GATWICK AIRPORT DEVELOPMENT
(Balancing Pond North)

Report on Archaeological Geophysical Survey
2011

Surveyed by:

Bartlett-Clark Consultancy

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for:

Network Archaeology Ltd
22 High Street
Buckingham
MK18 1NU

on behalf of:

Chris Blandford Associates for Gatwick Airport Ltd

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Introduction

This magnetometer survey forms part of an archaeological evaluation of a site which is subject to a planning application for the proposed construction of a drainage pond, and is located to the SE of Gatwick Airport.

The survey was commissioned from Bartlett Clark Consultancy, Specialists in Archaeogeophysics of Oxford, by Network Archaeology of Buckingham on behalf of Chris Blandford Associates for Gatwick Airport Ltd. Fieldwork for the survey was done on 9-11 November 2011.

The Site

The site, which covers a total area of c. 4.8ha, is one of three locations under consideration for the construction of drainage balancing ponds and flood storage areas in the vicinity of the airport. The three sites together are the subject of an Archaeological Desk Based Assessment (DBA) prepared by Network Archaeology Ltd (report no. 440, November 2010). [Background mapping in figure 1 is reproduced from figure 2 in the DBA report, and the following notes are also based in part on this document.]

The site referred to as Balancing Pond North (BPN) is located (at NGR TQ 293405) to the south of an airport car park and east of Horleyland Wood. It is currently mainly grassland, but has in part been planted with trees. It is on a bedrock of Cretaceous Wealden Mudstone, and appears to be free of drift deposits.

Previously identified nearby archaeological sites and findings which are mentioned in the DBA are located mainly in the vicinity of the proposed flood storage area (c. 500m SW of BPN). The site is adjacent to a scheduled medieval village, and is also close to the site of the 16thC Tinsley Green forge. It is concluded in the DBA that the potential for findings from earlier periods (prehistoric, Roman and early medieval) within the study area around the three development sites is only low to moderate. Recorded findings within the BPN site are limited to possible cropmark field boundaries (indicated in green on figure 1).

Archaeological features in some of these categories, if present, should be detectable in a

magnetometer survey, although the strength of magnetic response on a Wealden clay soil might not be particularly strong. Magnetic susceptibility readings from soil samples collected during the survey were in the range 7.5 to 16 SI. This is at the lower end of commonly encountered values, but not abnormally so. It is possible, therefore, that such features as earthworks or silted ditches lacking magnetically enhanced fill would not necessarily be detectable, but any concentrations of settlement or industrial remains could be expected to respond.

Survey Procedure

The magnetometer readings were collected along transects 1m apart using Bartington 1m fluxgate gradiometers. The results of the survey are presented as a grey scale plot (figure 2), and as a graphical (x-y trace) plot in figure 3. An interpretation of the findings is shown superimposed on figure 3, and is reproduced separately to provide a summary of the findings on the final plan (figure 4).

The survey plots show the magnetometer readings after standard treatments which include adjustment for irregularities in line spacing caused by variations in the instrument zero setting, and slight linear smoothing. Additional 2D low pass filtering has been applied to the grey scale plot to reduce background noise levels.

Colour coding has been used in the interpretation to indicate different effects. Magnetic anomalies of possible (but very doubtful) archaeological interest are outlined in red, with potentially non-archeological disturbances in light brown. Stronger and probably recent disturbances are in a darker brown. Pipes and ferrous disturbances are outlined shades of blue.

The survey was located by reference to a temporary site grid located by means of a sub-1m accuracy GPS system. OS co-ordinates of map locations can be read from the AutoCAD version of the plans which can be supplied with this report.

The magnetometer responds to cut features such as ditches and pits when they are silted with topsoil, which usually has a higher magnetic susceptibility than the underlying natural subsoil. It also detects the thermoremanent magnetism of fired materials, notably baked clay structures such as kilns or hearths, and so responds preferentially to the presence of ancient settlement or industrial remains. It is also strongly affected by ferrous and other debris of recent origin.

Results

The survey plots show various magnetic disturbances, although few appear to be of archaeological significance. Various wooded and obstructed areas of the site could not

be surveyed, but findings from the remainder which are visible in the survey data plots (figures 2 and 3) include a number of strong linear responses representing iron pipes and other recent disturbances. These are seen against an otherwise generally quiet background.

Alignments between some of the magnetic anomalies suggest they are linked by non-ferrous pipes or services (as indicated in addition to the iron pipes in the interpretation; figure 4). There are also strong isolated magnetic anomalies indicating buried iron objects (blue), as well as localised disturbed areas suggesting deposits of ferrous and other debris (rubble, concrete), as outlined in brown. [Fragments of concrete are visible among trees in the centre of the site, suggesting that modern demolition debris could contribute to the magnetic response.] There is also strong magnetic activity along a track across the site.

Very few of the detected features show any of the characteristics to be expected from archaeological findings. A few individual magnetic anomalies show rounded profiles (as seen in the graphical plot, figure 3), which can be a characteristic of silted pits. Some of these are outlined in red, but they are all small and inconclusive and do not suggest the presence of any concentrations of archaeologically significant findings. They are not clearly distinguishable from other small background magnetic anomalies (shown in light brown) which could be of natural or non-archaeological origin.

Conclusions

Comparison of figures 1 and 4 suggests that some of the linear cropmark features previously identified at the site can be accounted for by pipes detected in the survey.

The magnetic activity to be expected at an ancient iron-working or other industrial site would usually be more varied and extensive than is seen in the survey, where most of the magnetic disturbances are strong and isolated, as would be expected from localised deposits of modern debris. The generally quiet response from the remainder the site, where only a few small magnetic anomalies of limited and uncertain significance can be identified, does not suggest the presence of any significant concentration of settlement remains.

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13 November 2011

Fieldwork for this project was done by R. Ainslie and S. Ainslie.

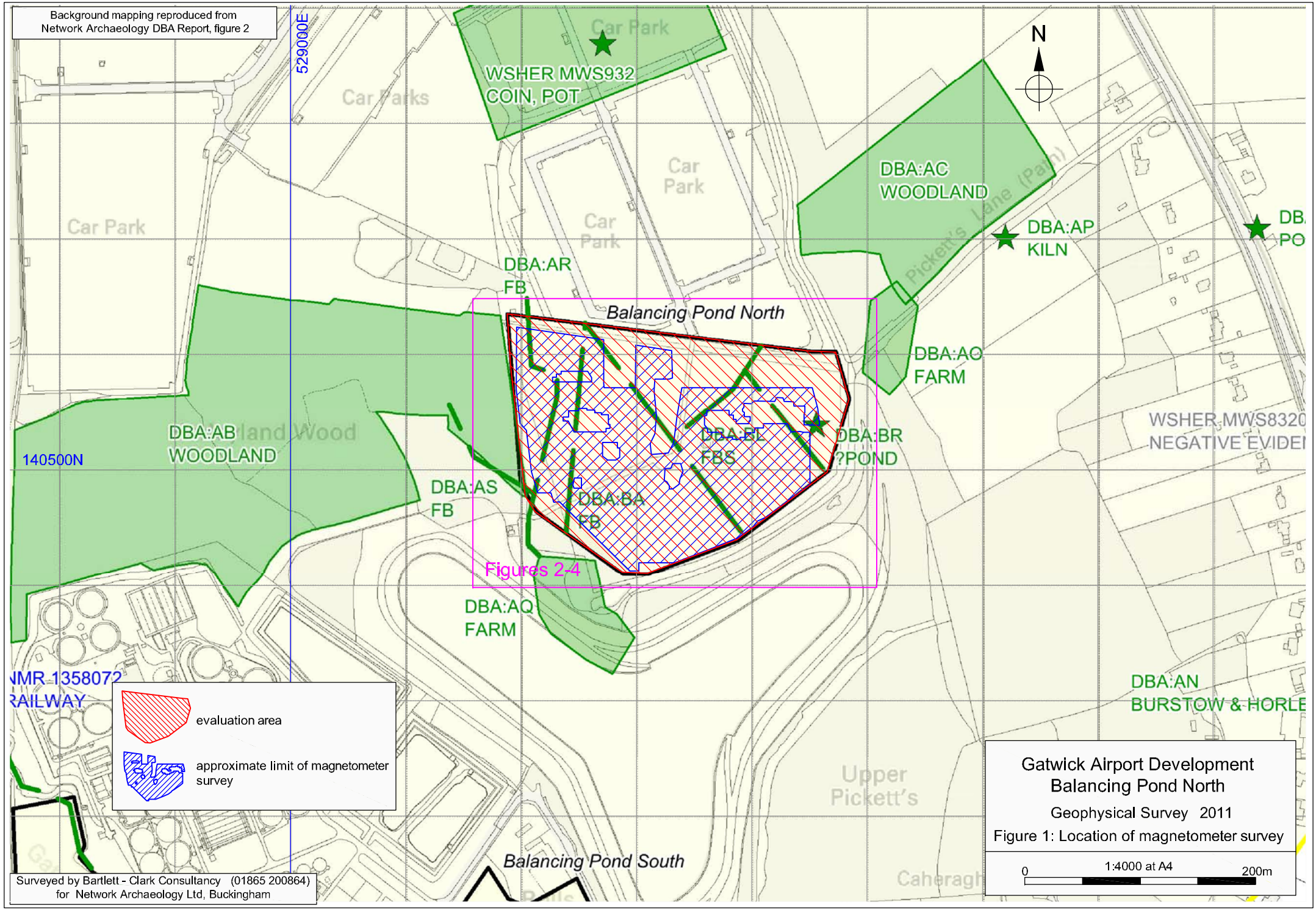
Background mapping reproduced from
Network Archaeology DBA Report, figure 2
529000E
140500N
N
WSHER MWS932
COIN, POT
Car Park
Car Parks
Car Park
Car Park
Car Park
DBA:AC
WOODLAND
DBA:AP
KILN
Pickett's Lane (Path)
DBA:AR
FB
Balancing Pond North
DBA:AO
FARM
DBA:AB
WOODLAND
DBA:BL
FBS
DBA:BR
?POND
DBA:AS
FB
DBA:BA
FB
Figures 2-4
DBA:AQ
FARM
WSHER MWS8320
NEGATIVE EVIDE
DBA:AN
BURSTOW & HORLE
Upper
Pickett's
Balancing Pond South
Caheragh
evaluation area
approximate limit of magnetometer survey
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Figure 1: Location of magnetometer survey
0
1:4000 at A4
200m
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for Network Archaeology Ltd, Buckingham


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N
2.4 nT
-2.2
trees
trees
trees
(+ concrete)
trees
Gatwick Airport Development
Balancing Pond North
Geophysical Survey 2011
Figure 2: Magnetometer survey
(grey scale plot)
1:1250
0
50m
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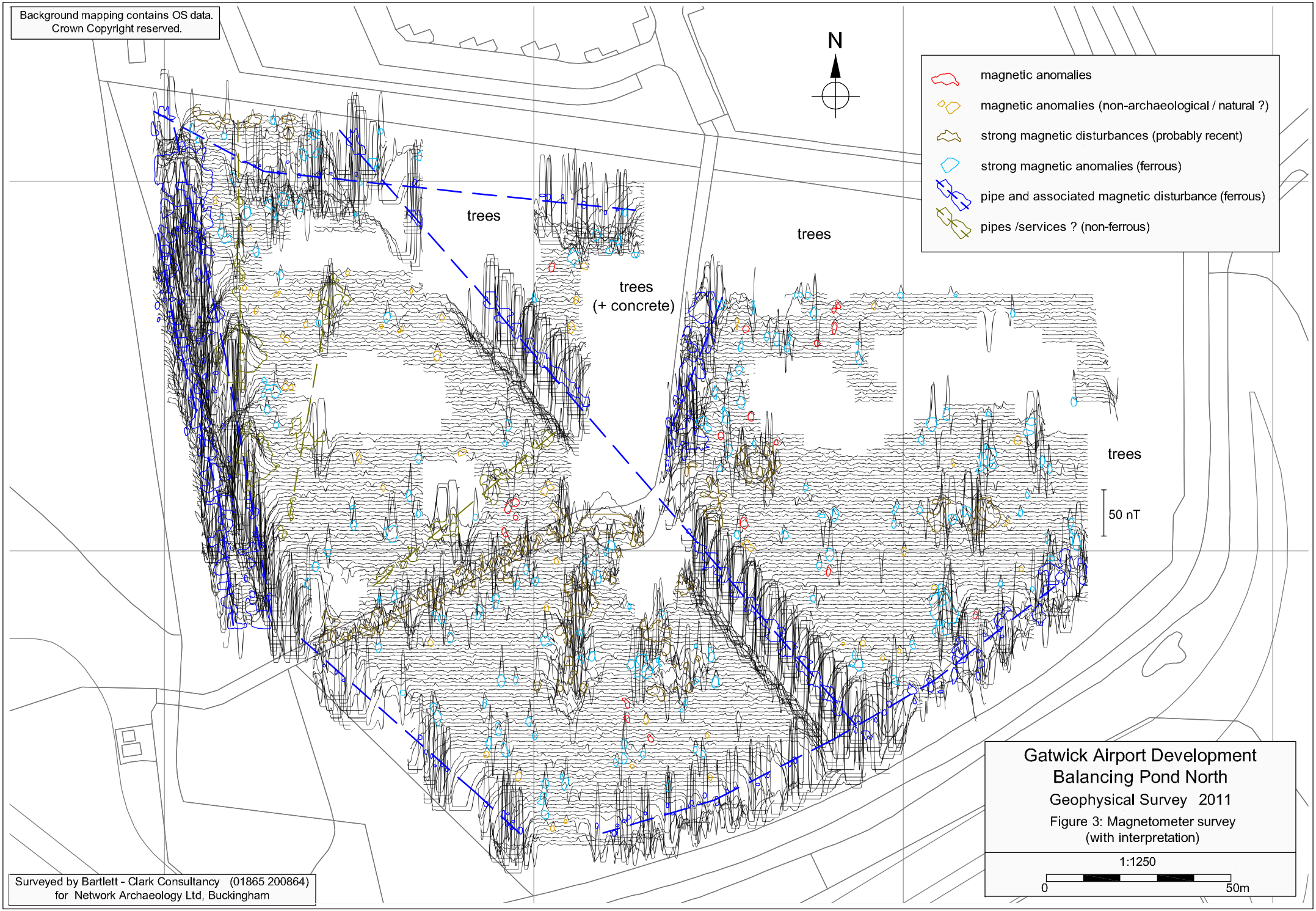
Background mapping contains OS data.
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N
magnetic anomalies
magnetic anomalies (non-archaeological / natural ?)
strong magnetic disturbances (probably recent)
strong magnetic anomalies (ferrous)
pipe and associated magnetic disturbance (ferrous)
pipes /services ? (non-ferrous)
trees
trees
trees
(+ concrete)
trees
50 nT
Gatwick Airport Development
Balancing Pond North
Geophysical Survey 2011
Figure 3: Magnetometer survey
(with interpretation)
1:1250
0
50m
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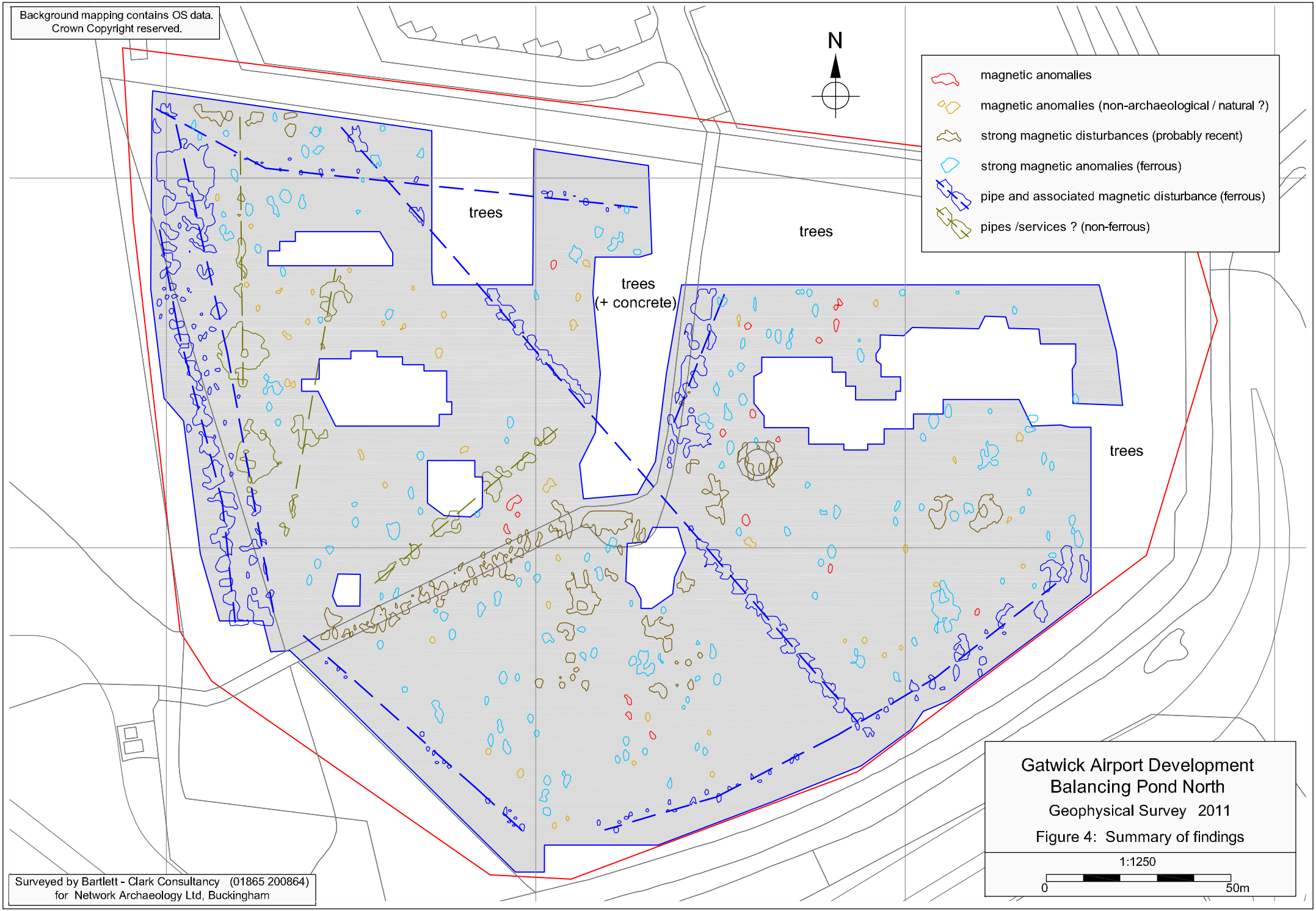
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N
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pipe and associated magnetic disturbance (ferrous)
pipes /services ? (non-ferrous)
trees
trees
trees
(+ concrete)
trees
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Figure 4: Summary of findings
1:1250
0
50m
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