

# **Alternative Sites Assessment**

Wisborough Green-1  
Exploratory Well Site

July 2013

***The proposed development of an exploratory well site, Wisborough Green-1,  
for the exploration, appraisal and testing of the Central Weald Basin  
including the development of an access road, and the installation and  
operation of all ancillary equipment and infrastructure***

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## 1.0 INTRODUCTION

1.1 This Alternatives Site Assessment (ASA) report has been prepared by Celtique Energie Weald Ltd (the “Applicant”) to outline the alternative options considered in the process of identifying a suitable site for the proposed development of an exploratory well site at Wisborough Green for the exploration, appraisal and testing of the Central Weald Basin including the development of an access road, and the installation and operation of all ancillary equipment and infrastructure (the “Proposed Development”). The exploration of onshore oil and gas reservoirs is heavily constrained by a number of factors including geology, the built and natural environment, and the technical limitations of drilling. Striking the balance between an appropriate site location - one that is both technically and environmentally acceptable - is a complex exercise notwithstanding the need thereafter to agree Terms with a willing landowner.

1.2 The first stage in the planning process is to complete a robust and comprehensive ASA. This process begins with seismic data gathering to identify a geographical area with suitable geology for potential oil or gas accumulations. This area is then assessed in terms of planning and environmental constraints and opportunities. The results of the ASA are used to inform the selection of the Application Site, and the planning and design process thereafter.

1.3 Celtique Energie and their consultants understand the importance of starting the planning process with a robust, comprehensive and methodical ASA in order to find the most environmentally and technically acceptable Application Site. This process took place at the outset to inform the selection of a suitable Application Site. This Report sets out the evidence base and methodology used to identify the Application Site and the reasons for discounting other potential locations. This Report contains the following Sections;

Section 2 Why and Where Are We Looking For Oil and Gas?

Section 3 Site Search Methodology

Section 4 Site Search Area

Section 5	Site Search Results
Section 6	Summary and Conclusions

## **2.0 WHY AND WHERE ARE WE LOOKING FOR OIL AND GAS?**

### **How and where is oil and gas formed?**

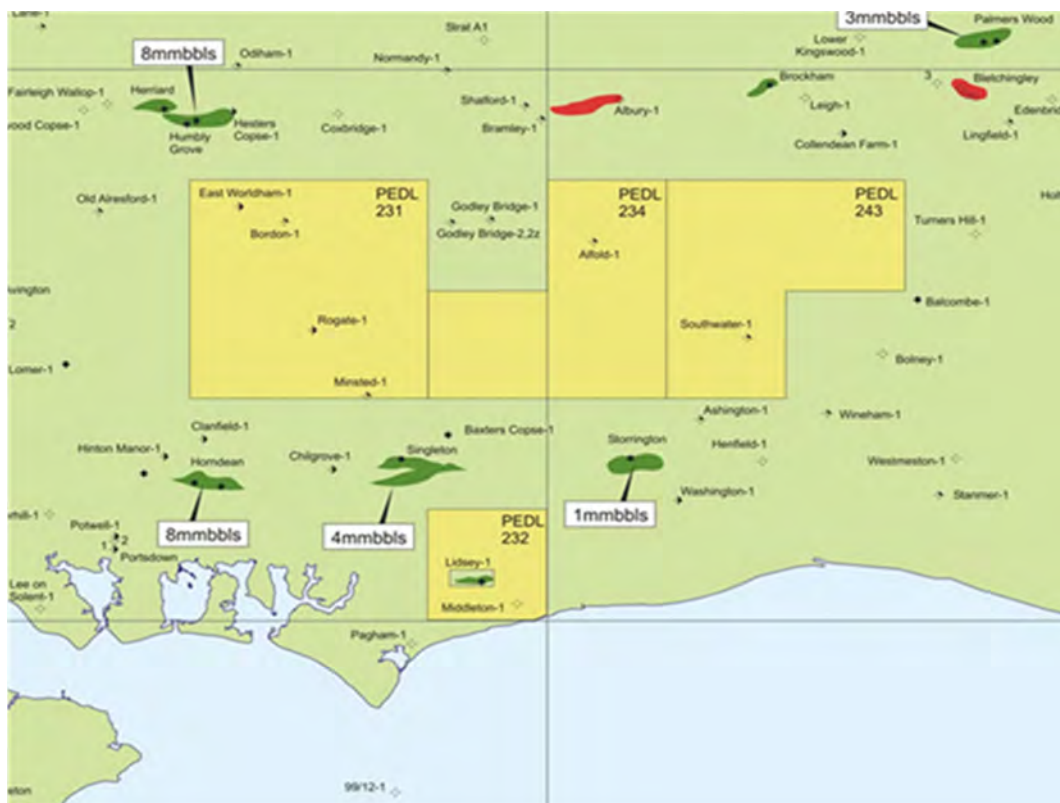
- 2.1 Oil and gas (hydrocarbons) are the product of the compression and heating of organic materials including the remains of plants and organisms mixed with clay, silt, sand and other sediments. Over a geological time period of millions of years, the sediment will be buried under many layers of further material. The organic-rich sediment which is referred to as a hydrocarbon “source rock” will be broken down, or “cooked” to oil and gas under the increased temperatures and pressures caused during burial in the Earth’s subsurface. Hydrocarbons will form near to the where the initial sediments were laid in the Earth’s past and providing suitable subsurface conditions are present.
- 2.2 This is a natural process which cannot be controlled and therefore hydrocarbons can only be mined from where they naturally occur. Mineral exploration involves drilling through these natural rock formations which may contain the oil and gas deposits, to understand the subsurface geology and assess any minerals discovered.

### **Why is the Applicant looking for oil and gas?**

- 2.3 The Department for Energy and Climate Change (DECC) issues Petroleum Exploration and Development Licences (PEDL) to oil and gas companies under powers granted by the Petroleum Act 1998. The PEDL confers the rights to the oil and gas company to pursue a range of oil and gas exploration and development activities and to “search for, bore for and get hydrocarbons” within a geographical area covered by the Licence.
- 2.4 The PEDL does not confer any exemptions from other legal or regulatory requirements such as drilling and development consents, planning permission, landowner rights and health and safety approval. Oil and gas is widely used as a source of energy, and DECC expects Licences to be optimally worked to maximise the economic recovery of oil and gas and the development of our national resources.

**Where is the Applicant looking for oil and gas?**

- 2.5 The Applicant along with its joint venture partner, Magellan Petroleum (UK), was awarded PEDL 234 in July 2008 with both parties having a 50% interest in the Licence. At the same time both parties were also awarded with adjoining Licences PEDL 231 to the east and PEDL 243 to the west. PEDL 234 is a right angled or “L” shape Licence area covering 300 sq. km.
- 2.6 From east to west, PEDL 234 extends 20km from Easebourne to Broadford Bridge, and 10km from Dunsfold to Rudgwick. From north to south PEDL 234 runs 20km from Cranleigh to Fittleworth, and 10km from Northchapel to the south of Petworth. PEDL 234 encompasses part of what is referred to geologically as the Weald Basin which is located in southern England to the south of London, extending eastwards to northern France. PEDL 234 falls within the centre of the Basin and is referred to by the Applicant as the Central Weald Basin. The location of PEDL 234 including the Applicant’s other southern England PEDL’s, is identified in **Diagram 2.1** below;

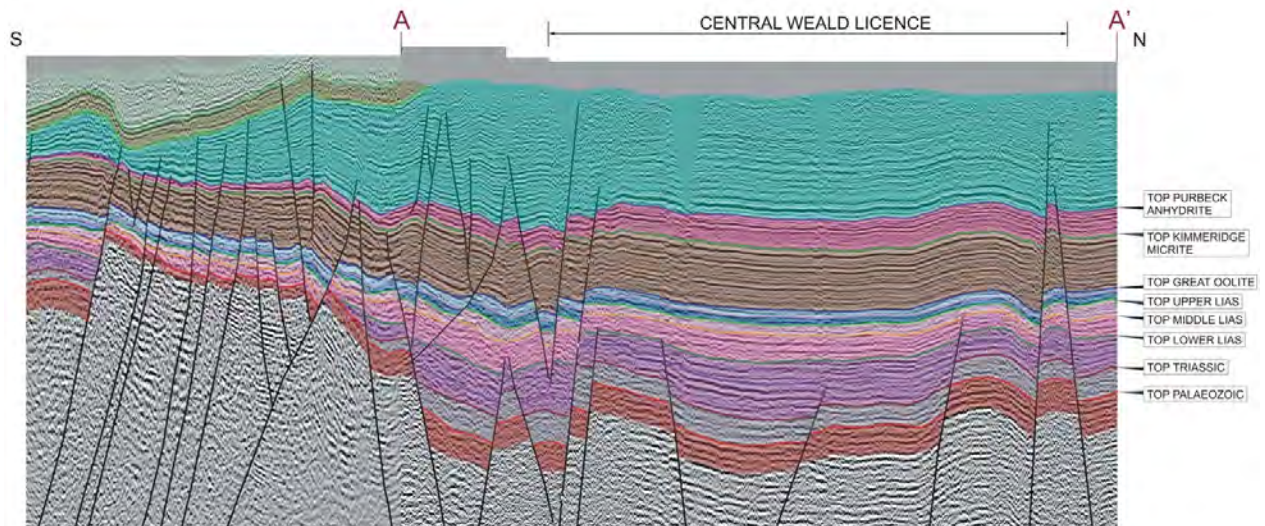


**Diagram 2.1** Location Map of PEDL 234

2.7 **Diagram 2.1** also illustrates the historic and on-going level of oil and gas activity in other parts of the Weald Basin at Storrington, Horndean, Singleton and Humbly Grove.

### What is special about the geology in PEDL 234?

2.8 Historic and more recent seismic surveys indicate that the Central Weald Basin may contain oil or gas accumulations within the Jurassic Limestones and Shales. Having evaluated seismic data of the underground rock structures in the Basin within PEDL 234, the Applicants geologists identified a large structure deep within the Basin. A section of seismic data for the Central Weald Licence area is shown in **Diagram 2.2**.



**Diagram 2.2** Seismic data from the Central Weald Licence Area

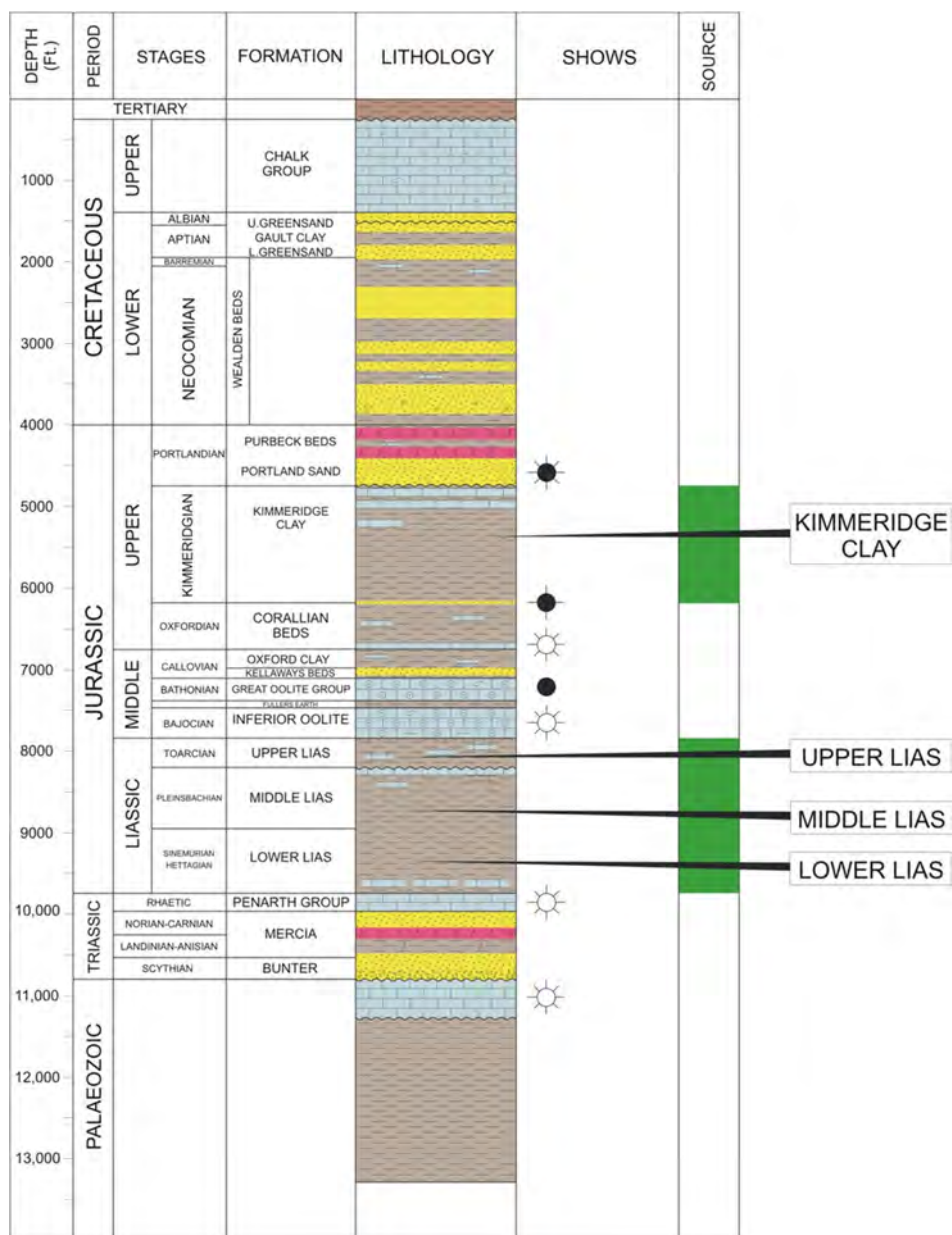
2.9 This rock structure consists of Jurassic Limestones and Shales including Kimmeridge Limestone, the Great Oolite, Kimmeridge Clay and Liassic Shales which may hold oil or gas accumulations. Data gathered from historic and more recent wells predominantly from the edge of the Weald Basin combined with additional analysis by the Applicant, has identified the Kimmeridge Limestone as the “target reservoir” because it is:

- A thick, porous layer of rock
- Likely to be naturally fractured allowing the oil or gas to flow more freely
- Within the Kimmeridge Clay which is a prolific source rock



- At a depth that is likely to mean oil is mature
- Located within the centre rather than the edge of the Weald Basin.

2.10 The geology in this central area of the Weald is technically referred to as a “stratigraphic trap” which means that the internal structure of the geological formations and rock strata are preventing oil in the centre of the Weald Basin from escaping to the edges of the Basin where there are already wells. The characteristics or “lithology” of the rocks in the Weald Basin can be seen in **Diagram 2.3** below.



**Diagram 2.3** Lithology of the Weald Basin

2.11 The Great Oolite is the secondary “target reservoir” in this area because it is unclear from geoscientific analysis if the stratigraphic trapping mechanism in this formation has occurred and if hydrocarbons have accumulated. If the stratigraphic trap has worked, it is likely that hydrocarbons will have accumulated in the rock formation. When the Great Oolite has been drilled by other operators in surrounding wells, the porosity of this rock has shown generally to be tight but where there has been porosity, there has been hydrocarbon shows. The porosity distribution of the Great Oolite is therefore uncertain, and coring this rock formation during drilling will gather information to enable a conclusion to be drawn on the potential for oil and gas extraction from this rock structure. From this evaluation it will be possible to establish whether hydraulic fracturing might be required in the future although no hydraulic fracturing will be used as part of this exploration activity, and therefore does not form part of this planning application.

## 3.0 SITE SEARCH METHODOLOGY

### From subsurface to surface

- 3.1 The award of PEDL 234 confers rights to the Licence holder to undertake a programme of oil and gas exploration activities but does not confer any ancillary planning rights which must be applied for separately. Having been issued with PEDL 234 and establishing through seismic and geological analysis that there may be oil and gas accumulations in the subsurface, the next stage of the site search process for the Applicant is the identification of a suitable well site location for the purposes of preparing a planning application.
- 3.2 The Methodology for identifying and analysing the surface level environment and identifying sites is explained in this Chapter. It was used by the Applicant to identify potential sites to locate the Proposed Development, and to assess each of the alternatives before choosing a site or sites to take forward and discuss with landowners. The Methodology is not based on any legal statute or published guidance but uses industry experience combined with planning and environmental information to identify the most suitable locations.

### Methodology

#### *Geology*

- 3.3 The initial part of the site selection process is a desk based exercise, with site visits being undertaken following the selection of potential sites. In the first instance a plan indicating the areas of geological interest in the subsurface are displayed on an electronic OS base map at a scale, normally of 1:25,000, to establish the surface constraints. The demarcation of the areas of geological interest can sometimes include a primary and secondary area (the “search area”) where the primary area is the preferred target for exploration with the secondary search area providing a viable but less preferable area for exploration. This map is reviewed by the Applicant’s geologists,

drilling engineer and Operations Manager prior to being issued to the Applicant's Planning Advisor for assessment, to ensure that it is technically possible to drill a borehole to the identified target search area.

*Geographical location and environmental context*

- 3.4 The following part of the site selection methodology focuses on the planning and environmental constraints and is undertaken by a town planner and draftsman. The geographical location and environmental context of the search area is reviewed by the town planner to gain an initial understanding of the built and natural environment over the subsurface. This includes looking at for example, topography, the presence and condition of roads, and extent of woodland and the boundaries of the planning authorities and Parishes.

*Environmental and local designations*

- 3.5 Following this review, using a Geographical Information Systems (GIS) package such as ArcGIS, the environmental constraints within the search area and the immediate surrounding vicinity are then layered onto the existing geological site search map using the same programme. The GIS layers will include for example, the location of Ancient Woodland, Special Protection Areas, Sites of Special Scientific Interest, Listed Buildings, and Scheduled Monuments. Local designations are often not available in a GIS compatible layer and must be applied to the Constraints Plan separately having reviewed the Local Plan.

*Acoustic buffer zones*

- 3.6 Finally, using the GIS package a 400m radius is plotted around all known residential buildings and represents a modest "buffer zone" between residential properties and the development of any potential hydrocarbon well sites, to limit noise intrusion prior to the carrying out of a full noise assessment. When all of these processes have been carried out, the final plan is commonly referred to by the Applicant as the Constraints Plan.

*Identifying and assessing potential sites*

- 3.7 On the Constraints Plan, the parcels of land within the search area that are left unaffected by any of these constraints are the first to be appraised against planning policies and guidance in terms of suitability for a well site. These parcels of land may constitute several fields and when numbered on the plan, do not indicate the location of the site itself but an area within which a site might be accommodated.
- 3.8 These locations are assessed in relation to access, existing natural screening, views into and out of the site, agricultural land classification, flood risk and any other relevant features, taking into consideration any allocations in the adopted Local Plan and Proposals Map which may not be available using GIS. This desk-based part of the assessment is carried out using the Constraints Plan, OS Base Maps and aerial mapping, GIS data, including listed buildings, flood zone and ground water protection mapping. Additional input is provided from specialist consultants on topics such as noise, transport and arboriculture where required, and the results of the process are reviewed by geologists and engineers.

*Flexibility and Limitations*

- 3.9 There is a degree of flexibility with this Methodology as well as some limitations which should be taken into consideration:
- The 400m buffer zone process can sometimes identify non-residential buildings such as barns, garages and other outbuildings. Where a residential building appears to be an anomaly i.e. in a remote location or small in size, clarification over the building use can usually be obtained through the Council's Public Access website or through a site visit. This can, however, be time consuming and will only be carried out where without this building may be otherwise suitable for development i.e. there are no other buildings or environmental constraints, or where there is established natural screening;

- The 400m buffer zone can be reduced to 300m where no suitable sites are identified in the first instance. The industry standard for limiting noise intrusion is considered to be approximately 300m from the source although this distance can be decreased further with additional mitigation. Whilst our Methodology proposes 400m as a preferable distance, there are instances where it is acceptable or necessary to reduce this distance due to the significance of constraints. This is particularly the case where a site has other merits such as high tree cover, an existing access or is located on level ground;
- It is important that the Constraints Plan is read in conjunction with the adopted Local Plan and Proposals Map, and applied separately where applicable.

3.10 The site selection methodology adopted is considered to provide a robust and systematic process for identifying suitable sites.

## 4.0 SITE SEARCH AREA

- 4.1 This Section of the ASA details the findings of the Site Search exercise having undertaken the Methodology outlined in Section 3 of this Report.

### Geology

- 4.2 The Kimmeridge Clay and Liassic Shales are known to be source rocks for oil and gas accumulations, and have been known to produce hydrocarbon shows in other wells in the Weald Basin. However, they are not thought to be as oil or gas rich as the Kimmeridge Micrite Limestone and as finely grained shale rocks they have a tight porosity which is likely to trap any hydrocarbon accumulations within the strata itself rather than allowing it to flow freely into a borehole. By coring and taking rock samples from the Kimmeridge Clay and Liassic Shales whilst drilling to the primary and secondary target reservoirs – the Kimmeridge Micrite Limestone and Great Oolite, the Applicant hopes to gain an understanding of the lithology of these rocks particularly their porosity.
- 4.3 The term “shale” is often associated with hydraulic fracturing. Defining shale is all about grain size, classification and texture - shale is not one rock type. The composition of shale is highly variable dependant on where the shale was deposited. Shale is a fine grained sedimentary rock and comprises of a mixture of minerals which may include calcite, quartz, clay silt, ash and organic matter, all of which affects the shale composition; so it may contain remnants of for example, limestones, and sandstones. A shale also has a textural component such that it is a fissile material and is layered in sheets and can often be split. A Limestone characteristic however, is usually a “blocky” rather than a sheet texture.
- 4.4 The Kimmeridge Micrite Limestone, one of the targets for this planning application, is a fine grained rock but not a shale due to its mineral composition primarily being Calcite and because of its “blocky” texture. It is a low permeability, tight reservoir but is a brittle rock which may be naturally fractured. Hydraulic fracturing does not form part of the

initial exploration activity or part of this planning application. If the rocks prove to be naturally fractured they may not need to be hydraulically fractured.

- 4.5 Based on geological and seismic data, the site search area which includes a primary and secondary search area, was defined by the geologists using the subsurface contours to indicate the extent of the target reservoirs. The primary search area indicates the deeper and more mature subsurface of the Central Weald Basin, which if drilled and hydrocarbons discovered, would provide more conclusive results on the lithology of the Basin. Drilling in the secondary search area is less likely to provide as substantial results, if indeed hydrocarbons are encountered at all. This site search area was reviewed by the Applicant's Drilling Manager and Operations Manager for approval before being issued to the Applicant's Planning Advisor to continue the site selection process.
- 4.6 The search area can be seen in **Figure 4.1** of this Report with details of the geographical location and environmental context provided below, as the first part of the site selection process. In the Assessment, the site search area is referred to as the "search area" and encompasses both the primary and secondary search area, unless these are referred to individually.

### **Geographical Location**

- 4.7 Geographically, the search area is centred around an irrigation reservoir to the south of Wephurst Park and falls in between the West Sussex villages of Ifold (2.3km north), Wisborough Green (3km south east) and Kirdford (1.8km south west). The search area extends almost 5km north to south from Ifold to Idehurst Copse, and approximately 2.5km east to west from Mackerel's Common to Naldretts Copse. The search area is oval in shape whilst the primary search area is almost semi-circular and is centred on Dunhurst Copse. The primary search area extends approximately 3km from north to south and 1.8km east to west.
- 4.8 The search area falls within the District of Chichester within West Sussex County Council and the boundary to the South Downs National Park is located on the southern edge of



the search area around Idehurst Copse. The search area predominantly falls within the Wards of Wisborough Green and Plaistow, and the Parishes of Wisborough Green, Kirdford, Loxwood and Plaistow.

### **Environmental Context**

- 4.9 The nearest built up areas are the surrounding villages of Wisborough Green, Kirdford and Ifold. The search area is predominantly rural in character and does not contain any villages in whole, although there are a number of scattered residential and agricultural properties throughout.
- 4.10 There are no motorways or “A” roads within the search area with the nearest being the A272 which runs in an east to west direction to the south of the search area. Kirdford Road runs in an east to west direction in the southern quarter of the search area and branches off to Skiff Lane at Dunhurst Copse leading in a northerly direction towards the villages of Ifold and Loxwood which are north of the search area. A small section of Plaistow Road falls within the search area to the west near Mackerel’s Copse but other than these roads, the search area consists of small rural roads and tracks. There are no railways, transport terminals or airports within the search area and large areas of commercial or industrial development are absent.
- 4.11 The primary search area contains a series of woodland blocks including Barkfold Rough to the west, Dunhurst Copse in the centre, Northup Copse to the south, Hookhurst Copse to the east and Crabfield Copse to the north. A small number of PROW run in an east to west alignment through the centre of the primary search area before branching out northeast towards Roundstreet Common, southwest towards Boxalland Copse and northwest towards Wephurst Furze. There are scattered residential and farm buildings throughout including Hookhurst Farm, Dounhurst Farm and Gunshot Farm. Electricity pylons, the River Adur and a series of tributaries run through the southern part of the primary search area whilst the northern part consists predominantly of open fields.

- 4.12 The secondary search area encompasses a significant network of PROW within its northern half with some larger woodland blocks around Wephurst Park to the northwest including Wephurst Wood, and Wephurst Furze. There are also a number of individual ponds and watercourses around Orchard Cottage to the north, Beldhamland Copse to the east, and Wephurst Park and Holland's Heath Farm to the southwest. The northern half of the secondary search area has an undulating topography and a number of scattered properties whilst the southern half of the secondary search area is predominantly open fields with scattered watercourses, ponds and some smaller woodland blocks including Boxalland Copse and Jacksland Copse, and part of the larger Idehurst Copse.
- 4.13 Having identified and reviewed the geographical location and environmental context of the search area, the environmental designations have then been layered onto the map using GIS. The search area including designations can be seen in **Figure 4.2** with details of the review undertaken during this stage of the site selection process provided below.

### **Applying the GIS layers**

#### *Environmental Designations*

- 4.14 There is a Scheduled Monument in the north western quarter of the secondary search area, located to the south of Wephurst Wood which is the historic site of Wephurst Glass House. There are no other Scheduled Monuments within the search area although there are a number of Listed Buildings throughout and these are identified in **Figure 4.2**. Within the secondary search area these include Fox Cottage in the north, then running in an east to west alignment across the northern part of the secondary search area are Costrong Farmhouse, Caleb's Brook, Wephurst Park, Walthurst Farmhouse and Pear Tree Cottage. In the western part of the secondary search area are Holland's Heath Farmhouse, Fountain's Farmhouse and Boxalland with Barkfold House to the south. Within the primary search area are Douince to the north, Dounhurst Farmhouse in the centre and Sparr Farmhouse and Skiff Farmhouse to the south east. There are a number

of Listed Buildings on the periphery of the secondary search area particularly in the village of Kirdford to the south west and Wisborough Green to the south east.

- 4.15 There are a number of blocks of Ancient Woodland in various sizes throughout the search area which are identified in **Figure 4.2**. In the primary search area this includes Crabfield Copse and a section of Cooper's Copse to the north, Hookhurst Copse to the east, Dunhurst Copse and Northup Copse in the centre, Jacksland Copse and Idehurst Copse to the south, and Barkfold Rough and Kiln Copse to the west. In the secondary search area this includes Wephurst Wood and Beldhamland Copse to the north, Walthurst Copse and Wephurst Furze in the centre, a section to the west of Boxalland Farm, Boxalland Copse to the south with a further section of Ancient Woodland between Barkfold Manor and Standgates to the south.
- 4.16 The boundary to the South Downs National Park can be seen in **Figure 4.2** and runs in an east to west alignment on the very southern boundary of the search area encompassing Idehurst Copse and Standgates. Idehurst Copse is part of The Mens and is designated as a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC) which is primarily designated because it is an extensive area of mature beech woodland with a secondary reason for designation being the population of protected Barbastelle bats in the woodland. There were no other statutory designations identified but a review of the search area against the Local Proposals map will also be undertaken to identify any further local designations.

#### *Local Plan Designations*

- 4.17 The Chichester Local Plan Proposals Map (1999) indicates that Dunhurst Copse and Northup Copse within the centre of the primary search area are both designated as a Site of Nature Conservation Importance (SNCI). The Chichester Local Plan Proposals Map also indicates that on the northern tip of the secondary search area is another very small SNCI – Headfoldwoods Meadow. These are shown on **Figure 4.3** and are considered in the assessment of the individual sites selected later in the process. The Local Plan Proposals Map did not highlight any further designations than those already identified.

### *Acoustic Buffer Zones*

- 4.18 Having plotted the environmental and local designations on the plan using GIS, a 400m buffer is circled around the properties within both the primary and secondary search area to provide an acoustic buffer to residential amenity in advance of a full noise assessment being undertaken. The buffer zones can be seen in **Figure 4.4** on the final Constraints Plan.

### **Summary**

- 4.19 Having identified a technically suitable search area including both a primary and secondary area of search, and having undertaken a review of the geographical location, environmental designations and indicated an acoustic buffer, a planning policy review is undertaken to establish the spatial planning policies which relate to the search area and any potential sites identified. To avoid duplication in the planning application submission, the planning policy review can be seen in the accompanying Planning Statement.

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## 5.0 SITE SEARCH RESULTS

- 5.1 This Section considers the Alternative Sites which were identified using the Site Search Methodology described in Section 3 of this Report.

### **The “No Development” Alternative**

- 5.2 The “No Development” Alternative is the option of retaining the Application Site in its current use rather than carrying out the Proposed Development. The “no development” alternative would see the Application Site continuing in agricultural use with no corresponding effects arising from landscape and visual impact, ecology, noise, traffic, lighting and socio-economics associated with the construction, operation and restoration or retention of the Proposed Development.
- 5.3 The Department for Energy and Climate Change (DECC) is responsible for making sure “the UK has secure, clean, affordable energy supplies”, and is responsible for issuing Petroleum Exploration and Development Licences (PEDL) for onshore oil and gas exploration. Licences take the form of a deed, binding the licensee to obey the conditions of the licence which DECC expect the operator to work (DECC website, 2013). The issuance of a Licence, the duty to fulfil the associated conditions and the rights conferred by the Licence all support the need for oil and gas exploration in the UK at a national level.
- 5.4 National Energy Policy set out in the Energy White Paper seeks to reduce the risks associated with relying on oil and gas imports from a small concentration of companies but acknowledges the need to reduce carbon emissions and ensure security of supply. On this basis national energy policy accepts that for now the UK cannot rely on renewables alone and promotes energy saving measures through the Energy Act (2011). The White Paper also advocates a diverse energy mix with fossil fuels being an important part of that mix for the foreseeable future and this is supported more recently by the National Policy Statement for Energy (EN-1) 2011.

- 5.5 Ofgem's Annual Energy Statements (AES) acknowledge that without action the UK will become susceptible to high and volatile oil and gas prices. In securing our supplies, the 2010 AES recommends high standards of safety and environmental management rather than moratoriums on development. DECC's strategy is to reduce energy usage whilst also making the best use of our domestic oil and gas resources including shale, and the 2011 AES acknowledges that the UK needs significant new investment in energy infrastructure to meet future demand.
- 5.6 With fuel poverty having doubled from 2001 to 2009 due to the increasing cost of fuel and with the energy sector making a significant contribution to employment and the economy, the Government recognises the positive socio-economic aspects associated with energy developments. The 2012 AES notes that in 2011, the energy industry contributed 4.4% to UK GDP, around £12.7 billion of investment and 22,800 jobs in the UK. The UK planning strategy supports the Government's energy strategy and the NPPF recognises that minerals are essential to support sustainable economic growth and our quality of life. Therefore ensuring sufficient supply is essential.
- 5.7 The Proposed Development aims to establish if there is oil or gas present within this area of the Central Weald Basin and secondly to establish the unconventional potential, if any. By not developing the proposed well site and exploring the Basin within PEDL 243, the Applicant would be in breach of the Conditions of their Licence and would not be in compliance with the national strategy on energy. Exploration is just the first step in establishing new domestic resources which if discovered and producible, would increase our security of supply and reduce our dependency on other countries for fuel. In turn, a successful discovery could reduce the UK's susceptibility to volatile price rises whilst also providing socio-economic benefits including employment, reduced energy prices, investment and tax contributions.
- 5.8 The accompanying Environmental Impact Assessment (EIA) concludes that all but one of the effects is temporary whilst the single permanent effect can be suitably mitigated from a moderate to negligible effect. The significance of the temporary effects range from moderate adverse to moderate/minor beneficial with mitigation being proposed as

such that the residual effects are reduced to negligible, minor adverse or moderate/minor beneficial. The only exception to this is Landscape and Visual Impact where the significance of effects were considered to be more adverse in comparison to the other disciplines and ranged from major/moderate to minor adverse. With mitigation the residual impacts are reduced to mostly moderate and minor adverse with two major adverse effects relating to landscape character during operation although these are all temporary effects.

- 5.9 Whilst the residual environmental impacts in the vicinity of the Application Site are expected to be temporary and mostly negligible or minor adverse with the exceptions identified above, the “no development” alternative would result in adverse socio-economic effects. It would also be contrary to national energy and planning guidance on the development of our domestic onshore oil and gas resources. These adverse socio-economic impacts outweigh any beneficial impacts that would arise from the “no development” alternative.

### **Desk Based Site Search**

- 5.10 Having applied a 400m acoustic buffer zone to the Constraints Plan, a total of 7 locations were identified which may be suitable for accommodating a well site. These are referred to in the review as “Site [number]” because the assessment considers various options for locating a site within that general location, using the site number on the Constraints Plan as a point of reference for measurements. These sites are illustrated in **Figure 5.1** and the results of their assessment provided below.

#### **Site 1**

- 5.11 **Site 1** indicates a small area consisting of fields, woodland and a bridleway. It is located outside of the South Downs National Park (SDNP) and falls within the secondary search area to the north of Walthurst Copse which is designated as ancient woodland (**Figure 5.2**). Walthurst Farmhouse is located 375m south east, Wephurst Park is located approximately 430m south west whilst Fox Cottage is located 450m north east. All of

these are Grade II listed buildings forming a triangle around **Site 1**. Orchard Cottage which is not listed, is approximately 500m north of **Site 1** and there is a Scheduled Monument – the site of Wephurst Glass House, 500m to the west.

- 5.12 **Site 1** as indicated on the Constraints Plan benefits from existing natural screening provided by Pond Field Plantation to the north and Walthurst Copse to the south. There is a bridleway which runs in a north to south alignment on the western boundary of the field marked **Site 1**. The field to the west of this is more open and in greater proximity to the Scheduled Monument. The eastern field edge around **Site 1** would be open to views from the properties to the south east on Skiff Lane as there is no woodland in between them. Using aerial mapping, an internal access road which serves Wephurst Park can be seen running in an east to west direction on the southern boundary of the **Site 1** field.
- 5.13 **Site 1** falls between Skiff Lane to the east and Plaistow Road to the west and would require either the use of the existing Wephurst Estate road or the development of a new access road. A new road would be approximately 750m from Skiff Lane or 1km from Plaistow Road and would require the felling of trees and hedgerows, the loss of field boundaries, and the crossing of watercourses and ditches, which is likely to have likely significant long term visual impacts on the surrounding area. From aerial mapping it is clear that the existing Estate road is narrow with limited or no opportunity for passing places due to the existing hedgerows and mature trees. Another Estate road runs in parallel to this road approximately 150m south but is tree lined, has a number of sharp bends and leads directly into historic Wephurst Park passing a number of other properties en route.
- 5.14 The location around **Site 1** was discounted on the basis that vehicular access to the locality was heavily restricted, and a new access road would have long term and likely significant landscape and visual impacts. A new access road would need to be long to connect the Site to either Skiff Lane or Plaistow Road and this would extend works and disruption associated with the Proposed Development. Moreover, this would require trees to be felled and hedgerows to be removed which would have a more significant



impact on the landscape and ecology whilst also causing visual impacts particularly to users of the Estate road leading up to the historic house.

## Site 2

- 5.15 **Site 2** on the Constraints Plan identifies an area of approximately 500m x 300m with a thin strip of land approximately 100m wide extending southeast towards Crabfield Copse, 700m away (**Figure 5.3**). An area of at least 90m x 120m is required to accommodate an exploration well site excluding the access road. The thin section of land which extends out towards Crabfield Copse crosses a number of field boundaries and is an open landscape with no significant natural screening particularly to Dounhurst Farmhouse to the south, Walthurst Farmhouse to the north and Gunshot Farmhouse to the north east which are all Grade II listed buildings.
- 5.16 The larger area marked as **Site 2** on the Constraints Plan falls outside the boundary of the SDNP and is located within the secondary site search area. The outer field boundaries consist of a series of bridleways and Public Rights of Way (PROW) with a number of ponds and watercourses in proximity. There are irrigational reservoirs approximately 400m southeast of **Site 2** but the Site does not fall within a flood risk area according to the Environment Agency map.
- 5.17 Wephurst Furze on the north eastern boundary is an area of mature woodland which is designated as ancient and semi-natural woodland, and would provide suitable natural screening to any development in this location subject to consideration of ecological and arboricultural constraints. Aerial mapping shows that there are also further areas of woodland planting and hedgerows around the eastern, southern and western boundary of the wider field boundary. This would provide some screening to nearby residential properties including Fountain's Farm (550m south), Holland's Heath Farm (820m south west) and Dounhurst Farm (800m south east) all of which are Grade II listed buildings.
- 5.18 **Site 2** falls between Skiff Lane to the east and Plaistow Road to the west and aerial mapping indicates that there is an existing private road with a restricted entrance width,

leading towards Holland's Heath Copse where an agricultural track leads north into the south western corner of the field of **Site 2**. A new access road from Skiff Lane to the east would be approximately 1km in length and would cross several field boundaries, a bridleway and a watercourse. It would also require the felling of trees and hedges which would have likely significant and long term impacts on the landscape and fields.

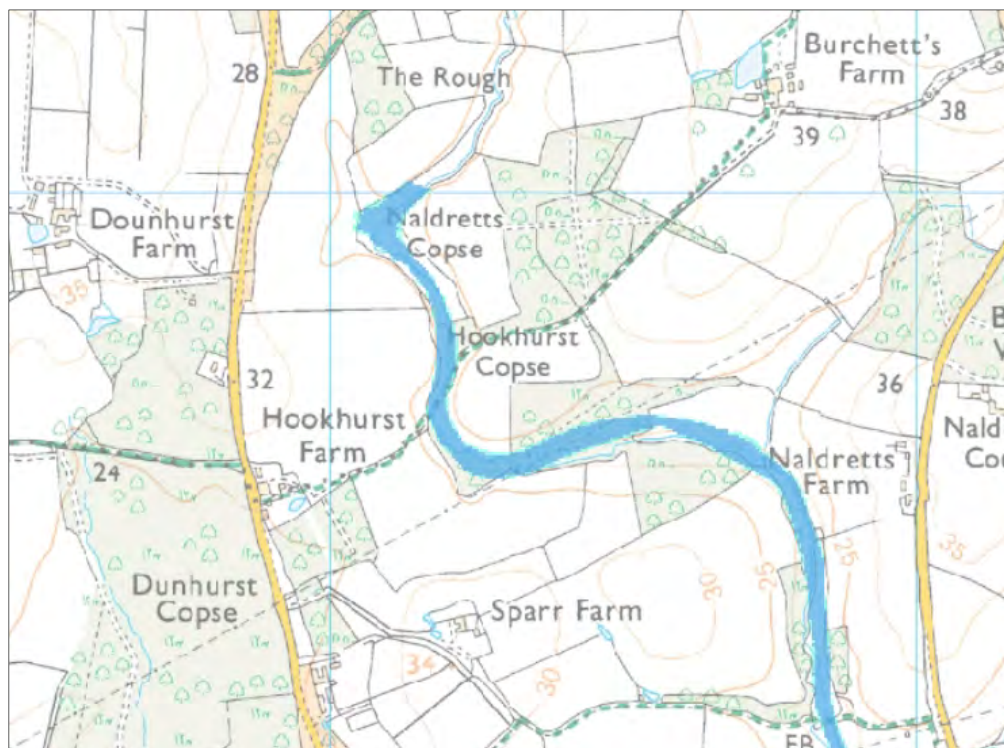
- 5.19 **Site 2** was considered to have some potential for development if a suitable vehicular access could be identified and providing that screening to the surrounding residential properties could be achieved. Any long term production site would require further landscaping to enhance views particularly from the south and south east, where landscaping exists only on the field boundary and not the Site boundary. Investigations into ecology and drainage would also need to be undertaken early due to the location of watercourses and the reservoirs, as well as the designation of Ancient Woodland.

### **Site 3**

- 5.20 The location around **Site 3** is identified on the Constraints Plan as an area of approximately 600m in length and 500m in width at the greatest extents, and roughly forming a pentagon shape (**Figure 5.4**). It consists of fields and woodland including Naldretts Copse and Hookhurst Copse with a PROW running through the middle from the northeast in an east to west alignment. There are three clearings within the woodland with one field to the west of Naldretts Copse, a right angled field between the two Copses marked as **Site 3** on the Constraints Plan, and another field to the east of **Site 3**.
- 5.21 **Site 3** is located outside of the South Downs National Park and falls within the primary search area. The Site is approximately 1.5km north of the village of Wisborough Green, located on undulating agricultural and wooded land which slopes from the northeast in a south westerly direction from about 39m AOD to 32m AOD. The nearest residential properties include Burchett's Farm (600m north east), Naldretts Farm (680m south east),

Sparr Farm (415m south) all of which are Grade II listed buildings, whilst Hookhurst Farm is located 425m east and Naldretts Court is 800m east but neither are listed buildings.

5.22 There are pylons which run in a north east to south west alignment through Hookhurst Copse from Bittles Wood towards Dunhurst Copse. A PROW runs in a north easterly direction from Hookhurst Farm to the south west of **Site 3** towards Burchett's Farm, and there is a watercourse which winds around the western edge of Hookhurst Copse and down past Naldretts Farm to the south east. The Environment Agency (EA) flood risk map indicates that there has been flooding from the watercourse to the west with a probability of between 1 in 200 and 1 in 75 chance of flooding, as indicated on **Diagram 5.1**. This is considered by the EA to be of moderate to significant flood risk although it does not affect the whole of the search area.



**Diagram 5.1:** EA flood risk map extract

5.23 **Site 3** is not directly accessed via a public highway although there are some existing internal agricultural tracks within the fields. The B2133 to the east leads north from the A272 and provides vehicular access to the surrounding area of **Site 3** with an existing farm track from Burchett's Farm providing access to Hookhurst Copse which is

designated as Ancient Woodland. The access track from Burchett's Farm towards **Site 3** is also a PROW, although mitigation measures could be incorporated to avoid conflicts between walkers and vehicles. However the gradient of the land here descends from 39m AOD to around 20m AOD meaning that vehicles would have to travel downhill and are likely to be more visible to the surrounding environment. An access road from the west via Hookhurst Farm would require crossing or use of the PROW, crossing or culverting of the watercourse where the land also dips, and tree felling.

- 5.24 The field marked as **Site 3** is well screened on all boundaries which would help to mitigate issues relating to visual intrusion although when avoiding the tree Root Protection Areas (RPA) the usable land is limited in size and by the right angled shape of the field. The fields to the north and east of **Site 3** are less favourable in comparison to the field marked **Site 3** because of the topography, pylons, and proximity to PROW, watercourses and flood risk. They may also be more exposed to the landscape due to limited natural screening, particularly to views for Burchett's Farm and Naldretts Farm and Court.
- 5.25 There was considered to be limited potential to develop a well site in this location because of the significant access, flood risk and topography issues. The positives of the Site are that it benefits from some screening, is located away from densely populated areas and is in the primary search area. The surrounding woodland at Hookhurst Copse, Naldretts Copse and Bittles Wood is all designated an Ancient Woodland and there is insufficient clearing within Hookhurst Copse to develop a well site when applying the RPA's. **Site 3** was therefore discounted.

#### **Site 4**

- 5.26 The location around **Site 4** consists of fields and woodland including a number of ponds and watercourses as well as pylons (**Figure 5.5**). It is roughly hexagonal in shape and measuring approximately 800m by 700m at its greatest extents. It falls outside the

boundary of the South Downs National Park approximately 950m north east of the village of Kirdford and falls on the edge of the primary and secondary search areas.

- 5.27 The nearest residential properties are Fountain's Farm (620m north), Holland's Heath Farm (760m north west) and Boxalland Farm (410m west) all of which are Grade II listed buildings. Many of the properties in Kirdford (950m south west) are also listed buildings and Barkfold Manor is located 820m south behind Boxalland Copse, and is Grade II listed.
- 5.28 The fields in the location of **Site 4** are all bound by watercourses with a number of larger ponds to the north east (300m) and south west (270m). The nearest roads are Kirdford Road which is approximately 1km to the south and Plaistow Road which is just over 1km to the west. There is no public highway into the site and the nearest of any kind of vehicular access is the road leading up from Kirdford Road to Boxalland Farm to the west of **Site 4**. In any case access to **Site 4** would involve crossing at least one watercourse which would require a culvert or bridge.
- 5.29 **Site 4** is shown on higher ground at approximately 27m AOD whilst the surrounding topography is around 20m AOD. There are pylons running in a north to south alignment through the fields to the west with the surrounding landscape being open and exposed with little natural screening other than that provided by Barkfold Rough to the east which is designated as Ancient Woodland. There are some PROW and bridleways in proximity to **Site 4** but not directly affecting any of the fields within this location.
- 5.30 Locating a well site in this location would require the removal of hedgerows and field boundaries to create a large enough area on level ground, and may result in a site being developed adjacent to one of the many ponds and watercourses which may present flood or drainage issues. A well site in this location would also be exposed to wider views particularly from Kirdford because there is very little natural screening. Moving the site further north or west would place it in closer proximity to residential properties particularly Boxalland Farm and those at Holland's Heath.

5.31 **Site 4** was discounted on the basis that there was limited land available to accommodate a well site and associated infrastructure at a suitable distance from surrounding properties and without extensive felling or disruption to field boundaries. In addition, the limited number of roads which lead towards the Site are rural - being narrow and tree lined, and would not be suitable for HGV access. The proximity of the Site to a number of watercourses, limited highway access with a new access road likely to require substantial tree and hedgerow removal, and the use of existing roads likely to cause disruption to a number of villages.

### **Sites 5, 6 and 7**

5.32 When undertaking the site search exercise, the Constraints Plan indicated a large “clear” section in the centre of the southern part of the primary search area which was divided into **Sites 5, 6 and 7** for ease of reference. **Site 5** is all the “clear” land to the north of Kirdford Road and Boxal Bridge whilst **Site 6** and **Site 7** are the northern and southern parts of the large agricultural field to the south of Kirdford Road.

### **Site 5**

5.33 The location of **Site 5** encompasses a small area within a larger field and a section of Dunhurst Copse (**Figure 5.6**). There is a PROW to the south and pylons running along the southern edge of the **Site 5** field, and further PROW to the north and west. The area around **Site 5** is roughly square in shape and is around 450m x 450m in size. It is located outside of the South Downs National Park and within the primary search area. The topography varies from 25m AOD to 20m AOD.

5.34 The Site is located off Skiff Lane with good access from the A272 to the south east and it benefits from significant natural screening on all boundaries by the surrounding woodland which is designated as Ancient and an SNCI. There is an existing access road off Skiff Lane opposite Hookhurst Farm which passes through Dunhurst Copse to the northern boundary of the field within which **Site 5** sits.

- 5.35 From aerial mapping an agricultural building can be seen on the north eastern corner of the field where the access road exits the Copse, and Chandler's Barn which is a residential property, lies just beyond the north western boundary approximately 400m north west of **Site 5**. There are electricity pylons running through the southern part of the field across the location of **Site 5** which run in a south westerly direction from Roundstreet Common, as well as a section of Boxal Brook.
- 5.36 The smaller section of land to the south of **Site 5** and Dunhurst Copse on the Constraints Plan which is in between Kirdford Road and Boxal Brook, is limited in size to approximately 100m x 300m. It is also split in the middle by a small section of woodland and is exposed to Kirdford Road from which there is limited natural screening. This smaller section of **Site 5** to the south was therefore discounted.
- 5.37 However, the main field marked **Site 5** on the Constraints Plan was considered to have potential for development because it is well screened although views north to Dounhurst Farm may need enhancements through landscaping in the long term. The Site is also in the primary search area and outside of the SDNP. It would require only a small access road, albeit following the path of a PROW, into the southern part of the field and vehicles could reach the site using the A272 to the south which is a main road through the local area. The land is relatively flat and would provide sufficient acreage to accommodate a well site whilst also respecting the RPA's.

### **Site 6**

- 5.38 The location of **Site 6** encompasses the northern half of a large agricultural field to the south of Kirdford Road and Boxal Bridge where there is a section of Boxal Brook within undesignated woodland to the north east, and a small section of Northup Copse which is designated as Ancient Woodland and a SNCI further north east (**Figure 5.7**).
- 5.39 **Site 6** is located outside of the South Downs National Park approximately 600m north of its boundary, and is located within the primary search area meaning that a vertical well

rather than a deviated well can be drilled making operations more efficient and thus helping to mitigate impacts. The Site is 1.1km west of the village of Wisborough Green and 1.6km east of the village of Kirdford. Dunhurst Copse to the north is designated as ancient and semi-natural woodland, and a SNCI. Idehurst Copse which is approximately 500m south is also designated as ancient and semi-natural woodland and forms part of The Mens which is a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) within the South Downs National Park.

- 5.40 **Site 6** is less than 1km from the A272 therefore providing vehicular access to the general location of the Site and avoiding significant disruption to smaller rural roads by passing through a number of villages. There are watercourses which curve around the eastern boundary of the agricultural field, and there is an area of flood risk around Boxal Bridge to the north although not on the Site itself. There are electricity pylons which run in a south easterly direction from the eastern boundary of the field although these are some 250m away, and screening is provided by the woodland to the north, east and south although the western boundary is exposed but for mature hedgerows along the road edge.
- 5.41 The area around **Site 6** is sparsely populated and it has been established from aerial mapping and Chichester District Council's Public Access website, that the building near to Kirdford Road within the northern part of the field is an agricultural rather than a residential building. The nearest residential building is Sparr Farm which is Grade II listed and 550m to the east beyond the woodland of Northup Copse. Other properties associated with Wisborough Green are more than 550m south east of **Site 6**. Barkfold Manor is approximately 800m west and is Grade II listed with the village of Kirdford being approximately 1.9km west.
- 5.42 **Site 6** was considered to have potential for development because of its vehicular access and proximity to the A272 – a main transport route, natural screening provided by the surrounding mature woodland and the suitable distances from residential properties. The existing pylons are around 80m high and therefore vertical structures are already present in this field of a greater height than a drill rig but at a sufficient distance from



the site. It is not affected by PROW and does not fall within the SDNP. Falling within the primary search area and on a level topography the site was also considered suitable from a geology and engineering perspective. The site was unlikely to require substantial, if any, tree or hedgerow removal and therefore it would be unlikely to result in long term or likely significant landscape impacts as some of the other sites which were considered would have.

### Site 7

- 5.43 **Site 7** is located to the south of **Site 6** within the same agricultural field but falls on the boundary of the South Downs National Park and on the edge of the primary search area (**Figure 5.8**). The Site was considered to be less favourable in comparison to **Site 6** because it was in greater proximity to the National Park and the environmental designations associated with The Mens. A Site in this southern part of the field would also need a longer access road, be in greater proximity to watercourses to the south and would need to pass under the electricity pylons. The Site was therefore quickly discounted from any further consideration as a potential well site location with **Site 6** offering greater potential for development in comparison.

### *Reducing the 400m buffer zone*

- 5.44 Having identified 7 Sites using the 400m buffer around residential properties, for completeness, the buffer was reduced to 300m to see if this identified any other potential locations which may be suitable notwithstanding the merit of **Sites 2, 5 and 6** which had already been identified. A further four potential sites (**Sites 8-11**) were identified and these are illustrated on **Figure 5.9** and detailed below.

### Site 8

- 5.45 **Site 8** is located 1.2km south east of the village of Ifold and is located in the secondary search area (**Figure 5.10**). It is accessed from Skiff Lane to the east with access to the B2133 further north and the A272 to the south. From aerial mapping, the field is

surrounded by mature trees and hedgerows on all sides, with an existing access track off Skiff Lane located opposite the entrance track to Hurst Farm House. Beldhamland Copse to the south is designated as ancient woodland with a small watercourse located on the northern boundary of the Copse. Beldhamland Farm House to the north (300m) is a Grade II listed building. There are no other environmental designations on or adjacent to the Site and it is outside of the South Downs National Park.

- 5.46 A short access road would be required which could utilise the existing access off Skiff Lane. The nearest house is just under 300m from the northern boundary of the field at Beldhamland Farm and whilst noise could be mitigated to the necessary levels at this distance, **Sites 2, 5 and 6** are further from residential properties and are therefore considered more suitable for development.
- 5.47 Notwithstanding the above, the existing trees provide good natural screening to the Site from the road and surrounding area but the development would be limited to the small field marked as **Site 8** on the Constraints Plan. Taking into consideration the tree RPA's it would not be possible to locate a well site including HGV turning circle and passing places, and all the ancillary infrastructure including parking and bunds in this field without felling trees and changing field boundaries. This would have long term visual, landscape, drainage, heritage and ecology impacts as a result of material changes to the existing landscape. **Site 8** was therefore discounted for the reasons identified above.

### **Site 9**

- 5.48 **Site 9** is located to the south west of **Site 8** and the west of Beldhamland Copse which as previously discussed is designated ancient woodland (**Figure 5.11**). The Site is outside of the South Downs National Park and within the secondary search area. There is a bridleway which runs north to south along the western boundary with existing mature trees and hedgerows on all boundaries and an internal access road on the southern boundary which runs east to west.

- 5.49 There are some agricultural buildings approximately 200m south of the southern boundary of **Site 9**, and Walthurst Farm lies approximately 315m south west from the same boundary. Another property is located 320m south east off Skiff Lane and one more property lies 320m north west. There is an extensive network of trees and woodland which would provide both acoustic and visual screening to the Site, and only a short access road from Skiff Lane would be required.
- 5.50 However, due to the limited size of the field it would not be possible to accommodate a well site at **Site 9**. There is insufficient space within the field unless trees are felled and field boundaries are realigned and the PROW moved. The development in this location would also front directly onto the Wephurst Estate road which as previously discussed not suitable for HGV access as there are limited opportunities to widen the road. A development here would have long term visual, landscape, heritage and ecology impacts as a result of material changes to the existing landscape, and was therefore discounted.

#### **Site 10**

- 5.51 **Site 10** is located outside of the South Downs National Park and is within the secondary search area (**Figure 5.12**). It also falls within proximity to Wephurst Park and the Grade II listed Wephurst House which lies approximately 400m west of **Site 10** whilst Walthurst Farm is located 250m east and is Grade II listed. There is an internal Estate road which is also a PROW on the northern boundary between the Site and Walthurst Copse to the north which is designated as ancient woodland. There is also a bridleway which runs north to south on the western boundary.
- 5.52 A development in this location would impact on the setting of the listed building and the Estate, particularly when combined with the substantial changes to the Estate road and its landscape that would be required to accommodate HGV traffic. Alternatively a new access road from Skiff Lane to the east would be long (circa 1km) causing potentially significant disruption and more substantial changes to the landscape and heritage. Some of the other sites identified with potential (Sites 5 and 6), already have access roads or

would need only a short extension to an existing access and are therefore favourable in comparison as the impacts would be less by comparison.

- 5.53 Notwithstanding the above, the **Site 10** field as marked on **Figure 2.16** is also limited in size which would constrain development and require changes to field boundaries, tree felling or hedgerow removal to accommodate the well site which would have long term impacts on the landscape, visual amenity, ecology and heritage. The field provides a maximum size of approximately 90m x 130m but tree root protection zones would reduce this size by a maximum of 15m on all boundaries with trees rendering the site unsuitable for development.

### **Site 11**

- 5.54 **Site 11** is located approximately 450m north of the boundary of the South Downs National Park and just outside the primary search area (**Figure 5.13**). It is 700m south east of the village of Kirdford with vehicular access being from Kirdford Road, and the A272 further east. The Site is located close to a road junction where there is very little space to develop a well site (approximately 250m x 100m), and limited screening from the Kirdford and the surrounding residential properties including Linfold Farm and Linfold Bridge to the south, both of which are listed. If a well site was to be developed in this location, it would be less than 50m from the large ponds to the south and the PROW.
- 5.55 The Site is also in greater proximity to the South Downs National Park and other associated designations including The Mens SSSI and SAC. The Site was discounted relatively quickly considering the open landscape at a road junction, the proximity of sensitive environmental designations and residential properties, and because more favourable Sites had been identified as part of the original site search exercise.

### Results of the initial desk based assessment

- 5.56 From the initial site search exercise using buffers of 400m and 300m, a total of 11 sites were identified including four in the primary search area and seven in the secondary search area. This desk based exercise concluded that eight of these sites (**Sites 1, 3 and 4, and 7-11**) should be discounted whilst the remaining three locations were worthy of further investigation (**Sites 2, 5 and 6**).
- 5.57 The desk based assessment including the recommendations for each of the sites, was reviewed by the Applicant's operations manager, drilling supervisor and geologists. In respect of geology, **Site 5** was discounted altogether due to the location of a fault line to the north. Whilst they had already been discounted for environmental reasons, the geologist concluded for the same reason that **Sites 8 and 9** were also not as geologically suitable in comparison to the other remaining sites – **Site 2** and **Site 6**. The operations manager and drilling supervisor confirmed that drilling from within the primary search area was preferable and that in consideration of the desk based report the preference was to investigate **Site 6** further with **Site 2** as a secondary preference although the highway constraints in particular, were noted.

### Site Visits

- 5.58 The search area was visited by the Applicants planning consultant and drilling engineer in October 2012 to assess the general locality and a number of the potential well site locations. This was undertaken to support the conclusions drawn from the desk based exercise, by viewing locations from the road or PROW. The site visits confirmed the results of the desk based report and highlighted the significant highway constraints associated with the search area, the limitations as a result of the topography and the need to minimise impacts on the villages and SDNP. It was concluded that **Site 6** was still the preferred option for development with **Site 2** been a secondary option although access was likely to be difficult to engineer causing potentially greater environmental effects.

5.59 **Site 8** was given some further consideration because of its proximity to the road and natural screening although concerns about site size and geological suitability remained. It was also noted that the land was for sale at the time. The site visit concluded that **Site 6** was the most viable option for development with very limited potential at **Site 2**. With such limited potential for development prior to even speaking with the landowners, it was decided that as the land at **Site 8** was for sale an approach would be made to the landowner for optionality. This highlights the significant constraints associated with identifying and securing land for oil and gas well sites.

### **Discussions with landowners**

5.60 Having identified the landowners for the three locations, contact was made with all parties to ascertain whether they would be receptive to accommodating a well site on their land.

5.61 The owner of **Site 2** also owns the discounted **Sites 1, 9 and 10** which is managed by a Trust. Following contact with the Estate Manager the sites were discounted as the Trust did not want to enter into negotiations with the Applicant for a well site proposal. With **Site 2** having been discounted, only **Site 6** and **Site 8** were left with potential for development with the latter being considered unlikely.

5.62 The landowner for **Site 8** was not in a position to enter into negotiations on the site because they were uncertain about the future of the land and its ownership. The Site was discounted on the basis of the information identified earlier in this report, and because the future ownership of the land was uncertain and the landowner unwilling.

5.63 **Site 6** and **Site 3** are owned by the same family of landowners. **Site 3** had already been discounted for a number of planning and engineering reasons outlined earlier in this report but **Site 6** was the preferred and only option for development. Having discussed the proposals with the landowner for **Site 6**, an onsite meeting was organised to discuss matters further.

### **Site visit with the landowner and project team**

- 5.64 A site visit to **Site 6** was undertaken in November 2012 and was attended by the Applicant's planning consultant, drilling manager, civil engineer and land agent along with the landowner. This site visit allowed a full on site review of the proposed site and face to face discussions on planning, engineering and land issues including topography, visual impact, access arrangements, and the design and location of the well site.
- 5.65 The site visit concluded that **Site 6** would be a suitable location for the development of a well site in respect of planning, environmental and engineering requirements subject to further specialist studies and mitigation measures including a full Environmental Impact Assessment. The proposals would provide significant economic benefits to the farm diversity which would help support the farm's core agricultural workings.

### **Site Selection Summary**

- 5.66 The Alternative Sites Assessment exercise concluded that **Site 6** was the only suitable location for the development of an exploratory well site in light of landowner, geology, planning, environmental and drilling constraints. Having assessed the site through a desk based appraisal and on site with the relevant specialists, it was considered that pre-application discussions should be held with the Planning Authority in this case West Sussex County Council (WSSC), to discuss the proposals.

### **Pre-Application Discussions with WSSC**

- 5.67 A pre-application submission was made to WSSC in February 2013 and a meeting was held with the Planning Officer on 4 March 2013 with a site visit on 17 May 2013. Written advice was provided by WSSC on 3 July 2013 and a copy is contained in **Appendix 5.1**. This advice has fed into the preparation of the ES.

## 6.0 SUMMARY AND CONCLUSIONS

### Summary

- 6.1 This ASA illustrates the robust and comprehensive assessment which has taken place to identify a site which is suitable in respect of geological, technical, environmental and planning constraints. This ASA sets out the site selection process which has taken place including reference to the Development Plan and other material considerations, geological, seismic and drilling limitations, and environmental designations.

### *Seismic Data*

- 6.2 This Assessment identifies the geological and seismic data which has been evaluated to determine the target drilling location, and how this impacts on the potential location of well sites. The target reservoir is a Kimmeridge Limestone within the Central Weald Basin in PEDL 234. The identification of the target reservoir below the surface, technically constrains where well sites can be developed on the surface which must also be balanced with environmental and planning considerations, and a subsequent landowner agreement.

### *Geographical and Environmental Context*

- 6.3 The search area that was used to identify a suitable well site to explore this area of the Basin falls within the parish of Kirdford but on the periphery of the Wisborough Green parish boundary. It is predominantly rural in character and the existing characteristics of the area were taken into consideration when developing the ASA including listed buildings, Boxal Brook and other watercourses, highway access and agricultural tracks, the location of residential properties and villages, and recreational amenities including PROW and woodland.



*The Development Plan and other Material Considerations*

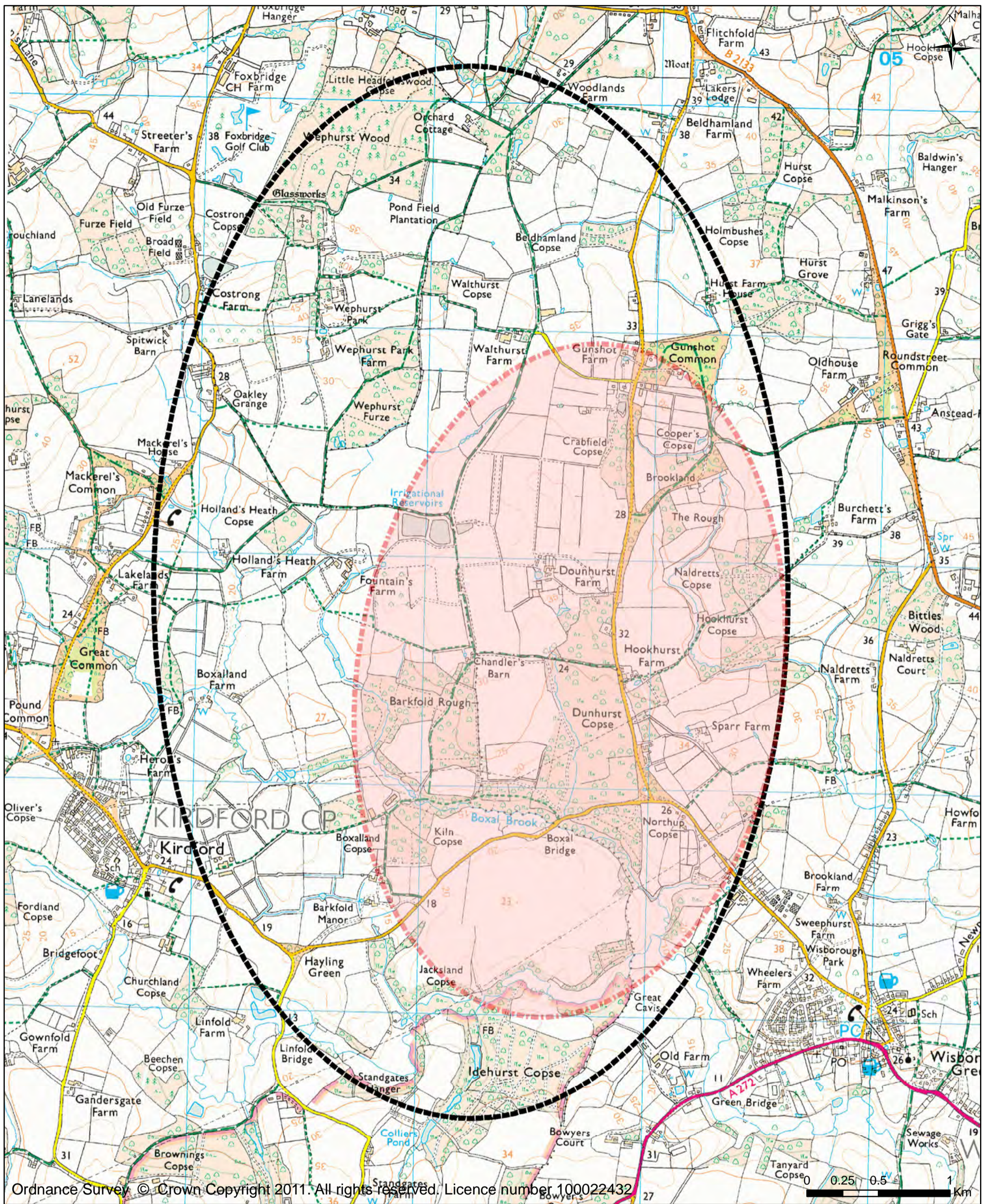
- 6.4 The location of the well site accords with the policies in the Development Plan at a regional, County and local level, and meets other material considerations in the NPPF. In accordance with the Development Plan, the Application Site will not have a detrimental impact on the existing character of the area, environmental designations or the local amenity.

**Conclusions**



- 6.5 Using the methodology outlined in this ASA, a number of potential well site locations were identified and evaluated. A number of sites were discounted at the desk based stage because there were issues which could not be mitigated against including highway access issues, landscape and visual impacts, and proximity to watercourses.
- 6.6 Three potential sites – **Sites 2, 5 and 6**, were originally identified as being suitable for development and a systematic approach to identifying the constraints and merits of each was undertaken. This involved correspondence and engagement with the project team including engineers and geologists, landowners and WSCC in designing a proposal which balanced all the influencing factors including technical, environmental and planning conflicts, and landowner agreements.
- 6.7 **Site 6** was taken forward as the proposed well site and forms the Application Site for this planning application. It is a well screened development which benefits from the use of an existing agricultural access and track that does not require the felling of any trees to accommodate the development, retains field boundaries and is in proximity to the A272 - a main vehicular route. The site does not fall within a flood risk zone.
- 6.8 The Application Site is considered a sufficient distance from residential properties as such that noise impacts will be mitigated. It falls within the primary search area and is outside of the South Downs National Park. It does not directly affect any environmental designations as it is located on agricultural land and will also support farm

diversification. The site does not impact on the local cultural heritage being located away from Scheduled Monuments and not directly adjacent to listed buildings. There is an area of non-designated woodland between the site and the designated ancient woodland as such that it is not immediately adjacent. The Application Site, which would be the subject of a full Environmental Impact Assessment, is considered to be the most suitable site for taking the development forward and fulfilling the Conditions of PEDL 234.

# FIGURES



**Legend**

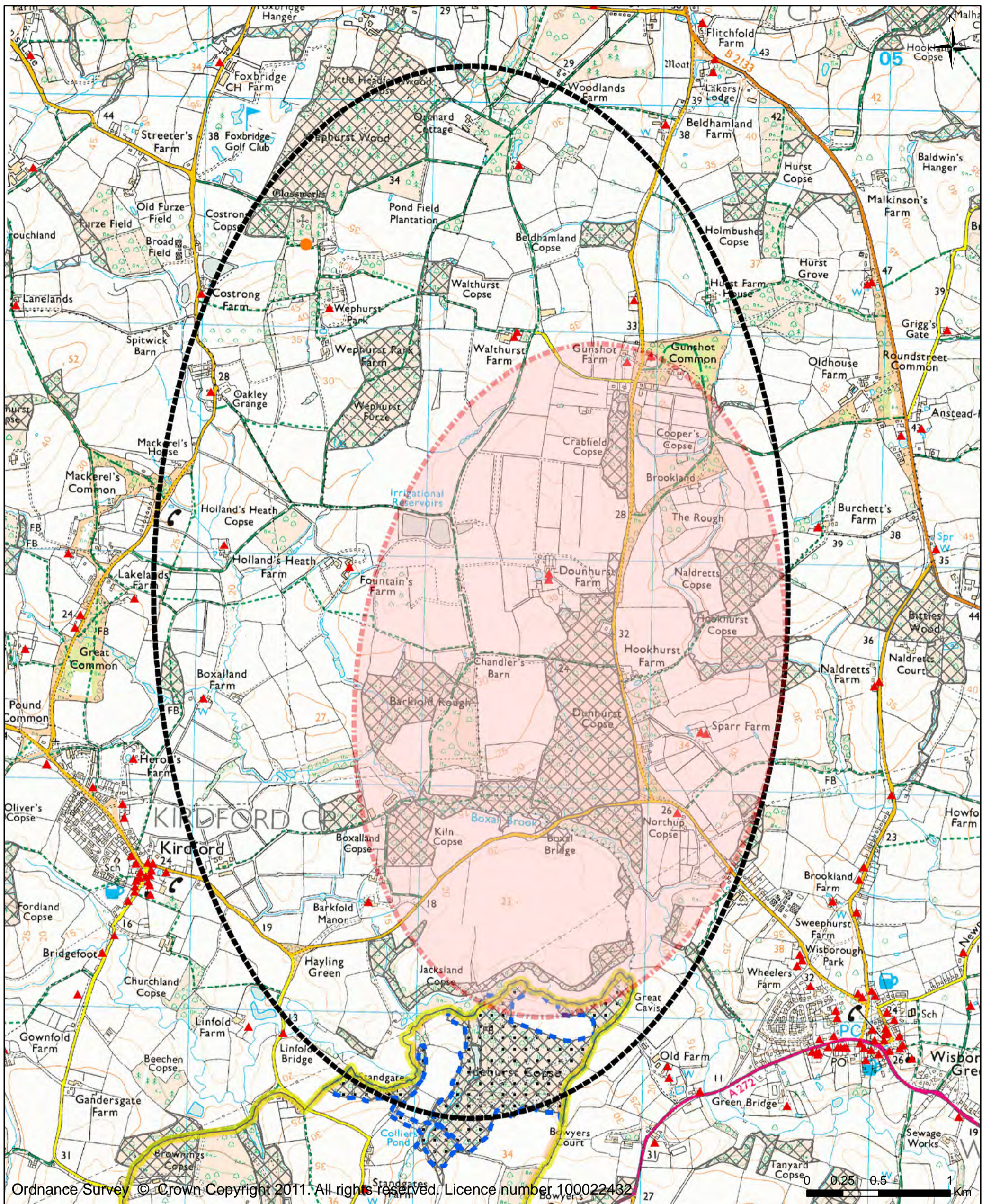
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-  Secondary Search Area



**Figure 4.1**

Site Search Area

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**Legend**

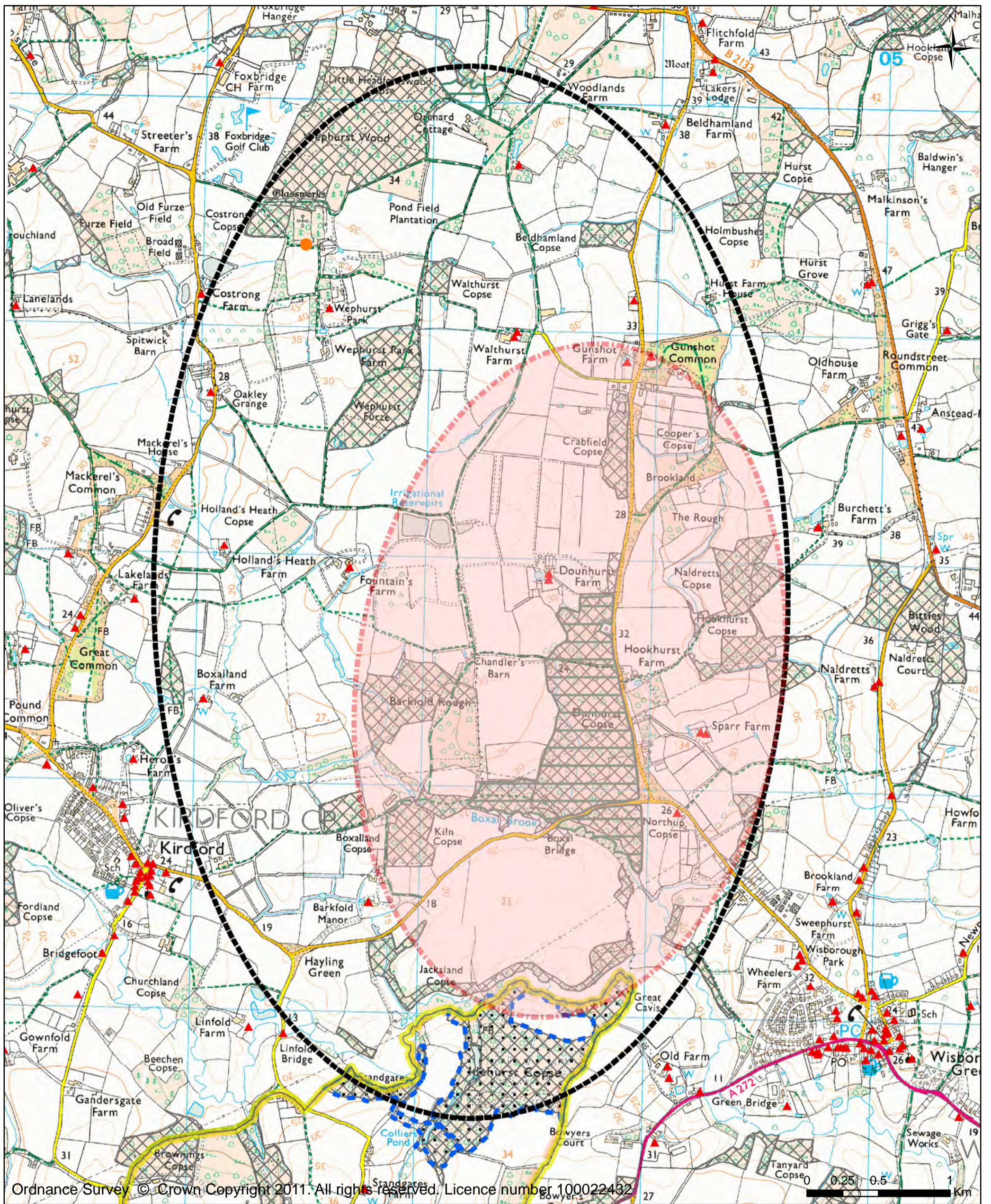
- Primary Search Area
- Secondary Search Area
- Listed Buildings
- Scheduled Monuments
- South Downs National Park Boundary
- Ramsar Sites
- Special Areas of Conservation
- Ancient Woodland
- Sites of Special Scientific Interest
- Special Protection Areas
- Nature Reserves















**Figure 4.2**

Environmental Designations

1:25,000



**Legend**

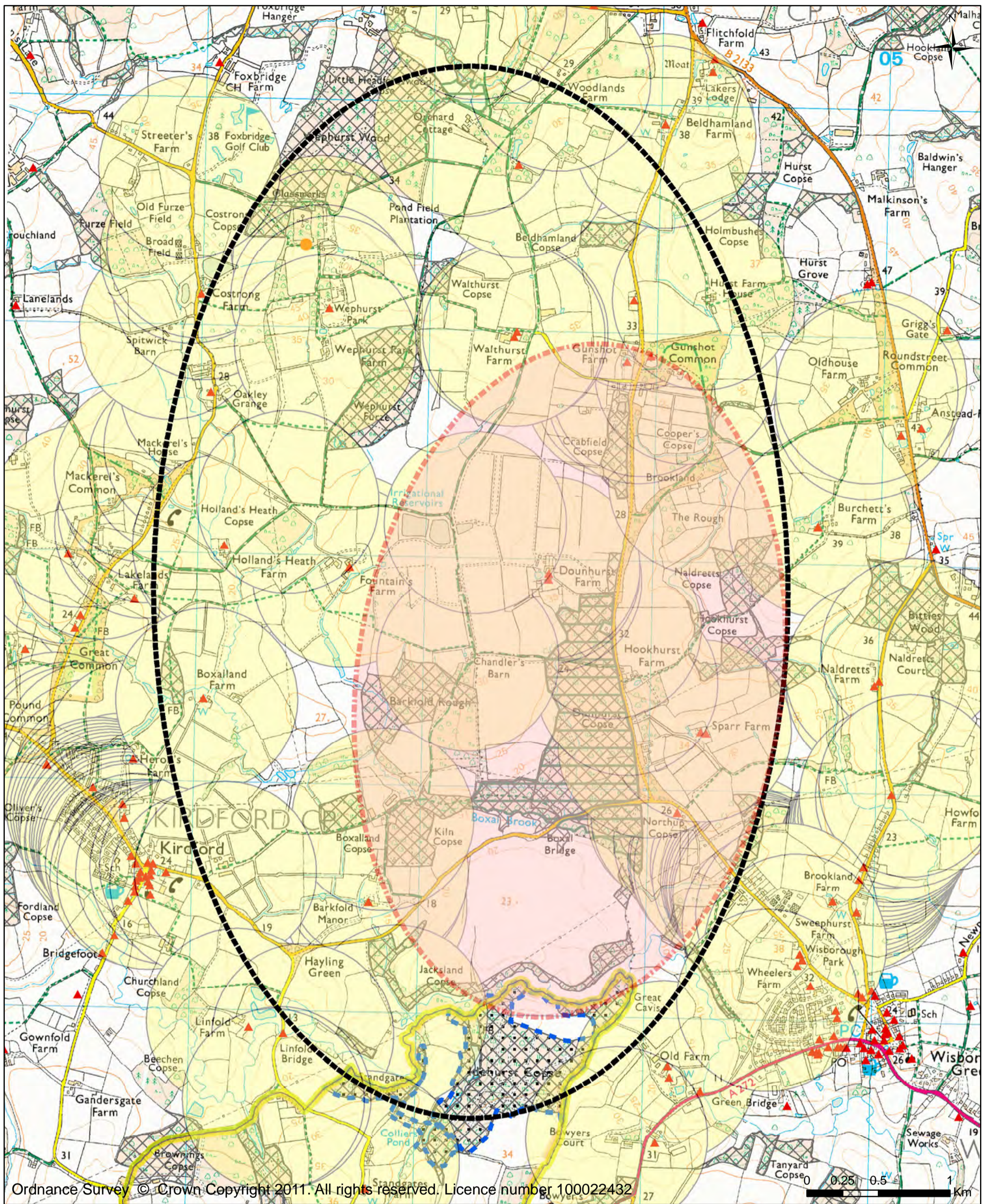
-  Primary Search Area
-  Secondary Search Area
-  Listed Buildings
-  Scheduled Monuments
-  South Downs National Park Boundary
-  Ramsar Sites
-  Special Areas of Conservation
-  Ancient Woodland
-  Sites of Special Scientific Interest
-  Special Protection Areas
-  Nature Reserves
-  Sites of Nature Conservation Importance



**Figure 4.3**














Local Designations

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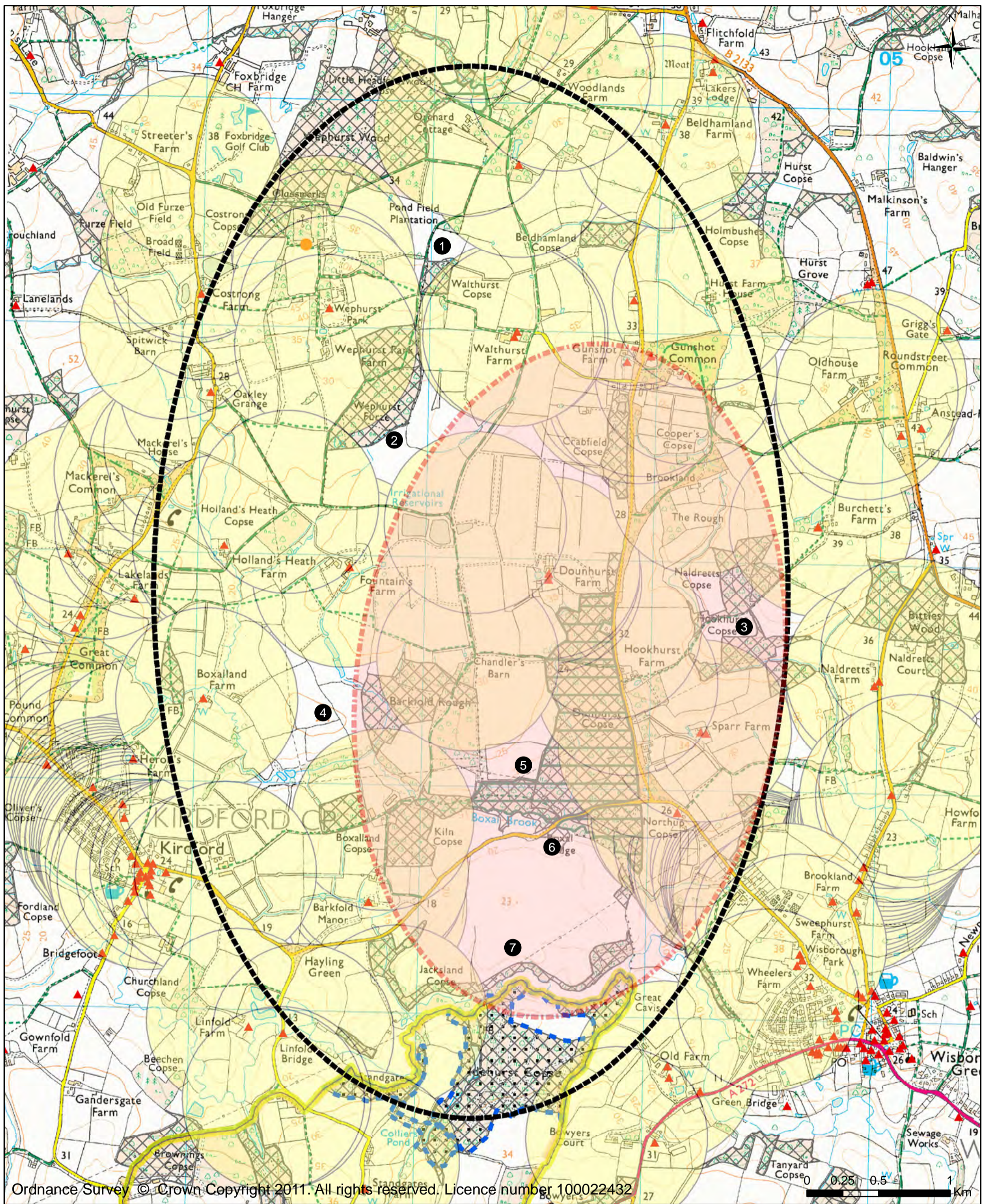
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**Legend**

-  Primary Search Area
-  Secondary Search Area
-  400m Buffer Zones
-  Listed Buildings
-  Scheduled Monuments
-  South Downs National Park Boundary
-  Ramsar Sites
-  Special Areas of Conservation
-  Ancient Woodland
-  Sites of Special Scientific Interest
-  Special Protection Areas
-  Nature Reserves
-  Sites of Nature Conservation Importance



**Figure 4.4**  
**Constraints Plan**  
 1:25,000



**Legend**

- Assessed Sites 1-7
- ▭ Primary Search Area
- ▭ Secondary Search Area
- 400m Buffer Zones
- ▲ Listed Buildings
- Scheduled Monuments
- ▭ South Downs National Park Boundary
- ▭ Ramsar Sites
- ▭ Special Areas of Conservation
- ▭ Ancient Woodland
- ▭ Sites of Special Scientific Interest
- ▭ Special Protection Areas
- ▭ Nature Reserves
- ▭ Sites of Nature Conservation Importance

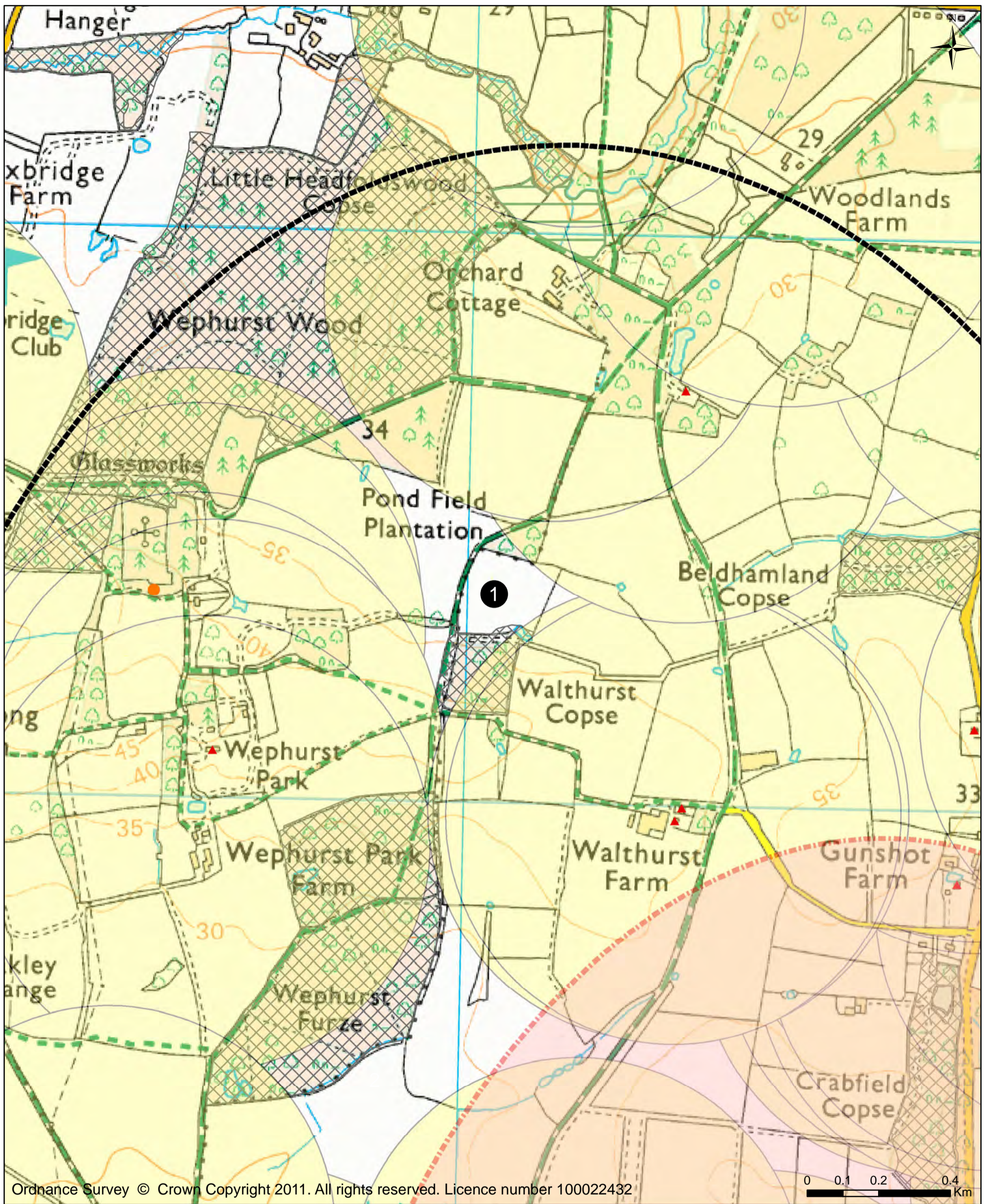


**Figure 5.1**














**400m Site Search Results**

**1:25,000**





**Legend**

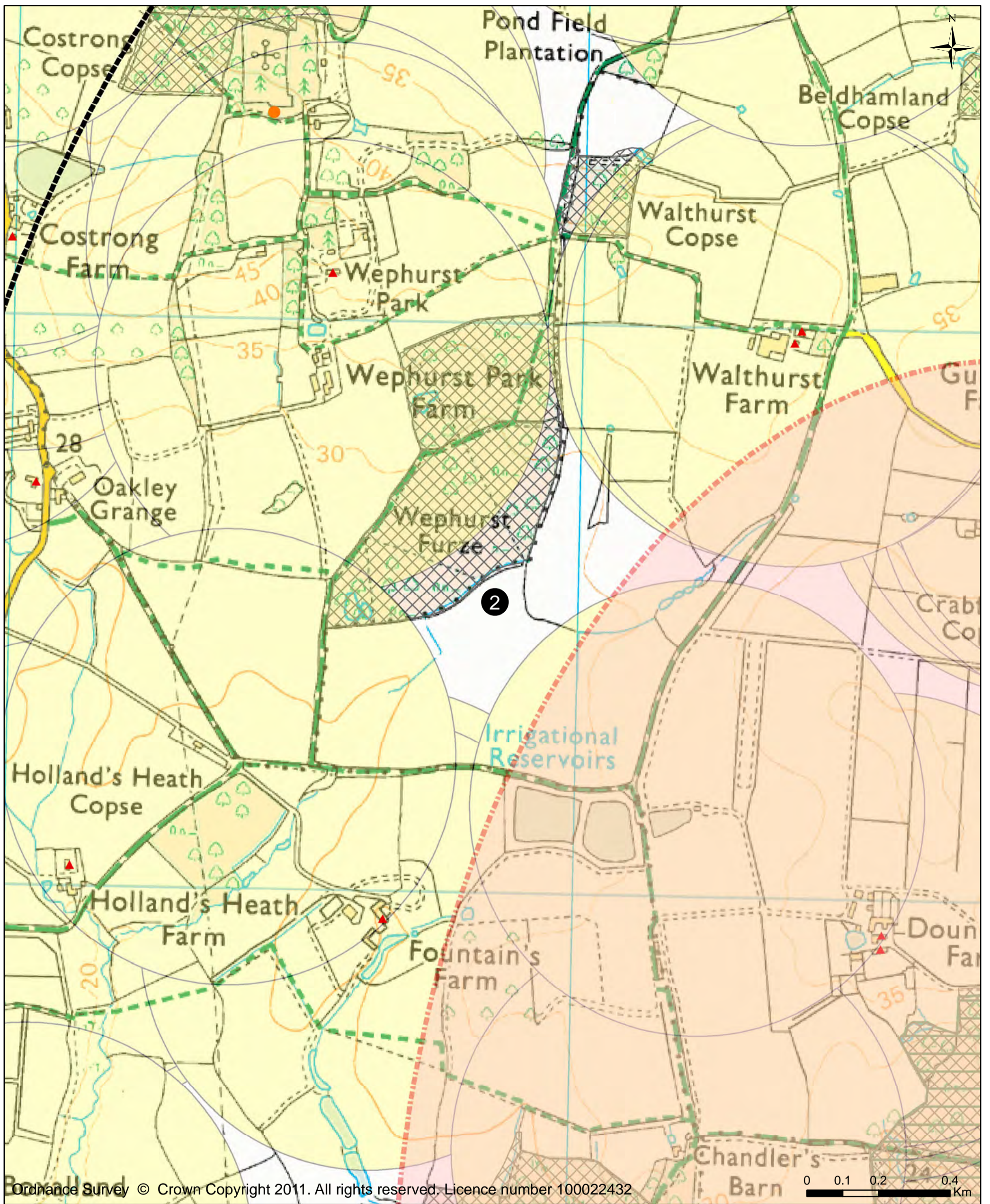
- |   |   |
|---|---|
|  Primary Search Area                |  Ramsar Sites                            |
|  Secondary Search Area              |  Special Areas of Conservation           |
|  Listed Buildings                   |  Ancient Woodland                        |
|  Scheduled Monuments                |  Sites of Special Scientific Interest    |
|  400m Buffer Zones                  |  Special Protection Areas                |
|  South Downs National Park Boundary |  Nature Reserves                         |
|   |  Sites of Nature Conservation Importance |
















**Figure 5.2**

Site 1

1:10,000

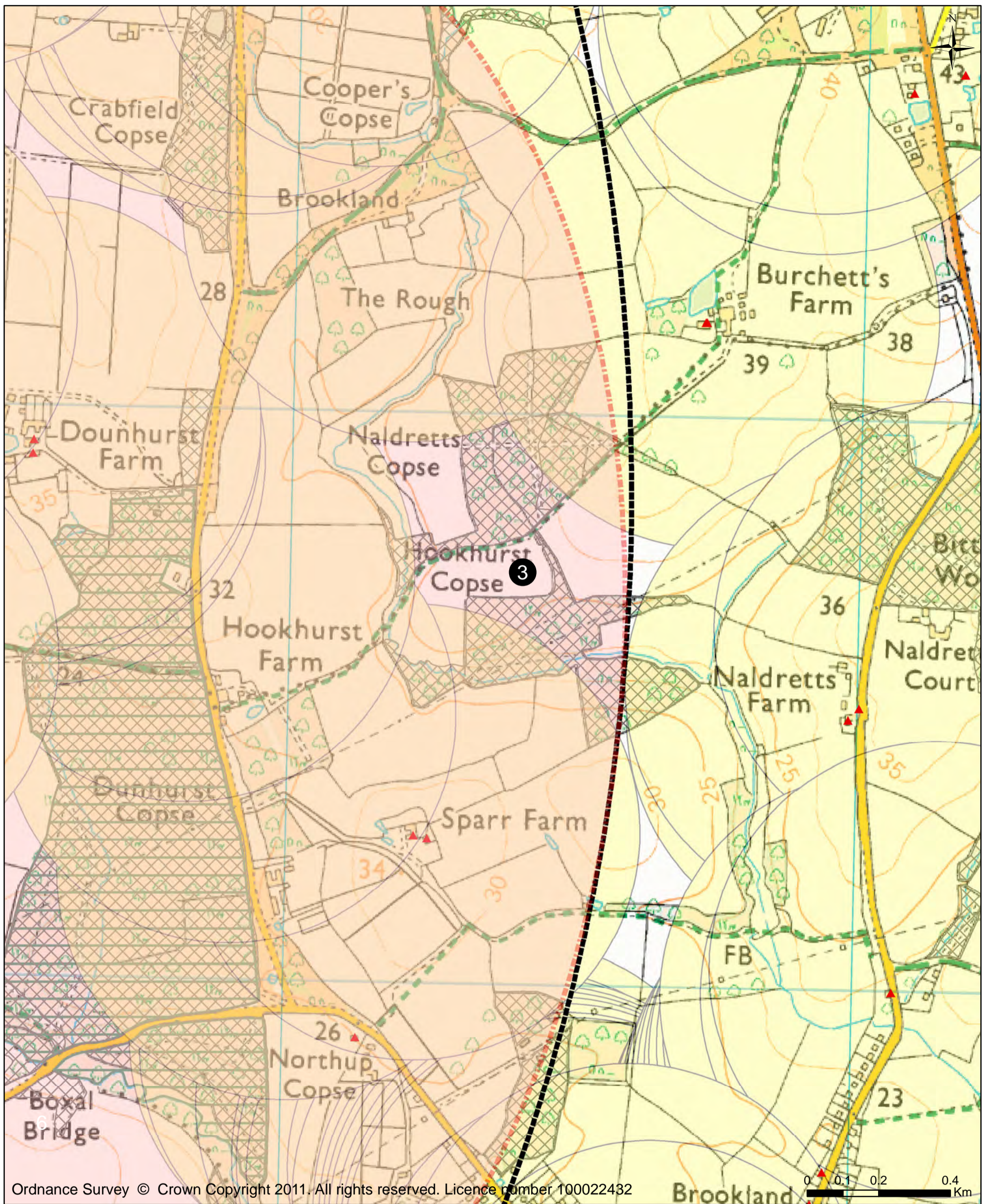


**Legend**

- |   |   |
|---|---|
|  Primary Search Area                |  Ramsar Sites                            |
|  Secondary Search Area              |  Special Areas of Conservation           |
|  Listed Buildings                   |  Ancient Woodland                        |
|  Scheduled Monuments                |  Sites of Special Scientific Interest    |
|  400m Buffer Zones                  |  Special Protection Areas                |
|  South Downs National Park Boundary |  Nature Reserves                         |
|   |  Sites of Nature Conservation Importance |



**Figure 5.3**  
 Site 2  
 1:10,000



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**Legend**

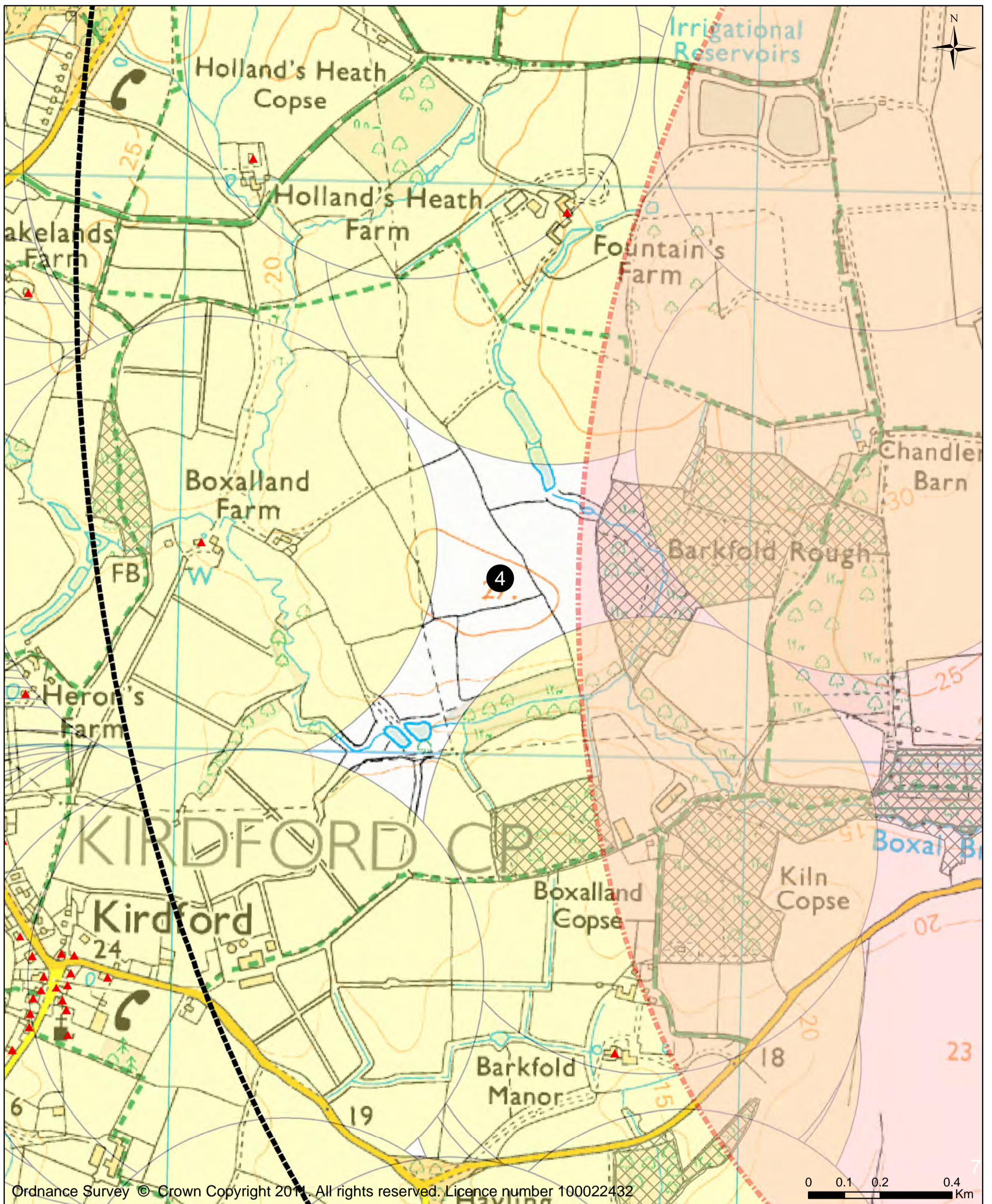
- Primary Search Area
- Secondary Search Area
- Listed Buildings
- Scheduled Monuments
- 400m Buffer Zones
- South Downs National Park Boundary
- Ramsar Sites
- Special Areas of Conservation
- Ancient Woodland
- Sites of Special Scientific Interest
- Special Protection Areas
- Nature Reserves
- Sites of Nature Conservation Importance















**Figure 5.4**

Site 3

1:10,000



**Legend**

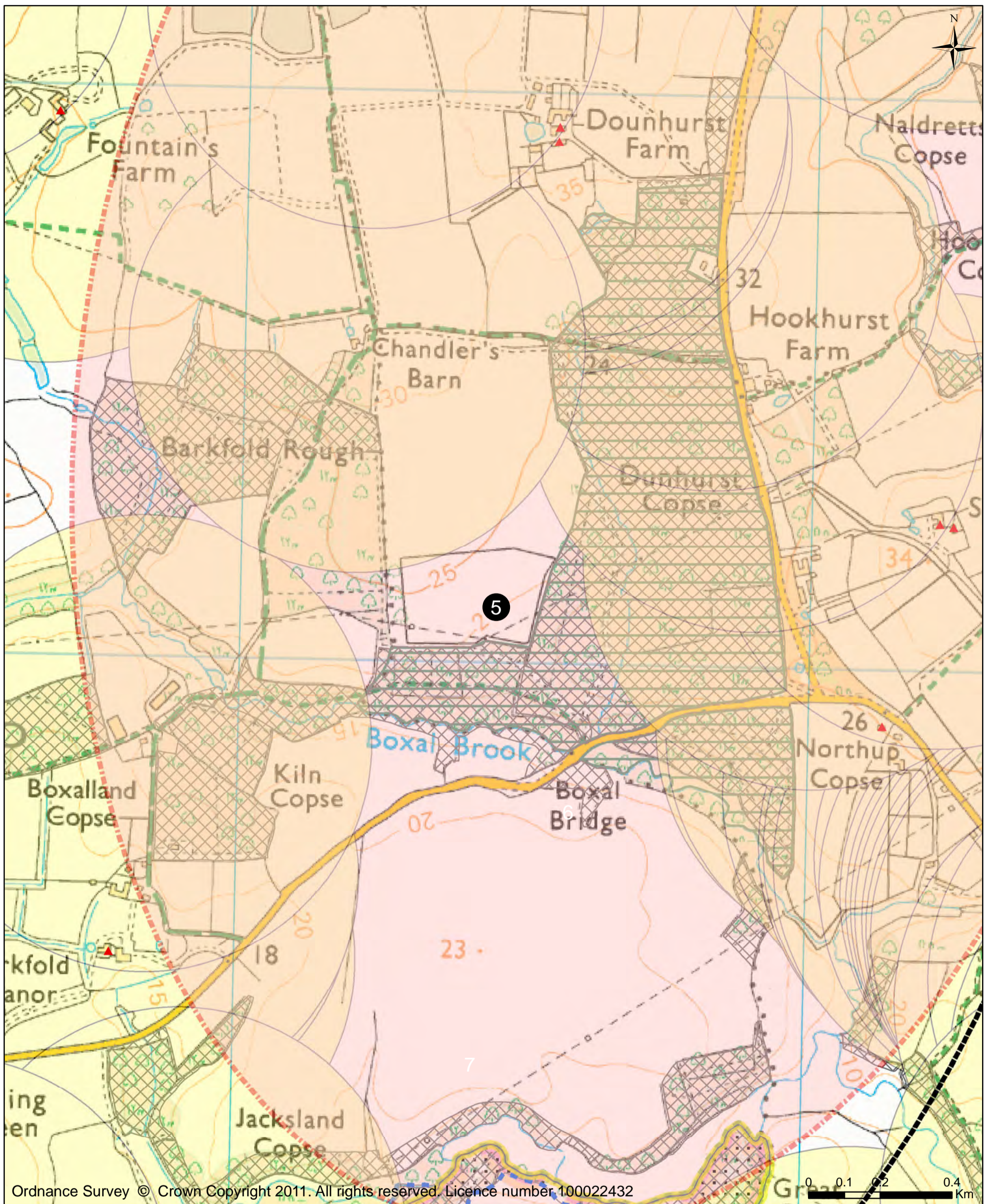
-  Primary Search Area
-  Secondary Search Area
-  Listed Buildings
-  Scheduled Monuments
-  400m Buffer Zones
-  South Downs National Park Boundary
-  Ramsar Sites
-  Special Areas of Conservation
-  Ancient Woodland
-  Sites of Special Scientific Interest
-  Special Protection Areas
-  Nature Reserves
-  Sites of Nature Conservation Importance
















**Figure 5.5**

Site 4

1:10,000



**Legend**

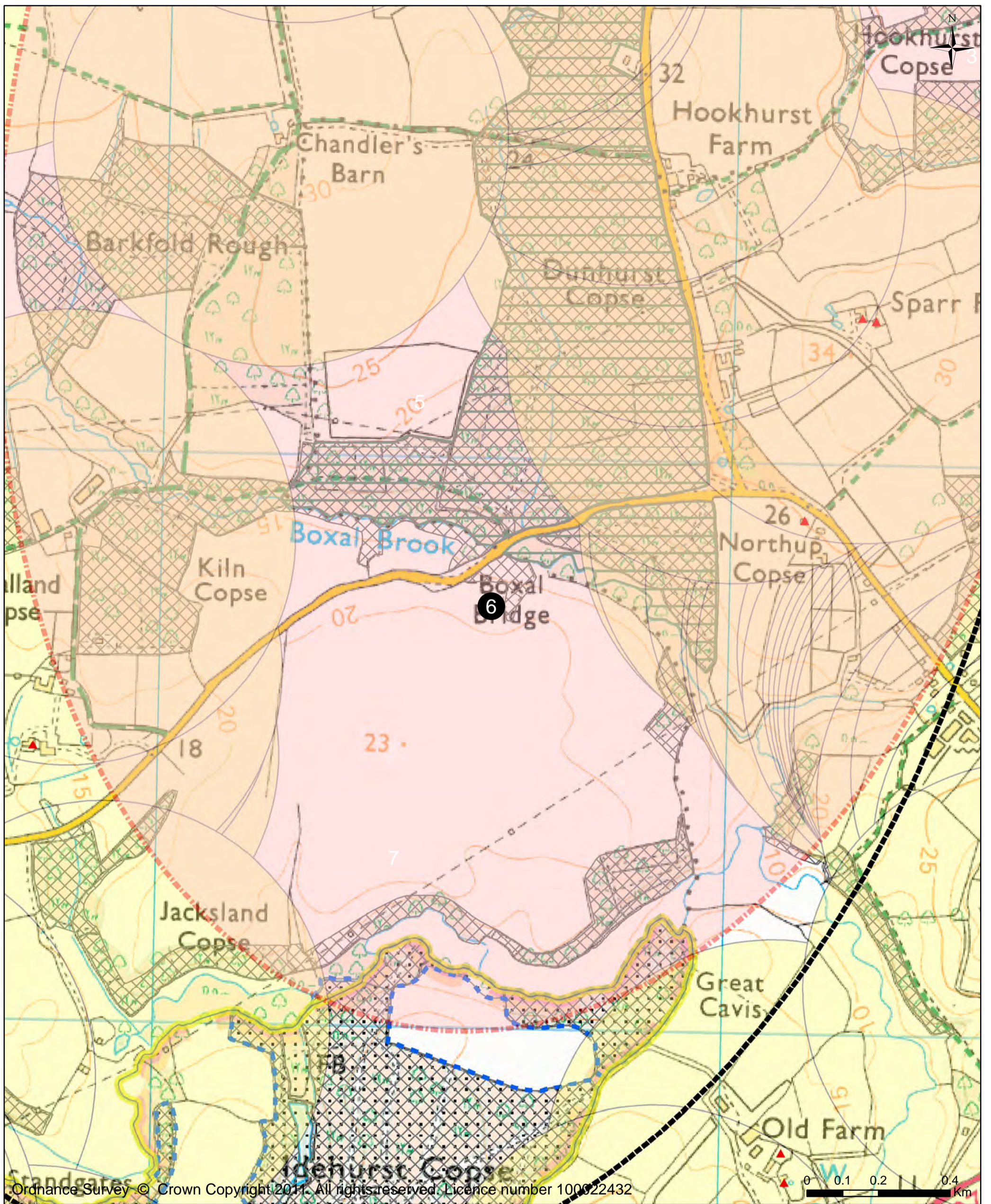
- |   |   |
|---|---|
|  Primary Search Area                |  Ramsar Sites                            |
|  Secondary Search Area              |  Special Areas of Conservation           |
|  Listed Buildings                  |  Ancient Woodland                        |
|  Scheduled Monuments               |  Sites of Special Scientific Interest    |
|  400m Buffer Zones                  |  Special Protection Areas                |
|  South Downs National Park Boundary |  Nature Reserves                         |
|   |  Sites of Nature Conservation Importance |



**Figure 5.6**

Site 5

1:10,000



**Legend**

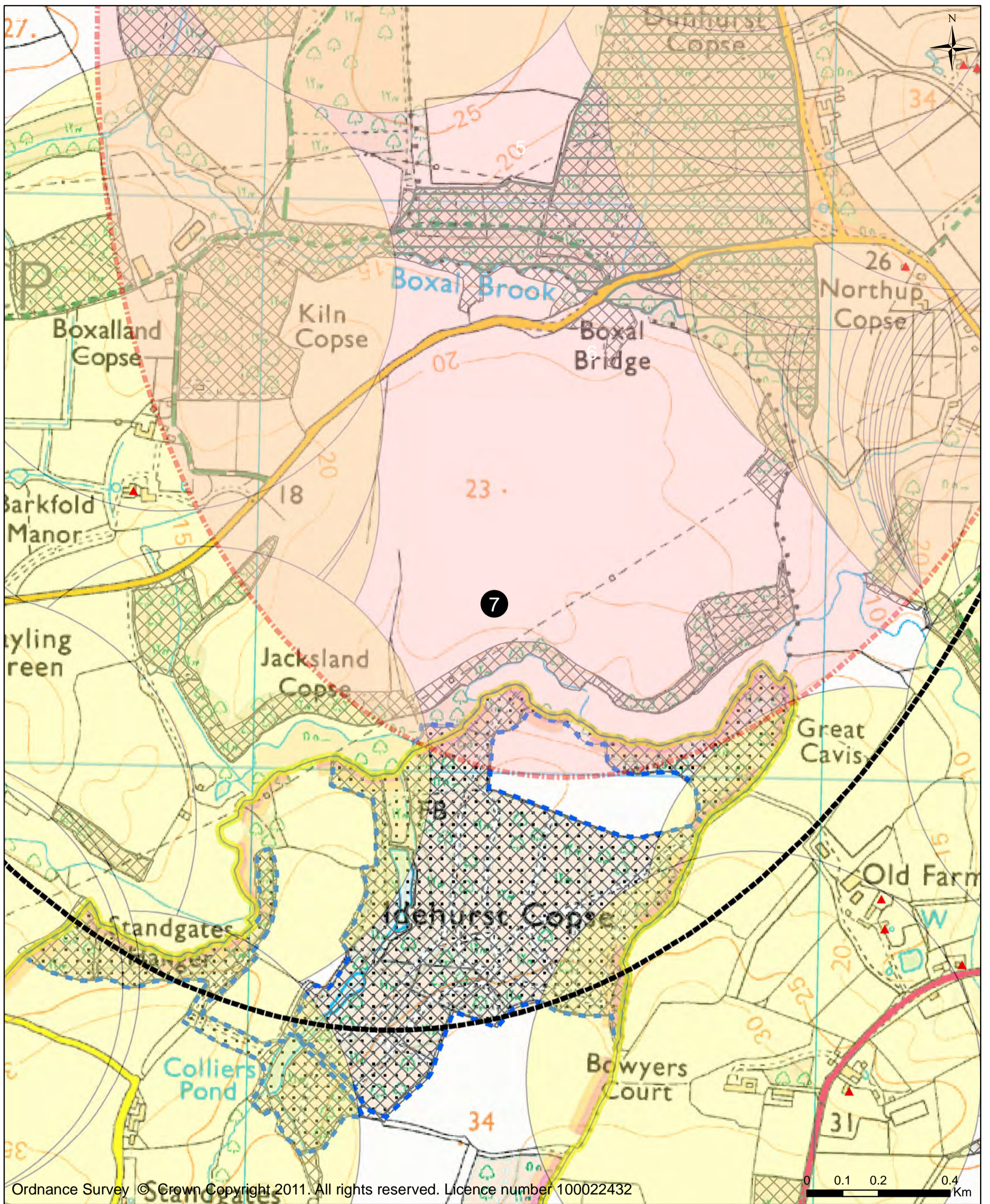
- |  |                                    |  |   |
|--|------------------------------------|--|---|
|  | Primary Search Area                |  | Ramsar Sites                            |
|  | Secondary Search Area              |  | Special Areas of Conservation           |
|  | Listed Buildings                   |  | Ancient Woodland                        |
|  | Scheduled Monuments                |  | Sites of Special Scientific Interest    |
|  | 400m Buffer Zones                  |  | Special Protection Areas                |
|  | South Downs National Park Boundary |  | Nature Reserves                         |
|  |                                    |  | Sites of Nature Conservation Importance |
















**Figure 5.7**

Site 6

1:10,000



**Legend**

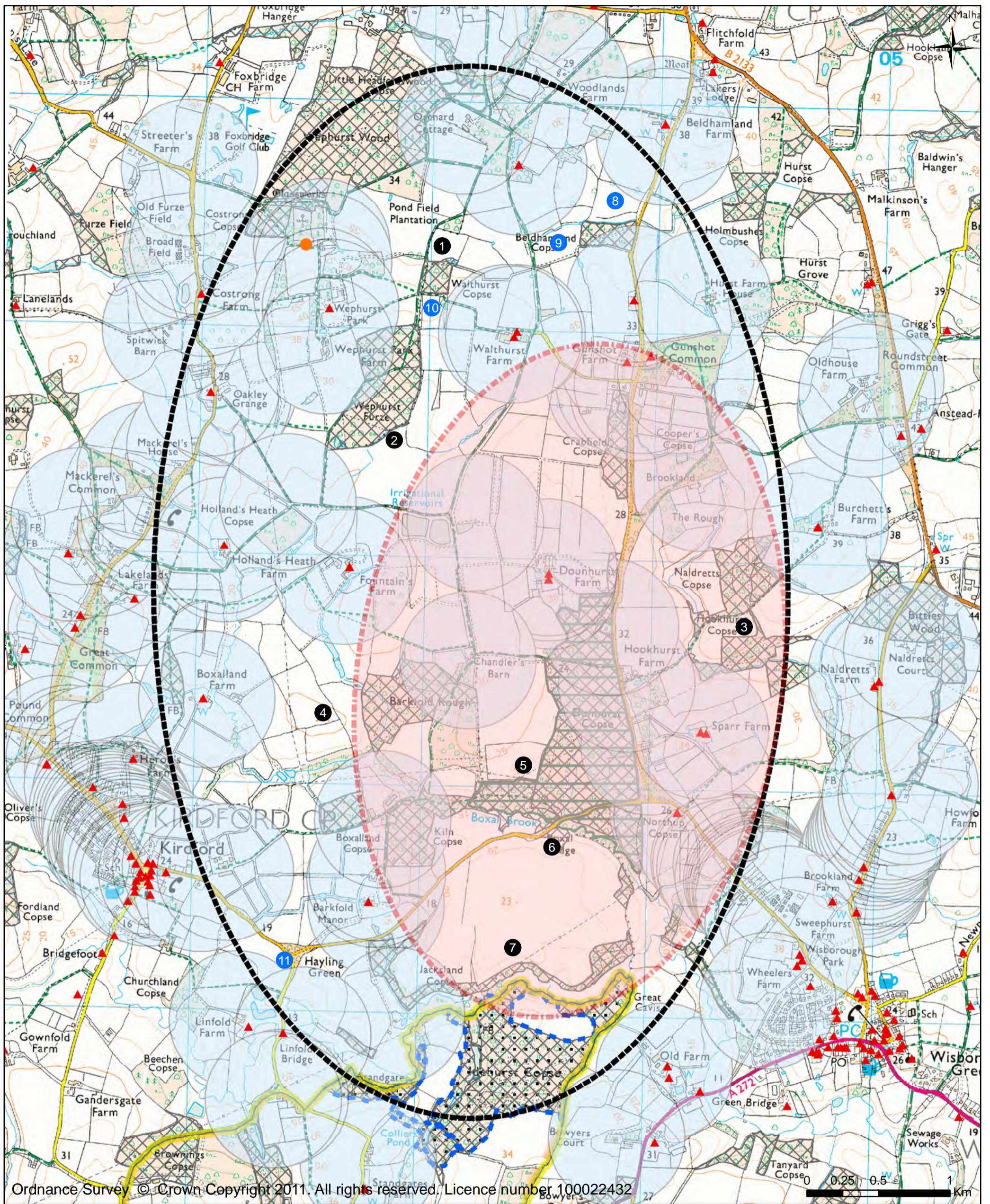
- |   |   |
|---|---|
|  Primary Search Area                |  Ramsar Sites                            |
|  Secondary Search Area              |  Special Areas of Conservation           |
|  Listed Buildings                  |  Ancient Woodland                        |
|  Scheduled Monuments               |  Sites of Special Scientific Interest    |
|  400m Buffer Zones                 |  Special Protection Areas                |
|  South Downs National Park Boundary |  Nature Reserves                         |
|   |  Sites of Nature Conservation Importance |



**Figure 5.8**

Site 7

1:10,000



**Legend**

- Assessed Sites 1-7
- Assessed Sites 8-11
- Primary Search Area
- Secondary Search Area
- ▲ Listed Buildings
- Scheduled Monuments
- 300m Buffer Zones
- South Downs National Park Boundary
- Ramsar Sites
- Special Areas of Conservation
- Ancient Woodland
- Sites of Special Scientific Interest
- Special Protection Areas
- Nature Reserves
- Sites of Nature Conservation Importance

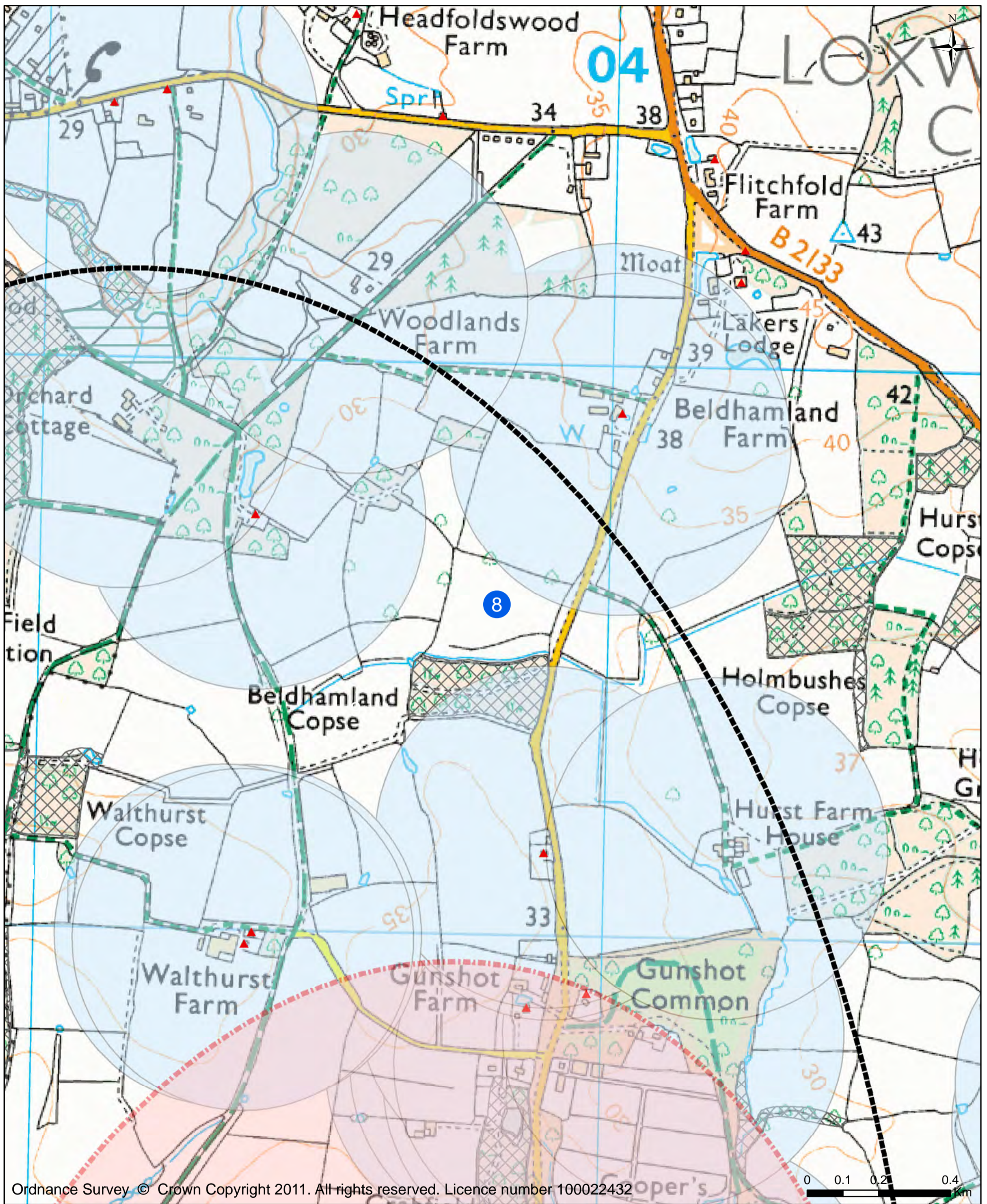


**Figure 5.9**

**300m Site Search Results**

**1:25,000**





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**Legend**

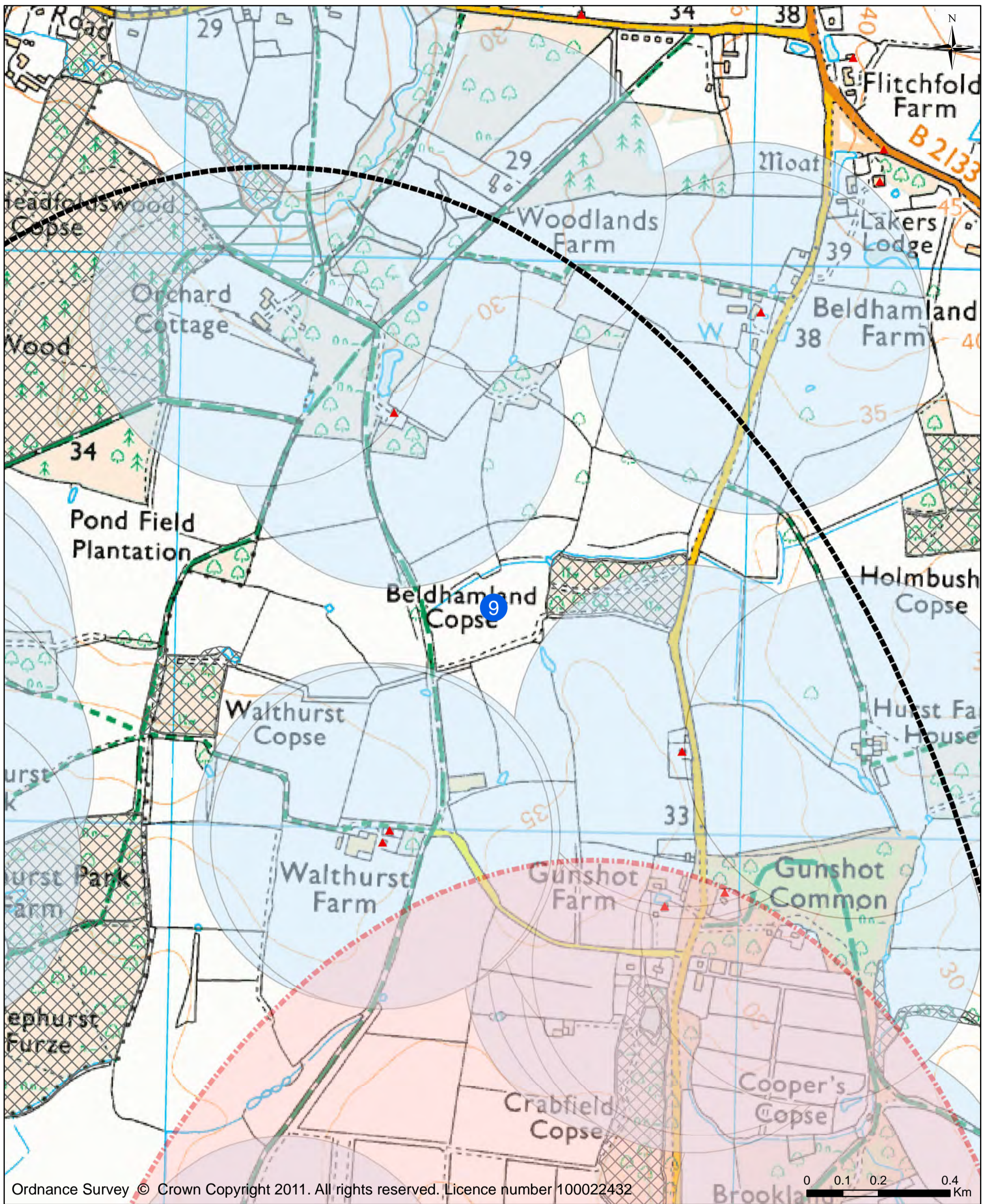
- Primary Search Area
- Secondary Search Area
- Listed Buildings
- Scheduled Monuments
- 300m Buffer Zones
- South Downs National Park Boundary
- Ramsar Sites
- Special Areas of Conservation
- Ancient Woodland
- Sites of Special Scientific Interest
- Special Protection Areas
- Nature Reserves
- Sites of Nature Conservation Importance
















**Figure 5.10**

Site 8

1:10,000



**Legend**

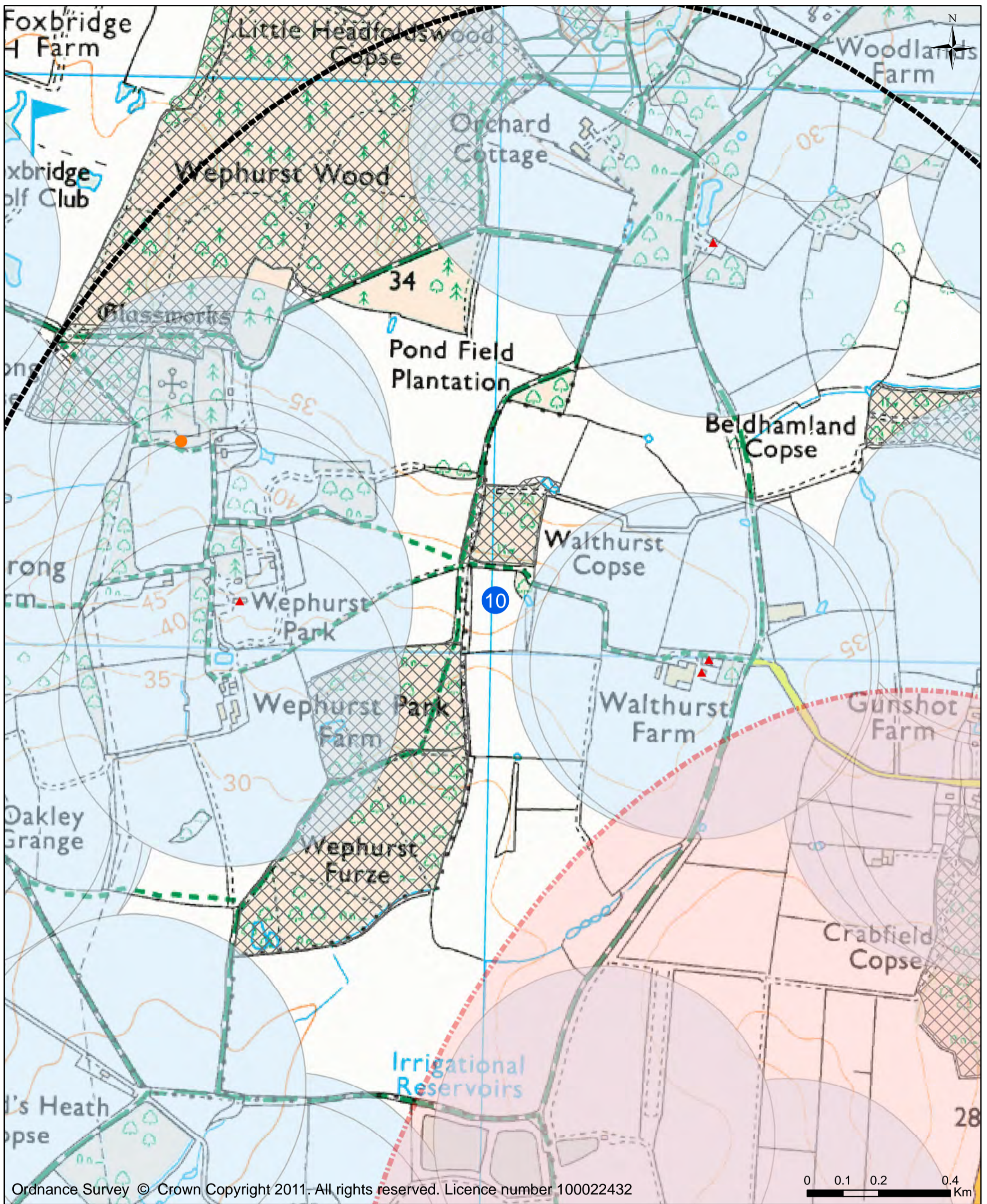
- |   |   |
|---|---|
|  Primary Search Area                |  Ramsar Sites                            |
|  Secondary Search Area              |  Special Areas of Conservation           |
|  Listed Buildings                   |  Ancient Woodland                        |
|  Scheduled Monuments                |  Sites of Special Scientific Interest    |
|  300m Buffer Zones                  |  Special Protection Areas                |
|  South Downs National Park Boundary |  Nature Reserves                         |
|   |  Sites of Nature Conservation Importance |



**Figure 5.11**

Site 9

1:10,000



**Legend**

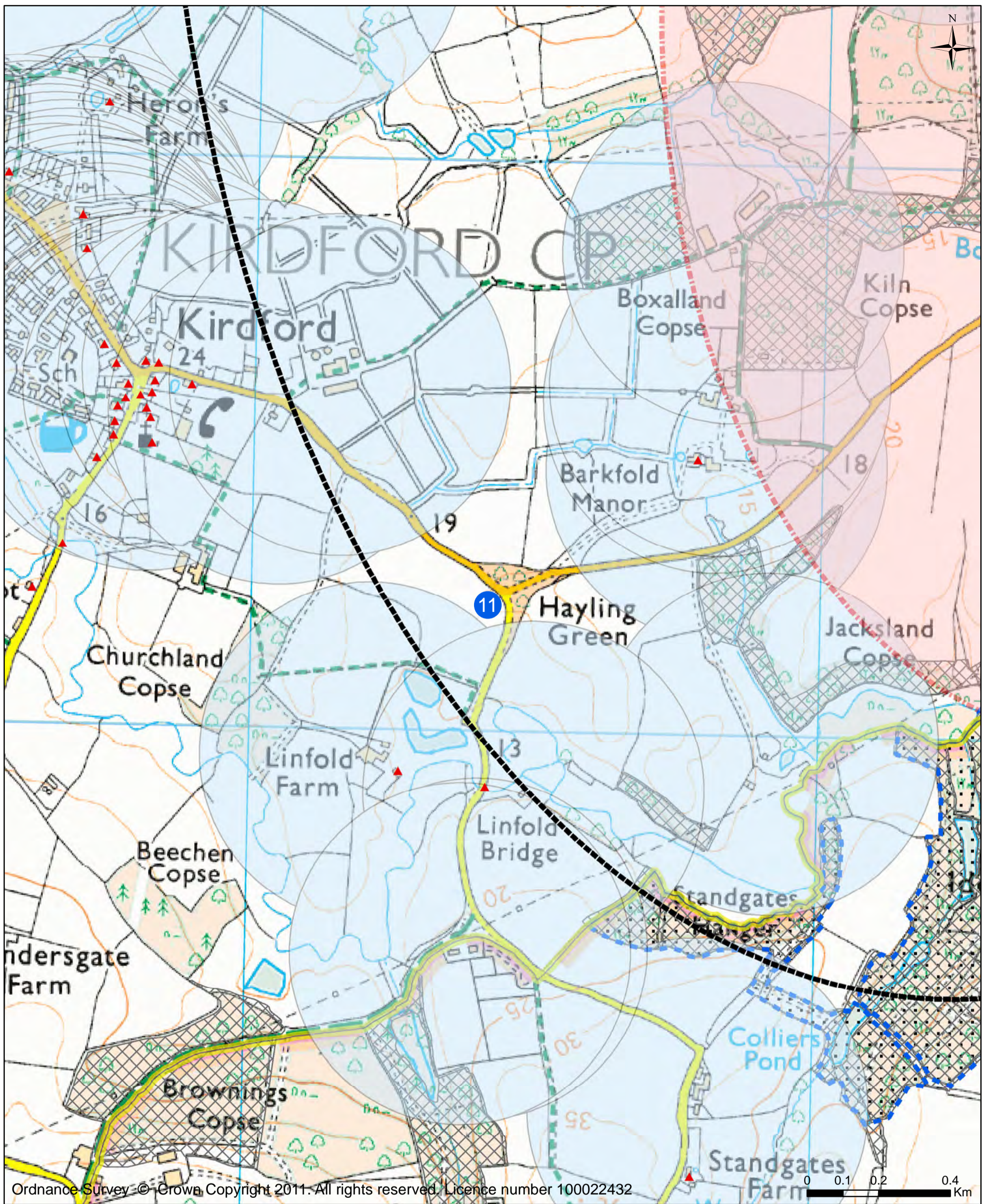
- |                                    |   |
|------------------------------------|---|
| Primary Search Area                | Ramsar Sites                            |
| Secondary Search Area              | Special Areas of Conservation           |
| Listed Buildings                   | Ancient Woodland                        |
| Scheduled Monuments                | Sites of Special Scientific Interest    |
| 300m Buffer Zones                  | Special Protection Areas                |
| South Downs National Park Boundary | Nature Reserves                         |
|                                    | Sites of Nature Conservation Importance |















**Figure 5.12**

Site 10

1:10,000



**Legend**

- |   |   |
|---|---|
|  Primary Search Area                |  Ramsar Sites                            |
|  Secondary Search Area              |  Special Areas of Conservation           |
|  Listed Buildings                   |  Ancient Woodland                        |
|  Scheduled Monuments                |  Sites of Special Scientific Interest    |
|  300m Buffer Zones                  |  Special Protection Areas                |
|  South Downs National Park Boundary |  Nature Reserves                         |
|   |  Sites of Nature Conservation Importance |



**Figure 5.13**

Site 11

1:10,000

# **APPENDIX 5.1**

**West Sussex County Council Pre-Application Advice**

**Michael Elkington**  
Strategic Planning Manager

Please respond to Chris Bartlett  
Tel: 01243 756 864  
email: [chris.bartlett@westsussex.gov.uk](mailto:chris.bartlett@westsussex.gov.uk)  
[www.westsussex.gov.uk](http://www.westsussex.gov.uk)

**County Planning**

County Hall  
Chichester  
West Sussex  
PO19 1RH



Tel: 01243 756 867

Jenny Massingham  
Celtique Energie Limited  
4<sup>th</sup> Floor Newlands House  
40 Berners Street  
London  
W1T NA

3 July 2013

**Confidential**

*By email only to [jennymassingham@celtiqueenergie.com](mailto:jennymassingham@celtiqueenergie.com)*

Dear Jenny

**Pre-Application Planning Advice: Proposed exploration well site (Wisborough Green 1) Northup Field, south of Boxal Bridge, Kirdford Road, Wisborough Green, West Sussex**

I write in response to the pre-application information submitted to us in February 2013 regarding the above, and our subsequent meeting at the site on 17 May 2013. Apologies for the delay in responding.

As I understand, it is intended that a temporary well site would be constructed to drill a borehole to explore for hydrocarbons. If hydrocarbons are found, drill stem testing would be undertaken to assess its economic viability. If this is positive, and the site is shown to be viable, the exploration process would be complete, and an application for production would be submitted. If no hydrocarbons are found, or they are found to be uneconomic, the site would be cleared and restored.

The phasing of the operations is set out in Figure 1: Drilling Process Chart submitted with your enquiry which indicates the process would take up to 18 months from construction to either restoration or retention pending planning permission for production, though this does depend on the availability of the rig.

The following is based on the information submitted, as well as our discussions on site. These initial comments are written with reference to our Local List. I should however mention that our Local List is currently being updated, with a new version hopefully coming forward this summer. I have tried to take account of this in the following but am happy to update you nearer submission if I have further information you need to take into account.

The following assumes that hydraulic fracturing would not be used at the exploration stage to which the response relates.

The following information should be submitted as part of any application at Wisborough Green 1:

- Details of the likely duration of each phase of works;
- Details of what physical works each phase involves – above and below ground. This should, for instance, describe the drilling process, the casing used, the physical extent of the works (vertically and horizontally), and the geology involved.

- Details of the measures to prevent chemical spills and procedures in place to manage them should they occur.
- Details of what equipment (in generic terms) is likely to be needed on site at each phase.
- Details of any flaring that is likely to take place, the duration and the location and size of the flare.
- Details of what chemicals would be used in the exploration process.
- An estimate of the amount of water likely to be used in the exploration process;
- Details of waste management, including the storage and transport of naturally occurring radioactive materials (NORMs).

I acknowledge that some of these matters are managed through other processes such as Environmental Permitting, but they have potential environmental implications so are relevant to the planning process. If possible, it would be helpful to include the information set out in the Environmental Risk Assessment – or as much information as you have available at the time.

Please use plain English where possible and/or a glossary if necessary to ensure that the submitted information is clear and can be understood by a wide audience, but particularly our specialists.

#### *Local Validation List*

1. Air Quality: A brief statement should be provided setting out the potential impact of the facility on air quality, particularly given that you will be 'industrialising' what is currently a rural area. A baseline survey of air quality should be carried out prior to works and measures to monitor potential leakages of methane and other emissions should be set out.
2. Archaeology: As the site is 'greenfield', an archaeological desk-based assessment should be provided, with recommendations as to whether further work may be necessary. Please discuss the likely requirements with the County Archaeologist (John Mills - [john.mills@westsussex.gov.uk](mailto:john.mills@westsussex.gov.uk)). Boxal Bridge is listed in the Scheduled Ancient Monuments records.
3. Biodiversity/Geodiversity: I understand that a Phase 1 ecological survey has already been carried out and this should accompany any application. In relation to the site, attention should be paid to the Dunhurst and Northup Copse Site of Nature Conservation Interest (SNCI) and Ancient Woodland to the west. I would suggest liaison with the Senior County Ecologist, Don Baker, to discuss your approach ([don.baker@westsussex.gov.uk](mailto:don.baker@westsussex.gov.uk)).
4. Community Involvement: Community engagement is particularly important for oil/gas applications to smooth the application process as much as is possible and to educate the local community prior to submission. Details of your pre-application engagement with the community should be submitted with the application. Given the high levels of community interest we are experiencing at other sites in the County, consideration should be given to the need for ongoing community engagement.
5. Daylight/Sunlight: Not relevant to this application.
6. EIA: the developments would fall within Section 2(d) and (e) of Schedule 2 to the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. You have already submitted a Scoping Request and this will be forthcoming.
7. Flood Risk: The site is not within an area identified as being at risk of flooding, but does appear to be adjacent to a Flood Risk Zone. Notwithstanding this, the site exceeds 1 hectare in area (including access roads) meaning a Flood

Risk Assessments should be submitted. Please see <http://www.environment-agency.gov.uk/research/planning/93498.aspx>.

It should be noted that consideration must be given to the management of surface water in terms of impacts on both water quality and flooding. The development will result in increased impermeable areas, and surface water run-off will need to be managed to avoid contamination. Full surface water drainage details, based on topographic surveys of the site, will therefore be required with the application submission.

8. Historic Heritage: The site does not sit within the setting of either a Listed Building or Conservation Area. However, there are Listed Buildings within the vicinity of the site and vehicles moving to and from the site will require passing through the village of Wisborough Green which is designated a Conservation Area and contains a large number of Listed Buildings.
9. Hydrology/Hydrogeology: Information relating to hydrology and hydrogeology should be submitted with any application, with particular attention paid to how groundwater will be protected during the drilling process.
10. Contamination: I am not aware of any potentially-contaminating uses having existing on or near either site, and do not consider this relevant to these applications. However, as already noted the prevention of contamination occurring as a result of the development should be clearly set out in the information relating to management of surface and groundwater.
11. Landscape/Visual Impact: The site is within the open countryside and has not been previously-developed. The South Downs National Park is approximately 550m to the south and a belt of Ancient Woodland is adjacent to the west. The development would introduce industrial-type equipment and operations to otherwise agricultural area. This has the potential to result in impacts on the surrounding landscape and in visual impact, albeit briefly.

Landscape and Visual Impact Assessments (LVIAs), informed by an Arboricultural Survey, should be submitted with any application. This should consider the potential impacts at each stage of the development, including in the creation of site access roads. The visual impact of the bunding to be created should also be considered.

The LVIA should inform the Landscape Mitigation Plans which should be submitted with the applications. Please contact WSCC's Landscape Officer (Tim Dyer: [tim.dyer@westsussex.gov.uk](mailto:tim.dyer@westsussex.gov.uk)) and Tree Officer (Julie Bolton: [Julie.bolton@westsussex.gov.uk](mailto:Julie.bolton@westsussex.gov.uk)) to discuss the applications and confirm their likely requirements.

12. Lighting: Details of lighting should be provided in relation to each phase clarifying the lighting that would be in place, its location and direction. This will inform the LVIA and the need for screening to minimise light spill from the site, given its rural locations
13. Mineral Safeguarding: Not applicable.
14. Noise: Given the rural location, a Noise Survey should be submitted to accompany any applications, setting out the baseline noise environment and considering the potential noise impact for each phase of the development. If the survey indicates that mitigation measures would be necessary, these should be set out in the submitted information.
15. Transport/Travel/Parking: It is likely that a Transport Statement would be required, and possibly a Transport Assessment, given the intensity of HGV movements during the construction and mobilisation phases, and during restoration. Please discuss this with our highways officers through Alex Jack ([alex.jack@westsussex.gov.uk](mailto:alex.jack@westsussex.gov.uk)). Minimising impacts on the highway network is



likely to be particularly key to any application as it is not particularly well located in relation to the major routes and any vehicles appear to have to pass through the village of Wisborough Green.

16. Photographs: Photographs should be provided of the existing site and their surroundings, though these can form part of the LVIA.
17. Planning Obligations: At this stage it is not considered that planning obligations would be necessary.
18. Planning Statement: A Planning Statement should be provided, setting out, in plain English, what is proposed. The oil industry in particular relies on a lot of jargon so I would ask that you try to use language that can be easily understood by the public when reading the submitted documents. The Planning Statement should outline how the development is likely to impact on the local environment and people at each phase, both positively and negatively. Your consideration of alternative sites should also be set out in the Planning Statement to clarify why this site was selected.

The development should be appraised against the development plan and other material considerations including the National Planning Policy Framework. The latter will be of particular importance given the age of West Sussex Minerals Local Plan. However, we intend to progress a new Minerals Plan later in 2013 so depending on the submission date, there may be additional emerging policy to consider.

19. Renewable Energy/Climate Change: We would encourage you to use measures which minimise the use of energy and materials, and minimise the impact on climate change and to outline such measures in your Planning Statement.
20. Restoration/Aftercare: The intended restoration/aftercare scheme should be clearly set out in your submission, including the time required to undertake the works, and the implications for the environment, highway, and local people.
21. Services/Utilities: Not relevant to this application.
22. Site Waste Management Plan: Not relevant to this application.
23. Woodland/Arboriculture: As already noted, an Arboricultural Survey should be undertaken in accordance with BS5837: 2012.

Given the location on agricultural land, the impact on soil resources and agricultural land should also be considered.

I hope this is clear but should anything require clarification please do not hesitate to contact me on the above telephone number.

The advice above is based on the information available at the time, and is given without prejudice to the formal planning process which may result in a different view being taken. None of the information should be taken to imply that planning permission will be granted.

Yours sincerely

Chris Bartlett  
Planner