

**HATTON  
TO SILK WILLOUGHBY  
1050mm GAS PIPELINE**

**ARCHAEOLOGICAL  
EVALUATION  
& WATCHING BRIEF  
AT CAR DYKE (SAM 314)**

Prepared by  
**NETWORK ARCHAEOLOGY Ltd**

For  
**ENGLISH HERITAGE**

on behalf of  
**TRANSCO**

**network**  
ARCHAEOLOGY LTD



Event L12745  
Lincolnshire L12220 1  
Archaeology Council

Source L17414  
L17415

negative

99/19.

14. Oct 99

99 10 14

**HATTON  
TO SILK WILLOUGHBY  
1050mm GAS PIPELINE**

**ARCHAEOLOGICAL  
EVALUATION  
& WATCHING BRIEF  
AT CAR DYKE (SAM 314)**

Report No. 133  
September 1999

Lincolnshire County Council  
Archaeology Section  
0 4. OCT 99  
ack 4/10/99



## CONTENTS

### *List of Figures*

### *List of Plates*

<b>1</b>	<b>SUMMARY</b>	<b>1</b>
1.1	General	1
1.2	Results	1
<b>2</b>	<b>INTRODUCTION</b>	<b>2</b>
2.1	Requirements of the Brief	2
2.2	Description of the Pipeline at Car Dyke	2
2.2.1	General	2
2.2.2	Topography and Geology	2
2.3	Archaeological Background	2
2.3.1	Magnetometer Survey	2
2.3.2	Fieldwalking and Field Reconnaissance Surveys	2
2.4	Objectives of the Field Evaluation & Watching Brief	3
<b>3</b>	<b>PIPELINE CONSTRUCTION</b>	<b>3</b>
3.1	Working Width	3
3.2	Machining	3
<b>4</b>	<b>ARCHAEOLOGICAL METHODOLOGY</b>	<b>4</b>
4.1	Evaluation Trenching	4
4.2	Permanent Presence Watching Brief	4
4.3	Field Records	4
<b>5</b>	<b>RESULTS</b>	<b>5</b>
5.1	Evaluation Trench	5
5.2	Watching Brief	5
<b>6</b>	<b>CONCLUSION</b>	<b>6</b>
<b>7</b>	<b>REPORT AND ARCHIVE DEPOSITION</b>	
<b>8</b>	<b>ACKNOWLEDGEMENTS</b>	<b>6</b>
<b>9</b>	<b>REFERENCES</b>	<b>6</b>
<b>10</b>	<b>APPENDIX 1: CONTEXT GAZETTEER</b>	<b>8</b>

### LIST OF FIGURES

Figure 1	Location map	2-3
Figure 2	Geophysical survey results and evaluation trench location plan	2-3
Figure 3	Plan of Car Dyke evaluation trench	5-6

### LIST OF PLATES

Plate 1	Evaluation trench to the north of Car Dyke
Plate 2	Construction of thrust pit to the north of Car Dyke



## 1 SUMMARY

### 1.1 General

This report presents the results of the archaeological evaluation and watching brief survey adjacent to the Scheduled Ancient Monument of Car Dyke (SAM 314) during the construction of the Transco *Hatton to Silk Willoughby* Gas Pipeline. The route is some 38km long and connects the existing Above Ground Installations (AGIs) at Hatton (TF 173762) and Silk Willoughby (TF 084436) in Lincolnshire. The route runs roughly north to south through the central part of the county, passing under Car Dyke to the north of the village of Martin (TF 123612).

Transco was granted Scheduled Monument Consent by the Department of National Heritage to bore the pipeline beneath this waterway (English Heritage Ref: HSD 9/2/2901). The Consent required that a geophysical survey be carried out either side of the monument where the pipeline groundworks were to take place.

Following the completion of geophysical, fieldwalking and field reconnaissance surveys, Network Archaeology Ltd was commissioned by Laing Engineering Ltd, on behalf of Transco and under the directive of English Heritage, to carry out further archaeological field work prior to and during pipeline construction. The objective was to locate and record any archaeological remains within the vicinity of the scheduled monument.

### 1.2 Results

A detailed geophysical survey was carried out on either side of the monument by GeoQuest Associates, on behalf of Laing Engineering Ltd, in October 1997 (GeoQuest Associates, 1997). No significant anomalies were recorded to the south of the monument but a number of possible ridge and furrow traces and several pit-like anomalies were detected to the north. This led to a recommendation that the area to the north of Car Dyke be subject to further investigation. This was to include the opening of an evaluation trench.

A programme of Non-Intrusive Field Survey was carried out by Network Archaeology Ltd in November 1997, consisting of fieldwalking and field-reconnaissance surveys (NAL, Dec. 1997). Visibility was poor with mature cereal crops to the north and permanent pasture to the south. No artefacts or earthworks were noted.

In February 1998 an evaluation trench measuring 30m long by 10m wide, was opened up to investigate the archaeological geophysical anomalies to the north-east of Car Dyke. This did not include the area of potential ridge and furrow. The pit-like anomalies were found to be tree and plant holes. Several post-medieval land drains were also identified.

The provision for a permanent presence watching brief was agreed with Laing Engineering Ltd, on behalf of Transco and under the directive of English Heritage, to monitor all further topsoil stripping operations and the excavation of the thrust and reception pits either side of the monument. No further archaeological remains were uncovered during these operations.



## 2 INTRODUCTION

### 2.1 Requirements of the Brief

All archaeological work was undertaken in accordance with Transco's general briefs for Field Evaluation, Watching Brief and Excavation (Transco, 1997). The subsequent fieldwork conformed to the Institute of Field Archaeologist's (IFA) *Code of Conduct* (1997), and the IFA's *Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology* (1997). The work was managed in accordance with the methods and practice described in the *Management of Archaeological Projects, second edition* (English Heritage, 1991).

### 2.2 Description of the Pipeline at Car Dyke

#### 2.2.1 General

The pipeline route is 38km long and connects the existing Above Ground Installations (AGIs) at Hatton (TF 173762) and Silk Willoughby (TF 084436) in Lincolnshire. The route runs roughly north to south through the central part of the county, crossing the Car Dyke Scheduled Ancient Monument to the north of the village of Martin (TF123612) (Figure 1).

#### 2.2.2 Topography and Geology

At the point where the pipeline route passes under the waterway, there is a distinct change in the surface geology and topography. Immediately to the north of the Car Dyke the land is low-lying at approximately 1m OD. Immediately to the south of Car Dyke the land rises sharply to about 10m OD. To the north marine and estuarine clays are overlain by patches of peat. Glacial till and chalky boulder clay deposits are present to the south.

### 2.3 Archaeological Background

Three stages of archaeological investigation were undertaken prior to the excavation of the evaluation trench to the north of Car Dyke:

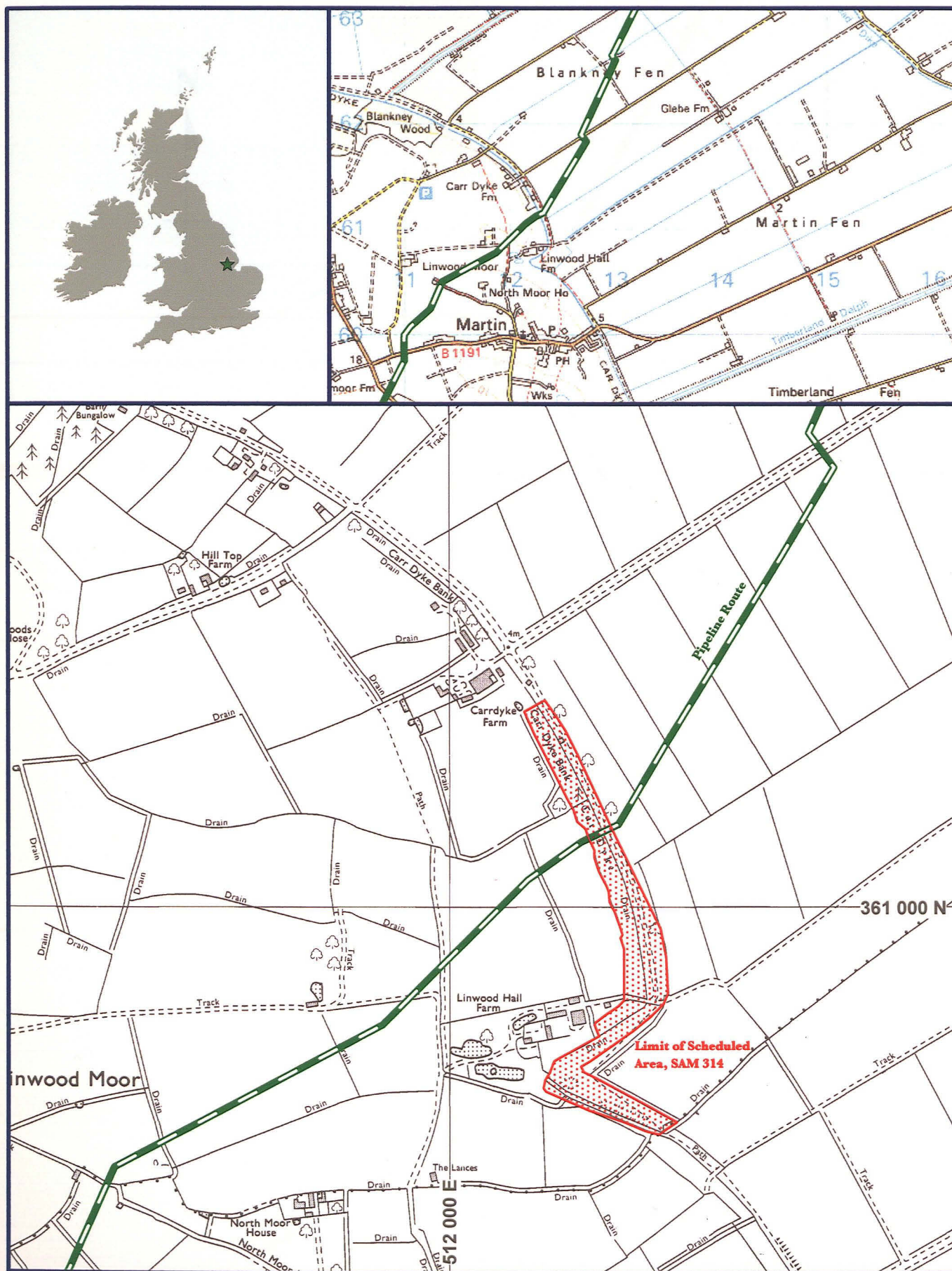
#### 2.3.1 Magnetometer Survey

A magnetometer survey was undertaken on the 28th October 1997 by Geoquest Associates, on behalf of Laing Engineering Ltd, using a Geoscan FM36 fluxgate gradiometer. The objective was to establish the nature and extent of any surviving archaeological features in the areas adjoining the watercourse. Area 1, on the north-east side, revealed evidence for possible former ridge and furrow cultivation, with a furrow spacing of approximately 5m (Figure 2). In addition to this, some small sub-circular anomalies were detected, these being interpreted as possible storage or refuse pits. No likely archaeological features were detected in Area 2, to the south-west of Car Dyke (Geoquest, 1997).

#### 2.3.2 Field Walking and Field Reconnaissance Surveys

Fieldwalking and field reconnaissance surveys were carried out by NAL in November 1997. These formed part of a larger fieldwalking survey covering the entire pipeline route. A team of five archaeologists walked at 10m spacings within the fields to either side of the waterway. A total of five traverses were made, one along the centre line and two either side, thus giving a 40m-wide survey area. The two fields adjacent to Car Dyke, field numbers 2630 and 3200,





Extracts from Ordnance Survey Landranger and 1:10 000 maps reproduced by permission of the Controller of HMSO. Crown copyright reserved NAL Licence AL 52256A

Scale 1:10 000

Figure 1: Location Map



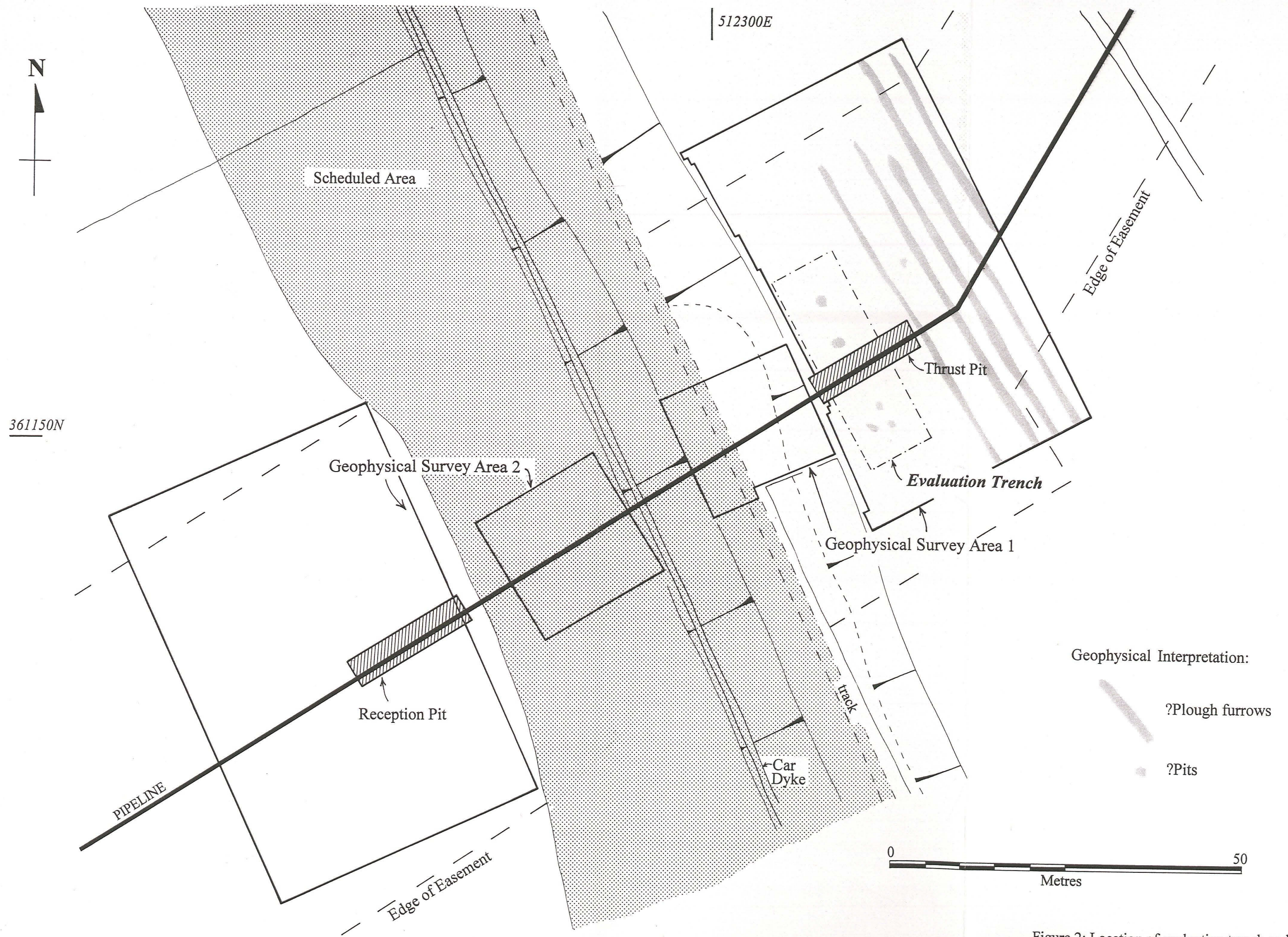


Figure 2: Location of evaluation trench and results of geophysical survey [scale 1:500]



were under cereal crop and pasture land respectively. No artefacts or earthworks were discovered (NAL, 1997).

## **2.4 Objectives of the Field Evaluation and Watching Brief**

The general objectives of the field evaluation at Car Dyke were:

- to gather sufficient information to establish the presence or absence, extent, condition, character, quality and date of any archaeological remains within the evaluation trench (The area of possible ridge and furrow detected further to the north east was not included within the trial trenching area);
- to assess the overall value and importance of any such remains;
- to assess the potential impact of the pipeline on any such remains;
- to provide information for the design of site-specific mitigatory measures.

The general objectives of the watching brief at Car Dyke were:

- to gather sufficient information to establish the presence or absence, extent, condition, character, quality and date of any archaeological remains;
- to locate, recover, identify, and conserve (as appropriate) any archaeological artefacts exposed during the pipeline's construction;
- to locate, sample, interpret and record any archaeological deposits exposed during the pipeline's construction;
- to recommend mitigatory measures for preservation *in situ* of any archaeological deposits (where feasible and desirable);

## **3 PIPELINE CONSTRUCTION**

### **3.1 Working Width**

The majority of the pipeline was constructed within a fenced easement, in general, thirty-six metres wide. The width of the easement, however, increased to *c.* 60m immediately either side of the Car Dyke to allow sufficient space for the excavation of a thrust pit to the north and a reception pit to the south of the dyke (Figure 2, Plate 1). This extra width ran for approximately 40m to the north of the scheduled area and 60m to the south.

### **3.2 Machining**

In general, topsoil was stripped from the working width of the easement in two operations. Initially, a third of the area was stripped by back-acting tracked excavators with smooth blades. The remaining two-thirds was then pushed aside by D6 and D8 bulldozers.

Trenching was carried out by back-acting excavators with toothed buckets. The average width of the pipe-trench was 3m wide at the surface, narrowing to 1.5m - 2m towards the base. On average, the pipe-trench was 2.1m - 2.5m deep.

The thrust pit to the north of the dyke and the reception pit to the south measured approximately 16m long by 4m wide and 18m long by 4m wide respectively (Figure 2). The thrust pit reached a maximum depth of 5m below ground surface whilst the reception pit reached a maximum of 10m below the ground surface. Segments of pipe totaling approximately 60m in length were pushed between the two pits, passing a minimum of 1.50m beneath the deepest section of the watercourse.

## **4 ARCHAEOLOGICAL METHODOLOGY**

### **4.1 Evaluation Trenching**

- The trench was accurately surveyed-in and clearly marked-out before digging commenced.
- Topsoil removal was by a 360 degree tracked excavator fitted with a 1.8m wide, toothless ditching blade.
- All machine work was supervised by a suitably qualified archaeologist.
- The machine removed the topsoil down to the surface of the alluvial drift deposits.
- Sufficient of each potential archaeological deposit was hand-excavated (in a controlled and stratigraphic manner) to ascertain its nature.

### **4.2 Permanent Presence Watching Brief**

- A suitably qualified archaeologist was present throughout all the earth-moving construction phases.

### **4.3 Field Records**

- The evaluation trench was referenced with the project code, construction plot number and trench number. Thus, the unique reference for the trench was: HWP 98 / 68 / 01.
- The evaluation work was allotted a block of three-digit context numbers, 900 - 999, for recording purposes.
- A system of *pro-forma* record sheets with appropriate fields was used for on-site recording. The system has been developed by Network Archaeology and is in a format that would be acceptable to the IFA.
- A written record was made of all archaeological and geological/pedological deposits within the trenches.



- A full drawn record was made of all archaeological deposits and included:  
An OS base plan (1:500 scale) showing the location of the trench;  
A trench plan (at 1:100 scale) showing all archaeological and natural deposits;  
Section drawings (at 1:20 scale) of all significant excavated features.
- Multi-context recording was used.
- Detailed records (drawn and written) were kept of the depth below ground level of archaeological and geological/pedological deposits across each site under investigation.
- A full and proper photographic record (35mm format) in colour was taken of all archaeological deposits. This included overall shots of the area, work in progress, overall trench shots and detailed feature shots. A suitable scale, context number and north arrow (if appropriate) appeared in each photograph.

## 5 RESULTS

### 5.1 Evaluation Trench

A 10m by 30m trench was opened up over the location of several pit-like anomalies which had been identified during the geophysical survey (Figure 2, Plate 2).

The trench revealed two pairs of parallel land drains (Figure 3). One pair, [902] and [908], ran at an angle across the trench in a WNW-ESE direction. Drain [908] had a steep-sided cut and contained a ceramic land drain. Drain [902] was unexcavated but fragments of ceramic drain were seen in the fill. No dating evidence was recovered but this type of drain is typical of the Post-Medieval to Modern period.

The other two land drains, [904] and [906], ran at a slightly different alignment to [902] and [908], running roughly NNW-SSE. Drain [904] cut drain [902] and is therefore a later feature. The relationship between [906] and the other features remains undetermined. Neither [904] nor [906] were excavated and thus their form is unknown. However, the large quantity of flint and limestone gravel visible within the fill of the features suggests that they were both gravel-filled drains.

Five further features, [910], [915], [917], [919] and [921], were investigated but have been interpreted as tree/plant holes. All were between 0.13m and 0.53m deep and had indistinct, irregular edges (See Appendix 1 for full details). One of these, [910], was cut by land drain [908] and therefore pre-dates that sequence of drains. The other tree/plant holes were isolated features containing no datable material and as such their relationship to each other and to the land drains is undetermined.

### 5.2 Watching Brief

No finds or features of archaeological significance were located during the watching brief. However, topsoil stripping of the fields immediately to the north-east of the dyke revealed the presence of narrow peat-filled linears running in a WNW-ESE direction at intervals of between three and six metres. Conversation with the landowner revealed that these were

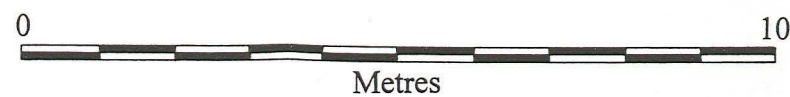
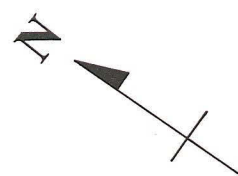
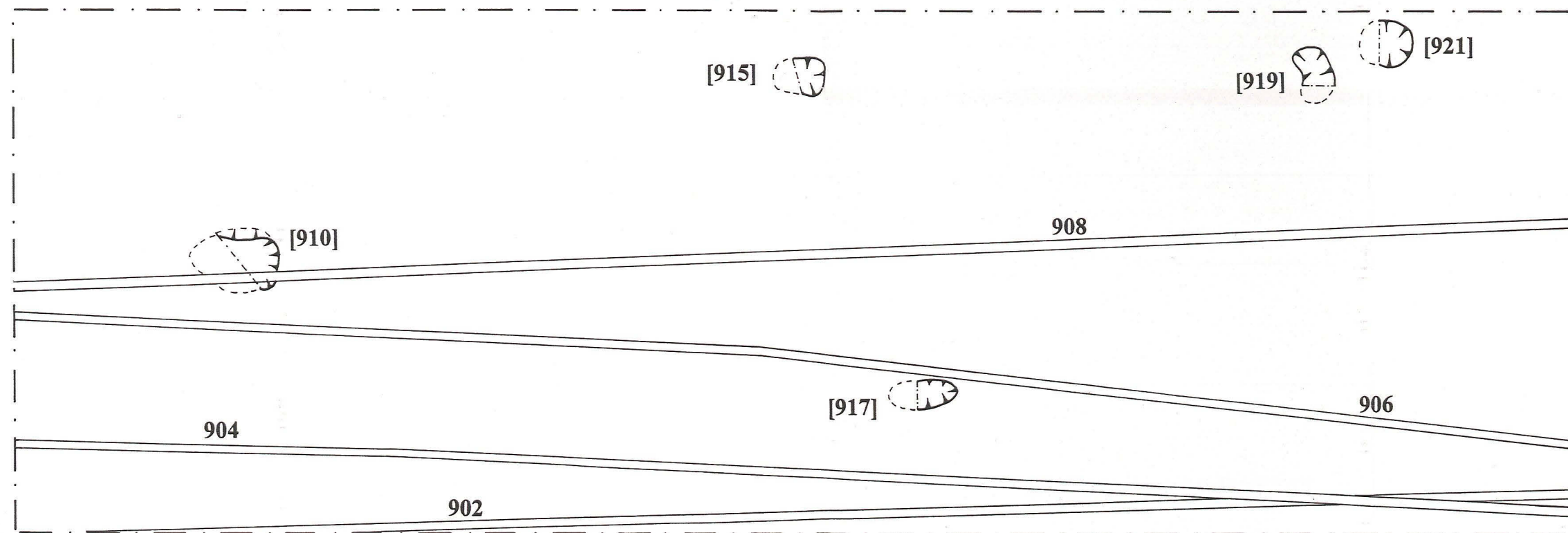


Figure 3: Plan of evaluation trench [scale 1:100]



created by a deep ploughing technique, formerly used to improve drainage. These 'drains' were in the same location and on the same alignment as the linear features interpreted as ridge and furrow in the geophysical survey. No furrow traces were found in this area and it seems most likely that the peat 'drains' are the true origin of the linear geophysical anomalies.

## 6 CONCLUSION

Apart from a series of recent drains no features of archaeological significance were exposed during the evaluation.

No evidence was found to support the presence of possible storage or refuse pits suggested by the geophysics. Given the mixed nature of the surface geology it seems more likely that these anomalies were the result of natural variations in this geology.

The watching brief phase of the archaeological investigation revealed no archaeological deposits.

## 7 REPORT AND ARCHIVE DEPOSITION

The general site code for the Hatton to Silk Willoughby Gas Pipeline project is HWP. The evaluation and watching brief records are labelled as HWP98.

The report by GeoQuest Associates on the geophysical survey has been lodged with Lincolnshire SMR and English Heritage.

Two copies of this report (NAL Report No. 133) will be lodged with Lincolnshire SMR and two with English Heritage. A further two copies have been deposited with the paper archive covering the entire pipeline project and deposited at the Lincolnshire Archives. The Accession Number is 269.98.

## 8 ACKNOWLEDGMENTS

The fieldwork was commissioned by Laing Engineering Ltd, on behalf of Transco, under the directive of English Heritage. Particular thanks are due to Phil Allen and Steven Boothroyd of Laing Engineering Ltd and Des Gelly, Barry Robinson and Nick Sheriff of Transco for their co-operation and assistance. Fieldwork was carried out by Mark Allen, Elizabeth Davis and Andrew Hunn.

## 9 REFERENCES

GeoQuest Associates, 1997. *Geophysical Surveys at Car Dyke, Lincolnshire*. A programme of research carried out on behalf of Laing Engineering Ltd: Internal Report.

Network Archaeology Ltd, Jan 1997. *Proposed Hatton to Silk Willoughby Gas Pipeline: Archaeological Desk-Based Assessment*. For Transco



Network Archaeology Ltd, Dec 1997. *Hatton to Silk Willoughby Gas Pipeline: Archaeological Fieldwalking and Field Reconnaissance Survey*. For Laing Engineering Ltd

General Transco Brief for *Excavation* (Stage 5), June 1997.

General Transco Brief for *Watching Brief (during development)* (Stage 6), June 1997.

## 10 Appendix 1

### Context Gazetteer Section 9 Plot 68

Topsoil 900 v dark brown silt loam, occ small rounded flint gravel, c. 0.30m deep

Alluvium 901 pale yellow-grey clay with orange sandy silt, occ small sub-angular gravel

Land drain 902 linear orientated WNW-ESE, unexcavated

Fill 903 v dark brown silt loam, occ small sub-angular and rounded flint gravel, ceramic drainage pipe

*Finds:* none

*Date:* Post-Medieval - Modern

*Interpretation:* land drain

*Other:* cut by 904

Land drain 904 linear orientated NNW-SSE, unexcavated

Fill 905 dark brown silt loam, freq rounded flint gravel

*Finds:* none

*Date:* ?Modern

*Interpretation:* land drain

*Other:* cuts 902

Land drain 906 linear orientated NNW-SSW, unexcavated

Fill 907 dark brown silt loam, freq sub-angular limestone gravel

*Finds:* none

*Date:* ?Modern

*Interpretation:* land drain

Land drain 908 linear orientated WNW-ESE, steep sides, base unrecorded (W 0.13m, D 0.37m)

Fill 912 ceramic land drain

*Finds:* none

Fill 909 dark brown silt loam, occ small gravel

*Finds:* none

*Date:* Post-Medieval - Modern

*Interpretation:* land drain

*Other:* cuts 910

?Tree hole 910 sub-circular, irregular steep sides, flattish base (W 2.3m, L 1.25m, D 0.53m)

Fill 913 pale yellow-grey silty clay, mod charcoal, occ v small flint and limestone gravel

*Finds:* none

Fill 914 brown-grey clay silt, occ rounded and sub-angular flint and limestone gravel

*Finds:* none

Fill 911 v dark red-brown silt, v occ small gravel

*Finds:* none

*Date:* undetermined

*Interpretation:* ?tree hole

*Other:* cut by 908

Plant hole 915 sub-square, steep sides, flattish base (W 0.66m, L 0.97m, D 0.13m)

Fill 916 mid-grey clayey silt, occ small rounded and sub-angular flint gravel

*Finds:* none

*Date:* undetermined

*Interpretation:* plant hole

**Plant hole 917** sub oval, irregular fairly steep sides, flattish base (W 0.6m, L 1.25m, D 0.17m)

**Fill 918** pale yellow-grey clayey silt, occ sub-angular and rounded flint gravel

**Finds:** none

**Date:** undetermined

**Interpretation:** plant hole

**Plant hole 919** oblong, irregular steep sides, slightly rounded base (W 0.6m, L 1.15m, D 0.32m)

**Fill 920** pale mid-grey clayey silt, occ sub-angular and rounded small flint gravel

**Finds:** none

**Date:** undetermined

**Interpretation:** plant hole

**Plant hole 921** sub-square, shallow, steep sides, slightly undulating base (W 0.85m, D 0.13m)

**Fill 922** v dark brown peaty clay, occ-mod small angular and sub-angular rounded flint

**Finds:** none

**Date:** undetermined

**Interpretation:** plant hole





Plate 1: Evaluation trench to the north of Car Dyke



Plate 2: Construction of thrust pit to the north of Car Dyke