

**Geoarchaeological Watching Brief Report  
Oaken Wood, Hermitage Quarry  
Maidstone, Kent**

**NGR: 572115,155680**

**ASE Project No: 6297  
Site Code: OWH13**

**ASE Report No: 2014321  
OASIS id: archaeol6-190894**



**By Matt Pope**

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**September 2014**

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**Abstract**

*In December 2013 Archaeology South-East were commissioned by CgMs Consulting to undertake an archaeological and geoarchaeological watching brief at Oaken Wood, Hermitage Quarry, Kent. No archaeological features were identified during the removal of woodland. The construction of a tunnel revealed a gull feature which contained Pleistocene sediment and a doline which also contained sediment. Due to the nature and timing of the works and the depth of excavations samples were unable to be collected from the gull; the doline remains to be investigated. This phase has demonstrated that gulls and dolines are present at the site and these have the potential to hold archaeological and palaeoenvironmental material from both the Pleistocene and Holocene.*

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## **1.0 INTRODUCTION**

### **1.1 Site Background**

1.1.1 Archaeology South-East (ASE), the contracting division of the Centre for Applied Archaeology (CAA), Institute of Archaeology (IoA), University College London (UCL) was commissioned by CgMs Consulting Ltd to undertake a geoarchaeological watching brief during the construction of a tunnel to access a quarry extraction area at Oaken Wood, Hermitage Quarry, Maidstone, Kent (Figure 1, NGR 572115,155680).

1.1.2 The access works comprised a 'cut and cover' tunnel from the existing quarry to the east and the creation of a working area to the west (Figure 2). Following the creation of the tunnel and working area a c. 5 year programme of woodland management will be instigated prior to the main phase of extraction.

### **1.2 Geology and Topography**

1.2.1 The British Geological Survey (BGS) shows the northern two thirds of the proposed quarry as being Hythe Formation bedrock (interbedded sandstone and subequal and subordinate limestone) sealed by superficial head deposits. The southern third is shown as Sandgate Formation bedrock (sandstone, siltstone and mudstone). Both formations date to the Cretaceous period.

1.2.2 The Hermitage quarry has been documented as exposing gull and doline-like features within the Hythe beds. Gulls are widened joints in the Cretaceous bedrock and dolines are solution structures. Both features are presumed to be infilled with Pleistocene and, potentially, Holocene sediments. These features have been demonstrated to have potential for the preservation of primary context artefactual material from Palaeolithic, Mesolithic and later prehistoric periods. Two recently investigated localities, Glaston in Rutland and Beedings, West Sussex, have produced nationally important artefactual assemblages from such features dating to the Early Upper Palaeolithic (Pope 2007-8).

### **1.3 Planning Background**

1.3.1 Following discussion between CgMs Consulting, their client and the KCC Heritage Conservation Group it was established that the site may contain geological features, 'gulls', which have the potential to preserve archaeological/geoarchaeological artefacts/ecofacts.

### **1.4 Research Aims and Objectives**

1.4.1 The aims of the geoarchaeological investigation are to ascertain:

- Whether gull features exist on the site
- If the gull features contain geoarchaeological/archaeological artefacts/ecofacts

- The character date and quality of ancient remains and deposits and their potential for further study
- How they might be affected by the development of the site
- What options should be considered for mitigation
- To make public the results of the investigation, subject to any confidentiality restrictions.

1.4.2 Should the investigation establish the presence of geoarchaeological/archaeological remains; the research aims of the investigation should take into account the forthcoming South East Research Framework.

## **1.5 Scope of Report**

1.5.1 The current report provides results of the geoarchaeological work carried out at Oaken Wood between December 2013 and May 2014. The fieldwork was conducted by Matt Pope with archaeological support being provided by Guy Hopkinson. The project was managed by Jon Sygrave (fieldwork) and by Jim Stevenson and Dan Swift (post-excavation).

## **2.0 ARCHAEOLOGICAL BACKGROUND**

### **2.1 Overview**

2.1.1 Existing documents relating to the site include: a Desk-based Assessment (OA 2010) covering the broader archaeological background for the site; an Environmental Archaeological Assessment (QUEST 2012) examining the potential of soils on the site and an aerial photographic analysis (Deegan 2012). The information within these documents is not repeated in full here.

### **2.2 Summary**

2.2.1 The formation of gull features typically occurs when stronger, permeable rock overlies weaker and impermeable beds such as mudstone. The stronger overburden develops a local dip and a fracture forms, when these occur on the valley sides these are known as gulls. These fractures then become sediment traps for softer material which are more likely to preserve palaeoenvironmental and archaeological material.

2.2.2 Dolines form by the dissolution of underlying deposits which causes the ground to collapse to create a sinkhole. This again forms a sediment trap where surrounding environmental conditions can be reconstructed by the information contained in the sediment.

2.2.3 The work carried out at Beedings (Pope 2009) involved the excavation of a fissure which contained Upper Palaeolithic tools. The potential of these features to preserve both archaeological and palaeoenvironmental material is well known but only occasionally subjected to modern excavation and analysis techniques.

2.2.4 There are no scheduled ancient monuments in at the site which is designated as '*Ancient and Semi-Natural Woodland*' by English Nature. The site has been considered to have low-moderate potential for prehistoric to medieval archaeology (OA 2010). The majority of the landscape features identified by the aerial photographic assessment are likely to be post-medieval in date.

2.2.5 The pollen analyses carried out by QUEST (2012) took samples from the top and subsoils at the site. This demonstrated that pollen and seeds survived within these deposits that characterised the surrounding woodland and areas of cultivation.

### **3.0 ARCHAEOLOGICAL METHODOLOGY**

#### **3.1 Fieldwork Methodology**

- 3.1.1 All intrusive ground works were aimed to be monitored by an archaeologist. This comprised the top and subsoil strip ahead of the cut and cover excavation for the access tunnel and the working area. Any deposits encountered were recording using *pro-forma* context sheets and digital photography. Where appropriate hand drawings were made on drafting film at a scale of 1:20 or 1:50.
- 3.1.2 Any machine used for removal of material above undisturbed natural geology was fitted with a toothless bucket of appropriate width whenever practicable.
- 3.1.3 When potential gull features were identified during the ground reduction a geoarchaeologist experienced in the excavation of such features attended the site where possible. The site was recorded by written record and supplemented by digital photography.

#### **3.2 Fieldwork Constraints**

- 3.2.1 The nature of topsoil removal and the grubbing out of trees made the conducting of an effective watching brief difficult and no features were observed prior to deeper excavation. The nature of the deeper excavations involved the use of blasting as well as machine excavation and left high unsupported sections in some areas. The timing of these works and the availability of a geoarchaeologist were difficult to reconcile and the section which exposed the gull features was unsafe to allow sampling at the time of monitoring. A written and photographic record was made of the doline and gull features but no samples were recovered.

#### **3.3 The Site Archive**

- 3.3.1 The site archive is currently held at the offices of ASE and will be deposited at an appropriate repository in due course. The contents of the archive are tabulated below (Table 1).

No. of files/paper record	1
Photographs	20

Table 1: Quantification of site archive



## **4.0 RESULTS**

### **4.1 Archaeological watching brief**

4.1.1 In advance of the tunnel works the area was cleared of woodland and the stumps grubbed-out. In some areas the topsoil had been removed and the head deposits were exposed, no features were recorded during these works.

### **4.2 Geoarchaeological watching brief**

4.2.1 The geoarchaeological watching brief was carried out after excavation by blasting and machine of the area for tunnel access (c. 50x10x10m) and the first extraction/working area. The topsoil and head were removed to 3m depth across a c. 3.5ha area exposing the surface of the Lower Greensand.

4.2.2 The tunnel cut exposed a single gull (fissure feature) on one side of the excavation (Figures 3 and 4). The fissure appeared up to 3m wide at the surface, narrowing to c.1m and continued to the base of the excavation (c.10m). The fissure was consistent with a Lower Greensand gull or widened joint and the fill consistent with Pleistocene head with a possible loessic content.

4.2.3 The removal of head in the first extraction area exposed at least one significant solution feature (possible doline) which may or may not be associated with gulls at depth (Figure 5). The feature had an apparent width of 30m and contained deposits consistent with stratified Pleistocene head. As the probable doline feature was observed in the uncleaned 45° battered section of the excavation edge, further features in the section cannot be discounted.

4.2.4 The extraction area section also showed that the overlying head appears to have been at a consistent c. 3m depth, with localised deeper areas suggesting the presence of further features. The presence of the probable doline in the section also suggests that there may be other solution or gull features within the wider excavation area, currently masked by the disturbed surface left after the removal of the head deposit.

## **5.0 DISCUSSION AND CONCLUSIONS**

### **5.1 Summary**

5.1.1 The works undertaken have been useful in demonstrating the presence of gulls and solution features at the site. The question now is to determine how prevalent these are within the proposed extraction areas and how a methodology can be refined for their identification and investigation in the future.

5.1.2 During the removal of the woodland, only parts of the surface of the head deposits were visible as the majority of the area was subject to grubbing out of tree stumps. No archaeological features were recorded but when wholesale stripping of larger areas, using a bladed bucket, is undertaken then it may be possible to identify features.

### **5.2 Methodological and mitigation considerations**

5.2.1 The gull exposed in the tunnel area is now covered and further excavation in this area is not possible due to Health and Safety concerns.

5.2.2 The doline is still exposed in a sloping section in the working/first extraction area and it is proposed that this feature is sampled for OSL dating and geochemical/sedimentary composition as per section 5.8 of the Project Design (ASE 2013). The results of the assessment of these sediments will help to determine their significance as capture points for archaeology, palaeoenvironmental and palaeoclimate records. The fieldwork required to sample the doline will require considerations of timing and health and safety to achieve.

5.2.3 The truncated surface of the working/first extraction area may still contain evidence of gull or doline features. Therefore it is proposed that a walkover survey should be undertaken in order to try and map their occurrence to determine where they may cross other extraction areas.

5.2.4 It is likely that the tops of gull and doline features are within the head deposit, as evidenced by the doline in the first extraction area. They may also not be identifiable in plan when the topsoil is removed (unlike the situation at Beedings, Pope 2007-8). It is therefore critical to establish the correct depth to which the initial phase of machining should go following the removal of the topsoil and trees. Too shallow and the features will not be revealed, too deep and the upper Pleistocene/Holocene fills will be truncated and a valuable part of the sequence lost. It is therefore suggested that the next area to be stripped should be, at least initially, undertaken under geoarchaeological supervision.

5.2.5 During future stripping of the site consideration should be given to the use of a drone with a mounted camera capable of undertaking photogrammetry. This could provide a means by which features could be rapidly identified and accurately surveyed, once the correct level (see 5.2.3) is reached.

5.2.6 If this is not possible then a more structured and constant monitoring approach may need to be implemented to ensure that when deposits are

exposed they can be accessed and sampled at the time of exposure. The locations of the observed features should also be surveyed and incorporated into a site-wide GIS.

- 5.2.7 This work will also allow KCC to formulate a specification for any further work required at the site and provide a starting point for developing a strategic long-term approach with KCC, including potential funding from external sources (NERC, HLF, EH funding) to enhance the results of the developer funded geoarchaeological work.

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## **ACKNOWLEDGEMENTS**

ASE would like to thank CgMs for commissioning the work and for their assistance throughout the project, and Wendy Rogers County Archaeologist Kent County Council for his guidance and monitoring. Robert Cole produced the figures for this report.

### HER Summary

Site Code	OWH 13					
Identification Name and Address	Hermitage Quarry, Oaken Wood, Kent					
County, District &/or Borough	Maidstone, Kent					
OS Grid Refs.	572115,155680					
Geology	Head, Hythe Formation, Sandgate Formation					
Arch. South-East Project Number	6297					
Type of Fieldwork			Watching Brief			
Type of Site	Green Field					
Dates of Fieldwork			WB. 2013-2014			
Sponsor/Client	CgMs					
Project Manager	Jon Sygrave					
Project Supervisor	Matt Pope					
Period Summary	Palaeo.					

#### Summary

*In December 2013 Archaeology South-East were commissioned by CgMs Consulting to undertake an archaeological and geoarchaeological watching brief at Oaken Wood, Hermitage Quarry, Kent. No archaeological features were identified during the removal of woodland. The construction of a tunnel revealed a gull feature which contained Pleistocene sediment and a doline which also contained sediment. Due to the nature and timing of the works and the depth of excavations samples were unable to be collected. This phase has demonstrated that gulls and dolines are present at the site and these have the potential to hold archaeological and palaeoenvironmental material from both the Pleistocene and Holocene.*

## OASIS Form

### OASIS ID: archaeol6-190894

#### Project details

Project name	a geoarchaeological watching brief at oaken wood
Short description of the project	In December 2013 Archaeology South-East were commissioned by CgMs Consulting to undertake an archaeological and geoarchaeological watching brief at Oaken Wood, Hermitage Quarry, Kent. No archaeological features were identified during the removal of woodland. The construction of a tunnel revealed a gull feature which contained Pleistocene sediment and a doline which also contained sediment. Due to the nature and timing of the works and the depth of excavations samples were unable to be collected. This phase has demonstrated that gulls and dolines are present at the site and these have the potential to hold archaeological and palaeoenvironmental material from both the Pleistocene and Holocene.
Project dates	Start: 12-12-2013 End: 10-05-2014
Previous/future work	Yes / Yes
Any associated project reference codes	6297 - Contracting Unit No.
Type of project	Recording project
Current Land use	Woodland 1 - Deciduous native
Investigation type	"Watching Brief"
Prompt	Direction from Local Planning Authority - PPG16

#### Project location

Country	England
Site location	KENT MAIDSTONE MAIDSTONE oaken wood
Site coordinates	TQ 572115 155680 50.9175493679 0.236821700463 50 55 03 N 000 14 12 E Point

#### Project creators

Name of Organisation	Archaeology South-East
Project brief originator	CgMs Consulting
Project design originator	ASE
Project director/manager	Matt Pope

Project director/manager	Jon Sygrave
Project supervisor	Matt Pope
Type of sponsor/funding body	CgMs Consulting
Name of sponsor/funding body	CgMs

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**Project archives**

Digital Archive recipient	MAIDSTONE MUSEUM
Digital Media available	"Images raster / digital photography","Text"

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**Project bibliography 1**

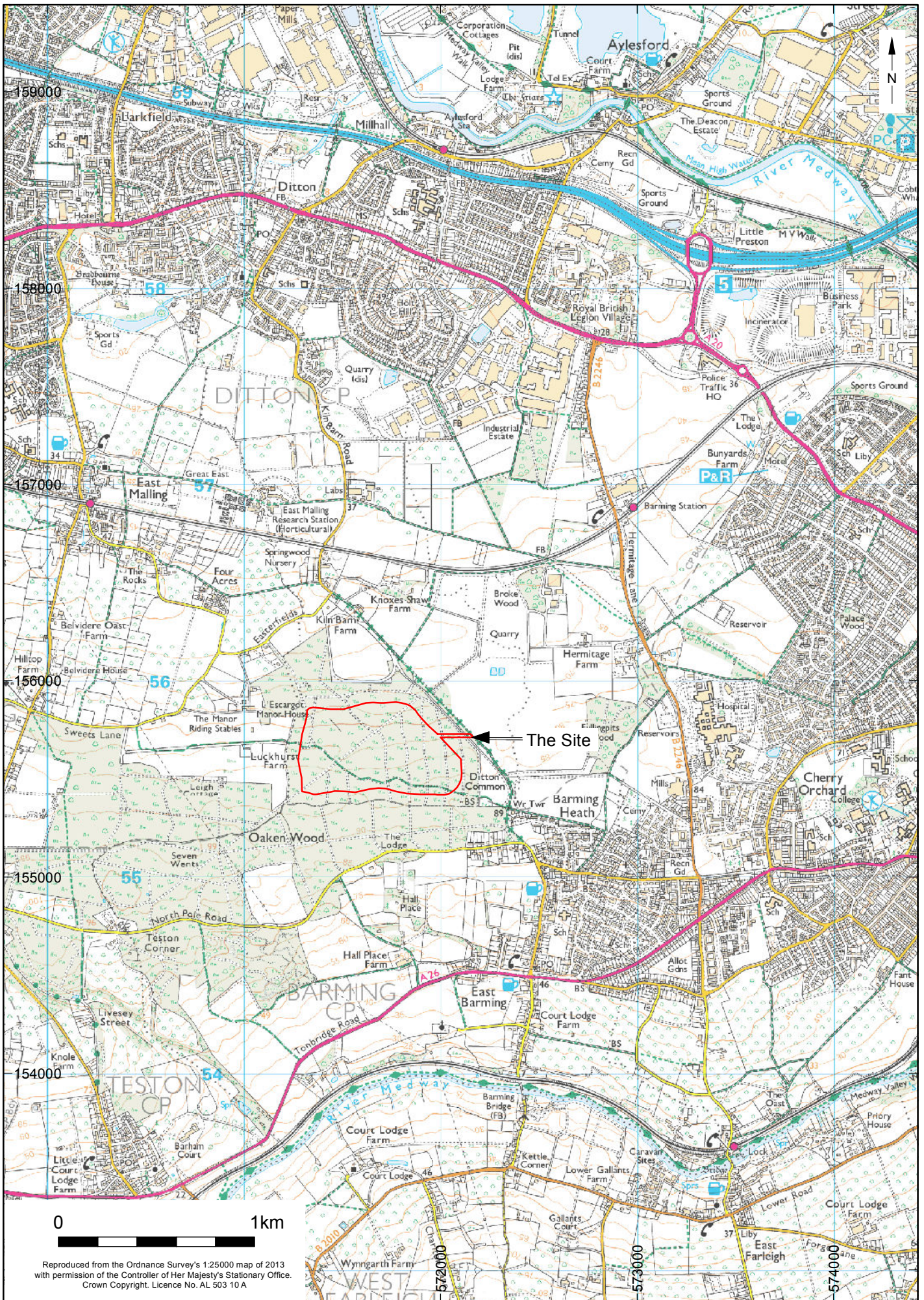
Publication type	Grey literature (unpublished document/manuscript)
Title	a geoarchaeological watching brief at Oaken Wood, kent
Author(s)/Editor(s)	Matt Pope and Guy Hopkinson
Other bibliographic details	2014321
Date	2014
Issuer or publisher	ASE
Place of issue or publication	ASE
Description	grey literature

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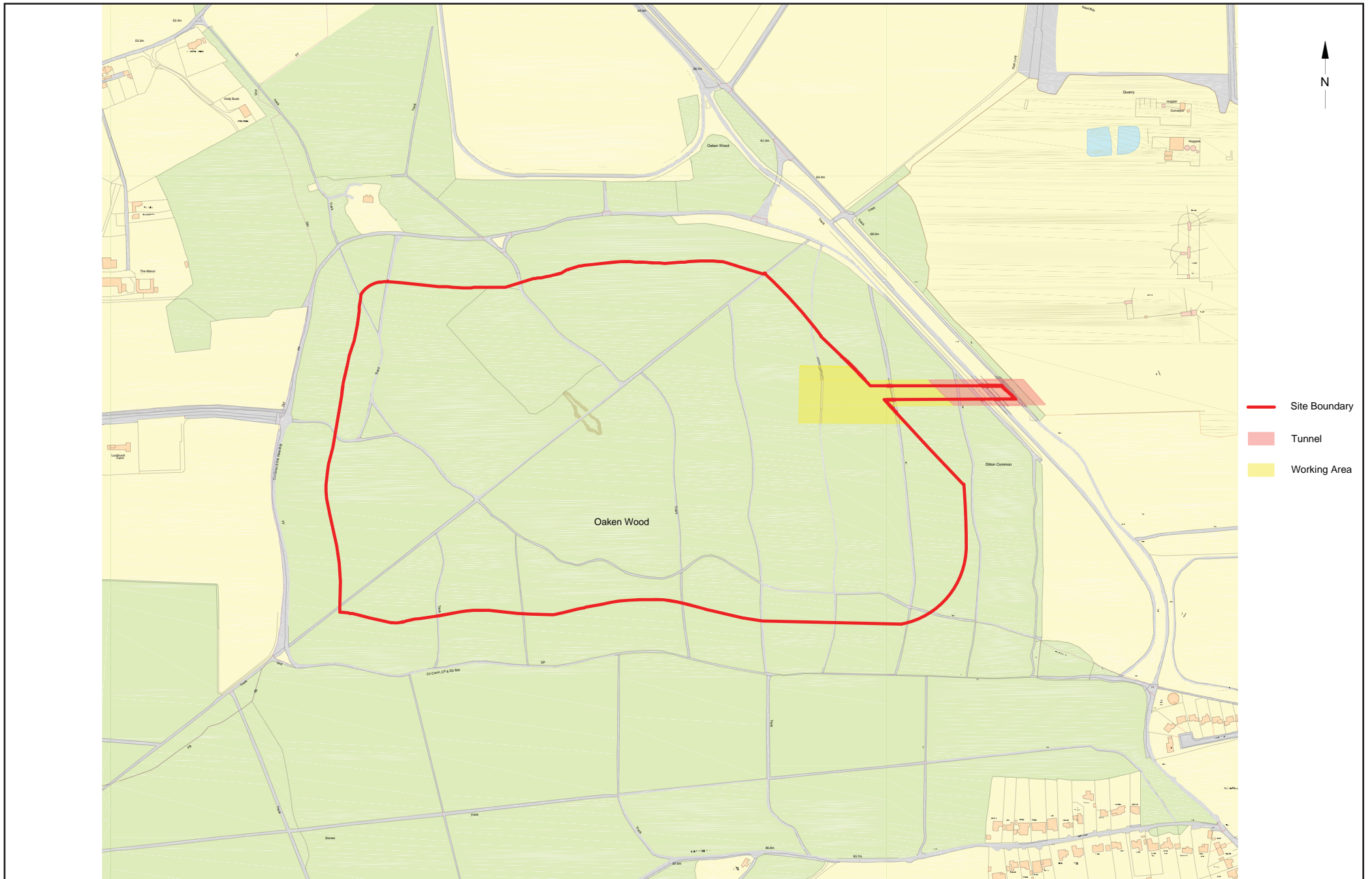
Entered by	k.krawiec (k.krawiec@ucl.ac.uk)
Entered on	24 September 2014







© Archaeology South-East		Hermitage Quarry, Oaken Wood		Fig. 1
Project Ref: 6297	August 2013	Site location		
Report Ref:	Drawn by: RHC			

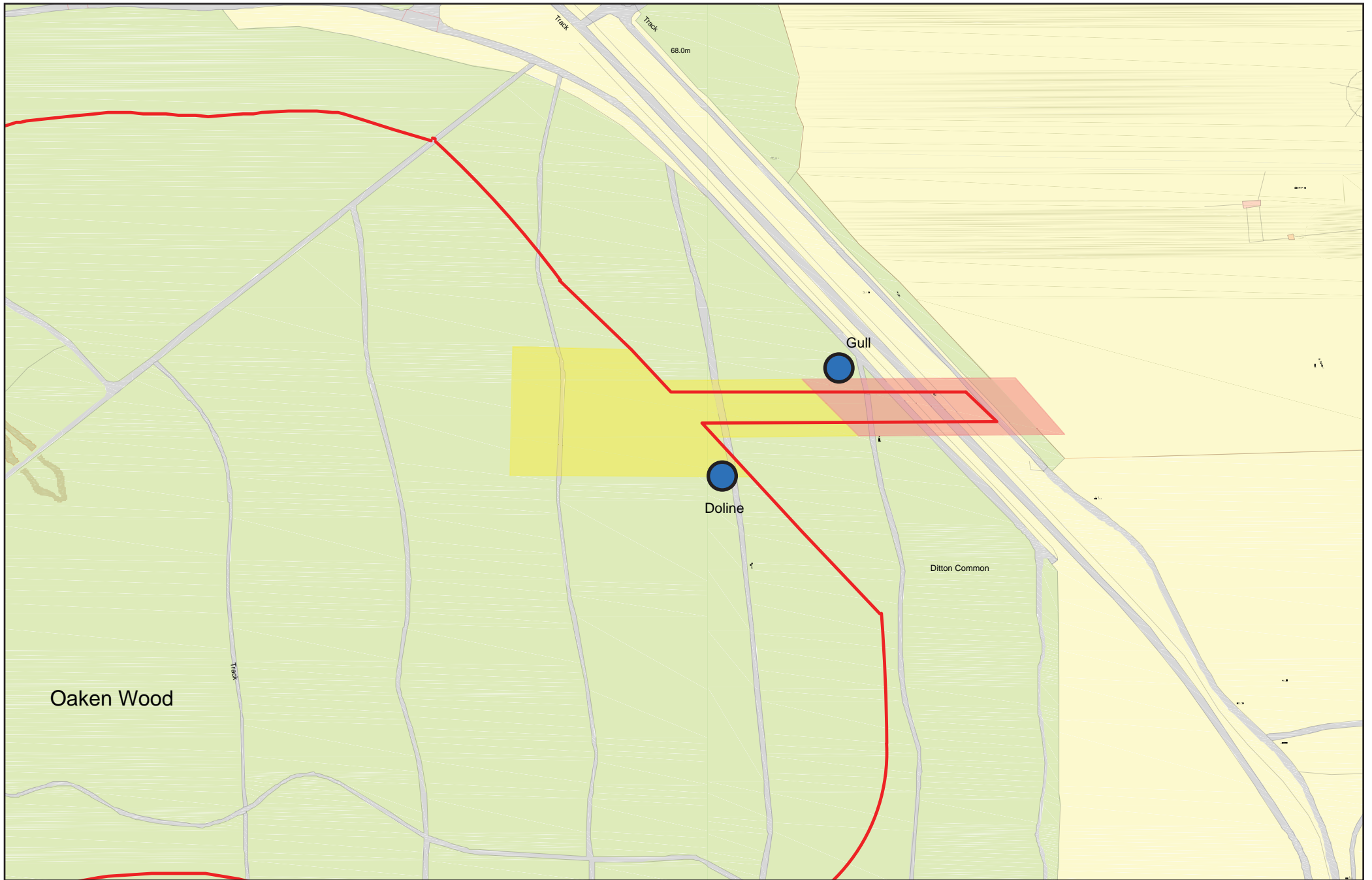


- Site Boundary
- Tunnel
- Working Area

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Hermitage Quarry, Oaken Wood  
 2012 Ordnance Survey map showing Tunnel and Working Area

Fig. 2



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Project Ref: 6297

Report Ref:

September 2014

Drawn by: RHC

Hermitage Quarry, Oaken Wood

Location of doline and gull

Fig. 3

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