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**LAND AT GREENWAYS, SAHAM ROAD,
WATTON,
AREA CENTRED TF908009,
NORFOLK:**

AERIAL PHOTOGRAPHIC ASSESSMENT

REPORT No: 2010/3

MAY 2010

Commissioned by:
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**LAND AT GREENWAYS, SAHAM ROAD, WATTON,
AREA CENTRED TF908009,
NORFOLK:
AERIAL PHOTOGRAPHIC ASSESSMENT**

SUMMARY

This assessment of aerial photographs examined an area of some 12 hectares (centred TF908009) in order to identify and accurately map archaeological, recent and natural features.

No definite archaeological features have been identified but there is a scatter of possible features in the north-east corner of the Study Area that may indicate buried pits. These may extend into the Development Area.

No non-archaeological features were identified.

Land in the Development Area has been cultivated but appears to have been used mainly for growing grass crops.

Original photo interpretation and mapping was at 1:2500 level.

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Rog Palmer MA MIFA

INTRODUCTION

This assessment of aerial photographs was commissioned to examine an area of some 12 hectares (centred TF908009) in order to identify and accurately map archaeological, recent and natural features and thus provide a guide for field evaluation. The level of interpretation and mapping was to be at 1:2500.

ARCHAEOLOGICAL AND NATURAL FEATURES FROM AERIAL PHOTOGRAPHS

In suitable cultivated soils, sub-surface features – including archaeological ditches, banks, pits, walls or foundations – may be recorded from the air in different ways in different seasons. In spring and summer these may show through their effect on crops growing above them. Such indications tend to be at their most visible in ripening cereal crops, in June or July in this part of Britain, although their appearance cannot accurately be predicted and their absence cannot be taken to imply evidence of archaeological absence. In winter months, when the soil is bare or crop cover is thin (when viewed from above), features may show by virtue of their different soils. Upstanding remains, which may survive in unploughed grassland, are also best recorded in winter months when vegetation is sparse and the low angle of the sun helps pick out slight differences of height and slope.

Grass sometimes shows sub-surface features through the withering of the plants above them. This may occur towards the end of very dry summers and usually indicates the presence of buried walls or foundations. Such dry summers occurred in Britain in 1949, 1959, 1975, 1976, 1984, 1989 and 1990 (Bewley 1994, 25) and more recently in 1995, 1996 and 2006. This does not imply that every grass field will reveal its buried remains on these dates as local variations in weather and field management will affect parching. However, it does provide a list of years in which photographs taken from, say, mid July to the end of August may prove informative.

Such effects are not confined only to archaeological features as almost any disturbance of soil and bedrock can produce its own range of shadow, crop and soil differences and it is hoped that a photo interpreter, especially one familiar with local soils, is able to distinguish archaeological from other features. There may, however, remain some features of unknown origin that cannot be classified without specialist knowledge or input from field investigation.

PHOTO INTERPRETATION AND MAPPING

Photographs examined

The most immediately informative aerial photographs of archaeological subjects tend to be those resulting from observer-directed flights. This activity is usually undertaken by an experienced archaeological observer who will fly at seasons and times of day when optimum results are expected. Oblique photographs, taken using a hand-held camera, are the usual products of such investigation. Although oblique photographs are able to provide a very detailed view, they are biased in providing a record that is mainly of features noticed by the observer, understood, and thought to be of archaeological relevance. To be able to map accurately from these photographs it is necessary that they have been taken from a sufficient height to include surrounding control information.

Vertical photographs cover the whole of Britain and can provide scenes on a series of dates between (usually) 1946-7 and the present. Many of these vertical surveys were not flown at times of year that are best to record the archaeological features sought for this Assessment and may have been taken at inappropriate dates to record crop and soil responses that may be seen above sub-surface features. Vertical photographs are taken by a camera fixed inside an aircraft and with its exposures timed to take a series of overlapping views that can be examined stereoscopically. They are often of relatively small scale and their interpretation requires higher perceptive powers and a more cautious approach than that necessary for examination of obliques. Use of these small-scale images can also lead to errors of location and size when they are rectified or re-scaled to match a larger map scale.

Cover searches were obtained from the Cambridge University Collection of Aerial Photographs (CUCAP) and the National Monuments Record: Air Photographs (NMRAP), Swindon. Sarah Howard (Norfolk Landscape Archaeology) provided detailed information about the holdings in their HER, all of which were duplicated at NMRAP.

The relevant photographs were all from routine vertical surveys. Images current on Google Earth and Bing at the time of this work (April 2010) were also examined.

Photographs consulted are listed in the Appendix to this report.

Base maps

No useable base maps was provided by the client so a background was constructed by underlying an area cropped from Google Earth and then geolocated using AirPhoto (Scollar and Palmer 2008).

Study Area

Photographs were examined in detail for an area extending up to one modern field beyond the Assessment Area.

Photo interpretation and mapping

All photographs were examined by eye and under slight (2x) magnification, viewing them as stereoscopic pairs when possible. One image in Google Earth was selected from within AirPhoto which automatically geo-references saved files (Scollar and Palmer 2008). This was then imported into AutoCAD, interpreted and overdrawn. Layers from this final drawing have been used to prepare the figure in this report and have been supplied to the client in digital form.

Accuracy

The accuracy of the geolocated Google Earth background fixes the greatest accuracy that can be achieved from transforming other photographs on to it. When that facility was being added to AirPhoto and tested, checks were made on a random sample of 12 UK triangulation points and showed most to be positioned within 2.0 metres (Scollar and Palmer 2008, 16).

COMMENTARY

Soils

The Soil Survey of England and Wales (SSEW 1983) shows the area to be situated on chalky till (soil association 711r: BECCLES 1), slowly permeable seasonally waterlogged clayey soils. To the north is a band of glaciofluvial drift and peat (soil association 861b: Isleham 2) that flanks a stream. Crops on chalky till soils tend not to indicate changes in subsoil depth, such as an archaeological ditch, except in conditions of severe drought.

Archaeological features

No definite archaeological features have been identified but in the north-east corner of the Study Area (and beyond this) is a scatter of possible features that may mark buried pits. These were recorded in one year only – 2006 – on two dates and can be seen on photographs in Google Earth. It has been noted (see above) that 2006 was one of the drier years and certainly features were recorded on ‘unresponsive soils’ in other parts of East Anglia. This gives some credibility to these as possible archaeological features and, if so, the scatter of pits may continue into the Development Area.

Non-archaeological features

No non-archaeological features were identified in the Study Area or its immediate environs.

Land use

The area seems to be used predominantly as grassland although this has been cultivated annually in the northern two fields. The southern field has also been grass but the photographs showed it to be cultivated less frequently than the other two fields. The field in which the possible pits are visible has been in arable use and this may explain why differences in growth can be seen there and not in the grass fields.

REFERENCES

- Bewley, R. H., 1994. *Prehistoric Settlements*. Batsford/English Heritage, London.
- Scollar, I. and Palmer, R., 2008. Using Google Earth Imagery. *AARGnews* **37**, 15-21.
- SSEW, 1983. *Soils of England and Wales: sheet 4: Eastern England (1:250,000)*. Soil Survey of England and Wales, Harpenden.

APPENDIX

Aerial photographs examined

Source: Cambridge University Collection of Aerial Photographs (searched 2 April 2010)

Vertical photographs

RC8-FE 77, 100 16 April 1983 1:10000

Source: Internet

Google Earth

Vertical photographs

Undated 1999
11 September 2006
Undated 2006

Microsoft Bing

Vertical photographs

Undated

Source: National Monuments Record: Air Photographs (cover search 49832)

Vertical collection

<i>Sortie number</i>	<i>Library number</i>	<i>Camera position</i>	<i>Frame number</i>	<i>Centre point</i>	<i>Date</i>	<i>Scale 1:</i>
RAF/3G/TUD/UK/52	181	V	5324	TF 913 019	31 JAN 1946	10500
RAF/3G/TUD/UK/52	181	V	5325	TF 906 019	31 JAN 1946	10500
RAF/106G/UK/1634	416	V	5158	TF 910 013	09 JUL 1946	10000
RAF/106G/UK/1634	416	V	5159	TF 904 013	09 JUL 1946	10000
RAF/CPE/UK/2021	605	RP	3135	TF 912 016	21 APR 1947	9800
RAF/CPE/UK/2021	605	RP	3136	TF 907 016	21 APR 1947	9800
RAF/CPE/UK/2021	605	RP	3137	TF 903 016	21 APR 1947	9800
RAF/3G/TUD/UK/101	956	RV	6018	TF 913 004	30 MAR 1946	10000
RAF/3G/TUD/UK/101	956	RV	6019	TF 903 004	30 MAR 1946	10000
RAF/543/T/899	2660	F21	43	TF 914 009	05 MAY 1960	10002
RAF/543/T/899	2660	F21	44	TF 913 016	05 MAY 1960	10002
RAF/540/1739	2770	V	27	TF 903 005	02 NOV 1955	10000
RAF/540/1739	2770	V	28	TF 903 014	02 NOV 1955	10000
RAF/540/1739	2770	V	52	TF 913 001	02 NOV 1955	10000
RAF/540/1739	2770	V	53	TF 913 010	02 NOV 1955	10000
RAF/58/1890	3878	V	168	TF 906 002	14 OCT 1955	10000
RAF/58/1890	3878	V	169	TF 906 011	14 OCT 1955	10000
RAF/82/1204	4006	F21	194	TF 901 004	02 JUN 1955	9600

RAF/82/1204	4006	F21	195	TF 908 004	02 JUN 1955	9600
MAL/67028	4787	V	157	TF 909 008	16 APR 1967	2400
MAL/67028	4787	V	158	TF 907 009	16 APR 1967	2400
MAL/67028	4787	V	159	TF 905 011	16 APR 1967	2400
RAF/82/1279	5006	V	58	TF 915 002	23 AUG 1955	10000
RAF/82/1279	5006	V	59	TF 915 011	23 AUG 1955	10000
RAF/82/1279	5006	V	111	TF 904 000	23 AUG 1955	10000
RAF/82/1279	5006	V	112	TF 904 008	23 AUG 1955	10000
RAF/82/1307	5013	V	67	TF 915 003	04 OCT 1955	10000
RAF/82/1307	5013	V	68	TF 915 014	04 OCT 1955	10000
RAF/82/1307	5013	V	103	TF 898 004	04 OCT 1955	10000
RAF/82/1307	5013	V	104	TF 898 013	04 OCT 1955	10000
OS/75269	9836	V	154	TF 900 003	22 JUN 1975	7500
OS/71046	10123	V	53	TF 910 012	11 APR 1971	7000
OS/71046	10123	V	54	TF 910 006	11 APR 1971	7000
OS/73243	10413	V	2	TF 900 005	05 JUN 1973	7500
OS/73243	10413	V	3	TF 900 012	05 JUN 1973	7500

Most informative photographs

Google Earth 11 September 2006

Google Earth Undated 2006

TERMS AND CONDITIONS

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Air Photo Services has consulted only those aerial photographs specified. It cannot guarantee that further aerial photographs of archaeological significance do not exist in collections that were not examined.

Due to the nature of aerial photographic evidence, Air Photo Services cannot guarantee that there may not be further archaeological features found during ground survey which are not visible on aerial photographs or that apparently 'blank' areas will not contain masked archaeological evidence.

We suggest that if a period of 6 months or more elapses between compilation of this report and field evaluation new searches are made in appropriate photo libraries. Examination of any newly acquired photographs is recommended.

That the original working documents (being interpretation overlays, control information, and digital data files) will remain the property of Air Photo Services and be securely retained by it for a period of three years from the completion date of this assessment after which only the digital files may be retained.

It is requested that a copy of this report be lodged with the relevant Sites and Monuments Record within six months of the completion of the archaeological evaluation.

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Land at Greenways, Saham Road, Watton, Norfolk:
Features identified on aerial photographs



- Development Area
- - - Study Area
- Possible archaeological pits

Original photo interpretation and mapping at 1:2500 level
based on aerial photographs at CUCAP/ULM, NMRC, Google
Earth
and Bing.

Air Photo Services Cambridge
May 2010
Drawing: 1003Watton.dwg