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# **ABINGDON PIPELINE**

Report on Archaeogeophysical Survey of Proposed Gas Pipeline 2003

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for

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> and Transco

# Abingdon Pipeline

## **Report on Archaeogeophysical Survey of Proposed Gas Pipeline 2003**

### Summary

This survey covered accessible sections of two alternative routes for a proposed pipeline to the north and west of Abingdon.

Findings of potential archaeological significance included extensive magnetic activity probably indicating a Romano-British or late Prehistoric settlement site between the railway and Kennington Road to the north of Abingdon. There could also be archaeological features in other fields nearby. A further area of possible archaeological concern was found in Radley park (field 20).

Strong magnetic disturbances to the west of the A34 appear less likely to be archaeologically significant, but findings next to the Manor School playing field (field 38) could perhaps be of interest. Ridge and furrow cultivation was detected at several locations towards the south of the route, together with other magnetic anomalies, some of which may be natural. The strength of magnetic response from fields near the River Ock could be limited by the presence of alluvial deposits.

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9 May 2003

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## Illustrations

A3 plans at the following scales are included in this report:

Figures 1 - 17	Survey location plans with grey scale plots of magnetometer data.	1:2000
Figures 18 - 34	Magnetic susceptibility plots with interpretation of magnetometer survey.	1:2000
Figures 35 - 45	Magnetometer survey data plots (with selected magnetic anomalies outlined)	1:1000

Plans are arranged in sequence from north east to south west (with south at the top). Fields have been numbered arbitrarily for the purposes of this report from north east to south west along both routes.

# Abingdon Pipeline

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### Introduction

This survey was commissioned by RSK Environment Ltd on behalf of Transco, and forms part of an archaeological evaluation of routes for a proposed pipeline around Abingdon, Oxfordshire.

The two alternative routes investigated both extend from near Toot Baldon to the north west of Abingdon and follow a course to the west and south, terminating near the River Ock south west of Abingdon. Access was not available to an initial 2km section at the western end of both routes, and coverage therefore started at the A4074 (SU 544 004). The routes follow a common line to the Thames, and then diverge in fields near the railway and through Radley Park. A section of the first route (Route 1 as shown in blue on the enclosed plans) which crosses Abingdon airfield was excluded from the survey. Route 2 (in red) follows closely to the west of the A34 and rejoins route 1 south of the airfield.

Fieldwork was carried out on Route 1 in February 2003 and on Route 2 in March, followed subsequently by return visits to fields previously under cultivation. This report incorporates a previously prepared summary of findings (Appendix), together with data plots and interpretative plans.

### The Proposed Route

The soil conditions and geology of the route appear to be generally favourable for magnetic surveying. To the north of Abingdon there are River Terrace gravels near the Thames, followed by Kimmeridge Clay around Radley. There are further Terrace gravels to the west of Abingdon, followed by an area of alluvial deposition near to the River Ock. Magnetic susceptibility values from the greater part of the route (perhaps excluding the alluvial area) are sufficiently high (with volume susceptibility readings in the range 20-40 x  $10^{-5}$  SI) to suggest that a wide range of archaeological features should be detectable.

A number of previously recorded archaeological findings in the vicinity of the route have been identified and listed by RSK Environment Ltd. These are particularly concentrated to the north of Abingdon and east of Radley College. Sites identified here include Romano-British and earlier settlements, linear cropmarks and ring ditches. A further

concentration of cropmark features at the south west end of the route includes fields systems, enclosures and barrows.

### Survey Procedure

The procedure employed for the survey is based on recorded magnetometer coverage of a continuous sample strip along the route, supplemented by magnetic susceptibility readings. This method provides detailed direct evidence for the presence of any detectable archaeological sites or features which intersect the route, and has been used successfully as part of the archaeological assessment process on numerous previous pipeline projects.

The magnetometer survey was arranged as a 15m wide strip, representing a 35 - 40 % sample of the total land take, depending on the working width. The survey was carried out using fluxgate magnetometers, and the results are presented as graphical or x-y trace plots and as grey scale plots on figures 35 - 45. These plots show the readings after standard processing operations including adjustments to the line spacing to correct for variations in the instrument zero setting, and numerical smoothing to reduce background noise levels. Outlines and cross hatching indicating selected magnetic anomalies of potential interest have been added to the graphical plots.

The magnetic anomalies which have been outlined on the plots are those for which an archaeological origin cannot be wholly excluded, although they may also include extraneous or non-archaeological features. Anomalies which are strong or narrow in profile, asymmetrical, or which have a prominent negative peak are likely to be caused by buried stones, bricks or iron objects and have been excluded as far as possible from the interpretation. The distribution and degree of clustering of the features, and correlations between magnetometer and susceptibility findings, as well as other archaeological evidence, are all relevant in reaching an interpretation. The anomalies as outlined are intended to signify the approximate distribution and extent of areas of potentially significant activity, but it is not always practical to indicate all individual features. Areas of particularly concentrated (and not necessarily archaeological) activity are marked by cross hatching, rather than as clusters of individual features.

The grey scale plots are reproduced at 1:2000 scale on the survey location plans (figures 1-17), as well as alongside the graphical data plots (figures 35-45). The location plans show the position of the 15m wide survey strips in relation to (DXF) background mapping and the pipe routes (blue and red lines). The OS coordinates of detected features can be read directly from digital copies of the plans.

The susceptibility survey was based on readings taken at 12.5m intervals along two transects using Bartington MS2 susceptibility meters with the MS2D field probe. The initial susceptibility readings are displayed as strips of shaded squares of density proportional to the readings at 1:2000 scale on figures 18 - 34. The interpretative outlines as shown on the magnetometer plots have been added to these drawings at reduced scale

to provide a summary of the survey findings. Susceptibility measurements can provide a broad indication of areas in which archaeological debris, and particularly burnt material associated with past human activity, has become dispersed in the soil. They can provide useful supplementary evidence when interpreting a magnetometer survey, but are also affected by non-archaeological factors, including geology, past and present land use, and modern disturbances.

The survey was positioned in each field by reference to OS co-ordinates measured from the digital mapping supplied by RSK, and located with a sub-1m accuracy differential GPS system. An arbitrary sequence of field numbers running from east to west is shown on the plans, and is used for identification in this report. (Fields 1-8 are to the east of the A4074, and were not surveyed.)

### Results

The enclosed plans represent the route from north east to south west with south (usually) at the top. The 1:1000 data plots from the two routes are presented separately, with results from Route 1 shown on figures 35 - 40, and Route 2 on figures 41 - 45. Plots and findings from the two routes are shown alongside each other on the 1:2000 location plans (figures 1-17), and susceptibility plans (figures 18-34). The blue and red lines representing Routes 1 and 2 are shown superimposed on the data on the grey scale location plans, but have been moved behind the plots for clarity in figures 18-34.

### Fields 9 - 12 (A4074 to River Thames)

There are no clearly identifiable magnetic anomalies in fields 9-10, other than a pipe, and the susceptibility readings are uniform. Susceptibility values are higher in field 11 and there are some possible pit-like magnetic anomalies, particularly near the ends of the field. These findings are too dispersed to suggest a clearly defined focus of archaeological activity.

A number of strong magnetic anomalies are indicated in field 12 near the Thames. Their amorphous plan suggests they could be natural. Features of this kind are often detected near watercourses, and appear to be naturally silted hollows on the floodplain.

### Fields 13 - 15 (River Thames to Kennington Road)

Magnetic anomalies near to the river in field 13 are similar to those detected on the east bank, and are again likely to be of natural origin. Section 13B of Route 1 was obstructed by trees and only surveyed in part. The survey in this field lies near to a crop mark causewayed enclosure (RSK reference number 55). It may be the case that the magnetic anomalies detected in section 13D and near to the pond in 13A relate to this feature, but their appearance suggests this is unlikely. The features indicated near the pond are of similar size and strength to the (probably) natural disturbances near the river, and the linear anomaly noted in 13D is isolated and does not appear to form part of an enclosure. There is a slight increase in susceptibility readings in 13B, but it does not exceed background variations as seen elsewhere. The features detected in field 13 may require investigation, but it appears likely that the crop mark enclosure lies outside the survey area.

Field 14 contains previously recorded linear crop marks and ring ditches, and linear features were detected by the survey. Some of the linear markings as indicated on the plans are weak and may be cultivation effects, but others are more distinct and could be former ditches or boundaries.

A number of individual pit-like features are noted at various locations. A group at the east of the field on Route 2 could be recent disturbances near the track, but others on both routes could indicates settlement activity, particularly in the western half of the field. High susceptibility readings would support this possibility. Some of the magnetic anomalies lie close to the railway, where Romano-British settlement remains are recorded (RSK ref. 1).

Previously recorded findings in field 15 are limited to a crop mark pit (RSK 73), a gravel pit (RSK 54), and flints. The survey, however, shows strong susceptibility enhancement with linear and other magnetic anomalies on both routes. It is perhaps possible that some of the magnetic activity could relate to former gravel diggings, but a pit filled with relatively modern debris will usually give rise to much stronger magnetic disturbances than are seen here. Some of the magnetic anomalies are irregular in plan and difficult to interpret (shaded areas), but elsewhere there are linear features suggesting enclosures, and associated pit-like features. Coverage within the 15m sample strips is too limited to confirm that a clearly defined pattern of rectilinear enclosures extends across the site, but this could well be the case. Such findings would be consistent with an Iron Age or Roman settlement site, as recorded near the railway. The full extent of the site is unclear, but there could be outlying features in fields 14 and 16.

### Fields 16 - 26 (Radley Park to A34)

Magnetic anomalies detected in field 16 on Route 2 and in section 16A on Route 1 could indicate a continuation of the probable settlement seen in field 15, but the findings are relatively sparse. There is interference from a power line in section 16B. Strong disturbances as shaded in section 16C could be a recently infilled pit or pond, and are unlikely to be archaeologically significant.

The anomalies as noted in field 17 lie in an area of raised susceptibility readings and increased background noise, but are too weak and isolated to be of clear significance. No definite findings can be identified in fields 18 and 19.

There is an increase in activity on both routes in field 20. Weak linear markings on route 2 could be caused by cultivation, but there are stronger magnetic anomalies and increased susceptibility readings on both routes towards the southern field boundary. These disturbances do not form a clearly interpretable plan, but could indicate activity in the vicinity of a building recorded on early OS maps (RSK 57).

Field 21 in an entrance drive to Radley College, and was not surveyed. Only very isolated small anomalies were detected in field 22.

There are weak disturbances on the line of the no-longer extant boundary between fields 23 and 24 on Route 2, but findings in fields 23 -26 are otherwise limited to small and isolated features on Route 1, and some interference (shaded) on Route 2.

A34 to A415 (Fields 27 - 45)

Route 2 crosses the A34 into field 27, where there are no clearly significant findings. The routes combine in fields 28-30, where findings are limited to relatively strong disturbances in field 30. The routes diverge between sections 30B and 30C-E, which all show areas of strong magnetic activity. Some of this lies close to the A34 and could be a result of ground disturbances during construction of the road embankment.

Other magnetic activity extends to the west in section 30B and field 31 on route 1, but is probably too strong to be archaeologically significant. There is no strong susceptibility enhancement to suggest this could have been an ancient industrial site.

Field 34 (Route 2) contains more disturbances near the A34, but also a strong ditch-like linear feature. There may be some further magnetic activity in field 35. Additional weaker but parallel linear markings in fields 36-37 probably represent ridge and furrow cultivation.

The area surveyed in field 38 shows pit-like magnetic anomalies and possible linear features against a disturbed background, with raised susceptibility readings. This combination of findings could be significant, but the level of background disturbance is perhaps rather high. The remainder of field 38 is a school playing field, and was not surveyed.

Fields 40 - 42 again show strong disturbances probably relating to the road embankment. A particularly disturbed area in field 42 could be an infilled pit or quarry. A strong ditchlike linear feature was detected in field 43, and ridge and furrow in section 44A.

Routes 1 and 2 converge in field 45, where there are strong magnetic disturbances near to the ditch and field boundary. These are unlikely to be archaeologically significant.

### South of A415 (Fields 46 - 56)

There are no clearly identifiable findings in field 46. Field 47 contains previously identified cropmark enclosures and a field system (RSK 12 and 40), but the survey shows only isolated pit-like magnetic anomalies. These appear similar to those near the Thames (fields 12 and 13), and may therefore be natural. The quiet background to the survey may indicate alluvial deposits near the River Ock.

Similar findings were obtained from fields 48 and 49 at the south end of route 1. There are weak linear markings which could perhaps relate to the cropmark enclosures, but the pit-like features could again be silted hollows on the floodplain, as suggested previously.

Route 2 turns to the east through field 53, which contains allotments and was not surveyed. A ring ditch is recorded nearby (RSK 32). Archaeological findings recorded near field 54 include a Bronze Age settlement, a long barrow and a ring ditch (RSK ref. nos. 34, 13 and 15), but the survey plot appears largely undisturbed. Broad magnetic anomalies at the west of the field could be natural. Disturbances in field 56 could be magnetic interference from a nearby existing gas pipe.

### Conclusions

The survey has identified a number of sites of potential archaeological interest. The most substantial of these is the probable Roman or earlier settlement site containing ditches, pits and enclosures in field 15. Cropmarks indicate there may be disturbances from gravel digging in the field, but the survey suggests that the Roman site previously recorded near the railway extends across much of field 15, and perhaps into fields 14 and 16.

Some linear and other features were detected in field 13, but it is not clear from the survey evidence that they relate to the nearby crop mark causewayed enclosure.

There is an area of magnetic activity on both routes in field 20 in Radley Park. This lies close to a former building (RSK 57). Magnetic disturbances in field 30 are probably too strong to be archaeologically significant.

Ridge and furrow was detected at various places west of the A34, particularly in fields 37 and 44. The magnetic disturbances in field 38 are not necessarily archaeologically significant, but cannot be eliminated immediately from consideration.

Fields near the River Ock at the south end of both routes gave a generally quiet response, probably indicating the presence of alluvial deposits. Some linear markings were detected which could relate to crop mark enclosures or cultivation, but other magnetic anomalies are likely to be natural.

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## Abingdon Pipeline: Geophysical Survey

## Appendix: Summary of Findings from Routes 1 and 2

This list notes the more significant findings from the magnetometer survey of this pipeline route. The grading (1-4) given alongside each entry refers to the reliability of the geophysical evidence rather than the archaeological significance of the findings.

Grade 1:	Distinct magnetic anomalies of probable archaeological origin.
Grade 2:	Magnetic anomalies possibly including natural or recent disturbances, but which could in part be archaeologically significant.
Grade 3:	Weak or isolated features; not necessarily archaeologically significant.
Grade 4:	Magnetic anomalies of probably recent or natural origin.

### \*\*\*\*\*\*\*

Field		Grade
11 (Routes 1,2)	Isolated magnetic anomalies at the ends of the Field, + raised susceptibility readings.	2-3
12		
(Routes 1,2)	Broad pit-like anomalies, possibly naturally silted hollows near river.	3
13		
(Routes 1,2)	Anomalies similar to above near west bank of river.	3
	+ Linear feature in section 13D is probably too isolated to form part of a cropmark causewayed enclosure.	2-3
14 (Route 1)	Isolated linear anomalies: ditches or former boundaries.	1
	+ Linear anomalies and other features + disturbances in area of raised susceptibility readings at west of field	
	near possible RB settlement (RSK 1).	1-2

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Field	9	<u>Grade</u>
14 (Route 2)	Additional linear features and possible pits in centre of field (near cropmarks RSK ref. 17,53,68).	1-2
15 (Route 1)	Strong magnetic anomalies extending for 200m, and high susceptibility readings. Plan of features is complex and irregular, but likely to be archaeological.	1
15 (Route 2)	Additional strong magnetic anomalies on route 2. Magnetically disturbed area is close to cropmark pit (RSK ref. 73), but detected features include linear anomalies/enclosures, and so are likely to be archaeological.	1
16 (Route 1)	Some isolated linear and other features with susceptibility anomaly.	1-2
16 (Route 2)	Weak isolated magnetic anomalies.	2-3
17 (Route 1)	Magnetic disturbances in area of high susceptibility readings, but possibly recent.	4
20 (Route 1)	Possible pit-like anomalies and high susceptibility readings at south of field.	2-3
20 (Route 2)	A few magnetic anomalies near former building (RSK ref 57). + Magnetic disturbances at south of field.	2 3
24 (Route 1)	Very isolated pit-like anomalies.	3-4
30 (Routes 1,2)	Magnetic disturbances, probably recent.	4
31 (Route 1)	Magnetic disturbances - less strong than in 30.	3
34 (Route 2)	Strong ditch-like feature at south of field.	1
35 (Route 2)	Magnetic anomalies with disturbed background.	3-4
36 (Route 2)	Linear magnetic anomalies align with boundaries - perhaps cultivation.	2-3

cont./

# <u>Field</u>

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Gr	ade

37 (Route 2)	Probable ridge and furrow.	1-2
38 (Route 2)	Magnetic anomalies with disturbed background.	2-3
40-41 (Route 2)	Possible ridge and furrow visible on ground, but survey shows strong magnetic disturbances near road embankment. 4	
42 (Route 2)	Strongly disturbed area - backfilled pit or quarry ?	4
44 (Route 2)	Possible ridge and furrow.	2
47 (Route 1)	Broad pit-like anomalies (possibly natural) .	3-4
48 (Route 1)	Cluster of pit-like anomalies.	3
49 (Route 1)	Pit-like anomalies in field near river. (Could be similar to 12-13.)	3
53 (Route 2)	Allotments not surveyed (but route is near cropmark ring ditch RSK32).	
54 (Route 2)	Broad magnetic anomalies at west of field Possibly naturally silted hollows, but near to cropmark long barrow, and Neolithic site (RSK 13).	3
56 (Route 2)	Broad magnetic anomalies. Perhaps natural silted hollows (c.f. fields 12-13), or interference from gas pipe.	3

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