



Northamptonshire
County Council

Northamptonshire Archaeology

Neslam Farm, near Billingborough

South Lincolnshire

Archaeological Evaluations

September 2008



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QUALITY CONTROL

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OASIS REPORT FORM

PROJECT DETAILS	
Project name	Neslam Wind Farm, Billingborough, Lincolnshire
Short description	The fieldwalking results were limited to a small amount of briquetage relating to nearby saltmaking sites (salterns). The geophysical survey identified a long curvilinear ditch in one area, and several discrete anomalies, including indications of fired material. Two trial trenches, targeted on areas of fired material confirmed the presence of ditches and gullies containing briquetage. The curvilinear ditch was revealed in two other trenches and also appears likely to be related to saltern activity, although it was without finds. The only associated pottery was a single sherd of Roman greyware, but the briquetage, some of which was in large pieces, is similar in form and composition to late Iron Age and Roman material found elsewhere in the region, and the activity is probably all datable to this general period.
Project type	Fieldwalking and geophysical survey and trial trenching
Site status	None
Previous work	DBA (Hyder Consulting), fieldwalking (Fenland Survey)
Current Land use	Arable farmland
Future work	unknown
Monument type/ period	Iron Age/Roman
Significant finds	Briquetage
PROJECT LOCATION	Neslam Farm, near Billingborough,
County	Lincolnshire
Site address	Neslam Farm, Neslam Road, nr Billingborough
Study area (sq.m or ha)	114 ha
OS Easting & Northing	TF 148326
Height OD	2m max
PROJECTCREATORS	
Organisation	Hyder Consulting
Project brief originator	Northamptonshire Archaeology
Project Design originator	Hyder Consulting
Director/Supervisor	Steve Morris
Project Manager	Andy Mudd for Northamptonshire Archaeology
Sponsor or funding body	Iberdrola Renewable Energies Ltd
PROJECT DATE	October 2008
Start date	7/9/2008
End date	14/10/2008
ARCHIVES	Location (Accession no.) Content (eg pottery, animal bone etc)
Physical	LCNCC:2008.134 Briquetage, pottery , animal bone
Paper	1 file, 2 plan sheets, two section sheets
Digital	photos, survey archive

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NESLAM FARM, NEAR BILLINGBOROUGH, SOUTH LINCOLNSHIRE
ARCHAEOLOGICAL EVALUATIONS
SEPTEMBER 2008

Abstract

Northamptonshire Archaeology conducted an archaeological evaluation at Neslam Farm, near Billingborough, Lincolnshire. The evaluation was carried out in three stages: fieldwalking, a geophysical (magnetometer) survey, and trial trenching.

The fieldwalking results were limited to a small amount of briquetage relating to nearby saltmaking sites (salterns). The geophysical survey identified a long curvilinear ditch in one area, and several discrete anomalies, including indications of fired material. Two trial trenches, targeted on areas of fired material confirmed the presence of ditches and gullies containing briquetage. The curvilinear ditch was revealed in two other trenches and also appears likely to be related to saltern activity, although it was without finds.

The only associated pottery was a single sherd of Roman greyware, but the briquetage, some of which was in large pieces, is similar in form and composition to late Iron Age and Roman material found elsewhere in the region, and the activity is probably all datable to this general period.

Other identified features included two relatively modern ditches and several palaeochannels, some showing as roddens in the modern landscape.

1 INTRODUCTION

Northamptonshire Archaeology was commissioned by Hyder Consulting (UK) Ltd, on behalf of Iberdrola Renewable Energies Ltd, to undertake an archaeological evaluation on land at Neslam Farm, near Billingborough, Lincolnshire, in relation to a proposal to build a group of six wind turbines on the site. The work was carried out ahead of a planning application to South Kesteven District Council, in order to provide input for the Environmental Impact Assessment.

The site occupies about 114 ha east of Billingborough and to the west of the South Forty Foot Drain on Neslam Fen (Fig 1; approx. NGR TF 148326).

The main objective of the archaeological evaluation was to determine the nature, extent and significance of any archaeological deposits within the areas to be affected by the proposed development. The specific aims of the project were to date and characterise sites identified in an earlier desk-based study (undertaken by Hyder Consulting) and to assess the potential for other areas within the site to contain archaeological deposits. The results of the evaluation work were to provide sufficient information to help determine the suitability of the proposed development, and to help develop any further mitigation measures which may be needed in the areas to be affected by the proposed development.

The archaeological fieldwork of site was carried out in stages comprising:

- archaeological fieldwalking (surface artefact collection) over part of the site
- geophysical survey over all parts of the site to be affected by ground disturbances associated with the development
- a trial trench examination of areas to be affected by ground disturbance, with the number and disposition of the trenches to be determined in the light of the previous surveys.

The scope and methods of the archaeological works was detailed in a Project Specification, prepared by Northamptonshire Archaeology, and approved by the South Kesteven Planning Archaeologist as adviser to the local planning authority (NA 2008). The Specification was prepared following a *Brief for Archaeological Evaluation and Recording (Geophysical Survey)* issued by the South Kesteven Planning Archaeologist (24 Jan. 2007) and the *Proposed Scope of Works* prepared by Hyder Consulting and approved by the South Kesteven Planning Archaeologist (*in litt.* 7 July 2008). The Specification follows the recommendations of the Institute of Field Archaeologists in implementing best practice for archaeological projects (*Standard and guidance for archaeological field evaluation*, rev. Sept 2001; IFA Paper No. 6 *The Use of Geophysical Techniques in Archaeological Evaluations*, by C Gaffney, J Gater and S Ovenden); the *Lincolnshire Archaeology Handbook* (1998); and procedures recommended by English Heritage (*Management of Archaeological Projects*, 1991). Northamptonshire Archaeology is a Registered Organisation with the IFA (now Institute for Archaeologists – IfA).

2 BACKGROUND

2.1 Topography and geology

The landscape is flat level farmland, formerly fenland, 1-2 m above sea level. The uppermost Holocene geology is marine alluvium upon which the soils of the Wallasea 2 soil association have developed (Soil Survey of England and Wales 1983 Sheet 4). This seals earlier fen silts and peats at depth. Oxford Clays and Kellaways Beds form the bedrock.

2.2 Archaeological background

Archaeological background material was collated by Hyder Consulting from the Lincolnshire Historic Environment Record (HER). Most of the site has been the subject of fieldwalking in the Fenland Survey. This survey identified several concentrations of fired clay (briquetage) indicative of saltmaking in the prehistoric or Roman period. Roman occupation has also been identified on the western side of the site, about 300 m north-west of Neslam Farm (information from Hyder Consulting and South Kesteven Planning Archaeologist).

3 STAGE 1: FIELDWALKING SURVEY

Fieldwalking was conducted two fields (Fig 2). The survey on the sites of Turbines 3 and 4 (Field NF 1), which had not been examined in the Fenland Survey, covered an area of approximately 8 ha. The survey in the area of Turbine 2 (Field NF 2) was reduced to approximately 5.5 ha in size due to unsuitable field conditions on part of the site, and was intended to define more precisely the briquetage discovered in the area in the Fenland survey.

3.1 Methodology

The fieldwalking survey was undertaken in a manner consistent with the Fenland Survey, along parallel transects spaced 30 m apart, laid out square to a baseline set up along a linear edge of the field, using an optical square, tapes and ranging poles. The field surveyed was walked systematically at slow pace along the parallel transects. Surface finds were collected from a corridor 2m to either side of the transect line. The overall sample of the surface area will therefore be about 15%. Pro-forma sheets were completed to record the weather, light and ground conditions at the time that each field was walked.

The surveyed fields had been ploughed and allowed to weather to produce the optimum condition for artefact visibility. A total area of c 13.5 ha was covered by this method.

All the finds were identified and each category subsequently had their distributions plotted in 30m collection units within each transect in relation to Ordnance Survey mapping, using MapInfo GIS software (Figs 3 – 5).

All artefacts predating the 20th century were collected in accordance with the approved collection strategy (NA 2008). The provision for precise plotting in 3D of exceptional finds was not, in the event, necessary. All finds were cleaned, processed and examined by suitably qualified specialists.

3.2 Results

Field NF1 (Figs 3-5)

A very low level scatter of post-medieval pottery sherds, ceramic roof tile, brick and ploughed out land drain fragments were recovered from this field. The pottery comprised 17th to 19th century glazed earthenware vessels, 19th to 20th-century stonewares and early modern wares (Blinkhorn, below). The brick/tile and land drains were also of a recent date. The materials displayed no concentrations and were all probably the product of manure scattering.

A single fragment of fired clay, possibly a fragment of briquetage, was recovered from the north-east corner of the field.

Field NF2 (Figs 3-5)

Similar to Field NF1, this field also produced a very low distribution of 19th to 20th century stoneware and early modern pottery, and ceramic building material. Fourteen fired clay fragments were recovered from the southern side of the field. These are similar in fabric to the briquetage later found in the evaluation trenches 4 and 11 (below). This appears to be the only material of any possible archaeological significance.

Post-medieval pottery from fieldwalking by Paul Blinkhorn

The pottery was recorded using the coding system of the City of Lincoln Archaeology Unit type-series, as follows:

LERTH: Early modern black-glazed earthenwares. Late 17th-19th centuries.

LSTON: Late Stonewares, 19th-20th centuries.

LPM: Early modern or modern wares, 19th-20th centuries.

The pottery occurrence by number and weight of sherds per fabric type by transect and stint is shown in Tables 1 and 2

Table 1: Fieldwalking pottery occurrence, Field NF1

TRANS	STINT	NO	WT	FABRIC
1	1	1	10	LPM
1	2	2	59	LERTH
2	4	2		LPM
2	6	1		LSTON
2	6	1		LERTH
2	8	1		?
2	12	1	9	LPM
3	1	1		LERTH
5	8	1	30	LERTH
5	10	1	4	LERTH
5	11	1	5	LERTH
5	12	1	1	LERTH
7	6	1		?
7	7	1		?

Table 2: Fieldwalking pottery occurrence, Field NF2

TRANS	STINT	NO	WT	FABRIC
2	4	2	31	LPM
2	6	1	6	LSTON
6	1	1	3	LPM
6	8	2	3	LPM

4 STAGE 2: GEOPHYSICAL SURVEY

Detailed geophysical survey using a magnetometer was conducted on all areas of proposed ground disturbance, and a buffer zone extending for 15 m around those areas. This included the cable runs which were surveyed in a corridor 20 m or 30 m wide (Fig 2). The total area amounted to about 17 ha.

4.1 Methodology

Geophysical survey was carried out in accordance with the Method Statement (NA 2008) and English Heritage and the Institute of Field Archaeologists Guidelines (EH 2008; Gaffney, Gater and Ovendon 2002). The proposed turbine bases (TB1-TB6), trackway and cable runs were subject to magnetometer survey.

All detailed magnetometer survey was undertaken using Bartington Grad601-2 fluxgate magnetic gradiometers. The Grad601-2 is constructed as a dual-sensor instrument with two vertical gradiometers separated on a yoke to enable two lines of survey to be recorded at the same time.

Eight blocks were surveyed in detail. The detailed gradiometer survey was composed of a total of 187 whole and partial, 30m x 30m grid-squares. Each grid square was traversed at rapid walking pace in zigzag mode; and data was recorded every 0.25m along traverses spaced at 1.0m separations.

The data was analysed using Geoplot 3.00u software. Low (negative) magnetism is shown as white and high (positive) magnetism as black in the resultant greytone plots. To avoid the introduction of processing errors, minimal data treatment was carried. The 'Zero Mean Traverse'

function was applied in order to bring the average level of each data line, and therefore each grid, into a balanced zero. The resultant data could then be analysed in consistent blocks.

The processed data is presented here in the form of greyscale images, highlighting the weaker magnetic anomalies (-3.0nT / +3.0nT scale; Figs 6-8), which are georectified to the Ordnance Survey base. Interpretative plots have been generated from the results (Figs 9-10), and both sets of figures are referred to directly in the following section.

4.2 Results

As with many magnetic surveys, much of the area was found to contain well distributed dipolar (paired positive/negative) magnetic anomalies (Fig 6), indicating random ferrous and brick debris in the plough soil.

TW (Figs 7 & 9)

Two blocks of survey were carried out, either side of the farm track. A broad, diffuse positive anomaly was detected curving east – west through the survey area, approximately 150m south along the track. A similar anomaly was identified *c.*40m further south. These forms of anomalies are thought to reflect silted palaeochannels. Four highly positive anomalies on the eastern side, between the two channel anomalies, may indicate thermoremanently magnetised - fired features, such as the salterns suspected on site.

Turbine 1 (Figs 7 & 9)

In the block surveyed for Turbine 1, the only anomalies of significance detected were two possible fired features. Dipolar noise at the southern end of the block was likely to emanate from a field entrance. There was data corruption in part of the northern area which could not be plotted.

AS & Turbine 2 (Figs 7 & 9)

The western end of the AS block contained considerable magnetic noise whilst centrally two likely ceramic field drains were detected crossing north – south. Broad, diffuse positive anomalies were detected at the eastern end of AS, indicating further possible palaeochannel remnants. Two high positive possible fired (saltern?) features were identified within and between the possible channels.

Crossing the drain (highly magnetic fill) to the east, the palaeochannel deposit anomalies were found to curve to the south-east and then broaden to the north within the Turbine 2 area. A curvilinear positive ‘ditch-type’ anomaly was detected for approximately 60m, south of the channel deposits. The ditch may shadow the edge of the palaeochannels. Thermoremanent anomalies were identified covering up to 20m in the north-east corner of the T2 block. If the anomalies are indeed from salterns, this would represent an area of considerable industrial activity. Two ceramic field drains, a ferrous feature and possible geological feature were identified in the south of the TB2 block.

Control Room & Compound (Figs 7 & 9)

A ferrous pipeline was detected on a south-south-eastern alignment through the area. Further south, another putative palaeochannel was identified crossing the survey area south-east – north-west.

Met. Mast (Figs 8 & 10)

A likely continuation of the ferrous pipe identified to the north-west was detected in the west of this area. Another iron pipeline was found to cross the centre of the survey block to the north. A series of ceramic field drains, aligned with the field, was identified crossing the survey area. In the eastern block, occasional responses of geological type were identified.

Turbine 6 (Figs 8 & 10)

Magnetic survey in this block identified ceramic field drains aligned with the axis of the field.

Turbine 5 (Figs 8 & 10)

Ceramic drains were identified in the north of this area. A ferrous pipeline was detected crossing west – east. A large area of ceramic and ferrous –type anomalies were recorded in the southern block. Several large ferrous anomalies were also identified. It is likely that these anomalies represent a spread of structural debris from the demolished ‘Sempringham Decoy Farm’. A possible ditch was located orientated northwards from the debris spread.

Turbines 3 & 4 (Figs 8 & 10)

Magnetic anomalies representing former channels, as described above, were recorded from the west of TB3 block deviating south-west then turning sinuously eastwards. The channels appear to become braided, bending out of the area once reaching the TB4 block. Other similar, smaller deposits were identified in the blocks as were field drains aligned with the axis of the field.

Discussion

Although the geophysical survey constitutes only a relatively small sample of transects through the entire site, it has illuminated the larger scale pattern of former channels that populate the fenland landscape. Interestingly, the groups of relatively amorphous thermoremanent magnetic anomalies thought to represent salterns were detected in the northern half of the site (TW, TB1, TB2, AS). The majority of these features were identified adjacent to the putative palaeochannels.

5 STAGE 3: TRIAL TRENCH EXCAVATION

5.1 Methodology

The trenches were positioned as shown on Figure 2. They were located where potential archaeological anomalies had been identified by the geophysical survey, on each of the proposed turbine bases, and in the areas of the meteorological mast options (Trenches 17 and 18). The airstrip was not trenched. There were a total of eighteen trenches (Trench 1 to 18), which were 50m in length, except Trenches 13, 14, 15 and 16 which were 30 m. There was a total of an 820m of trenching.

All the trenches were opened by mechanical excavator in accordance with the Project Specification. An additional limited area was opened up around the features found in Trench 11, at the request of the Planning Archaeologist, and sondages were excavated through the alluvial clays in six of the trenches in order to examine deeper deposits.

5.2 Results

General

Six of the eighteen trenches contained archaeological features (Trenches 2, 3, 4, 7, 10 and 11). All the trenches were excavated to the top of the recent geological deposits consisting of dark marine alluvial clay cut or overlain in several trenches (Trenches 2, 3, 4, 8, 9, 10, 11, 15, 16 and 17) by fine, sandy silt stream deposits, in most cases forming a slight rise in the ground level. The stream silt deposits corresponded to the large meandering anomalies, identified in the geophysical survey as possible palaeo-channels and the evaluation largely confirms their identification as roddens.

Fen peat and sediments beneath marine alluvium

In each of six of the trenches (Trench 1, 6, 7, 8, 9, and 12) on the proposed wind turbine locations, a test pit was excavated to locate the fen peat/silt layer beneath the marine alluvium (Fig 13). In Trench 12 the peat layer (1204) had a thickness of 0.10m to 0.20m and in Trench 18 the peat layer (1806) was 0.10m to 0.20m thick (Fig 13; Plate 1). The other trenches did not contain true fenland peat, but dark grey organic silt deposits (104), (603), (706), (803), (904) and (1404), which was probably the equivalent layer, in respective Trenches 1, 6, 7, 8, 9 and 14, with thicknesses of 0.20m to 0.30m. The peat/silt layer was sealed by the dark marine alluvium identified in each of the trenches, respectively (602), (705), (802), (902), (1202) and (1403) with a thickness of between 0.70m and 1.00m. In trenches 1 and 18 peat/silt layers (104) and (1806) were sealed by an intermediary silty clay deposits (103) and (1805) respectively. The peat/silt layer in turn overlay compact mottled light blue grey/yellowish brown clay, (105), (604), (707), (806), (903), (1205) and (1807) which was not bottomed, but was at least of 1.30m thick. Within the clay deposit (903) in Trench 9 a few flecks of charcoal and fired clay were observed, suggesting the possibility of early activity.

The archaeological features cut the dark alluvial layers or the light, sandy silt stream deposits. All the trenches contained a dark grey brown loamy clay plough soil which had a thickness of 0.24m to 0.46m. The plough soil was given context (1) in each trench, prefixed with the trench number, (101), (201), (301), etc. The plough soil sealed the archaeological features except for the ditch [1002] in Trench 10, which appears to have been ploughed out.

Trench 2

Trench 2 was located in the area of Turbine 2 on the eastern side of the site. The substrate consisted of bands of mottled grey and orange brown clay and light yellowish brown sandy silt (202) and broad deposit of sandy silt (203), which formed a slight rise.

Ditch [204]

There was a single ditch [204], aligned east-west, on the slight southern down slope of the natural sandy silt deposit (203). The ditch had a broad profile, 2.75m wide and 0.52m deep, which had gently curving sides sloping on to a rounded base. The single ditch fill (205) comprised a mottled orange to grey-brown clay, including a very small amount of charcoal and burnt clay flecks at the base, no more than 0.50m wide and 0.02m-0.03m thick. No other finds were recovered. The ditch corresponds to a curvilinear anomaly identified in the geophysical survey (Figs 7 and 9).

Trench 3

This trench was located west of Trench 2. Trench 3 had similar natural bands of mottled grey and orange brown clay and light yellowish brown sandy silt (303) and a broad deposit of light grey sandy silt (304), which, like the deposit (203) in Trench 2, had a slight camber. A more compact natural mottled grey to orange clay (302) occupied both ends of the trench.

Ditch [307] and gully [305]

Trench 3 contained a ditch [307] and gully [305]. The ditch [307] corresponded to the same curvilinear anomaly identified in the geophysical survey as ditch [204], but with a south-east to north-west alignment, located on the south slope of the natural sandy silt (304) camber. The ditch was 2.12m wide and 0.65m deep, with slightly uneven steep sloping sides, with a narrow flat base (Plate 2). The primary fill (309) was mottled orange grey sandy silt 0.12m thick, which was overlaid by 0.53m thick fill of grey brown silty clay (308), which included an occasional charcoal fleck and a thin lens of fired clay and charcoal. The north-east side of the fill was cut by a land drain.

Approximately 8m to the north of the ditch on the top of the natural (304) was a shallow south-west to north-east aligned gully [305], 0.42m wide and 0.13m deep. The fill was mid brown to

dark grey silty clay, with occasional small stone and charcoal flecks. No other finds were recovered from either of features.

Trench 4

This trench was located west of Trench 3, close to one of the proposed cable routes, but just outside the airstrip. The natural in the trench was a mottled light grey to yellowish brown sandy silt (402), which formed a generally flat surface rising gently to the middle of the trench. In the top of sandy silt deposit was a 3m wide natural deposit of compact dark grey clay (405), which was possibly the fill of a natural water course aligned north-west to south-east.

Gully [403]

To the west side of the natural clay deposit (405) was a slightly irregular U-shaped linear gully [403], 0.57m wide and 0.26m deep, aligned south-west to north-east. The gully fill (404) was with sticky grey-brown silty clay with no inclusions, similar to the natural clay (405). The similar clean fills and the alignment of the gully towards the natural clay feature (405), possibly suggests it may also have been a natural feature.

Gully [406]

To the east side of the natural clay (405) was a north to south orientated gully [406], 0.8m wide and 0.30m deep. It had a steep west side sloping onto flat base. The east side was truncated by a recent land drain. The fill (407) was a sticky dark grey to black silty clay, with a frequent amount of small fired clay fragments.

Gully [408]

Approximately 9m to the east of gully [406] was a south-west to north-east aligned U-shaped gully [408], 0.60m wide and 0.40m deep. The primary fill (414) was a compacted, mottled dark grey to yellowish brown silty clay, up to 0.35m deep, containing flecks of charcoal fired clay. The upper fill (409) was compacted, dark red-brown, gritty sand with frequent abraded fired clay fragments (briquetage) and charcoal, forming a deposit up to 0.14m thick (Fig 12, Section 2; Plate 4).

Gully [410]

The curvilinear gully [410] was approximately 3m in length, turning from the north-west to the west, where it terminated in a rounded butt-end, 1.5m from gully [408]. It had U-shaped profile, up to 0.30m wide and 0.30m deep, filled with compacted dark brown silty clay (411), containing frequent fired clay (briquetage) and charcoal (Fig 12, Section 3; Plate 4).

Gullies [412] and [415]

Towards the east end of the trench were two shallow parallel gullies [412] and [415], lying approximately 2m apart and aligned south-east to north-west. They were between 0.50m and 0.56m wide and up to 0.16m deep. Both had fills (413) and (416) of medium brown silty clay, with flecks of fired clay and charcoal.

Gullies [408] and [410] may correspond to what appeared to be a curvilinear anomaly identified in the geophysical survey. All the gullies except for gully [403], which may be a natural feature, displayed varying amounts of burnt material, including fired clay, probably fragments of briquetage derived from salterns located nearby. No other dating material was recovered.

Trench 7

Trench 7 was located in the area of Turbine 5, at the most southern part of the site. The natural throughout the trench was a compact blocky mottled dark grey to orange-brown clay (705).

Ditch [703]

In the middle of Trench 7 was a single shallow and broad ditch [703] aligned north to south, 2.30m wide and 0.12m deep, with negligible sides and a broad, flat base. The fill (704) was a organic peat like deposit, in a silty clay matrix. No finds were recovered.

The ditch may be the remains of an old drainage system, which lies approximately parallel to the present field boundary drains.

Trench 10

Trench 10 was the most westerly of the trenches excavated in the area of Turbine 3. Trench 10 had a wide deposit of natural light brown grey sandy silt (1005), which formed slight rise in the middle of trench. A natural mottled grey to orange silty clay (1004) occupied either end of the trench. Towards the south-west end of the trench, there was 3m wide natural compact blocky mottled blue-grey and orange-brown clay that may have been the fill of a natural water course.

Ditch [1002]

At the south-west end of Trench 10 was a single broad ditch [1002], aligned north to south, 2.0m wide and 0.62m deep, with fairly steep sloping sides and a broad, rounded base. The fill (1003) was a firm, mottled grey to orange-brown silty clay. It contained a moderate amount of post-medieval household waste, including 18th-century table and kitchen ware pottery. The top of the fill appeared to be ploughed out into the top soil, and could roughly be traced across the field surface, running parallel to the present field drainage ditch to the west.

Trench 11

This trench was located in the area of the access route to the east side of the farm access track. The central part of Trench 11 was occupied by a broad natural deposit of yellowish brown sandy silt (1102), which formed a slight camber, with natural bands of pale yellowish sandy silt and clay silt (1103) either side of it. A blocky natural dark yellowish brown clay (1113) occupied north end of the trench. The archaeological features occupied the area of the natural sandy silt (1102) on top of the camber.

Ditch [1105]

Ditch [1105] was located in the middle of the trench, orientated south-east to north-west, with steep sloping sides and a broad, flat base, up to 3m wide and 0.70m deep (Fig 12, Section 4).

The primary deposit (1114) formed a tip line down the south-west side and across the base of the ditch, which appeared to be no wider than 1.20m and up to 0.15m thick (not showing in Section 4). It was composed of a firm to compact layer of pale grey to yellowish brown silty clay, containing a frequent number of fired clay (briquetage fragments), with thin lenses of dark grey to black ash and charcoal flecks. The fill was possibly a natural in wash of material or, more likely, a deliberate dumping of waste.

Overlying fill (1114) was a compacted mottled light grey and dark, yellowish-brown clay fill (1104) that included a few lenses of silt.

The upper fill (1106) was only a thin deposit of compact dark grey clay, up to 0.10m thick, containing a moderate number of small briquetage fragments (not showing in Section 4). A single sherd of Roman greyware was recovered, dating to the early 2nd century or later. A small fragment of glassy fuel-ash slag was also retrieved, perhaps derived from the stoke hole area of the saltern kiln, which would have produced high temperatures, creating such waste.

Gully [1107]

Approximately 3m of a curvilinear gully [1107], near ditch [1105], turned from the north-east to the south, where it terminated in a squared terminal. The profile close to the butt-end was near U-

shaped, 0.35m wide and 0.30m deep but the north part of it became less regular, with uneven, gentler sloping sides and narrower base, where it was up to 0.80m wide and 0.35m deep (Fig 12, Section 5; Plate 3).

The primary fill (1112) was composed of compacted dark grey silty clay, containing frequent briquetage fragments to a depth of 0.20m. The fill appeared to have limited spread as it was located in the northern part of the gully and not at the terminal. It was also similar to, and located adjacent to the tip deposit (1114) down the south side of ditch [1105], suggesting they may have been part of the same dump of waste material, which may have been thrown towards the ditch, with some of the material ending up in the base of the gully. A single sheep's tooth was also retrieved from the fill.

The upper fill (1108) of the gully was composed of compact dark grey-brown silty clay, with a few small fragments of briquetage, flecks of fired clay and charcoal.

Spreads (1110) and (1111)

A roughly sub-circular spread (1110) of dark grey sandy silt covered a small area up to 0.70m wide and 0.04m deep in an uneven depression. It was located approximately 1m to the east of the butt-end of gully [1107].

At the other end of gully [1107] adjacent to the west side was another small spread (1111), composed of silty clay that lay in a slight hollow 0.80m wide and 0.04m deep. Neither the gully nor spreads contained any dating material. Both spreads contained a number of briquetage fragments. The briquetage from layer (1111) contained irregular-shaped fragments, which were possibly either pedestals to support the troughs or clips and stabilisers to secure the containers to one another and to the hearth walls (Plates 3 and 7).

6 THE TRENCHING FINDS

6.1 Roman Pottery by Tora Hylton

A single undiagnostic body sherd of Roman greyware, was recovered from context (1106), which has a date of early to middle 2nd century to the late 3rd or early 4th century.

6.2 Briquetage by Pat Chapman

This assemblage comprises 797 pieces, weighing 11,540g, from trenches 4 and 11 (Table 3). The vast majority comes from the features within Trench 11, with 713 pieces weighing 10,253g. Primary fill (1114) of ditch [1105] has nearly a third of all the assemblage, with 331 fragments weighing 3799g. The material, once dried, is in reasonable condition, with an overall sherd weight of 14.5g.

The fabric is typically a fine to slightly coarse silt, hard, bright orange red in colour and organically tempered with a very occasional small inclusion of flint or calcareous material. A small number of fragments from fill (1114) of ditch [1105] are in a soft fine silt, pink and buff in colour.

There is a thin white deposit on the surfaces of virtually all of the body sherds and some of the irregular-shaped pieces (Plate 5). This is due to the soluble salts being carried to the surface of the containers during drying and remaining there when the water evaporates (Lane and Morris 2001, 41).

The body sherds comprise *c* 65-70% of the assemblage. Their average size is 65 x 50mm and 10-15mm thick, with a few slightly larger and some smaller. Only one has a measurable curved diameter, of 100mm, and the one obvious base sherd has an external diameter of 80mm, but with no obvious internal surface. There are no complete profiles and no apparent rims. However, some of the body sherds have an angle of *c* 40 degrees, rather than being curved (Plate 6). Reconstructions of flat-based pans and trough-like pans were possible from the Morton Fen assemblage (Crosby 2001, 122-124), and the flattened U-shaped profile of the trough-like pan would be consistent with the angled body sherds from Neslam.

The irregularly-shaped pieces in the assemblage range in size from the largest measuring *c* 75 x 40 x 30mm to small fragments no more than 15 x 10mm. The irregularly-shaped pieces dominate the assemblage from context (1111), the largest measuring between 65 x 50 x 40mm, but usually 50 x 40 x 30mm. The irregular-shaped fragments, which form about one third of the assemblage, are possibly either pedestals to support the troughs or clips and stabilisers to secure the containers to one another and to the hearth walls (Plate 7). The clips in particular can lack obvious diagnostic features, so that element of the assemblage would require closer examination to determine possible function.

This material is similar to the briquetage found at Morton Fen, the site of an early Roman saltern, about eight miles south of Billingborough (Trimble 2001). The trough and flat-bottomed pans seem to be typical of late Iron Age and early Roman assemblages, rather than the cylindrical troughs cut lengthways from the earlier Iron Age assemblages. Organic-tempered material is commonly associated with late Iron Age and Romano-British briquetage, probably to take advantage of both lightness and thermal shock resistance due to the organic voids (Murphy in Trimble 2001, 111).

The evidence suggests that the production of salt by evaporation over a heat source was the presumed activity somewhere close in the vicinity. The material evidence indicates a late Iron Age to Romano-British date for this site.

Table 3: Quantification of briquetage

Context/feature	No	Wt (g)
409 / gully 408	12	237
411 / gully 410	72	945
413 / gully 412	3	105
Sub totals	84	1287
1104 / ditch 1105	2	86
1106 / ditch 1105	112	681
1114 / ditch 1105	331	3799
1108 / gully 1107	64	991
1112 / gully 1107	109	2887
1110 / layer	37	341
1111 / layer	58	1478
Sub totals	713	10253
Totals	797	11540

6.4 Slag by Andy Chapman

A single small fragment of light, vesicular and glassy fuel-ash-slag, weighing 6g, was recovered from the fill (1106) of ditch [1105]. This material is debris from high-temperature burning, but not necessarily from metalworking.

6.5 Post-medieval pottery by Tora Hylton

The pottery from fill (1003) of ditch [1002], were 18th-century table and kitchen wares, which included a salt-glazed earthenware cup and bowl, manganese mottled-ware bowl, a 17th to 18th-century Staffordshire slipware mug, and black iron-glazed bowl.

7 PALAEO-ENVIRONMENTAL EVIDENCE

7.1 Animal bone by Karen Deighton

A total of 47g of animal bone was collected from two contexts during the course of trial trenching. Analysis has shown these to be as follows:

Context 1109: *Equus* (horse) mandibular molar with worn crown.

Context 1112: Ovicaprid (sheep/goat) maxillary molar in wear.

Due to the low quantity of material recovered little can be said of the animal economy associated with the site other than that it involved horse and sheep/goat.

7.2 Charred plant remains and molluscs by Karen Deighton

Introduction

Thirteen samples were collected during the course of trial trenching. This material was assessed to determine firstly, the presence, nature and level of preservation of ecofacts; secondly, the potential of the material to provide information on the function and environment of the site; and finally, the suitability of any further sampling should this be considered at a later date.

Method

The 13 samples were processed in a siraf tank fitted with a 500 micron mesh and 250 micron flot sieve. The resulting flots were dried and examined under a microscope (10-20 magnification). Coarse residues were sorted for ecofacts and artefacts. Fine residues were scanned. Identifications for seed remains were made with the aid of Cappers (2006), Schoch *et al* (1988) and the author's small reference collection. Identification of molluscs were made with the aid of Kerney and Cameron (1994), Glöer and Meier-Brook (2003) and the Conchological Society of Great Britain and Ireland website.

Preservation

For plant remains preservation was solely by charring. The level of fragmentation and abrasion amongst seeds and grains was high which adversely affected identification.

The charcoal recovered was largely heavily fragmented. Only Sample 2 produced charcoal fragments large enough for identification. Mollusc shells exhibited a fairly frequent level of abrasion possibly due to soil conditions. The shells from Sample 2 (context 1108) were affected by concretions adhering to them again making identification difficult.

Taxonomic distribution

Table 4: Ecofacts by sample and context

Fill No.	Sample	Feature	Volume	*Charcoal (score)	Cereal	Seeds	Molluscs
704	1	Ditch 703	40	6	2	-	1
1108	2	Gully 1107	20	6	-	17	202
1111	3	Spread	5	1	-	2	-
1106	4	Ditch 1105	40	1	2	-	6
1114	5	Ditch 1105	20	Sterile	Sterile	Sterile	Sterile
308	6	Ditch 307	20	1	-	-	2
407	7	Gully 406	10	1	1	2	3
409	8	Gully 408	20	2	-	1	12
411	9	Gully 410	20	3	1	2	66
411	10	Gully 410	20	1	1	4	51
413	11	Gully 412	10	1	-	4	36
416	12	Gully 415	10	1	1	46	25
1112	13	Gully 1107	20	Sterile	Sterile	Sterile	Sterile

* key for charcoal 1=1-10, 2=10-20, 3= 20-30, 4=30-50, 5=50-100, 6=100-200 fragments

The cereal present was barley (*Hordeum* sp) and possibly breadwheat (cf *Triticum aestivum*). The wild/weed plant taxa present were dominated by fat hen (*Chenopodium album*) which is a common weed of disturbed ground. Other wild/weed taxa present were a single cleaver (*Galium Aparine*) and a number of indeterminate grass (*Poa* sp) seeds.

The freshwater molluscan taxa observed were dominated by *Bithynia* sp with fewer numbers of *Valvata* sp and *Planorbis* sp. The terrestrial molluscan taxa noted were *Pupilla muscorum*, *Azeca goodalli* and *Clausilia bidenata*.

The charcoal would need further work for species identification, where this is possible.

Discussion

The low level of charred material suggests it to be ‘background’, that is, material washed or blown in from activities taking place elsewhere. The paucity and poor preservation of charred material limits its value. It apparently adds little to the understanding of the function of the site other than, in the case of charcoal, perhaps to indicate the nature of fuel utilised on or near the site. It provides little information about the environment of the site as a whole.

The presence of freshwater molluscan taxa indicates standing water in some features and some terrestrial species suggest stony ground. Again this appears to reflect the local site rather than the general environment where salt marsh species might be expected.

Potential

Although the frequency of charred plant material was low, it was present and identifiable in the majority of features. Bulk samples could be collected from suitable contexts should further excavation be undertaken. The material could be used to examine the type of fuel use at the site.

The number of individuals and range of taxa of molluscs, at least from some contexts, suggest that incremental sampling for molluscs of well stratified and well dated features could be productive in any future investigations. Such sampling may provide an indication of the environmental conditions associated with the site though time.

8 DISCUSSION

8.1 Excavated evidence

There is clear evidence for occupation relating to saltmaking in Trenches 4 and 11. Trench 11 contained a large ditch [1105], a gully [1107] and two spreads of material [1109 and 1111] which together contained 10.25 kg of briquetage. A sherd of Roman from the upper fill of [1105] suggests final activity in the later Roman period, but a general later Iron Age / Roman date is more securely indicated by the nature of the briquetage (Section 6.2, above). Trench 4 contained six gullies and yielded 1.29 kg of briquetage.

The extents of these sites could not be demonstrated from the surveys undertaken. Both sites lie outside the areas of proposed turbine bases.

The ditch traced through Trenches 2 and 3 (Turbine 2) was not datable, but appears likely to belong to the same period of activity. It was a substantial feature and the magnetometer plot shows it running on an arc for over 50 m.

The ditches and gullies in Trenches 2, 3, 4 and 11 were located on the slight rises in the ground level formed by the natural sandy silt of roddens. This indicates that these features were not contemporary with the palaeochannels and were probably located above the marine tidal reach that must have existed not far away when they were in use.

The linear and curvilinear gullies in Trenches 4 and 11, if related to the production of salt itself, possibly functioned as drainage or water entrapment features close the areas of salt production. It may be similar to the late Roman saltern at Blackborough End, Middleton, Norfolk, which had ditches/gullies forming a small enclosure around a production area that was also located on a slight sandy ridge (Crowson 2001).

Similarly, the briquetage waste material thrown into the base of the gully and down the side of the ditch in Trench 11, probably indicates the main area of the saltern processing was also being undertaken close by, possibly to the west side of Trench 11, where the waste debris appears to have been thrown from. The recovery of the briquetage from the base of these features would also most likely make them contemporary with any salt producing features. Similar briquetage debris was recovered from ditches were found close to the Iron Age saltern at Cowbit Wash, Lincolnshire (Lane 2001).

The spreads in Trench 11 associated with the ditch and gully may represent a disturbed ground surface, created by work activity relating to the saltern, which were similar to the fill of shallow irregular depressions at saltern at Cowbit Wash that related to the stoke area for the salt making oven, containing briquetage and animal bone debris.

The ditches in Trenches 2, 3 and 4 may have functioned as drainage features, but they could have allowed the tidal waters to the areas of processing, acting as feeder ditches or sea water entrapment areas. The ditch in Trenches 2 and 3, identified on the geophysics, formed a large curvilinear feature probably extending over 100m. The ditch bears comparison to that in David Hall's survey at Elm Hall, Cambridgeshire, where artificial ditch loops were seen to cut into the side of river channels to capture the tidal salt-bearing waters (Hall 1978, 26). Similarly

curvilinear soil marks representing artificial channels were observed at Walpole St Peter, Norfolk (Silvester 1988, 99).

The ditch in Trench 10 was shown to be relatively modern, and that in Trench 7 was probably also so.

8.2 Effectiveness of fieldwork techniques

Fieldwalking survey

The fieldwalking revealed little of significance other than the fragments of fired clay (confirmed as briquetage) mainly along the southern margin of the Turbine 2 area (Fig 5). The geophysical survey identified only one clear anomaly here, a rectangular feature that was targeted by Trial Trench 1 (Fig 9). The trench revealed no features or finds and it seems probable that the feature was a spurious geological one (as interpreted on Fig 9). It is likely that, if there are any features associated with the debris in the ploughsoil, these lie further south.

The fields in which the briquetage sites were identified (Trenches 4 and 11) were not surveyed by fieldwalking, although Trench 4 is quite close to a saltern site found a little further south in the Fenland Survey. The site in Trench 11 does not appear to have been identified through surface remains in the Fenland Survey.

Magnetometer survey

The magnetometer survey correctly identified the curving ditch in Trenches 2 and 3 and the roddens (showing as palaeochannels) elsewhere. The curving ditch was, however, fainter than might have been expected from its actual size (Plate 2).

The saltern sites in Trenches 4 and 11 were identifiable through concentrations of fired material, rather than the associated ditches. The ditches in Trench 4 were very shallow and may not have been expected to register as magnetic anomalies anyway, but in Trench 11 it is possible that palaeochannel deposits masked the presence of cut features (Fig 9).

The results suggest that magnetometry is a good technique for identifying sites with briquetage. On this basis there may also be saltern sites adjacent to the field boundary south of Turbine 1, and in the north-east corner of Turbine 2 (Fig 9). Neither site was examined by trial trenching.

Trial trenching

The trial trenching largely confirmed the indications of features on the magnetometer plots, and was clearly effective in locating minor features which were not otherwise evident. There was also a certain amount of dating evidence collected, together with palaeo-environmental indicators.

The saltern features were buried immediately under the modern ploughsoil and easy to identify once the soil had been stripped. The features and finds were well-preserved and there may well be structural features relating to the saltern ovens surviving near by. It is, however, unclear from the trial trenching alone how extensive these remains are.

The area of airstrip was not trial trenched, although this displayed an area of anomalies that were potentially archaeological, which could be taken into consideration if further work is to be undertaken.

Small machine-dug sondages within a number of the trenches indicate that sediments with some archaeological potential lie beneath the marine clay (Fig 13). These sediments include peats and silts at 1.0-1.5 m below the present ground surface, which, on the basis of work undertaken elsewhere in the fens, have the potential for associations with earlier prehistoric activity and occupation. It would not be possible to assess this potential without detailed geo-archaeological

deposit modelling. Indications of burnt material at depth in Trench 9 suggest the possibility of earlier activity in this general area, but the material itself could be redeposited or naturally derived.

There is little potential for any post-Roman activity within the site. The evaluation was undertaken in an environment of former fenland in which periods of ancient marine incursions occurred. The archaeological evidence shows later Iron Age or Roman period activities relating to these marginal conditions, and the environment were not again suitable for occupation or sustained activity until the land drainage schemes of post-medieval times.

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Plate 1: Trench 18, peat deposit (1806) at base, overlaid by clay (1802) and (1805), facing west



Plate 2: Trench 3, ditch [307], facing east; drain cuts ditch fill (308) on north side



Plate 3: Trench 11, curvilinear gully [1107] and spread (1111), facing west



Plate 4: Trench 4, Curvilinear gully [410] and linear gully [408] (background), facing west

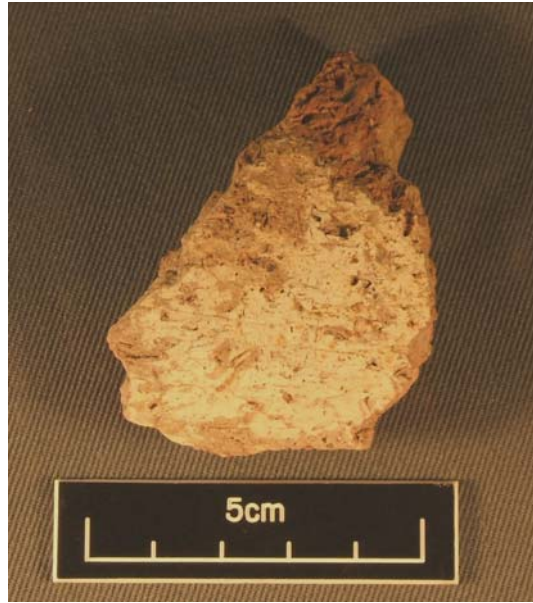


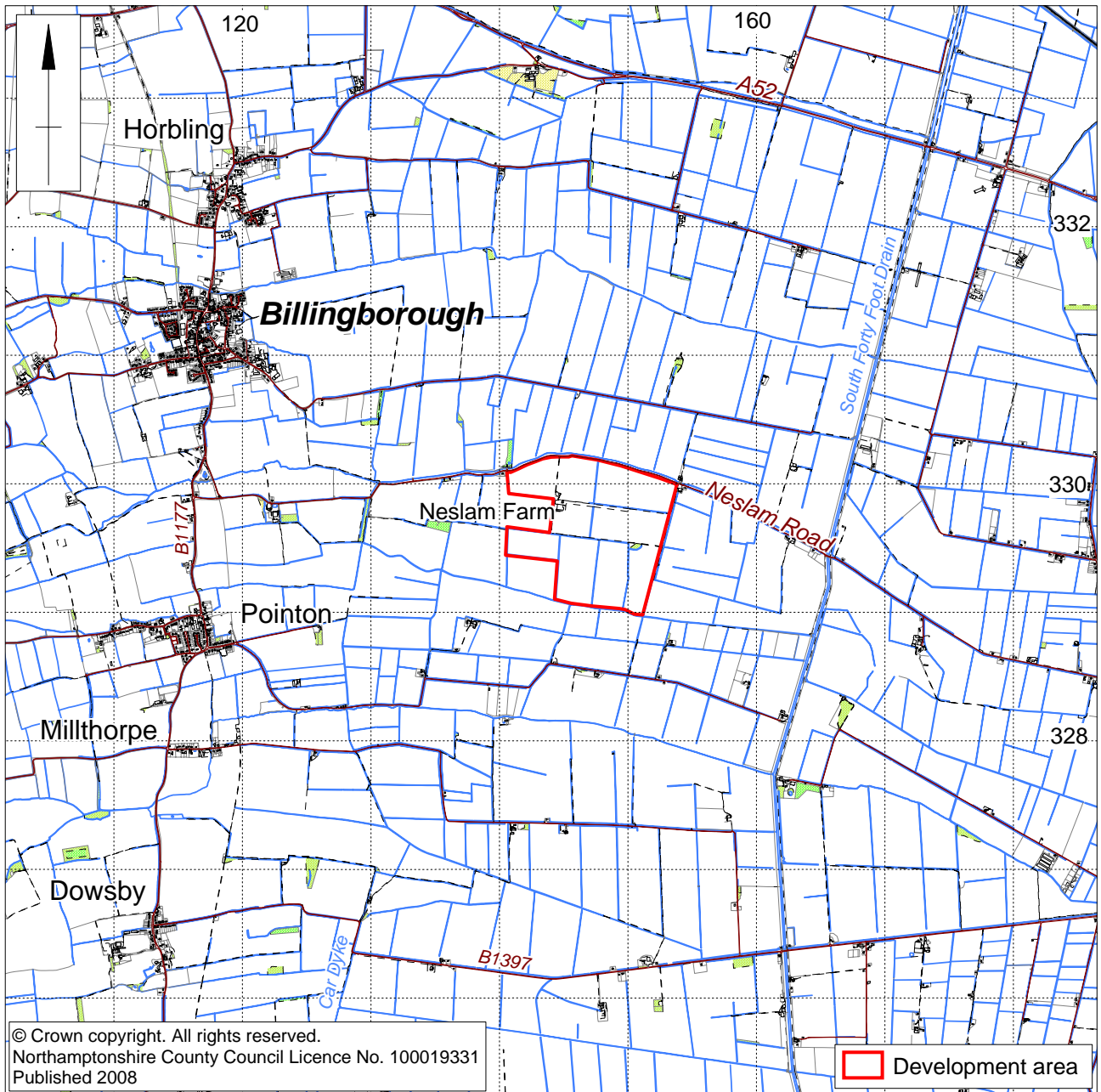
Plate 5: Salt deposit on briquetage sherd



Plate 6: Probable base to side sherds for salt evaporation trough

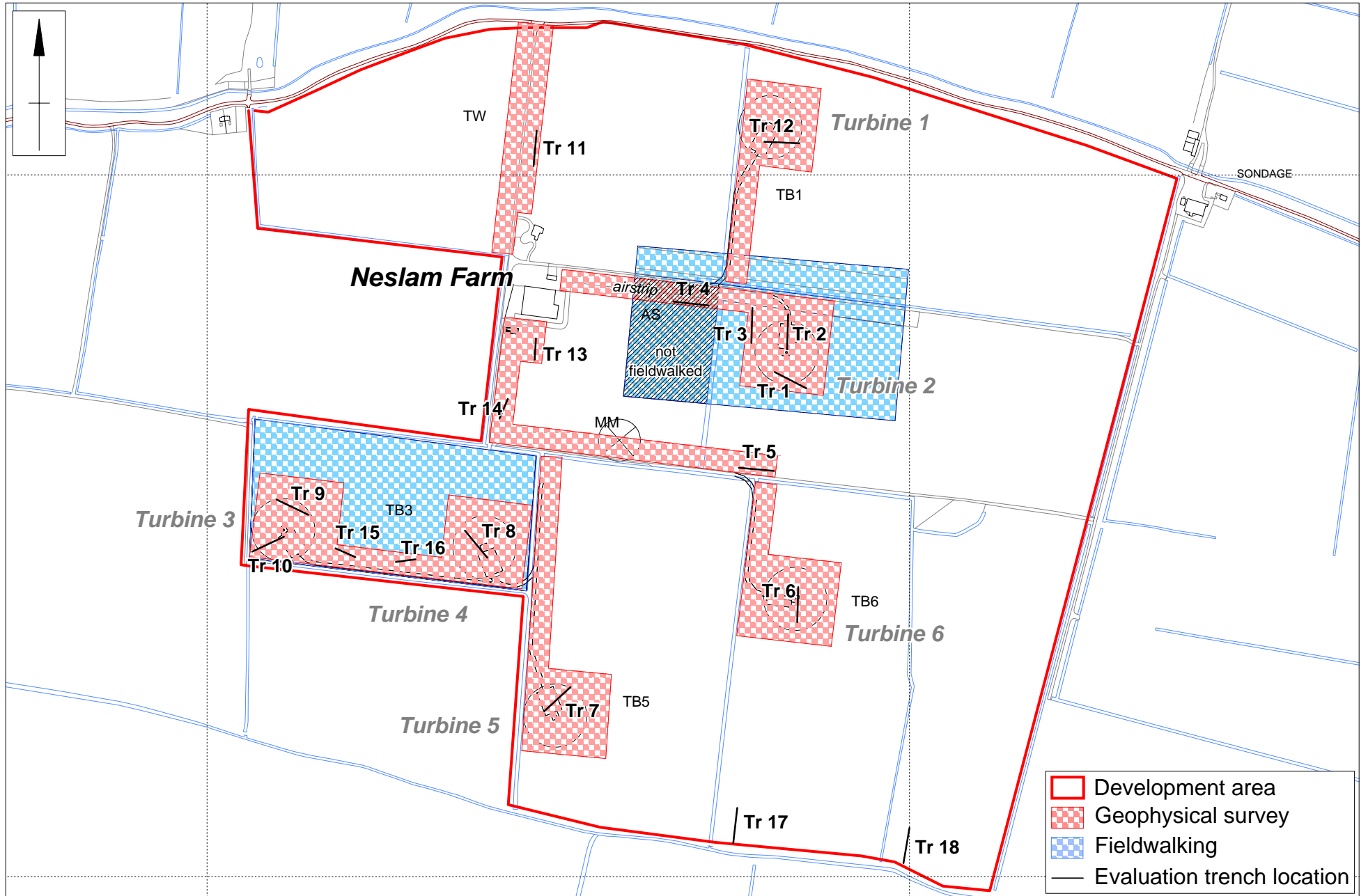


Plate 7: Possible pedestal fragments for supporting evaporation troughs

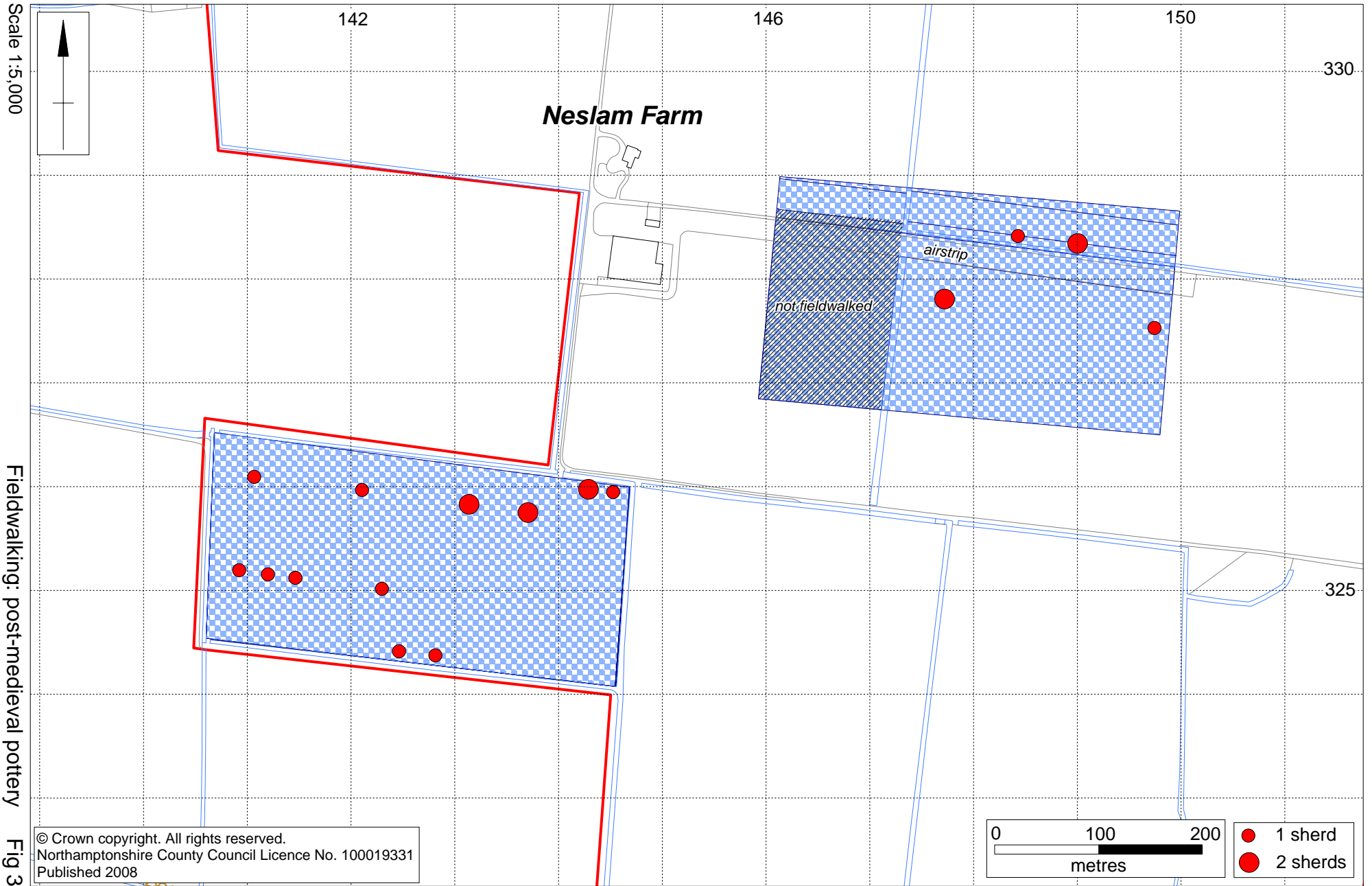


Site location Fig 1

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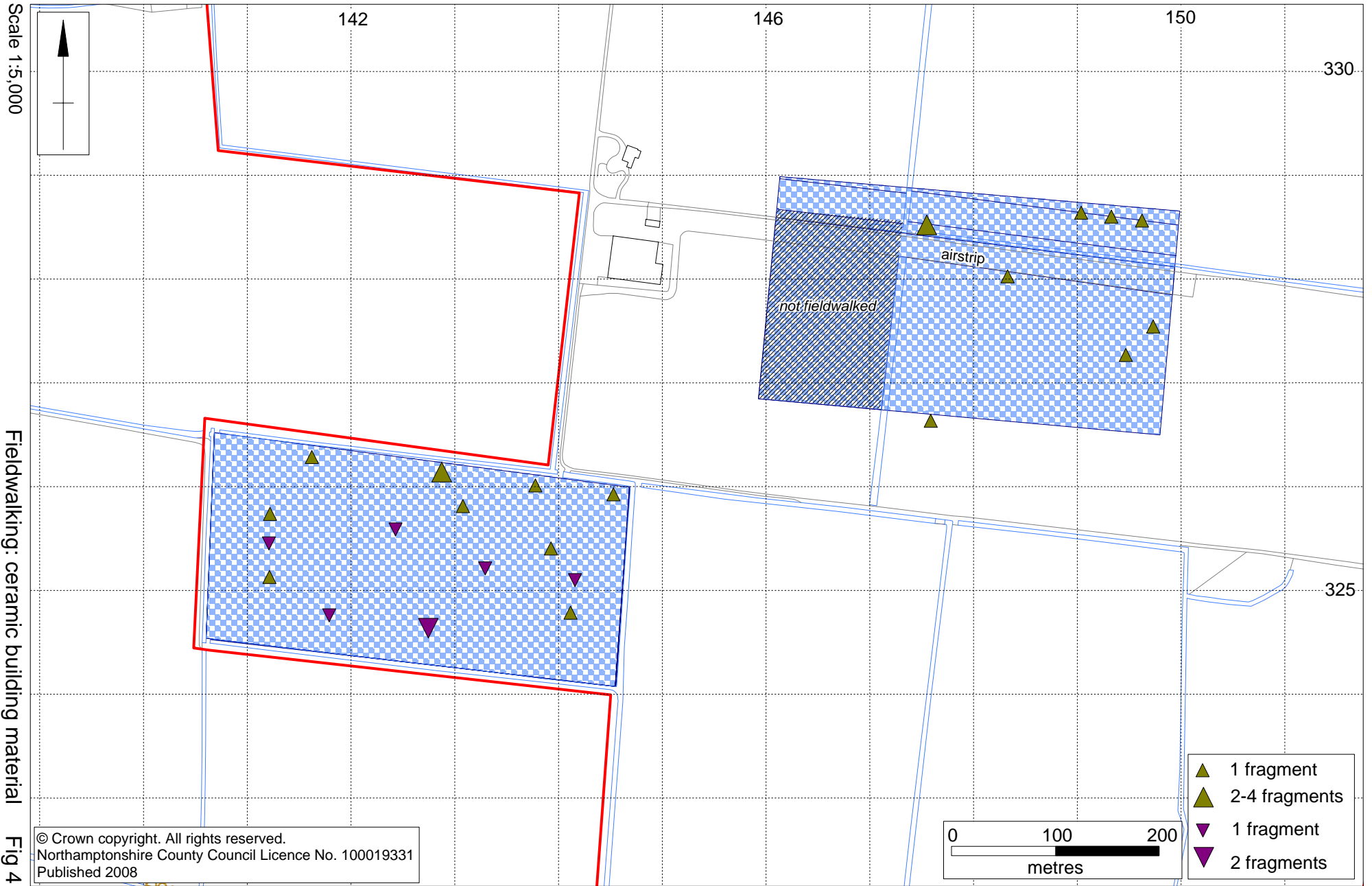


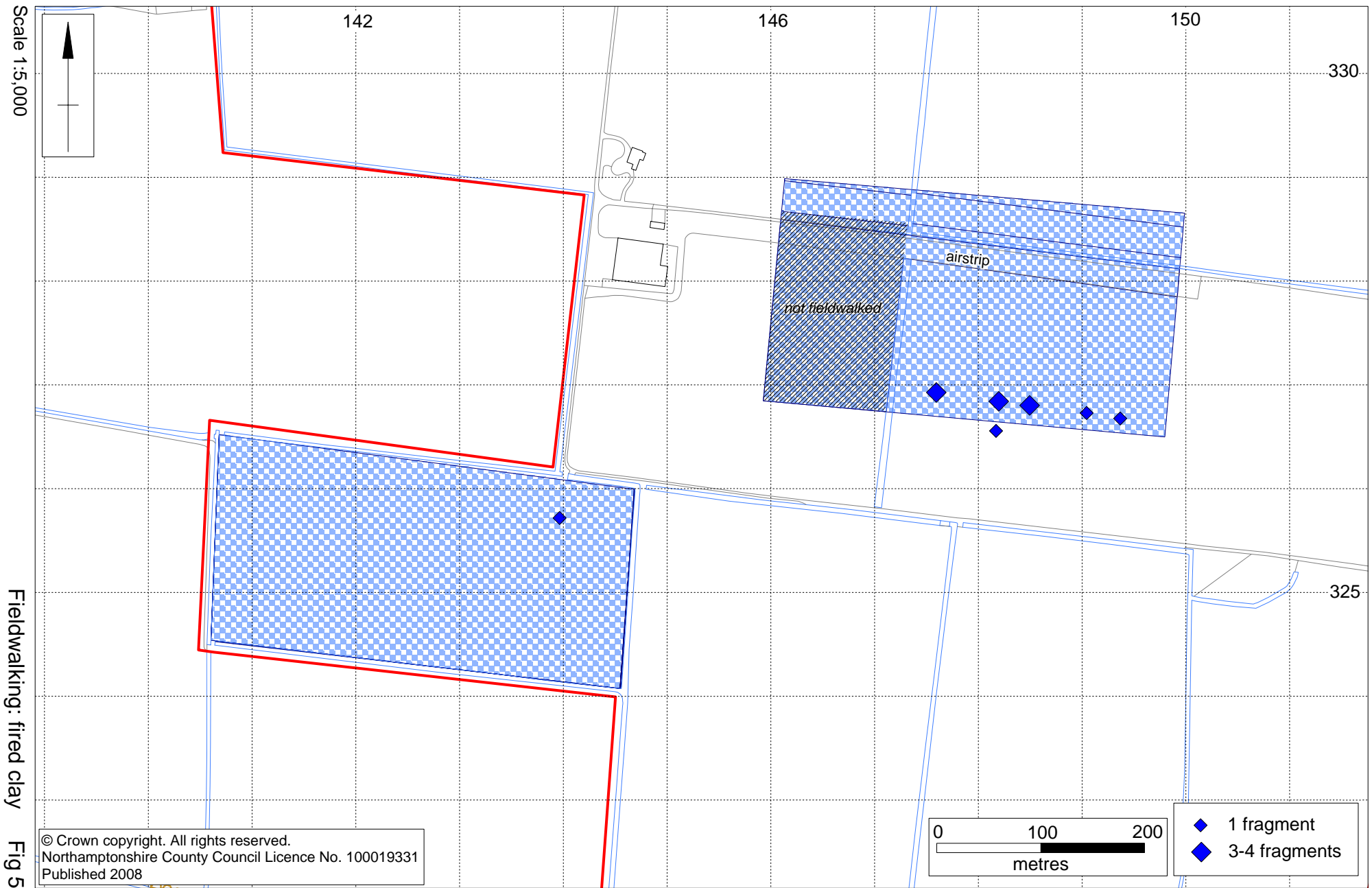
Areas of archaeological work Fig 2



Fieldwalking: post-medieval pottery Fig 3

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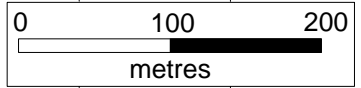


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Fieldwalking: fired clay

Fig 5

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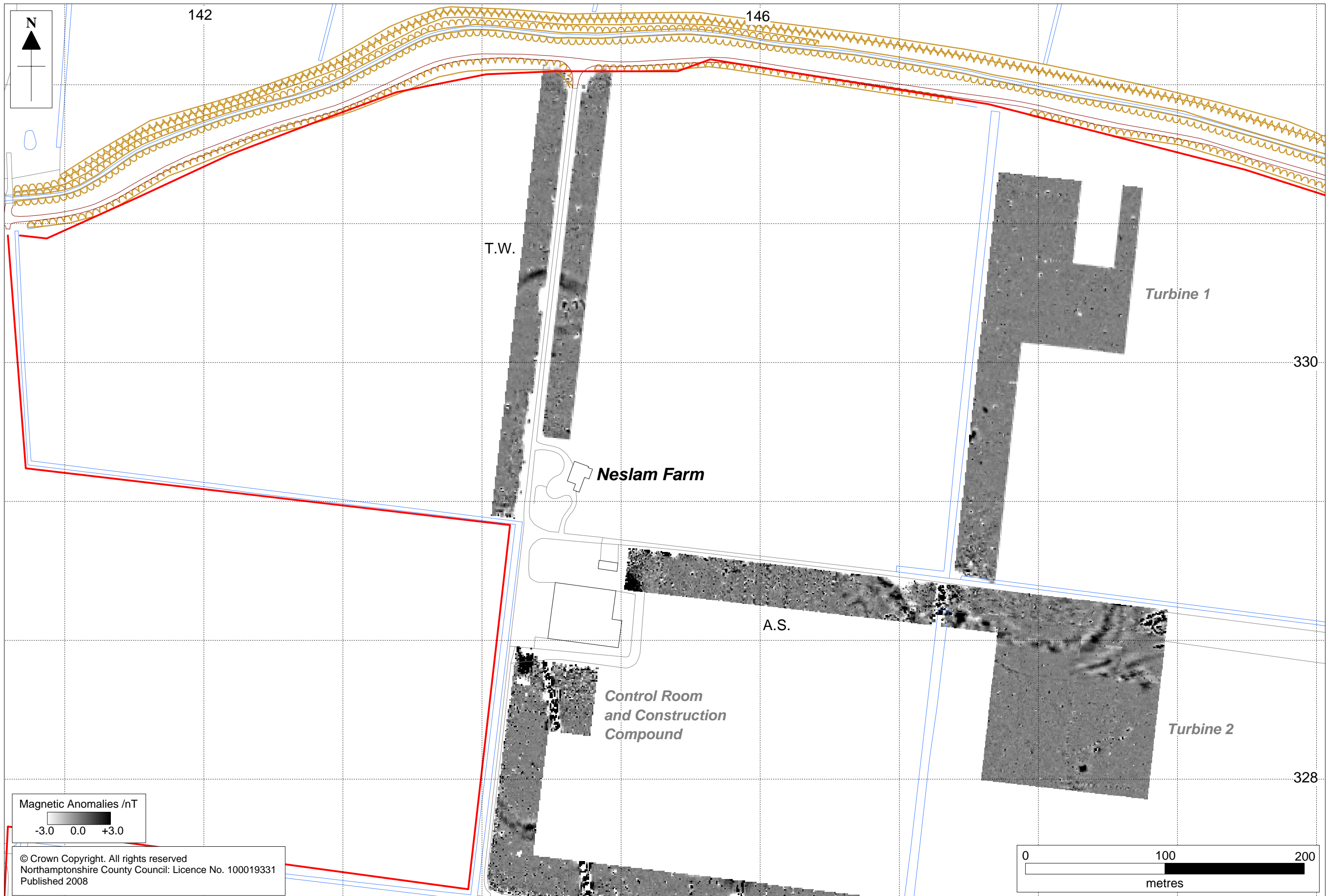


- ◆ 1 fragment
- ◆ 3-4 fragments



Scale 1:5000 at A4

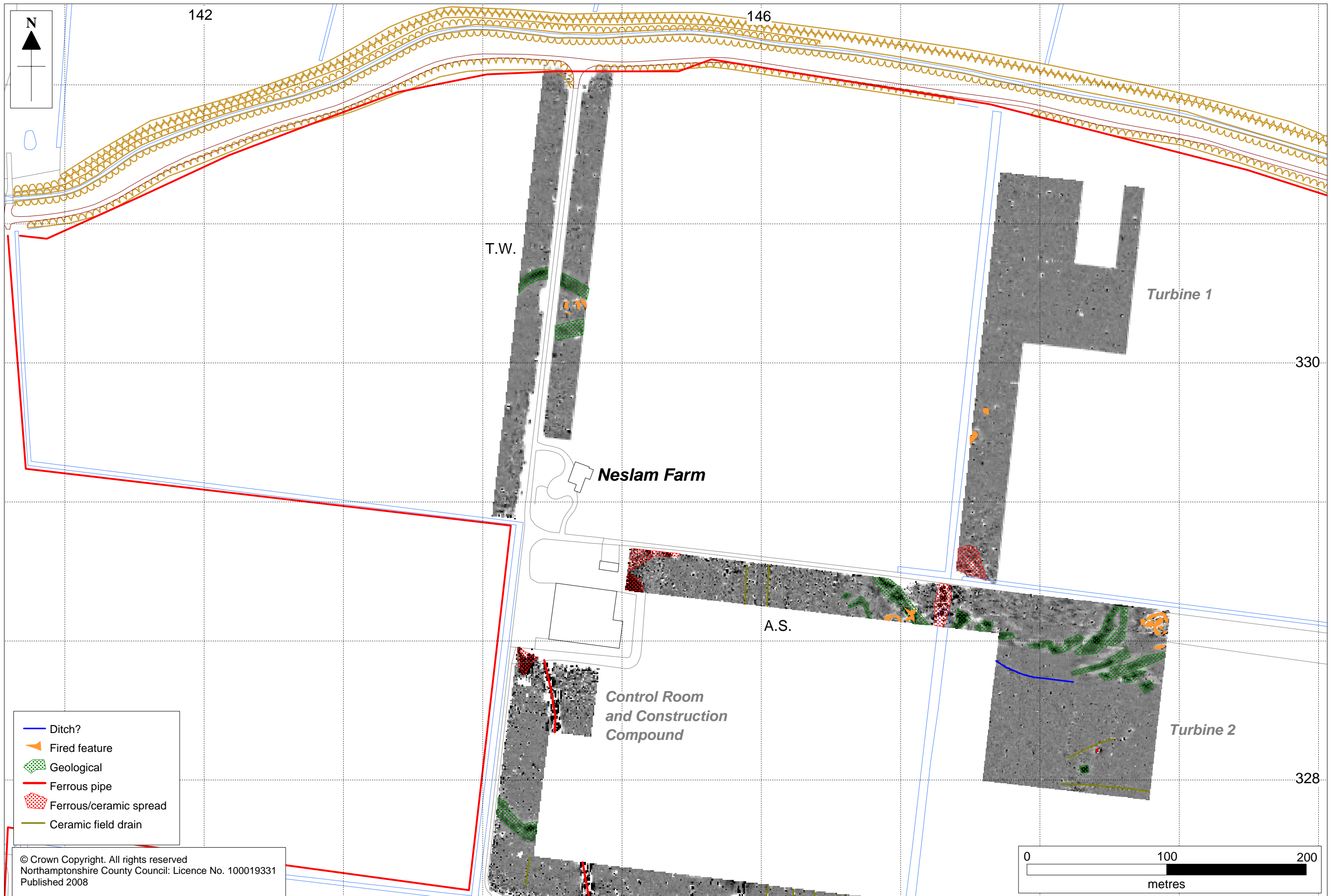
Gradiometer Survey Overall Results Fig 6





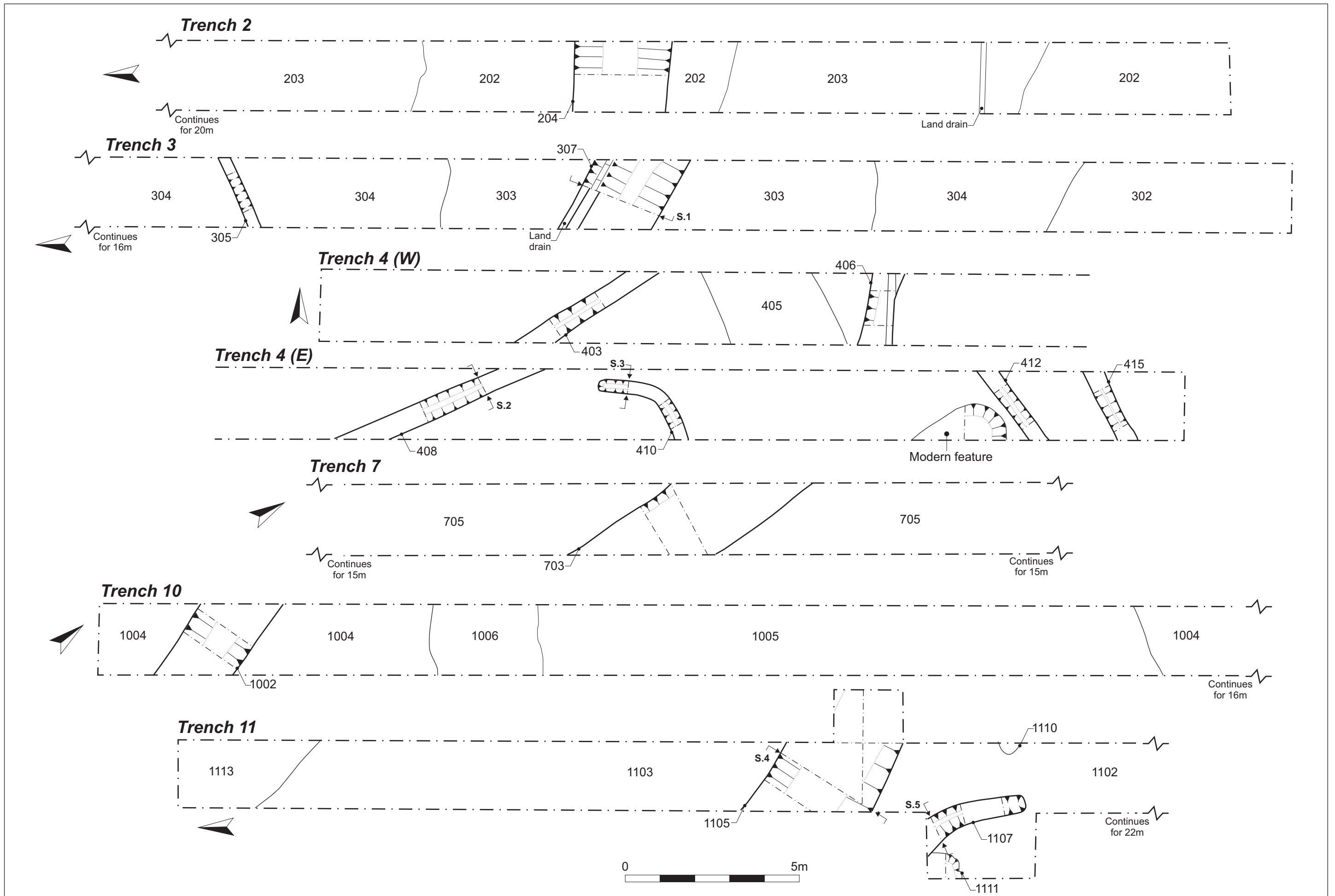
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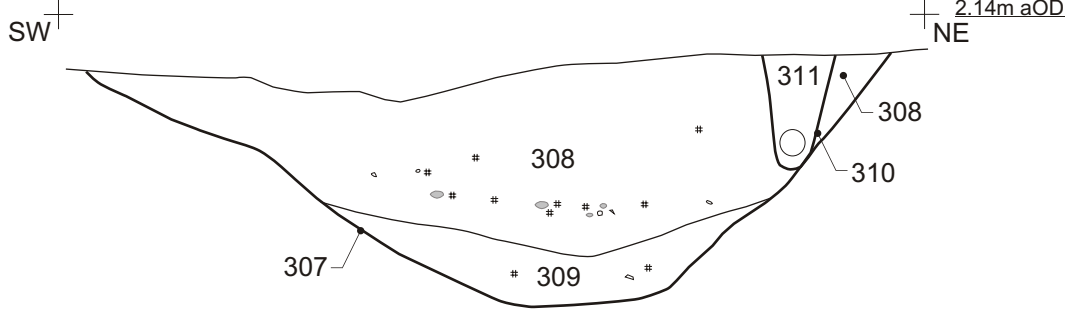


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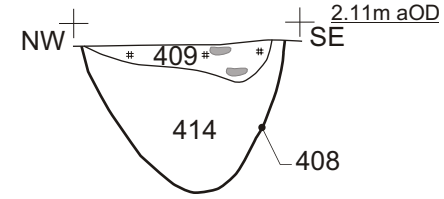


Trenches 2 - 4, 7 and 10 - 11 Fig 11

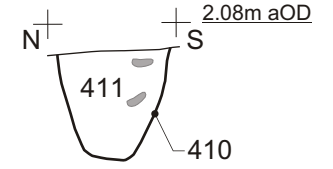
Section 1



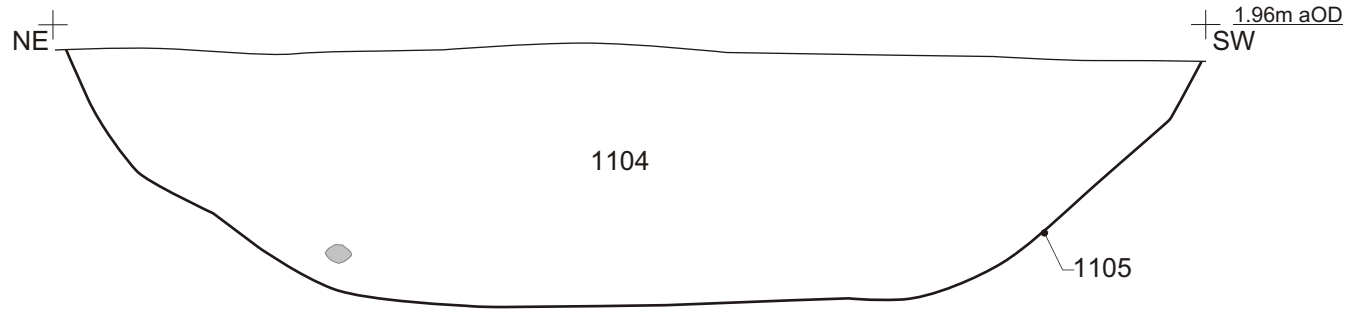
Section 2



Section 3





Section 4



Section 5



-  Burnt clay
-  Charcoal

