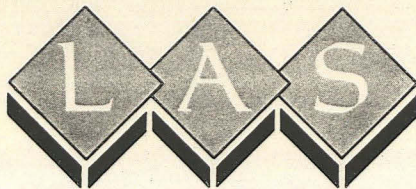


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LINDSEY ARCHAEOLOGICAL SERVICES

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ARCHAEOLOGICAL MONITORING
OF THE
WELTON TO LINCOLN TRUNKMAIN 1992-3

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ARCHAEOLOGICAL MONITORING
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WELTON TO LINCOLN TRUNKMAIN 1992-3 52202-03
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Introduction

Lindsey Archaeological Services (LAS) was commissioned by Anglian Water Services to monitor the route of a pipeline between the Welton Pumping Station and an intermediate point at the junction of the A15 and A46 (Fig.1). Responsibility for monitoring of the pipeline's approach into Lincoln lay with the City of Lincoln Archaeology Unit.

The pipeline was 10.7km from the pumping station at Welton to the City boundary of which c.8.7km passed through agricultural land and the remaining 2km was laid in the road or on roadside verges where archaeological investigation was limited.

The author was employed from late October 1992 to prepare and undertake the watching brief of the soil disturbance. A second Field Officer (Colin Palmer-Brown) and other staff were recruited to excavate specific archaeological sites on the route. The first groundworks on the pipeline were delayed until 9.11.92 and progress did not keep to the anticipated schedule because of poor weather conditions and a revision of the planned route. Fieldwork ended in July 1993 but processing of finds and preparation of this report continued until January 1994.

METHOD

a) Desktop study

The initial desk-top study for the route was carried out by officers at the Lincolnshire Sites and Monuments Record. LAS was invited to undertake the watching brief of the route 10 days before the contract start date. A full list of recorded sites and finds in the Lincolnshire SMR was obtained after the start of the project and is appended (Appendix 1). A brief examination of cartographic material held by Lincolnshire Archives Office was made, including the study of late 18th century enclosure awards for Nettleham and Welton. These failed to provide informative details of field names or past land use which some early maps contain.

The route was checked against records and air photographs held by LAS. Consultation of the air photographic libraries at the University of Cambridge and the Royal Commission on Historic Monuments (England) National Air Photographic Library at Swindon led to further sites being identified (see Appendix 2).

The study was complemented by a site visit to the route after access had been agreed but before groundworks began.

b)The Watching Brief

The pipeline easement was 12m wide where it passed through agricultural land. These areas were linked by a short stretch along the Nettleham Road where the pipe was laid within the roadside verge or below the carriageway. Across agricultural land the easement was defined by fencing and the topsoil was removed before the pipe laying operations commenced.

Intensive searching of the land surface is a common archaeological technique which is used to recover finds that were dropped in isolation or tipped with farmyard waste onto field surfaces. The route across agricultural land was investigated in two phases, comprising careful walking over the route looking for artefacts in the soil which were picked up and plotted onto 1:2500 maps. The first walkover on cultivated land took place in advance of topsoil removal (pasture could only be examined after removal of topsoil). Repeated ploughing of land causes progressive damage to any archaeological site immediately below the topsoil and this is reflected in the quantity of artefacts which circulate in the overlying topsoil. The size of pottery fragments and the condition of other finds deteriorates after several seasons of exposure to frost and temperature extremes, and these can be indicators of the present level of survival of a hidden site.

The second phase of investigations took place after topsoil removal. An Akerman H12b 360 degree mechanical excavator was used with a toothless bucket for most of the topsoil removal, although some fields were cleared with a small bulldozer. The stripping of topsoil from the defined easement began in early November 1992 at Nettleham Beck.

The need to keep the topsoil heap uncontaminated from less fertile subsoil resulted in a stripped surface which, although favourable from the landowners' viewpoint, still obscured signs of archaeological features such as ditches and pits below a thin topsoil residue. Other similar projects have stripped to a slightly greater depth which saves archaeological time and can prevent unexpected sites becoming revealed only at a later and less convenient stages of the project.

Fields affected by the pipeline route were numbered from the southern end of the route. Each area which produced archaeological remains was given a code on site comprising the Field number and a letter code (e.g. in Field 11 finds were made in seven separate zones which were allocated the letters A-G.) The findspots were plotted onto a 1:2500 map and an eight-figure National Grid Reference (NGR) was assigned (see Appendix 3).

Field 1

This field was located behind the Lodge House by the Riseholme Road roundabout. In Spring 1984 contractors completing the demolition of a Victorian house on the west side of Riseholme Road (A15) in preparation for the Lincoln Relief Road discovered a number of previously disturbed burials whilst excavating a trench by machine. Staff from The Trust for Lincolnshire Archaeology visited the site and recorded a minimum of 12 graves visible in the trench side (Field 1985). In the absence of dating material it was assumed that these were Roman and reflected the tradition of roadside interment on the outskirts of major settlements; the road is part of the Roman Ermine Street leading from the colonia at Lincoln.

Further burials or other signs of Roman activity were anticipated from this vicinity and a Home Office licence for the removal of Human Remains was obtained (20061) but not needed.

The pipeline easement in Field 1 was fieldwalked before and during topsoil stripping (Pl.1). The stubble and resprouting crop obscured much of the soil at the preliminary stage but a considerable number of small medieval pot sherds was found, together with a few fragments of Roman building tile; the concentration increased towards the north end of the field. Monitoring of the topsoil strip produced mid-late 2nd century Roman and further medieval pot sherds; the medieval pieces although small were numerous. Several medieval sherds were found close to a low ridge, 275m east of the Lodge garden hedge. The ridge was about 12m broad, which seemed excessive for a hedge bank, and was probably a natural feature. No burials or any other sign of Roman use of this land was exposed by the topsoil strip but the very close proximity of the major route of Ermine Street suggests the dumping of domestic waste from the city may have occurred here in antiquity.

The stripped easement was examined by the LAS excavation team to confirm that no burials were present at a lower depth and to investigate whether the pottery fragments had been disturbed from ditches or pits. No sign of archaeological features survived.

Field 2

The boundary between the parishes of Nettleham and Riseholme is still marked by a field ditch and a partly removed hedge where it approaches the Lincoln Relief Road. To the west of this boundary several scatters of pottery fragments, both Roman and medieval, were found. Medieval pottery of 13th - 14th century date was the most frequent and in the form of very small and worn sherds. This was mixed with 26 pieces of mid-late 2nd century Roman pottery including a sherd of

imported Samian ware. Neither periods of material appeared to have been associated with any settlement remains. The medieval pottery may have reached the field with farmyard waste carted from the deserted medieval village of Riseholme about 0.5km to the north of the easement. The Roman pottery may be explained by the high level of activity in the area, namely the Roman aqueduct to the south and a settlement site on the south side of the A46 Relief Road. A marked concentration of medieval sherds was found where a former hedge bank crossed the easement; the bank had been levelled during the Relief Road construction but survived as a visible ridge. Below the ploughsoil the bank material was apparent but there was no clear indication of the ditch; it was assumed to have been to the east of the bank .

Field 3

A number of medieval sherds were found scattered along the length of the easement through this field when the preliminary fieldwalking of the field was conducted in advance of topsoil removal. During the topsoil stripping a small number of 3rd century Roman pot sherds and tile fragments were found towards the western end. These were not associated with any pits or ditches and are interpreted as stray material from a nearby site away from the easement. The most likely source is from land to the south of the Relief Road where other finds have been recorded.

A close watch was maintained on the pipe trench excavation at the eastern end of this field in case the Roman aqueduct which was built to supply water to the city of Lincoln was present. It has been excavated at several points along the west side of Nettleham Road within the city boundary. Excavations in 1952 located the aqueduct and support piers in a field just south of the present Relief Road. It was assumed that the source for the aqueduct was the Roaring Meg, a stream which passes through that field. Some authorities challenged this interpretation and suggested that the water source for the aqueduct came from the Wolds (see Field 8 for another proposal). The evidence for this theory turned out to be an aerial photograph of a modern pipeline and when the Lincoln Relief Road was constructed in 1984 nothing was seen despite careful monitoring. The Anglian Water pipeline provided a further opportunity to examine the projected route north of the Roaring Meg but again nothing was seen. It appears very likely that the Roaring Meg was indeed the intended source of water for the aqueduct.

An area of pale cream concretion resembling a soft mortar was noted below the topsoil close to the Relief Road roundabout (Pls.2-4). This was surveyed and rapidly recorded, with a sample of the concretion taken for analysis. During the recording, a circular deep feature was observed to have been dug through the layer and backfilled

with disturbed limestone and loam (Pl.5). The diameter of the pit was 1m and the pitched redeposited stones continued slightly above the base of the present ploughsoil. These points indicated a modern feature, suspected to have been a bore-hole for either the A46 Relief Road (constructed 1984) or for oil prospecting. The concretion was apparently restricted to an area around the bore-hole and was found to overlay other fills of a large feature which cut the natural loamy limestone strata. It was unclear whether this was a filled natural depression or a large pit but the subsequent analysis implied that the large disturbance could be natural, perhaps associated with springs (see Field 4).

Field 4

The pasture field between the parkland and the A46 roundabout produced a very small prehistoric flint implement when the topsoil was stripped.

The remains of a pronounced hedge bank survived at the west edge of the easement; a fragment of Roman tile and a medieval sherd were found in the upcast. The bank was parallel to a backfilled ditch to the east which was exposed after topsoil had been removed from the easement. This relict boundary was still marked by occasional mature trees beside a wire fence 1.5m west of the ditch.

A low ridge, cut by the field ditch, was observed to cross the easement W-E and extend into the field to the west. It was confirmed to be a geological feature.

During the pipe-trench excavation at the south end of the field, further patches of the concretion noted in Field 3 were observed within the undisturbed loamy limestone. Denser areas of limestone platelets 1m below the surface were coated in a fine dark brown/black dust which was reminiscent of peat. Small pockets of fine sand were also present. These seemed to indicate a small glacial or post-glacial watercourse, probably a precursor of the adjacent beck. Analysis of a thin-sectioned sample of the concretion by A. Vince, City of Lincoln Archaeology Unit, showed that it had a laminated structure characteristic of calcium carbonate laid down as a result of algal growth. It was interpreted as a tufa formed under water and probably close to a spring issuing from the local limestone. The quartz sand component is a product of glacial action and would have filled gaps between limestone platelets on the Lincoln Edge pavement. This material was entirely natural and any continuation of the Roman aqueduct must be sought elsewhere!

Field 5

This small land parcel had become part of Field 6; recent construction works at the adjacent house had resulted in a spread of brick rubble, low heaps of limestone brash and drainage disturbances. The field had been formed out of the post-medieval parkland which extends over Fields 6 and 7 containing deliberately planted groups of trees.

Field 6 (Pl.6)

South of the road to Nettleham Fields Farm the parkland was disturbed by numerous recent features, some possibly dating from the 19th-20th century stone quarry in the SW corner of the same field. Frequent finds of broken bricks with no frog (19th century or earlier) in the northern part of the field had probably been laid as hardcore for a field entrance. Faint ridge and furrow, running almost N-S was noted on the field surface in the northern part of the field and topsoil stripping proved that this had been more extensive. The plough furrows appeared to predate the building at the southern end of the field that is now a dwelling with tennis court. The sequence of farming activity on this land reflected in the archaeological record is quite complex: the medieval ploughing which produced pronounced ridges and furrows may have been followed by a period of pastoral use during which plough technology advanced. A subsequent return to arable farming flattened many of the earlier undulations before the land was emparked. The building was probably originally associated either with the later arable use or with the stone quarry which is still visible beyond the easement to the SW of the field.

A single Roman greyware pot sherd was found on the easement but there were no signs of any settlement traces.

Field 7

Slightly further north the medieval ridge and furrow was still sufficiently uneven to frustrate the machine operator's aim of maintaining a level easement. The ridges were seen to represent two phases of ploughing using different alignments and plot sizes. At the highest (southern) part of the field the alignment was W-E, with furrows 10m apart and both ridge and furrow width about 5.5m (Pl.7). Over much of the field these W-E furrows were virtually flat. Further north there were traces of furrows 0.3m deep, aligned N-S down the slope with a broad headland by the stream (Pl.8). The N-S furrows appeared to be later than the shallower plough marks. The spacing was 9m, with slightly narrower ridges. This suggests a marked change in late medieval land tenure or use, perhaps associated with climatic change requiring furrows to encourage drainage down the slopes rather than the earlier convenient use of flatter

land for arable cultivation. A marked increase in topsoil depth over the ridges, from 0.07m on the slope to 0.13m near the stream, is evidence of relatively recent soil creep or hill-wash that may have been occasioned by ploughing erosion.

There were signs of several late 19th-20th century slight disturbances 100m south of the stream; there were china fragments in the topsoil around this area. The parkland had clearly once been denser and extensive rotted tree root-systems from large trees survived at 30-40m intervals. Existing mature trees beside the easement in this field include a walnut.

Field 8

A letter by J.W. Houlton, written in the late 1970s during widening of the A46 close to Nettleham Fields, is held in the County Sites and Monuments Record parish file for Nettleham. It relates a theory by a former resident of Nettleham, Mrs. Baker, that Lincoln's Roman aqueduct continued north beyond its investigated course and had as its source a spring in the field east of where the A46 crosses Nettleham Beck. The letter recorded Mrs. Baker's theory that 20yds west of the road, and north of the stream, a flat piece in the grass field was the site of the reservoir or pump for the aqueduct. She had apparently found Roman tiles on the site. Substantial amounts of Roman material have been retrieved from arable fields to the north-west of the easement on the west side of the road and the monitoring of the pipeline project offered an opportunity to record the extent of any associated archaeological features or finds (Pl.9).

A distinct ridge in the field beside the beck proved to be of a different subsoil type than the nearby ground (Pl.10). In field 8 (and at the south end of Field 9) the soil was an orange sandy loam below 0.15m of topsoil, but in Field 7 to the south of the beck the soil was a buff clay loam with disturbed limestone brash. It was unclear from the surface whether the ridge was the result of hillwash from the north, or a constructed feature and this was subsequently investigated by an excavation within the easement limits in Fields 8 and 9. To the west beyond the easement there were faint surface indications of a small square enclosure on part of the ridge; it was interpreted as possible building remains for a shed or minor structure (Pls.11 and 12).

Broad alluvial deposits, about 60m wide, were exposed by the topsoil stripping north of Nettleham Beck and testified to a much greater stream flow in the past. The upper lenses of the alluvium contained late 19th century china, slate and brick fragments. The stream is labelled "The Great Beck" on a map dated 1777 attached to the Nettleham Parish Inclosure Award and the Award required it to "be made 8 feet wide at

the top" (LAO, Lindsey Award 174). This survey omits any boundary between the beck and Riseholme Lane, suggesting that the present becks side meadow may date from the 19th century. The surface of the meadow was covered for part of Winter 1992-3 by surface water emanating from springs and channelling along a linear depression close to the beck. This might have been an appropriate location for a mill or mill leat; the ridge could be the remains of a dam bank (Pl.13). No mill site is known in the immediate vicinity.

Field 9

A prehistoric worked flint implement and sherds of Roman and medieval date were recovered from the ground surface despite the crop cover which obscured much of the soil during the preliminary fieldwalking. A small hand-blown dark blue glass bead found beside these sherds cannot be reliably dated.

Field 11

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The revised route passed through the field north of the Riseholme Lane/ A46 junction. Aerial photographs show 3 parallel ditches passing directly across the route; the ditches are part of an extensive prehistoric boundary arrangement which has been noted to the north and NE of Lincoln (Everson 1983, 16) (Pls.14 and 15). One scraper was found on the ground surface close to this site.

Two of the ditches were located after topsoil stripping and the other was found obscured below a deposit of hill-washed soil. They followed a minor natural depression across the field, unlike other stretches of the boundary system where natural topography seems to have been ignored (Pls.16-19). A subsequent excavation produced Iron Age pottery which permitted this stretch of the boundary to be dated (Palmer-Brown 1994).

Elsewhere in the same field sixteen 2nd-3rd century sherds of Roman pottery were recovered suggesting that a later habitation site may exist close to the ditches, probably at the top of the slope to the NW of the field (Pl.20).

Fields 12-14

A thin scatter of Roman and shell-tempered medieval potsherds were found in these fields.

Field 15

Eight poor quality struck prehistoric, possibly Neolithic, flints were found in a small area on Nettleham Heath but these are not thought to represent a settlement site.

Field 16

The field surface was walked in advance of the topsoil stripping and a number of small flints were retrieved which had signs of human preparation. Some of these were waste flints, struck during the manufacture of flake or core

implements, but others were scrapers or knives. The presence of quantities of waste material (known as "debitage") indicates that a community was operating in the vicinity. During machining further flints were found on the site but no evidence of ditches or pits could be seen (Pl.21). The artefacts have been provisionally dated to the Mesolithic period (8000-3500BC) and the survival of any traces of habitation or activity would have been of particular importance.

Another mesolithic flint has recently been reported from near Scothern Heath Farm, 0.9km to the east of this site. This find (SMR 50643) and the scatter on the pipeline may indicate a Mesolithic community in this vicinity.

Fields 17-19

The pipeline left agricultural land at the north end of Field 16 and was routed along roadside verges to the outskirts of Welton. This stretch was not cleared of topsoil in advance of the mechanical excavation of the pipe trench. No finds were recorded from this operation or from the topsoil strip of Field 19.

Field 20

This field was under pasture when the topsoil removal occurred. The topsoil was particularly shallow apart from places at the hedge base where a depth of leaf-litter had accumulated. Below the topsoil the subsoil had been disturbed and, in places, redeposited. There was a small quantity of 20th century debris incorporated into the clay subsoil, including glazed sewer pipe fragments. This disturbance is probably associated with the construction and demolition of a number of buildings on the NE part of the field (OS 1956 1:10560; TF 07NW). The farmer said that there had been an airstrip in the field.

A single sherd of medieval pottery was found during the topsoil stripping; it was unglazed with a finger impression.

Field 21

The field boundary between Fields 20 and 21 marked an abrupt change in slope, falling away markedly for a horizontal distance of 20m before sloping down to the north more gradually. The subsoil was a crumbly yellow clay with patches of a thin alluvial deposit above (Pl.22). A small copper alloy ferrule (probably from a domestic implement) and part of an early clay-pipe stem were found on the clay. The alluvial deposit became thicker, much darker and continuous further down the slope towards the north (Pl.23). It had masked ridge and furrow remains which crossed the field from NW-SE; buff silty subsoil was exposed only on the ridge crests. The furrow widths were 3m and the ridge width 5m. Surviving depth of the furrow earthworks was 0.2m but the depth to the base of the actual furrow was not recorded.

The sequence suggested that the field had been cultivated during the medieval period but this had been interrupted by stream flooding episodes which had spread quantities of black silt over the field surface. Two test pits were dug by hand to check the nature of the underlying material (Pl.24). No buried land surface was revealed. There was no evidence for any prolonged later cultivation after the alluvium had been deposited but the field had been drained at later periods with short yellow ceramic pipes and more recent red pipes.

Field 22

The remains of the field boundary on the south side of this field survived as a slight depression in the pasture. The sequence of alluvium over yellow silt noted in Field 21 was present here and was examined by test pits dug either side of the present stream course.

Field 23

A Romano-British and two early medieval pot sherds were found during fieldwalking and monitoring of the topsoil removal. The Roman material had probably been moved through plough action from the dense find scatter found by the landowner Mr. L.R. Dodsworth on the west side of the same field (SMR KI (OS map TF07NW)). This concentration, in a field called Tinker's Piece, is associated with the outline of a large rectangular building noted from the air (Dodsworth, pers. comm.). Another scatter over a wide area north of here in fields flanking Cliff Road was reported in 1968 (Whitwell 1969, 107).

The later sherds were Saxon and may reflect spread of occupation material from dwellings associated with the Anglo-saxon cemetery located slightly to the east in the NW corner of The Paddock, Cliff Lane in 1971 (Moore 1971; SMR 50590). A small test pit was dug in this field and located yellow clay subsoil with no buried land surface. Close inspection of the subsoil surface within the easement failed to locate any suggestion of further graves or disturbed human remains; this restricts the possible western extent of the cemetery. Thirteen human skeletons, possibly Roman, were found in 1963 behind council houses in Norbeck Lane just to the east of the Saxon burials site; an unknown number of others were found in Cliff Lane when a gas pipe was laid (Moore 1971). Remains of crofts and house sites of the shrunken medieval village of Welton were found on the same site (Moore 1971).

Field 24

Finds from this field included 2 worked flints, a fragment of Roman tile and 2 pot sherds dated as early medieval.

Field 25

Fieldwalking of the cultivated surface took place in November 1992 when a worked flint and a small number of 4th century Romano-British sherds were found. Topsoil stripping produced a similar number of finds, including a rim fragment of a 2nd century Samian ware Roman vessel imported from eastern Gaul and part of a box-tile from a hypocaust heating system. There were no signs of pits, ditches or other settlement features on the easement and it is thought that this material may come from a nearby site (Petch 1958, 101). The hypocaust tile and Samian sherd indicate a moderately high status site such as a small villa, and one possibility is that Welton's medieval ecclesiastical importance with 5 prebendal manors continued an earlier cluster of Roman estates.

Field 26

The pipeline route only passed through the corner of this field and no finds were made.

Field 27

The easement followed the southern headland of this field, then followed the roadside verge north. Both parts were recorded as Field 27. Within the field a particularly moist spot had been crossed by several land drain runs of post-medieval and modern date. Further disturbance had apparently been caused by the adjacent development which is considerably higher than the field surface. A shell-tempered rim sherd and a possible flint artefact were the only finds recovered which might indicate the date of the cropmark complex to the NE.

A defaced 1862 Napoleon III 10 centimes coin was found close to Prebend Lane but the circumstances of its loss cannot be explained.

Field 28

The pipeline was laid along the roadside verge outside this field and it was only possible to inspect the pipe trench. No archaeological remains were found.

Field 29

This field was cultivated in May 1993 and fieldwalked immediately afterwards. A small number of Roman greyware pot-sherds were found, as anticipated because of the known site immediately to the north (SMR ref.C (OS map TF08SW)). Further finds were recovered from the stripped surface and a small excavation team investigated part of the easement. A single N-S linear feature that appeared to correspond with a cropmark visible on air photographs (Lin.Mus. photos 9/2, 10/1, 10/2; CUC AFP31, AGC64-65) was identified and was found to be a modern land drain.

The landowner agreed to a request from LAS that the field surface to the north of the easement be walked while it remained as "set-aside". A rapid extensive check found a late 2nd-3rd century Romano-British pottery scatter which was restricted to an area of darker soil near the centre of the field, but with lesser concentrations elsewhere. Virtually no pottery was found close to the easement, confirming that the pipeline passed some distance from major features.

Field 30

One possibly worked flint and a small number of medieval sherds were found in this field. The ground drops away from Field 29 towards the east, becoming clayier, and Romano-British settlement activity appears to have centred on the higher limestone to the NW.

Field 31

No finds were made in this field.

Field 32

Four sherds of Romano-British pottery and a fragment of roof tile were found in this field which sloped upwards towards Hackthorn Road. Cropmarks of an archaeological site are known in the field to the east of the road and a continuation of the site onto this part of the easement was anticipated. The finds were not associated with any visible ground features and are interpreted as spread of material from the nearby cropmark complex.

Fields 33 and 34

Air photographs show two enclosures in the field immediately to the south of the Pumping Station but archaeological observation of an earlier pipeline found no material to date the feature (Field 1991a); a Romano-British enclosure was examined in a field to the NE when another pipeline was monitored by LAS in 1991 (Field 1991b). A neolithic stone axe has been reported from Hackthorn Road (SMR K (OS map TF08SW)).

The pipeline route passed from agricultural land at the east side of Field 32 and continued below the carriageway of Hackthorn Road before crossing into the Sewage Treatment Works. The road foundation was constructed on the subsoil; in places this lies less than 0.2m above bedrock, but the limestone is very thin and discontinuous and often the subsoil lies immediately above undisturbed clay. The thin subsoil layer was inspected but no finds were made.

Discussion

The initial assessment of the archaeological implications of this pipeline was prepared rapidly immediately before the contractor's fieldwork was expected to begin. There was no opportunity at that stage for the route to be geophysically prospected or trial trenched and this restricted the reliability of the assessment. In retrospect the anticipated threat to the local archaeology did not occur and a lesser archaeological input could have been recommended if fieldwork had been arranged at the planning stage of this pipeline. A succession of delays with the programme of works for this project caused high levels of inconvenience and negated initial timetabling of archaeological work that had been carefully phased to cause negligible delay to the Contractor's groundworks. Subsequent work, without a revised programme, required frequent abortive site visits or inconclusive liaison with the Contractor. These prevented benefit being gained from the reduced level of archaeological excavation, as monitoring works expected to finish in late February 1993 continued into June; an excavation timetabled for mid December was not possible until early June.

The original research indicated possible archaeological sites where the pipeline easement passed close to known findspots or air photograph cropmark sites. Finds of the appropriate periods were found on all of these indicated locations but in most instances no signs of associated features were observed. The 'casual' finds of worked flints and pottery had become disturbed from their original contexts beyond the easement by soil movement, land drainage and plough action but confirmed the presence of a nearby site and enabled a provisional date to be assigned to cropmark features. This is particularly useful when there has been no previous opportunity to define the extent of a site or examine finds other than metalwork reported by metal-detector users.

Roman pottery, mostly worn and badly damaged by plough action, was found in a thin scatter along much of the route. This, in part, reflects the ease with which this material can be recognized and its durability in the soil. No unexpected occupation areas were located on the easement but the density of small, rural Romano-British settlements in the vicinity must be even greater than the distribution of known sites suggests. The data from this pipeline will assist in the planning of future development by indicating the relative density of unstratified Romano-British finds.

No medieval sites were disturbed by this pipeline; the large quantities of pottery sherds reflects the prevalence of medieval manuring practices on easily accessible land in all the parishes studied.

The pottery fragments offer information about the source site, including the date range of activity, the economic standing, the trade network and degree of survival of remains. Large sherds have been raised into the ploughsoil recently by destructive deeper ploughing techniques; small abraded fragments have been eroded by plough damage and weathering over many years. The proportion of large to abraded sherds can indicate whether a site remains substantially preserved but subject to a continuing threat or has succumbed to past agricultural activity and may have been effectively lost.

The impact of introduced waste material including pottery onto a field surface in the past is known generally to have been considerable. Numerous sherds of medieval pottery can be recovered from the surface of most fields where no documentary evidence for nearby settlement exists. Excavation will frequently locate 13th century and later material in ploughsoil where no traces of soil-cut pits or ditches can be found. To a small extent the discarded crockery of careless medieval farm labourers can be blamed - but an extraordinary number of vessels (some most unsuitable for field use) must have been irreparably damaged during midday pauses if the quantities of sherds are to be explained in this way. Much of the pottery was imported, broken, onto the arable land in cartloads of domestic and farmyard waste spread as fertilizer. This process continued on a larger scale throughout the post-medieval period until designated landfill areas were used. It is not known whether large quantities of domestic refuse were carted and spread before the medieval period although it must have occurred. Less intensive occupation of the countryside would have allowed smaller volumes of waste to be discarded closer to habitation without creating intolerable conditions and extensive distribution may have been unnecessary. The Romano-British pottery scatter in Fields 1-3 is the only example from the route where a contemporary settlement site is not known or anticipated close to the easement, and here refuse disposal from the city may be the explanation.

The quality of flint tools and preparation waste from the project was generally poor and reflects the absence of a local supply of high quality flint. It was typical of material found elsewhere on the limestone, such as the A15 but this contrasted vividly with the flints from the Stenigot - Bully Hills Pipeline project in the Lincolnshire Wolds where high numbers of well-executed flints were recovered in prime quality natural material (Field 1992).

Acknowledgements

Considerable co-operation and interest in this archaeological project was forthcoming from Anglian Water personnel involved with the Welton to Lincoln Trunkmain, especially Phil Moon and John Lamond. Barry Maynard and the staff of the contractors, Stamford Construction, ensured that the watching brief could be conducted safely and with useful results.

Lincolnshire County Council's Archaeology Section provided considerable information and assistance while this project was in progress, as did the staff of the Lincolnshire Archives Office and the Library Local Collection.

Pottery and other finds were processed, examined and identified by staff at the City of Lincoln Archaeology Unit, including M. Darling, B. Davies, J. Mann and J. Young. A. Vince provided a report on the limestone concretion from Field 3. A specialist's report on the flints was provided by Dr A. Myers on behalf of ARCUS.

All the landowners encountered in the course of this project were helpful and contributed useful suggestions; Mr. Dodsworth (Vicarage Farm, Welton) described archaeological discoveries on his land and C. Ottewell, Manor Farm (Welton) permitted a rapid fieldwalking exercise beyond the pipeline easement.

The watching brief was conducted with close liaison with the archaeological excavations directed by C. Palmer-Brown for LAS. I should like to thank Naomi Field for her comments on and contributions to the text of this report and Jane Frost for her help with its production.

Geoff Tann
Lindsey Archaeological Services
20th January 1994

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WELTON - LINCOLN WATER PIPELINE 1992-93
FIELDWALKING COLLECTION: CATALOGUE.

Bag 3A 9895 7405

broken core fragment: patinated brown translucent flint with nodular skin.

Bag 3B 9895 7405

i) complete scraper: patinated translucent flint with nodular cortex. 37 x 38.

ii) broken tertiary flake: opaque mottled grey flint.

Bag 3D 9850 7401

complete tertiary flake: heavily patinated flint. 19 x 21mm.

Bag 4A 9929 7435

broken tertiary flake: slightly patinated brown translucent flint.

Bag 9A 9960 7495

lump: patinated brown translucent flint with nodular cortex.

Bag 9E 9967 7508

complete primary flake with possible abrupt retouch on part of left-hand margin: brown translucent flint with rough cortex. 32 x 32mm.

Bag 11C 9988 7558

broken tertiary flake: patinated translucent brown flint.

Bag 11F 9985 7554

complete scraper: black/grey translucent flint. 31 x 37mm.

Bag 13B 0010 7634

complete discoidal flake core: brown/toffee flint.

Bag 15A 0024 7710

i) complete scraper: patinated brown translucent flint. 34 x 36mm.

ii) complete scraper: patinated translucent flint with thin cortex. 23 x 30mm.

iii) complete tertiary flake: translucent brown/grey flint. 12 x 16.

Bag 15B 0022 7700

i) complete secondary flake: patinated flint. 25 x 23mm.

ii) broken tertiary flake: patinated brown translucent flint.

iii) broken core fragment: patinated flint.

Bag 15C 0021 7693

i) complete side scraper - simple abrupt retouch: patinated translucent flint with nodular cortex. 13 x 18mm.

ii) broken tertiary flake - burnt: crazed flint.

Bag 16A 0037 7752

i) broken tertiary blade: heavily patinated brown translucent flint.

ii) complete tertiary blade: opaque mottled grey/white flint. 38 x 17mm.

iii) broken secondary blade: heavily patinated flint.

iv) broken tertiary flake: heavily patinated brown translucent flint.

v) lump- burnt: flint.

Bag 16B 0037 7754

i) broken tertiary flake: heavily patinated translucent flint.

ii) broken tertiary flake: heavily patinated flint.

Bag 16C 0038 7755

i) complete tertiary flake: heavily patinated flint with black speckling. 27 x 18mm.

ii) complete scalene microlith: heavily patinated flint. 19.5 x 7mm.

iii) complete tertiary flake: heavily patinated flint. 13 x 7mm.

iv) chip: heavily patinated flint.

v) complete secondary blade with some edge damage (post-depositional?): slightly patinated flint with nodular cortex. 37 x 14mm.

Bag 16E 0037 7753

i) complete tertiary flake: opaque mottled grey flint. 12 x 19mm.

ii) broken tertiary blade: patinated opaque white flint.

iii) broken retouched tool fragment - possibly the barb from a petit-tranquet derivative arrowhead: patinated flint.

iv) broken tertiary flake: opaque mottled grey flint.

v) complete single platform blade core: patinated brown translucent flint.

Bag 24C TF0053 8010

i) complete 2 platform core with platform s at right angles: light brown translucent flint - cortex with iron staining.

ii) complete plunging blade with possible retouched notch on left-hand side: slightly patinated semi-translucent flint with very sharp cortex. 32 x 15mm.

Bag 25B 0049 8025

complete secondary flake: slightly patinated translucent flint with nodular cortex. 25 x 14mm.

Bag 25D TF 0052 8018

complete secondary flake with possible retouch: translucent brown flint. 19 x 24.

Bag 27C TF 0062 8043

lump: semi-translucent mottled brown flint.

Bag 29C TF 0075 8075

i) complete secondary flake with retouched notch on left-hand margin: part-patinated brown translucent flint with rough cortex. 46 x 23mm.

ii) broken tertiary flake with possible irregular abrupt retouch: brown translucent flint.

iii) complete secondary flake: brown translucent flint with rough cortex. 14.5 x 16mm.

iv) broken core fragment: brown translucent flint.

v) complete secondary flake: brown translucent flint. 11 x 11mm.

Bag 29E TF 0070 8084

i) complete ridge flake with simple retouch at tip: mottled patination of brown translucent flint.

ii) complete 2 platform core - platforms at right-angles: slightly patinated brown translucent flint with nodular cortex.

iii) broken single platform core: burnt and crazed brown translucent flint with nodular sharp cortex.

Bag 29D TF0075 8075

broken secondary flake: slightly patinated brown translucent flint.

Bag 30A TF 0090 8082

complete secondary flake: patinated flint. 17 x 14mm.

WLP92: WELTON TO LINCOLN PIPELINE

FINDS SUMMARY

Less than four dozen finds (excluding pottery) were recovered, and only three of these were registered during the archiving process. Most of the material is composed of flint fragments (see below), and the only datable items are post-medieval or modern. A mid-17th century clay tobacco pipe bowl was recovered from 11D, although other finds from this area include a modern iron hinge <2> and sherds of late earthenware pottery. A piece of (window?) glass from 7A is probably 18th- or 19th-century (sherds of late earthenware pottery again found in this area), and the only find from 11E is part of a mid-19th century decorated clay tobacco pipe bowl. A piece of copper alloy sheet <3> from 11G is almost certainly modern, while a globular glass bead <1> from 9E could be of virtually any date from Roman to post-medieval/modern.

J.E.M.
20/08/93

APPENDIX 1
Summary of SMR Entries

OS Sheet SK 97NE

SMR code	NGR	Description
I	982 753	Deserted medieval village site of Riseholme
O (50561)	991 753	Romano-British pottery; ?villa site or settlement
P "	9920 7525	Romano-British pottery scatter, virtually all 4thC AD.
AF "	992 752	R-B pottery and tile along 100 yds (c. 91m) of stream
AC	999 752	Bronze Age flint arrowhead, 1975
50359	9940 7625	Cropmarks of triple linear boundary ditch system (1979)
50360	9960 7770	Cropmarks of linear boundary (1980)
50361	9982 7554	Cropmarks of triple linear boundary ditch system, (1977,1979)

Sheet 97SE

C	973 741	Cropmark of double circle seen from air 1930 by OGS Crawford (OS Rec.)
D (50461)	9873 7396	Circular cropmark, T. Hayes 1959
E	9937 7456	Roman coin, Vespasian c.475AD, found during ploughing 1964
F	9915 7390	Cropmark of part of a square enclosure (OS Rec.)
R	993 747	R-B pottery scatter, 4thC, also 4 Roman coins 1967
AP	9922 7402	Earthwork remains of a stone bank 5'10" (1.8m) wide, which spanned stream at the Roaring Meg. Bank made of roughly squared stone and brick. In the field to the NW much R-B brick and tile and a little whitish concrete; in the field to the S a marked bank aligned on Roaring Meg. Roman aqueduct conduit head?
AR	972 739	Roman coin, Commodius, found 1961
BA	9822 7416	Early Bronze Age flint scraper found S of Riseholme Hall 1973
BM(50462)	9890 7396	Cropmark of circular shape seen from air, T.Hayes 1959
BP1(50460)	9877 7492	Cropmark of ringditch
BP2 "	9878 7497	Cropmark of ringditch
BS	977 73?	Roman coin, Claudius 42-54AD, in garden of 93 Laughton Way
BX	974 742	R-B and medieval pottery scatter 1977
BY	978 741	R-B and medieval pottery scatter 1977
50464	9965 7469	Cropmark of ring-ditch
50574		Roman road, Ermine St. (Margary 2D)
50584	9755 7409	?Roman cemetery, Lincoln Relief Road, found 1984

Sheet TF 07NW

AI(50590) 0077 7980 Anglo-Saxon inhumation cemetery,
excavated by C.N. Moore 1971
AJ 001 753 Late Neolithic/Early Bronze Age flint
arrowhead, 1974
K 006 794 R-B site, 4thC pottery, found after
deep ploughing in 1957
KI 005 796 R-B pottery scatter, reported by L.R.
Dodsworth
50504 0090 7955 Medieval earthworks of fishponds
50643 0140 7750 Mesolithic blade, found 1993
50644 0120 7750 Flint 'perforator' found 1993
- - - Roman coin, Constantine I c.326AD, in
garden of 14 Sudbeck Road, Welton,
1982
- - 0079 7860 Stone axe, E of Dunholme Lodge

Sheet TF 08SW

B 00 81 Cropmark of circular and forked
features, 1951
C 00 80 Cropmark of rectangular feature, 1959
K 0134 8066 Stone axe, 1960

Appendix 2

Aerial Photographs held at Cambridge University Collection
of Aerial Photographs (CUCAP) and the Royal Commission on the
Historical Monuments of England (RCHM) National Air
Photographic Library, Swindon.

SK999 754 (Nettleham) Field 11 RCHM ref. 2972/30
RCHM ref. 2990/10,11
TF006 806 (Welton) Field 27 CUCAP ref. AFP 31
TF007 809 (Welton) Field 29 CUCAP ref. AFP 31
CUCAP ref. AGC 64,65
TF015 800 (Welton) Field 32 RCHM ref. 2959/14
RCHM ref. 2965/0

Appendix 3
Finds from the Watching Brief

Field NGR Description (pot = sherd; R or Rom = Roman;
 med = medieval)

R/med
 54925
 54926

1A 9803 7402 med pot x 5, mostly local undated wares

1B 9770 7404 ?Rom tile x 2; Rom pot x 3; med pot x 9

1C 9787 7404 ?Rom tile x 2; med pot x 12

1D 9778 7404 ?Rom tile x 5; Rom pot x 5; med pot x 2

1E 9763 7404 ?Rom tile x 3; med pot x 9

2A 9802 7401 Rom pot x 3; med pot x 3

2B 9853 7401 med pot x 2

2C 9845 7401 Rom pot x 3; Saxo-Norman pot x 1; med
 pot x 11, incl. 1 x Toynton kiln ware

R/med
 54927
 54928

2D 9838 7402 ?R tile x 7; Rom pot x 8 (mid - late 2nd
 century; 6 very worn; incl. samian sherd;
 2 x 9th-early 11thC Lincoln kiln ware
 pot; med pot x 19, incl. Potterhanworth
 and Toynton wares

2E 9825 7402 ?Rom tile x 4; Rom pot x 5; med pot x 10;
 med tile with paw impression

2F 9816 7402 Rom pot x 3; 1 x shell-tempered ?late
 Saxon/ Saxo-Norman pot; med pot x 10,
 mostly local but 1 Beverley ware

2G 9948 7401 ?Rom tile x 3; Rom pot x 3 (2nd century);
 2 x very abraded 9th-early 11thC Lincoln
 kiln pot; med pot x 13; post med pot x 7

54930

54929
 54932-Ro
 54933-Med- 54934-PM

3B 9899 7405 2 struck flints, ?knapping waste; Rom
 pot x 4; med pot x 6, incl. Toynton
 ware; 2x post-med pot

54931
 54935

3C 9865 7401 Rom pot x 1; med pot x 5, incl.
 Nottingham ware

3D 9850 7401 post med gunflint

54933 3E 9910 7401 med pot x 3, very abraded

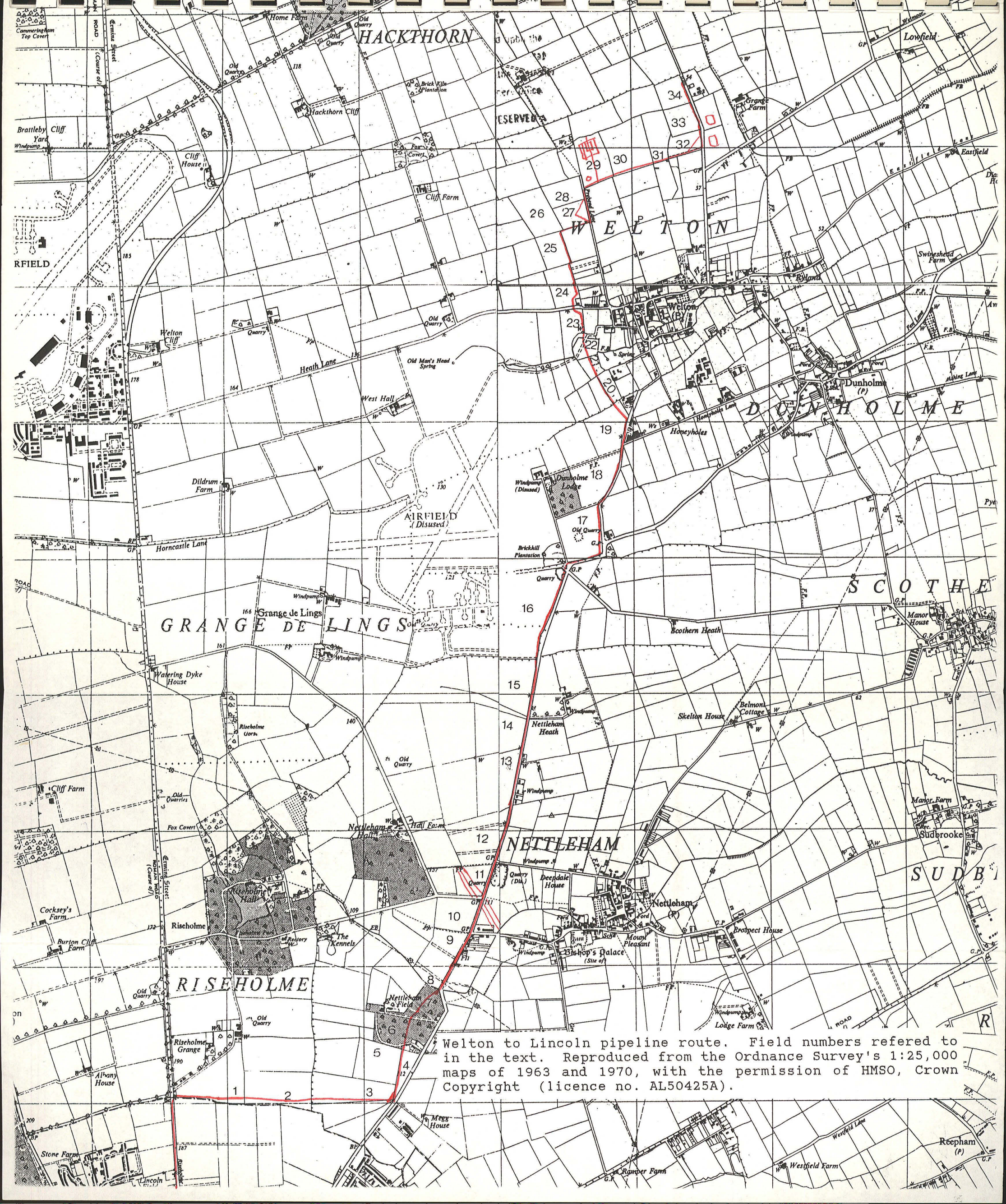
54932 3F 9895 7400 ?Rom tile x 1; Rom pot x 1

4A 9929 7435 flint; med pot x 1

	4B 9925 7431	?Rom tile x 1; post-med pot x 1
54936	- 6A 9932 7452	Rom pot x 1
54932	7A 9950 7470	?Rom pot x 2; med pot x 1; 18-19thC window glass frag.; post-med pot x 12
	7B 9830 7470	1888 penny
	7C 9936 7466	post-med pot x 2
	8A 9951 7486	post-med pot x 1
54938	- 9A 9960 7495	flint core x 1
54939	- 9B 9957 7492	Rom pot x 2; med pot x 2; 1 post-med pot
54940	- 9C 9959 7495	?IA pot x 2
	9D 9957 7490	med pot x 2
54941	- 9E 9967 7508	flint x 1; fragments of fired clay with no remaining surfaces (10g total): initially identified on site as possible prehistoric pottery but now thought to be possible mould or crucible fragments; part globular glass bead, not datable ?Rom - modern
54942		
	10A 9980 7535	post-med pot x 2
54943	10B 9980 7547	med pot x 3
54944	11A 9990 7568	Rom pot x 2 (late 2nd century?); post-med pot x 2
54945	11B 9988 7561	Rom pot x 2; med pot x3; post-med pot x 7
	11C 9988 7558	flint x 1
54946	11D 9988 7555	Rom pot x 7 (4th century?); med pot x 1; post-med pot x 3; mid 17thC clay pipe bowl; modern iron hinge
54946	11E 9982 7553	Rom pot x 1; ?Rom tile x 3; med pot x 3; med tile x 1; part of mid 19thC decorated clay tobacco pipe bowl; post-med pot x 4
54946	11F 9985 7554	flint x 1; Rom pot x 3 (2-3rd century) inc. strainer base frag
54946	11G 9984 7554	Roman pot x 2; Cu alloy frag, probably modern

- 54947 12A 0000 7592 Rom pot x 3; med pot x 1; med tile x 3;
post med pot x 2
- 54948 12B 0000 7590 Late 9th-11thC Lincoln kiln type pot x 1
- 54947 12C 9998 7589 ?Rom tile x 2
- 54949 [13A 0007 7620 Rom pot x 2
13B 0010 7634 flint x 1; Rom pot x 3
13C 0012 7645 Rom pot x 4; med pot x 2; post-med pot x3
- 54950 14A 0015 7664 Late Saxon and 9th-11thC Lincoln kiln
type pot x 2
- 54951 -14B 0016 7673 Rom pot x 2; post-med pot x 1
14C 0017 7678 med pot x 1
- 54952 [15A 0024 7710 flint x 3; Rom pot x 2; ?med tile x 2
54953 [15B 0022 7700 flint x 3; ?med tile x 1; post med pot x1
54954 [15C 0021 7693 flint x 2; med pot x 3; post med pot x 1
- 54955 [16A 0037 7752 flint x 6
54956 [16B 0037 7754 flint x 2; Rom pot x 2 (2nd century)
16C 0038 7755 flint x 3
16D 0038 7755 Rom pot x 3 (2nd century); med pot x 1
16E 0037 7753 flint x 4 (inc core); clay pipe bowl
- 20A 0079 7925 med pot x 1, ?Toynton ware
- 21A 0070 7950 clay pipe x 1; cu alloy frag x 1
- 23A 0048 7980 med pot x 1
- 5203 23B 0064 7973 Early medieval shell-tempered ?Maxey
8-9thC pot x 1; Lincoln kiln type ware
9-11thC pot x 1
- 24A 0055 8000 ?Rom tile x 1; Rom pot x 2; ?med floor
tile x 2; med pot x 13; pm pot x 1
- 54958 [24B 0055 7990 med pot x 5; post-med pot x 1
54959 [24C 0053 8010 ?flint x 2; med pot x 5; post-med pot x1;
54960 [cu alloy obj x 1 (modern)

- 54961 25A 0050 8020 ?flint x 1; Rom tile x 2;
med pot sherd with face mask of female;
post-med pot x 1
- 25B 0049 8025 flint
- 54961 25C 0048 8034 Rom pot x 3 (?4th century), incl. samian
sherd; med pot x3; post-med pot x 1
- 54962 25D 0052 8018 flint x 1; med pot x 3; post-med pot x 1
- 27A 0060 8045 med pot x 1
- 27B 0067 8048 1862 French coin
- 54963 - 27C 0062 8043 ?flint x 1; ?IA pot x 1; med pot x 2
- 54964
54967
54967 29A 0083 8080 Rom pot x 2; med pot x 4; post-med pot x1
- 29B 0068 8072 ?R tile x 1; med pot x 1; med tile x 2;
post-med pot x 3; clay pipe x 2
- 54965 -
54966
54967
54968 29C 0075 8075 flint x 2; ?flint x 3; ?IA pot x 4;
Rom pot x 9 (2-3 century); ?R tile x 1;
early-mid Saxon pot x 1 (Charnwood kiln);
med pot x 5; post-med pot x 9; clay pipe x
2; glass x 1; Fe nail x 3; post-med tile x
7 (some topsoil removed by hand)
- 29D 0075 8075 post-med pot x 1 (excavated land drain)
- 52214
54969
54970 29E 0070 8084 flint x 4; Rom pot x 50 (late 2nd-3rd
century); ?Rom tile x 1; Saxon sandstone-
tempered pot x 1; med pot x 1;
post-med pot x 1; fe obj x 2
(These finds were collected during rapid
fieldwalking of a small part of the field
to north of easement)
- 30A 0090 8082 ?flint
- 30B 0110 8090 med pot x 1; med tile x 1
- 54971 32A 0145 8102 ?Rom tile x 1; Rom pot x 3; med pot x 1
- 32B 0140 8098 med pot x 1
- 54972 32C 0130 8090 Rom pot x 3 (2nd century)



Welton to Lincoln pipeline route. Field numbers referred to in the text. Reproduced from the Ordnance Survey's 1:25,000 maps of 1963 and 1970, with the permission of HMSO, Crown Copyright (licence no. AL50425A).



Pl.1 Field 1 Topsoil removal beside A46 Relief Road

Pl.2 Field 3 Limestone concretion from former spring





Pl.3 Field 3 Detail of limestone concretion

Pl.4 Field 3 North edge of limestone concretion





Pl.5 Field 3 Backfilled possible bore-hole

Pl.6 Field 6 Slight north-south ridge and furrow; looking south





Pl.7 Field 7 West-east ridge and furrow, with former parkland, at top of field; looking south

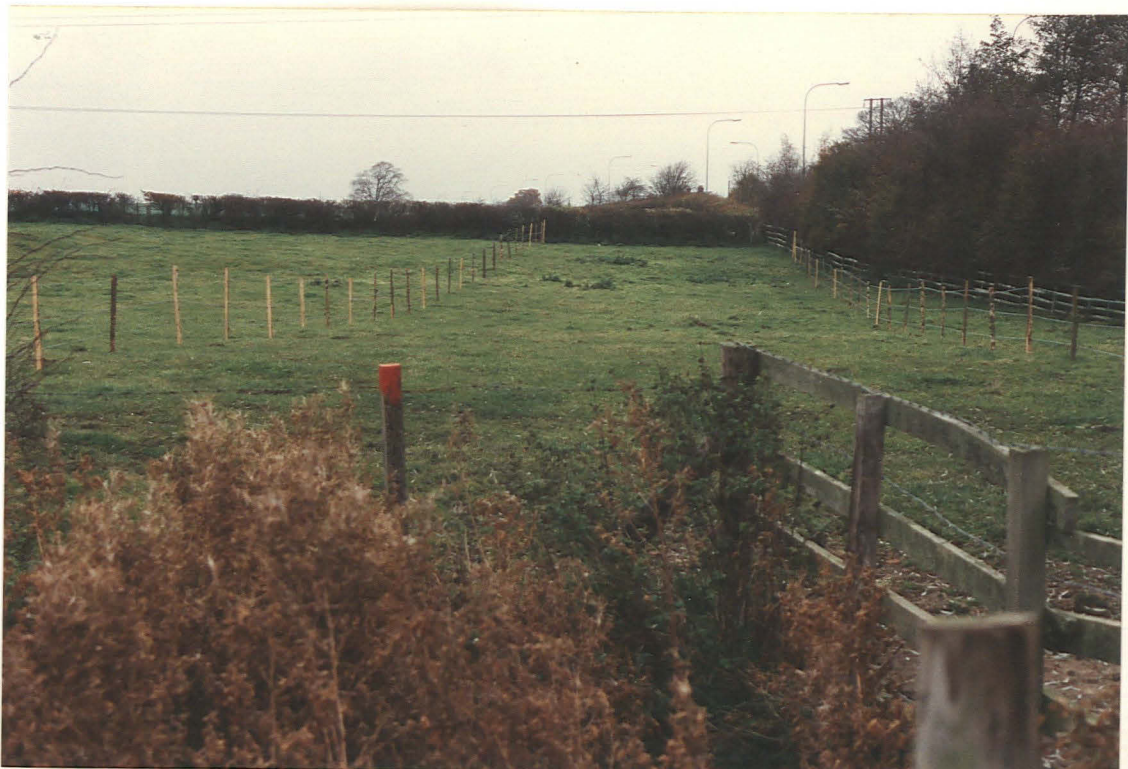
Pl.8 Field 7 North-south ridge and furrow down slope to beck; looking SE





Pl.9 Nettleham Fields Romano-British site, viewed from Field 7; looking NW

Pl.10 Field 8 Nettleham Beck and ridge crossing easement; looking north





Pl.11 Field 8 Pipeline easement and adjacent ridge; looking north-west

Pl.12 Field 8 Pipeline easement and adjacent mound; looking north-west





Pl.13 Fields 7-9 Mound and ridge to north of Nettleham Beck;
looking north

Pl.14 Field 11 Air photograph of triple linear ditch
cropmark (Paul Everson, 31.7.1977)





Pl.15 Field 11 Location of triple linear ditch and slope;
looking west

Pl.16 Field 11 Natural depression used by triple linear
ditch system; looking SW





Pl.17 Field 11 Pipeline easement across triple linear ditch;
looking north-east

Pl.18 Field 11 Hillwash deposit masking ditch fills





Pl.19 Field 11 Trenching across the prehistoric ditch system

Pl.20 Field 11 Position of Romano-British pottery scatter on Nettleham Road headland; looking south





Pl.21 Field 16 Site producing mesolithic microliths

Pl.22 Field 21 Mixed subsoil below turf; looking north





Pl.23 Field 21 Position of peat-filled channel

Pl.24 Field 21 Test pit through river alluvium and peat to limestone brash

