers the majority of the smelt mill complex and its related structures and earthworks. The works to the wall were carried out under the terms of a scheduled monument consent issued to the YDNPA. The entire smelt mill complex and flue system is also a Grade II Listed Building, although the Scheduled Monument status and legislation takes precedence.

3 METHODOLOGY

- 3.1 The condition of the retaining wall had been a matter of concern for some time, and it was anticipated that intensive use in the summer of 2011 by the Reeth Shooting Estate to bring in stone for track maintenance might cause further collapse. In order to ensure continued safe access by those using the track, it was proposed to take down and partially rebuild two sections (c.4 and 12m in length respectively) of the retaining wall and repair two sections of collapse (each c.3m in length). A culvert that runs beneath the eastern end of the wall would also be unblocked.
- 3.2 EDAS visited the site on 13th June 2011 to inspect and record the retaining wall prior to the commencement of the repair works. At the request of the YDNPA, EDAS also inspected the dressing floor to the south, in order to mark on any features which had become visible since the previous 1991 NAA survey (see figure 2). As a result of this inspection and recording work, it was considered unlikely that archaeological monitoring during the repairs works would produce any significant new information, and so following consultation with the YDNPA, no further recording or watching brief was undertaken.
- 3.3 The unblocking of the north side of the culvert was supervised by YDNPA archaeological staff. The culvert itself was open, the north side had silted up and possibly been accidentally partly sealed following undocumented drainage work north of the track: a plasticised prawn cocktail crisp packet from an unidentified company found in the silt suggest this occurred in the late 20th century. To prevent leaving a void adjacent to the track a 'French Drain' matrix of limestone blocks was laid at the entrance to the culvert and covered with a thin layer of turf. The collapsed sections of retaining wall were then taken down to sound courses and rebuilt using fallen stone.
- 3.4 The retaining wall and dressing floor were located on the 1:200 scale topographical plan of this part of the site made previously by NAA. Using measurements taken from adjacent structures which were shown, any features that had not been recorded on the original survey were marked onto the 1:200 plan as an overlay (see figure 4). The plan was then redrawn at 1:200 scale, largely using conventions analogous with the original NAA survey, for example, indicating spoil by showing the larger stones at the base of slopes. However, for reasons of clarity, it was necessary to depart from the previous conventions in a number of cases. For example, in order to show joints in the retaining wall and other structures, they were not blacked in; walls where all or a significant proportion of the thickness was visible have been cross-hatched, whereas those where the face only was visible have been left as a single thick line. A total of 26 35mm digital colour prints (at 10 megapixel resolution) were taken of the retaining wall and dressing floor, together with sufficient notes to allow a detailed description to be prepared.
- 3.5 The small project archive arising from the archaeological recording, comprising drawn and photographic elements, has been ordered and indexed according to the standards set by English Heritages' National Archaeological Record. It was

deposited with the YDNPA (site code WOG 11) on completion of the project. No artefacts were retained from the archaeological recording.

4 RESULTS OF THE ARCHAEOLOGICAL RECORDING (see figure 4)

- 4.1 The area inspected and recorded is described below, commencing with the retaining wall. Reference should also be made to the reduced survey drawings included in this report, and to the photographic record which appears as Appendix 1; digital photographs are referenced in the following text in bold type and square brackets, the numbers before the stroke representing the film number and the number after indicating the frame e.g. [1/32].
- 4.2 As has been previously noted, the retaining wall lies on south side of the main trackway, running north-west/south-east through the smelt mill complex. The ground level falls away steeply and sharply from the base of the retaining wall, south towards the adjacent dressing floor, and this has contributed towards the instability of the wall itself.
- 4.3 In order to place the wall within its proper topographical context, this description commences at the very western end, some 30m west of the section to be repaired. Here, a number of bouse teams are visible, located below the trackway on the north side of what is effectively a gully created by the tipping of spoil to the south (east end of NAA Spoil Tip 3). The westernmost bin has a curvilinear, almost semi-circular plan [1/387]. The wall forming the east side of this bin may be butted by the back of the next bin to the east, which displays evidence for rebuilding. The east side wall of this second bin is also slightly curvilinear in plan, although collapse has reduced it to little more than a projecting stub [1/388]. It is noticeable that the side walls of the first two bins are structurally tied into the rear wall, whereas the stub walls which define the four bins to the east butt the rear wall [1/389 to 1/391]. The rear and side walls of all the bins are built of coursed squared stone, sometimes set with a lime mortar, sometimes to a slightly battered profile and standing up to 1.50m in height. In the scarp of spoil opposite these bins, at least four largely buried wall lines are just visible projecting from the surface of the spoil, and in two cases, these are apparently aligned on the side walls of the bins.
- 4.4 The easternmost stub wall of the bouse teams is butted by the section of retaining wall to its immediate east. This section of wall is c.12m long and stands to a maximum height of 2.20m [1/392] (see plate 1). It is built to a battered profile from coursed squared stone with upright coping. At the end of this section, low level projecting stubs suggest that there may once have been a small structure set against the wall, measuring c.3m long, perhaps a former bouse bin. To the east of this possible structure, the wall face steps back 0.30m to the north and butts the retaining wall to the west [1/394] (see plate 2). This recessed section forms a discrete length of wall 2.60m long, of similar form to that to the west but standing only 1.70m high [1/395]. This section of retaining wall is in turn butted by the wall to the east, where the wall face again steps back to the north by 0.30m. This creates a separate section of wall 1.40m long [1/396], perhaps connected to a wheelpit to the south (see below). At the east end of this section there is another small step to the north, after which the wall continues east for c.4.8m before terminating at a 4m long area of collapse [1/397] (see plate 3). On the east side of the gap, there may possibly be a butt joint, but this is not certain. The retaining wall can then be traced east for a further 7.00m, before encountering another c.6m wide area of collapse. Within this section of collapse, there is a 1m wide strip of level ground at the base of the wall before the ground surface falls off very steeply to the south, and the remains of a small attached structure may be visible here. Beyond the second area of

collapse, the wall stands up to 1.40m high, and has a culvert emerging from the base [1/398]. Shortly beyond this culvert, the retaining wall has collapsed completely, as has the ground immediately behind, creating a near vertical south-facing scarp [1/399] (see plate 4).

- 4.5 As has been noted above, there is a narrow strip of level ground adjacent to the base of some parts of the retaining wall. However, for much of its length, the wall stands at the top of a very steep south-facing scarp of spoil, over 2m in height. At the base of this spoil, the remains of another retaining wall are visible, standing up to 0.30m high at the eastern end, rising to 1.00m at the western end. This lower retaining wall effectively forms the northern limit of the dressing floor, and is pierced by a water wheel pit. The stone pit is aligned north-east/south-west and has a total length of 6.60m [1/404 and 1/405] (see plate 5). It measures 1.60m wide at the south end, but narrows slightly towards the north end. The long side walls remain visible as does a step at the southern end. At the north end of the wheelpit, the long side walls can be traced slightly further up the slope amongst the spoil here. They appear to be aligned on the 1.40m long recessed section of the trackway retaining wall described above, presumably to hold a launder. It may also be significant that a previous watching brief undertaken in 2007 recorded a small culvert, perhaps controlled by a sluice, which was aligned on the same area (Richardson & Dennison 2008). The interior of the wheelpit is choked with rubble and one large piece of timber, and there are two further pieces of timber to the west. To the south of the latter, the NAA survey identified a post. This is no longer visible, although the fragmentary remains of an apparent stone flag and timber structure can be seen here. On the east side of the wheelpit, stone footings define a structure c.2m square [1/406] (see plate 6) - comparison with other recorded dressing floors within the Yorkshire Dales strongly suggests that these footings form the remnants of a crusher base, the crushing machinery being driven by the adjacent waterwheel.
- 4.6 To the south of the waterwheel pit, the NAA survey recorded a possible leat or culvert running north-west/south-east across the dressing floor for a total visible length of 29m. This almost certainly represents a tail race from the wheelpit, with the north-western extension probably draining other works to the north. The north-westernmost c.6m of the structure retains a capping of large flagstones [1/402]. There is then a break of c.3m, and the feature resumes as a slight depression, c.1.40m across, with traces of stone lining on both sides [1/407]. To the west of this feature, the current survey recorded a shallow right-angled east-facing scarp, c.13m long and returning c.7m to the west at its south end. This scarp may define a shallow platform, on which the fragmentary remains of flagstone and vertical plank structures are visible, largely covered by fine dressing wastes [1/408 to 1/410]. There is a shallow oval depression at the south end of the platform, while to the east, a truncated post originally recorded by NAA in 1991 is still visible. There may be further decaying linear structures visible to the south of the post, amongst the fine dressing waste here, terminating at a sub-square (possibly modern) excavation with a ceramic pipe set into the base [1/411]. To the west of the shallow platform, several low retaining walls can be seen eroding out of the scarp of the tall spoil heap (east end of NAA Spoil Tip 3) here, while to the south, a substantial retaining wall of several phases of construction and repair protects the dressing floor from erosion by Mill Gill.
- 4.7 There appear to be further flagstone and timber structures to the south-east of the wheelpit [1/400 and 1/401], set on a north-east / south-west alignment, with possible fragmentary structures beyond these to the north of the possible leat identified by NAA. This area of the dressing floor is particularly confusing, with several different grades of dressing wastes having washed over here, which appear to have then

been subject to relatively recent disturbance, including some modern debris washing off the adjacent track and perhaps some dumping of material resulting from unauthorised drainage works on the north side of the track in 2007 (see plates 7 and 8).

- 4.8 As has been noted above, at the east end of the trackway retaining wall, a culvert emerges from beneath the wall to run south-west. It is visible where it emerges from the lower retaining wall, and its line can then be followed for a further 5m as a leat represented by shallow linear depression, crossing the west end of a trackway which runs towards the smelt mill to the east (NAA Trackway 4). The NAA survey shows the leat crossing a feature running parallel to the south side of the trackway, but this is no longer the case. The feature is a linear depression, the north side of which is defined by a low stone wall, and the south side by a steeply scarped bank below a larger waste tip [1/413]. This earthwork can be traced west for a further c.9m than shown by NAA, as a shallow linear depression c.1m wide, and arguably even further as a shallow scarp. The linear depression incorporates a flagstone along its length, with some adjacent stonework visible in plan, perhaps forming the remains of a sluice along the line of a leat [1/412]. A wide shallow gully runs south from this linear depression towards the retaining wall on the north side of Mill Gill.

5 DISCUSSION AND CONCLUSIONS

- 5.1 Although limited in extent, the archaeological recording has identified a number of features not covered by the previous 1991 NAA survey, and has raised a number of issues regarding the retaining wall and dressing floor that might be confirmed by, for example, further documentary research.
- 5.2 A relative chronology can be suggested for the retaining wall, although it is difficult to put even approximate dates on any of these phases. The earliest parts of the retaining wall appear to be the two westernmost bins of the bouse teams, and their rear wall to the east. Given that these two bins are contemporary with the rear wall, that the stub walls of those to the east butt it and that there are partly buried walls within the spoil heap opposite, it is possible that there are several phases of activity present just within the bouse team area itself. It could be suggested that the two westernmost bins and the rear wall were contemporary with the partly-buried walls in the spoil opposite, which may themselves represent other bouse teams. Perhaps these were gradually obscured by spoil tipping from the west (NAA Spoil Tip 3), necessitating the construction of further bins opposite, represented by the four stub walls which butt the retaining wall of the trackway. Further east, the retaining wall was extended in a number of different phases, and it is likely that it supported both a launder and timber structures associated with the waterwheel pit and adjacent crusher.
- 5.3 The current survey has also identified a number of fragmentary flagstone and timber structures within the area of the dressing floor, concentrated to the south and south-east of the waterwheel pit. It is probable that these represent the remains of structures which dressed varying grades of material after it had passed through the crushers. This area appears to have been drained by both the tail race from the wheelpit and a smaller culvert/leat running south-east. The fine nature of much of the dressing waste in this area means that continuing erosion resulting from rainfall and water flow is likely, and so more information relating to these structures will continue to be exposed over time. However, the proposed repairs to the retaining wall should help to limit run off onto the sensitive parts of the complex, for example limestone chippings from recent track repairs are starting to spread over parts of the dressing floor and bouse teams.

6 BIBLIOGRAPHY

Fraser, R 1992 *Old Gang Lead Smelting Mill: A Topographic Survey for the Yorkshire Dales National Park* (unpublished NAA draft report 92/17)

Gill, M C 1992 'Yorkshire Smelting Mills Part 1: The Northern Dales'. *British Mining* vol 45, 111-150

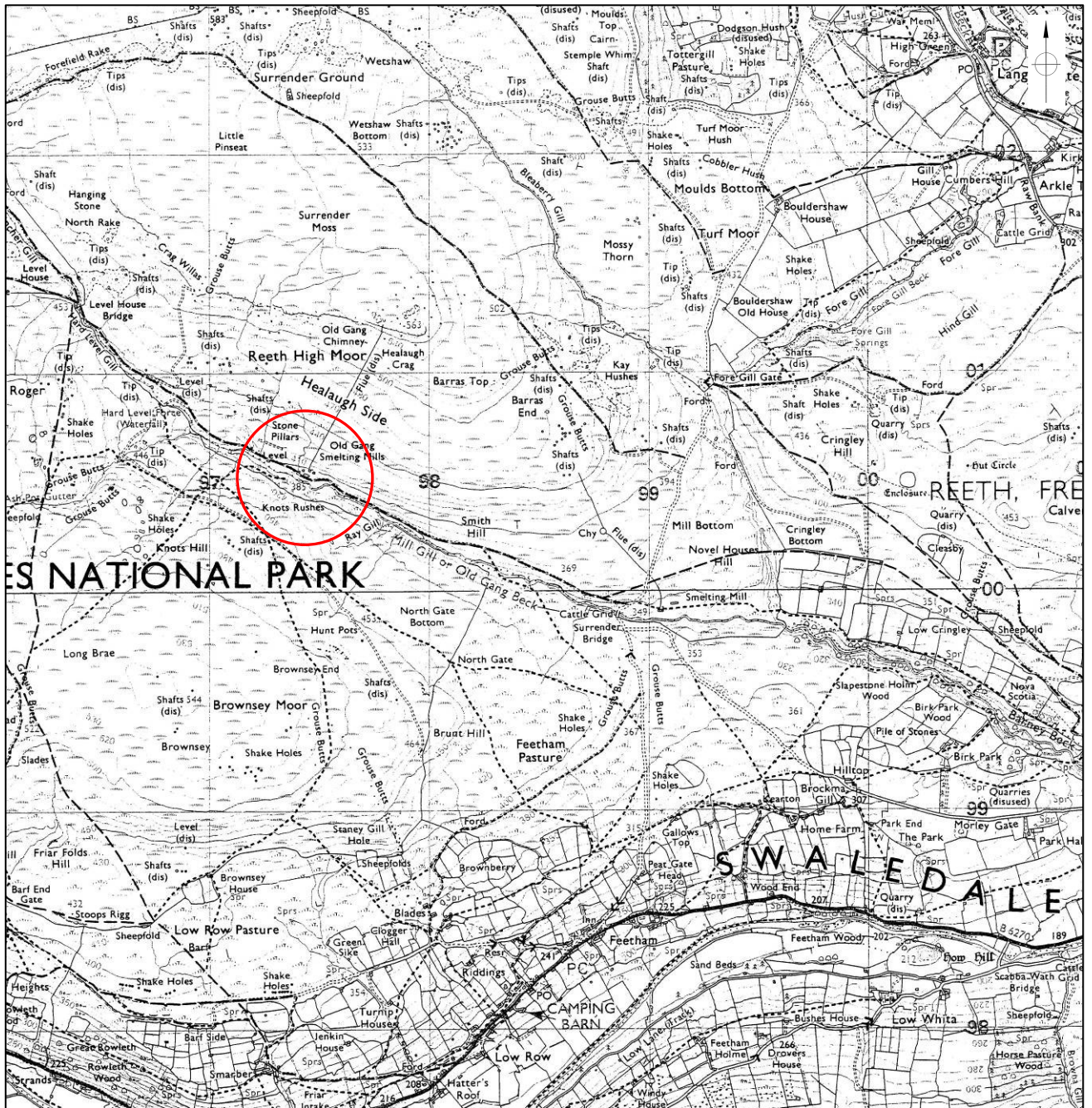
Gill, M C 2004 *Swaledale: its Mines and Smelt Mills*

Richardson, S & Dennison, E 2008 *Archaeological Watching Brief, Exposed Culvert, Old Gang Smelt Mill, Swaledale, North Yorkshire* (unpublished EDAS archive report 2007/317.R01 for YDNPA)

7 ACKNOWLEDGEMENTS

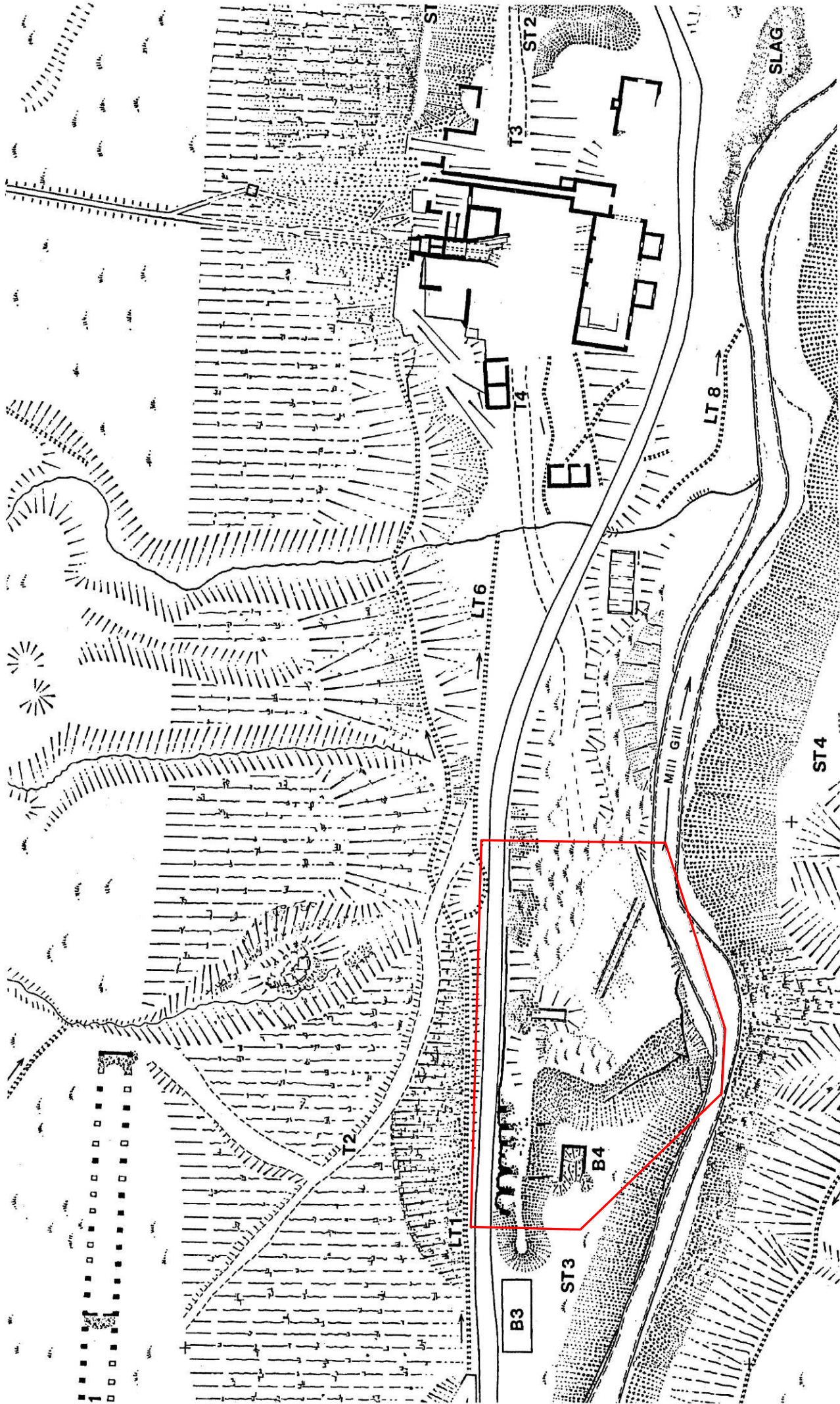
7.1 The pre-intervention archaeological recording at the Old Gang Smelt Mill was commissioned by the YDNPA, through their Senior Historic Environment Officer Mr Robert White. Thanks are due to him, and to other YDNPA staff, for their help and co-operation in carrying out the archaeological recording.

7.2 The on-site recording was undertaken by Shaun Richardson of EDAS, and he also produced the fieldwork records and a draft report. The final report was produced by Ed Dennison, with whom the responsibility for any errors remains.



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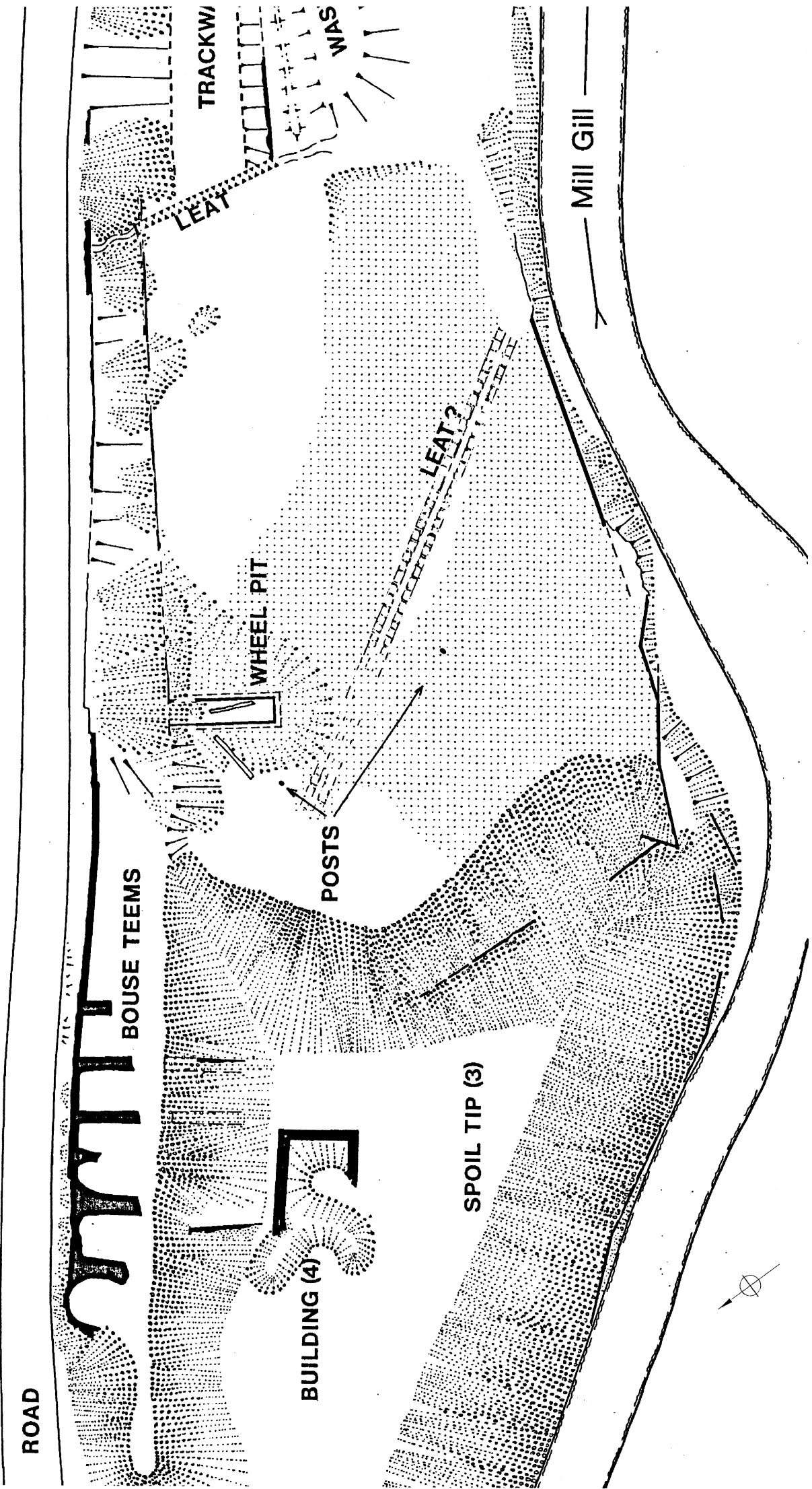
PROJECT		RETAINING WALL, OLD GANG MILL	
TITLE		GENERAL LOCATION	
SCALE	NTS	DATE	JULY 2011
EDAS		FIGURE	1



PROJECT	RETAINING WALL, OLD GANG MILL
TITLE	AREA OF SURVEY
SCALE	AS SHOWN
DATE	JULY 2011
FIGURE	2

Base plan: NAA topographical survey (Fraser 1992)

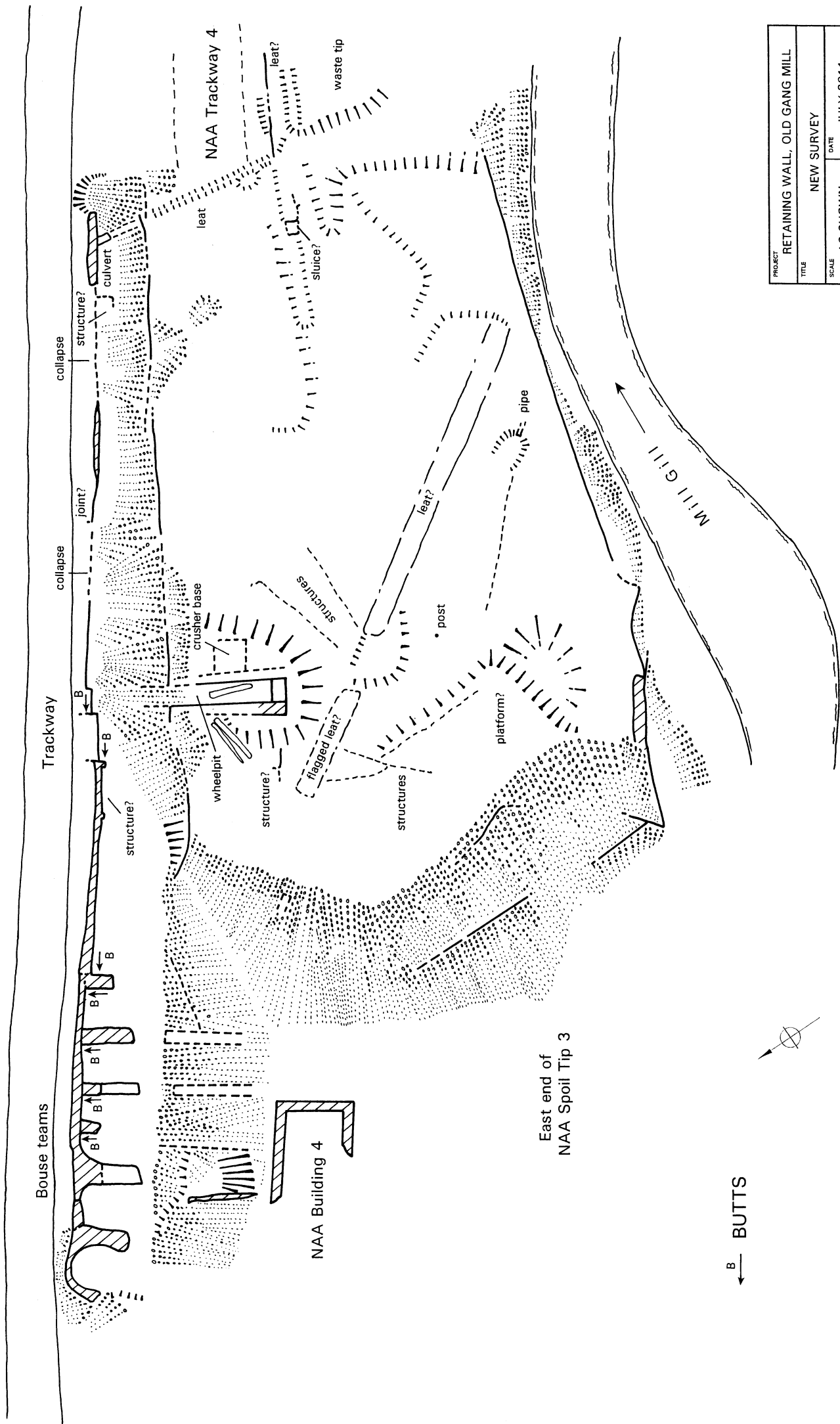





PROJECT	RETAINING WALL, OLD GANG MILL		
TITLE	NAA DETAILED SURVEY		
SCALE	AS SHOWN	DATE	JULY 2011
	EDAS	FIGURE	3

Base plan: NAA topographical survey (Fraser 1992)





PROJECT	RETAINING WALL, OLD GANG MILL		
TITLE	NEW SURVEY		
SCALE	AS SHOWN	DATE	JULY 2011
	EDAS	FIGURE	4

 BUTTS

0  20m

East end of
NAA Spoil Tip 3

NAA Building 4

Bouse teams

Trackway

NAA Trackway 4

collapse

collapse

joint?

structure?

structure?

structure?

structure?

structure?

structure?

culvert

crusher base

wheelpit

structure?

flagged leat?

structures

post

platform?

pipe

leat?

leat

leat?

leat

leat?

sluice?

waste tip

leat?

leat?



Plate 1: Retaining wall immediately to east of bouse teams, looking E (photo 1/392).



Plate 2: Step in retaining wall, looking N (photo 1/394).



Plate 3: Central part of retaining wall between collapses, looking NW (photo 1/397).



Plate 4: Collapse at east end of retaining wall, looking N (photo 1/399).



Plate 5: Wheelpit, looking NE (photo 1/405).



Plate 6: Probable crusher base on E side of wheelpit, looking NE (photo 1/406).



Plate 7: Dumping of material from unauthorised drainage works, September 2007 (YDNPA photo 1630).



Plate 8: Limestone chippings washed off track onto dressing floor, March 2011 (YDNPA photo 2041).

APPENDIX 1

APPENDIX 1: OLD GANG PHOTOGRAPHIC CATALOGUE

Film 1: Colour digital photographs taken 13th June 2011

<i>Film</i>	<i>Frame</i>	<i>Subject</i>	<i>Scale</i>
1	387	Westernmost bin of bouse teams, looking N	1m
1	388	Second bin of bouse teams, looking N	1m
1	389	Third and fourth bins of bouse teams, looking N	1m
1	390	Fifth bin of bouse teams, looking N	1m
1	391	Sixth bin of bouse teams, looking E	1m
1	392	Retaining wall immediately to E of bouse teams, looking E	1m
1	393	General view of dressing floor, looking SE	-
1	394	Step in retaining wall, looking N	1m
1	395	Step in retaining wall, looking E	1m
1	396	Step in retaining wall, looking NW	1m
1	397	Central part of retaining wall between collapses, looking NW	1m
1	398	Culvert at E end of retaining wall, looking N	1m
1	399	Collapse at E end of retaining wall, looking N	1m
1	400	Possible dressing floor structures SE of wheelpit, looking E	1m
1	401	Possible dressing floor structures SE of wheelpit, looking E	1m
1	402	Flagged W end of central leat, looking SE	1m
1	404	Wheelpit, looking NE	1m
1	405	Wheelpit, looking NE	1m
1	406	Probable crusher base, E side of wheelpit, looking NE	1m
1	407	E part of central leat, looking SE	1m
1	408	Platform and dressing floor structures S of wheelpit, looking NE	1m
1	409	Platform and dressing floor structures S of wheelpit, looking NE	1m
1	410	Platform and dressing floor structures S of wheelpit, looking NE	1m
1	411	Modern (?) pit and ceramic pipe, looking SE	1m
1	412	Possible sluice on line of depression, looking W	1m
1	413	Leat or culvert?, looking E	1m



1-387.JPG



1-388.JPG



1-389.JPG



1-390.JPG



1-391.JPG



1-392.JPG



1-393.JPG



1-394.JPG



1-395.JPG



1-396.JPG



1-397.JPG



1-398.JPG



1-399.JPG



1-400.JPG



1-401.JPG



1-402.JPG



1-404.JPG



1-405.JPG



1-406.JPG



1-407.JPG



1-408.JPG



1-409.JPG



1-410.JPG



1-411.JPG



1-412.JPG



1-413.JPG