

PFGR/08



# PERRY'S FARM, ISLE OF GRAIN, KENT

Geo-technical survey

commissioned by TNEI  
on behalf of Estuary Energy

May 2015



# PERRY'S FARM, ISLE OF GRAIN, KENT

## Geo-technical survey

commissioned by TNEI  
on behalf of Estuary Energy

May 2015

project info

**HA JOB NO.** PFGR/08  
**NGR** TQ 86844 76513  
**PARISH** Grain  
**LOCAL AUTHORITY** Medway Council

project team

**PROJECT MANAGER** Joe Abrams  
**AUTHOR** Emma Tetlow  
**GRAPHICS** Jake Streatfeild-James, Caroline Norrman  
**SPECIALISTS** Emma Tetlow – Environmental  
**APPROVED BY** Joe Abrams – Project Manager



.....

© 2015 by Headland Archaeology (UK) Ltd

### SOUTH & EAST

Headland Archaeology  
Building 68C, Wrest Park, Silsoe  
Bedfordshire MK45 4HS

01525 850 878

southandeast@headlandarchaeology.com

[www.headlandarchaeology.com](http://www.headlandarchaeology.com)





---

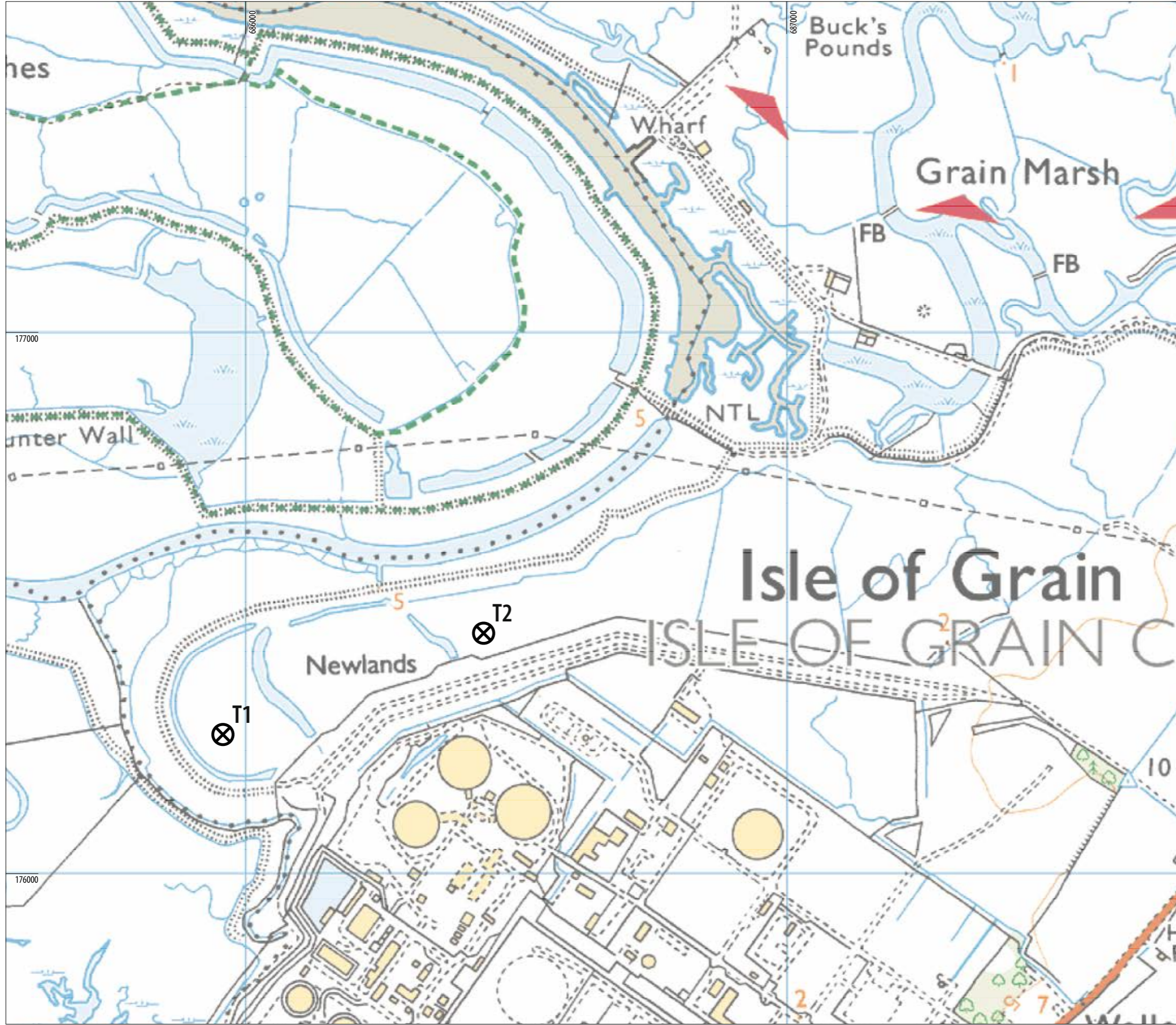
## CONTENTS

1	INTRODUCTION	3
2	SITE LOCATION	3
3	ARCHAEOLOGICAL BACKGROUND	3
	3.1 AERIAL PHOTOGRAPHIC EVIDENCE	5
4	GEOLOGICAL AND PALAEOENVIRONMENTAL BACKGROUND	5
	4.1 AUGER SURVEY UNDERTAKEN BY BATES (2002, 2008) ON BEHALF OF ARCHAEOLOGY SOUTH EAST	5
5	EXISTING RESEARCH FRAMEWORK	5
6	DISCUSSION	7
7	RECOMMENDATIONS	7
8	REFERENCES	9

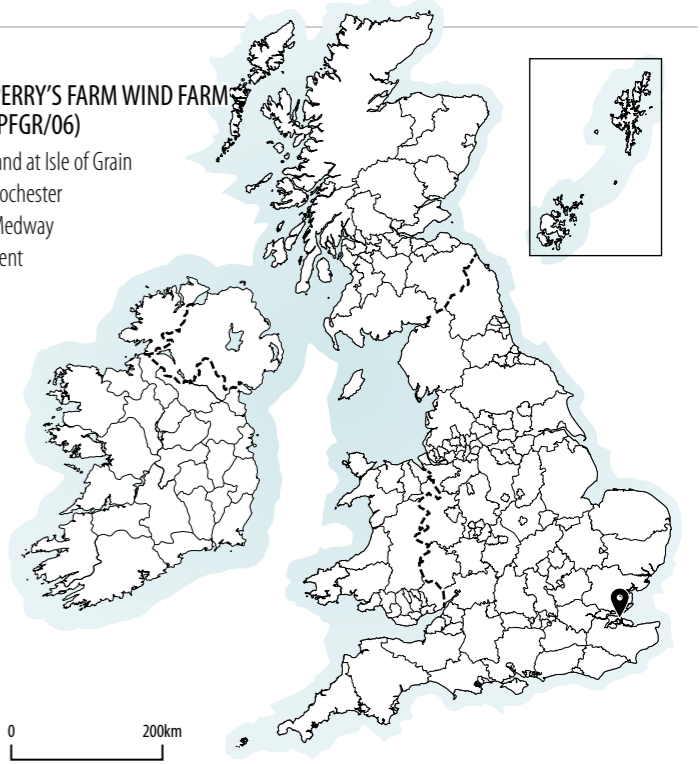
## LIST OF ILLUSTRATIONS

ILLUS 1	1
Site location	
FIGURE 2	4
Site plan	
FIGURE 3	6
Proposed development area superimposed onto RAF (1/05/1946) Run 41 Plate 4015	
FIGURE 4	8
Halstead's Survey of the Hundred of Hoo 1798	

---



**PERRY'S FARM WIND FARM  
(PFGR/06)**  
land at Isle of Grain  
Rochester  
Medway  
Kent

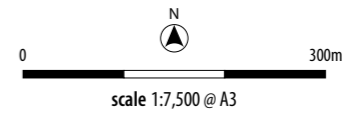


**HEADLAND  
ARCHAEOLOGY**

**SOUTH & EAST**  
Building 68C, West Park  
Silsoe  
Bedfordshire MK45 4HS  
01525 861 578  
www.headlandarchaeology.com

**KEY**  
⊗ proposed turbine location

**TURBINE CO-ORDINATES**  
**T1** 585959, 176258  
**T2** 586440, 176445



Ordnance Survey © Crown copyright. All rights reserved. Licence no. AL 100013329

**FIGURE 1**  
Proposed turbine locations  
Site location



# PERRY'S FARM, ISLE OF GRAIN, KENT

## Geo-technical survey

### 1 INTRODUCTION

This report presents an assessment of the geoarchaeological potential of a proposed wind farm at Perry's Farm, Isle of Grain, Kent; and sets out proposals for possible further investigation based on this data. This study has been prepared on behalf of TNEI for Estuary Energy. The Proposed Development Area (PDA) lies at an elevation of approximately 2mOD and comprises fields bounded by earth embankments which act as flood defences. The fields are divided into nine parcels of land divided by (in the west) two long ponds which were originally branches of the Yantlet Creek and (in the east) a mixture of channelized and natural creek systems. To the north and west of the PDA is the Yantlet Creek which runs in a sinuous course between All Hallows Marshes and Grain Marsh. Stoke Marshes lie west of the PDA, whilst the buildings of Perry's Farm lie to the east with the village of Grain beyond. To the south are the Grain Power Station, refinery and container port. This complex of industrial structures takes up almost the whole southern half of the island.

### 2 SITE LOCATION

The site is located in a group of fields to the North West of Grain Power Station on the Isle of Grain. The proposed wind farm consists of two turbines located in the western half of the proposed development area (PDA) centred TQ 8636 7644 (**Figure 1**). A haul road and access is proposed running from an existing access TQ 8780 7604, west into the PDA, utilising an existing access track.

### 3 ARCHAEOLOGICAL BACKGROUND

Evidence of relatively light prehistoric activity in this area extends from the Palaeolithic onwards, a fragment of Palaeolithic debitage was found to the north across the Yantlet Creek. Palaeolithic artefacts have been recovered from gravels along the Shakespeare Channel (Bridgland and Harding 1984). Later Prehistoric finds from the Mesolithic, Neolithic and Bronze Age in Kent are rare. Within the

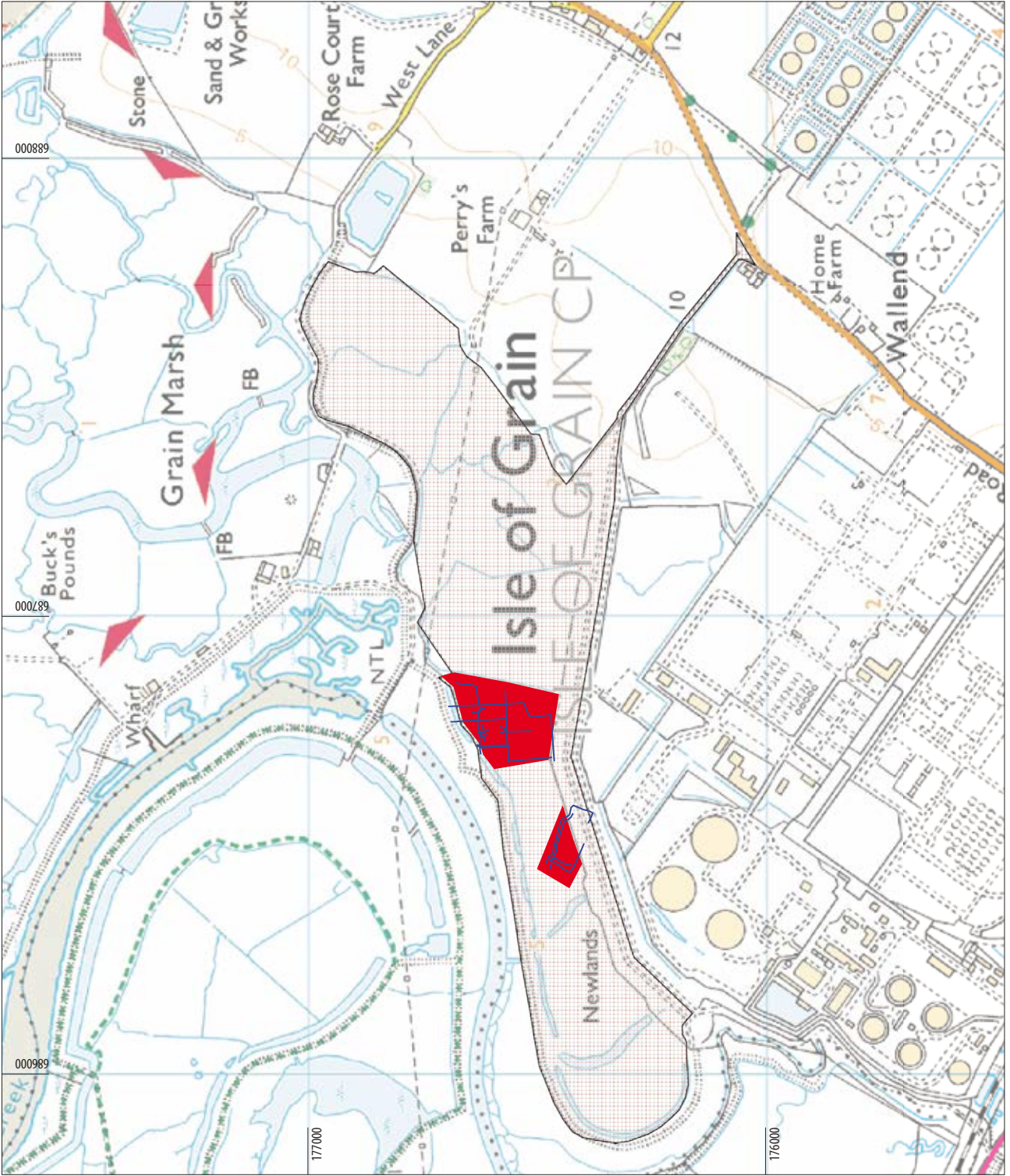
direct vicinity of the proposed development area (PDA), Mesolithic evidence is restricted to findspots from Cliffe to the west. Later periods are represented within the middle sections of the PDA and include crop-marks associated with ring-ditches, and an Iron Age flask was found to the south of the site. During the Roman period, exploitation of the Hoo Peninsula intensified, the area became a centre for pottery production and a cemetery was found less than a kilometre to the north east.

Medieval evidence is also limited to stray finds within the study area, there is no evidence of settlement. The island was linked to the mainland by a causeway, documentary evidence indicates the area was used for pasture, and that by the eleventh century there was a fishery in the area. The church building in the village of Grain also has its origins in the 12th Century.

More recently, the modifications to the landscape of the Hoo Peninsula have been for military purposes, linked to conflicts throughout the 19th and 20th centuries. Salt making, established in the later medieval period continued. A large salt works was noted by Halstead in 1798 and consisted of shallow, rectangular, evaporation ponds. The exact location of this is unknown but an illustration from this period indicates a location adjacent to Yantlet Creek, midway between the Medway and larger Thames Estuary.

Historic England has also provided a further document highlighting assets not currently recorded in the Kent County HER (Kendall, Peter. Letter to Medway Council Development Control 29 October 2013, TS), these include:

- Flood defences associated with Yantlet Creek;
- A railway embankment which served the gunnery proving range at Yantlet;
- The location of a sheepfold;
- A further medieval saltern; and
- Storage buildings dating from World War II.



- KEY
- crop-marks
  - crop-mark concentrations
  - proposed development area

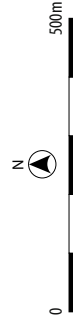


FIGURE 2  
Site plan



The document also outlines the potential for the 17th century Grain Bridge and associated features, it is suggested that the main route into Grain village may once have crossed the site.

There are currently 12 scheduled monuments, one protected wreck, 85 listed buildings and four conservation areas within the study area.

### 3.1 AERIAL PHOTOGRAPHIC EVIDENCE

Interpretation of aerial photographs, coupled with historic map evidence indicated several groups of linear crop-marks within the development area, centred on NGR TQ8659 7650. To the west, the linears were more substantial hinting at a tentative system of rectangular compartments (**Figure 2**). To the east, the feature was smaller and less obvious consisting of a single, obvious rectilinear feature (**Figure 2** and **3**).

Further analysis of the documentary evidence suggests that the larger grouping discussed by Halstead in 1798 (**Figure 4**), lay outside the PDA.

## 4 GEOLOGICAL AND PALAEOENVIRONMENTAL BACKGROUND

The solid geology consists of the Eocene London clay formation, the drift deposits consist of alluvium and intertidal sediments deposited since the beginning of the Quaternary. Of significance both archaeologically and palaeoenvironmentally is sea-level fluctuations in the area throughout the later Pleistocene and the Holocene. Devoy (1977, 1979, 1980) has already proposed a model for the area, it would not be unfeasible to suggest that a similar model could be proposed for the Hoo Peninsula. Devoy's work and later work by Milne et al. 1983 indicates the presence of post-glacial organic-rich deposits between Crossness and the northern shore of the Isle of Grain.

Previous work has also defined a well-developed terrace 'staircase' fringing the Medway shore of the Hoo Peninsula, dating from the Middle to Late Pleistocene (Bridgland 2003). Other areas have also produced evidence of deeply buried channels (Bates et al. 1999) which may contain both archaeological and palaeoenvironmental evidence (Bates et al. 2007).

Further synthetic work was undertaken by Hazell (2011). This considered the wider context of the Thames/Medway area with a short sectioned focused on the Isle of Grain. Earlier work by Bates (Barham and Bates 1991 cited by Hazell 2011) established the presence of peat or organic rich layer at -26m OD, this is thought to correspond with a similar deposit found in the Medway tunnel and dated to 7 000 BP. Devoy recorded an age of approximately 8,500 BP from a peat deposit found at a similar depth. Pollen analysis was also conducted on this material and indicated a transition from an open water environment to woodland and open grassland (Hazell 2011).

The most significant contribution to the existing knowledge of the immediate area was the construction of the Grain Power Station and

its pipeline. This work was largely undertaken by Bates (2002, 2008) and will be discussed in greater detail below.

### 4.1 AUGER SURVEY UNDERTAKEN BY BATES (2002, 2008) ON BEHALF OF ARCHAEOLOGY SOUTH EAST

An auger survey was undertaken ahead of the construction of a natural gas transmission pipeline. The survey extended from the west of Gravesend to approximately 700m due south of the current development area. The maximum depth of the pits was 5.1m and they were excavated in spits to control the removal and enhance the recording of the individual contexts. The survey reflected previous findings, with deposits largely consisting of alluvial or colluvial/slope-wash deposits.

Sands and gravels which may contain artefacts and other biological evidence were identified within the stratigraphy. The alluvial sequences are described as highly complex and contain terrace sequences and palaeochannels; 'terrace edge' deposits, much favoured for hominid activity, are also thought likely to survive.

## 5 EXISTING RESEARCH FRAMEWORK

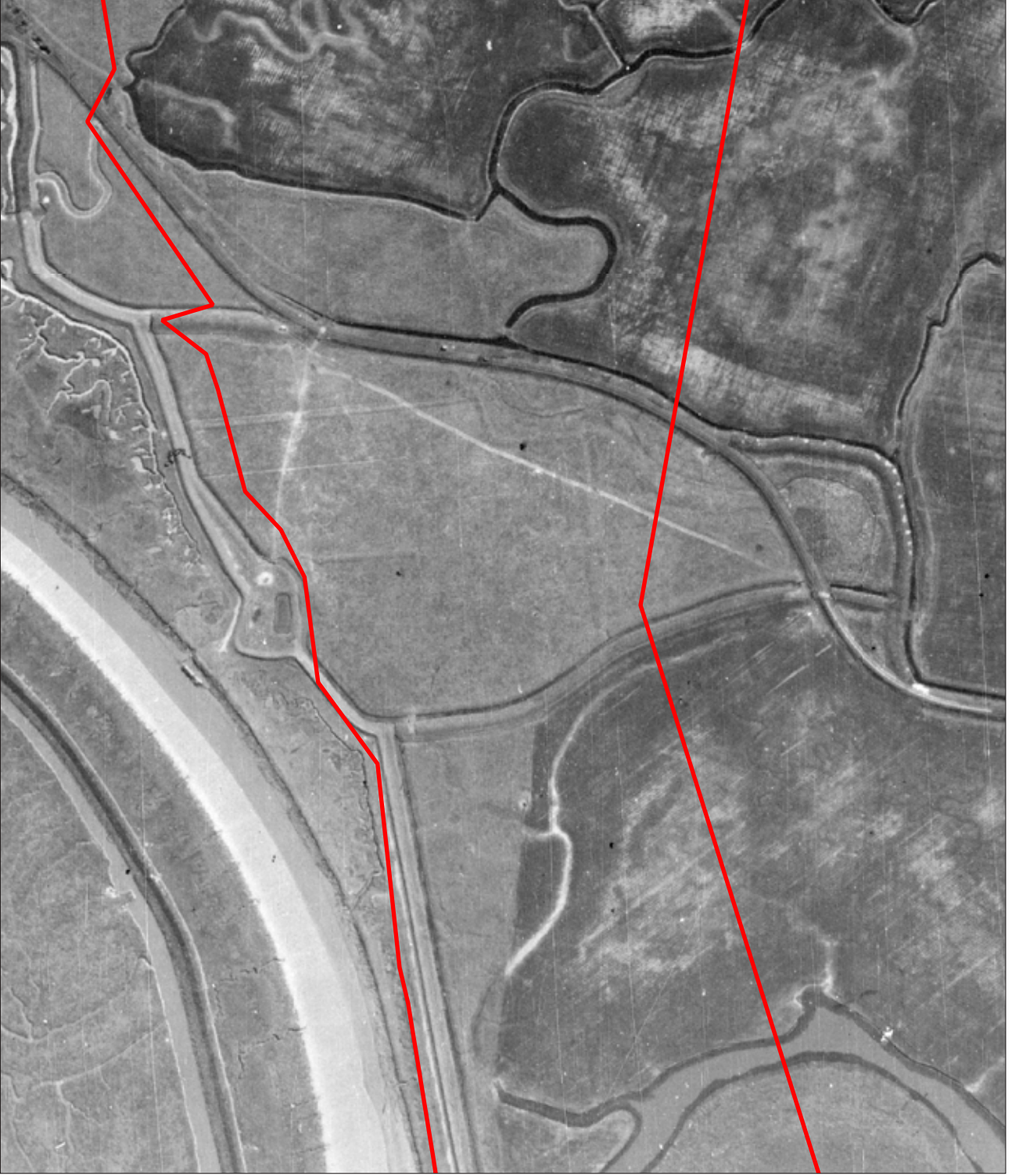
The Archaeological Research Framework for the Greater Thames Estuary (Essex CC 1999) provides both an archaeological overview and research agenda for the wider region. This section aims to contextualise the Isle of Grain within this Framework and select salient, site-specific points from the research agenda prior to making further recommendations.

The research framework indicates several gaps in our existing knowledge of the Greater Thames estuary of direct relevance to the development area outlined in section 3.1.8 of the volume (numbered points refer to those presented in the original text):

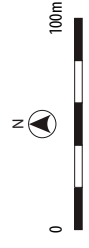
- 3.2 Pleistocene palaeoenvironments and geoarchaeology
- 3.3 Holocene palaeoenvironments.
- 3.5.2 Intertidal archaeology.
- 3.6.4 Industry and transport.

Under these sub-headings the research framework highlights a number of objectives.

1. Pleistocene palaeoenvironments and geoarchaeology.
  - Further understanding environmental and climatic change during the Pleistocene.
  - Defining human interaction within this environment and identifying areas where key contexts might be found.
2. Holocene palaeoenvironments.
  - Characterise key units (eg Allen 1987), establish vertical sequences and other deposits throughout the estuary.
  - Understand the coastline and sea-level change.
  - Develop the existing knowledge of human interaction at the wetland edge and within the related biomes.



KEY  proposed development area



**FIGURE 3**  
Proposed development area superimposed onto  
RAF (1/05/1946) Run 41 Plate 4015

- Isolate submerged woodlands for chronological and reconstruction purposes (e.g. Bell et al. 2000, Bell 2008, Sidell et al. 2000)

### 3. Intertidal archaeology

- Baseline survey to provide a framework for defining research priorities within the intertidal zone.
- Increase our understanding of industrial activity with the intertidal zone including salt production, fishing etc.
- Isolating organic-rich deposits which will contribute to our archaeological knowledge beyond the Wetland zone.

### 4. Industry and transport

- Formulating a systematic approach to the study of coastal industry.
- Identifying the important sectors of industrial activity for research.
- Identifying important representative sites.

## 6 DISCUSSION

This area has clearly been subject to dynamic alluvial and later intertidal activity throughout the Pleistocene and Holocene (Bridgland 2003, Devoy (1977, 1979, 1980), hence it is not unfeasible to suggest that pockets of peat/organic rich material may be found in other areas. The paucity of organic deposits in the surveys by Bates (2006, 2008) should not be used to inform this work on the presence/absence of peat or organic rich deposits. Peat and other organic rich deposits have been found in several other locations across the Hoo Peninsula. These include 1km to the south-east at Cockleshell Hard (Devoy 1979), and further afield, where similar deposits were identified at Cliffe Marsh and St Mary's Bay (Barham and Bates 1991 cited in Hazell 2011).

The recommendations for further work, are informed by the analysis and synthesis of existing desk-based assessment, field work, the existing research framework and the nature of the development. In light of this, the potential for the presence of the following heritage assets, as defined by the existing research framework are of most significance:

1. The potential for Pleistocene and Holocene deposits both minerogenic and in terms of the Holocene, organogenic in this area is high.
2. Pleistocene 'terrace edge sites' defined by Bates (2008) which are often associated with hominid activity

Isolating these deposits can be used to address many of the research framework objectives outlined above.

Archaeologically the most significant, visible asset, is the rectilinear feature identified during the analysis of the aerial photographs (**Figure 3**). This feature does not demonstrate the characteristic checkerboard formation of the larger array of evaporation ponds to the west but may be a further saltern.

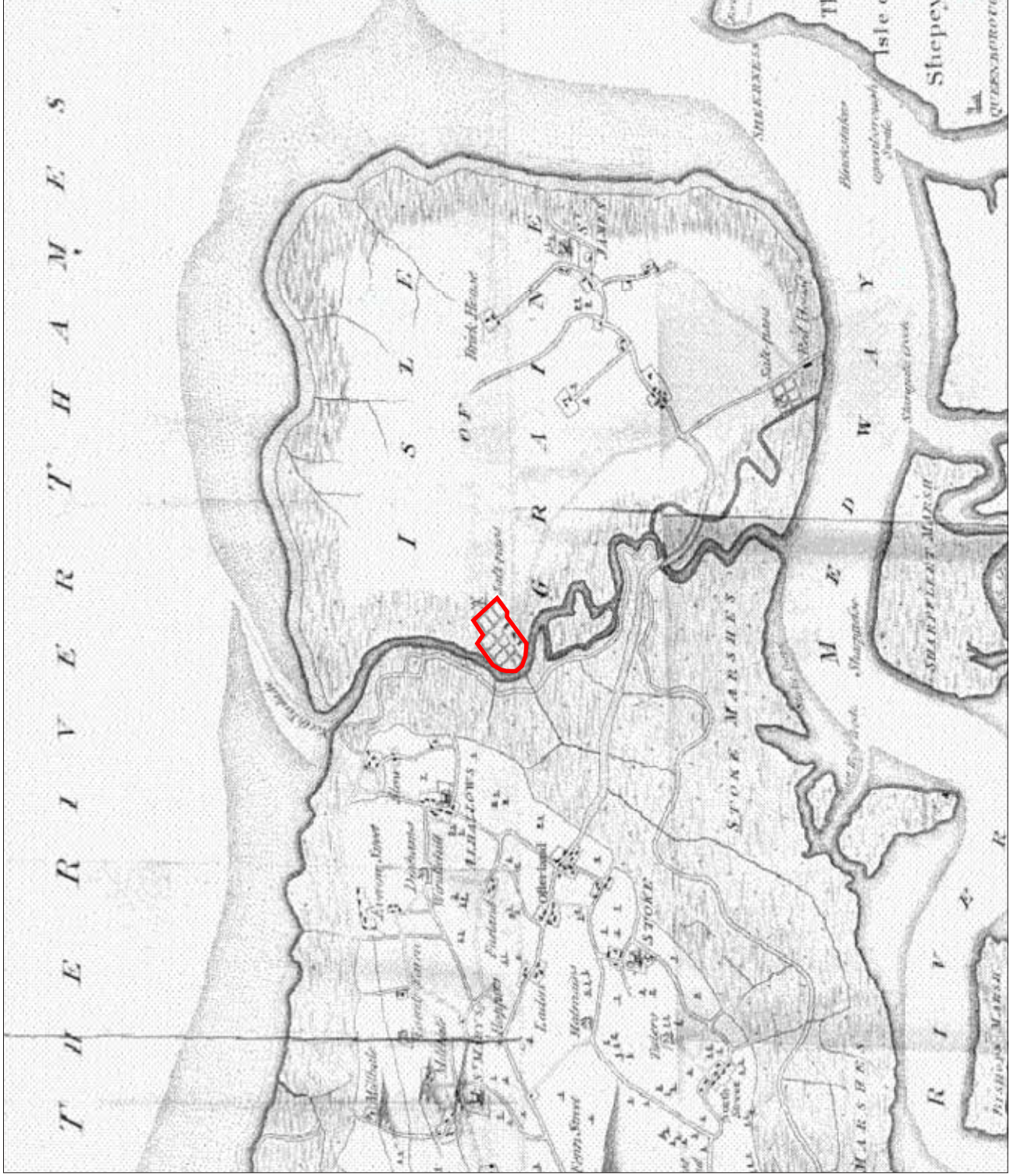
## 7 RECOMMENDATIONS

Given the size of the development, and the overall potential indicated by the existing data-set, the recommended further investigation works are relatively limited. It is recommended that:

1. A borehole survey is undertaken ahead of the construction; and
2. Boreholes are also recovered from any areas subject to significant invasive activity during construction i.e. were deposits/artefacts have the potential to be removed entirely by construction.

The recommended methodology would target the turbine bases, and consist of:

1. A sequence of boreholes horizontally and diagonally across the turbine bases and the areas affected by their construction; and
2. The number of boreholes and transects will be defined by the size of the affected area. It is not proposed that this number is less than five or greater than ten across each turbine base.



KEY  saltworks

FIGURE 4  
Halstead's Survey of the Hundred of Hoo 1798

## 8 REFERENCES

- Allen, JRL 1987b 'Late Flandrian shoreline oscillations in the Severn Estuary: the Rumney Formation and its typesite' in *Philosophical Transactions of the Royal Society B* 315:157–74.
- Barham, A & Bates, MR 1991 *A preliminary research report on the palaeoenvironmental and geoarchaeological significance of the North Kent Marshes*, Institute of Archaeology, University of London; unpublished report.
- Bates, MR 2008 *A palaeoenvironmental evaluation along the route of the proposed Isle of Grain transmission pipeline (stage 1)*, Project no. 3068. Archaeology South East; unpublished report.
- Bates, MR 1999 *A geoarchaeological assessment of a borehole from the Kingsnorth Power Station site, Hoo St. Werburgh, Rochester-upon-Medway*, S & MR Bates; unpublished report.
- Bates, MR, Keen, DH, Whittaker, JE, Merry, JS & Wenban-Smith, FF 2002 'Middle Pleistocene molluscan and ostracod faunas from Allhallows, Kent, UK' in *Proceedings of the Geologists' Association* 113:223–36.
- Bell, M, 2007 'Prehistoric coastal communities: the Mesolithic in Western Britain' in *Council of British Archaeology Research Report* 149, York.
- Bell, M, Caseldine, A & Neumann, H 2000 'Prehistoric Intertidal Archaeology in the Welsh Severn Estuary' in *Council of British Archaeology Research Report* 120, York.
- Bridgland, DR 2003 'The evolution of the River Medway, SE England, in the context of Quaternary palaeoclimate and the Palaeolithic occupation of NW Europe' in *Proceedings of the Geologists' Association* 114:23–48.
- Bridgland, DR & Harding, P 1984 Palaeolithic artifacts from gravels of the Hoo Peninsula. *Archaeological Cantiana* 191:41–56.
- Devoy, RJN 1977 'Flandrian sea-level changes in the Thames estuary and the implications for land subsidence in England and Wales' in *Nature* 270:712–5
- Devoy, RJN 1979 'Flandrian sea-level changes and vegetational history of the lower Thames Estuary' in *Philosophical Transactions of the Royal Society of London B* 285:355–407
- Devoy, RJN 1980 'Post glacial environmental change and Man in the Thames estuary: a synopsis' in Thompson (ed) *Archaeology and Coastal Change*, Society of Antiquaries Occasional Paper No. 1 New Series, 134–48
- Essex County Council 1999 An Archaeological Research Framework for the Greater Thames Estuary. Essex.
- Headland Archaeology 2014a *Perry's Farm Wind Farm, Isle of Grain, Kent: Cultural Heritage Baseline*, Prepared for TNEI on behalf of Estuary Energy.
- Headland Archaeology 2014b *Perrys Farm, Isle of Grain, Kent*, commissioned by TNEI on behalf of Estuary Energy.
- Lake, RD, Ellison, RA, Hollyer, SE & Simmons, M 1977 'Buried channel deposits in the southeast Essex area: their bearing on Pleistocene palaeogeography' in *Report of the Institute of Geological Sciences* 77/21.
- Milne, G, Battarbee, R, Straker, V & Yule, B 1983 'The River Thames in London in the mid 1st century AD' in *Trans London Middlesex Archaeological Society* 34:19–30.
- Sidell, J, Wilkinson, K, Sciafe, R & Cameron, N 2000 *The Holocene Evolution of the London Thames*, London: MoLA.







© 2015 by Headland Archaeology (UK) Ltd

**SOUTH & EAST**

Headland Archaeology  
Building 68C, Wrest Park, Silsoe  
Bedfordshire MK45 4HS

**T** 01525 861 578

**E** southandeast@headlandarchaeology.com

**MIDLANDS & WEST**

Headland Archaeology  
Unit 1, Premier Business Park, Faraday Road  
Hereford HR4 9NZ

**T** 01432 364 901

**E** midlandsandwest@headlandarchaeology.com

**NORTH**

Headland Archaeology  
Unit 16, Hillside, Beeston Road  
Leeds LS11 8ND

**T** 0113 387 6430

**E** north@headlandarchaeology.com

**SCOTLAND**

Headland Archaeology  
13 Jane Street  
Edinburgh EH6 5HE

**T** 0131 467 7705

**E** scotland@headlandarchaeology.com

[www.headlandarchaeology.com](http://www.headlandarchaeology.com)