

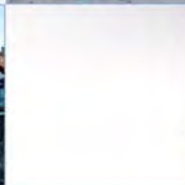
Woodmuir Farm Coke Ovens, West Lothian

Historic Building Recording

Report

AOC 21937

11th January 2012



ARCHAEOLOGY

HERITAGE

CONSERVATION

Woodmuir Farm Coke Ovens

Historic Building Report

On Behalf of:	Forestry Commission Scotland 1 Highlander Way Inverness IV2 7GB
National Grid Reference (NGR):	NS 96796 59799
AOC Project No:	21937
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Date of Fieldwork:	8th November 2011
Date of Report:	11th January 2012
OASIS Ref No:	114884

This document has been prepared in accordance with AOC standard operating procedures.

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Draft/Final Report Stage: Draft	Date: 11th January 2012

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Summary

Forestry Commission Scotland commissioned AOC Archaeology Group to undertake an historic buildings survey and landscape survey of the coke ovens that survive near Woodmuir Farm near the village of Breich in West Lothian in advance of a wider programme of consolidation and repair work on the structures, which are a Scheduled Ancient Monument.

The Woodmuir Farm coke ovens are a series of ten late 19th century features which survive in a wider landscape located within a former coal mining and industrial landscape.

This report synthesises the results of a Level 4 historic building survey which has included archive research together with a detailed photographic, written and laser scan 3D survey of the ovens in addition to a wider landscape survey of the immediate surrounding area to place the ovens into context.

1 INTRODUCTION

1.1 Site background

1.1.1 AOC Archaeology Group were commissioned by Forestry Commission Scotland to undertake a Level 4 historic building survey of the Woodmuir Farm Coke Ovens, which are a Scheduled Ancient Monument (Ref: 11227). These works have been undertaken in advance of any potential stabilisation and consolidation work to prevent further deterioration of the features. The ovens date to the late 19th century (probably dating to some time after 1896) and are associated with the nearby Woodmuir Colliery, which ceased operations in the 1960s.

1.1.2 Although the West Lothian region has always been associated in the past with other forms of mining and quarrying such as clay, ironstone, lime and sandstone, it was the mining of coal from the mid 19th century to the mid 20th century that dominated industry in the region. The mid-late 19th century saw a huge number of coal mines spring up which ranged from small discrete pits to huge collieries - including the Woodmuir Colliery established in 1896 – to which the beehive coke ovens near Woodmuir Farm are associated.

1.2 Site Location

1.2.1 The Woodmuir Farm coke ovens are located in an open area of land to the south-west of Woodmuir Farm and are located at National Grid Reference NS 96796 59799 (Figure 1). They sit within Forestry land and are accessed from a small car park and trackway to the north-east.

2 OBJECTIVES

2.1 The objective of this historic building survey was to create a baseline record of the surviving structural features of the ovens to inform any future conservation management and consolidation of the structures, as well have provide a clear understanding of their history and development through archive research, photographic, written and drawn record.

2.2 The objective of the landscape survey of the surrounding features was to provide a more detailed context for the coke ovens and identify how they would have operated within the immediate landscape.

3 METHODOLOGY

3.1 Archive research

3.1.1 A simple map regression exercise was undertaken on the site using publicly accessible maps from the National Map Library of Scotland including all pre-Ordnance Survey maps and Ordnance Survey maps up to the present day. All maps have been included in this report in chronological order in Figures 2 - 6.

3.1.2 Additional sources were also examined to identify in detail the history and development of the ovens and to place the site into context. Secondary sources and previous studies were consulted in the library of the RCAHMS and the National Library of Scotland. A list of all sources consulted can be found in Section 8 at the end of this report.



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Figure 1: Site Location Plan

3.2 Photography

- 3.2.1 General and detailed photographs were taken of the ovens and features in the surrounding landscape in black and white print film using a 35mm single lens reflex camera with a 1m or 2m ranging pole for scale where access and health and safety allowed. A colour digital photographic record was also taken using a 35mm digital camera (Nikon D80) to a 10 mjpg resolution. A register of all those photographs taken can be found in [Appendix 1](#), and some of the digital photographs have been used to illustrate this report.

3.3 Written record

- 3.3.1 A written record of the ovens was made on site using AOC *pro forma* building recording sheets with comment on condition, construction, architectural and historic features, structural features and any evidence for phasing or function. There are ten ovens in total, and each was given a unique reference number preceded by C, starting with C1, the southernmost oven on the east side, moving around in an anti-clockwise direction; each coke oven reference has been annotated on [Figure 8](#).
- 3.3.2 Notes were also made on the features within the wider landscape, which were each given a unique feature number preceded with the letter F (F01, F02, etc). These can be cross-referenced with the main plan in [Figure 7](#).

3.4 Measured survey

- 3.4.1 There were two elements to the measured survey, the 3D laser scan of the ovens and the main topographic survey, which was tied into the laser survey.
- 3.4.2 The 3D laser scan survey of the ovens was undertaken using a Faro Focus mid-range laser scanner from a range of viewpoints and was tied together using total station survey.
- 3.4.3 Tied into the laser scan survey was a wider topographic survey which included a general survey using a robotic total station of the main features associated with the ovens and the immediate landscape. Those features recorded included a large bank of additional ovens to the immediate east (now mostly demolished) with a small gully between them (probably representing former railway sidings) and a large mound to the south with the remains of the termination of former railway sidings. Additional gulleys, again, identifying smaller railway sidings associated with the ovens, were also recorded.

3.5 Archiving

- 3.5.1 The project has been recorded in the Online Access to the Index of Archaeological Investigations (OASIS) site (Ref: 114884). An entry has also been submitted to Discovery and Excavation in Scotland (DES) publication for inclusion in the forthcoming 2012 volume ([Appendix 2](#)). The original black and white photographs, together with a hard copy and a pdf digital version on CD of the report, has also been submitted to the National Archives of Scotland held at the RCAHMS building at John Sinclair House, 16 Bernard Terrace, Edinburgh EH8 9NX (tel. 0131 662 1456). A copy of this report has also been lodged with the relevant Historic Environment Record (HER).

4 HISTORICAL BACKGROUND

4.1 Coke Ovens

- 4.1.1 A coke oven is a vessel that produces coke from coal and was a vital component of the coal mining and associated industries in 19th and 20th century Britain. Coke can be used as fuel through slow controlled burning and in the 19th century was often used as fuel for larger blast furnaces for ironworks and steelworks. Ancient records and archaeological records have established that coke has been produced for around 2,000 years, although producing it in ovens on a larger and more efficient scale only dates back to the late 16th/early 17th century. Sir William St John is credited in many sources as the inventor of the beehive style coke ovens (ca. 1620), which are the type found here at Woodmuir, which work to effectively contain the heat of the coal. However, this type of oven was not widespread until the 1730s when they were used by Abraham Darby at Coalbrookdale (Magnum Archive, ud).
- 4.1.2 As their use became even more widespread, beehive coke ovens began to be built in batteries, and developments were made throughout the 18th, 19th and even 20th centuries to improve their heat retaining properties and increase the efficiency of the procedure. At Woodmuir, there was a simple bank of ten, back to back, three to each side and one to each of the corners. A similar arrangement was probably used to the demolished bank to the east.

4.2 The Woodmuir landscape in the 19th century

- 4.2.1 A settlement at Woodmuir dates back to at least the early 19th century as it appears on William Forrest's 1818 map of Linlithgowshire (it does not appear on General Roy's Military Survey of Scotland ca. 1747 – 55). The historic map evidence prior to the mid-late 19th century shows little of the character of the surrounding landscape, although it seems to have been largely a farming one. The 1832 map by John Thomson identifies a range of buildings at Woodmuir with a landscape defined around the north-east/south-west aligned Woodmuir Burn with a number of settlements located adjacent to it, such as Back Side, Back Burn, Hutch and Cross Dikes (Figure 2). Situated at the Burn, it is possible that some of these were early water-powered mills. There is no evidence of any coal activity in this early period in the immediate landscape at this time.
- 4.2.2 By the 1856 Ordnance Survey map, Woodmuir Colliery has been established to the south of the farm and to the south-east of the position of the coke ovens, although the ovens themselves are not represented here on this map (Figure 3). An old iron mine is also shown to the west suggesting that, despite lack of representation on the earlier maps, there was some industrial activity in the metal industry in the area prior to the establishment of the collieries.
- 4.2.3 In the 30-40 years after this map, the 1895 Ordnance Survey shows how the industrial landscape has been drastically changed with a number of 'old shafts' and 'old coal pits' and 'quarries' in the vicinity of the coke ovens (Figure 4). The Woodmuir Colliery which is represented in the 1856 map has now gone, its position marked only as 'Old Coal pit' with another 'Old Coal Pit' and 'Chimney' recorded at the roadside to the immediate south of the coke ovens. Another Woodmuir Colliery has started up to the north-east of Woodmuir Farm, although it is thought to have been established around 1896 (Hutton 1998, 31). It was later acquired by United Collieries in 1902 and worked in association with the Loganlea and Foulshells pits near Stoneyburn (*ibid*). Interestingly, Woodmuir was nicknamed the 'Blinky' because of the tiny size of the village: 'blink and you'll miss it' (*ibid*). One of the most important developments in terms of industry, however, is the establishment of the railway, which is seen to the north-west of the farm, even with its own offshoot railway annotated as 'Mineral Railways'. This would have greatly increased the productivity and distribution of the



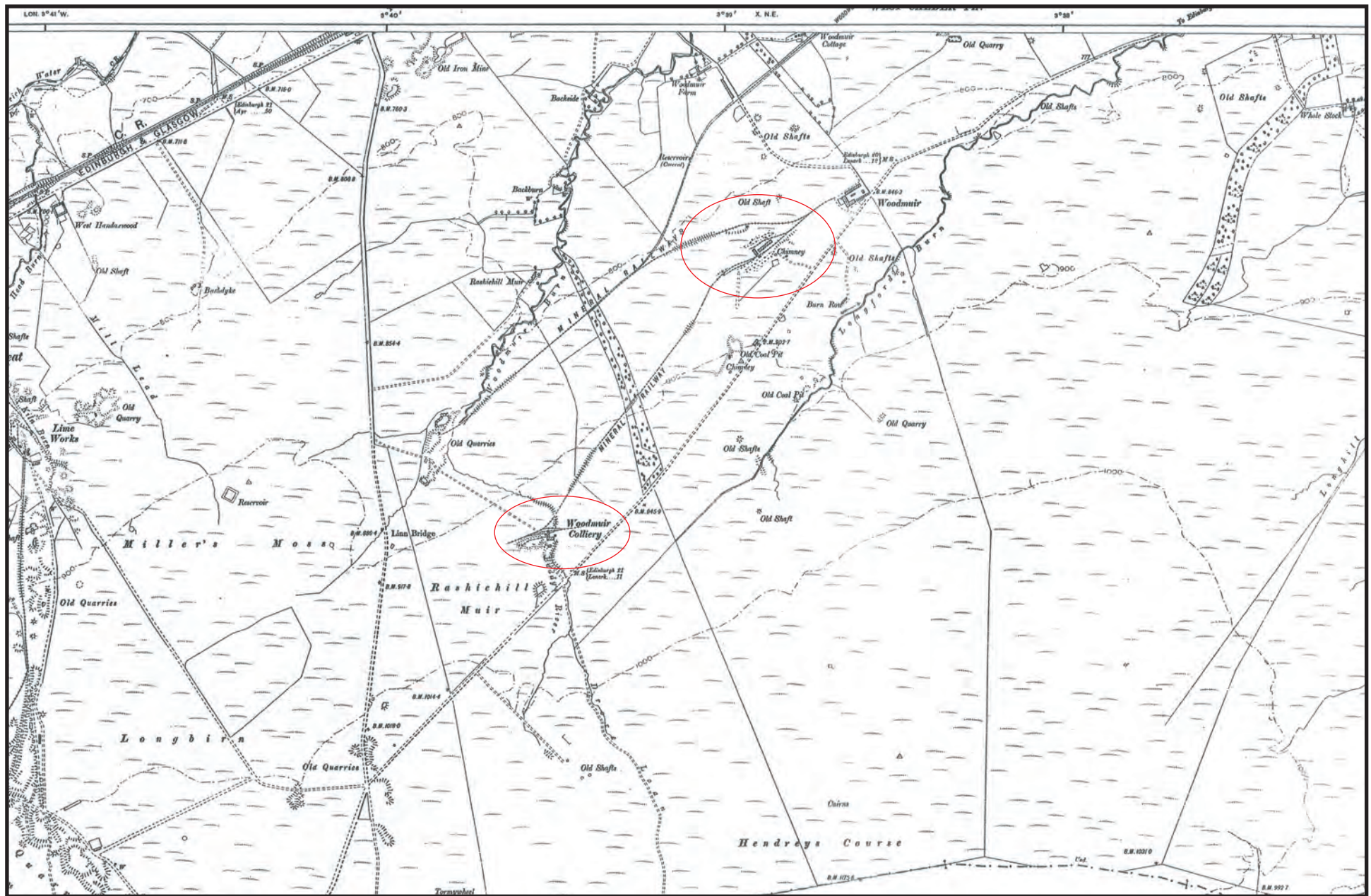
(Reproduced by kind permission of the National Map Library of Scotland)

Figure 2: Extract from John Thomson's map, 1832



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Figure 3: Extract from Ordnance Survey map, 1856



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Figure 4: Extract from Ordnance Survey map, 1895

coal mining industry and ancillary industries in the area and the establishment of the coke ovens was a natural step to the progression of these industries. There are some earthworks associated with the coke ovens on this map (see Figure 4), as well as a range of buildings to the north of them, and the mineral railway appears to run through the centre of the coke oven complex.

4.3 The Woodmuir landscape in the 20th century

- 4.3.1 The 1909 Ordnance Survey map shows a similar picture to that of 14 years earlier, with the Woodmuir Colliery now well established to the north-east of the farm annotated as Pits No 5 & 6 (Figure 5). By the time of the 1922 map, however, the mineral railway now stops at the farm and the range of ovens and associated ancillary buildings are shown as unroofed although the earthworks associated with the rail embankment are still marked (Figure 6). An old coal pit (disused) is marked directly to the south of the ovens.
- 4.3.2 Statistics from 1948 identify the productivity and workforce figures of the Woodmuir Colliery in these post-War years, and it mentions that the main activities of the site were coking (giving the assumption that the coke ovens were still in use at this time), house coal, manufacturing coal and steam (Oglethorpe 2006, 231). The workforce is mentioned as 255 (although it is said that the peak workforce had been 273) with the two No 5 and No 6 shafts 90m and 91m in depth respectively (*ibid*).
- 4.3.3 In 1962 the National Coal Board (NCB) classed Woodmuir as Class ‘C’, meaning that supplies of coal would be depleted in 5 years (Hutton 1998, 31). However, supplies expired much sooner than that and the colliery closed down in 1963, a year later (*ibid*). Although it isn’t certain when the coke ovens fell out of use, they most certainly would not have carried on after the Colliery closed down in 1963. The ovens are shown as an unroofed rectangle in the 1962 Ordnance Survey map. This continues throughout the later maps of the 20th century, which don’t really show any buildings in detail because of the small scale of the maps.

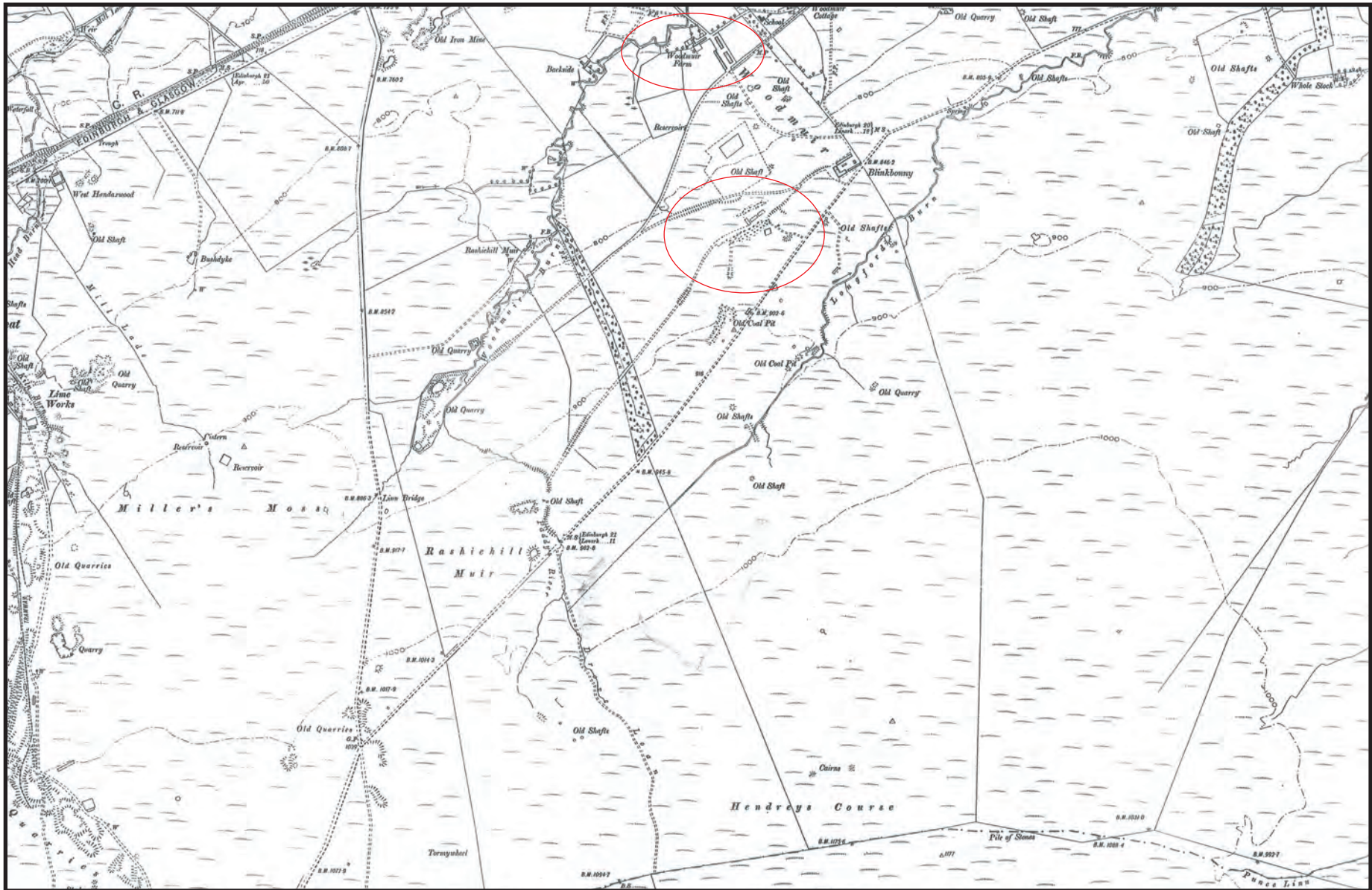
5 ARCHITECTURAL DISCUSSION

5.1 Introduction

- 5.1.1 There are ten brick-built surviving coke ovens (C1 – C10) set in a bank at the site (Figures 7 & 8). They are set in a north/south aligned block with three to the east (C1 – C3), three to the west (C6 – C8), two the north-east and north-west corners (C4 & C5) and two to the south-west and south-east corners (C9 & C10).
- 5.1.2 The following descriptions will look at the wider landscape to start with and then concentrate on the coke ovens in more detail. These should be looked at in conjunction with Figures 7 & 8 and also the accompanying Plates 1- 15.

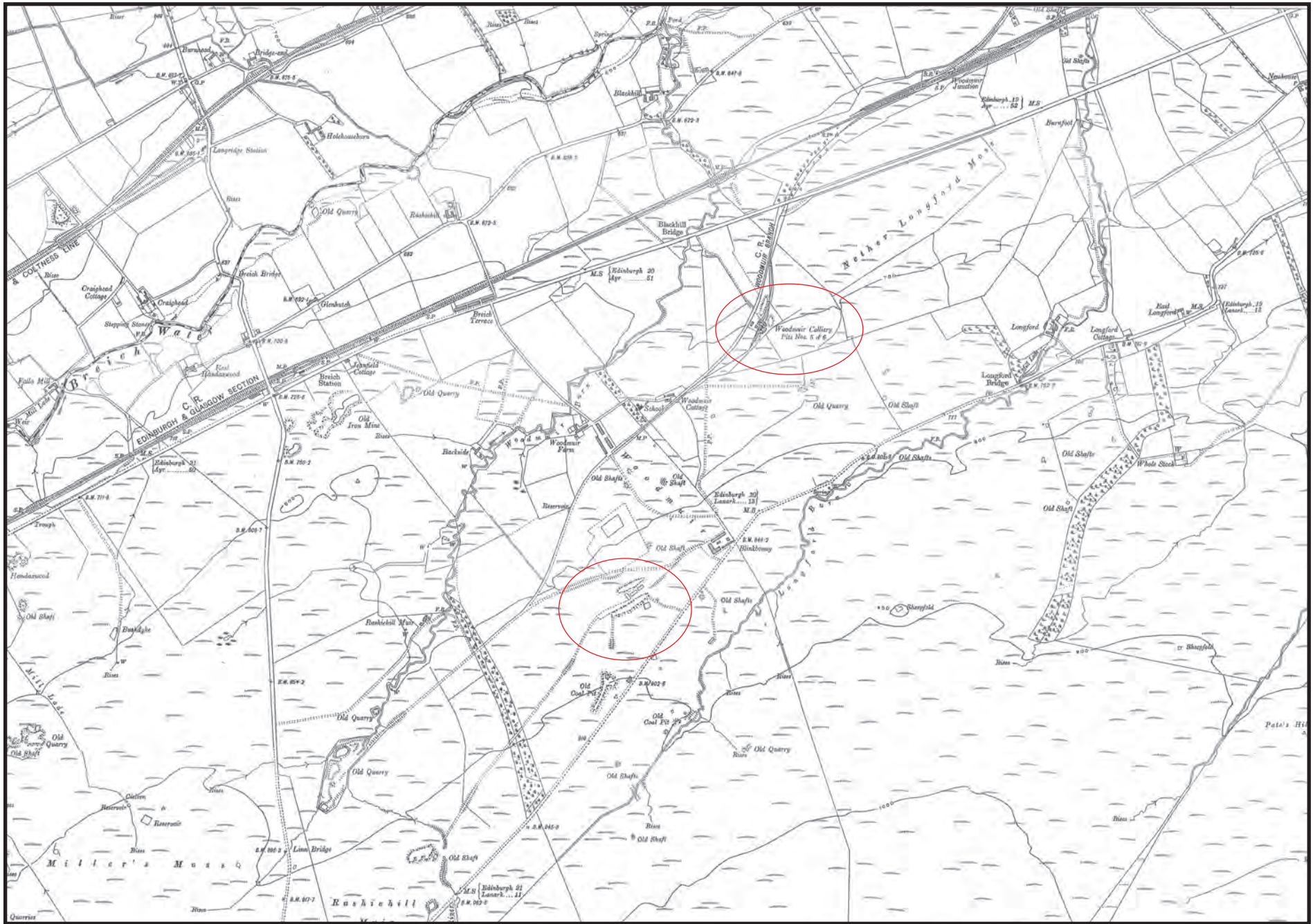
5.2 The Woodmuir Landscape

- 5.2.1 The following descriptions can be cross-referenced with Figure 7, and all associated features of the site have been given Feature Numbers (F01, F02, F03, etc) with F01, being the Coke Ovens which are the main focus of this report.
- 5.2.2 The present landscape associated with the Coke Ovens is set in a clearing in Forestry Land located to the immediate south of the main NEE/SWW Forest Track Road surrounded by Forest. Much of



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Figure 5: Extract from Ordnance Survey map, 1909



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Figure 6: Extract from Ordnance Survey map, 1922

the land to the south of the road, before the approach to the ovens and other features, is bogland and has a number of small streams and gulleys making the terrain very difficult to access. It is possible that some of these gully areas are actually the remains of now-removed railway sidings and small rail lines leading up to the ovens, although their exact position and form have now been obscured by the overlying terrain. However, the area to the south of this, despite being extremely overgrown, has a number of features that identify a much wider use of this area as a coke producing plant.

- 5.2.3 The main Coke Ovens (F01) will be described in more detail below, although it is clear that they were the smaller bank of a couple, with a larger bank of ovens (F02) to the immediate east, the remains measuring 111m east/west and 12m north/south at its widest point. They have been known to have been demolished and run over with Forestry vehicles in the past (FCS, pers comm), and it is clear that, although heavily covered with vegetation and trees, they still retain their original form. The survey (see [Figure 7](#)) identified at least three banks of ovens, the bricks of which were still in place. Only a few brick fragments on the top of the mound now remain, and it is clear that the roofs of these ovens have collapsed in on themselves.
- 5.2.4 Located between the two ovens is a straight gully (F04), measuring 21m in length (north/south) and approximately 1.4m in width at the top (east/west), very heavily overgrown, which probably represented a small railway siding which would have positioned wagons right up to the two coke ovens for unloading the coal within them for burning. To the west of the surviving ovens was another gully (F03) which followed the curve of the ovens and probably served the same purpose. This measured approximately 0.65m in width (although the vegetation has surely compromised the original dimensions). To the east of the F02 ovens was another siding (F05) with regular sides measuring about 32m in width and 0.65m in length north/south.
- 5.2.5 The main dominant feature of the site is the large raised bank to the south (F06) which is probably a large bank created to accommodate the railway sidings ([Plates 1 & 2](#)). Set to the south-east of the bank, slightly behind the rise of the bank, are the remains of the termination of the railway (F08) associated with an embankment to either side to the north-west of this (F07). The remains of F08 included straight concrete sidings with iron pins still in place protruding from the concrete. The embankment widened to around 8.9m in width at the base of mound F06.
- 5.2.6 To the north of the coke ovens is another unidentified mound (F09). It measures 8.8m in length (north/south) and 5.5m in width (east/west) and is heavily covered in vegetation. Its function is not immediately clear.
- 5.2.7 Adjacent to (south of) the present Forestry Road are the possible remains of more railway sidings (F10), although these could not be fully recorded due to the boggy conditions of the ground in this area. However, they seem to form a regular 'gully' moving westwards towards the ovens.

5.3 The Coke Ovens

- 5.3.1 The Coke Ovens are located to the west of the landscape, with Forestry plantation to the west and north ([Plate 3](#)).
- 5.3.2 The ovens are all brick-built and survive in varying conditions ranging from only a small area of the back wall surviving (C10) or more substantial with at least half of the oven surviving (C1, C7, C8). They are all identical and are formed from a bell shape with a distinct flue in the top of the oven with a space at the rear appearing to 'connect' it with the ovens behind. [Plates 4 - 13](#) give a general

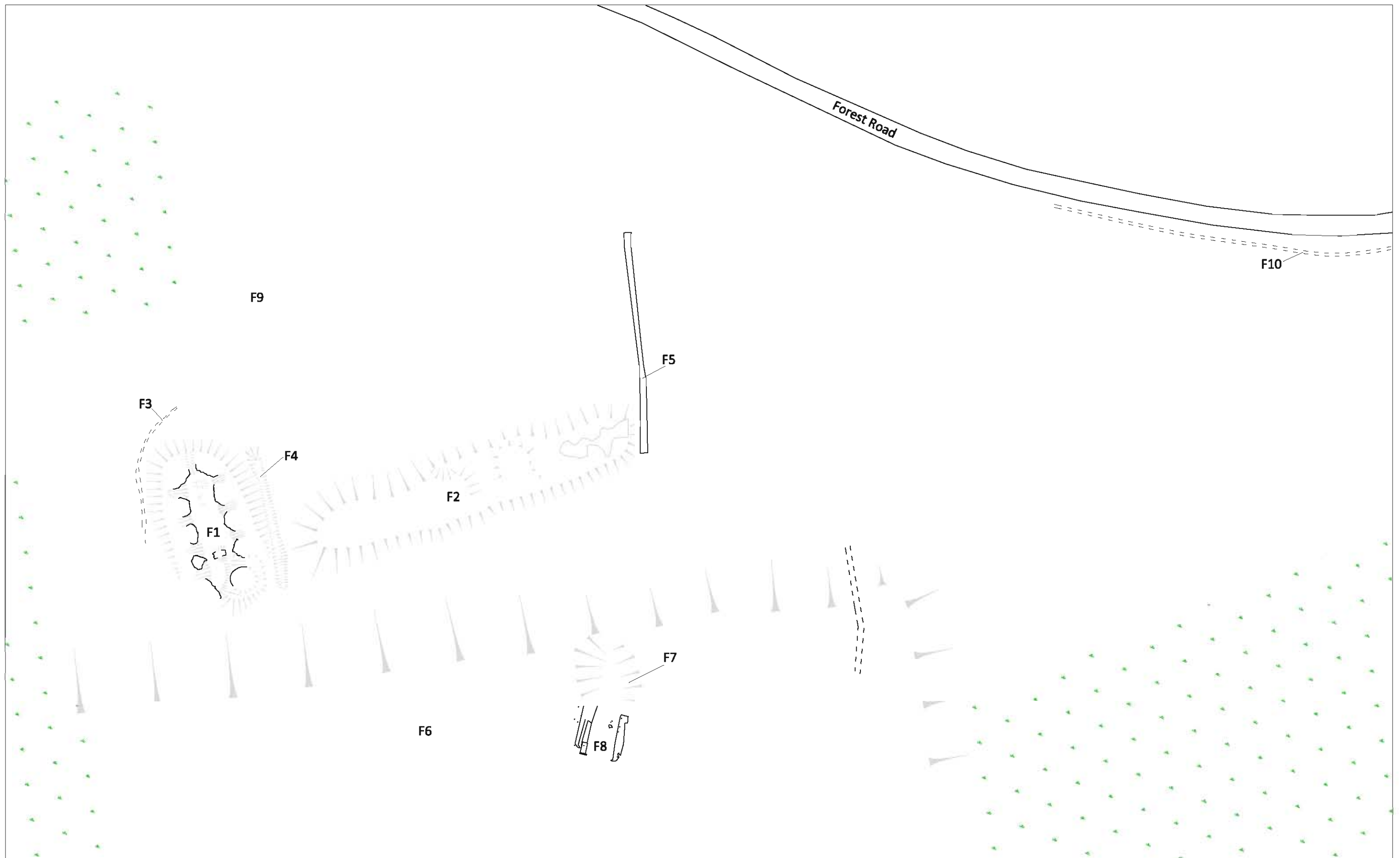
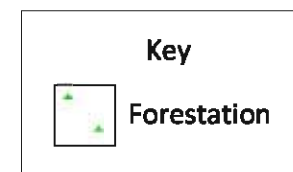
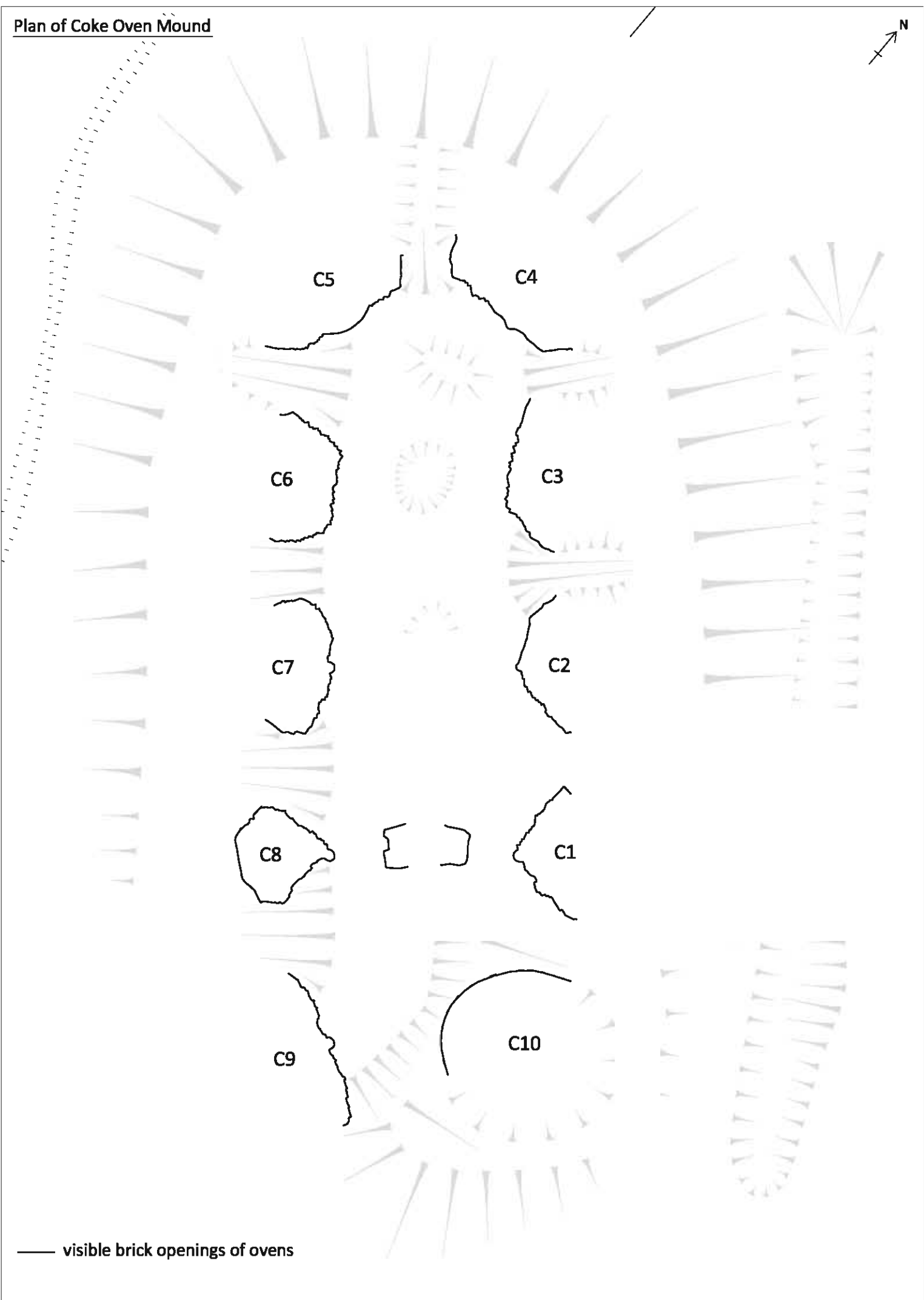


Figure 7: General plan of the site and surrounding landscape

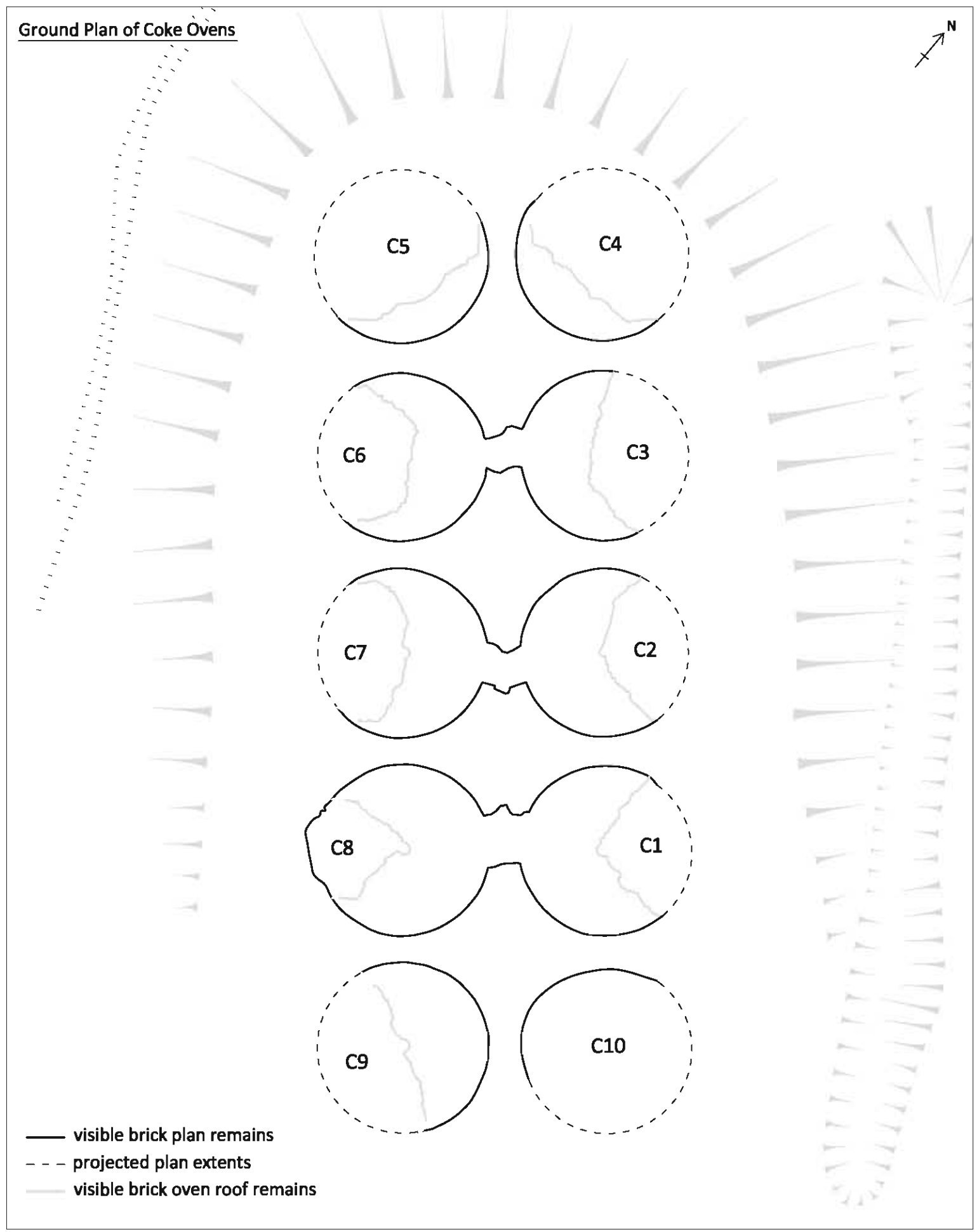


Plan of Coke Oven Mound



— visible brick openings of ovens

Ground Plan of Coke Ovens

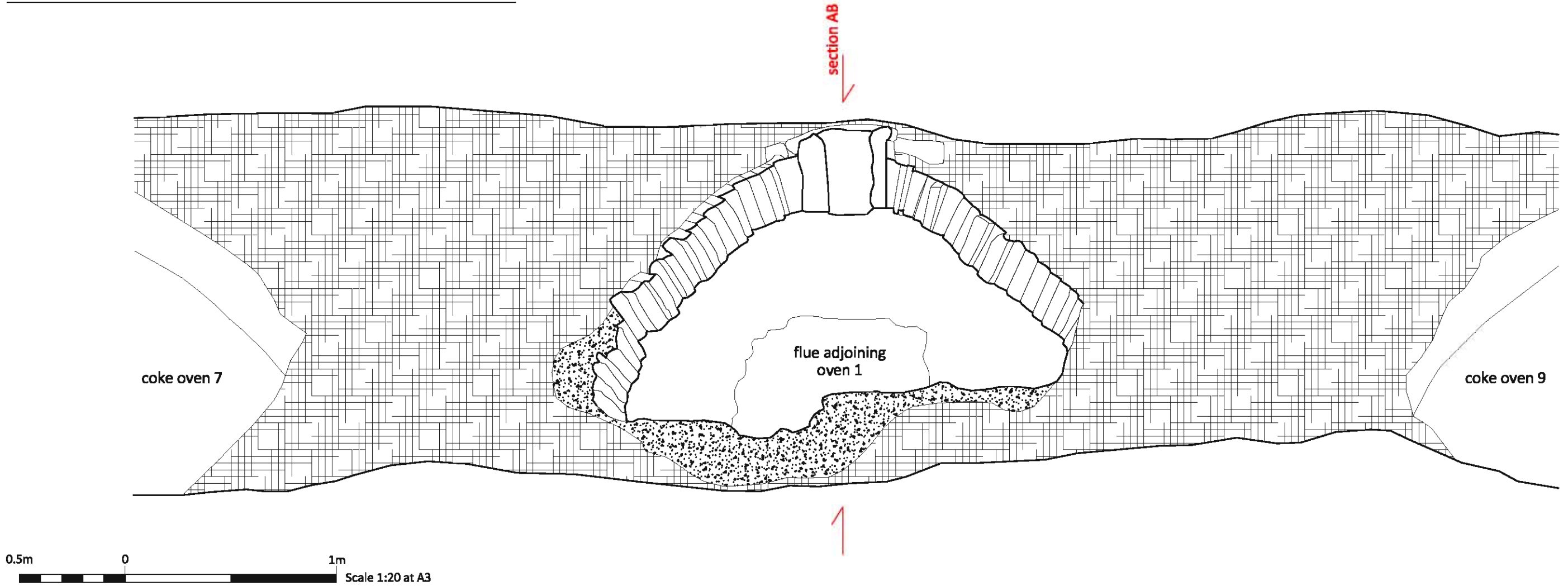


— visible brick plan remains
 - - - projected plan extents
 — visible brick oven roof remains

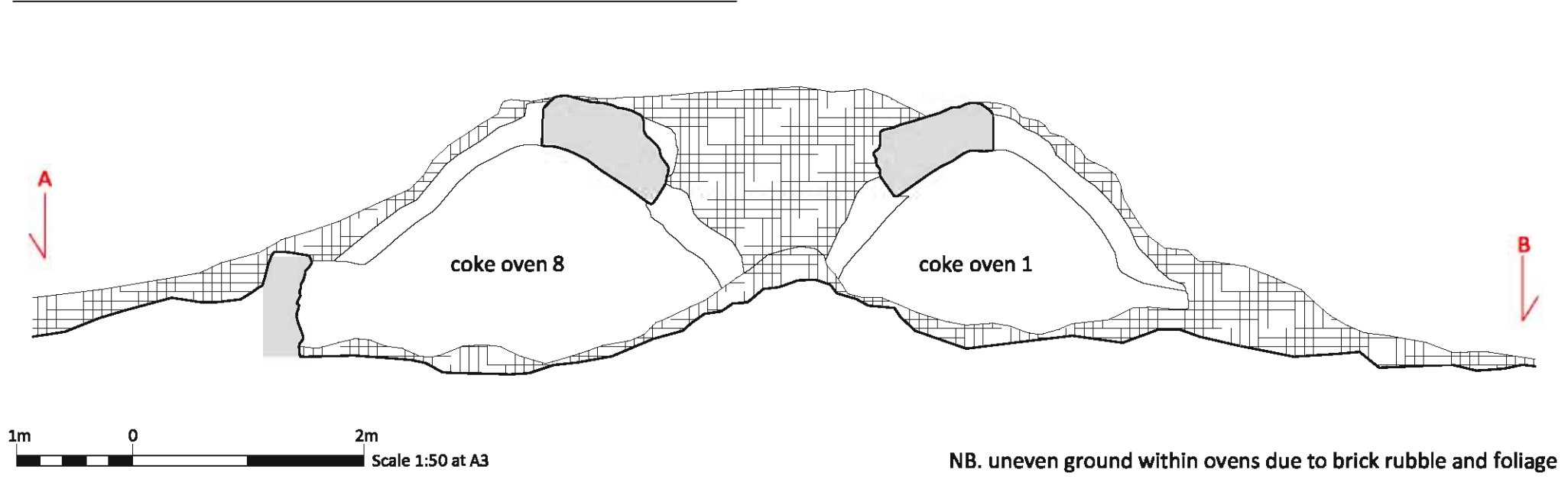


Figure 8: General Plan of the Coke Ovens

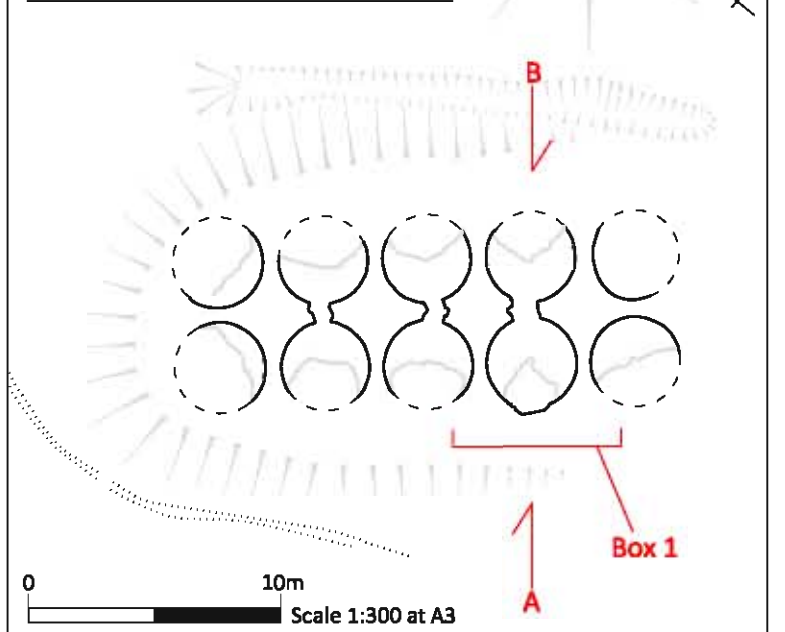
Box 1: South-West External Elevation and Partial Interior of Coke Oven 8



Box 2: North-West Facing Section Through Coke Ovens 8 and 1 (section AB)



Box 3: Plan of Coke Ovens Mound






-  section through solid brickwork
-  areas covered by foliage
-  moss covered stone

Figure 9: Detail of Coke Oven No. 8, including south-west external elevation and north-west facing section (also including Coke Oven 1)

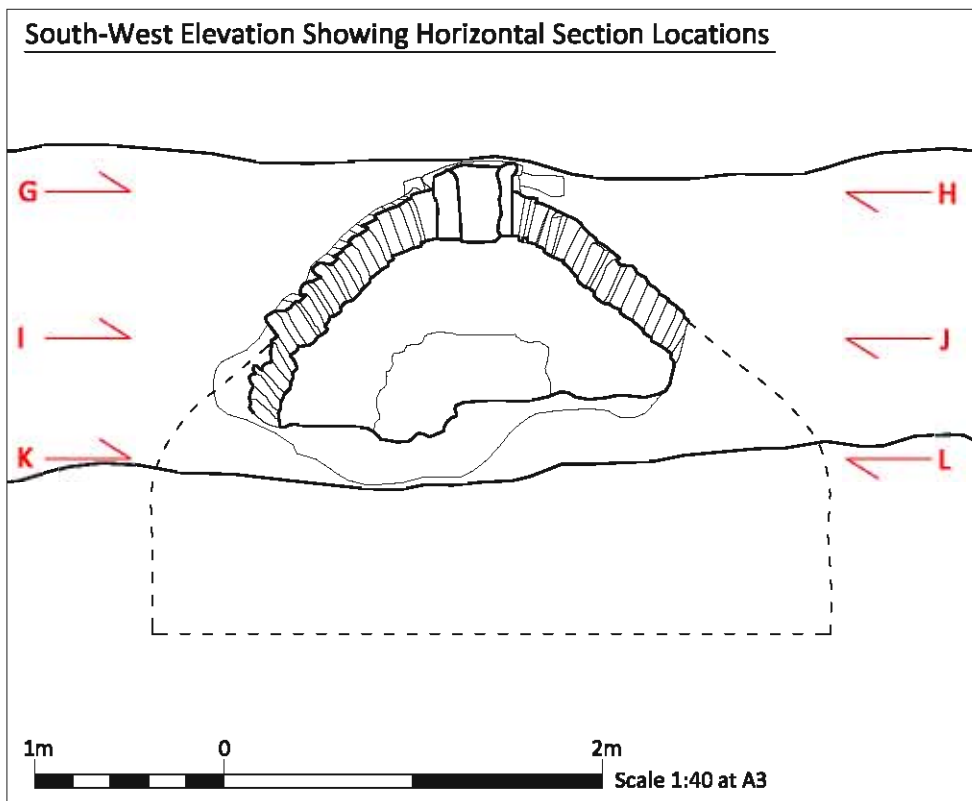
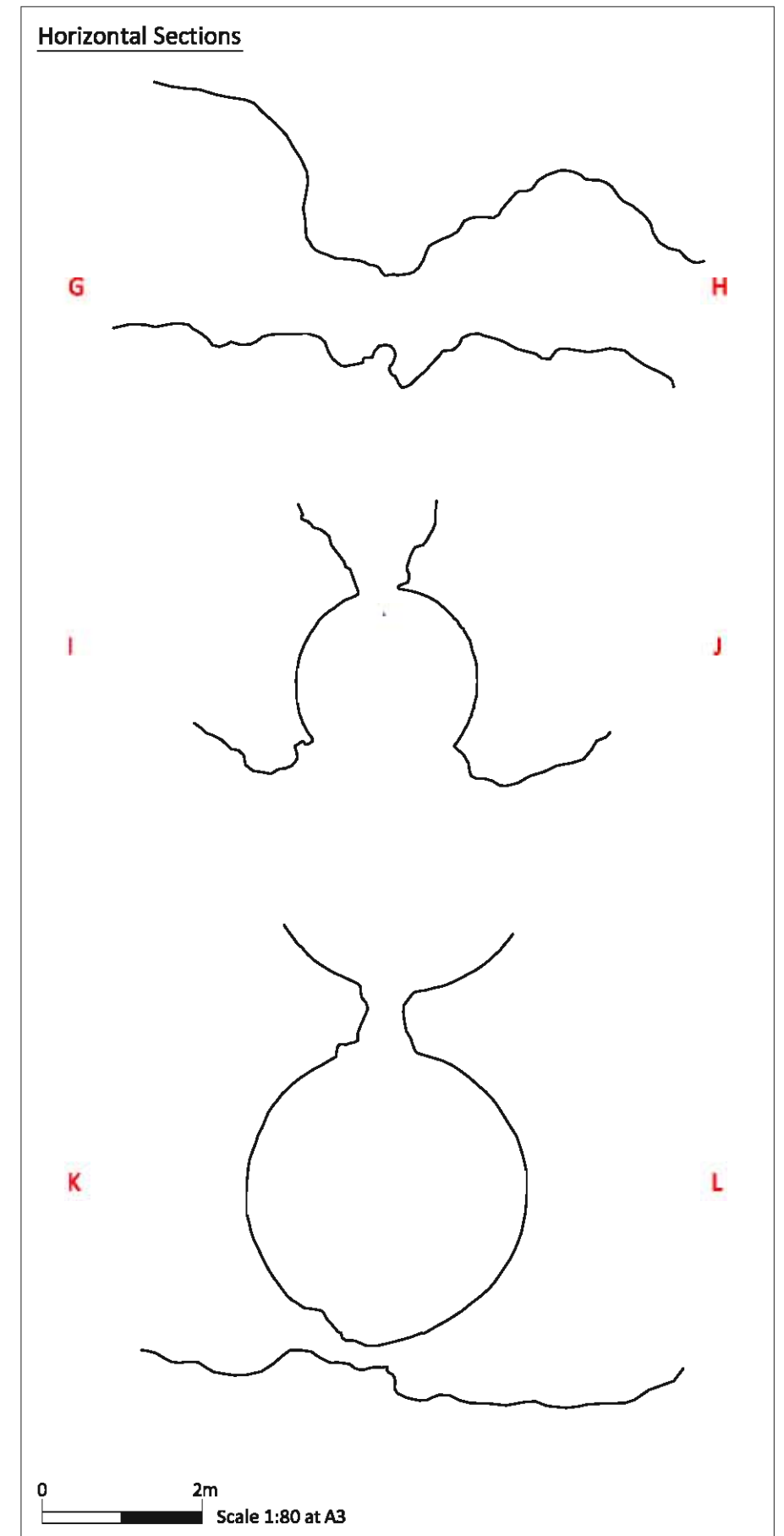
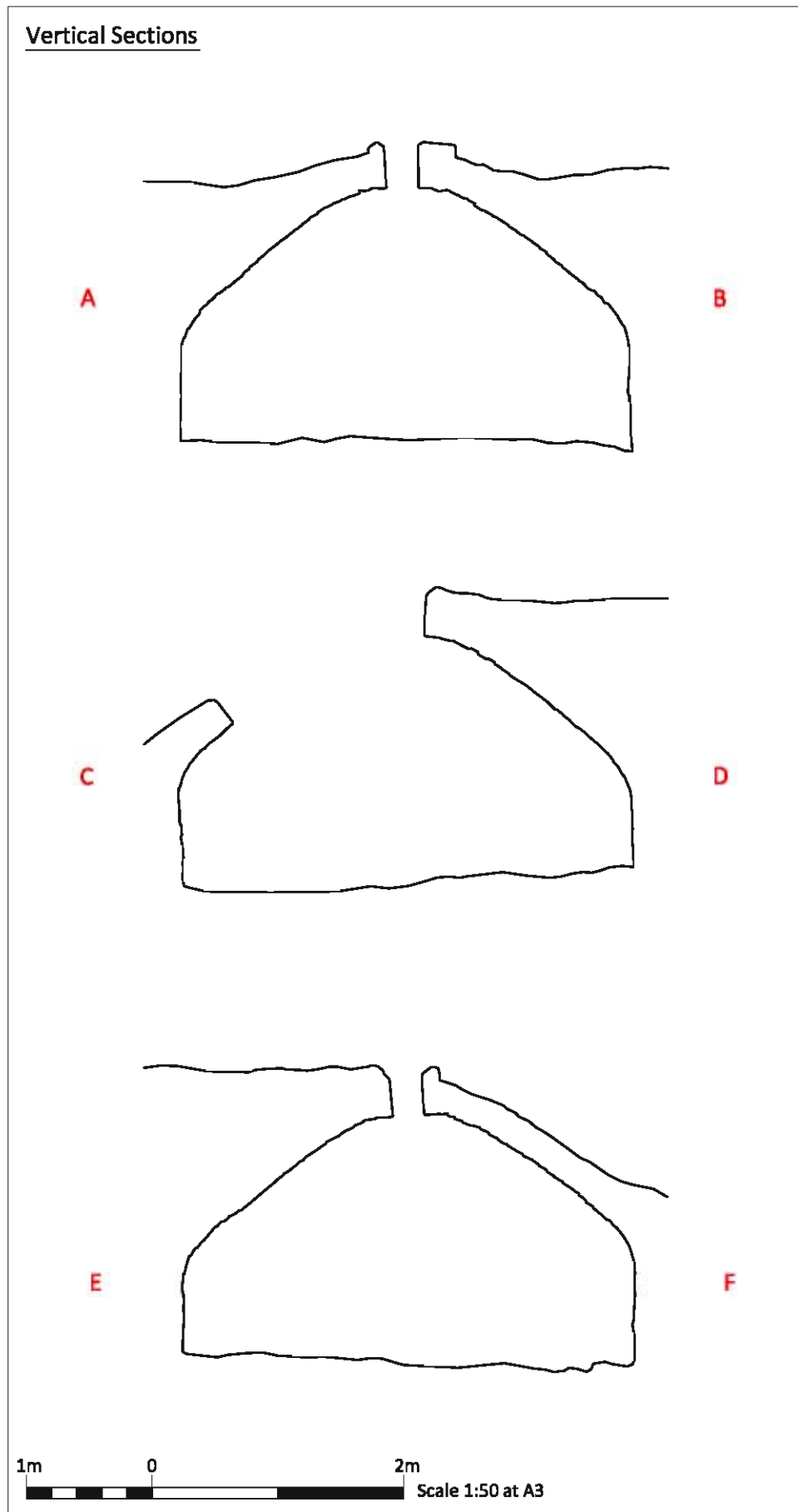
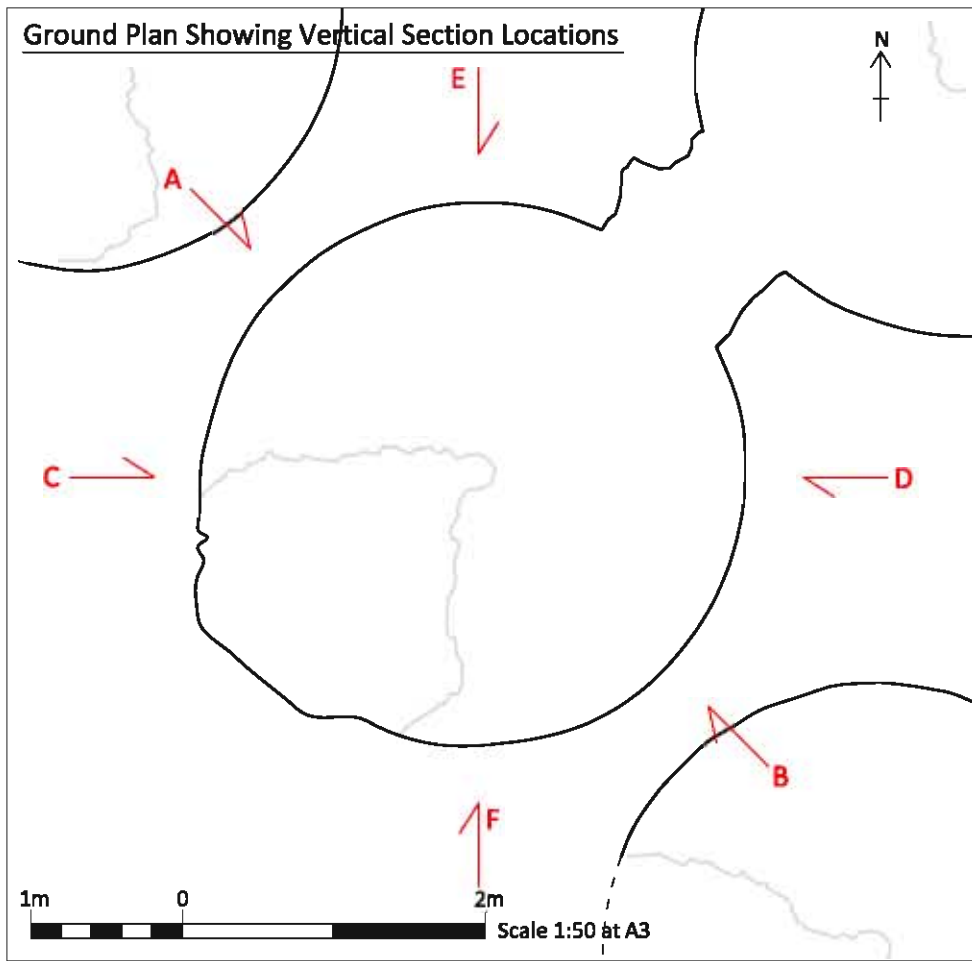


Figure 10: Detailed Sections through Coke Oven 8



Plate 1: General view of the remains of the railway sidings F08 from the south



Plate 2: General view of the remains of the railway sidings F08 from the west



Plate 3: General view of the main coke ovens (F01) to the west side, taken from the west



Plate 4: General view of C1 from the NEE



Plate 5: General view of C2 from the north-west



Plate 6: General view of C3 from the north-east



Plate 7: General view of C4 from the north-west



Plate 8: General view of C5 from the west



Plate 9: General view of C6 from the west



Plate 10: General view of C7 from the south-west



Plate 11: General view of C8 from the west



Plate 12: General view of C9 from the south



Plate 13: General view of C10 from the east



Plate 14: Detail of blackened brick flue to C8 from the south-west



Plate 15: Detail looking down into the linking chamber between C1 & C8 from the south-east

view of each oven from C1 - C10 and were all originally identical. They formed a bell shape in brick with a flue to the centre top in a wider brick (Plate 14). The best surviving examples are to the east and west sides, which also contain some survival of brick partitions within the coke ovens. Figures 9 & 10 provide a more detailed example showing a plan and various sections through C8. It shows that to the rear of the east and west coke ovens was another flue hole to the base, very crude in execution, linking to the chamber behind (Plate 15). This feature certainly wasn't present in the corner ovens (C4, C5, C9 & C10). All the ovens were set back-to-back with a mound over them, no doubt to keep in the heat of the burning coal.

6 DISCUSSION

6.1 The dating of the ovens

6.1.1 The ovens are associated with the nearby Woodmuir Colliery and their construction date is likely to be some time after this was established in 1896 and may have survived into the early 1960s, the colliery itself closing down in 1963.

6.2 The workings of the beehive coke ovens

6.2.1 Beehive ovens were the popular design for coke ovens by the mid-late 19th century and, although no two designs were entirely the same in terms of operations and workings, the ovens at Woodmuir are a fairly typical example.

6.2.2 To quickly précis the process of the coking procedure, the coal would have been shovelled into either the top or the front of the ovens as soon as the previous load had been removed to retain the heat and reignite the new batch of coal and then levelled by a rake. Working day and night, the air supply would then have been removed from the ovens by means of either bricking up the access hole or by means of an iron gate with holes that could be covered to control the air supply. This control was considered a very important post and the role of the 'coke burner' was a skilled one (Gould 1994, 84). After two or three days, the coal was removed and placed on benches to be picked up and transported to waiting wagons. The process would immediately begin again before the ovens had a chance to cool down. There have been some examples of larger banks of ovens that have a complicated flue system attached to a chimney to expel the gases, such as that at the Unstone Coke Ovens in Derbyshire (Reedman & Sissons 1985) and Summerley Coke Ovens (Battye et al 1991). The frontage of the ovens has not survived at Woodmuir and therefore it isn't clear how they would have been loaded, although one would make an assumption that the coal was loaded at the front from the wagons which would have been set at the front of each oven by way of railway sidings (F03 & F04) and then the heat controlled by the flue at the top.

6.3 The wider landscape

6.3.1 The coke ovens most certainly did not sit in isolation in this large landscape associated with the coke industry and at its height there would have been a complex of railway lines linking the main coke ovens (F01) and the now-demolished coke ovens (F02) with the distribution of coal and removal of coke. These appear to have largely been removed, leaving behind remnants of almost straight-sided 'gulleys' adjacent to the ovens and leading away from them towards the north and east. Much of the area is now quite boggy, although it is possible that more evidence of these lines exists beneath the bog and vegetation.

7 CONCLUSIONS

- 7.1 This study has identified the date and has preliminary identified the workings of one of the few surviving coke ovens in Scotland that are still upstanding today.
- 7.2 The ovens are presently in a fairly poor state of survival, although a few remain in well enough condition to gauge the shape and dimensions of the ovens. However, it is clear that the land has suffered greatly from vegetation problems which would only exacerbate their deterioration. Access at present is also very difficult from the main Forestry road due to the boggy conditions adjacent to it. At the time of writing, there is no access to the ovens which does not require the traversing of at least one water course.

8 REFERENCES

8.1 Bibliography and bibliographical references

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8.2 Cartographic References

1832	John Thomson	Edinburgh Shire	
1856	Ordnance Survey	Edinburghshire Sheet X.S.E.	1:10,580
1895	Ordnance Survey	Edinburghshire Sheet X.S.E.	1:10,580
1909	Ordnance Survey	Edinburghshire Sheet X.S.E. & XVI NE Lanarkshire (parts of) Sheet XIV Linlithgowshire (parts of) Sheet XII	1:10,580
1922	Ordnance Survey	Lanarkshire Sheet XIV Linlithgowshire Sheet nXIV Edinburghshire (parts of) Sheet X, XI, XVI, XVII	1:10,580
1963	Ordnance Survey	Sheet NE 95 NE	1:10,000
1987	Ordnance Survey	Sheet NE 95 NE	1:10,000

APPENDIX 1: BLACK AND WHITE PRINT AND COLOUR DIGITAL PHOTOGRAPHIC RECORD

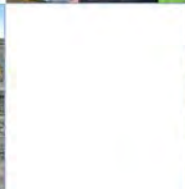
WOODMUIR FARM COKE OVENS: HISTORIC BUILDING RECORDING REPORT

Film	Frame	Structure/Feature	Description	Taken From	Date
1	1	C4	General view	N	08/11/2012
1	2 – 3	C2	General view	N	08/11/2012
1	4 – 6	C1 & C2	General view	NW	08/11/2012
1	7 – 9	C1	General view	NNE	08/11/2012
1	10 – 12	C2	General view	NNE	08/11/2012
1	13 – 14	F08	General view	W	08/11/2012
1	15 – 16	F08	General view	S	08/11/2012
1	17 – 18	F06	General view to W side	N	08/11/2012
1	19 – 21	C10, C1 – C2	General view	E	08/11/2012
1	22 – 23	C5 – C8	General view	W	08/11/2012
1	24 – 26	C5	General view	W	08/11/2012
1	27 – 28	C6	General view	SW	08/11/2012
1	29 – 30	C7	General view	SW	08/11/2012
1	31 – 33	C8	General view	SSW	08/11/2012
1	34 – 35	C9	General view	S	08/11/2012
1	36	-	Film 1 Registration	-	08/11/2012
2	32 – 33	C10	General view	E	08/11/2012
2	34 – 35	-	General view (looking down into space between C1 & C8)	E	08/11/2012
2	36	-	Film 2 Registration	-	08/11/2012

APPENDIX 2: DISCOVERY AND EXCAVATION IN SCOTLAND (DES) ENTRY

WOODMUIR FARM COKE OVENS: HISTORIC BUILDING RECORDING REPORT

LOCAL AUTHORITY:	West Lothian Council
PROJECT TITLE/SITE NAME	Woodmuir Farm Coke Ovens
PROJECT CODE:	AOC21937
PARISH:	West Calder
NAME OF CONTRIBUTOR:	Diana Sproat
NAME OF ORGANISATION:	AOC Archaeology Group
TYPE(S) OF PROJECT:	Historic Building Recording
NMRS NO(S):	NS95NE 66.01
SITE/MONUMENT TYPE(S):	Industrial
SIGNIFICANT FINDS:	Bank of 10 brick built coke ovens
NGR (2 letters, 6 figures)	NS 96796 59799
START DATE (this season)	8 th November 2012
END DATE (this season)	8 th November 2012
PREVIOUS WORK (incl. DES ref.)	None
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	An historic building record was undertaken on a bank of 10 coke ovens located in Forestry Commission land to the south of Woodmuir Farm in West Lothian. The ovens are now ruinous and are typical brick-built coke ovens constructed most likely in the 1890s and were associated with the nearby Woodmuir Colliery which existed from the 1890s up until the early 1960s. The coke ovens are associated with a wider landscape of features including a large bank to the south, evidence of rail lines and railway sidings and another adjacent bank of coke ovens to the north-east, which are now completely collapsed although there is still a large and noticeable mound. The ovens were subject to a written and photographic record together with a 3D laser scan of the bank of ovens to produce a detailed plan of the ovens with a variety of sections identifying their general shape. A general topographic plan of the features in the area was also undertaken.
PROPOSED FUTURE WORK:	None.
CAPTION(S) FOR ILLUSTRS:	None.
SPONSOR OR FUNDING BODY:	Forestry Commission Scotland
ADDRESS OF MAIN CONTRIBUTOR:	AOC Archaeology Group, Edgefield Road Industrial Estate, Edgefield Road, Loanhead, Midlothian, EH20 9SY
EMAIL ADDRESS:	edinburgh@aocarchaeology.com
ARCHIVE LOCATION (intended/deposited)	Archive to be deposited in NMRS



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