APPENDIX 7.1: PRELIMINARY ECOLOGICAL APPRAISAL

Appendix 7.1

Cuadrilla Balcombe Ltd

Preliminary Ecological Appraisal

Lower Stumble Exploration Site, Balcombe

857001

OCTOBER 2017

RSK GENERAL NOTES

Project No.: 857001

Title: Lower Stumble Exploration Site, Balcombe – Preliminary Ecological Appraisal Report

Client: Cuadrilla Resources Ltd

Date: October 2017

Office: Hemel Hempstead

Status: Rev00

This report has been prepared by a professional ecologist and reviewed by a Director. Both are members of the Chartered Institute of Ecology and Environmental Management (CIEEM).Names have been omitted from this report for confidentiality reasons but can be provided on request.

EXECUTIVE SUMMARY

1. This report presents the findings of a Preliminary Ecological Appraisal (PEA) at the Lower Stumble Exploration Site near Balcombe in West Sussex.

2. The survey area is comprised of hard-standing, ruderal vegetation, scrub, trees, a hedgerow and woodland (both plantation and ancient). The site was previously surveyed by The Environmental Project Consulting Group in 2009 and 2013.

3. Works will be restricted to an area of hard-standing and an existing access track and adjacent habitat will not be directly affected.

4. Although there are areas of ancient woodland adjacent to the survey area, habitats and plant species within the works footprint were common and widespread and are replaceable.

5. The only protected species which may be affected by the works are nesting birds and foraging and commuting bats. Further actions and mitigation for these species is provided.

6. There will be no direct effects on nearby designated and non-designated sites, but indirect effects (such as run-off, light spill and effects to air quality) need to be considered.

7. Ashdown Forest Special Area of Conservation (SAC) is within 10 km of the site and in order to identify whether there will be any adverse effects on the qualifying features a Habitat Regulations Assessment (HRA) screening assessment is required to help the competent authority decide whether an Appropriate Assessment is needed.

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1 INTRODUCTION

1.1 Purpose of this Report

This report presents the results of a Preliminary Ecological Appraisal (PEA) carried out at a site in the Lower Stumble Exploration Site near Balcombe in West Sussex (*Figure 1*). The survey was undertaken to assess the ecological value of the site and identify its suitability for protected animal species. This will allow identification of ecological constraints that may be associated with the proposed development and will also identify any requirement for further survey.

Planning permission was granted in 2014 for flow testing and monitoring of a borehole previously drilled earlier in 2014; this permission expired in May 2017. A new planning application will be submitted to West Sussex County Council and this report will be used to support the application. This will effectively be for the same scope of development applied for in 2014. The original non-EIA application was supported by a 2013 Ecological Appraisal Pre-works Update report by The Environmental Project Consulting Group (which also updated a previous survey carried out in 2009). In addition, bat activity surveys (which also included dusk emergence and dawn re-entry surveys of trees and a railway bridge) were undertaken by The Environmental Project Consulting Group in 2013.

1.2 Ecological Context

The site lies to the south of Balcombe; a village in West Sussex. It comprises an area of hard-standing (previously used as a drilling platform) with an associated access road (hereon referred to as the "works footprint"). The area immediately surrounding the works footprint comprises planted broadleaved and coniferous trees, scrub, grassland and hedgerows and was surveyed as part of this assessment. There are patches of ancient woodland (which form part of Lower Stumble Wood and Lower Beanham Wood) to the north and south of the survey area, a railway line to the east, and London Road the B0236 to the west.

Although the works footprint solely comprises hard-standing with some encroaching ruderal vegetation, it is surrounded by habitat which is suitable for a number of protected species including bats, birds and Badgers.

1.3 Structure of this Report

The remainder of this report is structured as follows:

- *Section 2* describes the survey and assessment methods;
- *Section 3* presents the survey results;
- *Section 4* gives an evaluation of the results;
- *Section 5* lists the references;
- *Section 6* present the figures;

- *Appendix A* provides botanical and animal 'target notes' from the survey;
- *Appendix B* lists the plant species recorded during the survey;
- *Appendix C* lists the notable species from the data search; and
- *Appendices D and E* explain the legislation and abbreviations used for protected species legislation.

2 METHODS

2.1 Background Data Search

A search was made in April 2017 for reference materials relating to the ecology of the site, and a list of sources is given in *Table 1*.

Table 1. Data sources

Information Obtained	Available From
Protected and Noteworthy species-records	Sussex Biodiversity Records Centre
Designated site locations and citations	Natural England website
Designated site locations and citations	Joint Nature Conservation Committee (JNCC) website
Designated site locations and citations	Sussex Biodiversity Records Centre
Designations and legal protection of noteworthy species	Joint Nature Conservation Committee (JNCC) website
Details of species and habitats listed on the Sussex LBAP	Local BAP website http://www.biodiversitysussex.org/

A search was made for information on statutory designated sites (often internationally and nationally important sites for ecology) within 2 km of the site boundary and non-statutory designated sites (often important in a local context) within 2 km. A search was also made for records of noteworthy species within 2 km of the site boundary. Species included in the search parameters were:

- European protected species (listed on *Schedules 2* and *5* of *The Conservation of Habitats and Species* (Amendment) *Regulations 2012*);
- nationally protected species under *Schedules 1, 5* and *8* of *The Wildlife & Countryside Act 1981* and *The Protection of Badgers Act 1992*;
- species listed as Critically Endangered, Endangered or Vulnerable on the *IUCN 2001 Red List*
- all species listed on the RSPB *Birds of Conservation Concern 4* as Red or Amber;
- species listed on *The Convention for the Protection of the Marine Environment of the North-East Atlantic* (the OSPAR Convention)
- Nationally Rare or Nationally Scarce species;
- Notable invertebrates; and

- species of Principal Importance under *The Natural Environment and Rural Communities (NERC) Act (2006)* or are Priority Species under the Local Biodiversity Action Plan.

2.2 Habitat Survey

2.2.1 General

An extended Phase 1 Habitat Survey and assessment for protected species was carried out on 20 April 2017 by an ecologist from RSK. The surveyor is experienced in surveys of this type and is a member of the Chartered Institute of Ecology and Environmental Management (CIEEM). She holds a Natural England survey licence for bats and Great Crested Newts and has around five years experience of working in ecological consultancy.

2.2.2 Phase 1 Habitat Survey

The habitat survey centred on the Phase 1 Habitat Survey approach (Joint Nature Conservation Committee, 2010) as extended for use in Environmental Impact Assessment (Institute of Environmental Assessment, 1995). This involves the following elements.

- Habitat mapping using a set of standard colour codes to indicate habitat types on a Phase 1 Habitat Map (these are shown in *Figure 2*).
- Description of features of ecological or nature conservation interest in notes relating to numbered locations on the Phase 1 Habitat Map, called target notes (provided in *Appendix A*).

Basic Phase 1 Habitat Survey methods are described in detail in Joint Nature Conservation Committee 2010. Limits to the achievable reliability of the method are discussed in Cherrill & McClean (1999). There are no firm guidelines to specify what extended Phase 1 Habitat Survey involves, but the Institute of Environmental Assessment (1995) suggests that it simply involves more extensive and detailed target notes.

Plant nomenclature in this report follows Stace (2010) for vascular plants and plant names in text are given with scientific names first, followed by the English name in brackets.

2.2.3 Invasive Plant Species

Phase 1 Habitat survey does not involve exhaustive surveying for any individual plant species, but if invasive plant species, *e.g. Fallopia japonica* (Japanese Knotweed), *Heracleum mantegazzianum* (Giant Hogweed) or *Impatiens glandulifera* (Indian Balsam), were seen during the normal course of the survey they were noted and reported.

2.3 Habitat Assessment for Protected Vertebrates

2.3.1 Introduction

The site was assessed for its suitability for the protected animals that are likely to occur in the area. Obvious signs and incidental sightings of protected species would have been noted where present, although this type of survey cannot usually confirm whether species are actually present or absent.

Taking into account the location and habitats at the site, assessment was carried out for:

- Badgers (*Meles meles*);
- Great Crested Newts (*Triturus cristatus*) (and other amphibians);
- bat species;
- common reptiles, and;
- breeding birds (common nesting birds and Nightjar), and;
- Hazel Dormice (*Muscardinus avellanarius*).

Further details of the assessment methods are given below and results are shown in *Figure* 3.

2.3.2 Badgers

An initial assessment was carried out to identify areas that might be used by Badgers for commuting, foraging and sett-building within 30 m of all areas potentially affected by the proposed development (where access was possible). The area was systematically searched for signs of Badgers including setts, foraging signs, paths (runs) and latrines where possible.

2.3.3 Great Crested Newt

Terrestrial Habitat

The terrestrial habitats were assessed for their suitability for Great Crested Newts in accordance with published guidelines (Oldham *et al.* 2000). Suitable habitat generally includes rough grassland and woodland where they can forage and hibernate, and requires good links (with cover from predators) between such areas and the ponds where they breed.

2.3.4 Bats

Roosting – trees

An initial inspection was undertaken of all trees found during the PEA for their potential for roosting bats. This involved the inspection of trees from ground-level using binoculars and a torch to identify any potential roosting features (PRFs), which bats could use for roosting and for any evidence of bats such as scratch marks, oil stains and droppings around or below the PRFs.

PRFs that may be used by bats include (amongst others):

- holes (*e.g.* woodpecker holes);
- cracks and splits (in trunks and limbs);
- cavities (e.g. formed by occluded stems or limbs);
- peeling bark;
- crevices formed by epicormic growth; and
- deadwood.

Trees and PRFs were then categorised in accordance with *Table 2* below.

Table 2. Categorisation of roosting habitats (adapted from Collins, 2016)

Category	Description
Negligible potential	Negligible habitat features on the site likely to be used by roosting bats.
Low potential	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and / or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats. A tree of sufficient size and age to contain potential roosting features (PRF) but with none seen from ground level or features seen with only very limited roosting potential.
Moderate potential	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, condition and surrounding habitat but unlikely for a roost of high conservation status.
High potential	A structure or tree with one or more potential roost sites that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Confirmed roost	Bats or evidence of bats recorded within the building or tree during the initial inspection surveys or during dusk/dawn surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

Foraging and Commuting

Habitats were assessed for their suitability for foraging or commuting bats and categorised in accordance with *Table 3*. Areas of particular interest vary between species, but generally include sheltered areas and those habitats with good numbers of insects, such as woodland, scrub, hedges, watercourses, ponds, lakes and more species-rich or rough grassland. For commuting, well-connected hedgerows, woodland

edges, watercourses and other linear features are generally considered to be of high value.

Table 3. Categorisation of foraging and commuting habitats (adapted from Collins, 2016)

Category	Description
Negligible	Negligible habitat features on the site likely to be used by commuting or foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated *i.e.* not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be regularly used by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.3.5 Reptiles

The site was assessed for reptiles, with particular attention to features providing suitable basking areas (*e.g.* south-facing slopes), hibernation sites (*e.g.* piles of rubble, banks) and opportunities for hunting (*e.g.* rough grassland and scrub).

The site was assessed for its suitability for each of the four more widespread reptile species, as well as the two rarer species due to the location of the site. Specific habitat requirements differ between species.

Common Lizards (*Zootoca vivipara*) use a variety of habitats from woodland glades to walls and pastures, although one of their favoured habitats is rough grassland. Slow-worms (*Anguis fragilis*) use similar habitats to Common Lizards, and are often found in rank grassland, gardens and derelict land. Grass Snakes (*Natrix natrix*) have broadly similar requirements to Common Lizards with a greater reliance on ponds and wetlands, where they prey on Common Frogs (*Rana temporaria*). Adders (*Vipera berus*) use a range of fairly open habitats with some cover, but are most often found in dry heath (Beebee & Griffiths, 2000).

Sand Lizard (*Lacerta agilis*) and Smooth Snake (*Coronella austriaca*) are afforded additional protection under European law (see *Appendix D*). Sand Lizards are restricted to a few isolated areas with sandy heaths such as Dorset, Hampshire and Surrey. Smooth Snake is thought to be confined to the South East of Dorset, South West Hampshire and a small area of East Hampshire and West Surrey. This species is found on dry heath slopes with mature heather and *Ulex minor* (Dwarf Gorse), usually south facing.

2.3.6 Birds

Breeding and Nesting Habitat

The suitability of habitat for nesting birds was assessed. Incidental sightings of birds and old nests were recorded, but observations from an initial general survey are of limited value.

2.3.7 Hazel Dormice

The habitats were assessed for their general suitability for Hazel Dormice. Dormice generally use areas of dense woody vegetation cover, and are more likely to be found where there is a wide diversity of woody species contributing to three-dimensional habitat complexity, a number of food sources, plants suitable for nest-building material, and good connectivity to other areas of suitable habitat.

2.3.8 Other UKBAP Species

The site was also assessed for its potential for Nightjar (*Caprimulgus europaeus*) and European Hedgehog (*Erinaceus europaeus*).

Nightjars are primarily found in lowland heathland and young forestry plantations. Heathlands support strong Nightjar populations in the south of Britain.

European Hedgehogs occupy a range of lowland habitats with enough cover to allow nesting. It is common in parks, farmland and gardens.

2.4 Survey Constraints

The data from these surveys should be considered relevant for a maximum of 12 months. Therefore, if more than one year elapses prior to commencement of the works, a repeat Phase 1 Habitat survey will be required to ensure up-to-date information.

There were no constraints associated with this report. The survey was carried out during the optimal period for Phase 1 habitat surveys (April – September) it is considered likely that all major habitats and significant plant species on the site were recorded.

3 RESULTS

3.1 Background Data Search

3.1.1 Biodiversity Action Plans

Habitats within the survey area qualify as the Habitat of Principal Importance type 'Hedgerows' but no hedges will be affected by the proposed development.

The latest Sussex Local Biodiversity Action Plan (LBAP) lists 23 Habitat Action Plans (HAPs) and 21 Species Action Plans (SAPs). There are no local HAPs that are relevant to the proposals however the following SAPs should be considered:

- Duke of Burgundy
- Glow-worm
- Pipistrelle
- Song Thrush

3.1.2 Designated Sites

Statutory Sites

There are three statutory designated sites within 2 km of the site centre point, comprising two Local Nature Reserves (LNRs) and one Area of Outstanding Natural Beauty (AONB). These sites are listed in *Table 4* in order of proximity to the site; short descriptions are given for the sites.

Table 4. Statutory Sites within 2 km of the Site Centre Point

Site Name	Designation	Approximate Distance (m)
High Weald	AONB	0
The High Weald AONB covers over 145,000 hectares and is designated for its landscape interest. Habitats of note in the area include ancient woodland, open heaths and steep sided streams. The site is within the High Weald AONB.		
Rowhill Copse	LNR	800
Rowhill Copse LNR is predominately mixed deciduous woodland that is dominated by *Castanea sativa* (Sweet Chestnut) and *Corylus avellana* (Hazel). Other habitats in the LNR include heathland, meadows, bog, ponds and streams.		
Ardingly Reservoir	LNR	1,150
Ardingly Reservoir LNR comprises deciduous woodland, *Corylus avellana* (Hazel) coppice, hay meadows and wetlands. There are also sandstone outcrops that support a rare community of ferns, mosses, liverworts and lichens. The LNR is important for birds; species include Barn Owl, Great Crested Grebe, Kingfisher and Osprey. Dormouse, Glow-worm and various bat species have also been recorded on site.		

SSSI Impact Risk Zones

There are several SSSIs in the wider area, including the Cow Wood & Harry's Wood SSSI, the Worth Forest SSSI and the Wakehurst & Chiddingly Woods SSSI. The site intersects SSSI Impact Risk Zones for these sites. As the proposed works are in connection with exploration for and appraisal of oil and gas, Natural England should be consulted prior to any works taking place.

Non-statutory Sites

There are five non-statutory designated sites within 2 km of the site centre point, all of which are Local Wildlife Sites (LWSs). These sites are listed in *Table 5* in order of proximity to the site; short descriptions are given for the sites.

Table 5. Non-Statutory Sites within 2 km of the Site Centre Point

Site Name	Designation	Approximate Distance (m)
Rowhill and Station Pastures	LWS	800
Rowhill and Station Pastures LWS comprises two unimproved pastures separated by a wooded stream valley. The pastures are steep and have areas of scrub and a damp flush. The grassland is dominated by *Agrostis capillaris* (Common Bent), *Anthoxanthum odoratum* (Sweet Vernal-grass), *Centaurea nigra* (Common Knapweed), *Cynosurus cristatus* (Crested Dog's-tail), *Festuca rubra* (Red Fescue) and *Holcus lanatus* (Yorkshire-fog). Notable species include *Cirsium dissectum* (Meadow Thistle), *Lotus tenuis* (Slender Bird's-foot-trefoil), *Ononis repens* (Common Restharrow) and *Verbascum nigrum* (Dark Mullein). The site is important for invertebrates, particularly butterflies. Species include Purple Hairstreak and White Admiral.		
Balcombe Marsh	LWS	900
Balcombe Marsh LWS is a small calcareous fen meadow that has a rich herb flora. Species of note include *Anagallis tenella* (Bog Pimpernel), *Carex pulicaris* (Flea Sedge), *Epipactis palustris* (Marsh Helleborine), *Gymnadenia conopsea* (Chalk Fragrant-orchid), *Hydrocotyle vulgaris* (Marsh Pennywort) and *Valeriana dioica* (Marsh Valerian).		
Balcombe Estate Rocks	LWS	1,065
Balcombe Estate Rocks LWS comprises three separate sites that are important for the ferns and lower plants that grow in them, some of which are very rare. The rocks are surrounded by plantation and ancient woodland. Rare species include *Dryopteris aemula* (Hay-scented Buckler-fern), *Hymenophyllum tunbrigense* (Tunbridge Filmy-fern), the lichens *Cystocoleus ebeneus*, *Leproloma vouauxii* and *Psilolechia lucida*, the liverwort *Harpanthus scutatus* and the moss *Oxystegus tenuirostris*.		
Ardingly Reservoir and Loder Valley Nature Reserve	LWS	1,150
Ardingly Reservoir and Loder Valley Nature Reserve LWS comprises standing water, marginal vegetation, herb-rich grassland, scrub, plantation woodland and ancient woodland. Dormouse, Chalkhill Blue and Purple Emperor have been recorded on the site. The LWS is important for breeding and passage wetland birds. Species include Great Crested Grebe, Greylag Goose, Gadwall, Green Sandpiper, Lapwing, Pochard, Tufted Duck and Wigeon. Many other woodland bird species and birds of prey have also		

Site Name	Designation	Approximate Distance (m)
been recorded on site.		
Balcombe Lake and Associated Woodlands	LWS	1,480
Balcombe Lake and Associated Woodlands LWS consists of a number of woodland blocks alongside wooded stream valleys and a lake. The majority of the woodland is dominated by *Quercus sp.* (Oak) and *Fraxinus excelsior* (Ash) with *Carpinus betulus* (Hornbeam) and *Corylus avellana* (Hazel) coppice. There are also areas *Alnus glutinosa* (Alder) woodland along watercourses and of conifer plantations. The woodlands are species rich with species such as *Circaea lutetiana* (Enchanter's-nightshade), *Hyacinthoides non-scripta* (Bluebell), *Lamiastrum galeobdolon* (Yellow Archangel) and *Melica uniflora* (Wood Melick) in the ground flora. The LWS is important for wetland and woodland bird species.		

Other Notable Sites

There are large areas of ancient woodland within 2 km of the site centre point. The closest areas of ancient woodland to the site are Lower Stumble Wood (which borders the survey area to the north) and Lower Beanham Wood (which borders the survey area to the south).

3.1.3 Protected and Noteworthy Species

At least 110 noteworthy species are recorded from places within 2 km of the site centre point. Of these, 5 are amphibians, 56 are birds, 2 are fish, 7 are invertebrates, 1 is a lichen, 27 are plants, at least 8 are mammals and 4 are reptiles. Species that are protected by law under *Schedules 2 and 5 of The Conservation of Habitats and Species (Amendment) Regulations 2012*, *The Wildlife and Countryside Act 1981* or *The Protection of Badgers Act 1992* and have been recorded in the search area are listed in the table below; a full species list is given in *Appendix C.*

Table 6. Protected Species Records within 2 km of the Site Centre Point (excluding species protected only against collection for sale).

Latin Name	Common Name	Designation	Most Recent	No of Records	Within 100m	Within 1km	Within 2km
Amphibians							
Triturus cristatus	Great Crested Newt	EPS(Sch2), WCA5	2014	19		☒	
Birds							
Alcedo atthis	Kingfisher	WCA1.1	2016	77		☒	
Botaurus stellaris	Bittern	WCA1.1	2011	6		**P**	☒
Falco subbuteo	Hobby	WCA1.1	2014	17	**P**	☒	
Loxia curvirostra	Common Crossbill	WCA1.1	2003	10		**P**	☒

Latin Name	Common Name	Designation	Most Recent	No of Records	Within 100m	Within 1km	Within 2km
Lullula arborea	Woodlark	WCA1.1	2008	1			**P**
Milvus milvus	Red Kite	WCA1.1	2014	14	**P**	☒	
Pandion haliaetus	Osprey	WCA1.1	2005	7		**P**	☒
Regulus ignicapilla	Firecrest	WCA1.1	2009	6			**P**
Tyto alba	Barn Owl	WCA1.1	2013	19	**P**	**P**	☒
Invertebrates							
Apatura iris	Purple Emperor	WCA5	2013	3		☒	
Mammals							
Arvicola amphibius	Water Vole	WCA5	2015	3			☒
Chiroptera	a bat	EPS(Sch2)	1991	1		**P**	☒
Eptesicus serotinus	Serotine	EPS(Sch2), WCA5	2010	1			☒
Muscardinus avellanarius	Hazel Dormouse	EPS(Sch2), WCA5	2013	4		☒	
Myotis sp.	a Myotis bat	EPS(Sch2), WCA5	2007	1			☒
Pipistrellus sp.	a Pipistrelle bat	EPS(Sch2), WCA5	2014	2		☒	
Pipistrellus pipistrellus	Common Pipistrelle	EPS(Sch2), WCA5	2012	6		☒	
Pipistrellus pygmaeus	Soprano Pipistrelle	EPS(Sch2), WCA5	2011	4			☒
Plecotus auritus	Brown Long-eared Bat	EPS(Sch2), WCA5	2013	9		☒	
Plants							
Mentha pulegium	Pennyroyal	WCA8	2000	3		**P**	☒
Trichomanes speciosum	Killarney Fern	EPS(Sch5), WCA5	1995	5			☒
Reptiles							
Anguis fragilis	Slow-worm	WCA5	2002	3		☒	
Natrix natrix	Grass Snake	WCA5	2002	8		☒	
Vipera berus	Adder	WCA5	1990	2		☒	
Zootoca vivipara	Common Lizard	WCA5	2010	1			☒

Note - **P** relates to records with 4 figure or tetrad grid references that could potentially be anywhere within a 1 km or 2 km square.

3.2 Phase 1 Habitat Survey

The habitat types within the survey area (defined as the site boundary on *Figure 1*) include the following:

- plantation woodland (broadleaved and coniferous);
- scattered trees;
- dense scrub;
- hedgerows;
- amenity grassland;
- ruderal vegetation on hard-standing; and
- fences, bare ground and hard standing.

Target notes and species lists are provided in *Appendix A* and *B* respectively. The habitats are described in more detail below and shown on *Figure 2*.

3.2.1 Plantation woodland

Broadleaved

There is an area of recently planted broadleaved woodland along the western edge of the drilling platform (*Target Note* 4). Species include *Quercus cerris* (Turkey Oak) and *Tilia ×europaea* (Lime). The understory was sparse and comprised patches of grassland and ruderal vegetation.

Coniferous

There is an area of recently planted *Picea abies* (Norway Spruce) to the north of the drilling platform (*Target Note* 8). The trees all appear to be of the same age and are between 3 and 4 m tall.

3.2.2 Scattered trees

There are scattered trees within dense scrub along the southern boundary of the drilling platform. These appeared to have been recently planted and included species such as *Betula pendula* (Silver Birch), *Corylus avellana* (Hazel) and *Fraxinus excelsior* (Ash).

3.2.3 Dense scrub

Dense scrub is present around the northern, eastern and southern boundaries of the drilling platform (*Target Note* 10). Species included *Rubus fruticosus* agg. (Bramble), which is dominant in places, with lesser amounts of *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), and *Rosa canina* (Dog-rose). Young trees are scattered throughout; species include *Corylus avellana* (Hazel), *Fraxinus excelsior* (Ash) and *Quercus robur* (Pedunculate Oak).

3.2.4 Scattered scrub

Scattered scrub has colonised some areas, particularly around the boundaries of hard standing and bare ground. In some areas the scattered scrub is entirely comprised of *Rubus fruticosus* agg. (Bramble). Scattered scrub has grown to a height ranging between of *c.* 0.5 – 2 m tall. Other than *Rubus fruticosus* agg. (Bramble), the main species were *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn).

3.2.5 Hedgerows

There is a hedgerow along the western edge of the survey area, along the B2036 road. The hedge was closely pruned during 2014 survey, but it was relatively outgrown during the present survey. It was intact and contained species such as *Corylus avellana* (Hazel), *Crataegus monogyna* (Hawthorn), *Fagus sylvatica* (Beech), *Rosa canina* (Dog-rose) and *Rubus fruticosus* agg. (Bramble). Trees were prominent throughout and included *Fraxinus excelsior* (Ash) and *Fagus sylvatica* (Beech).

3.2.6 Amenity grassland

There are patches of mown amenity grassland along the edges of the access track. The majority of the sward was *c.* 2 cm with longer patches nearer the edges of scrub and hedgerows. Species included *Dactylis glomerata* (Cock's-foot), *Lolium perenne* (Perennial Rye-grass) and *Poa annua* (Annual Meadow-grass) with sporadic patches of herbaceous vegetation including *Bellis perennis* (Daisy), *Cirsium vulgare* (Spear Thistle) and *Ranunculus repens* (Creeping Buttercup).

3.2.7 Ruderal vegetation on hard-standing

Hard-standing covers the centre of the survey area and was previously used as a drilling platform. The platform has been vacant for *c.* three years and ruderal vegetation has begun to colonise. Species include *Cirsium vulgare* (Spear Thistle), *Jacobaea vulgaris* (Common Ragwort) and *Urtica dioica* (Common Nettle).

3.2.8 Fences, hard-standing and bare ground

The works footprint comprises hard-standing created by compacted soil, gravel and brick hardcore. The drilling platform is surrounded by metal palisade fencing with an access gate onto the access track. The fencing is mostly intact however would not prevent access by Rabbit-sized mammals or smaller; a number of holes were noted where mammals (likely Rabbits) have dug underneath the fence.

3.2.9 Invasive non-native species

No non-native invasive plant species listed under *Schedule 9* of the *Wildlife and Countryside Act 1981 (as amended)* were recorded during the survey.

3.3 Protected Species

3.3.1 Badgers

There are no records of Badgers within 2 km of the site. Hedgerows and dense scrub offer suitable foraging habitat but no signs of activity or setts were identified during the survey. Although it was not possible to comprehensively search all of the dense scrub, the edges were searched and there were no obvious signs of Badgers entering or leaving.

Throughout the site there was recent evidence of grazing Rabbits (*Oryctolagus cuniculus*); though no active burrows were located.

3.3.2 Great Crested Newts

There are 19 records of Great Crested Newts within 1 km but there are no water-bodies ecologically connected to the site. There is suitable terrestrial habitat within the survey area but given the lack of suitable and accessible breeding ponds it is unlikely that newts will be present.

3.3.3 Bats

Roosting - Trees

There are a number of mature trees along the edge of the woodland to the north, east and south of the works footprint. However, none of these will be felled as part of the proposed development and they have not therefore been considered any further. All of the remaining trees have 'negligible potential' for roosting bats as they are too immature to have suitable features.

Foraging and Commuting

Although the works footprint is dominated by hard-standing and has negligible value for foraging and commuting bats, there are a number of records of bats within 1 km and habitat in the immediate vicinity comprises continuous, high quality habitat in the form of hedgerows, woodland edge and streams. It is also well connected to the wider landscape, including large areas of ancient woodland. Therefore the survey area is considered to be of **high value** to foraging and commuting bats.

3.3.4 Reptiles

There are records of the four more widespread reptiles within 1 km of the site and scrub provides some potential for foraging and hibernation. However the site is isolated from any large patches of rough grassland and does not provide extensive areas of suitable habitat which could support more than a few individuals.

There are no records of Smooth Snake or Sand Lizard within 2 km and the site does not contain habitats suitable for them (*i.e.* sandy heathland). They are considered to be absent from the site.

3.3.5 Birds

Breeding Birds

Although no active bird nests were observed during the survey, the hedgerow, areas of scrub and trees provide suitable habitat for common nesting bird species.

Nightjar

There are no records of Nightjar within 2 km and no suitable habitat within the works footprint. The wooded site boundaries are subject to disturbance and typical edge effects, being more open and subject to disturbance from the adjacent access track. Therefore this species is considered absent from the survey area however it may be present in adjacent ancient woodland.

3.3.6 Hazel Dormice

There are records of Hazel Dormouse within 1 km and the hedgerow and patches of woodland adjacent to the survey area contain some stands of semi-mature *Corylus avellana* (Hazel). However, the structure and species composition would only provide limited foraging habitat for Hazel Dormice. Nevertheless, these habitats are connected to extensive areas of mixed semi-natural and ancient woodland to the north and south which is likely to provide more suitable habitat for Hazel Dormouse. Therefore it is possible that this species is present within the survey area.

3.3.7 Invertebrates

There are records of Purple Emperor butterfly from within 1 km and areas of ancient woodland nearby These provide suitable habitat for this species and it is possible that Purple Emperor are present within adjacent woodland. Other woodland butterfly species, such as Duke of Burgundy, may also be present within adjacent woodland (although the habitat is currently suboptimal for this species due to lack of coppicing). Both these species are listed on Sussex LBAP.

Glow-worm is also listed on Sussex LBAP and there is suitable habitat for this species within and adjacent to the survey area including grassland, hedgerows, woodland rides and a railway embankment.

3.3.8 Other UK BAP Species

Hedgehog

There are no records of Hedgehogs within 2 km of the site. However, the habitats on the site do provide suitable foraging and hibernation potential for Hedgehogs. Suitable foraging habitat includes the grassland, hedgerows and scattered scrub. Suitable hibernation habitat includes the areas of dense scrub and brash piles within adjacent woodland.

4 EVALUATION

4.1 Designated Sites

4.1.1 Statutory sites

The site lies within the High Weald AONB but the AONB is designated for its landscape interest. The proposed development will not alter the landscape features of the site or the surrounding area so there will be no effect on the AONB which does not need to be considered further.

The works will be restricted to existing areas of hard-standing, so there will be no direct effects on other nearby designated sites. The effects on air quality will need to be considered and will be addressed in a separate air quality assessment.

The site lies within 10 km of Ashdown Forest Special Area of Conservation (SAC). Ashdown Forest contains one of the largest single continuous blocks of lowland heath in south-east England, with both dry heaths and, in a larger proportion, wet heath. A Habitat Regulations Assessment (HRA) screening assessment will be required to identify the likelihood of there being any significant, adverse effects of the proposals upon the qualifying features of Ashdown Forest. This is currently being undertaken by RSK and will be submitted as part of the planning application.

4.1.2 Non-statutory and other notable sites

There are five non-statutory designated sites within 2 km however as the works will be restricted to existing areas of hard-standing there will be no direct effects on these sites. The effects on air quality will need to be considered however these will be addressed in a separate air quality assessment.

Lower Stumble Wood and Lower Beanham Wood lie adjacent to the survey area boundary however neither will be directly affected by the works. There are streams within these woodlands therefore steps should be taken to ensure no contaminated water reaches these water-bodies and that any lighting is directed away from the woodland edges (further measures to minimise light spill onto adjacent habitats are provided in the bat report – see Appendix 7.2).

4.2 Habitats

4.2.1 Value of habitats

Areas of planted vegetation have been created to act as a screen to works previously undertaken on the drilling platform. They provide habitat for nesting birds and some potential for reptiles; however they contain common plant species and are replaceable.

The only habitats directly affected by the works are hard-standing and ruderal vegetation, which are of negligible value to biodiversity.

4.3 Protected Animals

4.3.1 Badgers

Badgers regularly move territories, open up old setts or dig new ones. However, the hard-standing that covers the works footprint offers no potential for sett creation. The scrubbed banks to the north and east of the works footprint do, and so should evidence of Badgers be noted there during works an ecologist should be consulted and further action may be required.

4.3.2 Bats

Roosting – Trees

No trees will be directly affected. Mature trees along the edges of adjacent woodland are likely to provide roosting opportunities for bats.

Foraging and commuting

As a whole, the survey area is considered to have high value for foraging and commuting bats but as the works will be restricted to the area of hard-standing in the centre of the site there will be no direct effects on foraging and commuting habitat.

The works area will be lit, so there is potential for indirect effects. Following discussions with the county ecologist (Don Baker) in February 2017, a survey scope proportionate to the works and potential effects was agreed to determine the level of bat activity around the site.

Three survey visits have been undertaken across the survey season (one in spring, one in summer and another in autumn) (Collins, 2016). Static detector monitoring has also been employed and the guidelines recommend one location per transect, with data to be collected on five consecutive nights per season in appropriate weather conditions. These surveys have provided the information to assess annual usage of the survey area by bats and inform lighting proposals for the works footprint[1].

4.3.3 Common Reptiles

Although there are records of reptiles within 1 km, there are no extensive areas of suitable habitat within the survey area and only individuals are likely to be present. However, as works will be restricted to the hard-standing (which is unsuitable for reptiles), any individuals which are present will be unaffected by the works and no further surveys are required.

4.3.4 Hazel Dormice

Although there is suitable habitat for Hazel Dormice in the survey area it will not be affected by the proposed development. Indirect impacts such as light-spill will be mitigated (see bat report). The works footprint comprises hard-standing and ruderal

[1] Bat surveys were undertaken between May and September 2017 and are reported in the bat report (RSK, September 2017) – see Appendix 7.2.

vegetation which is unsuitable for Hazel Dormice. Therefore this species will not be affected and no further action is necessary.

4.3.5 Birds

Breeding Birds

Vegetation clearance is unlikely to be required as part of the proposed development however if required, any vegetation clearance should be conducted outside the breeding bird season (March to August inclusive). If this is not possible then a watching brief by an ecologist would be required to ensure that no nesting birds are present no more than 48 hours prior to vegetation being cleared. If nests were found to be present during this time work would have to stop until the nestlings had fledged. All active birds' nests, regardless of species, are protected by law. A nest is deemed to be active even if it is in the process of being built and does not yet contain eggs or young. If vegetation clearance is undertaken outside of the nesting season then nesting birds do not have to be considered.

Nightjar

Although there are no records of Nightjars within 2 km, adjacent ancient woodland is likely to be suitable for them. However, the sub-optimal quality of the woodland edges abutting the site, disturbance, and the large extent of better-quality habitat outside the potential light-spill zone, means that Nightjars will not be affected by the proposed development. Indeed, the plantation woodland around the works footprint provides a buffer between the works and wider habitats suitable for Nightjars. Mitigation provided in the bat report (RSK, September 2017) will also protect Nightjars so further surveys are not required.

4.3.6 Invertebrates

Butterflies

Uncommon species such as Purple Emperor and Duke of Burgundy are likely to be present within adjacent woodland but this habitat will not be directly affected by the works. Indirect effects could result from light spill but this will not affect butterflies and works will be restricted to hard-standing and ruderal vegetation which is unsuitable for butterflies. Therefore further surveys are not required.

Glow-worm

During the bat survey in June 2017, a female Glow-worm was found at TQ 30927 29249. Although there is no suitable habitat within the works footprint, light spill onto adjacent habitat where this species has been found should be avoided. Mitigation provided in the bat report (RSK, September 2017) will also protect Glow-worms using adjacent habitat.

4.3.7 Other UK BAP Species

European Hedgehog

Hedgehogs are partially protected under *Schedule 6* of the *Wildlife & Countryside Act 1981* and listed as a Priority Species on the UK Biodiversity Action Plan (BAP). Although there is no suitable habitat for Hedgehog within the works footprint, adjacent woodland, scrub and hedgerows do provide opportunities for foraging and hibernation. Fences around the works footprint are not impenetrable to small mammals therefore it is possible that Hedgehogs could commute across this area. Any excavations should be covered at night or a ramp provided to reduce the risk of trapping Hedgehogs (and other small mammals).

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The Environmental Consulting Group (September 2013) Lower Stumble Exploration Site – Land off London Road, Balcombe, West Sussex – Bat Survey Report

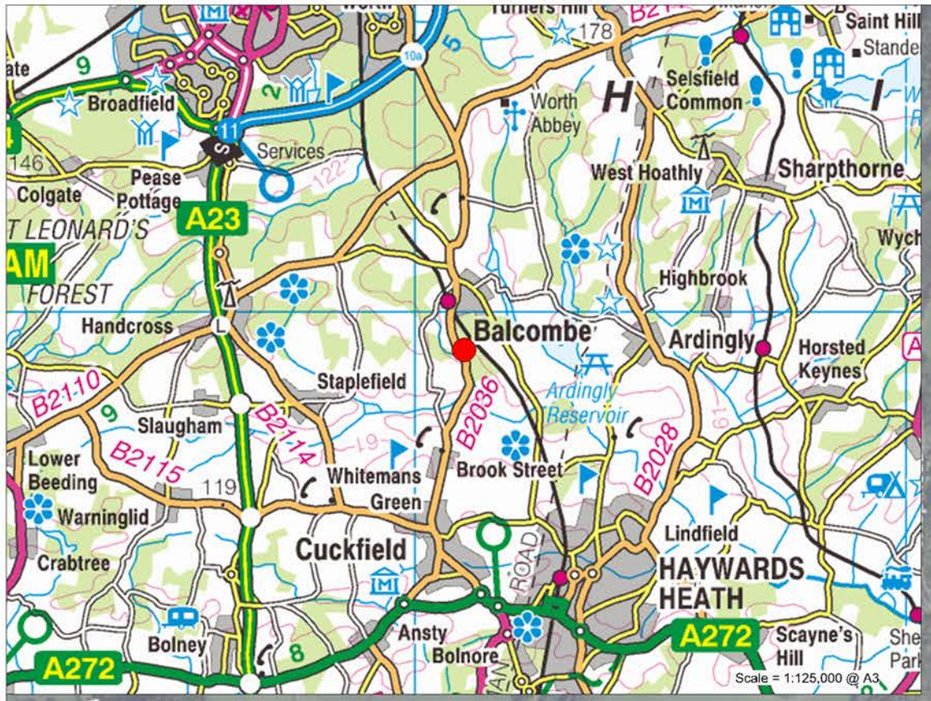
6 FIGURES

Figure 1 Site Location Plan

Figure 2 Phase 1 Habitat Survey Map

Figure 3 Animal Constraints Map

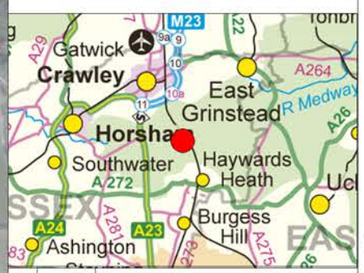
Figure 4 500 m pond search



Above ground work site boundary

Below ground works site boundary

Survey Area



Rev	Date	Description
00	12.10.17	857001

Balcombe 2z Hydrocarbon Well Testing

Figure 1

Site Location Plan

0 300

Metres

Scale = 1:10,000 @ A3

N W E S

REV 00

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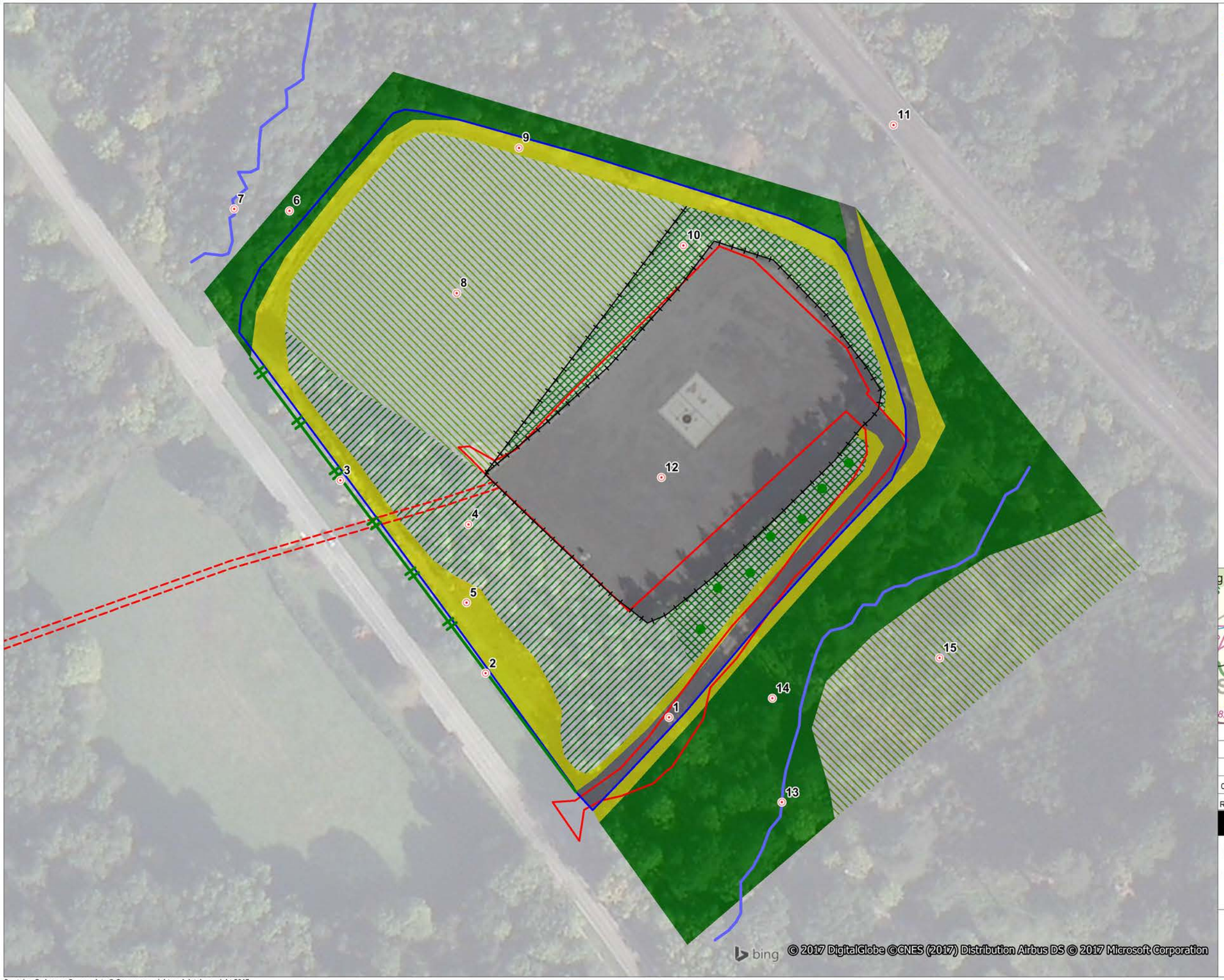
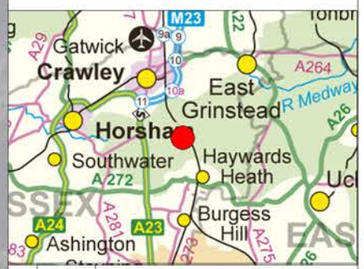


Above ground work site boundary
Below ground works site boundary
Survey area
Broad-leaved semi-natural woodland
Broad-leaved plantation woodland
Coniferous plantation woodland
Dense / continuous scrub
Scattered broad-leaved tree
Running water
Amenity grassland
Hedge
Hedge with trees
Fence
Hardstanding
Target note



Rev	Date	Description
00	12.10.17	857001

Balcombe 2z Hydrocarbon Well Testing

Figure 2

Phase 1 Habitat Survey

0 30
metres
Scale = 1:1,000 @ A3

N W E S

REV 00

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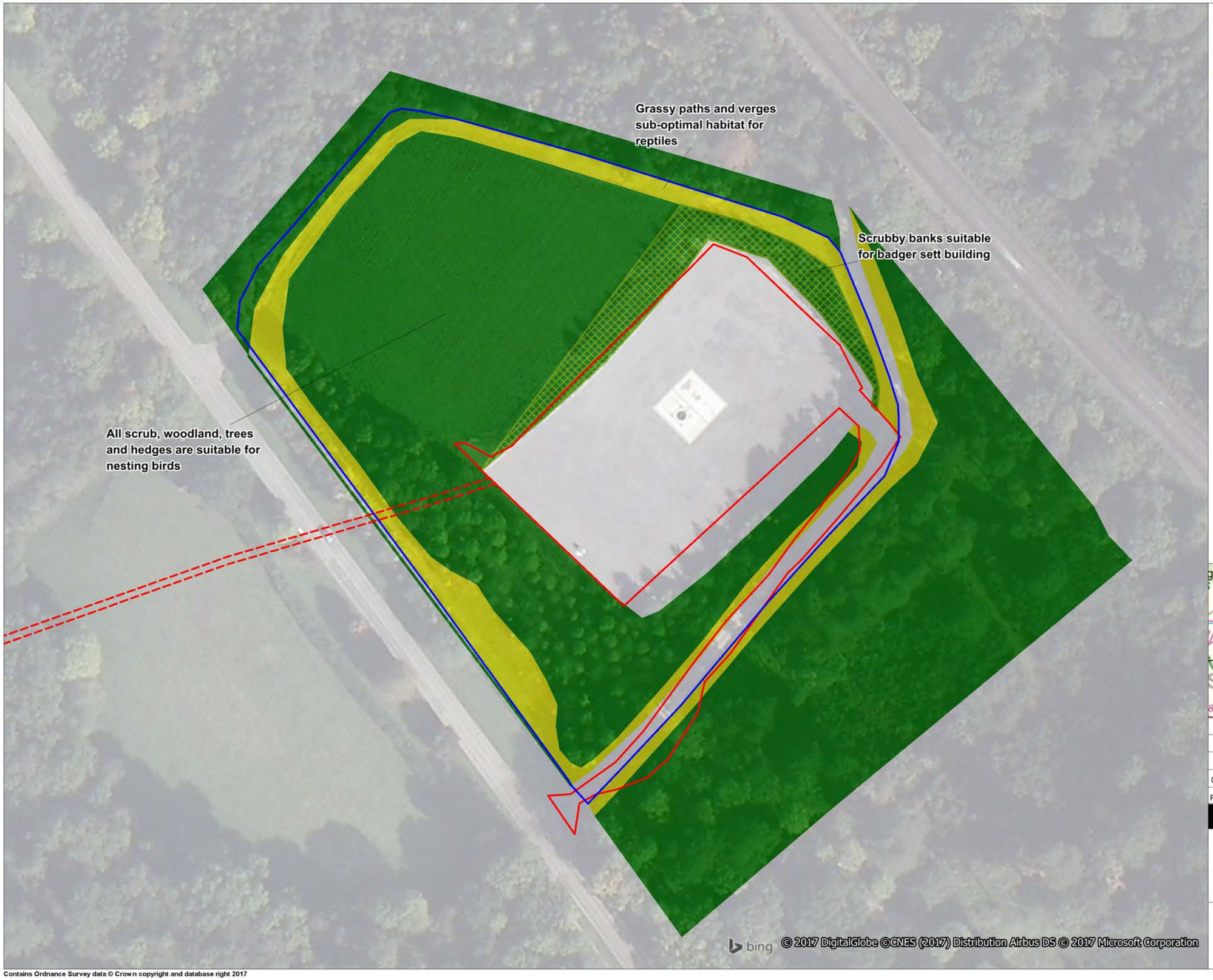


Above ground work site boundary

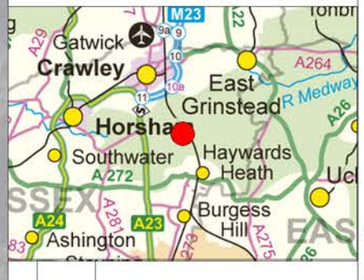
Below ground works site boundary

Survey area

Nesting birds habitat

Banks suitable for badger sett building

Sub-optimal reptile habitat



Rev	Date	Description
00	12.10.17	857001

Balcombe 2z Hydrocarbon Well Testing

Figure 3

Animal Constraints Map

0 30

metres

Scale = 1:1,000 @ A3

N W E S

REV 00

File Name : U:\Ecology\857000s\857001 - Cuadrilla Balcombe PEA\07 - GIS

Above ground work site boundary
Below ground works site boundary
Survey area
500m buffer of site boundary
Pond within 500m

Cottage
Upper Stumble Wood
Radford
Spring Shaw
Kemps Farm
LC
Stumble Field Wood
Sawmill
HAYWARDS HEATH ROAD
Unitroy Cottages
Rowhill Wood
Lower Stumble Wood
LONDON ROAD
Upper Beanham Wood
Bowder's Farm
ROWHILL LANE
Pilstye Wood
Lower Beanham Wood
Bushey Wood
Furland Wood
Furzefield
Upper Pilstye Cottages
Spicers Cottages
LANE
1

Rev	Date	Description
00	12.10.17	857001

Balcombe 2z Hydrocarbon Well Testing

Figure 4

Waterbodies within 500m

0 150
metres
Scale = 1:5,000 @ A3

N W E S

REV 00

File Name : U:\Ecology\857000s\s857001 - Cuadrilla Balcombe PEA\07 - GIS

APPENDIX A – TARGET NOTES

Target Note 1 – Hard-standing entrance track off the B2036 leading to the works footprint and continuing underneath the railway line to Balcombe Estate Sawmill.

Target Note 2 – A species-rich intact hedge which runs along the B2036. It appears to be managed but was outgrown at the time of survey. The hedge was *c.* 5 m tall and 2 – 3 m wide with a fence along its eastern side. Species included *Crataegus monogyna* (Hawthorn), *Hedera helix* (Ivy), *Rosa canina* (Dog-rose) and *Rubus fruticosus* agg. (Bramble) with scattered *Corylus avellana* (Hazel), *Fraxinus excelsior* (Ash) and *Fagus sylvatica* (Beech) trees.

Target Note 3 – This section of the hedge was more outgrown than the rest with trees being more prominent.

Target Note 4 – Planted *Tilia ×europaea* (Lime) and *Quercus cerris* (Turkey Oak) trees with a grassland understory. The northern edge was being encroached by adjacent *Crataegus monogyna* (Hawthorn) and *Rubus fruticosus* agg. (Bramble) scrub.

Target Note 5 – A mown track alongside the hedge. Species included *Bellis perennis* (Daisy), *Poa annua* (Annual Meadow-grass), *Rumex acetosa* (Common Sorrel), *Ranunculus repens* (Creeping Buttercup) and *Urtica dioica* (Common Nettle).

Target Note 6 – Ancient woodland (forming part of Lower Stumble Wood) adjacent to the northern survey area boundary. This area was outside the survey zone however some plant species were noted, including trees such as *Betula pendula* (Silver Birch), *Corylus avellana* (Hazel), *Quercus cerris* (Turkey Oak), *Prunus spinosa* (Blackthorn), *Prunus sp.* (Cherry species) and herbaceous plants such as *Arum maculatum* (Lords-and-Ladies), *Helleborus viridis* (Green Hellebore), *Hyacinthoides non-scripta* (Bluebell), *Mercurialis perennis* (Dog's Mercury), *Rumex obtusifolius* (Broad-leaved Dock) and *Stellaria holostea* (Greater Stitchwort).

Target Note 7 – A small stream running through Lower Stumble Wood. The stream had earth banks, was shallow with a slow flow.

Target Note 8 – *Picea abies* (Norway Spruce) plantation.

Target Note 9 – A mown grass track along the edge of the conifer plantation, similar to *Target Note* 5.

Target Note 10 – Dense scrub along the northern, eastern and southern boundaries of the works footprint. It is dominated by *Rubus fruticosus* agg. (Bramble) with some *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn) and *Rosa canina* (Dog-rose). Scattered trees occur throughout and include *Corylus avellana* (Hazel), *Fraxinus excelsior* (Ash) and *Quercus robur* (Pedunculate Oak).

Target Note 11 – Access track leads underneath a railway bridge which has some potential for roosting bats.

Target Note 12 – An area of hard-standing with colonising ruderal vegetation.

Target Note 13 – A seasonally dry stream running through Lower Beanham Wood. Although the majority of the stream contained water at the time of survey it was very shallow with a slow flow, it was dry in some places.

Target Note 14 – An area of woodland (known as Lower Beanham Wood) similar to *Target Note* 6.

Target Note 15 – A conifer plantation dominated by *Pseudotsuga menziesii* (Douglas Fir).

APPENDIX B – PLANT SPECIES LIST

Table 7. Plant species found at the Balcombe site on 20 April 2017.

Plant Species
Woody species
Alnus glutinosa (Alder)
Betula pendula (Silver Birch)
Corylus avellana (Hazel)
Crataegus monogyna (Hawthorn)
Fagus sylvatica (Beech)
Fraxinus excelsior (Ash)
Hedera helix (Ivy)
Picea abies (Norway Spruce)
Prunus spinosa (Blackthorn)
Prunus sp. (Cherry species)
Pseudotsuga menziesii (Douglas Fir)
Quercus cerris (Turkey Oak)
Quercus robur (Pedunculate Oak)
Rosa canina (Dog-rose)
Rubus fruticosus agg. (Bramble)
Herbaceous species
Arum italicum (Italian Lords-and-Ladies)
Arum maculatum (Lords-and-Ladies)
Bellis perennis (Daisy)
Carex pendula (Pendulous Sedge)
Cirsium vulgare (Spear Thistle)
Dactylis glomerata (Cock's-foot)
Dryopteris sp. (Buckler Fern species)
Helleborus viridis (Green Hellebore)
Senecio jacobaea (Common Ragwort)
Juncus effusus (Soft-rush)
Lamium purpureum (Red Dead-nettle)
Lolium perenne (Perennial Rye-grass)
Mercurialis perennis (Dog's Mercury)
Poa annua (Annual Meadow-grass)
Potentilla reptans (Creeping Cinquefoil)
Primula veris (Cowslip)
Ranunculus repens (Creeping Buttercup)
Rumex acetosa (Common Sorrel)
Rumex obtusifolius (Broad-leaved Dock)

Plant Species
Poterium sanguisorba (Salad Burnet)
Stellaria holostea (Greater Stitchwort)
Urtica dioica (Common Nettle)

APPENDIX C – NOTEWORTHY SPECIES RECORDS

Table 8 displays noteworthy species records that are located within 2 km of the site centre point. These species records were obtained from Sussex Biodiversity Records Centre. The Latin and common names for species are given as well as their level of designation. A glossary defining abbreviations used in the table is given in *Table 9, Appendix E*. If a species is not included in the table below it does not necessarily mean the species is absent from the search area, but rather that data-holding organizations do not have records of it in these locations.

Table 8. Noteworthy species records within 2 km of the site centre point

Latin Name	Common Name	Designation
Amphibians		
Bufo bufo	Common Toad	WCA5, S41
Lissotriton helveticus	Palmate Newt	WCA5
Lissotriton vulgaris	Smooth Newt	WCA5
Rana temporaria	Common Frog	WCA5
Triturus cristatus	Great Crested Newt	EPS(Sch2), WCA5, S41, LBAP
Birds		
Acanthis cabaret	Lesser Redpoll	S41, Red
Actitis hypoleucos	Common Sandpiper	Amber
Alauda arvensis	Skylark	S41, Red, LBAP
Alcedo atthis	Kingfisher	WCA1.1, Amber
Anas clypeata	Shoveler	Amber
Anas penelope	Wigeon	Amber
Anas platyrhynchos	Mallard	Amber
Anthus trivialis	Tree Pipit	S41, Red
Apus apus	Swift	Amber, LBAP
Aythya ferina	Pochard	Red
Aythya fuligula	Tufted Duck	Amber
Botaurus stellaris	Bittern	WCA1.1, S41, Amber
Chroicocephalus ridibundus	Black-headed Gull	Amber
Coccothraustes coccothraustes	Hawfinch	S41, Red
Columba oenas	Stock Dove	Amber
Cuculus canorus	Cuckoo	S41, Red
Cygnus olor	Mute Swan	Amber
Delichon urbicum	House Martin	Amber
Dendrocopos minor	Lesser Spotted Woodpecker	S41, Red
Egretta garzetta	Little Egret	Amber

Latin Name	Common Name	Designation
Emberiza citrinella	Yellowhammer	S41, Red
Emberiza schoeniclus	Reed Bunting	S41, Amber
Falco subbuteo	Hobby	WCA1.1
Falco tinnunculus	Kestrel	Amber
Hirundo rustica	Swallow	Amber
Linaria cannabina	Linnet	S41, Red
Loxia curvirostra	Common Crossbill	WCA1.1
Lullula arborea	Woodlark	WCA1.1, S41, Amber
Luscinia megarhynchos	Nightingale	Red
Milvus milvus	Red Kite	WCA1.1, Amber
Motacilla cinerea	Grey Wagtail	Red
Muscicapa striata	Spotted Flycatcher	S41, Red
Pandion haliaetus	Osprey	WCA1.1, Amber
Passer domesticus	House Sparrow	S41, Red
Passer montanus	Tree Sparrow	S41, Red
Perdix perdix	Grey Partridge	S41, Red
Phoenicurus phoenicurus	Redstart	Amber
Phylloscopus sibilatrix	Wood Warbler	S41, Red
Phylloscopus trochilus	Willow Warbler	Amber
Picus viridis	Green Woodpecker	Amber
Poecile montana	Willow Tit	S41, Red
Poecile palustris	Marsh Tit	S41, Red
Prunella modularis	Dunnock	S41, Amber
Pyrrhula pyrrhula	Bullfinch	S41, Amber
Regulus ignicapilla	Firecrest	WCA1.1, Amber
Scolopax rusticola	Woodcock	Red
Sterna hirundo	Common Tern	Amber
Streptopelia turtur	Turtle Dove	S41, Red
Strix aluco	Tawny Owl	Amber
Sturnus vulgaris	Starling	S41, Red
Sylvia communis	Whitethroat	Amber
Tachybaptus ruficollis	Little Grebe	Amber
Turdus philomelos	Song Thrush	S41, Red, LBAP
Turdus viscivorus	Mistle Thrush	Red
Tyto alba	Barn Owl	WCA1.1, Amber, LBAP
Vanellus vanellus	Lapwing	S41, Red
Fish		
Anguilla anguilla	European Eel	S41, OSPAR
Salmo trutta	Brown/Sea Trout	S41
Invertebrates		
Apatura iris	Purple Emperor	WCA5
Coenonympha pamphilus	Small Heath	S41

Latin Name	Common Name	Designation
Erynnis tages	Dingy Skipper	S41, GB RDB(VU)
Limenitis camilla	White Admiral	S41, GB RDB(VU)
Pyrgus malvae	Grizzled Skipper	S41, GB RDB(VU)
Somatochlora metallica	Brilliant Emerald	GB RDB(VU)
Timandra comae	Blood-Vein	S41
Lichen		
Cladonia incrassata	a lichen	NS
Mammals		
Arvicola amphibius	Water Vole	WCA5, S41, LBAP
Chiroptera	a bat	EPS(Sch2)
Eptesicus serotinus	Serotine	EPS(Sch2), WCA5
Erinaceus europaeus	West European Hedgehog	S41
Lepus europaeus	Brown Hare	S41, LBAP
Muscardinus avellanarius	Hazel Dormouse	EPS(Sch2), WCA5, S41
Myotis sp.	a Myotis bat	EPS(Sch2), WCA5
Pipistrellus sp.	a Pipistrelle bat	EPS(Sch2), WCA5, LBAP
Pipistrellus pipistrellus	Common Pipistrelle	EPS(Sch2), WCA5, LBAP
Pipistrellus pygmaeus	Soprano Pipistrelle	EPS(Sch2), WCA5, S41, LBAP
Plecotus auritus	Brown Long-eared Bat	EPS(Sch2), WCA5, S41
Plants		
Acaulon muticum	Rounded Pygmy-moss	NR
Adiantum capillus-veneris	Maidenhair Fern	NS
Anthemis arvensis	Corn Chamomile	GB RDB(EN)
Anthemis cotula	Stinking Chamomile	GB RDB(VU), ENG BSBI RDB(VU), NS
Bromus secalinus	Rye Brome	GB RDB(VU), NS
Buxus sempervirens	Box	NR
Calypogeia integristipula	Meylan's Pouchwort	NS
Camelina sativa	Gold-of-pleasure	NS
Carex vesicaria	Bladder-sedge	ENG BSBI RDB(VU)
Centaurea cyanus	Cornflower	S41
Cephalozia catenulata	Chain Pincerwort	NS
Equisetum pratense	Shady Horsetail	NS
Euphrasia officinalis subsp. anglica	Small-flowered Sticky Eyebright	S41
Genista tinctoria	Dyer's Greenweed	ENG BSBI RDB(VU)
Hieracium aggregatum	Hawkweed	NR
Hyacinthoides non-scripta	Bluebell	WCA8

Latin Name	Common Name	Designation
Juniperus communis	Juniper	S41
Mentha pulegium	Pennyroyal	WCA8, S41, GB RDB(EN), ENG BSBI RDB(CR), NR
Mentha suaveolens	Round-leaved Mint	NS
Myosurus minimus	Mousetail	GB RDB(VU), ENG BSBI RDB(VU)
Orthodontium gracile	Slender Thread-moss	S41, GB RDB(VU), NR
Racomitrium affine	Lesser Fringe-moss	NS
Ranunculus flammula	Lesser Spearwort	ENG BSBI RDB(VU)
Scleranthus annuus	Annual Knawel	S41, GB RDB(EN), ENG BSBI RDB(EN)
Spergula arvensis	Corn Spurrey	GB RDB(VU), ENG BSBI RDB(VU)
Trichomanes speciosum	Killarney Fern	EPS(Sch5), WCA5, S41, GB RDB(CR)
Valerianella dentata	Narrow-fruited Cornsalad	GB RDB(EN), ENG BSBI RDB(EN)
Reptiles		
Anguis fragilis	Slow-worm	WCA5, S41
Natrix natrix	Grass Snake	WCA5, S41
Vipera berus	Adder	WCA5, S41
Zootoca vivipara	Common Lizard	WCA5, S41

APPENDIX D – LEGISLATION AND POLICY

Badger

Badgers are protected in Britain under the *Protection of Badgers Act 1992* and *Schedule 6 of the Wildlife and Countryside Act 1981 (as amended).*

The legislation affords protection to Badgers and Badger setts, and makes it a criminal offence to:

- willfully kill, injure, take, possess or cruelly ill-treat a Badger, or to attempt to do so;
- intentionally or recklessly interfere with a sett by damaging or destroying it;
- to obstruct access to, or any entrance of, a Badger sett; or
- to disturb a Badger when it is occupying a sett.

Great Crested Newt

Great Crested Newts are listed on *Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)*, and receives full protection under *Section 9*. Great Crested Newts are also European Protected Species listed on *The Conservation of Species and Habitats Regulations 2010 (as amended)*. This legislation makes it an offence to:

- deliberately capture, injure or kill a Great Crested Newt;
- deliberately disturb a Great Crested Newt (in such a way as to be likely to significantly affect, (i) the ability of a significant group of Great Crested Newt to survive, breed or rear/nurture their young; and (ii) the local distribution or abundance of the species concerned);
- deliberately take or destroys the eggs of such an animal;
- damage or destroy a breeding site or resting place of a Great Crested Newt; and
- possess, control, transport, sell, exchange a Great Crested Newt, or offer a Great Crested Newt for sale or exchange.

All resting and breeding places of Great Crested Newts receive legal protection even when Great Crested Newts are not present.

Bats

Bats are European Protected Species listed in Scotland on *The Conservation (Natural Habitats, & c.) Regulations 1994 (as amended).* This legislation makes it an offence to:

- deliberately capture, injure or kill;

- deliberately disturb, including in particular any disturbance which is likely (a) to impair their ability - (i) to survive, to breed or reproduce, or to rear or nurture their young; or (ii) hibernate or migrate, where relevant; or (b) to affect significantly the local distribution or abundance of the species to which they belong.
- damage or destroy a breeding site or resting place; and
- possess, control, transport, sell, exchange, or offer for sale or exchange.

Common Reptiles

Zootoca vivipara (Common Lizard), *Anguis fragilis* (Slow-worm), and *Vipera berus* (Adder) are listed under *Schedule 5* of the *Wildlife and Countryside Act 1981 (as amended)*, in respect of *Section 9(5)* and part of *Section 9(1)*.

- Under the above legislation it is an offence to:
- intentionally or deliberately kill or injure any individual of such a species; or
- sell or attempt to sell any part of the species alive or dead.

Nesting Birds

All species of bird are protected under *Section 1 of the Wildlife and Countryside Act 1981 (as amended)*.

- The legislation makes it an offence to intentionally:
- kill, injure or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

APPENDIX E – ABBREVIATIONS

Table 9 displays abbreviations of protected species legislation.

Table 9. Glossary of abbreviations used in this report

Code	Full Title	Explanation
Amber	Amber list	Amber listed species have a population status in the UK of medium conservation concern.
BA	The Protection of Badgers Act 1992	Legislation making it an offence to kill, injure or take a Badger, or to damage or interfere with a sett unless a licence is obtained from a statutory authority.
BAP	Biodiversity Action Plan	A plan that identifies threats to significantly important species and habitats, and sets out targets and actions to enhance or maintain biodiversity.
DA	The Deer Act 1991	All wild deer with the exception of Muntjac (*Muntiacus reevesi*) and Chinese Water deer (*Hydropotes inermis*) are protected by a closed season.
ENG BSBI RDB	A Vascular Plant Red List for England	A list published in 2014 by the Botanical Society of Britain and Ireland of the red list status of plants in England. Measured against standardised IUCN criteria.
ENG BSBI RDB(CR)	Critically Endangered	A BSBI Red List designation for species at an extremely high risk of extinction.
ENG BSBI RDB(EN)	Endangered	A BSBI Red List designation for species at a very high risk of extinction.
ENG BSBI RDB(VU)	Vulnerable	A BSBI Red List designation for species at high risk of extinction.
EPS (Sch 2)	European Protected Species (Schedule 2)	European protected animal species (listed on *Schedules 2* of *The Conservation of Habitats and Species* (Amendment) *Regulations 2012*)
EPS (Sch 5)	European Protected Species (Schedule 5)	European protected plant species (listed on *Schedules 5* of *The Conservation of Habitats and Species* (Amendment) *Regulations 2012*)
GB RDB	Red Data Book Species	Species identified in one of the UK Red Data 2001.
GB RDB(CR)	Critically Endangered	An IUCN Red List designation for species at an extremely high risk of extinction.
GB RDB(EN)	Endangered	An IUCN Red List designation for species at a very high risk of extinction.
GB RDB(VU)	Vulnerable	An IUCN Red List designation for species at high

Code	Full Title	Explanation
		risk of extinction.
HAP	Habitat Action Plan	A plan that identifies threats to a priority habitat and sets out targets and actions to enhance or maintain that habitat.
IUCN	International Union for Conservation of Nature and Natural Resources (also known as The World Conservation Union)	A worldwide partnership and conservation network to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.
LBAP	Local Biodiversity Action Plan	A plan that identifies threats to locally important species and habitats, and sets out targets and actions in Species Action Plans and Habitat Action Plans to enhance or maintain biodiversity at the county or regional level.
LHAP	Local Habitat Action Plan	A plan that identifies threats to a locally important priority habitat and sets out targets and actions to enhance or maintain that habitat.
LSAP	Local Species Action Plan	A plan that identifies threats to locally important species, and sets out targets and actions to prevent losing that species from the local area.
Notable	Scarce and threatened invertebrates	Invertebrate species which are estimated to occur within the range of 16 to 100 10km squares but subdivision into Notable A and Notable B categories is not possible as there is insufficient information available).
Notable:A	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories but which are none-the-less uncommon in Great Britain and thought to occur in 30 or fewer 10km squares of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties.
Notable: B	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories but which are none-the-less uncommon in Great Britain and thought to occur in between 31 and 100 10km squares of the National Grid or, for less-well recorded groups between eight and twenty vice-counties.
NN	Nationally Notable	Designation for invertebrate taxa that are thought to be notably important in the UK.
NR	Nationally Rare	Species in 15 or fewer hectads in Great Britain.
NS	National Scarce	Species in 16-100 hectads in Great Britain.
OSPAR	OSPAR	Species listed on *The Convention for the Protection of the Marine Environment of the North-East Atlantic*
Red	Red List	Red listed species have a population status in the UK with high conservation concern.

Code	Full Title	Explanation
SAP	Species Action Plan	A plan that identifies threats to significantly important species, and sets out targets and actions to prevent losing that species to extinction.
S41	Species of Principal Importance	Species of Principal Importance in England under *The Natural Environment and Rural Communities (NERC) Act (2006)*
UKBAP	UK Biodiversity Action Plan	A plan that identifies threats to locally important species and habitats, and sets out targets and actions in Species Action Plans and Habitat Action Plans to enhance or maintain biodiversity in the UK.
WCA	*The Wildlife and Countryside Act 1981* (as amended)	Containing 4 Parts and 17 Schedules, the Act covers protection of wildlife (birds, and some animals and plants), the countryside, National Parks, and the designation of protected areas, and public rights of way. All wild plants in Britain are protected from intentional uprooting by an unauthorized person, but land owners, land occupiers, persons authorized by either of these or persons authorized in writing by the Local Authority for the area are exempt. Protection for some species may be limited to certain Sections of the Act (*e.g.* S13(2).
WCA1	Schedule 1 of *The Wildlife and Countryside Act 1981* (as amended)	This Schedule lists birds protected by special penalties at all times, but virtually all wild birds have some protection in law. Acts which are prohibited for all wild birds (except derogated 'pest' species) include intentional killing, injuring or taking; taking, damaging or destroying nests in use or being built; taking or destroying eggs; possessing or having control of (with certain exceptions but including live for dead birds, parts or derivative); setting or permitting certain traps, weapons, decoys or poisons. Selling, offering or exposing for sale, possessing or transporting for sale any live wild bird, egg or part of an egg or advertising any of these for sale, or dead wild bird including parts or derivatives are also prohibited. Many birds must be formally registered and ringed if kept in captivity. Schedule I WCA birds are additionally protected from intentional or reckless disturbance while building a nest, or when such a bird is in, on or near a nest containing eggs or young, or intentional or reckless disturbance of dependent young.
WCA5	Schedule 5 of *The Wildlife and*	Schedule 5 animals are protected from intentional killing, injuring or taking; possessing

Code	Full Title	Explanation
	Countryside Act 1981 (as amended)	(including parts or derivatives); intentional or reckless damage, destruction or obstruction of any structure or place used for shelter or protection; selling, offering or exposing for sale, possessing or transporting for the purpose of sale (alive or dead, including parts or derivatives). Protection of some species is limited to certain Sections of the Act (*e.g.* S9(1), S9(4a), S9(4b), S9(5)).
WCA8	Schedule 8 of *The Wildlife and Countryside Act 1981* (as amended)	Plants and fungi protected from intentional picking, uprooting, destroying, trading (including parts or derivatives), *etc.*