Northern Archaeological Associates

GREEN PARK SEWER, AUSTHORPE, LEEDS

POST-EXCAVATION ASSESSMENT REPORT

on behalf of

Thorpe Park

NAA 05/70

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Marwood House, Harmire Enterprise Park, Barnard Castle, Co. Durham DL12 8BN

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SUMMARY

This document presents a report on the results of a topographic survey and a programme of monitoring, excavation and investigation within the Green Park, Austhorpe, Leeds. The work was carried out in advance of the construction of a new sewer pipe and consisted of recording extant earthwork remains in the pipeline corridor, monitoring and excavation of archaeological features encountered during the earth moving and two investigative trenches on the supposed line of an Iron Age ditch and bank feature. The work was undertaken by Northern Archaeological Associates for Thorpe Park Ltd.

In the course of the programme of works significant archaeological remains were encountered that dated from the prehistoric periods to the early 20th century. The earliest remains were dated to the Iron Age and were exposed in the two investigation trenches. The trenches were sited to determine the presence of a substantial ditch and bank feature known as Grim's Ditch, which had previously been unrecorded in that part of the Green Park. In one of the trenches the ditch and remains of the bank were encountered and in the other trench the ditch was apparent with no remains of the bank being evident. In the pipeline easement archaeological features dating to the Romano-British period were exposed, represented by a large palisade ditch. Further remains in the pipeline corridor may be attributable to this period and include part of an enclosure though the lack of dating evidence ruled out absolute dates. Several medieval features were also encountered including ditches, plough furrows and pits. Several mine shafts were exposed in one area of the pipeline corridor, which had not previously been recorded and as such may have been medieval or early post-medieval bell pits. Two later post-medieval trackways were also uncovered, which were related to the 19th century mining in the Green Park.

No further analysis is recommended on either the records or the artefactual and environmental assemblages. The results of the programme of survey and investigation should be incorporated into the overall report on the programme of archaeological work undertaken on Thorpe Park Business Park and the Green Park. The records and retained finds should be incorporated into the project archive.

1.0 INTRODUCTION

1.1 This document presents the results of a programme of archaeological monitoring and recording, excavation and investigation undertaken in conjunction with an earthwork survey carried out in advance of the construction of a new sewer pipeline within the Green Park at Austhorpe, Leeds (SE 382340) (Fig. 1).

1.2 The programme comprised archaeological monitoring of the pipeline route and associated works with subsequent excavation and recording, two investigation trenches and survey of extant earthworks on the pipeline route (Fig. 2). The new sewer pipe was required to link Thorpe Park Business Park to the east of the Green Park into the Yorkshire Water drainage network. The majority of the work was undertaken over the course of six weeks between December 2004 and January 2005, with additional archaeological monitoring in February 2005. This report has been prepared by Northern Archaeological Associates (hereafter NAA) on behalf of Thorpe Park Ltd.

1.3 An archaeological assessment of the wider development area was carried out in 1994 by M. Newman. This included the entire business park to the east of the Green Park and identified a range of archaeological activity dating from the prehistoric to post-medieval periods. The line of a prehistoric ditch and bank (Grim's Ditch) is located along the eastern edge of the park as well as later post-medieval remains including the site of the 19th century Adelaide pit. Although the post-medieval remains would not be affected by the proposed works, Grim's Ditch (a Scheduled Ancient Monument) lay on the line of the sewer route. Following discussions with English Heritage and Doug Moir of West Yorkshire Archaeology Services a project design for the scheme was prepared and agreed (NAA 04/112) to mitigate the impact of the pipeline.

1.4 The mitigation comprised advance earthwork survey in the area north and north-east of Austhorpe Hall and advance stripping of topsoil and subsoil of the pipeline easement and associated working areas under archaeological supervision. The route of Grim's Ditch in the south-eastern portion of the park would be avoided by micro-tunnelling beneath the monument In addition two investigation trenches were excavated in the eastern part of the park, to determine the presence or absence of a gap that had been recorded on the First Edition Ordnance Survey map of 1860 in the length of Grim's Ditch. The trenches were excavated in order to inform future design proposals in the Green Park.

2.0 LOCATION, TOPOGRAPHY AND GEOLOGY

2.1 The Green Park comprises gently undulating pasture and arable farmland between 70m and 80m OD. It is located to the north of Austhorpe and to the west of the Thorpe Park Business Park on the eastern edge of Leeds, West Yorkshire (Fig. 1). The park lies within Austhorpe civil parish.

2.2 The scheme consisted of the construction of a new pipeline built between a point on Austhorpe Lane (SE 3690 3440) and a point to the west of Grim's Ditch within the Green Park (SE 3755 3385) (Fig. 3). This section of pipeline would measure approximately 1km in length.

2.3 The base geology comprises Lower Carboniferous Middle Coal Measures, the surface of which alternates between mudstones, coal seams and sandstone (BGS, 1983, Sheet 53N 02W). This is capped by a varying depth of glacial sands and clays. The soils of the area are fine loamy over clayey soils of the Dale Association. These are slowly permeable seasonally waterlogged soils (Jarvis 1984).

3.0 ARCHAEOLOGICAL BACKGROUND

3.1 The Green Park has been the subject of previous archaeological works. The northern part of the area transected by the sewer was the subject of a geophysical survey by West Yorkshire Archaeological Services (WYAS) in July 2004 and a detailed earthwork survey has also been carried out by English Heritage. The geophysical survey recorded a roughly square triple-ditched enclosure to the south-east of Austhorpe Hall, which had an approximate internal area of 900m². The enclosure appears to have an eastern entrance and the western ditches cut a large circular ditch which may be a barrow. The survey also identified evidence of an Iron Age/Romano-British field system to the east. Sample excavation of the enclosure ditches by East Leeds History and Archaeology Society (ELHAS) identified deeply cut ditches lying beneath a substantial subsoil horizon and some evidence of cobble surfaces within the enclosure. Roman pottery was recovered from the enclosure ditches, which appears to date to the 2nd–3rd centuries AD. Earlier fieldwalking surveys carried out by the society in fields to the south of the site and to the west of Grim's Ditch also produced some Roman pottery finds (Kathy Allday *pers. comm.*).

3.2 An earthwork survey undertaken by English Heritage has already mapped features in the immediate vicinity of Austhorpe Hall. Although no report is as yet available, a copy of the survey plan has been produced and has recorded garden remains to the south of the hall and a trackway, a possible building platform and ridge and furrow ploughing to the east. To the north of the hall two former ponds, a possible icehouse, a trackway, a possible building platform and ridge and furrow ploughing were recorded. The survey did not record the full extent of the ridge and furrow to the north and east of the Hall but this has been undertaken subsequently by NAA.

3.3 The present Austhorpe Hall was constructed in 1694 but it seems likely that the building perpetuates the site of an earlier capital messuage and probably the site of a former medieval manor. An earlier hall building is recorded in 1574 and it is considered likely that some earlier buildings may formerly have extended beyond the existing curtilage. The hall is considered to be a rare survival of a late 17th century rural merchant's house and is listed Grade II*. The ha-ha wall to the south of the hall is listed Grade II.

3.4 The eastern edge of the Green Park is transected by the line of a linear earthwork system called Grim's Ditch (also known as Grimes Dyke), which comprises a substantial bank with a ditch running along its eastern face. The monument is orientated north to south (with possible breaks along its length) and has been traced for *c*. 8km along the eastern side of Leeds, from Whinmoor in the north (SE 358 380) to the River Aire at Swillinton Bridge in the south (SE 374 295). Radiocarbon dates obtained from recent excavations of the monument suggest that it was constructed during the Early to Middle Iron Age with a possible re-definition in the later Roman period (Wheelhouse 2001). Grims Ditch is scheduled as an archaeological monument of national importance where it can be seen to survive as an upstanding earthwork and where its course has been determined through geophysical survey. Although no above–ground remains of the monument survive within the Green Park, a section of ditch has been identified to the west of Brown Moor Farm through geophysical survey. This element of the monument has also been scheduled.

3.5 Only a limited number of industrial remains are recorded within the Green Park. These include the site of the Adelaide Pit, an associated spoil heap (or ramp) and a railway spur linking with the railway embankments to the north-east.

4.0 AIMS AND OBJECTIVES

Survey

4.1 The principle objectives of the survey were:

- to record the form and extent of any earthwork remains within the area of the development which had not previously been recorded

Scheme of archaeological monitoring, investigation and recording

4.2 The principal objectives of this phase of work were:

- to investigate and record any archaeological features identified during the course of topsoil stripping prior to construction works and recover any associated artefacts
- to expose and record any archaeological features identified during deeper excavation
- to establish the location, date and nature of any areas of archaeological activity and assess the degree of preservation of any remains encountered
- to prepare an illustrated report on the results of the monitoring to be deposited with both the WYAS Sites and Monuments Record and the National Monuments Record

- to prepare a report on the results of the excavation were any significant archaeological remains to be identified or recorded and published in a local, regional or national journal as appropriate

5.0 METHODOLOGY

Topographic Survey Methodology

5.1 The earthwork survey undertaken by English Heritage was extended to the north and south of the hall to include any other upstanding remains in areas transected by the sewer, an access from Austhorpe Lane and the works compound. This survey work was undertaken prior to the commencement of groundworks.

5.2 The topographic survey (Fig. 2) was undertaken on the 9 December 2004, by two archaeological landscape surveyors using a Leica Wild TC500 Total Station Theodolite and Penmap real-time mapping software. Additional survey was subsequently undertaken in April 2005 to map the earthworks to the north-east of the hall to assist in the design of the Green Park and the results of this work are also included here.

5.3 After an initial assessment of the site the top and bottom of each feature were recorded using the total station; any additional detail was recorded by hand or total station as appropriate.

5.4 On completion of the survey, the recorded data was downloaded into AutoCAD Map 2002, plotted to scale and annotated according to notes taken on site.

5.5 The survey was conducted using a local site grid, later transformed to provide Ordnance Survey co-ordinates. An OD height was transferred in the field using data derived from the earlier Flannerys (pipeline sub-contractor) survey. This was conducted at a 1:1000 scale although additional detail was surveyed at a larger scale where appropriate.

Monitoring and excavation methodology

5.6 Archaeological monitoring was undertaken during topsoil stripping of the entire length of the pipeline route and associated areas of construction works (such as the compound area and access routes). In several areas deep subsoil deposits were encountered and a two–phase programme of soil strip was implemented. The pipeline working width was between 11m and 15m wide with the second phase of deeper strip being between 6m to 8m wide dependent upon the depth of the pipe trench. Within the pasture fields soil storage was contained partially within the easement and partially outside it, whilst in the arable fields the soil was stored within the easement width.

5.7 The easement was stripped using a 360° back-acting mechanical excavator equipped with a toothless ditching bucket which was operated under direct archaeological supervision at all times. Once a length of easement had been stripped it remained untrafficked by the contractor until archaeological recording had been completed. On the completion of any necessary excavation within designated areas these were released to the contractor. A vehicular route along the corridor was made available to the contractor after initial recording and investigation.

5.8 All exposed surfaces were cleaned by hand where archaeological features were identified and these were then planned and photographed. Hand excavation of selected archaeological features was undertaken to evaluate the depth, character, and degree of preservation, and to attempt the recovery of sufficient artefactual and environmental evidence to enable dating and assessment of the archaeology. Discrete features were half-sectioned. Linear features were sampled a minimum of 20% along their length or a minimum of a 1m sample section, if the feature was less than 10m long. The deposits at junctions or interruptions of linear features were sufficiently excavated for the relationship between components to be established.

5.9 Finds were recorded and processed using the NAA system and submitted for post-excavation assessment. Forty-litre bulk palaeoenvironmental samples were taken where possible from appropriate deposits and submitted for assessment. Recovery and sampling of environmental remains was in accordance with guidelines prepared by English Heritage (2002).

5.10 All finds recovered were appropriately packaged and stored under optimum conditions. Finds recovery and storage strategies were in accordance with published guidelines (English Heritage 1995; Watkinson and Neal 1998).

5.11 All archaeological features were photographed and recorded at an appropriate scale. Sections were drawn at a scale of 1:10 or 1:20 where necessary. Archaeological plans were drawn at a scales of 1:20, 1:50 and 1:100 dependent upon the extent and nature of the archaeological activity. Levels were tied in to Ordnance Datum.

5.12 A written description of features was recorded on *pro forma* sheets using the NAA context recording system. A photographic record of the site was taken using monochrome prints and colour slide film at a minimum format of 35mm.

6.0 RESULTS

Topographic survey results (Fig. 2)

6.1 The topographic survey mapped the extent of plough furrows and a plateau of imported material within the vicinity of the pipeline easement. The English Heritage survey was undertaken in field 2 and parts of fields 1 and 7 where plough furrows and several other features were surveyed. The survey conducted as part of the pipeline mitigation mapped any remains which had previously been excluded to a

maximum of 20m either side of the corridor route. This part of the survey was carried out in advance of any groundworks with additional survey to map the entire park and any previously unrecorded features being carried out subsequent to the completion of the groundworks. The ridge and furrow encountered in the northern part of the park was medieval and post-medieval in origin. The narrow ridge and furrow in the east part of field 1 was spaced between 4m and 4.50m apart and was post-medieval in date. The wider ridge and furrow located in the west of field 1 and in field 7 was spaced between 7m and 10.50m apart and was medieval in date. All of the ridge and furrow was oriented approximately north to south and formed part of an extensive cultivation system evident in the surrounding fields.

6.2 A large plateau of imported deposits lay partially across the route of the corridor. It was oriented approximately east to west and extended for some 50m in width and approximately 285m in length. The plateau was composed of industrial debris and deposits that may have been upcast from mining works encountered below the plateau in the pipeline corridor during its subsequent excavation. To the south of the plateau seven distinct mounds were recorded in field 7 which overlay the medieval ridge and furrow. These earthworks ranged in size from 45m by 38m to 9m by 12m and consisted of three circular mounds, two amorphous mounds and two linear mounds. One of the circular mounds, formerly recorded in the EH survey was bisected by the pipeline route and found to be a dump of mine waste.

Excavation Results

6.3 The archaeological excavations covered four areas, the main pipeline easement, the associated working areas and two trenches. The pipeline easement was approximately 1km in length and between 11m and 15m wide. The results are discussed working from north-west to south-east and the fields in which features were located are numbered 1 to 7 to aid location (Fig. 3). The associated working areas comprised the works compound, access routes and other working areas utilised for the implementation of the pipeline within field 4. The trenches (1 and 2) refer to the trenches excavated across the line of Grim's Ditch in field 3.

Pipeline easement (Figs. 4–7)

Field 1

6.4 The natural subsoil in this field was a light yellow boulder clay (02). It was cut by medieval ridge and furrow cultivation which survived as upstanding earthwork remains that were well preserved in the northern portion of the field. The ridge and furrow were aligned approximately north to south and measured 4.50m and 9.50m apart, which would suggest more than one phase. These earthworks were truncated by extensive mining remains which were likely to be post-medieval in date though no dating evidence was found from any of the dumped deposits. A total of fourteen circular mine shafts (Plate 3), some of which may have constituted bell pits, were recorded in field 1 over a distance of 44m (Fig. 4). Several of these features were sampled to a depth just beyond the impact of the pipeline route though none were

fully excavated. All of the mine shafts were sealed beneath a substantial plateau of imported material recorded in the topographic survey.

6.5 The two most northerly mine shafts (51, 52) were machine excavated to a depth of 0.63m below the level at which they appeared (74.99m OD). The eastern of the two shafts (51) was 1.50m in diameter and was filled with a fragmented coal deposit (108). The western shaft (52) was 1.87m in diameter and contained two fills of mid yellowish brown silty clay (82) overlain by a fragmented coal deposit (94). Directly south of these shafts was a large spread of mixed coal mudstone and clay which upon excavation resolved into the fill of a further two shafts (53, 54). These shafts were mechanically excavated to a depth of 0.50m below the level at which they became apparent (75.03m OD). The fills were composed of mid brown sandy clayey silt overlain by fragmented coal deposits and the shafts measured between 2.34m and 2.50m in diameter.

6.6 Immediately to the south of these shafts, five discrete mine shafts (55, 58, 61, 62, 63) and a posthole (60) were exposed within the easement. Directly south of shaft 54 a further probable mine shaft (58) was observed extending beyond the eastern limit of the easement. It was filled with a deposit (109) of fragmented coal with sandy clay lenses. Shaft 55 (Plate 4), which measured 2.10m in diameter, was fully exposed against the western trench section and contained one fill (110), a mixed fragmented coal silt and clay deposit. Mine shaft (61) contained two deposits, the primary a blue grey clay (111) overlain by a mixed fragmented coal deposit (100). It measured 2.82m in diameter and was fully exposed. Directly south of shaft 61 a further mine shaft (62) was partially exposed. It contained one fill of bluish grey clay (112) and measured 1.83m in diameter. To the west of shaft 62 another mine shaft (63) was fully exposed. It contained one mixed and variegated fill (101) of yellowish white to grey clay stone and coal. Immediately to the north of this was a small posthole 60 which measured 1.07m in diameter. This feature may have formed part of an extraction mechanism related to shaft 63. The posthole was filled with four deposits that ranged from mid brown to black silty clay and fragmented coal that were up to 0.19m thick.

6.7 To the south of the group of five isolated pits discussed above was a large spread of mixed coal, sand and clay (107) some 12m in length. When sectioned this area resolved itself into a group of at least four shafts (77, 78, 80, 81). The eastern shaft 78 contained a mixed bluish grey yellow clay with sandy lenses (103). The shaft had a diameter of 3.20m. To its west shaft 77 also contained a single fill (102) identical to that of shaft 103. This shaft had a diameter of 3.70m and was machine excavated to a depth of 75.13m OD. Another two excavated mine shafts (80, 81) were located directly south of shafts 77 and 78 and had diameters of up to 2.30m. Shaft 81 contained two fills the primary a grey blue clay (129) overlain by mixed coal and sand and clay (105). Mine shaft 80 contained three fills (104, 113, 122) that varied between fragmented coal to blue grey clay to grey brown silt clay. A further shaft (79) was identified approximately 4m to the south of shafts 80 and 81. It was filled with brownish black silt (106) and measured 3.70m in diameter.

6.8 All of the above shafts were sealed by a large dump of upcast material that was composed of mixed and variegated layers of clay, coal, sand and silt, and which measured between 0.20m and 0.72m thick. These deposits appeared to have been dumped subsequent to the cessation of mining activity in this area and they formed a plateau some 50m wide by 285m long. The mines are thought to be post-medieval in date although there was no artefactual material associated with them. The overlying upcast material was partially overlain by narrow ridge and furrow to the north. On the 1839 tithe map the plateau is depicted as a wood, which would suggest that it had been in existence for some time.

Field 7

6.9 Within field 7 which lay to the south of field 1 the pipeline cut through broad upstanding ridge and furrow and two dumps of mine waste. One of the waste dumps formed a raised mound that had been recorded in the English Heritage survey in the centre of the pipeline easement. The second dump lay close to the boundary with field 2 at the point where the easement turned to the east. Several of the furrows exposed in the pipeline easement had been filled with fragmented coal deposits. The small raised mound was found to comprise light to mid grey mudstone and clay. It had been deposited above a coal filled furrow and may have constituted upcast from a mineshaft. Located some 23m to the south of this feature was a shaft which measured 5m in diameter and was excavated to a depth of 3m below ground level. It contained several fills though only the upper fill was recorded for safety reasons. This consisted of light grey clay and mudstone and no artefactual material was recovered from it.

Field 2 (Figs. 5&6)

6.10 A range of features were encountered in field 2 which dated from the prehistoric to post-medieval periods though the majority were undated and disparate. The features comprised a substantial palisade ditch at the northern end of the field; part of a small enclosure towards the centre of the field; and two lines of postholes, several gullies, and a post-medieval field boundary and trackway in the southern part of the field. The natural subsoil was of the same composition as in field 1 though towards the highest point in the field it became more sandy and weathered sandstone bedrock was exposed. All of the features in this field were cut into the natural subsoil, and apart from the modern features, they were sealed by a deposit of mid brown clay silt ploughsoil (13), which was also encountered in field 4. This subsoil was up to 0.40m thick.

6.11 A post-medieval ditch 2.50m wide was identified which underlay the existing field hedge between fields 2 and 7. It was aligned east to west and had an irregular profile with three fills which were up to 0.45m thick. Pottery and bricks were encountered in the fills which dated from the post-medieval period to the early 20th century.

6.12 South of this field boundary a plough furrow and two modern pits were recorded cutting the natural subsoil. The furrow was north to south aligned and extended into

the eastern section of the trench. The furrow formed part of the system of earthworks recorded in the English Heritage survey of the field.

6.13 Directly south of the furrow and pits a large east to west oriented ditch (19) was exposed (Fig. 5). The ditch which had an irregular V-shaped profile (Plate 1), measured a maximum of 2.90m wide by 1.20m deep and had been re-cut on at least one occasion. The ditch cut the natural subsoil and its primary fill (167) was a 0.34m thick grey orange clay; this had been cut by a linear group of 22 postholes (17) which formed a possible palisade (Plate 2) in the base of the ditch. These postholes measured up to 0.30m in diameter and up to 0.40m deep. Seven of the postholes were excavated and were filled with deposits of hard light grey clay. It is likely that the posts were extracted from the holes and these fills comprise backfill or silting up rather than the rotted remains of the posts. The postholes were sealed by a deposit of orange grey silty clay (166) which was 0.12m thick and overlain by a brown orange silty clay (165) that was up to 0.41m thick. This deposit was cut by a re-cut (161) of the ditch which had a U-shaped profile and concave base. It was 1.11m wide, 0.41m deep and contained three fills (162, 29, 28). The primary fill, a mid grey to blue grey clay silt (28) was 0.07m thick and overlain by a deposit of light orange grey clay silt (29) that was 0.22m thick. This fill was sealed by a mid grey sandy clay (162) that was 0.21m thick. A thin deposit of light brown yellow (163) sandy clay that was 0.20m thick sealed this upper fill of the re-cut and was overlain by a dark to mid brown sandy silt (20) that was 0.23m thick. The ditch was overlain by the ploughsoil layer.

6.14 Located on the summit of the hill towards the highest point in the field part of an enclosure (185) formed by three gullies was exposed (Fig. 6). It measured approximately 25m north to south though its full width was not exposed in the pipe corridor. The northern side comprised an east to west aligned gully (33), which had a U-shaped profile and concave base. It measured up to 1.15m wide and was 0.16m deep. It was filled with a deposit of mid yellow brown clay sand (34) which was truncated by a south-west to north-east aligned gully (37) which had a similar profile and was 0.67m wide and 0.24m deep. This was filled with a light brownish grey silty sand (38). The entrance to the enclosure which was approximately 10m wide was located between the northern gully 33 and the enclosure's eastern side. The eastern side of the enclosure comprised another U-shaped gully (23) with an irregular base. This gully was 0.50m wide and 0.13m deep and extended southwards for 14m from gully 33. It was filled with a deposit of yellow brown sandy silt (24) that had been truncated by another east to west gully (21), which formed the south side of the enclosure. It was V-shaped with a flat base and measured 0.38m deep and 1.40m wide. This was filled with a deposit of (22) yellow brown sandy silt. No artefactual evidence was recovered from any of the gullies though the enclosure lay in close proximity to the triple-ditched Romano-British enclosure identified in July 2004.

6.15 Two pits were exposed adjacent to the eastern section of the pipe trench to the east of the entrance to enclosure 185. The northern pit (31) measured 1.20m by 0.98m and was up to 0.13m deep. It was composed of a deposit of mid brown silty sand (32) that contained a sherd of medieval pottery. The southern pit (159) was pear-

shaped in plan and had a wide U-shaped profile and flat base. It was 2.80m long and up to 2.05m wide. It contained a deposit of yellow brown sandy silt (160) that was devoid of any artefactual material.

6.16 To the east of the enclosure 185 was a fire pit or hearth (35). It was sub-oval in shape and measured 1.58m by 0.79m and was 0.24m deep. It had been filled with a deposit (36) of light brown sandy clayey silt with 30% heat affected stones and a burnt lens in its base. The natural subsoil surrounding the pit had been heat affected and the depth of the feature suggests that it was more then a single usage fire pit. No artefactual material was associated with this feature. No carbonised material was recovered from the soil sample which could be used for carbon dating.

6.17 Between enclosure 185 and the southern boundary of field 2 several minor features were encountered consisting of seven pits and two short gullies. No artefactual material was recovered from any of the features. Six of the pits were interpreted as postholes and formed two lines of three posts, which may have been structural or simple fencelines. Two of the linears were heavily truncated ditch termini which were isolated from other features.

6.18 Immediately north of the field boundary between fields 2 and 4 a post-medieval trackway was encountered which was oriented east to west. It measured 3.84m in width and extended in the direction of the former mine, the Adelaide Pit. The track cut through the plough soil and incorporated a probable drainage gully to the south side. The track comprised a layer of fragmented coal that was up to 0.33m thick above which was an orangey red shale that was sealed by the topsoil. No artefacts were recovered from the trackway.

Field 4

6.19 In field 4 two gullies were encountered which had converging alignments and were separated by some 50m. Neither of the gullies contained artefactual remains and did not have relationships with any other features.

Field 5

6.20 A possible former stream channel was encountered beneath the hedge between fields 4 and 5. Two deposits of colluvium sealed the natural clay; these ranged from grey clay silt to whitish grey clay and were overlain by the plough soil. This was cut by the current hedge boundary which was recorded on the First Edition Ordnance Survey map of 1860. It was filled with a dark brown silt clay which contained modern refuse.

Field 6

6.21 At the southern end of the pipeline corridor in field 6 a post-medieval gully was exposed. It was aligned north-east to south-west and had an irregular profile and concave base. The gully measured 0.41m wide and contained a fill of mid to pale

brownish yellow clayey silt. This deposit was truncated by a re-cut, which measured 0.80m wide and 0.23m deep and was filled with mid brownish grey clayey silt that contained pot, bone and brick.

***Associated Working Areas** (Field 4)*

6.22 The works compound was located in the south-west corner of field 4 with the access route extending eastwards adjacent to the public footpath. At the eastern end of the access route, a turning area was also soil stripped. The compound measured 14m east to west and 19m north to south. The access route measured 9m wide and was approximately 130m long. The turning area was 40m by 20m in size and was devoid of archaeological features.

6.23 The natural subsoil in the compound area (Fig. 7) was a greyish orange sandy clay (02). This had been cut by two ditches (03, 05). A north-west to south-east ditch (03) which extended for 17m was exposed in the western half of the compound. It had an irregular profile with a flat base and measured 1.75m in diameter and 0.30m deep. It was filled with a deposit of mid brown sandy clayey silt (04), which contained 12th to 13th century medieval pottery. A further ditch (05) lay partly beneath the eastern edge of the working area which also cut the natural subsoil. It was north to south aligned and 12m of its length was exposed in the compound area. The ditch measured 0.45m deep and was filled with a deposit of mid brown sandy clayey silt (06). These ditches may have been boundary divisions and their converging alignments suggested they were not contemporaneous. A layer of dark brown sandy silt topsoil (01) that was 0.21m thick extended across these features.

6.24 Natural clay subsoil was exposed in the access track in a series of sondages which were between 0.80m and 1m deep. Above the natural subsoil was a 0.60m thick deposit of re-deposited natural clay which extended for approximately 90m along the access track. It appeared to have been imported to raise the ground level above a possible former stream channel identified between fields 4 and 5. It was decided not to remove deposits other than topsoil from the access as any underlying archaeology would be protected by upwards of 1m of deposits.

Trenches 1 and 2 (Fig. 8)

6.25 Two trenches were excavated on the eastern limit of field 3, in order to determine the presence or absence of a gap that had been recorded on the First Edition Ordnance Survey map in the length of Grim's Ditch. The trenches were positioned across the supposed line of the ditch with the intention of exposing the feature in plan were it to survive, but not to excavate it.

6.26 Trench 1 was located in the south east corner of field 3 and was aligned approximately east to west. It measured 70.85m east to west, 2.10m north to south and was between 0.17m and 0.55m deep. The natural subsoil (02) in this trench was a brownish yellow clay with some weathered sandstone bedrock in the extreme east of the trench. Some 10m from the western end of the trench a deposit of mid

brownish orange clay sand (141) which was deposited above the natural and spread across the width of the trench was traced for some 26.51m. It contained occasional stones and some root disturbance and was thought likely to constitute the ploughed out remains of the large earthwork bank that existed to the west of Grim's Ditch. Three metres east of this deposit was a substantial linear ditch (140), which measured between 5.50m to 6.0m wide. Based on its size and alignment, this feature was thought likely to constitute Grim's Ditch. To the east of this feature were several plough scars filled with topsoil but no further activity was encountered. All of the features in the trench were sealed by the topsoil (01) which was up to 0.30m thick.

6.27 Trench 2 was located in the north-east corner of field 3 and measured 95.50m long, between 2.5m to 8.70m wide and was oriented east to west. At the eastern end of the trench a substantial ditch (135) was recorded. It measured 8.50m wide and was filled with (126) a light to mid yellow brown silty clay. Based on its size and alignment this feature was interpreted as Grim's Ditch in trench 2. A range of other features were found to the west of this ditch. The natural subsoil was a mid yellow clay (02) that was cut by eight north to south oriented plough furrows. Approximately 23m from the west end of the trench a large shallow feature (142) was encountered that was up to 11m wide and filled with several deposits of clay. This feature lined up with a field boundary depicted on the First Edition Ordnance Survey map and may have been a hollow-way. All of the features in the trench were sealed by the topsoil which was of the same composition as in trench 1.

7.0 ASSESSMENT OF SITE ARCHIVE

Initial analysis

7.1 As part of the assessment of the site the following analysis have been undertaken:

1. A provisional matrix for the site was drawn up showing the stratigraphic relationships of all 186 contexts.

2. Plans and sections were checked against record sheet to ensure cross-referencing. Catalogues of context and finds records have been put onto a computerised database.

3. Catalogues of slide and print photographs, and illustrations have been input onto a computerised database.

The quantification of the site record is as follows:

Table 4: Primary archive inventory

Context descriptions	186
Plans	24
Sections	44
Colour slides (films)	8

Black and white photographs (films)	8

Recommendations for further analysis

7.2 It is recommended that no further analysis be carried out of the site matrix as little or no additional information could be supplied from the relatively small finds assemblages and because the majority of features did not contain dating material. Further analysis of the site could be incorporated into previous and future phases of archaeological works at the Green Park and Thorpe Park. This would enable contextual analysis of the site and individual features, which could be typologically analysed with the assistance of C14 dating from more productive features in the wider development area.

7.3 The site archive should be integrated with the illustrated publication report of the wider development area.

Storage and curation

7.4 The written, drawn and photographic records and soil samples are currently held by NAA. A representative proportion of the soil samples was sent to Palaeoecology Research Services and has been processed for this assessment.

7.5 The retention and disposal policy for the assemblage from Green Park will be to retain the medieval artefacts and to dispose of the later post-medieval and modern artefacts. Only a small proportion of the material was derived from secure contexts and the assemblage, which is very small, is not considered to be important either in local or regional terms. The archive will be deposited in the Leeds City Museum after completion of all phases of archaeological work at Thorpe Park.

8.0 SPECIALIST FINDS ASSESSMENTS

Processing and quantification

8.1 Washing of the bulk finds, including animal bone, was completed and all finds recovered have been recorded, marked where appropriate, packed in labelled bags and placed in labelled museum storage boxes. A finds database was produced in order of context number. This database tabulates the artefact type, quantity and includes a brief description. The artefact assemblage from Green Park is summarised below. Once prepared the material was sent to the specialists for assessment.

Table 5: Finds assemblage

Animal bone	1
Ceramic building materials	21
Claypipe	8
Fe	3

Industrial waste	13
Plaster	1
Pottery	46
Stone	1
Unidentified ceramic	1

Environmental assessment

Allan Hall, Deborah Jaques and John Carrott (Appendix A)

Summary

8.2 Eight samples were recovered during excavations at Green Park. All of the samples were examined and a subsample of each was processed. Ancient biological remains recovered were restricted to traces of fine charcoal of no interpretative value. No remains suitable for radiocarbon dating were recovered from the samples. All of the samples contained rootlets which were almost certainly modern intrusions into the deposits. Context 30 gave some plant remains of taxa of wet/damp habitats (namely water-plantain and rush) where preservation by anoxic waterlogging could occur. However these remains were too well-preserved to be ancient and were more likely a modern intrusion.

Recommendations

8.3 No further investigation of the biological remains from the site is warranted. On the evidence of the samples examined here, further archaeological interventions at the site are unlikely to encounter deposits with interpretatively valuable assemblages of biological remains. Any future works should perhaps allow a small assessment contingency against the eventuality of revealing deposits with greater concentrations of charred plant remains. On the evidence of the current samples the organic preservation at the site is very poor and the potential for interpretatively useful information to be obtained from biological remains is negligible.

Pottery

Peter Didsbury (Appendix B)

Summary

8.4 A total of forty-six sherds (835gms) with an average sherd weight of 18.2 grams, was recovered from the excavations at the Green Park. The material was quantified by the two measures of sherd count and weight, according to fabric category within archaeological context. The assemblage ranged from possibly the Romano-British period to the early twentieth century. Three small crumbs of pottery were recovered which may have been of either Romano-British or medieval date, though were too small to be accurately dated. The largest medieval component consisted of gritty wares, which were principally small body sherds in a wide variety of different

fabrics, and there were few diagnostic formal characteristics which would allow close dating. In general terms the majority of these wares were in the variously named Pimply Ware/Northern Gritty Ware tradition of around the late eleventh to mid thirteenth century, though later material may possibly be present. The earliest post-medieval pottery was two sherds of a Trailed Slipware of *c.* seventeenth or eighteenth century date and late 18th century or early 19th century Creamware was also recovered. A large proportion of later material was derived from later features included factory produced wares Blackware, white earthenwares and yellow-glazed white earthenwares and early twentieth century stoneware and porcelain.

Recommendations

8.5 The assemblage is small and of relatively low quality but the presence of grit tempered material including particularly a sherd stamped with wheel motifs. It is recommended that this part of the assemblage be brought to the attention of Dr Chris Cumberpatch, who may make further recommendations in the light of recent reclassifications of medieval pottery of this area.

Slag material

Jane Cowgill (Appendix C)

Summary

8.6 A total of 2.14kg (8 pieces) of slag and coal were submitted for recording. The finds were identified solely on morphological grounds by visual examination, sometimes with the aid of a x10 binocular microscope.

8.7 The slag was recovered from two deposits; the fill of a post-medieval trackway and the topsoil layer. The slag from the trackway are all in a fresh condition and show no signs of damage. All the pieces incorporate, or are largely composed of, very poor quality coal including some large pieces. This slag is not the by-product of iron smithing but is probably a waste product from coal burning. It is likely that the cindery slag was produced while the coal was being burnt and is an amalgam of the mineral components that would be present in such a low quality coal. Coal-powered machinery would almost inevitably be used by the miners and perhaps this slag was the by-product of one of those, later discarded on the trackway as metalling. The piece of slag from the topsoil was very abraded and is probably a by-product of iron production, the smelting of iron in some type of bloomery shaft. It appears to be a piece of block slag, a by-product from a technology that is not yet understood. If it is then it is likely to be Late Iron Age or Romano-British in date. It is, however, just possible that it is part of an exceptionally large and dense plano-convex slag accumulation (commonly known as hearth bottoms), but this is less likely given the site location in northern England.

Recommendations

8.8 No further work is recommended on the later slag material from the trackway. The piece of slag from the topsoil should be retained and used for comparative study with finds of a similar type from previous and future excavations within the wider development area.

Conservation assessment

Jennifer Jones (Appendix D)

Summary

8.9 Three iron objects were examined and X-radiographed. They were found to be moderately corroded and stable. The material was X-radiographed using **5** XR plates. Two of the objects (150 AA and 150 AB) are heavy and dense and appear to be pieces of rectangular-sectioned bar with intact long edges and broken short edges. Both pieces appear to have a groove running along at least one face. Object 150 AA has a right angle in its length, which the X-radiograph shows to be the join between two pieces of bar. No means of attachment of the two pieces is visible on the X-radiograph. The Fe nail, 146 AA has extensive mineralised wood on its shank.

Recommendations

8.10 The continued storage in an airtight container at a stable temperature and below 20% relative humidity to inhibit further corrosion which can be controlled by active silica gel.

Assessment of Miscellaneous materials

Sarah Wilkinson (Appendix E)

Summary

8.11 A range of material was recovered from the excavations, which included animal bone, ceramic building material, clay tobacco pipe, plaster and a worked stone. All of the material was quantified by the two measures of count and weight and the data was entered onto an Access database.

8.12 *Animal bone* - One piece of animal bone was recovered which came from the recut 132 of gully 130. It weighed 75g and was part of a long bone from a cow or a horse that had been sawn at both ends.

8.13 *CBM* - A total of twenty-one fragments of ceramic building material which weighed approximately 7.5kg was recovered from the excavations. The majority of the assemblage consisted of diagnostic and non-diagnostic bricks and brick fragments. All identifiable bricks dated to between the 18th and 19th centuries.

8.14 *Clay Tobacco Pipe* - A total of eight clay pipe fragments, which weighed 18g was recovered from the excavations. These consisted of one bowl fragment and seven stem fragments, all of which probably date from the mid to late 18th century.

8.15 *Plaster* – A fragment of plaster which weighed 8g was recovered from the topsoil. Traces of red paint were visible on it and it is likely to be 19th or 20th century in date.

8.16 *Worked Stone* – A roughly hewn disc shaped stone was encountered in the fill (27) of the re-cut (161) of the large palisade ditch (19). It measured 110mm in diameter and was between 35mm to 40mm thick. It was composed of medium-grained sandstone. One surface had been worn smooth with a possible sharpening groove towards one edge, suggestive of a whetstone. It may date to the prehistoric period though such whetstones were also common in the medieval period.

Recommendations

8.17 Aside from the worked stone which may be medieval or earlier in date the remainder of the finds date to the 18th and 19th centuries and are of no intrinsic interest. No further work is recommended on these artefacts and they should be disposed of with the stone being retained with the archive.

9.0 DISCUSSION OF RESULTS

9.1 The excavations within the Green Park identified previously unrecorded archaeological remains of a significant nature which date from the prehistoric period to the early 20th century. These remains consisted of a section of Grim's Ditch and bank, a large palisade ditch, an enclosure, medieval and post-medieval field systems and extensive mining related remains.

9.2 The evaluation determined that the line of Grim's Ditch through the Green Park was continuous and that the gap recorded on the First Edition Ordnance Survey map did not reflect below ground remains. The line of Grim's Ditch was recorded in both trenches and the survival of the associated bank in one trench. Though the ditch was not excavated, the existence of the monument in this area will be of use in informing future development proposals in this area of the Green Park.

9.3 The large palisade ditch and the small enclosure were encountered in a field where further less coherent remains were also exposed. Due to the lack of dating evidence from most of these features it is difficult to assess the individual significance of these remains. However, the field in which this activity was exposed has been the focus of previous archaeological works, which encountered multi-phased remains. These remains consisted of a triple-ditched Romano-British enclosure and a Bronze Age barrow. The features encountered within the pipeline easement provide further information about the wider context of these features.

9.4 Examination of the excavation results in conjunction with the results of the geophysical survey (WYAS, 2004) did not establish any definite associations. Several intermittent linear anomalies (E on Fig. 4, WYAS 2004) in the area west of enclosure 185 identified in the gradiometer plot, may mark the progression of this enclosure to the west. An approximately east to west linear trend was recognised on the same plot to the west of the palisade ditch. Though these features do not correspond precisely the linear trend does extend west from the area of the ditch. However, the quality of the data collected in this area has been compromised probably by spoil deposits from mining activity to the north and this has made definitive interpretation of the survey results difficult.

9.5 Remains of extensive ridge and furrow cultivation were recorded during the survey work which dated to the medieval and post-medieval periods. Several dumped deposits were found to have overlain the earlier phase of ridge and furrow probably resulting from mining activity. The survey also established that the later phase of ridge and furrow was carried out subsequent to another series of mining dumping. This phase of dumping had resulted in a large plateau of material being formed, beneath which several shafts were exposed. Although these were not fully excavated, from their form in plan they have been interpreted as bell pits. This information along with the excavation of two post-medieval mining tracks provides additional information about the extent of mining activities in the Austhorpe area.

10.0 CONCLUSION

10.1 Archaeological remains of a diverse nature, dating from the prehistoric period to the early 20th century were encountered both within trenches 1 and 2, and along the length of the pipeline corridor. Though most of the remains were not interrelated and disparate, they are of value because they help provide a greater understanding of the archaeology in the landscape around Austhorpe Hall.

10.2 No further analysis is recommended on either the records or the artefactual and environmental assemblages. The results of the programme of survey and investigation should be incorporated into the overall report on the programme of archaeological work undertaken on Thorpe Park Business Park and the Green Park. The records and retained finds should be incorporated into the project archive.

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Appendix A

ENVIRONMENTAL ASSESSMENT

John Carrot, Örni Akeret and Stewart Gardner

Summary

Eight sediment samples, recovered from deposits encountered during excavations at Green Park were submitted for an evaluation of their bioarchaeological potential. The excavations revealed a range of negative features (including gullies, ditches and postholes), together with extensive evidence of mining and the remains of ridge and furrow cultivation. Dating evidence was rather sparse but, where present, indicated activity in the medieval and post-medieval periods. In addition, the line of Grim's Ditch (an early/middle Iron Age ditch and bank feature) was revealed in two of the three excavated trenches.

All of the samples were examined and a subsample was processed from each for the evaluation. Ancient biological remains recovered were restricted to traces of fine charcoal of no interpretative value. No remains suitable for submission for radiocarbon dating were recovered from the samples.

No further study of the current material is warranted.

INTRODUCTION

A programme of archaeological monitoring and recording was carried out by Northern Archaeological Associates (NAA) at the Green Park (NGR SE 382 240) during December 2004 and January 2005. This programme was undertaken in advance of the installation of a new sewer pipeline and associated works.

A pipeline easement and two trenches were excavated. Extensive evidence of mining, the remains of ridge and furrow cultivation, linear features, postholes, a trackway, gullies and ditch features, of medieval and post-medieval date (where dating evidence was recovered), were encountered in the pipeline easement. The last of these included a substantial ditch with evidence of a palisade in the base and which had been re-cut. Trenches 1 and 2 both revealed the line of Grim's Ditch (a probable early/middle Iron Age ditch and bank feature) and a post-medieval trackway.

Eight bulk sediment samples ('GBA'/'BS' *sensu* Dobney *et al.* 1992) were recovered from the encountered deposits. The samples were submitted to Palaeoecology Research Services Limited (PRS), County Durham, for an evaluation of their bioarchaeological potential.

METHODS

The sediment samples were inspected in the laboratory and their lithologies recorded, using a standard pro forma, prior to the processing of subsamples, broadly following the procedures of Kenward *et al.* (1980), for the recovery of plant and invertebrate macrofossils. The subsamples were disaggregated in water for at least 24 hours before processing and their volumes recorded in a waterlogged state.

The washovers resulting from processing were examined for plant and invertebrate macrofossils. Plant and invertebrate remains in the processed subsample fractions (residues and washovers) were recorded briefly by 'scanning' using a low-power microscope, identifiable taxa and other components being listed on paper. Nomenclature for plant taxa follows Stace (1997).

The residues were primarily mineral in nature and were dried, weighed and their components recorded.

Results

The results are presented in context number order. Archaeological information, provided by the excavator, is given in square brackets. A brief summary of the processing method and an estimate of the remaining volume of unprocessed sediment follows (in round brackets) after the sample numbers. The numerical parts of the sample numbers were derived from the context numbers for PRS internal recording keeping purposes (the initial double letter code being the NAA sample designation).

CONTEXT 22 *[FILL OF EAST-WEST GULLY 21 WHICH MAY HAVE FORMED PART OF ENCLOSURE 185]*

Sample AA2201/T (3kg/2.5 litres sieved to 300 microns with washover; approximately 15 litres of unprocessed sediment remain)

Just moist, light to mid orange-brown to mid grey-brown, crumbly to unconsolidated, slightly silty sand, with stones (2mm to 60mm), coal and modern rootlets present.

Apart from modern rootlets and amorphous charred material the tiny washover (~3ml) from this sample contained only a few seeds or fruits. These last comprised three seeds of orache (Atriplex), three achenes of knotgrass (Polygonum) and two seeds of elder (*Sambucus nigra L.*).

The residue was very small (dry weight 0.46kg) and mostly of stones (to 38mm) and sand, with traces of coal (to 35mm, 8g) and charcoal (1 fragment to 6 mm, <1g).

CONTEXT 28 *[PRIMARY FILL OF RECUT 161 OF DITCH 19]*

Sample AA2801/T (3kg/2.8 litres sieved to 300 microns with washover; approximately 1 litre of unprocessed sediment remains)

Just moist, light grey to light grey-brown, stiff (working plastic), clay, with patches of mid orange-brown oxidised clay silt. Modern roots and rootlets were present.

There was a tiny washover (~10ml) of modern rootlets and sand grains, with a trace of charcoal (to 3mm) and a few fragments of ?cinder (to 10mm).

There was a tiny residue (dry weight 0.16kg) of stones (to 28mm) and coarse sand.

***CONTEXT 29** [SECONDARY FILL OF RECUT 161 OF DITCH 19]*

Sample AA2901/T (3kg/3 litres sieved to 300 microns with washover; approximately 13 litres of unprocessed sediment remain)

Moist, light grey to light to mid grey-brown (with mm-scale mid orange-brown oxidation mottling), stiff to crumbly (working soft and slightly plastic), clay silt, with modern roots, rootlets and root traces present.

The tiny washover (~10ml) was mostly of modern rootlets and other modern plant detritus, with a trace of fine ?coal/charcoal (to 2mm).

The residue was very small (dry weight 0.30kg) and mostly of sand, with a few stones (to 12mm) and a little ?coal (to 10mm, ~1g).

***CONTEXT 30** [FILL OF POSTHOLE 180 – PART OF PALISADE SERIES IN DITCH 19]*

Sample AA3001/T (3kg/2.2litres sieved to 300 microns with washover; approximately 15 litres of unprocessed sediment remain)

Just moist, light grey, stiff (working plastic), clay, with patches of mid orange-brown oxidised clay silt. Stones (6mm to 60mm), traces of charcoal and modern rootlets were present.

The tiny washover (~5ml) from this sample consisted largely of fibrous plant debris and a few small plant stems. Achenes of water-plantain (Alisma) and caryopses of different representatives of the grass family (Poaceae) were numerous, as well as seeds of rush (Juncus). All of the plant remains were preserved in an uncharred state. There were also a few insect remains including four beetle leg fragments and a single unidentified elytron (also broken), all of which were rather badly eroded.

There was a tiny residue (dry weight 0.13kg) of sand and stones (to 50 mm), with a trace of charcoal (3 fragments to 5mm, <1g).

***CONTEXT 32** [FILL OF SMALL PIT ADJACENT TO THE PROBABLE ENTRANCE OF ENCLOSURE 185; ?MEDIEVAL]*

Sample AA3201/T (3kg/2.4 litres sieved to 300 microns with washover; approximately 13 litres of unprocessed sediment remain)

Just moist, light to mid yellow-brown to mid brown to mid to dark grey-brown, crumbly, silty sand, with stones (6mm to over 60mm) and modern rootlets present.

The small washover (~20ml) was mostly modern rootlets and sand grains, with a little charcoal and coal (both to 7mm), one or two ?charred unidentified 'seeds' and a few modern beetle fragments (abdominal sclerites).

There was a small residue (dry weight 0.43kg) of stones (to 50mm), with some sand and traces of ?cinder/part burnt coal (to 8mm, <1g) and charcoal (a single fragment to 2mm, <<1g).

CONTEXT 34 *[FILL OF EAST-WEST GULLY 33 WHICH MAY HAVE FORMED PART OF ENCLOSURE 185]*

Sample AA3401/T (3kg/2.5 litres sieved to 300 microns with washover; approximately 33 litres of unprocessed sediment remain)

Just moist, light to mid orange-brown to mid grey-brown, crumbly to unconsolidated, slightly silty sand, with ?brick/tile common and modern rootlets present.

There was a very small washover (~15ml) of modern rootlets, with traces of fine ?coal/charcoal (to 2mm) and cinder (to 9mm).

The small residue (dry weight 0.75kg) was mostly stones (to 50mm), with some sand and traces of ?coal (to 5mm, <1g) and charcoal (to 7mm, <1g).

CONTEXT 36 *[FILL OF PROBABLE FIRE PIT 35]*

Sample AA3601/T (3kg/2.8 litres sieved to 300 microns with washover; approximately 32 litres of unprocessed sediment remain)

Moist, light grey-brown to mid grey-brown (in shades of brown and grey-brown between), crumbly (working soft), slightly clay silt, with some stones (over 60mm) and modern roots/rootlets/seedlings present.

The tiny washover (~10ml) was approximately two-thirds charcoal fragments (most to 4mm, with one larger to 10mm) and sand grains, and one-third modern rootlets. A single unidentified ?charred grain fragment was also noted.

The small residue (dry weight 0.44kg) was of stones (to 40mm) and sand, with a trace of ?coal (to 6mm, ~1g).

CONTEXT 38 *[FILL OF GULLY 37 WHICH TRUNCATED GULLY 33 AND SO LIKELY TO POST DATE THIS AND ENCLOSURE 185]*

Sample AA3801/T (3kg/2.2 litres sieved to 300 microns with washover; approximately 15 litres of unprocessed sediment remain)

Moist, light to mid orange-grey-brown, crumbly to unconsolidated, ?slightly clay silty sand. Stones (20mm to over 60mm) and modern rootlets were present, and fragments of ?brick/tile were common.

There was a very small washover (~15ml) consisting mostly of coal or cinder and small charcoal fragments, together with uncharred (and probably modern) rootlets. In addition, there were a few seeds of orache (Atriplex) and one poorly preserved unidentified charred cereal grain.

The residue was rather small (dry weight 0.81kg) and mostly of stones (to 70mm), with some sand and trace amounts of ?coal (to 8mm, <1g), charcoal (3 fragments to 16mm, <1g) and modern rootlets.

Discussion and statement of potential

Ancient biological remains recovered from the processed subsamples were restricted to small quantities of charcoal. All of the samples contained rootlets which were almost certainly modern intrusions into the deposits.

Context 30 gave some plant remains of taxa of wet/damp habitats (namely water-plantain and rush) where preservation by anoxic waterlogging could occur. However, some other remains from this deposit were, if ancient, suspiciously well preserved—some of the grass caryopses still containing the endosperm. Even at sites with excellent organic preservation this would be exceptional, suggesting that at least part of the plant assemblage from this context was of modern origin. This deposit also gave a few rather poorly preserved insect remains but, again, these could well be modern contaminants.

No remains suitable for submission for radiocarbon dating were recovered from the samples.

On the evidence of the current samples, organic preservation at this site is very poor and the potential for interpretatively useful information to be obtained from biological remains negligible.

Recommendations

No further investigation of the biological remains from this site is warranted.

On the evidence of the samples considered here, further archaeological interventions at this site are unlikely to encounter deposits with interpretatively valuable assemblages of biological remains. Any future works should perhaps allow a small assessment contingency against the eventuality of revealing deposits with greater concentrations of charred plant remains, however.

Though not necessarily true here, it should be noted that interpretatively valuable assemblages of fairly well preserved (by anoxic waterlogging) insect remains (mostly beetles) have been recovered from Grim's Ditch itself (south-west of Garforth, West Yorkshire) in the past (Kenward and Large 1999). Such assemblages of Iron Age date are rather rare and, should future interventions in the area reveal similar deposits within this feature, these should certainly be systematically sampled, their content of biological remains assessed and subsequent analysis undertaken where appropriate.

Retention and disposal

Unless required for purposes other than the study of biological remains, the remaining sediment samples and the washovers and residues from the processed subsamples may be discarded.

Archive

All material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

Acknowledgements

The authors are grateful to Sarah Wilkinson, of Northern Archaeological Associates, for providing the material and the archaeological information.

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Appendix B
POTTERY

Peter Didsbury M. Phil.

Introduction and methodology

A total of 46 sherds of pottery, weighing 835 grams and having an average sherd weight (ASW) of 18.2 grams, was recovered. All material was quantified by the two measures of sherd count and weight, according to fabric category within archaeological context. Data was entered onto an Access database, which is supplied as an integral part of this report, and which should be consulted on matters of detail where appropriate. Fabric codes employed in the database are set out in an appendix, below (see also 'A note on fabric terminology').

A note on fabric terminology

The largest medieval component on the site consisted of gritty wares. These were principally small body sherds in a wide variety of different fabrics, and there were few diagnostic formal characteristics which would allow close dating. In general terms, the majority of these wares would be at home in the variously named Pimply Ware/Northern Gritty Ware tradition of the c. late eleventh to mid thirteenth century, though later material may possibly be present. These have all been codified as UGRIT (Unattributed Gritty Ware). They are described individually in the database, which should be consulted. Certain vessels of interest have been accorded individual fabric codes, viz. F1–F4 (Fabrics 1 to 4). Again, fabric descriptions occur in the database, and the relevant material is discussed in the text below.

Discussion: the assemblages

PIPELINE EASEMENT

Fill 12 of pit 11 contained two sherds of later nineteenth- or early twentieth-century pottery. The database may be consulted for details.

The main component in buried ploughsoil 13 is three small sherds (ASW 4g) of UGRIT, possibly of twelfth- or thirteenth-century date. The only other sherd, however, is a small body of stoneware-hard oxidised material, possibly an 'industrial ceramic' and presumably of 'modern' date.

Fill 27 of recut 161 of ditch 19 unfortunately contained only three small crumbs of pottery, with a combined weight of 1 gram. These are in a slightly sandy grey fabric with a light core, and may be of either Romano-British or medieval date.

Fill 32 of pit 31 contained a single 2 gram fragment of UGRIT, of possible 12th or 13th century date.

Primary fill 42 of east to west field boundary ditch 41 contained four post-medieval and modern sherds (ASW 22.5g). The earliest material is two sherds of a Trailed Slipware of *c.* 17th or 18th

century date, while the latest comprises later 19th or early 20th century stoneware and porcelain. The database may be consulted for details.

Fill 13 of recut 132 of gully 130 contained two low-weight abraded flakes of late 18th or early 19th century creamware.

TRENCH 1

The only material possibly from this trench will occur in the unstratified assemblage from Trench 1/2, context 128. See 'Unstratified material', below.

TRENCH 2

The only material from this trench was associated with trackway 143, (fills 146, 147, 148 and 151). These fills produced an aggregated assemblage of seven sherds of pottery, weighing 8 grams (ASW 1.1g). All were later 19th or 20th century factory-produced wares, comprising Late Blackware, white earthenwares, and yellow-glazed white earthenwares.

COMPOUND AREA

Fill 04 of ditch 03 yielded a medieval assemblage of seven sherds, weighing 447 grams (ASW 6.7g). The earliest material present is probably two sherds of UGRIT, of 12th or 13th century date. The latest diagnostic material is a jug or cistern handle in 14th or 15th century West Cowick type Humberware.

In addition to these there are single sherds of Fabrics 1 and 3, and two sherds of Fabric 4. The F1 sherd is a heavily distorted, 'blown' and vitrified waster, apparently from a slightly necked jar with a horizontally outbent rim. The form may find its best comparison in late medieval and early post-medieval jars in regional traditions such as Humberware and South Yorkshire Gritty Ware, and it is tentatively regarded as being broadly contemporary with the Humberware from this assemblage. Further waster material in this fabric occurs in topsoil 01, q.v.

The F3 sherd is the base and lower body of a hard-fired jar, in a dark grey fabric with light buff exterior, the tempering containing some quartz by dominated by angular dark grey shale-like stone inclusions. This may fall within the East Pennine Gritty Ware tradition, which developed from the Pimply/Northern Gritty wares and which continued in use through much of the medieval period. It may also, therefore, belong to the latest component in the group.

Finally, the two body sherds of Fabric 4, which probably come from the same pot, are in a gritty brown fabric. One of the sherds bears two large impressed 'wheel' patterns. These have been stamped onto an applied pad of white-firing clay. There are what appear to be slight remains of a thin light yellow suspension glaze. Very similar stamping, on an apparently similar fabric, occurs among kiln material from Upper Heaton some 10 miles south-west of Leeds (Manby 1965, figs. 16, 17). This pottery was dated by Manby to the late 13th or early 14th century on typological grounds, but this chronology probably now needs to be pushed back by up to a century (McCarthy and Brooks 1988, 246).

UNSTRATIFIED MATERIAL

Unstratified assemblages came from: topsoil 01, across the entire site; context 76, from fields 2 and 4; and context 128, Trenches 2 and 3.

Topsoil 01 contained a chronologically mixed assemblage consisting of 12 sherds (ASW 15.8g). The latest material is comparable to the other later 19th to early 20th century assemblages from the site, and there is a visible 17th to 18th century component which includes Staffordshire slipware and Brown-glazed Red Earthenwares. The earliest material may be a 12th or 13th century basal angle in Fabric 2 (see also context 128, below) and a scrap of *c.* 13th century Yorkshire Redware. Of most interest are three further body sherds of Fabric 1. Two of these are fused together and undoubtedly further examples of wasters, already noted in context 04. The iron-rich green suspension glaze on one of these fabrics is reminiscent of other late medieval glazes, in the region, e.g. on South Yorkshire Gritty Ware, and this might tend to support the late medieval date suggested for this material in context 04.

Context 76 contained two joining (freshly fractured) sherds of UGRIT. The database may be consulted for details.

The context 128 material consists of a sherd of nineteenth- or twentieth century Yellow Glazed Earthenware, and a rim sherd in Fabric 2 (fabric described in database). This is probably from a bowl, and is similar in form to the range of rims on Pimply/Northern Gritty bowls from York (cf. Holdsworth 1978, illus. no. 131).

Conclusions and recommendations

The chronological range of material from the site possibly spans a period from the late 11th or 12th century though to the earlier 20th. Despite the rather low quality of these assemblages, the presence of Fabric 1 wasters is important, and other grit-tempered material, particularly the sherd stamped with wheel motifs, is of intrinsic interest. It is essential that Dr Chris Cumberpatch be made aware of this material, and that any recommendations he may make in respect of it be followed.

Appendix: fabric codes employed in the database

Most of the common names employed below are in accepted regional or national use, or are generic/self-explanatory. For others, refer to 'A note on fabric terminology', above

Fabric code	Common name/remarks
CBM	Ceramic building material
CREAM	Creamware
F1-F4	Medieval fabrics 1-4 (see text)
FPWW	Factory-produced white earthenwares
FSAN	Fine sandy ware
GREB	Brown-glazed red earthenware (post-medieval)
HUM1	West Cowick-type Humberware
LBLAK	Late Blackware
MODSW	Modern stoneware
PORC	Porcelain

STAFSL	Staffordshire Slipware
TRSL	Trailed slipware (local version of seventeenth-century
Metropolitan types)	
UGRE	Unglazed red earthenwares
UGRIT	Unattributed medieval gritty wares (see text)
UNAT	Unattributed
YELG	Yellow-glazed factory-produced whitewares
YRW	Medieval Yorkshire Redwares (sensu Brooks 1987, 154-155). Cf. thirteenth-century Beverley products.

References

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Appendix C

SLAG MATERIAL

Jane Cowgill

Introduction.

The archaeological monitoring and excavations were conducted in advance of the construction of a new sewer pipeline. The majority of the features identified were associated with substantial mining activity that had not previously been recorded. including mine shafts, spoil tips and ground levelling activity. A post-medieval trackway appeared to be heading towards a 19th century minethese mine workings.

Recording Methodology.

A total of 2.14kg (8 pieces) of slag and coal were submitted for recording. The finds were identified solely on morphological grounds by visual examination, sometimes with the aid of a x10 binocular microscope. It was recorded on pro forma recording sheets and this information was entered directly into the catalogue below. A note of probable fuel type has been recorded when fragments were incorporated within the slag.

Catalogue.

Context	Description	Type	Count	Weight	Comments
1	Topsoil	slag	1	554g	Very abraded piece of block slag or dense hearth bottom.
147	Trackway 143	slag	1	120g	Coal fuel; fresh condition; very cindery.
149	Trackway 143	slag	1	639g	Coal fuel; fresh condition; large cindery 'plate'; 60mm thick.
149	Trackway 143	coal	1	203g	Slagged.
150	Trackway 143	slag	1	14g	Slagged coal?
150	Trackway 143	slag	1	110g	Coal fuel; fresh condition; very cindery; curved tuyere mark on the back?
151	Trackway 143	coal	1	407g	Slagged.
151	Trackway 143	slag	1	93g	Coal fuel; fresh condition; very cindery.

Discussion.

The slag from the trackway-fill contexts are all in a fresh condition and show no signs of damage due to trampling underfoot or any other use of the track by carts for example. All these pieces incorporate, or are largely composed of, very poor quality coal including some large pieces (the piece from context

151 catalogued as coal for example). This slag is not the by-product of iron smithing but is probably a waste product from coal burning. It is likely that the cindery slag was produced while the coal was being burnt and is an amalgam of the mineral components that would be present in such a low quality coal. Coal-powered machinery would almost inevitably be used by the miners and perhaps this slag was the by-product of one of those, later discarded on the trackway as metalling.

The very abraded piece of iron slag recovered from the topsoil is probably a by-product of iron production, the smelting of iron in some type of bloomery shaft. It appears to be a piece of block slag, a by-product from a technology that is not yet understood. If it is then it is likely to be Late Iron Age or Romano-British in date. It is, however, just possibe that it is part of an exceptionally large and dense plano-convex slag accumulation (commonly known as hearth bottoms), but this is less likely given the site location in northern England.

Appendix D

CONSERVATION ASSESSMENT

Jennifer Jones

QUANTIFICATION AND CONDITION

Three iron objects were received for examination and X-radiography. All three were found to be moderately corroded and stable.

Moderately corroded metallic material is defined as having the surface detail, but not usually the general form of the object, obscured by corrosion products, and has some metal remaining below the corrosion.

X-RADIOGRAPHY

The material was X-radiographed, using 5 XR plates. Details of the artefacts examined, including an identification of the material and of the object where possible, the condition of the object when examined, its XR plate number, and any technological or other observations, will be added to the site database

OBSERVATIONS

Two of the objects (150 AA & 150 AB) are very heavy and dense. They appear to be pieces of rectangular-sectioned ?bar with intact long edges and broken short edges. Both pieces appear to have a groove running along at least one face. 150 AA has a right angle in its length, which the XR shows to be the join between 2 pieces of bar. No means of attachment of the 2 pieces is visible on the XR.

The Fe nail, 146 AA, has extensive mineralised wood on its shank.

STORAGE

The material was received well packed for medium to long term storage. It should continue to be stored in an airtight container at a stable temperature and below 20% RH, to inhibit further corrosion. The RH should be controlled by active silica gel, which is regularly monitored and regenerated as necessary.

Appendix E
MISCELLANEOUS MATERIALS

Sarah Wilkinson

Introduction

A range of material was recovered from excavations at Green Park Sewer, Austhorpe, Leeds during a programme of archaeological monitoring and recording (Table 1). The pottery, industrial waste and the environmental assessments are discussed elsewhere.

Table 1

Material	Quantity	Weight gms	% of finds
animal bone	1	75	1
CBM	21	7625	17
ceramic	1	75	1
clay pipe	8	18	6
fe	3	4095	2
industrial waste	13	2061	10
plaster	1	8	1
pottery	46	839	37
sample	30		24
stone	1	683	1

Methodology

All the material was quantified by the two measures of count and weight and the data was entered onto an Access database. The materials not discussed elsewhere are summarised below by material type and by context.

Discussion

ANIMAL BONE

Only one piece of animal bone weighing 75g was recovered from context 133 fill of re-cut 132 of gully 130. The bone was part of a long bone from a large mammal possibly a cow or a horse. The bone was sawn at both ends

CERAMIC BUILDING MATERIAL (CBM)

A total of twenty-one fragments of CBM weighing approximately 7.5 kilograms were recovered from the excavations. The majority of the assemblage consisted of diagnostic and non-diagnostic bricks and brick fragments (Table 2). All identifiable bricks were dated to between the 18th and 19th centuries. A complete handmade 18th century brick was recovered from the primary fill of boundary ditch 41. There were two part bricks from context 158, a redeposited clay layer, which were stamped with presumably the manufacturer's name and probably from Leeds. Both bricks were 19th century.

Table 2

Context	Trench	Material	Object type	Artefact description	Quantity	Weight (gms)
1	1,2,3	cbm	tile	hard fired flat hearth tile, ?19th century	1	76
42	1	cbm	brick	complete handmade brick, 240 x 112 x 50mm, 18th century	1	2600
42	1	cbm	brick	non diag frag 52mm thick, probably 18th C	1	254
42	1	cbm	roof tile	non diag flat tile chips	2	67
133	1	cbm	brick	non diag frag 75mm thick, prob 19th Century	1	289
146	3	cbm	brick	chip	1	18
147	3	cbm	brick	non diag frags	6	244
149	3	cbm	brick	non diag frag	1	153
151	3	cbm	brick	non diag frags	5	374
158		cbm	brick	diag:--x 108 x 80mm, 19th C, stamped: WHIT..... / LE.....	1	1550
158		cbm	brick	diag:--x 108 x 75mm, 19th C, stamped: WH..... / LEE.....	1	2000
					21	**7625**

CLAY TOBACCO PIPE

A total of eight clay pipes weighing 18g was recovered. The bore hole diameter was measured in 64ths of 1 inch, for example 6/64ths is equal to 3/32 nds or 2.4mm. All the clay pipes were probably from the mid to late 18th century (Table 3).

Table 3

Context	Material	Artefact description	Quantity	Weight gms
1	clay pipe	plain stem frag, bore hole diameter 4, late 18th century	1	2
128	clay pipe	plain stem frags, bore hole diameters 5 and 6, mid - late 18th century	2	3
133	clay pipe	plain partial bowl with stem with spur, bore hole diameter 4, late 18th century	1	7
148	clay pipe	2 plain stems, bore hole diameters 4 and 5, mid - late 18th century, 1 very small plain bowl fragment.	3	3
150	clay pipe	plain stem, bore hole diameter 5, mid - late 18th century	1	3
			8	18

IRON (FE)

Only three Fe objects weighing just over 4 kilograms were recovered from two of the fills from trackway 143. The finds were examined with reference to the X-rays and comments provided by the conservator. The two large objects 150 AA and 150 AB may be described as rectangular sectioned, broken lengths of bar measuring 52mm wide x 32mm deep with a groove along one edge. The interpretation of these ?bars is likely to be of an industrial nature and probably related to the trackway. A modern iron nail, 146 AA with mineralised wood on its shank was also recovered.

PLASTER

A single fragment of plaster weighing just 8g was recovered from the topsoil (01). Traces of red paint were visible on one surface. The plaster is likely to be 19th or 20th century in date.

WORKED STONE (27)AB

A roughly hewn, disc-shaped stone was recovered from context 27 the fill of re-cut 161 of ditch 19. The stone was approximately 110mm diameter x 35 - 40mm deep, medium-grained sandstone. One surface has been worn smooth with a possible sharpening groove towards one edge, suggesting the stones use as a possible whetstone. Hones and whetstones have been used since the Bronze Age but were particularly common during the medieval period.

Conclusions

Apart from the stone object 27 AB, which may be medieval or earlier in date, all the finds discussed above date to the 18th and 19th centuries and has no intrinsic value or interest. It is therefore suggested that further work is not considered necessary and that the material may be discarded. The stone should be kept and deposited in the appropriate museum.

References

Ayto E G *Clay Tobacco Pipes* Shire Publications Ltd (No 37).

Museum of London Department of Urban Archaeology *Identifying Ceramic Building Material.*

Shopland N (2005) *Archaeological Finds, A Guide To Identification* Tempus.

Figure 1 Thorpe park, Green Park: site location

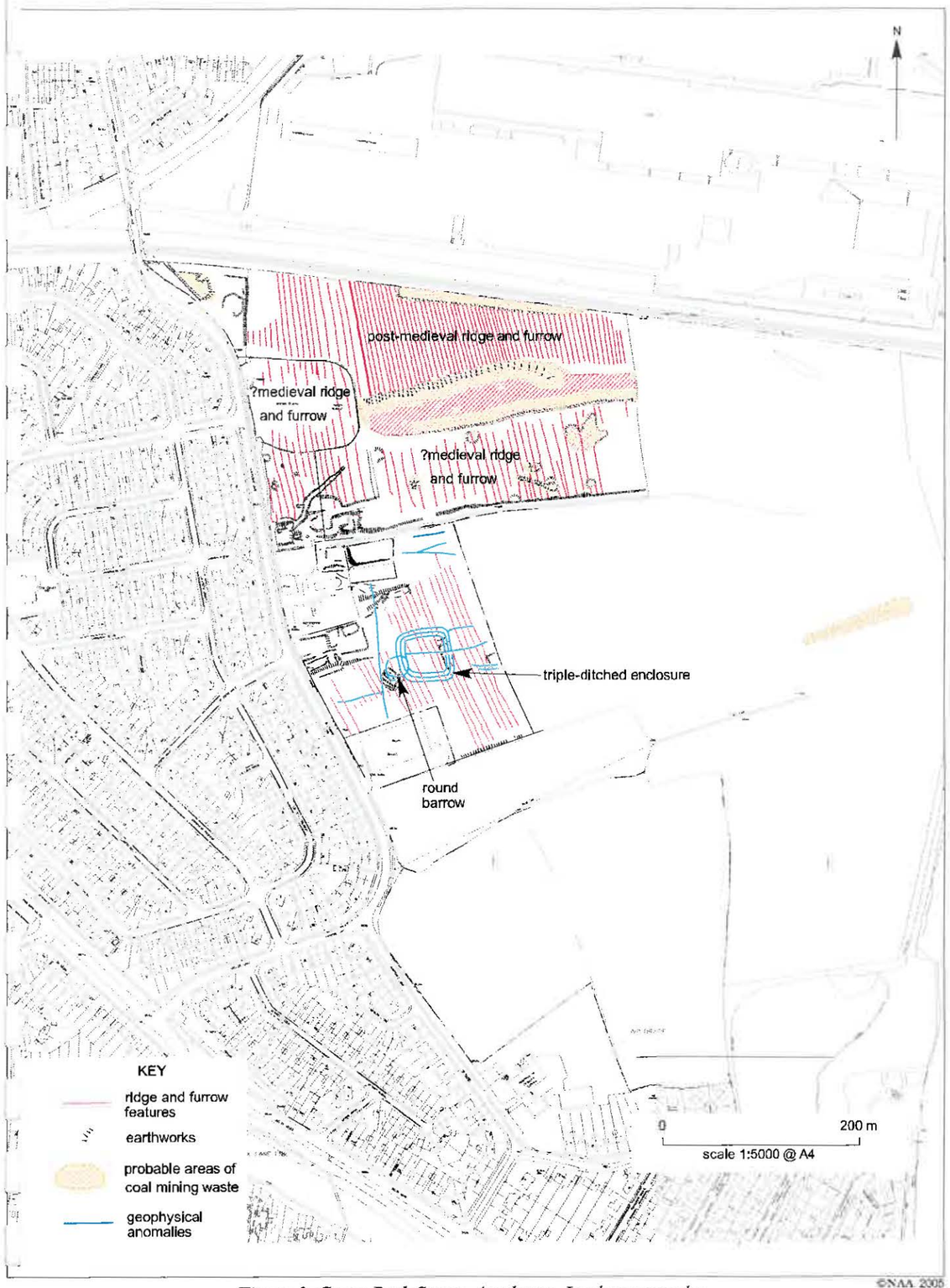


Figure 2 Green Park Sewer, Austhorpe, Leeds: survey plan

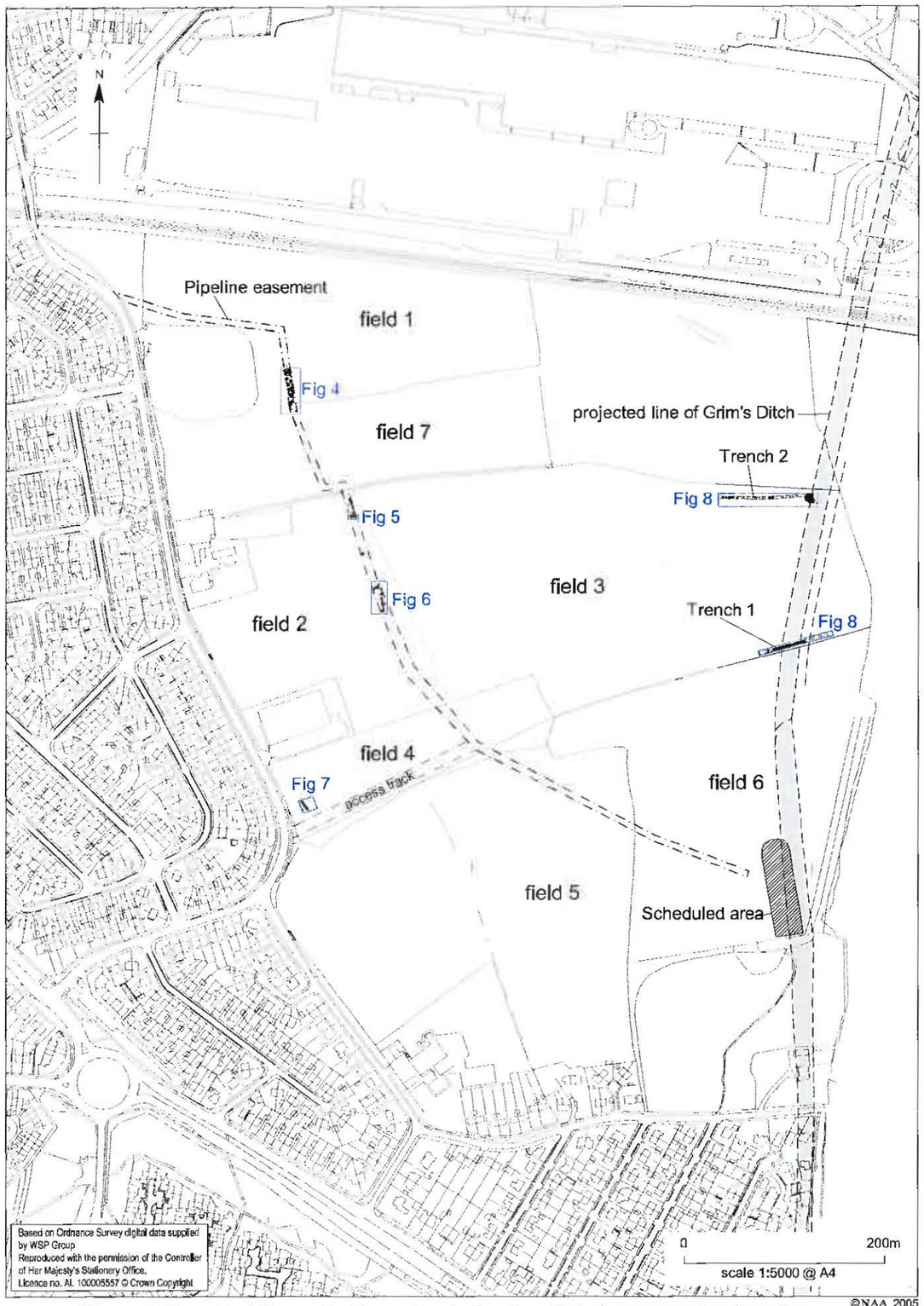
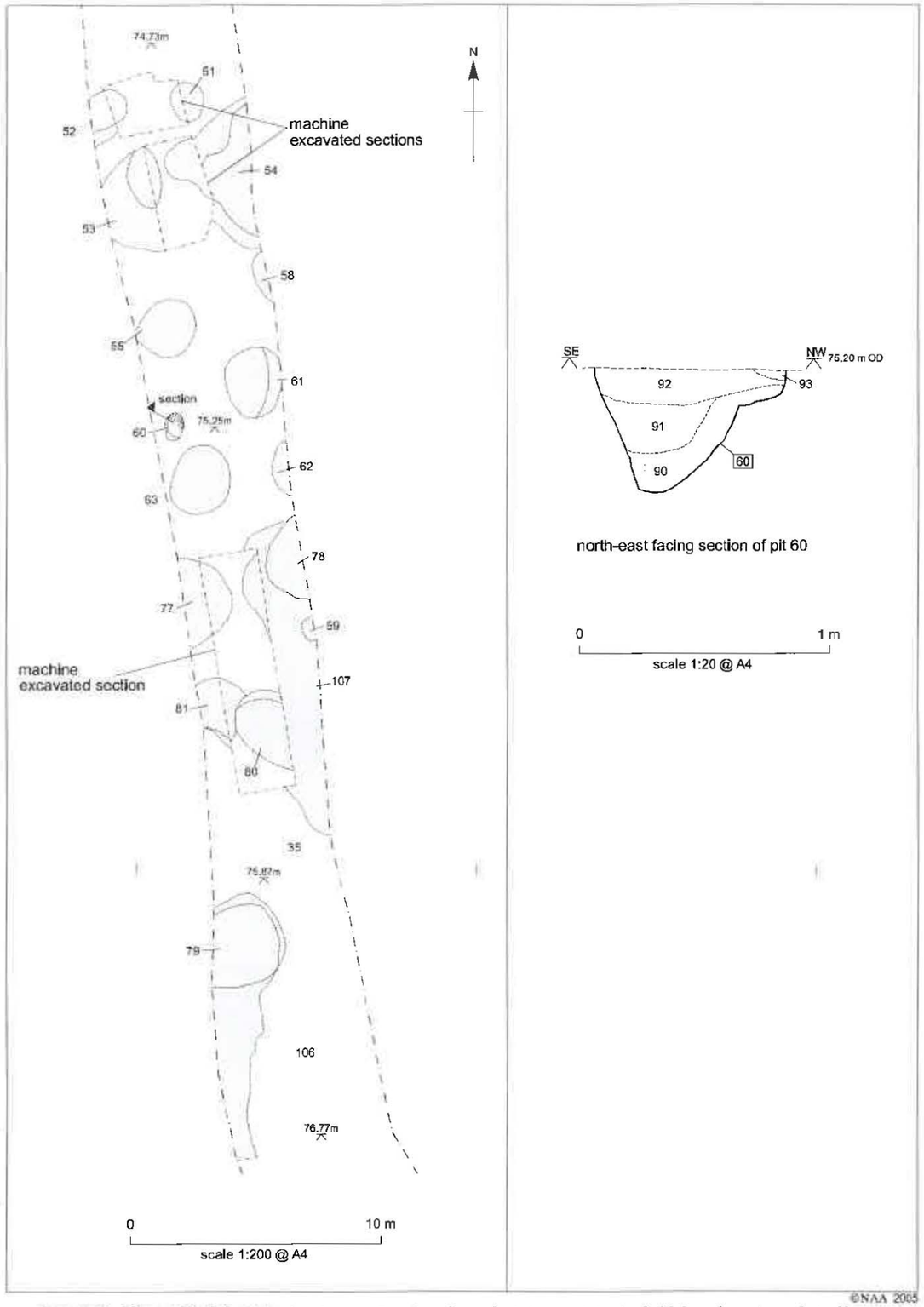


Figure 3 Green Park Sewer, Austhorpe, Leeds: location of pipeline easement and trenches



north-east facing section of pit 60

0 1 m

scale 1:20 @ A4

Figure 4 Green Park Sewer, Austhorpe, Leeds: plan of mining activity in field 1 and section of pit 60

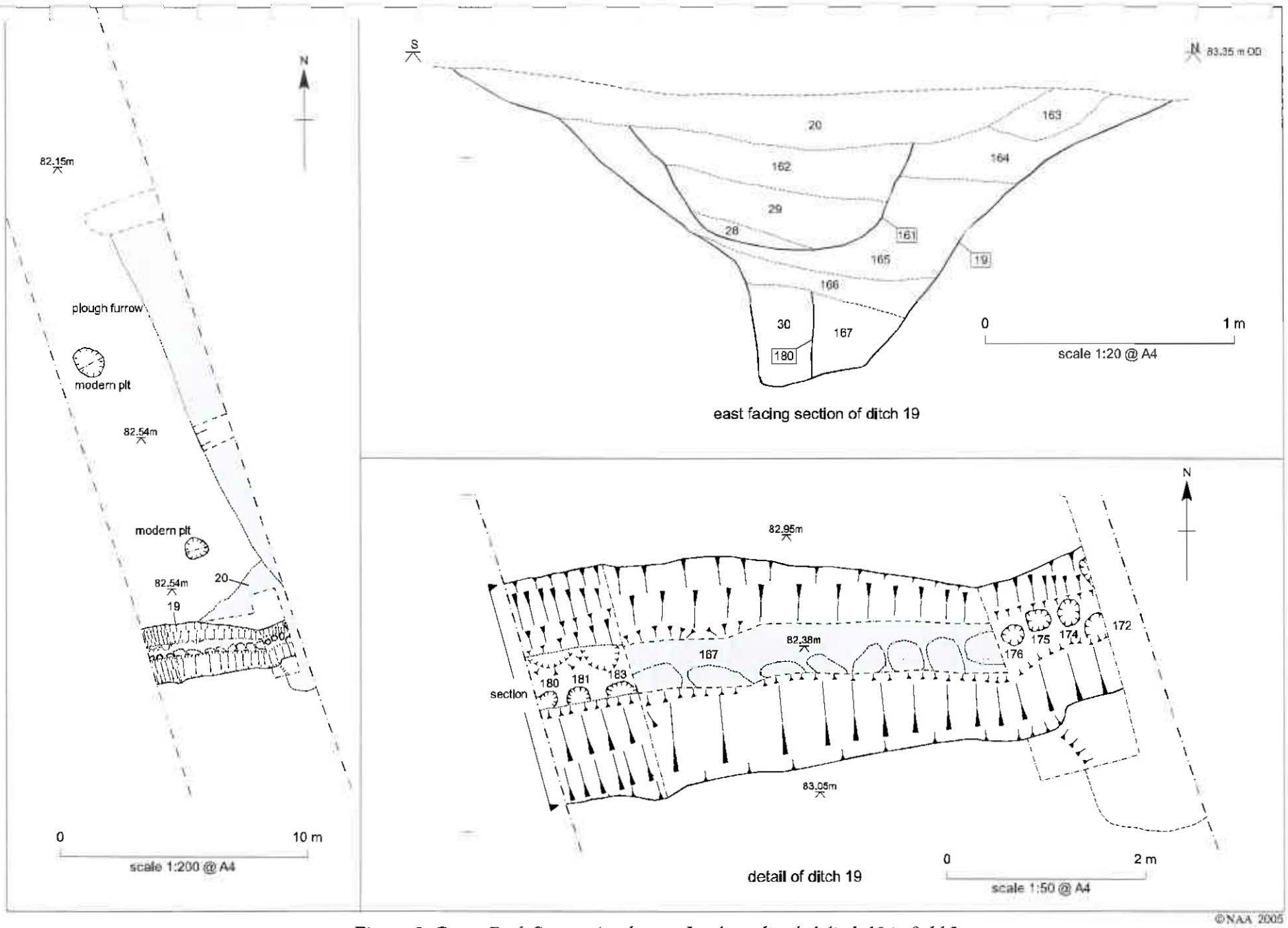


Figure 5 Green Park Sewer, Austhorpe, Leeds: palisaded ditch 19 in field 2

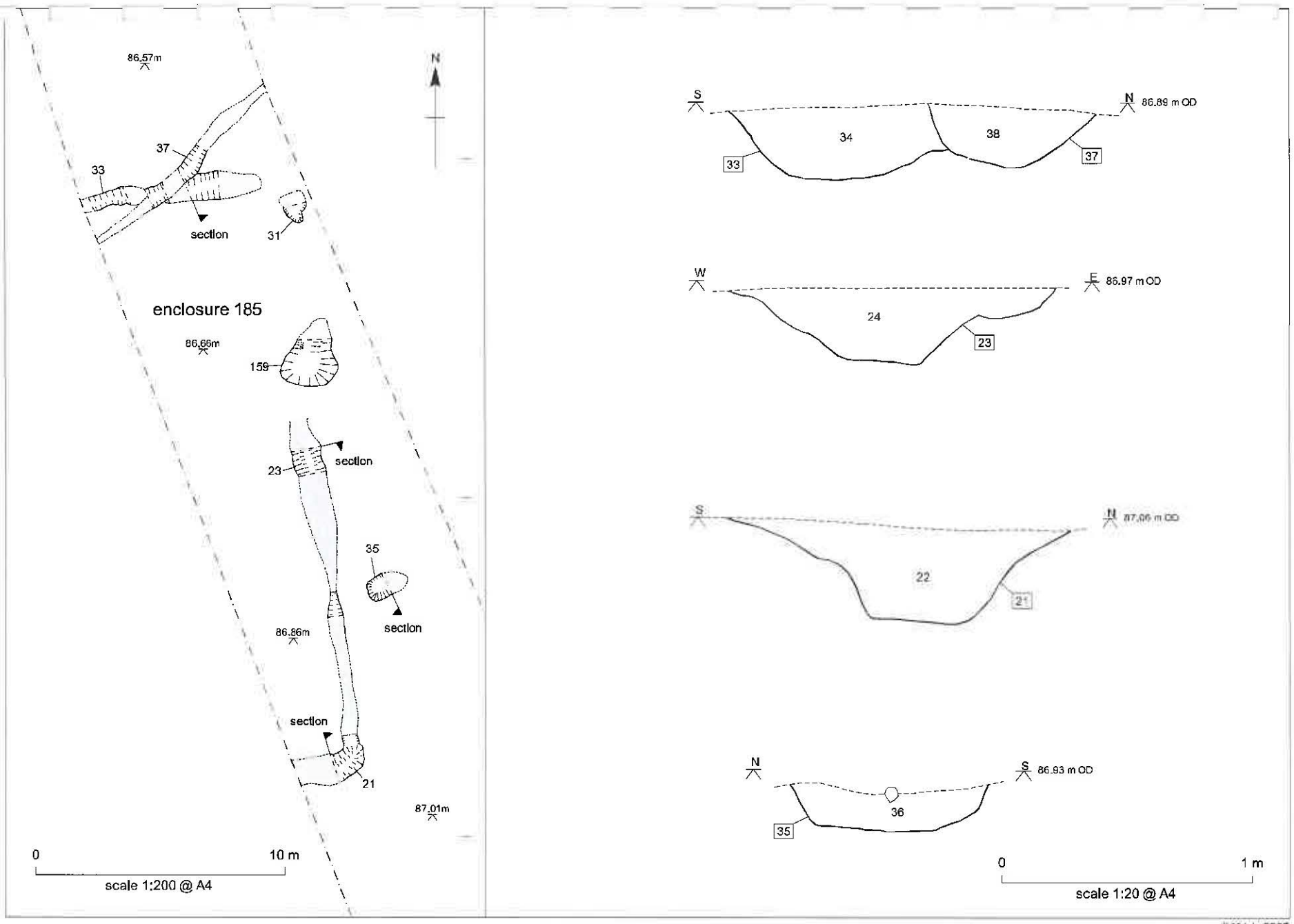


Figure 6 Green Park Sewer, Austhorpe, Leeds: plan of enclosure 185

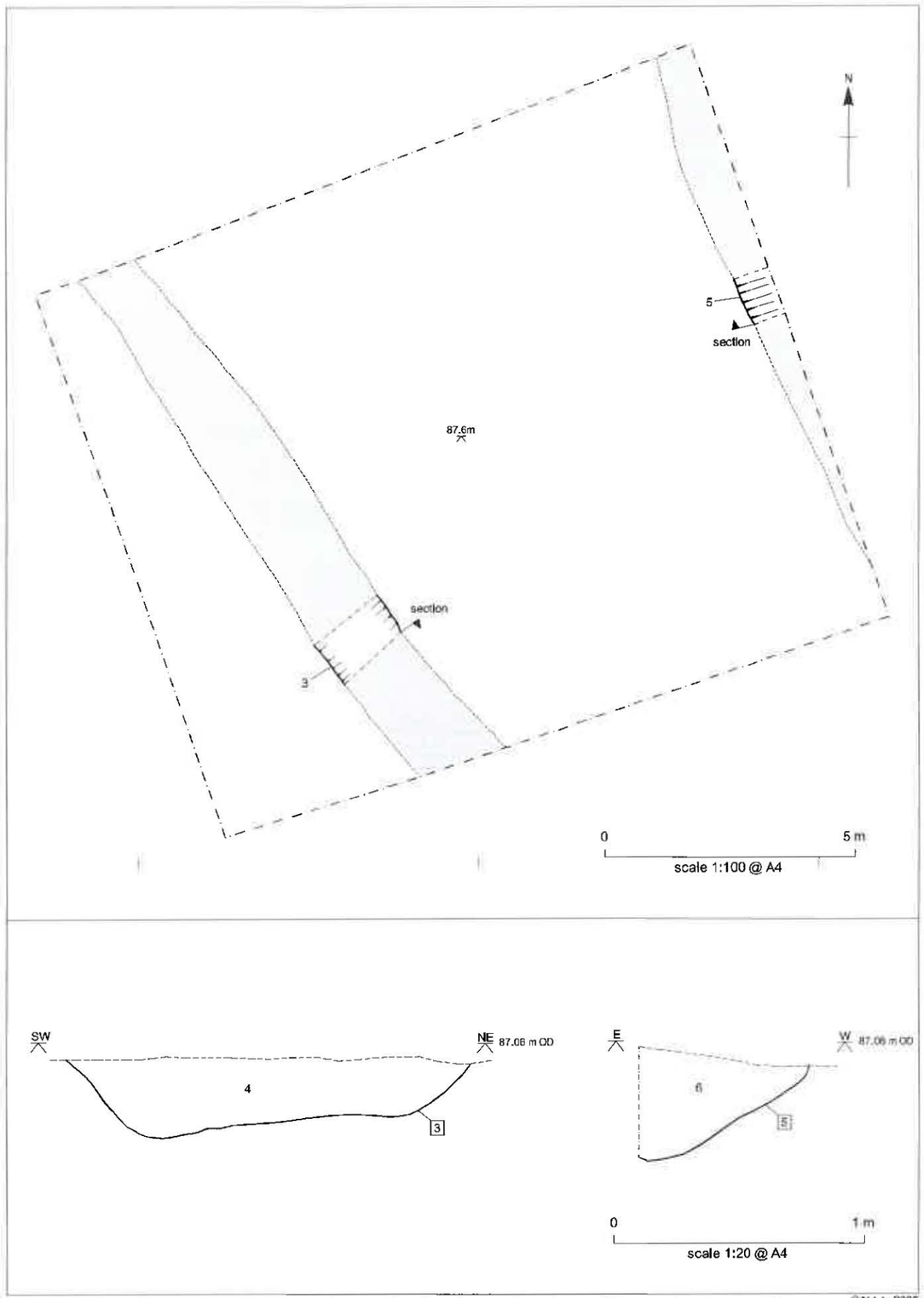


Figure 7 Green Park Sewer, Austhorpe, Leeds: plan and sections of features in compound area

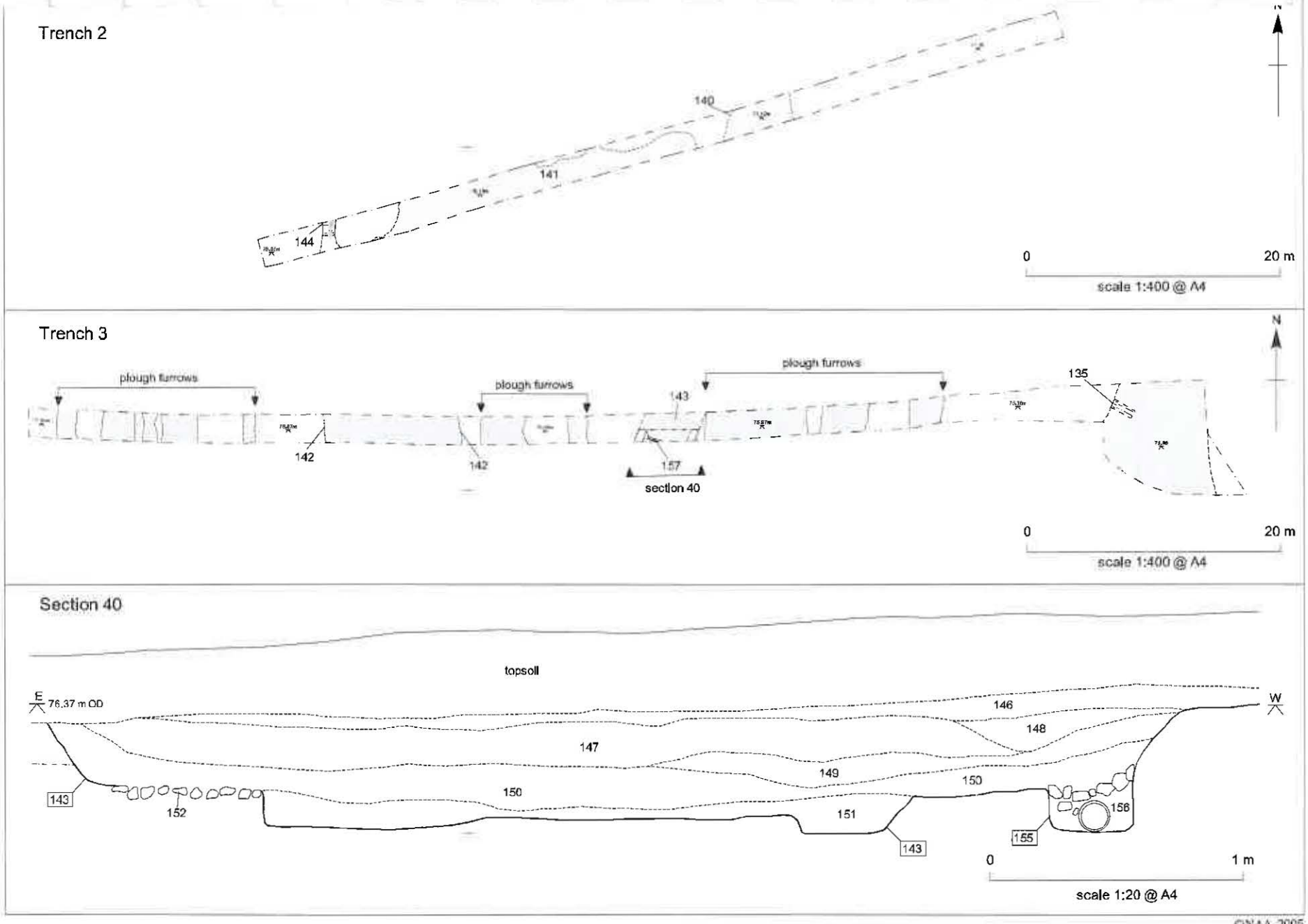


Figure 8 Green Park Sewer, Austhorpe, Leeds: plan of trenches 1 and 2 and section 40

Plate 1: east facing section of ditch 19

Plate 2: plan view of palisade in ditch 19

Plate 3: view of mining activity in field 1

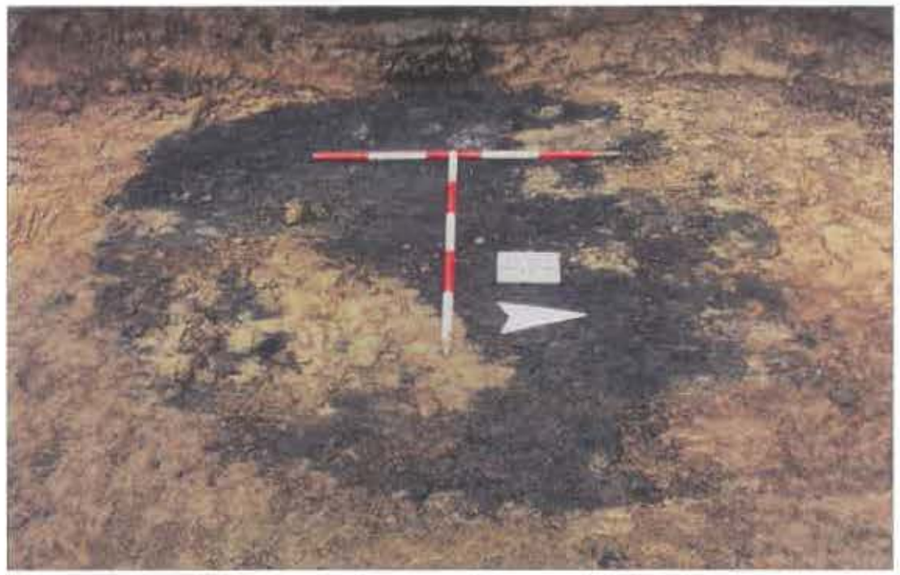


Plate 4: plan view of mine shaft 55

Plate 5: Grim's Ditch and bank in trench 1

Plate 6: Grim's Ditch in trench 2

Thorpe Park, Green Park Sewer: earthwork survey overlain on contour plan