Report on Archaeological Works at Fernhurst Furnace, Fernhurst, West Sussex

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NON-TECHNICAL SUMMARY

This document sets out the results from archaeological works carried out at Fernhurst Furnace, Fernhurst, West Sussex. The near vertical section of the south side of the tail-race was cleaned and recorded in order to compare its condition and stratigraphy with a similar recording exercise carried out during archaeological works in 1989 and 1992.

The results indicate that the deposits on the south side of the tail-race have not suffered the damage evident to those feature lying below, within the race itself, probably due to the protection offered by their height and vegetation cover. The stratigraphy exposed enabled further conclusions to be drawn about the nature of the deposits in this location, with the tentative conclusion drawn that the structures visible relate to a mid-18th century covered area for works relating to the production of cannon. The hope is expressed that further work will be undertaken in order to better understand this important phase of the furnace's operation.

PROJECT BACKGROUND

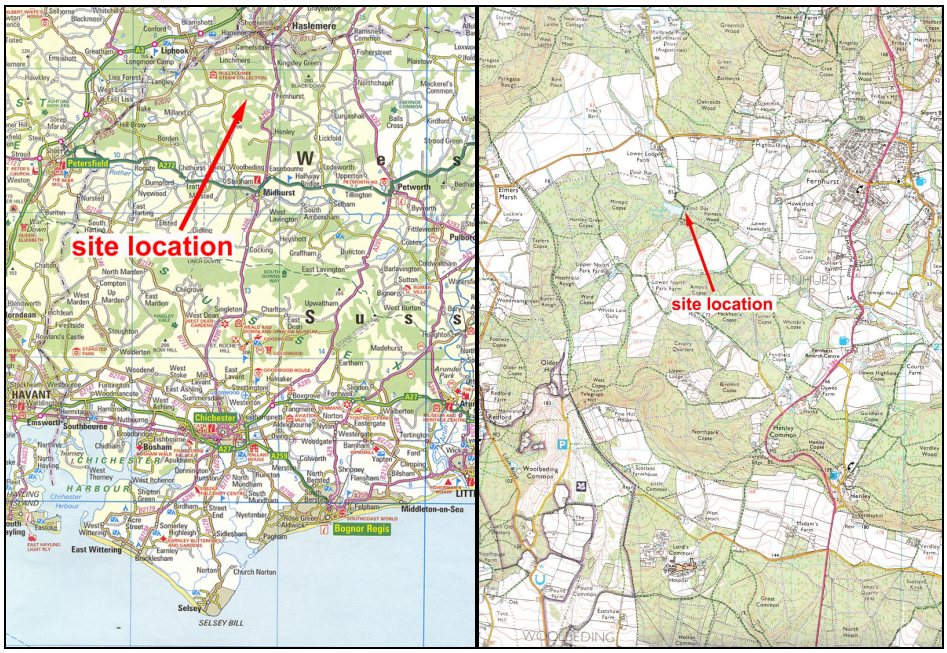

Figure 1 Site location. © Crown copyright. All rights reserved. License number: AL100036068

1. Fernhurst furnace lies within the parishes of Fernhurst and Lynchmere, approximately 1.5 miles to the west of the village of Fernhurst and 5 miles to the north of Midhurst, in West Sussex (see Fig.1). The top of the dam to the furnace pond lies at 64.5m aOD and at NGR SU8792 2817. The geology is Lower Cretaceous Weald clay, with sandstone pockets.

2. As part of preparatory works associated with the restoration of the furnace site, it was decided to take the opportunity to clean back and record the near vertical section forming the south side of the tail-race, both to assess its condition and re-assess the exposed archaeological deposits. Since the furnace is a Scheduled Monument (SM 30909) an application for Scheduled Monument Consent was made to DCMS, with the resulting permission including a condition that any works be carried out in accordance with an approved Written Scheme of Investigation (WSI). West Sussex Archaeology Ltd (WSA) was appointed by the landowner to draw up such a WSI (WSA 2017) and to carry out the ensuing archaeological works.

3. This report details the results of that archaeological work, which was carried out on the 8th – 10th September 2017 by George Anelay of WSA and a team of volunteers. The project archive, which consists solely of paperwork, will be deposited with West Sussex Record Office.

HISTORICAL BACKGROUND

1. A detailed description of the known history of the furnace and past archaeological works at the site can be found in a monograph

produced by Chichester District Council (Magilton 2003). In summary, this states that an iron smelting furnace was in operation at the site by 1614, but it seems likely from documentary and dendrochronology evidence that it was also in use during the 16th century. The furnace continued in operation, with periodic lulls in operation, until falling into disuse in 1776 (Magilton, pps.37-40).

2. The south face of the tail-race channel had previously been recorded during the archaeological works at the furnace in 1989, with amendments added in 1992. The conclusions drawn then, based upon what was visible, were that the features recorded pre-dated the last phase of the furnace's use, since they were overlain by a considerable deposit of slag, although it was also noted that the bricks used suggested that neither were they associated with its earliest phase. In terms of their function, it was suggested that they may be associated with a boring mill to ream out the cannons produced by the casting pit on the north side of the tail-race (Magilton, p.54)

RESULTS (see Figures 3 & 5)

1. A fourteen metre long section was cleaned and recorded along the south side of the tail-race, approximately 4.5m shorter than the earlier 1989/1992 section, but including all the key archaeological features then identified, all of which have survived the intervening years with only minor damage, perhaps due to their height in the section and the protection afforded by vegetation growth.

2. The natural Wealden clay geology was not seen in the base of the section, due to the height of the stream at the time of recording, the lowest layers noted all being of imported material. Indeed it would appear that neither was the natural clay seen in 1989/1992, despite the water level being c.0.3m lower. The lowest visible layers then and now being composed of slag, Lower Greensand rubble and clay (8 – 12, 14 & 16), with larger sandstone rubble within the lowest (12), a higher clay content in those above (10 & 11), smaller sandstone rubble and clay in the next (14) and the densest slag in the highest (8 & 16).

3. Above these layers there was a clear break, with a level surface extending along much of the section immediately above the slag-rich layers (8 & 16). The western end of this surface was formed by a wall (24) faced only on its eastern side. This would suggest that it was built to retain the layers to the west of it (4), composed of silt, slag and sandstone rubble, rather than as a free-standing structure.

4. The eastern end of the surface appeared to end where the underlying layer of slag (8) rises up above its level. This layer would seem to have been cut back to allow for the surface, as also were the layers of red (7) and yellow (5) slag above it, together with an intervening layer of silt (6). There was no trace of a reveting wall here, but a pocket of the overlying slag-rich topsoil (1), which extended down to meet the

surface against the cut back face of these layers, might represent where either a stone or timber revetment has been removed or rotted.

5. At its eastern end the surface itself was topped by a course bricks (26), extending c.1.85m westwards, and aligned north-west or south-east. The central portion of the surface was formed simply by the levelling of the underlying slag (8). At the western end there was another course of bricks (27), sitting not directly upon the slag (8), as at the eastern end, but upon layers of black (17) and yellow sand (23). These latter layers raised the height of the surface slightly above that to the east.

6. Between the western course of bricks (27) and the revetment wall (24), was a second wall of Lower Greensand stone, set in an orange/yellow mortar (25). Again it appeared to be faced only on its eastern side, with space between it and the other wall (24) filled with silt, sandstone, slag and brick rubble (19). It is not clear as to the function of this second wall, but it may have formed a shelf or bench running in front of the revetment (24). A plate of iron lying flat upon its surface might give some support to this idea, and a thin layer of dark brown smooth silt (21) lying on the bricks in front of it might be associated with its use. Overlying this dark brown silt, and the brick surface to the east (26) were layers of brick dust (13 & 22), possibly formed during the use of the surface, or immediately after its abandonment.

7. Between the two brick surfaces, and cut into the top of the underlying slag (8), was void of square section, with a thin layer of silt (15) at its base. The excavations of 1989/1992 had demonstrated that this was a drain, linked to a drain cover set in the surface of the slag, c.2m to the south of the section face. The mouth of the drain, as it exited the section, had clearly suffered some erosion subsequent to its recording in 1989/1992, since it was found to be larger and less defined in 2017.

8. Overlying the surface as a whole was a deposit of silt containing frequent to abundant slag, sandstone, tile and brick rubble. To the east this rubble consisted of more tile and larger sandstone blocks (2) than to the west (3). Capping all the deposits was the current topsoil (1), containing frequent slag.

9. Essentially the deposits visible in the section as a whole can be divided into three broad phases. First there are the extensive deposits of clay, slag and sandstone that precede the level surface. It is presumed that these built up during the lifetime of the furnace as it was formed, developed and used. Second there is the surface itself, cut into these earlier deposits, which were held back by revetments at its limits, and which was at least partially floored with bricks. The nature of those bricks would suggest a later date in the furnace's history. Thirdly there is the abandonment of the surface, marked by the renewed dumping of waste material over it, probably in the last period of the furnace's use.

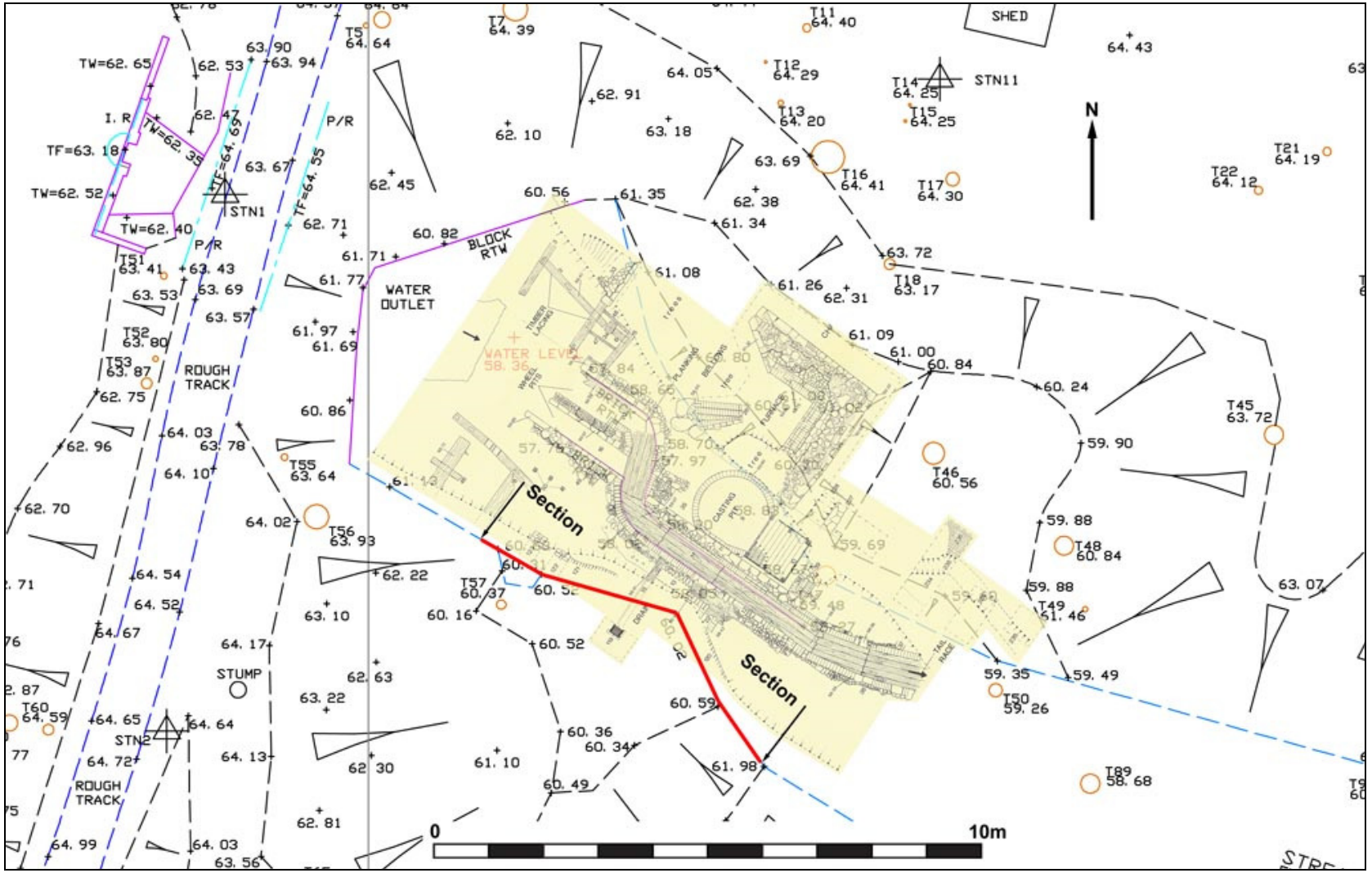

Figure 2 Location of the drawn section in relation to the 1989/92 works

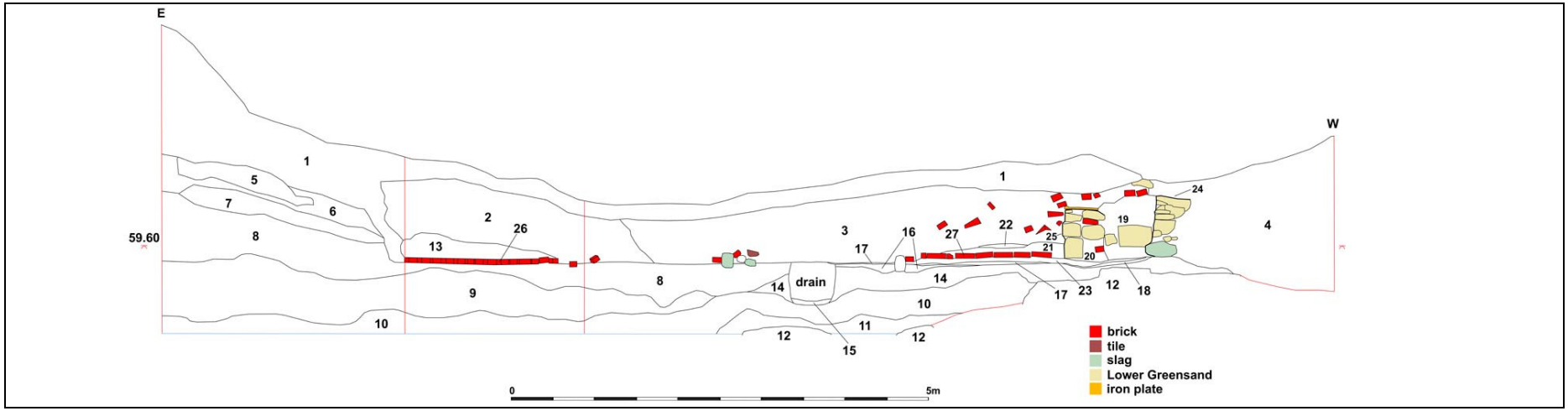

Figure 3 The 2017 Section

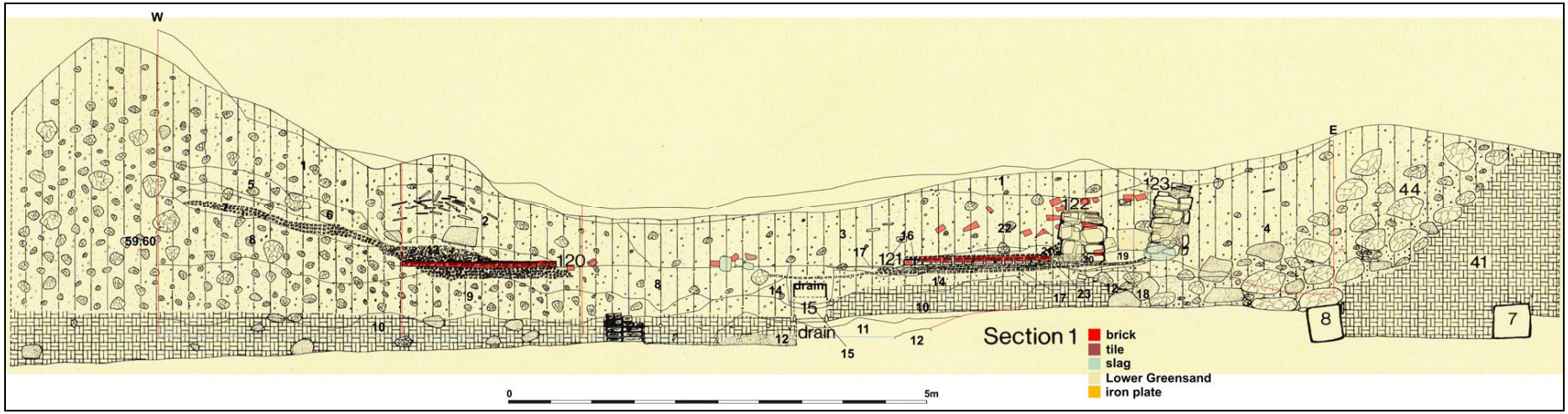

Figure 4 The 1989/92 Section, with the 2017 Section overlain

Figure 5 Photographic composite of the 2017 Section, the scales mark the principle changes in direction

CONCLUSION

1. A further examination of the south side of the tail-race at Fernhurst Furnace has provided more data that can be fed into the discussions over exactly what was happening in the area to the south of the furnace itself. In the furnace's earlier phases it would seem that the area was used as a dumping ground for waste material. The lowest layers visible in the recorded section include large blocks of slag, indicating that they were clearly laid down after the furnace began work, rather than as part of its construction.

2. This phase of dumping waste clearly came to an end with the establishment of the flat surface, defined by revetments holding back the mounds of slag and rubble. The function of this new area is still not clear, although its comparatively late date would fit with the construction of the gun-casting pit to the north, itself a later phase in the furnace's life. It has already been suggested that it might have been the location of the boring mill used to ream out cannon (Magilton, p.54), and the level of its floor at 59.40m aOD, below that of the furnace (59.65m aOD) and above the top of the gun-casting pit (58.90) would be not be inconsistent with this, providing some form of crane was operating to lift the cast cannon up and over the stream. It may also have been used as the location for the preparation of the moulds needed for casting.

3. Judging by the evidence seen in the section, the surface is unlikely to have existed within a brick or stone building, instead probably just being covered by a roof supported by timbers, with its flooring being part brick and part crushed slag. A central drain took waste water off the floor and back into the tail-race.

4. The question of how the power generated by the water-wheels was taken to the boring mill remains unanswered. Clearly it cannot have been carried to the west of the western revetment wall, but whether there was a space between that and the wall immediately adjacent to it for a shaft, or whether it was taken further to the east before being transferred southwards awaits further investigations.

5. The exact date for the use of the surface to the south of the tail-race has not yet been tied down, but the form of the bricks and clues from the documentary evidence, would suggest a date in the 18th century, probably during the control of John Butler, from the mid-18th century until, at the latest, 1769 (Magilton, pps. 39-40). The subsequent tenants oversaw the furnace's decline and closure, presumably reflected in the abandonment of the area to the south of the tail-race as a working floor, and its return to being merely a dumping ground for waste.

6. It is hoped that future investigations will be undertaken to better define not only the date, but also the layout and form of the structures on the south side of the tail-race, since the features exposed in the recorded

section suggest that the mounds of slag from the end of the life of the furnace cover a well-defined and potentially well-preserved phase of the furnace's use for 18th century cannon production.

BIBLIOGRAPHY

Magilton, J. 2003. **Fernhurst Furnace**. Chichester District Archaeology 2. Chichester District Council.

West Sussex Archaeology. 2017***.*** **Written Scheme Of Investigation For A Programme of Archaeological Works at Fernhurst Furnace, Fernhurst, West Sussex***.*** Unpublished.