

PRELIMINARY ECOLOGICAL APPRAISAL

SEPTEMBER 2023

Sandy Brow RFP

Perimeter Road

Knowsley

L33 3AN

U R B A N
G R E E N



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NON-TECHNICAL EXECUTIVE SUMMARY

Balance Power Ltd are proposing to develop land off Perimeter Road in Knowsley (hereafter referred to as ‘the site’). The proposals include the development of a battery storage site, with power grid infrastructure and associated hard landscaping.

Urban Green have been appointed to complete a Preliminary Ecological Appraisal of the site. The objectives of the assessment are to identify habitats on site and determine the suitability for any ‘protected and/or notable’ species that may occur on site. Further ecological surveys and mitigation are recommended to aim to minimise potential impacts on ecology, due to the proposed development.

Following the survey work, the key recommendations are summarised in the following table:

Current Site Use and Adjacent Site Use	The site is a marshy grassland in effective disuse. Adjacent land has been used historically for livestock, which occasionally use the site.
Potential Impacts on Designated Sites	No potential impacts on designated sites nearby to the site are anticipated to occur due to the proposed development. The site is located at a sufficient distance from nearby designated sites, and the proposed development activities have been considered.
Habitats	The site comprised predominantly marshy, mossy grassland. Brief plantation woodlands and ditches bordered aspects of the site.
Ecological Constraints	The following potential ecological constraints were identified during the assessment: • Potential for reptiles. • Suitable commuting and foraging habitat for bats. • Potential for ground-nesting and wintering birds • Suitable habitats for badgers, hedgehog and amphibians. • Potential occasional presence of water vole, red squirrel
Recommended Ecological Mitigation	The following mitigation measures are recommended to minimise potential impacts due to the proposed development: • Precautionary Working Methods during the construction phase for amphibians, badgers, hedgehog, water vole, and red squirrel, reptiles. • If any vegetation requires removal, it should be completed outside of the breeding bird season (March to September, inclusive). If this is not feasible, a Nesting Bird Check is to be completed by a qualified ecologist within 48 hours before removal is completed.
Recommended Further Surveys and Reports	The following ecological surveys and reports are recommended to further assess the sites suitability for protected/notable fauna and/or flora: • Reptiles • Foraging and Commuting Bats • Wintering Birds • Water Voles
Recommended Ecological Enhancements	The National Planning Policy Framework (NPPF) (2021) highlights the requirement for planning policies and decisions to conserve and enhance the natural environment. The Liverpool City Region Ecological Network highlights opportunities to enhance the undisturbed Nature Improvement Area. The proposed development provides the opportunity to enhance the site and ecological enhancements have been recommended.

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1 Introduction

1.1 Background to the Scheme

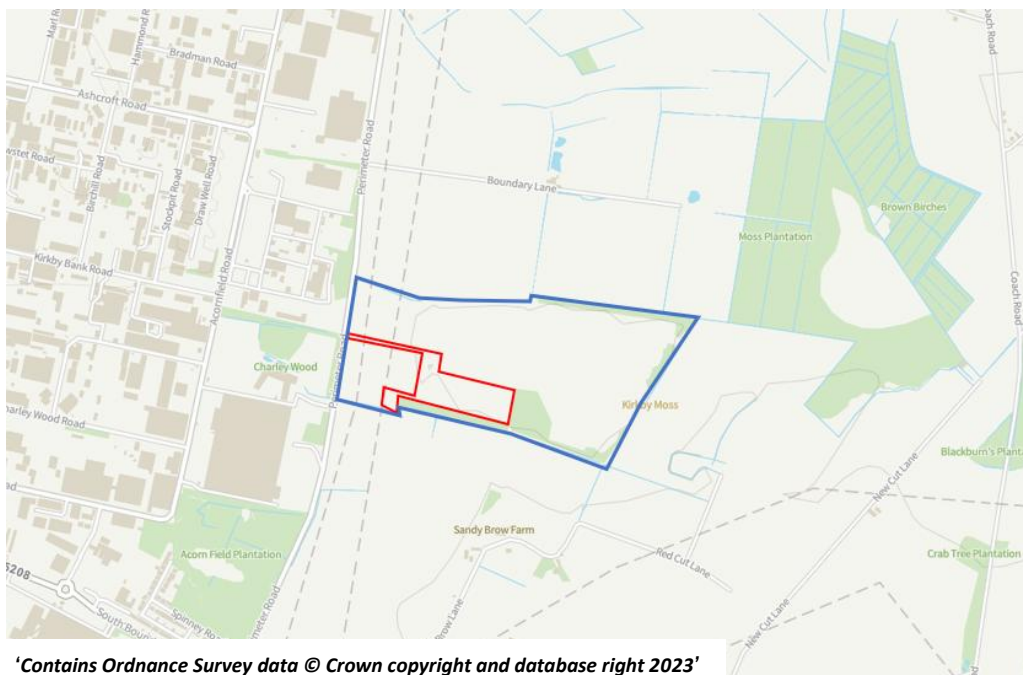
Balance Power Ltd are proposing to develop land off Perimeter Road in Knowsley (hereafter referred to as 'the site'). The proposals include the development of a battery storage site, with power grid infrastructure and associated hard landscaping.

The author of the report is Barnaby Indio Gardner, MEnv, Qualifying CIEEM, Assistant Ecologist at Urban Green. Barney has experience providing ecological consulting services for a range of development schemes across the UK, including residential and commercial schemes.

1.2 Site Context

The site is located at National Grid Reference SJ 44170 98325 and comprises a total area of approximately 3ha (see Figure 1).

Figure 1 – Site Extent



The red-lined site lies within a greater area leased by the client, due for later development. The red-line concerns the site detailed in this report.

The site is located in the rural outskirts of the greater Liverpool built-up area, ~2.2km north of Knowsley. The site is bounded west by Perimeter Road, immediately beyond which lies an extensive retail/industrial estate. Expansive rural land dominates the wider landscape to the north, east, and south of site – mostly agricultural land, and notably Knowsley Park & Safari, ~3km to the south.

1.3 Purpose of this Report

This report has been produced to set out the methods, results, and conclusions of a PEA. The purpose of the PEA report is to identify habitats on site and determine the sites potential value for protected and/or notable fauna and flora, with the addition of potential impacts on designated sites. This will inform the need for any further ecological surveys and/or mitigation to minimise the potential impacts on ecology on site and within the local area.

Further information and details of UK legislation for those species which are formally protected is defined in Appendix 1, which are considered throughout the assessment.

The National Planning Policy Framework (NPPF) (2021) and other Local Planning Policies are considered with the PEA. Ecological enhancements are advised to be in line with relevant Planning Policies.

2 Methods

The PEA assessment and Report follows the good practice methodology as detailed within the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2019).

2.1 Desk Study

2.1.1 Online Resources and Local Records Centre

Due to the size and low impact of the proposed development, a 2km Local Data Search was conducted as it is deemed an appropriate distance for the Zone of Influence.

Sources of information used in the desk study are presented in Table 1.

Table 1 – Desk Study Sources of Information

Source	Date Consulted	Information Sought
MAGIC website (www.magic.gov.uk)	29/08/2023	Locations of statutory designated sites within 1km of the site boundary. Locations of Natura 2000 sites (Ramsar, Special Area of Conservation (SAC) and Special Protection Area (SPA)) within 5km of the site boundary. Locations of European Protected Species Licences (EPSL) and Class Licences within 1km.
Natural England (https://designatedsites/nature.naturalengland.org.uk/)	29/08/2023	Relevant statutory designated site citations.
JNCC (https://jncc.defra.gov.uk/)	29/08/2023	Information on European wildlife sites. Details of relevant Section 41 species and habitats.
Merseyside Biobank & Lancashire Ecological Records Network	12/09/2023	Locally designated wildlife sites within 1km of site boundary. Records of protected and notable species within 1km of the site boundary.
North Merseyside Biodiversity Action Plan	12/09/2023	Species and habitats which are given special conservation status at the local level.

2.2 Field Survey

2.2.1 Vegetation

The site was subject to a field survey on August 3rd, by Barnaby Indio Gardner, Assistant Ecologist at Urban Green. The weather conditions were 23°C, partly cloudy (4/8 oktas), wind speed 2 Beaufort scale.

The methods were based on the standard methodology as detailed by The UK Habitat Classification User Manual (Butcher et al, 2020). A UKHab Habitat Plan has been produced to demonstrate habitats within

the proposed development and the surrounding area. The mapping techniques are based on The UK Habitat Classification User Manual (Butcher et al, 2020) guidance.

Flora species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and/or uncommon habitats, were searched for during the survey.

Species abundance is described using the DAFOR scale as shown in Table 2. Percentages are an approximate indication rather than a quantitative measure.

Table 2 – Key to Species Abundance

		Description	Indicative Percentage Ranges
D	Dominant	Covers most of the area	90% or greater
A	Abundant	Very common throughout the area.	50 – 90%
F	Frequent	Common or with many individuals.	20 – 50%
O	Occasional	Occurs in several places but not throughout. Populations are not large.	5 – 20%
R	Rare	Occurs in low numbers in relation to size of area.	Less than 5%
“L” will be used to indicate abundance in a localised area, e.g. LA = Locally abundant			

Any invasive species, including those listed on the revised (April 2010) Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) were noted during the field survey when sighted.

2.2.2 Fauna

A site search for field signs of protected and notable fauna was undertaken, and incidental sightings are detailed. The searches completed were as follows:

- Suitability of any ponds to support notable and protected amphibians, and the suitability of the site’s terrestrial habitats to support amphibians.
- Suitability of the site to support reptiles by way of habitat structure and refuge piles, as well as links to the wider landscape.
- Search of any watercourses for signs or suitability for white clawed-crayfish (*Austropotamobius pallipes*), water vole (*Arvicola amphibius*) and otter (*Lutra lutra*) by way of burrows, resting places, holts, and foraging signs.
- Suitability of the site to support notable bird species. Bird nests and droppings of notable and protected bird species.
- Suitability of the site to support notable invertebrates.
- Search of the site for any invasive species.
- Badger (*Meles meles*) field signs such as setts, mammal, paths, snuffle holes and latrines.
- Suitability of the site to support notable terrestrial mammals including harvest mouse (*Micromys minutus*) and brown hare (*Lepus europaeus*).

2.3 Bat Assessment

2.3.1 Preliminary Roost Assessment

A Preliminary Roost Assessment (PRA) was carried out on the site's trees using close-focussing binoculars.

The PRA methodology is based on information contained within the Bat Conservation Trust (BCT) guidelines, 3rd edition (Collins, 2016). The categorisation within this report is based on that set out in Table 3, which is used as a basis for determining the requirement for further surveys.

Table 3 – Suitability of Trees for Roosting Bats (adapted from Collins, 2016)

Category of Suitability	Typical Characteristics	Further Survey Requirements
High Roost Suitability	A structure/tree with one or more potential roost sites that are obviously suitable for use by 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.	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. Surveys can be undertaken between May and September, with at least two surveys between May and August.
Moderate Roost Suitability	A structure/tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but are unlikely to support a roost of high conservation status.	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey. Surveys can be undertaken between May and September with at least one survey between May and August.
Low Roost Suitability	A structure/tree 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 condition and/or suitable surrounding habitat to be used on a regular basis by larger numbers of bats.	Structures: one emergence/re-entry survey between May and August. Trees: No further survey required but precautionary methods of felling recommended.
Negligible Suitability	Negligible habitat features on site likely to be used by roosting bats.	No further work required.

2.3.2 Commuting and Foraging Bats

The site was assessed for its suitability for use by commuting and foraging bats.

The commuting and foraging assessment methodology is based on information contained within the Bat Conservation Trust guidelines 3rd edition (Collins, 2016). The categorisation within this report is based on that set out in Table 4, which is used as a basis for determining the requirement for further surveys.

Table 4 – Suitability of Site for Foraging and Commuting Bats (adapted from Collins, 2016)

Category of Suitability	Typical Characteristics
High Suitability	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting or foraging bats such as; river valleys, streams, hedgerows, lines of trees or woodland edge. Site is close to or connected to known roosts.
Moderate Suitability	Continuous habitat connected to the wider landscape that could be used by commuting bats such as lines of trees, scrub or linked back gardens. Habitat connected to wider landscape that could be used for bats for foraging such as; trees, scrub, grassland or water.
Low Suitability	Habitat that could be used by small number of commuting bats such as; defunct hedgerow, isolated features not well connected to surrounding habitat or Isolated habitat that could be used by a small number of foraging bats such as a lone tree or patch of scrub.
Negligible Suitability	No features on site suitable for use by commuting and foraging bats.

2.4 Habitat Suitability Index

One pond was located within 250m of the site, ~170m west. The pond is artificial, located within the Knowsley Industrial Park and first appearing in satellite imagery in 2015; considered to be a SUDS pond for the surrounding urban development built at the same time.

Considering this, and the pond's separation from site by extensive hardstanding land - notably a large car park, its access road, and adjoined Perimeter Road – the pond is not thought suitable habitat for newts, nor commuting to site from it feasible. No further natural ponds are located within 250m.

2.5 Constraints to the Survey

Whilst every effort has been made to provide a comprehensive description of the site, no investigation could ensure the complete characterisation and prediction of the natural environment.

This PEA does not constitute a full botanical survey. The protected species assessment provides a view of the likelihood of protected species occurring on the site based on the known distribution of species in the local area and the suitability of the habitat. It should not, however, be taken as providing a full and definitive survey of any protected species group.

Where a lack of records is found during the desk search for a defined geographical area, it does not necessarily mean that there is a lack of ecological interest; the area may be simply under-recorded.

The conclusions and recommendations detailed in this report are based upon the site redline boundary and the development proposals as outlined by the client at the time of writing. Should there be any changes to the site redline boundary or development proposals at a later stage, this assessment should be reviewed to determine whether any amendments or additional survey work is required.

The findings of this report represent the professional opinion of qualified ecologists and do not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited within this document.

2.6 Lifespan of Report

In accordance with CIEEM's Advice Note on the Lifespan of Ecological Reports and Surveys (CIEEM, 2019), the details of this report will remain valid for a period of **18 months** from the date of the survey (i.e. until 3rd February 2025). After this date, this assessment should be reviewed to determine whether any updated surveys are required.

2.7 Definitions

For the purposes of this report, the term 'protected and notable species relates to:

- Species included on Schedules 2 and 4 of *The Conservation of Habitats and Species Regulations 2017*;
- Species included on Schedules 1, 5 and 8 of the *Wildlife and Countryside Act 1981* (as amended), excluding species that are only protected in relation to their sale (see section 9[5] and 13[2]);
- Invasive non-native species included on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended);
- Species of principal importance for the conservation of/maintaining and enhancing biodiversity as required under: Section 41 of the *Natural Environment and Rural Communities Act 2006* (England), Section 7 of the *Environment (Wales) Act 2016*, Section 2[4] of the *Nature Conservation (Scotland) Act 2004*;
- Local species of importance as identified within various local biodiversity action plans; and,
- Badgers, which are protected under the *Protection of Badgers Act 1992*.

3 Baseline Ecological Conditions

3.1 Desk Study

3.1.1 Site Location

The site is located in the rural outskirts of the greater Liverpool built-up area, ~2.2km north of Knowsley. The site is bounded west by Perimeter Road, immediately beyond which lies an extensive retail/industrial estate. Expansive rural land dominates the wider landscape to the north, east, and south of site – mostly agricultural land, and notably Knowsley Park & Safari to the south.

Habitats within the surrounding area comprise a broad suite of grassland variety – marshes, mosses, variable swards – as well as interspersed scrub and woodlands.

3.1.2 Designated Sites

No sites that form part of the National Site Network were located within 5km of the site boundary. One statutory site and one non-statutory designated sites were located within 2km of the site and are detailed within Table 6.

Table 6 – Designated Sites within the Search Areas

Designated Site	Approx. Distance from Site	Details
Statutory designated sites		
Acornfield Plantation LNR, LWS	400m	A 12-hectare woodland, designated for its basin mire habitat and associated abundance of sphagnum mosses, as well as other aquatic habitats and vegetation assemblages.
Non-statutory designated sites		
Charley Wood LWS	10m	A broadleaved woodland on acid peat soil – hosting two local BAP habitats, thirteen locally rare plant species and rare invertebrate interest.

The site also falls within the Knowsley and St Helens Mosslands Nature Improvement Area. Whilst this area does not comprise an official designation, the area has been highlighted by the Merseyside Biobank for “opportunities for ecological mitigation and compensation, habitat management and enhancement”. The area is defined for its grassland, woodland, and wetland priority habitats, as well as populations of pink-footed goose, water vole, red squirrel (*Sciurus vulgaris*), brown hare, and several farmland birds.

3.1.3 Flora and Fauna

The following section summarises protected and/or notable species records that have been recorded within 1km of the site.

Invertebrates

There were 69 records detailing notable invertebrates: alder leaf beetle (*Agelastica alni*), azure damselfly (*Coenagrion puella*), blue-tailed damselfly (*Ischnura elegans*), broad-bodied chaser (*Libellula depressa*), brown hawker (*Aeshna grandis*), common blue damselfly (*Enallagma cyathigerum*), common darter (*Sympetrum striolatum*), common hawker (*Aeshna juncea*), emperor dragonfly (*Anax imperator*), four-

spotted chaser (*Libellula quadrimaculata*), large red damselfly (*Pyrrhosoma nymphula*), migrant hawkler (*Aeshna mixta*), ruddy darter (*Sympetrum sanguineum*), and southern hawkler (*Aeshna cyanea*).

The majority of records were associated with the nearby designated sites, Acornfield Plantation, Charley Wood, and their surrounding habitat. This includes the nearest record, of alder leaf beetle recorded in Spinney Woods, 412m east, in 2022. Species records returned are listed between Section 41 of the Natural Environment and Rural Communities Act (NERC) 2006, the North Merseyside BAP, and are also listed as red-list species by the IUCN.

Vascular Plants

The data search returned seven records of notable vascular plant species: English bluebell (*Hyacinthoides non-scripta*), common cudweed (*Filago vulgaris*), corn spurrey (*Spergula arvensis*), cornflower (*Centaurea cyanus*), and hare's-foot sedge (*Carex lachenalii*). All but bluebell are ICUN red-listed species. Bluebell is listed on the Wildlife and Countryside Act 1981, as well as a priority species on the North Merseyside BAP. The closest, common cudweed was recorded 192m west, in Charley Wood.

Amphibians

Thirteen records of great crested newt (*Triturus cristatus*) were recorded within 1km of the site, all but two within Acornfield Plantation, ~400m southwest of site; the most recent of these was from 2018. Great crested newts a European Protected Species, and are domestically protected under the NERC S41 2006, the Habitat Regulations 2017, the Wildlife and Countryside Act 1981, as well as a priority species on the North Merseyside BAP. A MagicMap search returned no granted EPSL relating to great crested newts present within 1km of the site.

Birds

A total of 43 records of protected or notable birds were returned within 1km of the site as detailed in Table 7.

Table 7 – Protected or notable birds recorded within 1km

Scientific Name	Common Name	Protection	Closest Record to Site	
			Approx. Min. Distance (m)	Date
<i>Branta leucopsis</i>	Barnacle Goose	BoCC5**	Within 2km	2008
<i>Emberiza calandra</i>	Corn Bunting	BoCC5*, S41****	Within 2km	2006
<i>Numenius arquata</i>	Curlew	BoCC5*, S41****	Within 2km	2003
<i>Perdix perdix</i>	Grey Partridge	BoCC5*, S41****	Within 2km	2008
<i>Vanellus vanellus</i>	Lapwing	BoCC5*, S41****	Within 2km	2006
<i>Dendrocopos minor</i>	Lesser Spotted Woodpecker	BoCC5*, S41****	Within 2km	2003
<i>Athene noctua</i>	Little Owl	Bern2	Within 2km	2008
<i>Anas platyrhynchos</i>	Mallard	BoCC5**	Within 2km	2008
<i>Anser brachyrhynchus</i>	Pink-footed Goose	BoCC5**	Within Main Roost*****	2019***** *
<i>Alauda arvensis</i>	Skylark	BoCC5*, S41****	Within 2km	2006

Scientific Name	Common Name	Protection	Closest Record to Site	
			Approx. Min. Distance (m)	Date
<i>Muscicapa striata</i>	Spotted Flycatcher	BoCC5*, S41****	Within 2km	2004
<i>Passer montanus</i>	Tree Sparrow	BoCC5*, S41****	Within 2km	2005
<i>Poecile montana</i>	Willow Tit	BoCC5*, S41****	Within 2km	2004
<i>Scolopax rusticola</i>	Woodcock	BoCC5*	Within 2km	2004
<i>Motacilla flava</i>	Yellow Wagtail	BoCC5*, S41****	Within 2km	2005
<i>Emberiza citrinella</i>	Yellowhammer	BoCC5*, S41****	Within 2km	2006

* Red list of BoCC5 (2021)

** Amber list of BoCC5 (2021)

*** Black list BoCC5 (2021)

**** Section 41 of the NERC Act (2006)

***** Schedule 1 of the WCA (1981)

Whilst no formal records of pink-footed goose were returned within 1km in the past 20 years, an extensive area immediately north of the site was in 2019 locally designated by Lancashire County Council as a main roost for pink-footed goose, with notice that the species may overwinter over a wide area within and adjacent to the roost area, including on-site.

Bats

Forty-six records of bats were returned during the data search, including multiple records of unidentified bat species (*Chiroptera* spp). Species included mostly common pipistrelle (*Pipistrellus pipistrellus*), as well as myotis species, noctule (*Nyctalus noctula*), and soprano pipistrelle (*Pipistrellus pygmaeus*) bats. The closest record was that of a common pipistrelle present approximately 100m west of the site in 2009. All species of bat returned are European & nationally protected species, listed on Section 41 of the NERC Act 2006, the WCA 1981, the Habitat Regulations 2017, as well as priority species on the North Merseyside BAP. There were no granted EPSL within 1km of the site, per consultation with MAGIC.

Mammals

Five records of hedgehog (*Erinaceus europaeus*) were returned with 1km of the site, the nearest just 50m west of the site in 2021. Hedgehogs are listed on Section 41 of the NERC Act (2006) and are a Priority Species on the North Merseyside BAP.

Six records of brown hare were returned, all but one recorded within 1km, along Old Coach Road. Brown hare are listed on Section 41 of the NERC Act (2006) and are a Priority Species on the North Merseyside BAP.

Two records of red squirrel were returned, also along Old Coach Road, to within 1km. The most recent sighting was in 2016.

There were five records of water vole returned, three of which were close by, within Acornfield Plantation, 560m southwest in 2021. Water voles are protected under the Wildlife and Countryside Act 1981, the NERC S41 2006, as well as priority species on the North Merseyside BAP.

Invasive Non-native Species

Fauna

Seventeen records of WCA Schedule 9 grey squirrel (*Sciurus carolinensis*) were returned, most recently in Acornfield Plantation in 2015. An extensive area encompassing the site is locally designated as a grey squirrel control zone by the Merseyside Biobank.

Flora

Fifty-four records of invasive non-native plant species were returned within 1km of the site, comprising water fern (*Azolla filiculoides*), Canadian waterweed (*Elodea canadensis*), Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*), *rhododendron ponticum*, and three-cornered garlic (*Allium triquetrum*). The closest record to the site was attributed to Himalayan balsam, located approximately 200m west of the site in 2009.

No Records Returned

The data search returned no records for:

- Badger
- Hazel dormice (*Muscardinus avellanarius*)
- Reptiles
- Otter

3.2 Field Survey

The site habitats and accompanying Target Notes are presented in the UKHab Habitat Map in Appendix 2.

Secondary codes are added to confirm the identity of a habitat (when necessary), and also to provide information on management and the environment relating to that habitat parcel. The number and type of secondary codes added to a primary habitat will vary depending on the habitats present. There is no limit to the number of secondary codes that can be used for a single parcel. More details regarding the secondary codes used can be found in Appendix 2.

3.2.1 Modified Grassland (G4 10 14 101 128 504)

The majority of site was defined by a good-quality ecological niche of modified grassland. The land featured peaty soils and marshy ground with an abundance of extensive puddles and bogs with accordingly wetland vegetation indicative of human disturbance. Whilst species present indicated human disturbance or cultivation, the land was evidently left relatively unmanaged or infrequently managed – with hay carts and bales suggesting livestock grazing in the wider area. The land featured a diverse, structurally complex sward with interspersed aquatic and scattered rock microenvironments.



Photograph 1 – Wet modified grassland comprising much of the centre of the site



Photograph 2 – Wet modified grassland comprising much of the centre of the site

3.2.2 Mixed Scrub (h3h)

Dense scrub habitat lined the banks of the ditch bordering the south of site. The scrub showed negligible management and was densely packed, tall growing, with a variable sward height throughout. The habitat hosted two invasive non-native species: Japanese knotweed and Himalayan balsam (Target Notes 1, 2).



Photograph 3 – Dense scrub lining a border ditch

3.3 Site Suitability for Protected and Notable Species

3.3.1 Species Discounted from Assessment

Hazel dormouse mainly occur in southern counties, especially in Devon, Somerset, Sussex and Kent. There are few recorded localities north of the Midlands, though they are present in parts of the Lake District and in scattered Welsh localities (Matthews *et al.*, 2018). The species are not generally known to be present within the area (Wembridge *et al.*, 2016). The habitats on site are of limited value due to limited areas of extensive woodland and scrub. As such, the species are reasonably discounted from site.

3.3.2 Vascular Plants

The site is composed of a large area of relatively unmanaged grassland. The land is known to feature peaty soils and abundant mosses, indicating a rich nutrient base for potentially rare and notable flora. Nonetheless, much of the flora assemblage composition of site is indicative of human disturbance, across

all its microhabitats, and such species are densely spread. Furthermore, no notable species were found during the survey.

Recruitment of notable species in future is possible but may require long timescales, and as such the potential of such species on site is considered negligible.

3.3.3 Invertebrates

The site featured an abundance of floristic species and aquatic habitats, and its adjacent woodlands feature deadwood, shelter, and cover. The site's grassland also features areas of dense grasses, marsh, rocky outcrops, and bare ground – altogether a diversity of microhabitats suitable for invertebrate lifecycles, and foraging resources. Several common butterfly species were observed during the survey, and the data search returned abundant records of several locally designated species in the nearby Charley Wood, and Acornfield Plantation – sites designated in part for their invertebrate assemblages. These sites are separated from site by Perimeter Road, a busy dispersal barrier.

The site's habitats are likely to support an abundance of common invertebrates, dominantly common soil species, though given the proximity of designated sites with abundant records of notable invertebrate assemblages, their presence on-site is considered low potential.

3.3.4 White-Clawed Crayfish

The site's main aquatic habitats are bog puddles and ponds, without the rocky substrates, flows, or hydrology connections to support the species. The bordering ditch features minor flowing water, but is small and does not feature rocks or pebbles, and no records of the species were returned in the wider area.

White-clawed crayfish are reasonably discounted from site.

3.3.5 Amphibians

One pond was located within 250m of the site, ~170m west. The pond is artificial, located within the Knowsley Industrial Park and first appearing in satellite imagery in 2015, considered to be a SUDS pond for the surrounding urban development built at the same time. Considering this, and the pond's separation from site by extensive hardstanding land - notably a large car park, its access road, and adjoined Perimeter Road – the pond is not thought suitable for newts, nor commuting to site feasible. No further natural ponds are within 250m. As great crested newts' upper dispersal limit is generally considered to be up to 250m from a waterbody (though occurrence of greater distances does exist), great crested newts are not anticipated to breed or reside on site (English Nature, 2001). There were however, found to be records of natural ponds across similar habitat in the 500m-1km range of site, and the mossy, peaty wetland habitat may feature several temporary waterbodies throughout the year.

The site comprised a mosaic of unmanaged and notably wetland / aquatic habitats which may provide suitable foraging resources and cover for amphibians, and records of great crested newts were returned in the nearby Acornfield plantation. Perimeter Road, between the sites, is expected to be a major dispersal barrier for newts, though more suitable habitat may occur in the wider rural, commutable area east of site, though no records of newts nor licenses were returned for that area.

The presence of great crested newts within the site is considered low, though common amphibians may occur on site. Precautionary working methods for great crested newts and for common amphibians should be nonetheless undertaken on site.

3.3.6 Reptiles

The site was found to provide suitability for reptiles. The majority of site was composed of a relatively unmanaged grassland, with notable variability in sward heights and densities, with stands of mixed scrub cover as well as hosting scattered rocky outcrops for basking. Together, these features define a mosaic of suitable ecotones between habitats, and basking resources. The habitat's grassland, aquatic features, and adjacent woodlands are also suitable for a range of reptile prey and provision of shelter. Whilst the habitat type was highly suitable, there were, however, no records returned for the species group within 1km, at any point in time.

The site features low potential to support reptile species.

3.3.7 Birds

Ground Nesting

The site's unmanaged mosaic of variable grassland swards, as well as abundant aquatic and rocky features, provide good suitability for ground-nesting species; for nest-building, foraging, and shelter resources. The site's peaty and marshy soils are likely to host a great abundance of accessible invertebrate prey, such as earthworm species. Furthermore, a group of lapwing – a ground-nesting species – were observed in flight over the site during the survey, and the data search returned records for lapwing, skylark, and rare curlew.

Passerine

Comprised mostly of low-lying grassland, the site offers lesser opportunities for perching birds, limited to rocky outcrops, standalone trees, and the smaller scrub and woodland habitats present on site. Within the context of site, these features may offer suitable foraging opportunities to make use of the abundance of invertebrates associated with aquatic habitats and marshy, peaty soils. Directly adjacent woodlands and nearby designated sites are confirmed to host a great abundance of nesting passerines, however, so their presence on site may be expected. The site may form an important foraging resource for locally nesting passerine birds, though such species are unlikely to nest within site itself.

Wintering

The site is confirmed to offer suitable habitat for overwintering birds. The site's unmanaged grass swards offer suitable cover for birds and their nests, and the extent of marshy, peaty soils is likely to provide an abundance of accessible invertebrate prey such as earthworm species that may support an overwintering population. The site lies directly adjacent to an officially designated main roost for host pink-footed geese populations, with relevant documentation highlighting the area surrounding the roost as potential nesting habitat. Records were also returned for barnacle goose, a migrant species known only to overwinter within the region.

The site was confirmed to provide value for overwintering birds.

Birds of prey

The site's habitats and the wider area are likely to host a range of amphibian, small mammal, and bird prey species, and records of little owl were returned for the area. It is also likely that common birds of prey such as buzzard would make use of the site.

3.3.8 Bats

Preliminary Roost Assessment

A PRA was completed on all trees located on site and adjacent. No features were found that have the ability to support roosting bats on site, or in the adjacent woodlands.

Commuting and Foraging Bats

The habitats on site are anticipated to provide value for foraging bats due to unmanaged linear and aquatic features, and their proximity to nearby designated sites confirmed to host a variety of bat species, though such records may be expected to remain within such designated sites. The site's aquatic features, bordering ditches and woodland may provide suitable commuting from around the wider environment. The habitats on site appear to be generally common within the wider area to the east.

The site has negligible potential to support roosting bats, whilst the unmanaged habitats may provide low foraging and commuting value.

3.3.9 Hedgehog

The dense grassland and scrub habitats will provide suitable cover and foraging habitats for the species.

Hedgehogs are potentially present within the site.

3.3.10 Red Squirrel

The site's low, wet grassland is unlikely to offer much suitability for the species, though adjacent woodlands and nearby designated sites are known to, with records returned within 1km east of the site as recently as 2016. The squirrel may well commute and forage temporarily across site. Furthermore, the site falls within a grey squirrel control area, and protection of the species is locally paramount.

Red squirrel may be occasionally present on site.

3.3.11 Water Vole

The site's unmanaged, aquatic habitat may offer suitable habitat for foraging, though the site's lack of a stream or raised bank substrates would limit burrow-building potential. The site runs by a more suitable narrow ditch, though the habitat was bordered by dense scrub and abundant Himalayan balsam, with only shallow and seasonally variable water – limiting foraging potential. The ditch does, however, hydrologically link with a network of other small watercourses in the area, and records were returned for the species in the nearby Acornfield Plantation; a commute over Perimeter Road is not infeasible. More distant records were returned for Knowsley Brook to the south, separated from site by greater distance though lesser, farm road dispersal barriers.

The potential presence of water voles on-site is considered a moderate possibility.

3.3.12 Badger

No signs of badger presence were found during the survey, though the site was assessed as suitable for several types of badger prey, and the raised and variable topography of the wider grassland beyond the site is suitable habitat for sett-building. Badgers can be highly mobile and opportunistic with sett-building, and whilst no signs were found, the site's suitability means their presence cannot be ruled out.

The wider landscape was assessed as having suitability for the species based on the areas of woodland which connect the site to the wider area. The site provides potential sett-building opportunities within adjacent woodlands and grassland, whilst fruiting trees will provide suitable foraging resources. There were, however, no records returned for badger within 1km of site.

Badger may be occasionally present on site.

3.4 Invasive Species

3.4.1 Fauna

The site's wet grassland is sub-optimal habitat for the grey squirrel - listed under Schedule 9 of the *Wildlife and Countryside Act 1981* - though adjacent woodlands are highly suitable and so occasional presence on site may be expected. Grey squirrel is known to be abundant in the local area, with several records returned within 1km all throughout the wider landscape. The site falls within a locally designated grey squirrel control area, and limiting its presence is paramount for the local area.

3.4.2 Flora

Himalayan balsam and Japanese knotweed were present on the site during the field survey (TN1, 2). These species are listed under Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) as invasive non-native species.

4 Ecological Constraints and Recommended Mitigation

4.1 Proposed Development

Balance Power Ltd are proposing to develop land off Perimeter Road in Knowsley (hereafter referred to as 'the site'). The proposals include the development of a battery storage site, with power grid infrastructure and associated hard landscaping.

4.2 Designated Sites

The nearby Acornfield Plantation is locally designated and explicitly highlighted in the North Merseyside Biodiversity Action Plan as a priority habitat – one of just two actively growing lowland raised bogs remaining in the county, a habitat noted for its irreplaceable record of plant and animal remains. The proposed developments may impact the area. Protection of the habitat is of county importance and must be considered in the proposals.

Therefore, it is recommended that a detailed Construction and Environment Management Plan (CEMP) specific to the proposed development is created (and adhered to throughout the course of construction works) to avoid, minimise and mitigate for negative impacts resulting from construction practices on all habitats surrounding the site.

This plan will detail measures to avoid, minimise or mitigate any potential negative effects caused by construction practices on the environment on and surrounding the site including:

- The control of run-off from areas of arisings to prevent any pollutants/contaminants entering nearby waterbodies.
- Appropriate measures to suppress dust during hot, dry and/or windy conditions.
- Excavations should be sealed overnight or should have at least one shallow-sloping side to allow any animals that may fall in to escape.
- An ecologist should be contacted for advice should any protected species be discovered during construction.

4.3 Habitats

The site comprised habitats that were found to be widespread within the local area – surveyed as modified grassland under UKHAB, and with habitat survey records returned classifying the land as semi-improved neutral grassland under JNCC Phase 1 methodology. However, the land did contain value for wildlife such as invertebrates, birds, and various terrestrial mammals. The site falls within the locally defined Knowsley and St Helens Mosslands Nature Improvement Area – land under locally high strategic significance. Comprehensive efforts should be made to improve the quality of habitats left undeveloped under the proposals, with specific focus towards the habitat types highlighted by the Merseyside Biobank:

4.3.1 Modified Grassland

Whilst the grassland's vegetation assemblages were indicatively influenced by human disturbance or cultivation, the habitats host areas of bog, peaty soils, and sphagnum mosses rare in the wider landscape. Best efforts should be taken to protect and manage land left undisturbed by the proposals, to be detailed by the recommended CEMP. The LCR Ecological Network highlights the potential to re-wet grasslands, which may improve the ecological condition of undisturbed land.

4.4 Fauna

4.4.1 Amphibians

Great crested newts were deemed unlikely to be present on site, though may be occasionally present; there is also a possibility that common amphibians such as common toad may be present on site.

It is recommended that Reasonable Avoidance Measures are to be followed during site clearance. All site contractors are to be inducted to the potential presence of the species. Any debris is to be cleared by hand, and any common amphibians located moved carefully, by hand, to outside of the development area. Should great crested newts be found, a suitably qualified ecologist should be alerted.

4.4.2 Reptiles

The site's habitat was deemed highly suitable for reptiles, featuring an extensive abundance of habitats for foraging, commuting, hunting, basking, and for cover. There was, however, a total lack of records returned for reptiles, though a lack of records does not prove absence. A review of satellite imagery highlights that the wider area surrounding the site has not seen any meaningful development since at least 1985, and it is reasonable to assume the land has not been subject to surveys despite its suitability. Reptiles have been identified as potentially being present on site and as such further surveys should be conducted to confirm presence or likely absence.

Construction activities should also consider the potential presence of the species by adhering to the following Reasonable Avoidance Measures (RAMs):

- An Ecological Clerk of Works (ECoW) will be appointed and available as and when required throughout the construction period.
- Any vegetation works including the removal of taller vegetation (above 15cm) and other vegetation along woodland edges will be undertaken using hand tools (e.g. hand held strimmer), under the supervision of the ECoW. This will encourage animals to vacate the area temporarily. Cut material should be removed immediately from the working area.

4.4.3 Birds

The site features suitable habitat for ground nesting. Due to the small scale and development footprint of the proposals, however, the area of suitable habitat is not assessed to be important for local populations, and loss of such habitat is assessed to be insignificant; a far greater area of suitable habitat in the blue-line boundary to be retained, and 0.3ha within the red line is to be enhanced. No significant impact to ground-nesting breeding birds is then anticipated, though habitat clearance should avoid the breeding bird season.

Vegetation removal, including grassland, should be undertaken outside of the breeding bird season (March to September, inclusive). If this is not possible, a suitably experienced ecologist should check the habitat for breeding bird activity no more than 48 hours before clearance. If nesting activity is found, nests must be left in situ until the young have fledged.

Any loss of foraging and nesting habitat caused by the development should be compensated for in the final plans of the proposed development. This could include bird nest boxes that target local species and suitable planting that can provide foraging and nesting opportunities for local species. Landscape designs for this site should include plants of value to bird species, including fruiting and seeding producing plants, to compensate for the loss of potential nesting habitats.

Due to the site's grasslands, it is not expected the site will not support any notable passerine breeding bird assemblages. There is, however, potential for overwintering birds on site, for which surveys are recommended.

4.4.4 Bats

Foraging and Commuting Bats

The site was assessed as being of low value to commuting and foraging bats. It is recommended that the landscape designs for this site contain a mix of native plant species and those known to be of value to native invertebrate species, providing additional value to local bat populations as a foraging resource.

Slow-flying species such as *Myotis* species, which are known to be in the local area, are sensitive to lighting; given the nature of the developments bordering woodlands, it is expected that the woodlands and bats within will be exposed to high lighting disturbance. Given these bats likely emerge from local designated sites, and contribute to their designation, the magnitude of this disturbance should be gauged by foraging and commuting bat surveys.

The site should also precautionarily consider lighting mitigation efforts. Lighting mitigation should follow the guidance outlined in the Institute for Lighting Engineers document "Guidance for the Reduction of Obtrusive Lighting" (2005) and BCT's "Bats and Artificial Lighting in the UK" (2018).

Construction lighting should not be directed towards retained and surrounding habitats including the broadleaved woodland and grassland. The construction lighting may impact bats which are sensitive to light. Directional lighting will be achieved by angle and orientation of beam, use of a cowl, louvre or other light shield, or a combination of these.

An External Lighting Scheme had not been produced on the writing of this report. As such, the following recommendations are to be considered within the scheme during its condition, to minimise impacts of lighting. The recommendations are as follows:

- Keep site lighting to minimum levels.
- Luminaries should lack UV elements and preferably LED lighting with a warm white light should be used over cool white light (ideally <2700Kelvin).
- Lighting should feature peak wavelengths greater than 550nm.
- Internal lighting should be positioned away from windows to minimise light spill, where appropriate.
- Light placement should be downward facing to prevent excess horizontal or vertical light spill.
- The use of integrated fittings such as cowls, shields, louvres, and hoods, that effectively contain light spill from unintended areas, where appropriate.
- The use of hard landscaping features to block light and create dark corridors.
- Avoid illuminating any suitable retained bat habitats, particularly the adjacent woodlands and rural trees that are potential commuting and foraging habitat for bats.
- Use of timed security lights should be set on motion-sensors and using short, 1-minute timers, to minimise light use, where appropriate.

- Column heights of lighting can be considered to minimise light spill.

4.4.5 Hedgehog

Hedgehog may be present on site, as such checks for hedgehogs should be carried out prior to grassland and hedgerow removal to avoid harming this species during works.

4.4.6 Red Squirrel

Although no evidence was found of red squirrels using the site during the field survey, they are reasonably likely to be present within the adjacent woodlands, intermittently throughout the year. It may be possible that red squirrel may use the adjacent habitats for foraging and constructing dreys. An inspection for red squirrel dreys should be completed no more than 48 hours prior to the felling of scattered trees (if require removal) to confirm continued absence of this species.

Furthermore, should felling be necessary, trees that are to be removed must be felled outside the red squirrel breeding season (February to September, inclusive which also considers nesting bird season) to minimise the impact to red squirrel (SNH, 2020).

4.4.7 Water Vole

Though deemed low potential, water vole may use the aquatic habitats on site for commuting and foraging purposes. The species are sensitive to disturbance and if found to use the vegetation present beside aquatic habitats, then it may be necessary to obtain a licence from Natural England before works can proceed. The following Reasonable Avoidance Measures should be followed throughout the construction phase:

- All site personnel are to be inducted through use of a toolbox talk on the presence of water vole, their legal protection and working limits.
- Regular inspections of the water and its banks for signs of water vole burrows or activity. These should be undertaken by an ecologist at regular intervals during the construction of the site.
- Any man-made excavations, trenches or pits relating to the development that must remain open overnight, will either be securely fenced off or covered up overnight to avoid entrapment of water vole, if left open, access ramps (e.g., mammal ladders, a roughened plank or even a ramp of earth) will be placed within the excavation each night near to crossing points to allow any animals that accidentally fall into the excavation a means of climbing out.
- Any temporarily exposed open pipe system will be capped in such a way as to prevent water vole gaining access, as this may happen when contractors are off-site.
- A 10m buffer zone should be maintained around the pond to limit impacts to its habitat.
- Nocturnal lighting should be directed away from the pond and stream.
- If in the unlikely chance a water vole is discovered on site, the project ecologist is to be contact immediately and Natural England are to be informed.

4.4.8 Badgers

The following Precautionary Working Methods will be adhered to during construction phase to ensure that no badgers are impacted by the proposed development:

- All site operatives will be inducted to the potential presence of the species and the species legal protection.
- All site operatives will be inducted as to identifying potential badger setts and should be vigilant if they suspect they locate a new sett during works and inform the site manager immediately. A minimum 30m buffer will be maintained from the potential sett until an ecologist has been to site.
- All excavations will be battened at a 45-degree angle or ramps to be positioned to allow escape should animals become trapped.
- All site machinery and materials will be appropriately stored to avoid harm to the species, notably between July and November each year when extra care is needed to avoid potential impacts on pregnant females.

4.5 Invasive Species

Non-native invasive flora species Himalayan Balsam and Japanese knotweed were identified during the site walkover. As such, it is recommended, prior to the development, that an invasive species specialist should be contracted to map the extent of invasive species present within the site and produce a detailed management plan for the removal and eradication of such species onsite.

5 Further Surveys

5.1 Reptiles

The surveys will follow the standard guidance as detailed within the Herpetofauna Workers' Manual (Gent & Gibson, 2003) and relevant reptile survey guidance (Froglife, 1999; Sewell et al., 2013).

Artificial refugia should be placed within suitable habitat on site and left to “bed down” for at least 20 days before the first survey. The recommended minimum number of surveys is seven visits. Each session should be planned to take less than 2 hours. A suggested pattern is:

- Visit 1 – 2: Mid-March – early April
- Visit 3 – 4: April – May
- Visit 5 – 6: Late May – end June
- Visit 7: Late August – Late September

Surveys should aim to incorporate both walkabout searches and refugia searches. Walking a predetermined route slowly and looking for evidence of reptiles basking in the sunlight or under refugia. Surveys should take place between 8:30am – 11:00am and/or 4:00pm – 6:30pm in optimal weather conditions of 9-20°C, bright sunshine. Surveys should not be conducted in rainy or windy weather.

5.2 Foraging and Commuting Bats

As the site was broadly assessed as having low potential for commuting and foraging bats, and significant disturbance expected, further surveys in the form of dusk and/or dawn transects are recommended to confirm the activity and usage of site's features by bats. The surveys would involve a route covering site walked by two qualified surveyors at either sunset or sunrise, for a specified amount of time. The surveys should be completed thrice, seasonally, and supplemented by the deployment of static bat detectors on each occasion, between May – September (inclusive). This would include one survey occasion within each calendar season (Spring – Autumn).

5.3 Wintering Birds

The site has been identified to be of value to breeding birds through a mosaic of habitats. Therefore, further surveys should be conducted on site.

The site has been confirmed to provide suitable habitat for overwintering birds, namely pink-footed goose, therefore it is recommended that winter bird surveys are to be completed at the site. Three surveys (once per month) should be conducted between January and March. The surveys will entail a watch over the site to ascertain if the site holds roosting waders and geese, which would be impacted by construction, thus depleting the birds' energy reserves.

5.4 Water Vole

The site's hydrological connectivity to the wider area - featuring water vole records - was deemed suitable for the potential to support water vole. Two surveys need to be undertaken, and will involve a direct hand search for burrows, feeding signs, pathways, latrines, footprints etc. in accordance with the current survey guidance (Dean et al. 2016). The first survey must be carried out between April and June and the second between July to September, with at least 2 months between the two surveys. The survey should aim to

encompass 500m both upstream and downstream of the site where possible. If evidence of water vole is found, then a camera trap should be deployed within suitable habitat to monitor the use by water vole.

The results will then be used to confirm presence/absence and inform mitigation measures, necessary to minimise impact on these species, if present.

Please note that a licence cannot be issued for the specific purpose of development, and rather Natural England will only consider issuing a licence in relation to a development proposal if the licensed action is going to provide a positive conservation benefit for water voles. This is extremely hard to achieve and therefore, it is strongly advised that a 10m no works buffer is implemented on site to reduce the need for any licensing.

6 Opportunities for Enhancement

The National Planning Policy Framework (NPPF) (2021) highlights the requirement for planning policies and decisions to conserve and enhance the natural environment.

Paragraph 174 states that this should be achieved by (in terms of this assessment only):

- a) *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- d) *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*

The Liverpool City Region Ecological Network highlights the opportunities for habitat management, creation, and enhancement of the Knowsley and St Helen's Mosslands, within which the site lies. The Merseyside Ecological Advisory Service (MEAS) may be contacted for guidance in doing so.

Documentation for the land states that:

“Ecological priorities are:

Habitat creation;

- *Wetlands, specifically lowland bog and fen on areas that contain degraded/drained peat; and;*
- *Wet grassland and wet woodland.”*

Specific enhancement recommendations for the site include the following:

- Remaining, undisturbed grassland within the blue-line lease could be re-wetted to create wet grasslands and to create small habitats where pooling naturally occurs, to the benefit of lapwing, curlew, grey partridge, and meadow pipits.
- Bat and bird boxes could be placed on the new buildings / retained trees. A plan to show the locations of these boxes and the specifications should be produced by a suitably qualified ecologist once the layout is finalised.
- An ecologically sensitive planting scheme could be incorporated on the site to promote invertebrate use of the site, which could benefit local bat and bird species.

7 Conclusion

The PEA has met the objectives of the report, by demonstrating the following:

- The major habitats identified on site included wet modified grassland and mixed scrub and are detailed in Section 3.
- Potential ecological constraints identified included the presence of reptiles, ground nesting and overwintering birds, as well as small mammals, and great crested newts, and are detailed in Section 4.
- Mitigation recommendations to be completed prior and during the construction phase for badgers, small mammals including red squirrel, great crested newts and common amphibians, breeding birds, and habitat management, and have been detailed in Section 4.
- Further reptile, bat, water vole, and winter bird surveys are required to determine presence or absence and inform relevant mitigation requirements, detailed in Section 5.
- General ecological enhancements and opportunities associated with the Knowsley and St Helens Mosslands are listed within Section 6.

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Appendix 1 – Relevant Legislation

Legislation relating to European Protected Species (e.g. bats, otter, great crested newt)

European Protected Species and their resting places (e.g. bat roosts) are protected under the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way (CROW) Act 2000, and the Conservation of Habitats and Species Regulations 2017.

The Conservation of Habitats and Species Regulations 2017 transpose the European Union's 'Habitats Directive' (Council Directive 92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora (EC Habitats Directive) into UK law. The Regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species' (EPS), and the adaptation of planning and other controls for the protection of European Sites. EPS are listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2017.

Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to:

- Intentionally kill, injure or take certain animals listed in Schedule 5;
- Intentionally or recklessly damage or destroy any structure or place which any wild animal specified in Schedule 5 uses for shelter or protection;
- Intentionally or recklessly disturb any such animal while it is occupying a structure or place which it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any structure or place which any such animal uses for shelter or protection.

In addition, under this legislation there are offences relating to sale, possession and control of wild animals listed in Schedule 5.

- Under the Conservation of Habitats and Species Regulations 2017 it is an offence to:
- Deliberately capture, injure or kill any wild animal listed as a European Protected Species;
- Deliberately disturb wild animals of any such species in such a way as to be likely:
- to impair their ability:
 - to survive, to breed or reproduce, or to rear or nurture their young, or;
 - in the case of animals of a hibernating or migratory species, to hibernate or migrate, or;
- to affect significantly the local distribution or abundance of the species to which they belong.
- Deliberately take or destroy the eggs of such an animal, or;
- Damage or destroy a breeding site or resting place of such an animal.

In addition, under this legislation there are offences relating to possession, control sale and exchange of an EPS.

Great crested newt, otter and several species of bat are listed as a SoPI under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Legislation for amphibians (other than great crested newt)

Under the Wildlife and Countryside Act 1981 (as amended) the four widespread amphibian species, smooth newt (*Triturus vulgaris*), palmate newt (*Triturus helveticus*), common toad (*Bufo bufo*) and common frog (*Rana temporaria*) receive limited protection through section 9(5) only which makes selling, offering for sale, possessing or transporting for the purpose of sale (live or dead animal, part or derivative) an offence.

Common toad is listed as a SoPI under Section 41 of the NERC Act 2006.

Legislation relating to reptiles

All native reptile species have some degree of protection in the UK, through section 9(1) and (5) (specified in Schedule 5) of the Wildlife and Countryside Act 1981 (as amended). There are two different levels of protection afforded to reptiles through this legislation according to species and this is described in more detail below.

Full Protection

Sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*) are afforded protection under The Conservation of Habitats and Species Regulations 2010 (are species of European importance) and are fully protected under the Wildlife and Countryside Act 1981 (as amended) and the CRow Act (2000). The Conservation of Habitats and Species Regulations 2010 implements the European Union's 'Habitats Directive' (Council Directive 92/43/EEC (a) on the Conservation of Natural Habitats and of Wild Fauna and Flora) in Great Britain. The relevant sections of this legislation make it an offence to:

- Intentionally kill, injure or capture or take a reptile;
- Possess or control (live or dead animal, part or derivative);
- Deliberately (intentionally) or recklessly damage, destroy or obstruct access to a breeding site or any structure or place used for shelter or protection by a reptile;
- Disturb whilst the reptile is occupying such a structure or place; and
- Sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative).

Sand lizard and smooth snake are listed as a SoPI under Section 41 of the NERC Act 2006.

Protection against killing, injuring and trade

This level of protection under section 9 (parts 1 and 5) applies to the four widespread species of reptile, namely the common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*), grass snake (*Natrix natrix*) and adder (*Viper berus*). Only part of sub-section 9(1) applies, which make it an offence to:

- Intentionally kill or injure, and
- Sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative).

Grass snake, slow-worm and adder are all listed as SoPI under Section 41 of the NERC Act 2006.

Legislation relating to breeding birds

All birds, their nests and eggs are protected by the Wildlife and Countryside Act 1981 (as amended) and it is an offence, with certain exceptions, to:

- Intentionally kill, injure or take any wild bird;
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built;
- Intentionally take or destroy the egg of any wild bird; and
- Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building or is in, on or near a nest with eggs or young; or disturb the dependent young of such a bird.

Schedule 1 of the Wildlife and Countryside Act 1981 provides further protection for selected species (including peregrine falcon (*Falco peregrinus*), barn owl (*Tyto alba*), little ringed plover (*Charadrius dubius*) and black redstart (*Phoenicurus ochruros*) during the breeding season. If any person intentionally or recklessly disturbs any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or disturb dependent young of such a bird. That person shall be guilty of an offence.

A number of bird species are listed as SoPI under Section 41 of the NERC Act 2006.

Conservation status - Birds of Conservation Concern (Eaton et al. 2015)

The UK's leading bird conservation organisations have worked together on the third quantitative review of the status of the birds that occur regularly in the UK, updating the last review in 2011. The status of birds within the UK have been regularly monitored through a series of surveys, including the national Breeding Bird Survey, Common Bird Census, sea bird monitoring programs and wetland monitoring programs. The result of this review and continued monitoring is The Population Status of Birds in the UK, Birds of Conservation Concern 4: 2015.

Birds are assessed against criteria to place each species on one of three alert lists, red, amber or green. Red list species are considered to be of high conservation concern, being either globally threatened, having historical UK population declines, having a rapid population decline or breeding range contraction of 50% or more in the last 25 years.

Amber list species are considered to be of medium conservation concern as they meet one or more of the following criteria (but none of the red list criteria): Red listed for historical decline in a previous review but with substantial recent recovery (more than doubled in the last 25 years), a UK breeding range contraction of between 25% and 49%, a reduction of breeding or non-breeding population of 25-49% in the last 25 years, a 5-year mean of 1-300 breeding pairs in the UK, an unfavourable European conservation status, at least 50% of the UK breeding population found in 10 or fewer sites, or where the breeding population in the UK represents 20% or more of the European breeding populations.

Green list species are considered to be of low conservation concern. They include all regularly occurring species that do not qualify under any of the red or amber criteria are green listed. The green list also includes those species listed as recovering from Historical Decline in the last review that have continued to recover and do not qualify under any of the other criteria.

Legislation relating to badger

Badgers are protected under the Protection of Badgers Act 1992 (as amended) which makes it an offence to:

- wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so;

- intentionally or recklessly damage, destroy or obstruct access to a badger sett; and
- disturb a badger when it is occupying a sett.

These provisions have implications for construction or preparation works undertaken in the vicinity of an active sett and may be confounded by distance from the sett entrance. Any works resulting in ground penetration, vibration or noise near an identified badger sett entrance/s have the potential to disturb badgers and advice should be sought from a suitably experienced ecologist under such circumstances. If disturbance to an active sett is probable, then a licence may need to be obtained from Natural England before any works commence.

Legislation relating to water vole

The water vole is fully protected under Section 9 of the Wildlife & Countryside Act 1981 (as amended) through its inclusion in Schedule 5. The legal protection makes it an offence to:

- Intentionally kill, injure or capture or take a water vole;
- Possess or control (live or dead animal, part or derivative);
- Deliberately (intentionally) or recklessly damage, destroy or obstruct access to a breeding site or any structure or place used for shelter or protection by a water vole;
- Deliberately (intentionally) or recklessly disturb a water vole whilst occupying such as structure or place, and
- Sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative).

Water vole is listed as a SoPI under Section 41 of the NERC Act 2006.

Legislation relating to invasive plant species

Several non-native invasive plant species such as Himalayan balsam, giant hogweed (*Heracleum mantegazzianum*), Japanese rose (*Rosa rugosa*), variegated yellow archangel (*Lamium galeobdolon*), rhododendron and Japanese knotweed are listed under Schedule 9 of the Wildlife and Countryside Act, 1981 (as amended), which makes it an offence to ‘...plant or otherwise cause the species to grow in the wild’. This includes spreading or transferring contaminated soil from one area to another.

Estate Managers and landowners have a duty to pro-actively treat knotweed outbreaks. Under the Natural Environment and Rural Communities Act 2006 (NERC), subsection 14ZA (1), makes it is an offence to sell, offer or expose for sale, or to have in one’s possession or transport for the purpose of sale, any Schedule 9 animal or plant or anything from which such an animal or plant can be propagated, including rhizomes of Japanese knotweed. Under subsection 14ZA (2) it is also an offence to publish or cause to be published any advertisement for the purchase or sale of these animals and plants.

The Environmental Protection Act 1990 (EPA 1990) contains a number of legal provisions concerning controlled waste. Any Japanese knotweed contaminated soil or plant material that is intended for discard is likely to be classified as controlled waste.

The Environmental Protection (Duty of Care) regulations 1991 also imposes a ‘duty of care’ on persons concerned with controlled waste, which includes any materials incorporating Japanese knotweed including soil, grass cuttings, general wastes and ash arising from the burning of knotweed. The duty applies to any person, who produces, imports, carries, keeps, treats or disposes of controlled waste.

Failure to appropriately dispose of any material containing Japanese knotweed may lead to prosecution under Section 33 and 34 of the EPA 1990 and Section 14 (2) of the Wildlife & Countryside Act 1981 (as amended).

If knotweed stands are to be treated with herbicides, The Control of Pesticides Regulations (1986) applies. These regulations require any person who uses a pesticide to take all reasonable precautions to protect the health of human beings, creatures and plants, safeguard the environment and in particular avoid the pollution of water. If pesticides are to be used in or near to a watercourse, the Environment Agency should be contacted, and approval must be sought (application to use herbicides in or near water).

Waste leaving the site must be handled responsibly and in accordance with the law at all stages between its production and final recovery or disposal. Waste must be transferred to an authorised person, who is either a registered waste carrier or exempted from registration by the Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991.

Additional legislation regarding the transport of Japanese knotweed contaminated materials is covered by the Hazardous Waste Regulations 2005 (HWR 2005). This contains provisions about the handling and movement of hazardous waste. Consignment notes must be completed when any hazardous waste is transferred, which includes details about the hazardous waste properties and any handling requirements. Untreated Japanese knotweed is not classed as hazardous waste, but material containing knotweed which has been treated with certain herbicides, may be classified as hazardous waste.

If any waste soil or knotweed is sent for landfill either before or after treatment, it must go to a landfill that is authorised to receive it.

The Hedgerows Regulations 1997

The Hedgerows Regulations 1997 were introduced to protect hedgerows of importance from destruction. However, the legislation does not apply to any hedgerow (even if it is within the list above) which is within or marking the boundary of the curtilage of a dwelling house.

For the Regulations to be applicable, the hedgerow must be at least 20 metres in length or, if less than 20 metres, it must meet another hedgerow at each end. A hedgerow is deemed to be important if it is more than thirty years old and meets at least one of the criteria listed in Part II of Schedule 1 of the Regulations.

If a hedgerow which qualifies under the Regulations is to be removed, the landowner must contact the Local Planning Authority (LPA) in writing by submitting a hedgerow removal notice. The LPA then has a period of 42 days to decide whether or not the hedgerow meets the importance criteria of the regulations.

Appendix 2 - Habitat Map and Target Notes

Hierarchical code	Code	Meaning
Primary Code	u1c	Artificially Unvegetated Unsealed Land
	h3h	Mixed Scrub
	g4	Modified Grassland
	R2	Rivers and streams
Secondary Code	11	Scattered Trees
	17	Ephemeral
	80	Unmanaged
	189	Scattered Grass
	191	Ditch
	524	Invasive Non-Native Species