



John Mills/PL/WSCC  
28/03/2011 10:44

To james.neave@westsussex.gov.uk  
cc Claire Potts/PL/WSCC@WSCC  
bcc  
Subject Fw: BN/31/05 Lidsey Well site geoarchaeological report - draft

James,

I've just received from Dan Swift of Archaeology South-East (for Moorhouse Petroleum), and read through a draft report on the archaeological monitoring of the drill pit excavation at Lidsey Oilfield.

This looks OK - see below - and a copy of the report should shortly be on its way to you, formally.

In the mean time I am happy that all archaeological works under Condition 20 of BN/31/05 are now complete, and can recommend that this Condition be discharged.

John

John Mills  
Senior Archaeologist  
Strategic Planning (Local Development)

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Save the environment - think before you print.

----- Forwarded by John Mills/PL/WSCC on 28/03/2011 10:36 -----

John Mills/PL/WSCC

28/03/2011 10:38

To "Daniel Swift" <d.swift@ucl.ac.uk>  
cc james.neave@westsussex.gov.uk  
Subject BN/31/05 Lidsey Well site geoarchaeological report - draft

Dan,

Thanks for sending me a draft copy of your report.

This looks fine. It is a shame that OSL samples of the deposits could not be taken, owing to water seepage in the pit, and unstable sides, and that microfossils were absent, but good that pollen was present. The ascription of the deposits to the Pagham Raised Beach, although only tentative, is interesting, as Lidsey is further north than I might have expected for that Raised Beach facies to occur. But as no-one has yet prepared - as far as I know - even a provisional sketch of a Pagham Raised Beach "cliff line" across a map of the coastal plain, I guess that there is still a lot to learn of this deposit.

Lidsey Well Site, Lidsey Road  
Aldingbourne, West Sussex

NGR SU 945 032

Arun District  
Barnham Parish

Geoarchaeological  
Assessment Report

Planning reference: BN/31/05

Site Code: LWA 10

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Project No: 4453

March 2011

By Dr Matt Pope,  
Dr Rob Scaife and Dr John Whittaker

**Lidsey Well Site, Lidsey Road  
Aldingbourne, West Sussex**

**NGR SU 945 032**

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**ASE Report no: 2011067  
OASIS no: archaeol6-97502**

**March 2011**

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**OASIS Form**

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## **2.0 GEOARCHAEOLOGICAL AND ARCHAEOLOGICAL BACKGROUND**

- 2.1** The site is situated at 6m OD within part of the drainage system of the Lidsey Rife (NGR SU 945 032). The Lidsey Rife is a tributary of the Aldingbourne Rife system, a series of small misfit streams occupying an alluvium-filled former inlet of the English Channel. The inlet was formed when rising sea levels during the early Holocene flooded the mid-reaches of a glacial melt water channel draining the South Downs and coastal plain to the north. The Rife systems of the Sussex coastal plain are geoarchaeological significant providing an extensive records of marine, intertidal and alluvial sedimentation for the coastal plain of Sussex.
- 2.2** Previous investigations on similar Rife systems within 5km of the site have produced palaeoenvironmental evidence relating to landscape development from the end of the Pleistocene through the medieval period (Allen et al. 2004; Pine 2005; Whittaker 2007a, 2007b). We expected a similar range of sediment deposits to be present at the Lidsey site possibly comprising high energy Pleistocene fluvial deposits, marine inlet sediments, intertidal silts and fluvial alluvium. The possibility of localised peat deposits also existed at the site and for associated preservation of organic material.
- 2.3** At the contact between the basal marine/alluvial sequence and the underlying solid geology, which is mapped by the BGS as being Upper Chalk (Berry and Shephard-Thorn 1982) there also existed the possibility of encountering Pleistocene sediments associated with either the Merston or Paghams Raised Beaches (Bates et al. 1997; Bates et al. 2007a). These are of palaeogeographic significance and should also be considered archaeologically sensitive if terrestrial facies are present.

#### **4.0 METHODOLOGY**

**4.1** The works requiring geoarchaeological monitoring were machine excavations associated with the construction of a drilling cellar, namely the mechanical excavation of a 4m x 4m area up to 2m deep (Figure 2)

**4.2** Perimeter ditches also being excavated did not require geoarchaeological monitoring.

**4.3** Geoarchaeological monitoring was undertaken in the following way:

Groundworks were initiated across the 4m x 4m area of the cellar construction to a depth of 1.1m to the basal limit of the made ground. At this level a stepped 3m x 3m area was taken down to 2.2m to the top of the water table whereupon a sheeting wall was constructed around the walls of the cellar to prevent collapse. The cellar excavation then proceeded to a maximum depth of just over 3m.

**4.5** Recording was undertaken throughout the process and samples were taken directly from the machine bucket as entry to the hole was considered unsafe. Sections were photographed and recorded prior to shuttering.

## 6.0 RESULTS

6.1 The following observations were made in the course of the watching brief; the observed sections are shown on Figure 2.

Depth	Sedimentology	Samples	Notes
0 – 0.8m	Made Ground 80% sub rounded flint gravel	None.	Imported Chichester fan gravels
0.8 -1.1	Made Ground 70% surrounded flint gravel. Terram Geotextile at base.	None.	Imported Chichester fan gravels
1.1 -1.3	Silty Clay Gley 1 5/Y Greenish grey Contorted and disturbed from earth moving.	Bulk Sample 1 Palynology Sample 1 MicroFossil Sample 1	Charcoal Flecks Noted. Occasional burnt flint fragments.
1.3-1.8m	Silty Clay. Firm to Compact. 10YR 6/6 Brownish yellow 20% subrounded white patinated flints 10-20mm, frost pitted. Some evidence of disturbance.	Bulk Sample 2 Palynology Sample 2 MicroFossil Sample 2	Brickearth/Head
1.8- 2.2m	Medium Sand. Firm 7.5YR 6/6 reddish yellow With 10% grey mottles Very occasional 40-150mm rounded marine flint gravel	Bulk Sample 3 Palynology Sample 3 MicroFossil Sample 3	Marine Sand Possible Raised Beach Deposits
2.2 - 3	Medium Sand. Waterlogged. 7.5YR 6/6 reddish yellow Very occasional 40-200mm rounded marine flint gravel	Bulk Sample 4 Palynology Sample 4 MicroFossil Sample 4 Possibly contaminated due to trench collapse.	Marine Sand Possible Raised Beach Deposits
3m	Base of Hole		

6.2 The recorded sequence appears to show facies of marine, head and alluvial origin. The basal marine deposits had the general characteristics of sands associated with raised beach deposits known to underlying the coastal plain in this area. Determining the age and character of these deposits will have to rely of careful correlation with other known beach deposits and characterisation based on microfauna. No OSL samples were obtainable due to waterlogging and safety concerns.

6.3 The marine sands were overlain by compact head deposits comprising silty clay brickearths with seams of small frost-pitted flints. The general character was a water lain Pleistocene deposit derived from solifluction gravel lobes to

## 7.0 PALAEOENVIRONMENTAL ANALYSIS

### 7.1 Palynological Assessment by Rob Scaife

7.2 The following three samples of alluvium were analysed to ascertain if sub-fossil pollen and spores are present and if so, to provide some background information on the vegetation and an indication of the age of the sediment sequence.

Palynology Sample 1:	1.1-1.3m:	grey alluvium
Palynology Sample 2:	1.3 -1.8m:	head deposit
Palynology Sample 3:	1.8m – 2.2m:	marine deposit

7.3 Samples 1 and 2 are of oxidised, buff and pale brown, predominantly silt and sample 3 an unoxidised and grey alluvium with higher organic content. Standard chemical pollen extraction techniques were used on larger than normal (4-5ml) samples. Much of the mineral material was removed using micromesh sieving (10 micron) and decanting. Hydrofluoric acid (boiling) was used to dissolve remaining silica. Pollen was largely absent in sample 2 and present in samples 1 and 3 from which totals of 100 to 150 grains were identified and counted. These data are listed in table 1 below.

<b>SAMPLE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Trees</b>			
<i>Pinus</i>	1		7
<i>Quercus</i> (oak)	2	1	
<b>Herbs</b>			
<i>Dianthus</i> type (pinks)			1
<i>Plantago lanceolata</i> (ribwort plantain)	1		
<i>Centaurea nigra</i> type (knapweeds)	8		1
Lactucoideae (dandelion types)	109	1	78
Poaceae (grasses)	8		7
Cereal type			1
Cyperaceae (sedges)	20		7
Unidentified	1		
<b>Spores</b>			
<i>Pteridium aquilinum</i> (bracken)	1		2
<i>Polypodium</i> (polypody fern)	1		1
<i>Dryopteris</i> type (typical ferns)	1		1
<b>Misc.</b>			
Pre-Quaternary	1		3
<b>Total pollen</b>	<b>153</b>	<b>2</b>	<b>102</b>
<b>Total spores</b>	<b>3</b>		<b>4</b>

Table 1: Lidsey pollen count data



**7.10** The samples were processed in the normal way. Briefly, they were put into bowls and first dried in an oven. A teaspoon of sodium carbonate was added to help remove the clay fraction and boiling water was then added. Each sample was left to soak overnight. Washing was with warm/hot water through a 75 micron sieve. The samples were then dried again in an oven. Examination was undertaken under a binocular microscope.

**7.11** Unfortunately, all the samples were barren of microfauna (foraminifera and ostracods) and also lacked any material of a calcareous nature apart from a few reworked Cretaceous foraminifera.

Sample 1 contained a large amount of iron mineral many very small circular/oval organic objects which may be either algal cysts or spores.

Sample 2 contained iron minerals and virtually nothing else.

Sample 3 contained organic material. There are also the same circular/oval organic objects as found in Sample 1.

Sample 4 contained iron minerals, most notably goethite, which is usually indicates weathering. No microfossils of any sort were found, although the sediment does look like marine sand.

**7.12** Samples 1-3 are may be freshwater, deposited beyond the limit of tidal access in the Aldingbourne Rife. The iron mineral suggests weathering and probably decalcification, but, in spite of a diligent search, no agglutinating foraminifera (indicative of saltmarsh), whose organic membrane would surely be preserved even in these circumstances, were found. There is no evidence that Sample 4 is a solifluction deposit and therefore it is unlikely to belong to the Devensian cold-climate deposits known extensively in the Bognor area, as mentioned in the Introduction. Instead, the sand appears to have a marine origin and perhaps belongs to the Pagham Raised Beach, if the height and location is in line with the known course of this deposit. In my experience, the Pagham Raised Beach (thought to be Ipswichian in age) is only patchily fossiliferous and is often completely barren.

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## **Acknowledgements**

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planning process

**Project location**

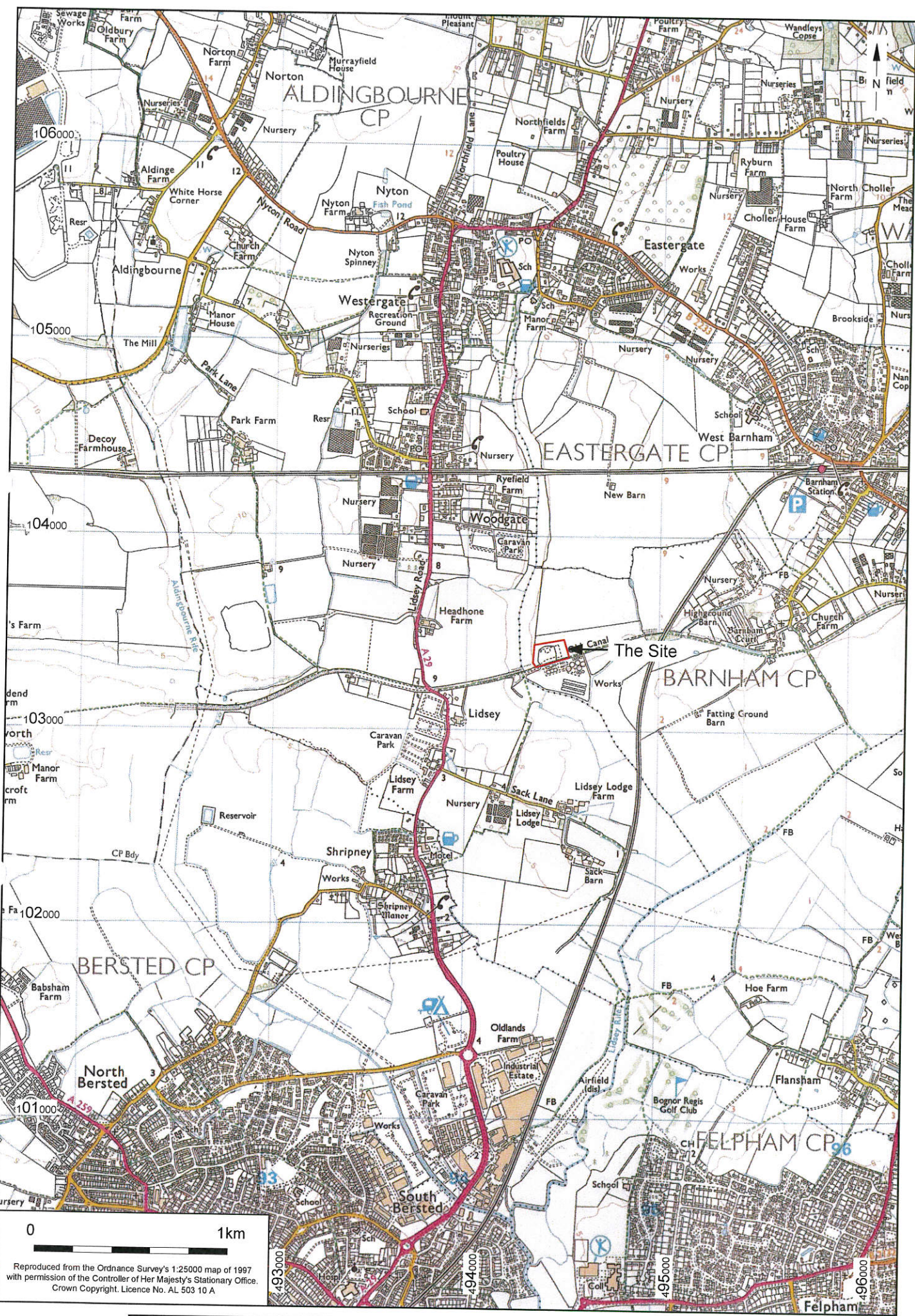
Country	England
Site location	WEST SUSSEX ARUN BARNHAM Lidsey Well Site
Postcode	PO20
Study area	16.00 Square metres
Site coordinates	SU 945 032 50.8200576624 -0.658291810896 50 49 12 N 000 39 29 W Point
Height OD / Depth	Min: 6.00m Max: 6.00m

**Project creators**

Name of Organisation	Archaeology South-East
Project brief originator	Archaeology South-East
Project design originator	west sussex county council
Project director/manager	Darryl Palmer
Project supervisor	Matt Pope
Type of sponsor/funding body	Client
Name of sponsor/funding body	Moorhouse Petroleum Limited

**Project archives**

Physical Archive recipient	Local Museum
Physical Archive ID	LWA 10
Physical Contents	'Environmental'
Digital Archive recipient	Local Museum
Digital Archive ID	LWA 10
Digital Contents	'Environmental'



0 1km

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© Archaeology South-East		Lidsey Well Site, Bognor Regis	Fig. 1
Project Ref: 4453	March 2011	Site location	
Report Ref:	Drawn by: HLF		



Fig. 3.1: Footprint of excavation area looking east



Fig. 3.2: Section through groundworks at limit of observations (within marine sand)

© Archaeology South-East		Lidsey Well Site, Bognor Regis	Fig. 2
Project Ref: 4453	March 2011	Photographs	
Report Ref:	Drawn by: HLF		