ARCHAEOLOGICAL SERVICES
DURHAM UNIVERSITY

on behalf of
GA Pet Food Partners Group Ltd

Asland Walks Energy Park
Borough of Chorley
Lancashire

geophysical survey

report 6025r
April 2025

Durham University

Contents

Figures

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1. Summary

The project

1.1 This report presents the results of a geophysical survey conducted in advance of the proposed development of Asland Walks Energy Park, Borough of Chorley, Lancashire. The works comprised approximately 32.5ha of magnetometer survey.

1.2 The works were commissioned by GA Pet Food Partners Group Ltd and conducted by Archaeological Services Durham University.

Results

1.3 Many former field boundaries were detected throughout the survey area, corresponding to those shown on 19th-century Ordnance Survey maps. One probable linear ditch detected in the east of the site may reflect another former field boundary.

1.4 Land drains follow the courses of the old boundaries, and link the many sets of field drains which were identified across the site.

1.5 Two probable former tracks were detected, in the north and south-west of the survey area.

1.6 No other features of probable archaeological origin have been identified in the survey.

1.7 Much of the site is underlain by deposits almost certainly associated with former river courses.

1.8 No utilities were detected in the survey.

2. Project background

Location (Figure 1)

2.1 The proposed development area (PDA) was located on land south of the A59 Banks Bridge, to the south-east of Tarleton, Borough of Chorley, Lancashire (NGR centre: SD 46110 19225). It is irregular in plan and covers an area of approximately 36.75ha. The land is bound in the west by the Rufford Branch of the Leeds and Liverpool Canal (former course of the River Asland/Douglas) and in the east by the current course of the River Asland/Douglas.

2.2 One survey of approximately 32.5ha was conducted across all surveyable parts of the PDA in two phases, approximately 25ha in 2023 and the remaining 7.5ha in 2025.

Development proposal

2.3 The proposed development is for a solar farm and wind turbine.

Objective

2.4 The aim of the survey was to assess the nature and extent of any sub-surface features of potential archaeological significance within the survey area, so that an informed decision may be made regarding the nature and scope of any further scheme of archaeological works that may be required in relation to the development.

Methods statement

2.5 The survey has been undertaken in accordance with instructions from the client, a method statement prepared by Archaeological Services Durham University and national standards and guidance (below, 5.1).

Dates

2.6 Fieldwork was undertaken between 18th-27th September 2023 and on 7th-8th April 2025. This report was originally prepared for October 2023 and revised in April 2025.

Personnel

2.7 Fieldwork was conducted by Duncan Hale, Richie Villis and Mark Woolston-Houshold. The geophysical data were processed by Richie Villis and Mark Woolston-Houshold. This report was prepared by Duncan Hale and Richie Villis, with illustrations by Janine Watson. The project manager was Peter Carne.

Archive/OASIS

2.8 The site code is **LCA23/LCA25**, for **L**ancashire **C**horley **A**sland 20**23**/20**25**. The survey archive is held at Archaeological Services Durham University. Archaeological Services Durham University is registered with the **O**nline **A**cces**S** to the **I**ndex of archaeological investigation**S** project (**OASIS**). The OASIS ID number for this project is **archaeol3-519494**.

Acknowledgements

2.9 Archaeological Services Durham University is grateful for the assistance of the landowner and tenant in facilitating this scheme of works.

3. Historical and archaeological background

3.1 A detailed archaeological desk-based assessment has been conducted for the proposed development (Archaeological Services 2023); the results of that assessment are summarised here.

3.2 There is no direct evidence for prehistoric or Roman activity within the proposed development area, although palaeoenvironmental evidence from peat recovered from nearby Plocks Farm does indicate that the landscape was probably exploited in the Bronze Age. Settlement from the prehistoric period would be expected to have been located on higher ground, and it is considered unlikely that development will impact on a significant archaeological resource from this period.

3.3 Medieval settlement was located away from the site, and it is probable that the site itself was undrained low-lying land next to the River Douglas at this time, making it unsuitable for agriculture.

3.4 The proposed development area was probably drained and enclosed in the post-medieval period for agricultural purposes. Evidence for associated field boundaries and cultivation may survive below ground, although this would be of limited significance.

3.5 The proposed development has some limited potential to impact upon any archaeological resource that may be present through any groundworks associated with the development, including installation of turbines, solar panels and associated utilities.

4. Landuse, topography and geology

4.1 At the time of survey in 2023 the proposed development area predominantly comprised a field of cereal stubble. Ploughing in the north-east of the field prevented survey in that part of the site; this was surveyed in April 2025 immediately after it had been rolled and seeded. Small parts of the site could not be surveyed due to the boggy nature of the ground, the depth of standing water or vegetation. Bands of young trees have been planted around much of the field. Two large drains were present in the field: one was aligned north-west/south-east in the north of the field and the other was aligned north-east/south-west in the south of the field. A small structure stood in the north of the main body of the field, in the north of the 2025 survey area.

4.2 The area was predominantly level with elevations of between 5-7m OD.

4.3 The underlying solid geology of the area comprises Permian and Triassic sandstone of the Sherwood Sandstone Group, which are overlain by tidal flat deposits of silt, clay and sand (British Geological Survey 2023).

5. Geophysical survey

Standards

5.1 The survey and reporting were conducted in accordance with the Chartered Institute for Archaeologists (CIfA) *Standard and Guidance for archaeological geophysical survey* (2020); the *EAC Guidelines for the Use of Geophysics in Archaeology* (Schmidt

et al. 2016); and the Archaeology Data Service & Digital Antiquity *Geophysical Data in Archaeology: A Guide to Good Practice* (Schmidt 2013).

Technique selection

5.2 Geophysical survey enables the relatively rapid and non-invasive identification of sub-surface features of potential archaeological significance and can involve a suite of complementary techniques such as magnetometry, earth electrical resistance, ground-penetrating radar, electromagnetic survey and topsoil magnetic susceptibility survey. Some techniques are more suitable than others in particular situations, depending on site-specific factors including the nature of likely targets; depth of likely targets; ground conditions; proximity of buildings, fences or services and the local geology and drift.

5.3 In this instance, based on desk-based research, it was considered likely that cut features such as ditches (eg former field boundaries) and pits might be present on the site, and that other types of feature such as trackways, wall foundations and fired structures (for example kilns and hearths) could also be present.

5.4 Given the anticipated nature and depth of targets, and the non-igneous geological environment of the study area, a magnetic technique, fluxgate gradiometry, was considered appropriate for detecting the types of feature mentioned above. This technique involves the use of magnetometers to detect and record anomalies in the vertical component of the Earth's magnetic field caused by variations in soil magnetic susceptibility or permanent magnetisation; such anomalies can reflect archaeological features.

Field methods

5.5 Magnetic gradient measurements were determined using a Sensys Magneto MX V3 multi-sensor magnetometer survey system towed by a quad-bike. Eight FGM650/3 fluxgate gradiometer sensors were mounted at 0.5m intervals, logging data at less than 0.08m intervals along traverses, providing high density data collection.

5.6 Data collection point locations were recorded using an integrated global navigation satellite system (GNSS) with real-time kinematic (RTK) correction typically providing 5-10mm accuracy and subsequently converted to the Ordnance Survey (OS) National Grid using the OSTN15 transformation.

5.7 Data were downloaded on site into a laptop computer for initial processing and storage and subsequently transferred to a desktop computer for processing, interpretation and archiving.

Data processing

5.8 Sensys MonMX, DLMGPS and MagnetoARCH software were used to record and display gradient and positional data, to create a matrix of gridded values at 0.2m by 0.2m intervals and to produce a continuous tone greyscale image of the raw data. TerraSurveyor software was then used to produce a continuous tone greyscale image of filtered data and trace plots; trace plots of the data were examined but are not presented in this report. The greyscale images are presented in Figures 2, 3 and 6; geophysical and archaeological interpretations are presented in Figures 4, 5, 7 and 8. In the greyscale images, positive magnetic anomalies are displayed as dark grey

and negative magnetic anomalies as light grey. Palette bars relate the greyscale intensities to anomaly values in nanoTesla.

5.9 The following basic processing functions have been applied to the data:

clip	clips data to specified maximum or minimum values; to eliminate large noise spikes; also generally makes statistical calculations more realistic
de-spike	locates and suppresses iron spikes in gradiometer data
interpolate	increases the number of data points in a survey to match sample and traverse intervals; in this instance the data have been interpolated to 0.1m x 0.1m intervals

5.10 The following filter has been applied to the magnetic data (Figures 3 and 6):

low pass filter	(applied with Gaussian weighting) to remove high frequency, small-scale spatial detail; for enhancing larger weak features and smoothing data

Interpretation: anomaly types

5.11 A colour-coded geophysical interpretation plan is provided. Three types of magnetic anomaly have been distinguished in the data:

positive magnetic	regions of anomalously high or positive magnetic field gradient, which may be associated with high magnetic susceptibility soil-filled structures such as pits and ditches
negative magnetic	regions of anomalously low or negative magnetic field gradient, which may correspond to features of low magnetic susceptibility such as wall footings and other concentrations of sedimentary rock or voids
dipolar magnetic	paired positive-negative magnetic anomalies, which typically reflect ferrous or fired materials (including fences and utilities) and/or fired structures such as kilns or hearths

Interpretation: features

5.12 A colour-coded archaeological interpretation plan is provided. For ease of reference, anomaly numbers shown bold in the text below (eg **a**, **b**, etc) are also shown on the archaeological interpretation plan.

5.13 Many linear and curvilinear positive magnetic anomalies have been detected throughout the survey area. The stronger, more prominent, anomalies reflect relative increases in high magnetic susceptibility materials and almost certainly represent the remains of soil-filled features, in this instance former field boundaries, as shown on 19th-century OS map editions. When the field boundaries were removed they were replaced with land drains.

5.14 One linear positive magnetic anomaly (**a**), detected in the east of the site, is parallel to a recorded former field boundary, and probably also reflects a former field boundary. This feature may have been short-lived as it was not recorded on the early maps.

5.15 The majority of the linear positive magnetic anomalies detected across the site are land drains, probably made with fired clay; a few further land drains are represented by negative or dipolar magnetic linear anomalies, probably reflecting stone or plastic drains. Each set of drains is represented by parallel anomalies spaced at regular intervals of approximately 10m.

5.16 Although not evident on the ground during survey, a band of strong positive and dipolar magnetic anomalies (**b**) detected in the narrow, northern end of the proposed development area almost certainly reflects a recent metalled track.

5.17 A slightly curved positive magnetic anomaly (**c**) was detected in the south-western corner of the survey. This anomaly almost certainly reflects a soil-filled ditch. It lies parallel to and approximately 5m west of a known former boundary and probably represents the western drainage ditch of a former earthen track.

5.18 Underneath most of the site the survey has detected a palimpsest of generally irregular positive magnetic anomalies. The anomalies range from strong to weak, broad to narrow, with some sinuous and others forming discrete patches. These anomalies together almost certainly reflect deposits laid down by former courses of the River Asland or Douglas.

5.19 Series of closely spaced positive and negative magnetic striations have been detected across the survey area, which almost certainly reflect the current plough texture. The planting and ploughing directions were different between the 2023 and 2025 phases of survey. In 2023 these were aligned broadly north-west/south-east; in 2025 the plough direction was aligned east-north-east/west-south-west.

5.20 Small, discrete dipolar magnetic anomalies have been detected across the survey area. These almost certainly reflect items of near-surface ferrous and/or fired debris, such as horseshoes and brick fragments, and in most cases have little or no archaeological significance. A sample of these is shown on the geophysical interpretation plan, however, they have been omitted from the archaeological interpretation plan.

5.21 Discrete areas containing high concentrations of these small dipolar magnetic anomalies were detected in the west (**d**) and north of the site. These concentrations are typically indicative of disturbed ground.

5.22 A large and strong dipolar magnetic anomaly has been detected in the north of the main body of the area (**e**): this corresponds to the structure in the field

6. Conclusions

6.1 Approximately 32.5ha of magnetometer survey was undertaken prior to the proposed development of Asland Walks Energy Park, Borough of Chorley, Lancashire.

6.2 Many former field boundaries were detected throughout the survey area, corresponding to those shown on 19th-century OS maps. One probable linear ditch detected in the east of the site may reflect another former field boundary.

6.3 Land drains follow the courses of the old boundaries, and link the many sets of field drains which were identified across the site.

6.4 Two probable former tracks were detected, in the north and south-west of the survey area.

6.5 No other features of probable archaeological origin have been identified in the survey.

6.6 Much of the site is underlain by deposits almost certainly associated with former river courses.

6.7 No utilities were detected in the survey.

7. Sources

Archaeological Services 2023 *Asland Walks Energy Park, Borough of Chorley, Lancashire: archaeological desk-based assessment*. Report **5995**, Archaeological Services Durham University

CIfA 2020 *Standard and Guidance for archaeological geophysical survey*. Chartered Institute for Archaeologists

Schmidt, A, 2013 *Geophysical Data in Archaeology: A Guide to Good Practice*. Archaeology Data Service & Digital Antiquity, Oxbow

Schmidt, A, Linford, P, Linford, N, David, A, Gaffney, C, Sarris, A & Fassbinder, J, 2016 *EAC Guidelines for the Use of Geophysics in Archaeology: Questions to Ask and Points to Consider*. EAC Guidelines **2**, Namur

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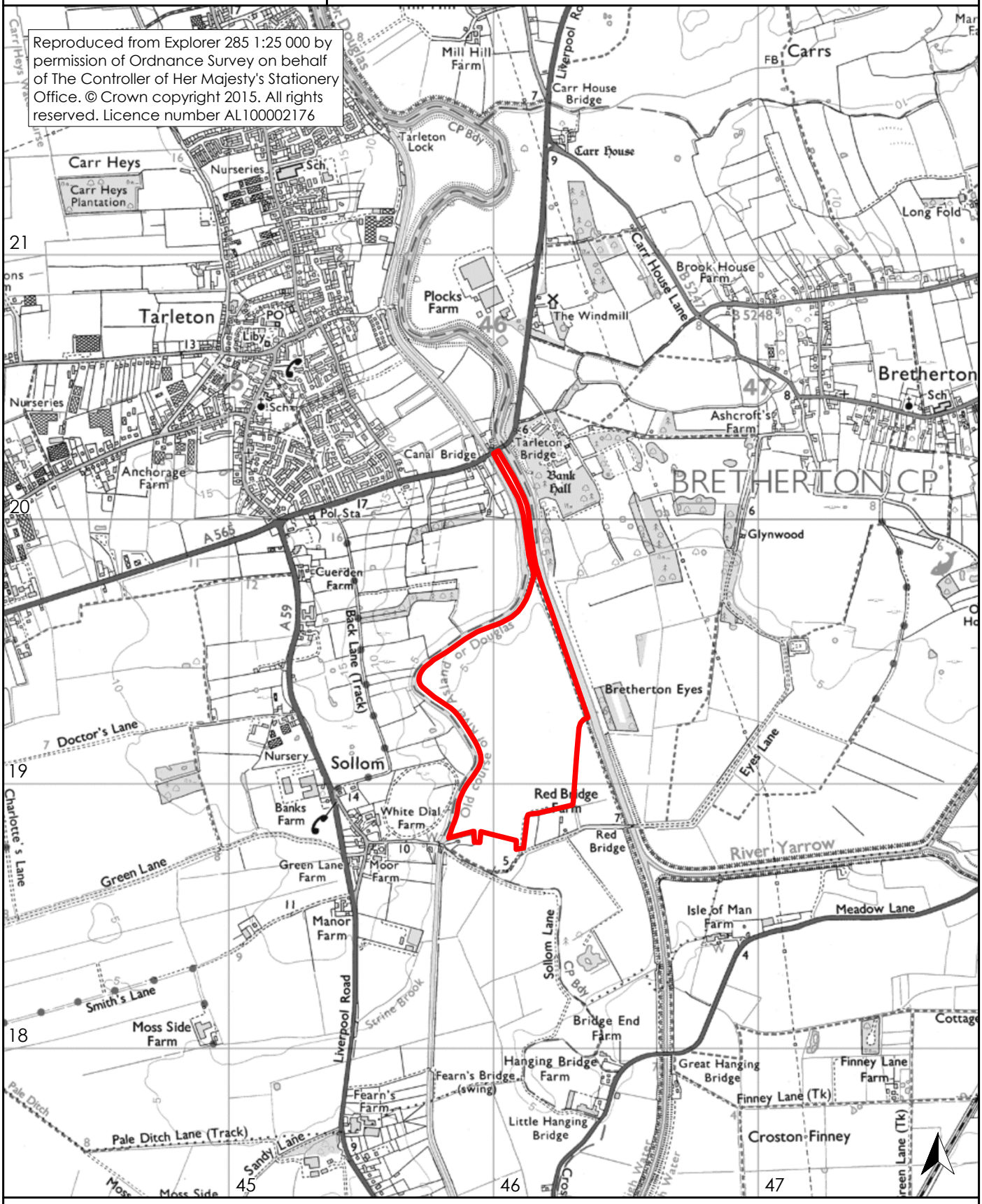
Figure 1: Site location



site boundary

0 1km
scale 1:20 000 for A4 plot

site boundary

magnetometer survey

-4 nT 6

A59

Bretherton Eyes

20

19

46

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0 250m
scale 1:5000 for A3 plot

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Figure 2: Magnetometer survey overview

site boundary

magnetometer survey

-4 nT 6

0 50m
scale 1:1000 for A1 plot

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Figure 3: Magnetometer survey (filtered data), northern area

Contains Ordnance Survey
Open Data © Crown copyright
and database right 2023

site boundary
magnetometer survey
dipolar magnetic anomaly
positive magnetic anomaly
negative magnetic anomaly

0 50m
scale 1:1000 for A1 plot

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Figure 4: Geophysical interpretation, northern area

site boundary
magnetometer survey
possible soil-filled feature
disturbed area
geological feature
track
former field boundary
land drain

0 50m
scale 1:1000 for A1 plot

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Figure 5: Archaeological interpretation, northern area

site boundary

magnetometer survey

-4 nT 6

0 50m
scale 1:1000 for A0 plot

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Figure 6: Magnetometer survey (filtered data), southern area

198
197
196
195
194
193
192
191
190
189
188

457 458 459 460 461 462 463 464

Track
Drain
Drain
Drain
Drain
CP & ED Bdy
CC
MLW
Sluice
Old Course of River
Aigburth Drain
Leeds and Liverpool Canal
Rufford Branch
Drain
CP & ED Bdy
CC
Pond
Track
Track
10.4m
LOCK LANE
Strand
Bridge
Drain
7.3m
Well
Sollom Lock
Lock
House
Ditch
Ditch
Barrowford
House
River Douglas
Path (um)
Path (um)
Scalmarsh
MHW
MLW
Sluice
Sluice
Drain
Drain
Drain
Red Bridge Farm
Ditch
Ditch
Track
4.6m
Drain
Path (um)

site boundary
magnetometer survey

dipolar magnetic anomaly
positive magnetic anomaly
negative magnetic anomaly

0 50m
scale 1:1000 for A0 plot

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Figure 7: Geophysical interpretation, southern area

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Figure 8: Archaeological interpretation, southern area