Archaeology South-East

ASE

Detailed Magnetometer Survey
Detailed Magnetometer Survey on Land at The Pines, Chelwood Gate, East Sussex

NGR: 541368 129952
(TQ 41368 29952)

Site Code: CPL18
OASIS ID: archaeol6-
ASE Project No: 180004
ASE Report No: 2018035
Wealden District Council
Planning Reference: WD/2017/2624/MAO

By John Cook

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Date of Issue:	February 2018		
Version:	2		

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Abstract

Archaeology South-East (ASE) was commissioned by Fairfax Acquisitions Ltd to undertake a geophysical survey on Land at The Pines, Chelwood Gate, East Sussex, NGR 541368 129952. The work was undertaken on Monday 29th January 2018.

Evidence for possible archaeological features was sparse across the site. Moderate positive anomalies. These anomalies may represent pits and ditches. However, these anomalies may relate to natural features such as tree boles. Areas of strong magnetic debris may relate to a scattering of near surface ferrous (iron) material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground. Dipolar anomalies may also indicate industry in the form of possible kilns or furnaces. But, these are more likely to relate to near surface ferrous objects.

Statement of Indemnity

Geophysical survey is the collection of data that relate to subtle variations in the form and nature of soil and which relies on there being a measurable difference between buried archaeological features and the natural geology. Geophysical techniques do not specifically target archaeological features and anomalies noted in the interpretation do not necessarily relate to buried archaeological features. As a result, magnetic and earth resistance detail survey may not always detect sub-surface archaeological features. This is particularly true when considering earlier periods of human activity, for example those periods that are not characterised by sedentary social activity.

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1.0 INTRODUCTION

1.1 Site background

1.1.1 Archaeology South-East (ASE) was commissioned by Fairfax Acquisitions Ltd to undertake a magnetometer survey on Land at The Pines, Chelwood Gate, East Sussex (centred on NGR 541368 129952; Figure 1).

1.1.2 It is understood that an outline application for residential development of the site has been submitted to Wealden District Council. The East Sussex County Council's (ESCC) Archaeologist (Greg Chuter) in his capacity as advisor to Wealden District Council has recommended a geophysical survey of the site to support the application.

1.1.3 A Written Scheme of Investigation (ASE 2018) was prepared by ASE for a geophysical survey.

1.2 Geology and topography

1.2.1 According to the online British Geological Survey 1:50,000 mapping, the bedrock geology of the site consists of Ashdown formation - sandstone and siltstone interbedded (BGS 2018).

1.2.2 The survey was undertaken over c.1 hectare of grassland to the north of Sandy Lane (Figure 2).

1.3 Aims of geophysical investigation

1.3.1 The general aim of this programme of geophysical survey is to obtain a better understanding of the archaeological potential of the site. The results of this fieldwork will allow informed decisions to be made as to the need, nature and scope of any further mitigation measures that may be required.

1.3.2 The geophysical survey comprised a detailed magnetometer survey within all accessible areas shown on Figure 2. The survey aimed to detect any anomalies of an archaeological origin that are within the boundaries of the survey area. The features detected will naturally be limited to those features that will produce a measurable response to the instrumentation used.

1.4 Scope of report

1.4.1 This report details the findings of the survey undertaken on the 29th January 2018. The project was conducted by John Cook with the assistance of Sophie Morrish. The project was managed by Vasilis Tsamis (fieldwork) and Dan Swift (post-excavation).

2.0 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

2.1.1 A detailed desk-based assessment (DBA) has already been prepared (ASE 2016) and is summarised below.

2.2 Prehistoric

2.2.1 Prehistoric material within the Weald tends to be sparse. The region was covered in dense forest throughout this period, and much of the known settlement pattern concentrates around the rim of the Weald, exploiting the better soils of the Chalk and Greensand. The small amount of prehistoric material that is known from the area tends to be of Mesolithic date and reflects activities associated with resource exploitation, often on a seasonal basis, and mainly comprises evidence for hunter gathering activity. Three flint findspots are recorded on the HER within the Study Area at Mill Brook, Chelwood Gate and Wickens Wood. Some small-scale agricultural exploitation of the more tractable soils is suggested by pollen evidence from the Neolithic onwards. Neolithic finds in this area are usually restricted to individual findspots of flint axe heads and other tools. Recent pipeline excavations in the Ashdown Forest revealed small flints dating to the Neolithic and Mesolithic periods. Two flint blade findspots at Birch Barn and Heron's Brook, as well as a flint concentration at Brookside are recorded on the HER within the Study Area.

2.2.2 Bronze Age activity in Sussex tends to focus on the South Downs and Coastal Plain. Activity in the area north of the Downs is very limited with a few isolated find spots of bronze axes perhaps indicating some utilisation of woodland resources, probably associated with woodland camps (Drewett, Rudling and Gardiner 1988, 112). A Bronze Age arrowhead is recorded on the HER within the Study Area to the northeast of the Site at the Isle of Thorns.

2.2.3 Activity in Sussex during the Iron Age continues the focus on the South Downs and Coastal plains, towards more intense systems of agriculture and the emergence of defended sites, notably hillforts. Despite a few scattered hillforts found across The Weald, Iron Age sites are still relatively sparse north of the Downs. Only one Iron Age site is recorded on the HER within the Study Area; the Scheduled Monument of Chelwood Gate Enclosure, which is located approximately 850 metres north of the site (see DBA para. 4.2.2).

2.2.4 A prehistoric trackway, the Ashdown Forest to Horsham Ridgeway, is recorded on the HER within the Study Area 31 metres northeast of the site.

2.3 Roman

2.3.1 As one of the nearest parts of Britain to the Continent, Sussex experienced contact with Rome from an early date, first as trade and then as conquest. Following the Roman invasion of AD43, the region became heavily settled, particularly along the Downs and the fertile Coastal Plain, where settlements were mostly associated with farming and are characterised by evidence of continuity with the previous Iron Age (Rudling 1999, 24). The Weald remained heavily wooded throughout the Romano-British period. Settlements also occur along principal routes such as Stane Street, which linked the major urban

centre of Chichester with London. The iron industry took advantage of the favourable Wealden landscape during the Romano-British period, although the evidence is sparse and often destroyed or obscured by later working. Hodgkinson (2008) notes two factors which make the Weald an appealing location for iron-working processes; its geology of clay and sandstone, which provide many of the structural needs for the industry (e.g. iron stone/ore), and its woodland, which was necessary for the production of charcoal, the fuel that kept the furnaces and forges alight. Within the Study Area are several areas of ancient woodland, the Mill Brook to the northeast as well as ponds and quarries likely to have originated from iron-working processes, although the date of such activities is unknown.

2.3.2 There is one site dating from the Romano-British period recorded on the HER within the Study Area, which is a probable iron-working cut feature at Beaconsfield Road *c.*140 metres east of the site. Although badly disturbed by modern services, the feature provides an indication that iron working was taking place in the immediate vicinity.

2.4 Early Medieval

2.4.1 The demise of Roman authority in Britain saw a return to older ways of life, with a gradual decline in both the economy and administration of the colony, and an influx of settlers from Germanic lands across the North Sea. This migration of Germanic peoples introduced a new language and material culture into southern and eastern Britain. However, knowledge of the period following the departure of the Romans is fragmentary, in part due to issues with dating evidence, as a result of the lack of official coinage and the decline of the big pottery industries.#

2.4.2 During the early medieval period, the Weald was largely covered by the great forest of *Andredeswald*, which was known to the Romans as *Sylva Anderida* and is known today as The Ashdown Forest. The heavily forested nature of the region limited settlement at this period, and the iron-working industry seems to have shrunk in scale in comparison with the Roman period. What is known is that the Weald was an important area for seasonal swine pastures established as extra-territorial parcels of land associated with parent manors situated on better soils elsewhere in the region.

2.4.3 Reverend Edward Turner, writing in 1862, reported that the Chelwood Gate enclosure was known locally as ‘Dane’s Churchyard’, after a tradition that it was the burial place for Danes slaughtered at a battle with the Saxons.

2.5 Medieval

2.5.1 By Domesday, the Wealden landscape had incorporated settlements and agriculture mainly of a pastoral nature but also included some early ‘irregular’ open-field systems that were later enclosed. Ridge and furrow evidence recorded on the HER within the Study Area indicates partial cultivation during the medieval and/or post-medieval periods.

2.5.2 As previously noted, the site’s geological area would have made it a favourable location for iron production, which was a prolific industry within the Weald during the Roman occupation and the Tudor and early Stuart periods. Although it appears 1.4km northwest of the site and outside of the Study Area, the 16th

century blast furnace site, known as 'Stumbletts Furnace' (Historic England ref. 1002202) demonstrates local iron-working activity continuing from the Romano-British to medieval periods within the broader landscape.

2.5.3 The Normans created the Ashdown Forest as an area where Forest law applied; this law was designed to protect the venison and the vert (e.g. the animals of the hunt and the foliage that they consumed). Forest law also prescribed harsh punishment for anyone who committed any of a range of offences within these areas. Forests were designed as hunting areas for the monarch and aristocracy. Following the Conquest, The Ashdown Forest (DBA Fig. 3) accounted for much of the Rape of Pevensey and was therefore known as the forest of Pevensey in the early medieval period (Lower 1870: 21). In 1377, Edward III granted the forest to his son, John of Gaunt, and from this time it was also referred to as Lancaster Great Park. The forest was originally enclosed by a pale (derived from pallisade) which was a ditch with a fence on top to prevent the escape of the deer, this pale was about twenty-four miles long with thirty-four gates, one of which is at Chelwood and probably explains the derivation of the place-name. There were two types of entrance to the forest; a gate that a cart and horses could go through and a hatch where people could enter into the forest. Chelwood Gate was one of the entrances into the Ashdown Forest through which John of Gaunt (1340 - 1399) the third surviving son of King Edward III would have entered the forest from his hunting lodge.

2.6 Post-medieval

2.6.1 The Great Park was mostly used as a royal hunting ground, and was well stocked with deer, horses and black grouse (Lower 1870: 22). However, the park became neglected and its stock depleted, particularly during the 16th and 17th centuries (Turner 1862: 50-52), and was included in a major survey of Crown lands in 1658 (DBA Fig. 4), intended to ensure the more efficient use of the forest (Margary 1940: 137). At this time, Chelwood Gate is recorded on the periphery to the southwest. With the sale of Crown lands in the reign of Charles I, the forest passed to the Earl of Bristol in 1662 who was also granted power of enclosure. However, subsequent attempts to enclose the land met with repeated opposition from commoners who held land within the park, and also from neighbouring freeholders who retained the right of pasture within the forest (Straker 1940: 124). A second government survey was undertaken in 1692-3 (DBA Fig. 5) which divided the forest into large warrens, centred on existing lodges. Chelwood Gate is not recorded on this survey but also appears on the periphery to the southwest. Both the 1658 and 1692-3 surveys give a broader understanding of the wider landscape during this period. Stumblewood and Chelwood Commons, bordering The Ashwood Forest, in the Manor of Broadhurst, were enclosed in 1864 (ESRO ref. QDD/6/13); the resultant subdivision of Chelwood Common into plots is reflected in its present character.

2.7 The Archive

2.7.1 The digital and paper archive derived from this project will be housed at Archaeology South-East's Sussex office and will be combined with any further archive generated in the event of further fieldwork being required.

3.0 SURVEY METHODOLOGY

3.1 Geophysical survey

3.1.1 A fluxgate gradiometer (magnetometry) survey was undertaken across approximately 1ha of land as depicted on Figure 2. The work was undertaken on Monday 29th January 2018 in cool overcast conditions.

3.2 Applied geophysical instrumentation

3.2.1 The Fluxgate Gradiometer employed was the Bartington Instrumentation Grad 601-2. The Grad 601-2 has an internal memory and a data logger that store the survey data. This data is downloaded into a PC and is then processed in a suitable software package.

3.2.2 30m x 30m grids were set out using a GPS (see below). Each grid was surveyed with 1m traverses and samples were taken every 0.25m.

3.2.3 Data was collected along north-south traverses in a zigzag pattern beginning in the south west corner of each grid, following the contours of the site.

3.3 Instrumentation used for setting out the survey grid

3.3.1 The survey grid for the site was geo-referenced using a Leica Viva SmartRover. The GPS receiver collects satellite data to determine its position and uses the mobile phone networks to receive corrections, transmitting them to the RTK Rover via Bluetooth to provide a sub centimetre Ordnance Survey position and height. Each surveyed grid point has an Ordnance Survey position; therefore, the geophysical survey can be directly referenced to the Ordnance Survey National Grid.

3.4 Data processing

3.4.1 All of the geophysical data processing was carried out using TerraSurveyor published by DW Consulting. Minimally processed data was produced using the following schedule of processing. Due to the very high positive readings of some of the magnetic disturbance, the values were replaced with a dummy value so as to avoid detrimentally affecting the dataset when further processed. The first process carried out upon the data was to apply a DESPIKE to the data set which removes the random ‘iron spikes’ that occur within fluxgate gradiometer survey data. A ZERO MEDIAN TRAVERSE was then applied to survey data. This removes stripe effects within grids and ensures that the survey grid edges match.

3.5 Data presentation

3.5.1 Data is presented using images exported from TerraSurveyor into AutoCAD software and inserted into the geo-referenced site grid. Data is presented as raw and processed data greyscale plots (Figures 3 and 4).

4.0 GEOPHYSICAL SURVEY RESULTS

4.1 Description of site

4.1.1 The survey was undertaken over grassland in a single enclosure on a south facing slope bounded by hedgerows (Figure 2). General site photographs are shown in Figure 7 and their locations recorded on Figure 2.

4.2 Survey limitations

4.2.1 Physical obstructions encountered on site, included areas of fallen branches, hidden dips, wire fences, piles of logs and a livestock trailer as well as the steepness of the terrain, particularly in the north-west corner of the site. In addition, the effectiveness of magnetometer surveys depends on a contrast between the absolute magnetic susceptibility of the topsoil to the underlying subsoil (Clark 1996). Features may also be difficult to detect where there has been significant primary silting and development of significant overburden. Areas where physical obstructions form a barrier to survey, or a health and safety issue, have been omitted. The site lies over Ashdown formation - sandstone and siltstone interbedded. The response to magnetometer survey is variable on this geology (English Heritage 2008).

4.3 Introduction to results

4.3.1 The results should be read in conjunction with the figures at the end of this report. The types of features likely to be identified are discussed below.

Positive Magnetic Anomalies

4.3.2 Positive anomalies generally represent cut features that have been in-filled with magnetically enhanced material.

Negative Magnetic Anomalies

4.3.3 Negative anomalies generally represent buried features such as banks or compacted ground that have a lower magnetic signature in comparison to the background geology.

Magnetic Disturbance

4.3.4 Magnetic disturbance is generally associated with interference caused by modern ferrous features such as fences and service pipes or cables.

Magnetic Debris

4.3.5 Low amplitude magnetic debris consists of a number of dipolar responses spread over an area and is indicative of ground disturbance.

Dipolar Anomalies

4.3.6 Dipolar anomalies are positive anomalies with an associated negative response. These anomalies are usually associated with discreet ferrous objects or may represent buried kilns or ovens.

Bipolar Anomalies

4.3.7 Bipolar anomalies consist of alternating responses of positive and negative magnetic signatures. Interpretation will depend on the strength of these responses; modern pipelines and cables typically produce strong bipolar responses.

Thermoremanence

4.3.8 Thermoremanence is most commonly encountered through the magnetizing of clay through the firing process although stones and soils can also acquire thermoremanence.

4.3.9 Magnetism from ferromagnetic materials (iron) and from thermoremanence are forms of permanent magnetism and in most cases a magnetometer will not enable the separation of anomalies into the two categories. The interpretation of these anomalies into either category relies on field strength within an area. Magnetic anomalies due to iron normally rise and fall rapidly, forming a 'spike' in the data.

4.4 Interpretation of fluxgate gradiometer results (Figure 5)

4.4.1 The interpretation of fluxgate gradiometer results should be read in conjunction with the figures at the end of the report. Specific examples of anomaly types may be numbered in the figures and text but not all anomalies are numbered.

4.4.2 Evidence of possible archaeological activity included the following described anomalies. The most obvious possible archaeological anomalies are the positive anomalies (coloured green) noted across the site. These may relate to cut features such as pits and ditches. Although, these may have a natural origin. In addition, plough marks create linear anomalies that may be mistaken for ditches.

4.4.3 Areas of magnetic debris may relate to a scattering of near surface ferrous material, demolished buildings, former field boundaries, ground disturbance or made ground (dotted brown).

4.4.4 Dipolar anomalies (pink dots) may relate to possible thermoremanent magnetic enhancement, such as kilns or furnaces, but are more likely due to near surface ferrous (iron) objects.

4.4.5 Areas of magnetic disturbance caused by large nearby metallic objects and nearby services (shaded brown) are noted mostly in the extreme western extent of the survey and may obscure any underlying archaeological features.

4.4.6 Services are known to run across the site within the immediate vicinity of the survey and account for some of the magnetic disturbance in the north of the site.

5.0 CONCLUSIONS

5.1 Discussion

5.1.1 The magnetometer survey did reveal a number of anomalies across the investigation site, discussed below. However, it should be noted that this technique does not allow for specific dating of features and may not detect certain features such as small post holes or magnetically inert features. In addition, magnetometry is a near surface technique and therefore areas of overburden may mask subtle features.

5.1.2 Evidence for possible archaeological features was sparse across the site. Moderate positive anomalies (A1, Figure 5). These anomalies may represent pits and ditches. However, these anomalies may relate to natural features such as tree boles. Areas of strong magnetic debris (A2) may relate to a scattering of near surface ferrous (iron) material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground. Dipolar anomalies (A3) may also indicate industry in the form of possible kilns or furnaces. However, these are more likely to relate to near surface ferrous objects.

5.1.3 Magnetic disturbance (A4) is noted in the north of the site. These anomalies relate to nearby magnetic objects such services and nearby buildings.

5.1.4 With regards to the site-specific research aims, several possible archaeological features were encountered across the site. However, it is not possible to attach confident dates to these features based upon the geophysics survey results.

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Acknowledgements

Archaeology South-East would like to thank Fairfax Acquisitions Ltd for commissioning the survey and Greg Chuter (ESCC) for his monitoring and guidance.

HER Summary

HER enquiry number	N/A					
Site code	CPL18					
Project code	180004					
Planning reference	WD/2017/2624/MAO					
Site address	Land at The Pines, Chelwood Gate, East Sussex					
District/Borough	Wealden					
NGR (12 figures)	541368 129952					
Geology	Ashdown formation - sandstone and siltstone interbedded					
Fieldwork type					Survey	
Date of fieldwork	10th to 12th January 2018					
Sponsor/client	Fairfax Acquisitions Ltd					
Project manager	Vasilis Tsamis					
Project supervisor	John Cook					
Period summary						
Project summary	*Archaeology South-East (ASE) was commissioned by Fairfax Acquisitions Ltd to undertake a geophysical survey on Land at The Pines, Chelwood Gate, East Sussex, NGR 541368 129952. The work was undertaken on Monday 29th January 2018.* *Evidence for possible archaeological features was sparse across the site. Moderate positive anomalies. These anomalies may represent pits and ditches. However, these anomalies may relate to natural features such as tree boles. Areas of strong magnetic debris may relate to a scattering of near surface ferrous (iron) material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground. Dipolar anomalies may also indicate industry in the form of possible kilns or furnaces. But, these are more likely to relate to near surface ferrous objects*					
Museum/Accession No.	N/A					

OASIS form

OASIS ID: archaeol6-308521

Project details	
Project name	Detailed Magnetometer Survey Detailed Magnetometer Survey on Land at The Pines, Chelwood Gate, East Sussex
Short description of the project	Archaeology South-East (ASE) was commissioned by Fairfax Acquisitions Ltd to undertake a geophysical survey on Land at The Pines, Chelwood Gate, East Sussex, NGR 541368 129952. The work was undertaken on Monday 29th January 2018. Evidence for possible archaeological features was sparse across the site. Moderate positive anomalies. These anomalies may represent pits and ditches. However, these anomalies may relate to natural features such as tree boles. Areas of strong magnetic debris may relate to a scattering of near surface ferrous (iron) material, demolished buildings, former field boundaries, ground disturbance, former industrial activity or made ground. Dipolar anomalies may also indicate industry in the form of possible kilns or furnaces. But, these are more likely to relate to near surface ferrous objects
Project dates	Start: 29-01-2018 End: 29-01-2018
Previous/future work	Yes / Not known
Any associated project reference codes	180004 - Contracting Unit No.
Any associated project reference codes	CPL18 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 3 - Disturbed
Monument type	NONE None
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Housing estate
Prompt	Planning condition
Position in the planning process	Not known / Not recorded
Solid geology (other)	Ashdown Forest Formation - Sandstone and siltstone interbedded
Drift geology	Unknown
Techniques	Magnetometry
Project location	
Country	England
Site location	EAST SUSSEX WEALDEN DANEHILL Land at The Pines, Chelwood Gate, East Sussex
Postcode	RH17 7DB
Study area	0.7 Hectares
Site coordinates	TQ 41368 29952 51.050938624714 0.01715281127 51 03 03 N 000 01 01 E Point
Project creators	
Name of Organisation	Archaeology South-East

Project brief originator	Fairfax Acquisitions Ltd
Project design originator	Archaeology South-East
Project director/manager	Vasilis Tsamis
Project supervisor	John Cook
Type of sponsor/funding body	Developer
Name of sponsor/funding body	Fairfax Acquisitions Ltd

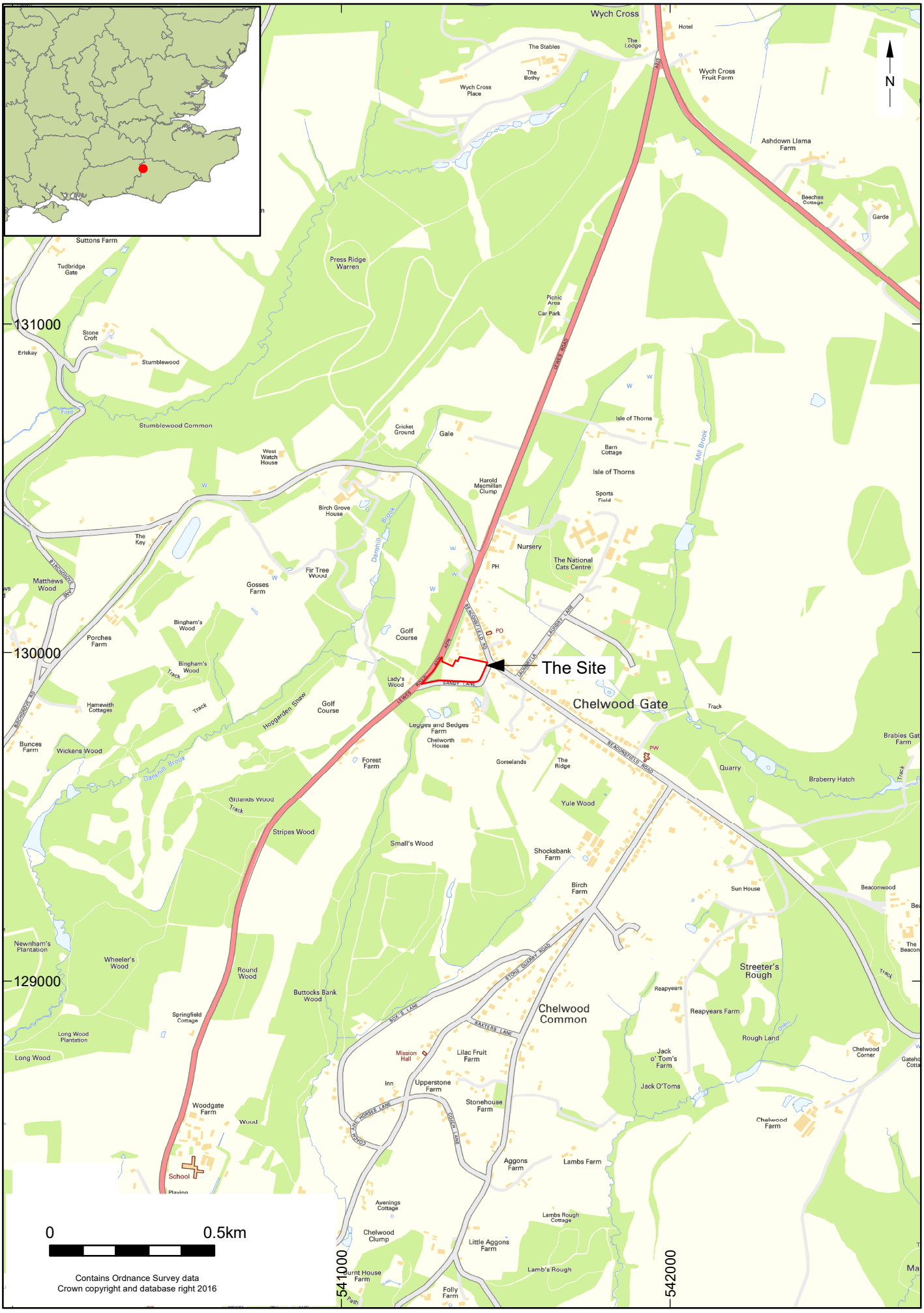
Project archives

Physical Archive Exists?	No
Digital Archive recipient	ASE
Digital Media available	"Geophysics","Images raster / digital photography"
Paper Archive recipient	ASE
Paper Media available	"Report","Unpublished Text"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Detailed Magnetometer Survey Detailed Magnetometer Survey on Land at The Pines, Chelwood Gate, East Sussex
Author(s)/Editor(s)	Cook, J.
Other bibliographic details	Report number: 2018035
Date	2018
Issuer or publisher	Archaeology South-East
Place of issue or publication	Portslade

Entered by	John Cook (john.cook@ucl.ac.uk)
Entered on	7 February 2018



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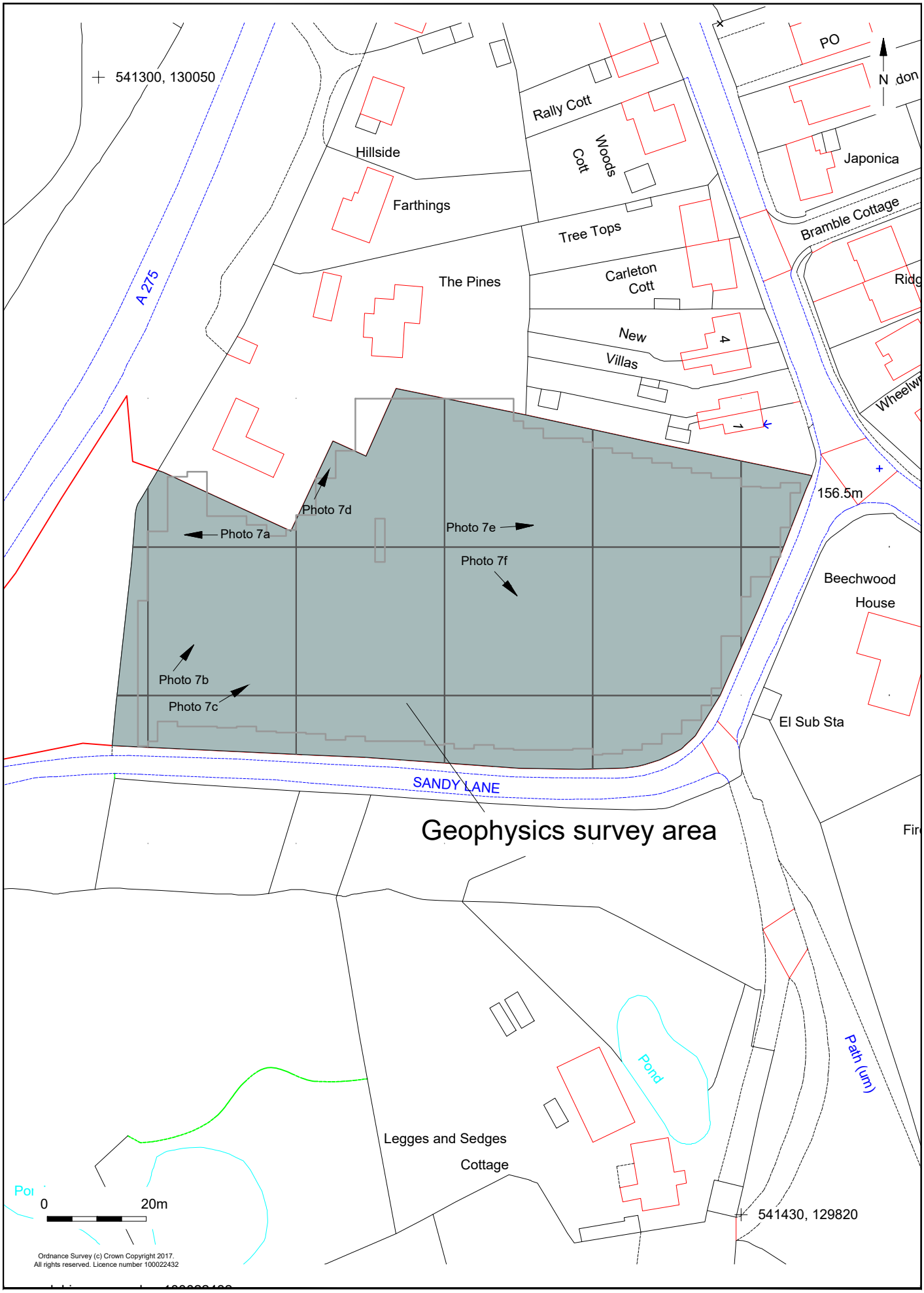
Project Ref: 180004	February 2018	Site location	
Report Ref: 2018035	Drawn by: JC		



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Project Ref: 180004	January 2018	Location of geophysics survey area	
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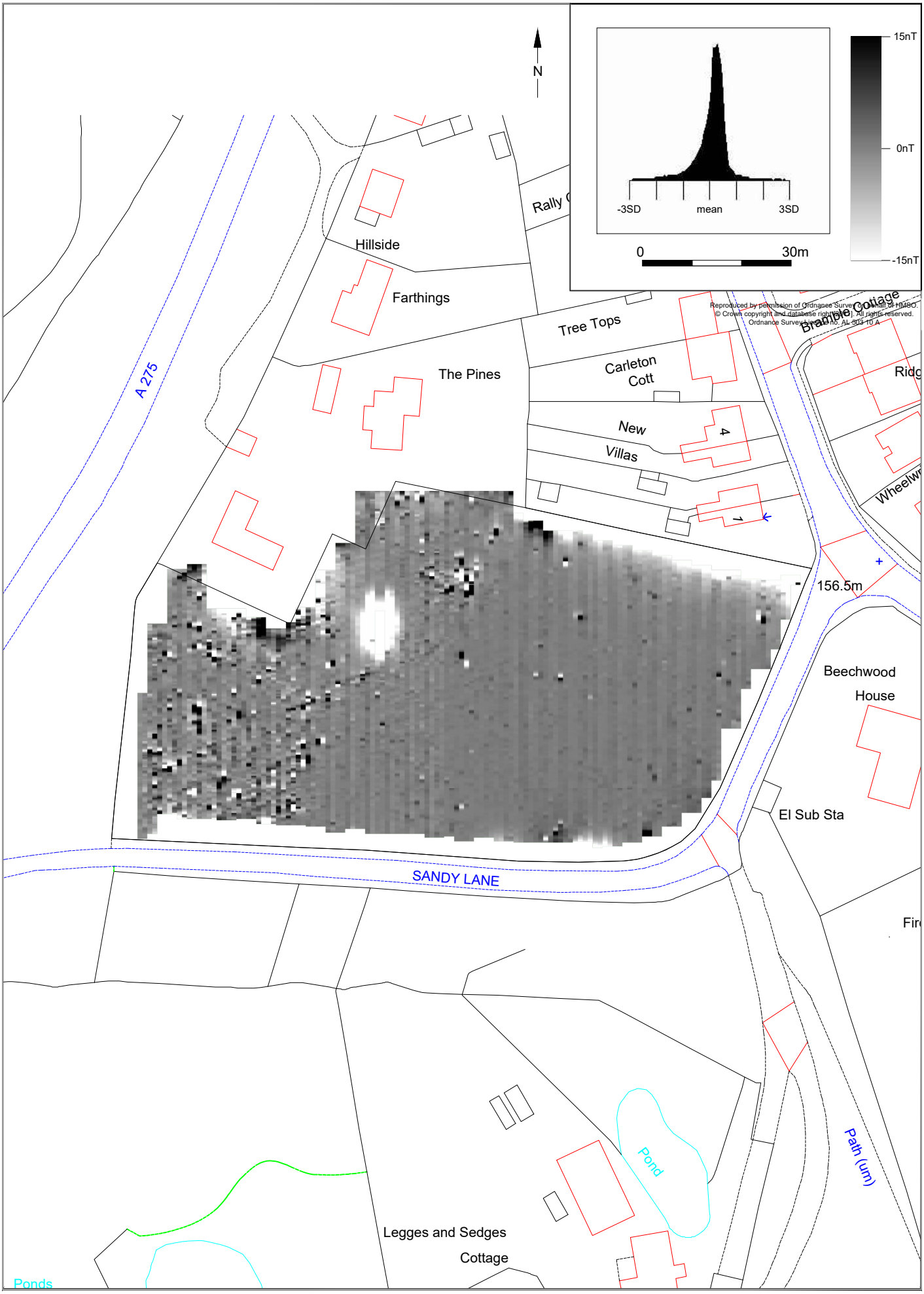

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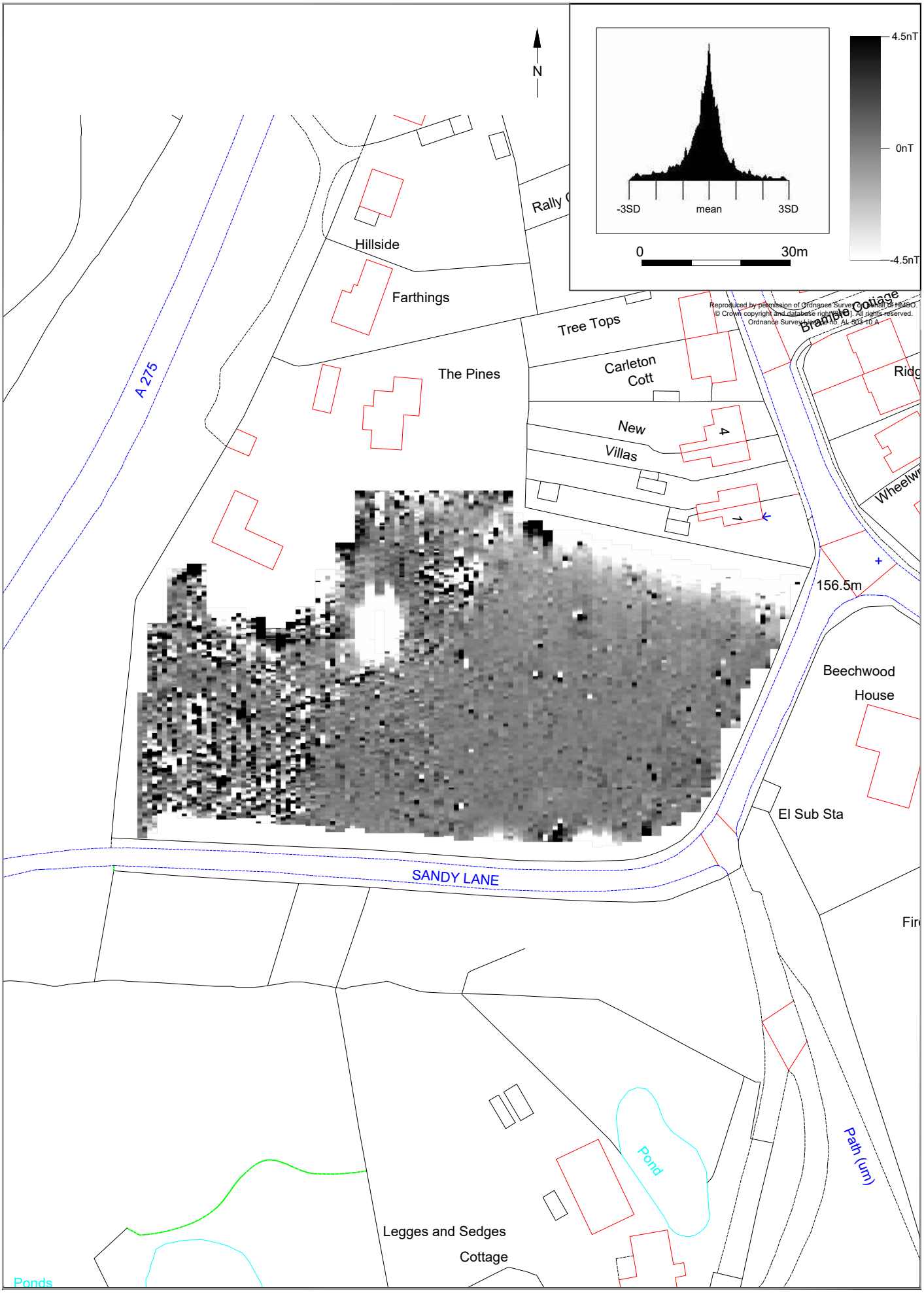
Project Ref: 180004	January 2018	Raw data	
Report Ref: 2018035	Drawn by: JC		



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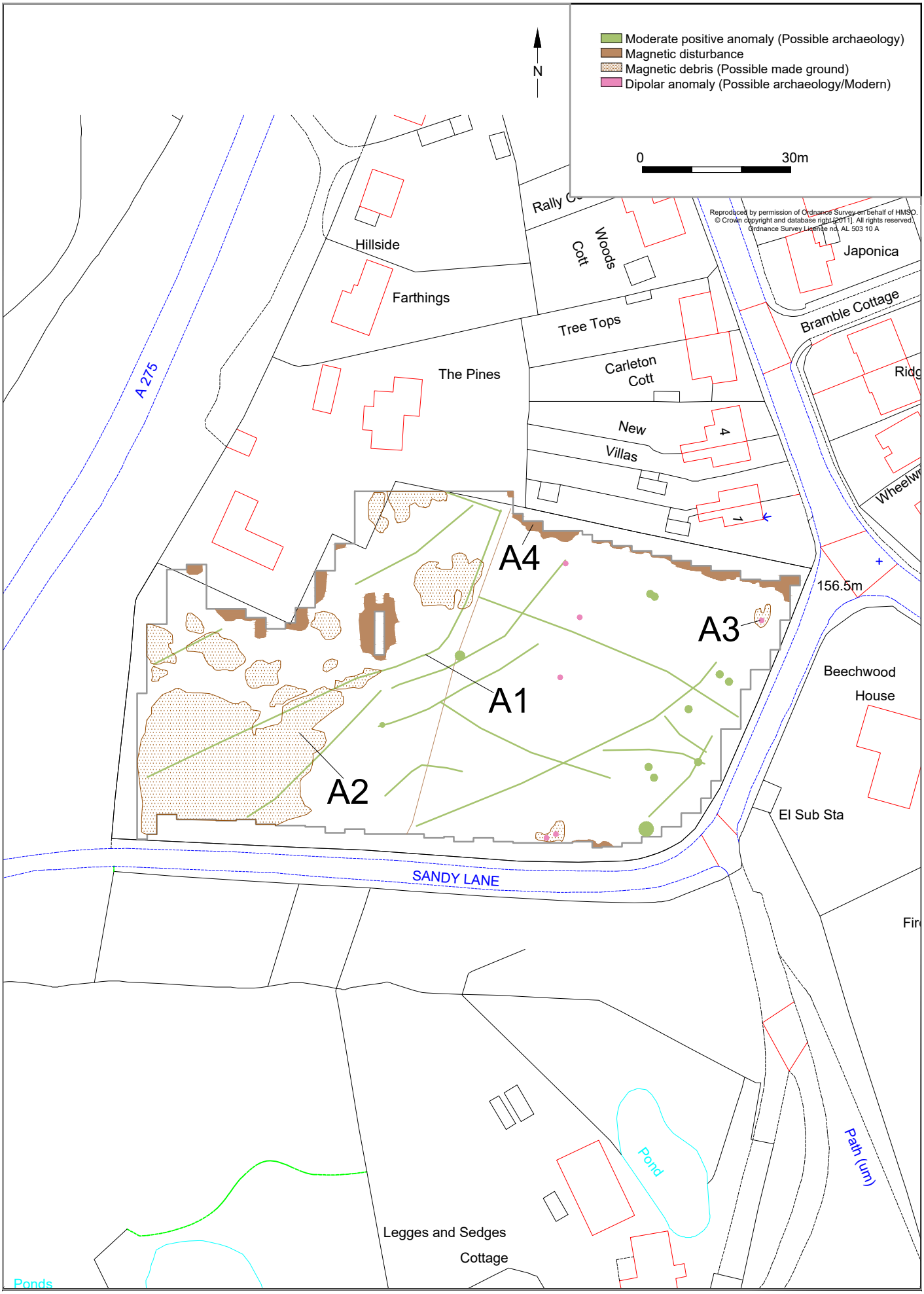
Project Ref: 180004	January 2018	Processed data	
Report Ref: 2018035	Drawn by: JC		



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Project Ref: 180004	January 2018	Interpretation	
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Fig. 6a Oblique Google Earth imagery

Fig. 6b Oblique Google Earth 3D imagery with geophysical survey data overlain

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Project Ref: 180004	January 2018	Google Earth images	
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Photo 7a

Photo 7b

Photo 7c

Photo 7d

Photo 7e

Photo 7f

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Project Ref: 180004	January 2018	Site photographs	
Report Ref: 2018035	Drawn by: JC		

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