OMEGA ZONE 8, ST HELENS

Omega St Helens Ltd / T. J. Morris Limited

Document Title
ES Vol. 1 Chapter 9 Biodiversity
Document No. OPP DOC.11.9

Omega St Helens / T. J. Morris Limited

OMEGA ZONE 8, ST. HELENS

Environmental Statement Volume 1 - Main Text
OPP DOC.11.9 Chapter 9: Biodiversity

70060349-CH9
JUNE 2020

PUBLIC

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TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70060349

OUR REF. NO. 70060349-CH9

DATE: JUNE 2020

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TABLES

9. BIODIVERSITY

9.1. INTRODUCTION

9.1.1. This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development upon biodiversity.

9.1.2. The assessment of biodiversity has established that the following additional mitigation measures are required:

- On site habitat creation targeted for notable and protected species noted on or near to the application site, to include;
    - Native woodland/tree planting (80,639m^2); pond habitat (15,742m^2), species diverse, native hedgerow (9621 linear m), high-quality grassland (wetland and meadow – 91,534m^2) and native aquatic planting (2,133m^2).
- Off-site compensation for woodland and trees provided to meet 2:1 planting requirement OR biodiversity compensation payment (subject to agreement);
- Provision of bat boxes and suitable bat habitat;
- Provision of bird boxes and suitable bird habitat;
- Provision of a Construction Environmental Management Plan (CEMP) for the detailed planning application site, to include (among other items);
    - Tree Protective Fencing and Root Protection Areas (RPAs);
    - Agreed Method Statements for any works required within RPAs or sensitive areas;
    - Protective fencing of sensitive receptors (where necessary);
    - Fish rescue methodology when draining ponds;
    - Allocated compounds/areas for temporary storage of materials (hazardous and non-hazardous);
    - Advice for habitat removal in relation to sensitive species and habitats on and near to the application site (such as Tree Protection Orders (TPOs), roosting bats, breeding birds and brown hare);
    - Provision of buffer to protect purple ramping-fumitory; and
    - The requirement for an Ecological Clerk of Works and/or Aboriculturalist.
- Provision of a CEMP for the outline planning application site as details emerge;
- Provision of a detailed Lighting Strategy;
- Provision of a detailed Landscape Scheme.

9.1.3. The following residual effects have been identified:

- During the construction phase there is likely to be an initial large (**negative**) magnitude of change due to felling wooded areas, as newly planted areas mature, this change will reduce in magnitude from large (**negative**) to a **moderate** beneficial residual effect on woodland and trees (**significant**) following the implementation of mitigation measures.

- During the operational phase the magnitude of change, following mitigation, is negligible, therefore, there is likely to be a negligible residual effect on woodland and trees (**not significant**) following the implementation of mitigation measures.
- During the construction phase there is likely to be a direct, permanent **moderate** long-term beneficial residual effect on hedgerow (**significant**) following the implementation of mitigation measures.
- During the construction phase there is likely to be a direct, permanent **moderate** to **major** long-term beneficial residual effect on ponds (**significant**) following the implementation of mitigation measures.
- During the operational phase magnitude of change, following mitigation, is **negligible**. Therefore, there is likely to be a **negligible** residual effect on ponds (**not significant**) following the implementation of mitigation measures (lighting strategy).
- During the construction phase there is likely to be **negligible** residual effect on Booths Wood LWS (**not significant**) following the implementation of mitigation measures.
- During the operational phase there is likely to be a **negligible** residual effect on Booth's Wood LWS (**not significant**) following the implementation of mitigation measures.
- During the construction phase there is likely to be a **negligible** residual effect on Whittle Brook (**not significant**) following the implementation of mitigation measures.
- During the operational phase, there is likely to be a **negligible** residual effect on Whittle Brook (**not significant**) following the implementation of mitigation measures.
- During the construction phase there is likely to be a direct permanent **moderate** long-term beneficial residual effect on bats (**significant**) following the implementation of mitigation measures.
- There will be a direct, permanent **minor** adverse residual effect on breeding birds (**not significant**) following the implementation of mitigation measures.
- There is likely to be a direct permanent **minor** long-term adverse residual effect on brown hare (**not significant**) following the implementation of mitigation measures.
- There is likely to be a **negligible** residual effect on purple ramping-fumitory (**not significant**) following the implementation of mitigation measures.

9.1.4. The following enhancement opportunities have been identified:

- Improve the quality of retained ponds by reducing shading, dredging, and introducing aquatic planting);
- Bat and bird box provision within the outline planning application site;
- Enhancement of Whittle Brook via planting with native tree species and high-quality grassland. Potential to reduce siltation by introducing reed beds / coir rolls;
- Control of Himalayan balsam throughout the application site.

9.1.5. The remainder of this chapter describes the assessment methodology and the baseline conditions relevant to the assessment, which have been used to reach these conclusions, as well as a summary of the likely significant effects leading to the additional mitigation measures required to avoid, prevent, reduce or, if possible, offset any likely significant adverse effects, and the likely residual effects and any required monitoring after these measures have been employed. Opportunities for enhancement, where such opportunities exist, are also discussed.

9.1.6. This chapter (and its associated figures and appendices) is intended to be read as part of the wider ES, with particular reference to **Chapter 10: Landscape and Visual** and **Chapter 11: Water**.

9.2. CONSULTATION, SCOPE, METHODOLOGY AND SIGNIFICANCE CRITERIA

CONSULTATION UNDERTAKEN TO DATE

9.2.1. **Table 9-1** provides a summary of the consultation activities undertaken in support of the preparation of this assessment.

Table 9-1 - Summary of consultation undertaken

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
Merseyside Environment Advisory Service	Rachael Rhodes	08 May 2019. Communications via email.	Confirmation that the appropriate ecological surveys have been undertaken. Wintering bird surveys were recommended as part of Stage One Screening to support Habitats Regulations Assessment due to relative proximity of Mersey Estuary Special Protection Area (SPA) and Ramsar.

SCOPE OF THE ASSESSMENT

9.2.2. The scope of this assessment has been established through an ongoing scoping process. Further information can be found in **Chapter 5: Approach to EIA**.

9.2.3. This section provides an update to the scope of the assessment and re-iterates the evidence base for scoping out elements following further iterative assessment.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

9.2.4. The elements shown in **Table 9-2** are not considered to give rise to likely significant effects as a result of the Proposed Development and have therefore not been considered within this assessment.

Table 9-2 - Elements scoped out of the assessment

Element scoped out	Justification
White-Clawed Crayfish	During the Preliminary Ecological Appraisal (PEA) habitat assessment, Whittle Brook resulted in 'unsuitable' habitat for white-clawed crayfish. No records were retrieved for this species.

Element scoped out	Justification
Dormouse	During the PEA, the habitat was deemed unsuitable for dormouse and there were no records of dormouse returned through the desk study.

ELEMENTS SCOPED INTO THE ASSESSMENT

Construction Phase

9.2.5. The following elements are considered to have the potential to give rise to likely significant effects during construction of the Proposed Development and have therefore been considered within this assessment:

- Priority / Valuable Habitat; woodland/trees, ponds and hedgerow;
- Badgers;
- Bats;
- Brown hare (Local Biodiversity Action Plan (BAP) species);
- Breeding birds (including local BAP species; grey partridge, lapwing and song thrush);
- Wintering birds (Mersey Estuary SPA);
- Great crested newts and suitable habitat;
- Reptiles;
- Water voles;
- Booth's Wood (Local Wildlife Site); and
- Purple ramping-fumitory (Local and UK Priority Species, endemic and 'vulnerable' in England).

Operation Phase

9.2.6. The following elements are considered to have the potential to give rise to likely significant effects during operation of the Proposed Development and have therefore been considered within this assessment:

- Badgers;
- Bats (including their roosts and habitat);
- Great crested newt welfare (drainage, kerbing and population monitoring);
- Breeding birds (permanent loss of habitat);
- Wintering birds (effect of qualifying species for Mersey Estuary SPA); and
- Booth's Wood (Local Wildlife Site).

EXTENT OF THE STUDY AREA

9.2.7. Study areas have been defined by the habitat and species of concern, following the best practice guidelines and have therefore varied as per the relevant receptor. The relevant survey areas are defined individually below. A summary of the survey extent is presented in **Figure 9.1**.

DESK STUDY

9.2.8. A desk study included a data trawl of all protected and notable species within 2km of the application site, statutory designated sites within 5km of the application site, non-statutory designated sites within 2km of the application site, and priority habitats within 1km of the application site.

FIELD SURVEY

9.2.9. Field surveys for the following have been undertaken at appropriate locations within and around the application site boundary for up to 50m, with the exception of great crested newts survey where all suitable waterbodies and terrestrial habitat within 500m of the application site have been considered:

- Habitat – a Phase 1 habitats assessment has been undertaken following Joint Nature Conservation Committee 2010 (Ref. 9.1).
- Hedgerows were assessed in accordance with Defra 2007 and following the criteria set out by the Hedgerows Regulations 1997 (Ref. 9.2)
- Bats – in accordance with Collins, J. 2016 (Ref. 9.3) a ground level tree assessment, bat endoscope surveys, dusk/activity surveys and transect surveys have been undertaken within the application site.
- Badgers – in accordance with Cresswell *et al* 1990 (Ref. 9.4), a badger survey was undertaken within the application site and within 30m of the application site boundary where access allowed.
- Great crested newts – following English Nature 2001 (Ref. 9.5), all ponds with approved access and within 500m of the application site boundary, not separated by a barrier, were first identified. eDNA surveys were undertaken in accordance with Natural England's approved protocol (WC1067, **Appendix 9.1**).
- Reptiles – in accordance with Gent & Gibson 2003 (Ref. 9.6) reptile surveys were undertaken within areas of suitable habitat within the application site.
- Breeding birds – in accordance with Bibby et al 2000 (Ref. 9.7), bird breeding surveys were undertaken in April and June 2019.
- Wintering birds - The Mersey Estuary SPA & Ramsar is located approximately 7.5km to the southwest of the application site. Whilst there will be no direct impact upon Mersey Estuary SPA and Ramsar, indirect impacts may prevail on SPA qualifying species (wintering birds) on or adjacent to the application site through noise impacts or loss of satellite habitat. Limited suitable wintering bird habitat is present within the application site and therefore a wintering bird survey is being undertaken between October 2019 and March 2020, inclusive, to determine whether SPA qualifying species are using the application site. Upon pending agreement with Mersey Environmental Advisory Service, a negative result by the December 2019 survey inclusive will be regarded as sufficient evidence that the application site is not supporting SPA qualifying species. Surveys are being undertaken following Scottish Natural Heritage (Ref. 9.8).
- Water vole - following Dean *et al* 2016 (Ref. 9.9), all suitable habitat on within the application site has been surveyed for water vole presence; the first in May 2019 and where suitable habitat existed a second in mid-June 2020.
- Invasive species – plants listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), were recorded during the Phase 1 Habitat Survey within 30m of the application site boundaries, where access was permitted.
- Aquatic invertebrates – a walkover habitat evaluation was undertaken to assess opportunity for aquatic invertebrates within the application site.
- Fish – a walkover habitat evaluation was undertaken in accordance with Hendry and Cragg-Hine 1997 (Ref. 9.10) to assess opportunity for fish within the application site.

METHOD OF BASELINE DATA COLLATION

DESK STUDY

9.2.10. All records on protected and notable species and non-statutory designated sites were obtained from the following two sources;

- Merseyside BioBank Records (Ref. 9.11) (St. Helens); and
- RECORD LRC (Ref. 9.12) (Warrington/Cheshire).

9.2.11. The following website was utilised to collect information relating to statutory sites and priority habitats:

- The government interactive mapping website MAGIC Maps (Ref. 9.13).

9.2.12. The following website was utilised to collect information relating to internationally protected sites:

- The website for government advisor public body Joint Nature Conservation Committee (Ref. 9.14).

9.2.13. The following report was reviewed in relation to this assessment:

- 169-01 South Omega Ecological Assessment (Arnott-Mann, 2013).

SITE VISIT AND SURVEYS

Phase 1 habitat

9.2.14. The Phase 1 Habitat Survey (see **Appendix 9.2**) assessed all habitat within the application site following Joint Nature Conservation Committee 2010 (Ref. 9.15). The Phase 1 Habitat Survey was undertaken between 8 – 12 April 2019. A Phase 1 habitat map (see **Figure 9.2**) and target notes (see **Appendix 9.3**) have been provided.

9.2.15. The Phase 1 Habitat Survey and desk study identified the requirement for further surveys, which were also undertaken during 2019:

- Bat tree roost survey;
- Bat activity survey;
- Badger survey;
- Great crested newt eDNA survey;
- Reptile survey;
- Breeding bird survey;
- Water vole survey; and
- Wintering bird survey.

Tree surveys (bat roosts)

9.2.16. A ground level tree assessment of all trees within the application site and within 30m of the application site boundary, where access was permitted, was undertaken during January 2019. Trees extending into Booth's Wood, outside of the application site boundary, were not assessed due to access constraints.

9.2.17. Trees were categorised in terms of their potential to support roosting bats following guidelines set out by Collins (Ref. 9.3). Trees identified as having 'Low' potential were mapped and those with 'Moderate' and 'High' bat roost potential, and which were likely to be affected by the Proposed Development, were subject to Potential Roost Feature surveys to confirm their roost potential status or reclassify their status where necessary. Where 'Moderate' and 'High' roost potential features were confirmed, these trees were climbed and subject to endoscope surveys. For trees identified as having 'Moderate' and 'High' roost suitability but were not suitable to climb or a potential roost feature could not fully be assessed, dawn/dusk bat activity surveys were undertaken.

Table 9-3 - Potential suitability of bat roosting habitat within trees

Suitability	Description
Negligible	Negligible habitat features with no potential to support roosting bats
Low	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
Moderate	A 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 unlikely to support a roost of high conservation status
High	A 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

9.2.18. Aerial surveys were conducted where trees were safe to climb. The methods are detailed in the Bat Report (June 2020). Where trees were unsafe to climb, dusk and dawn activity surveys were carried out between June – August 2019, inclusive. Trees offering 'Moderate' potential were surveyed a minimum of two times. Trees offering 'High' roosting potential were surveyed a minimum of three times. Survey dates were; 24 June 2019, 25 June 2019, 26 June 2019, 16 July 2019, 23 July 2019, 26 July 2019, 13 August 2019 and 22 August 2019.

9.2.19. During the dusk activity surveys, a surveyor was positioned at each tree a minimum of 15 minutes before sunset and approximately 1.5-2 hours after sunset. For dawn activity surveys, a surveyor was positioned at each tree approximately 1.5-2 hours before sunrise until 15 minutes after sunrise.

Bat transect surveys (foraging/commuting habitat)

9.2.20. A total of five dusk transect surveys were carried out across the application site. The transect survey dates were; 22 May 2019, 19 June 2019, 4 July 2019, 5 August 2019 and 8 October 2019. The application site was split into two transects, with timed survey counts of three minutes incorporated in each transect to allow spatial and temporal comparisons. At each point, all bat activity was recorded using frequency division or time expansion bat detectors. Any bats seen or heard between observation points were also recorded. Surveys lasted from 15 minutes before sunset to approximately 2 hours after sunset. The surveys were carried out in accordance with Collins (Ref. 9.3).

9.2.21. Static bat detectors were deployed at two locations along the transect routes and left *in situ* for a minimum of five consecutive nights per month during the months of May, June, July, August and October 2019 (a combined period of 36 days). Both static detectors used were an Anabat Express.

Badgers

9.2.22. During the Phase 1 Habitat survey in April 2019, evidence of badgers was searched for within the application site boundary, extending 30m off-site, where possible. Areas of Booth's Wood outside of the application site boundary were not surveyed owing to access constraints.

Great crested newts

9.2.23. All waterbodies within 500m of the application site boundary, not separated by a barrier to the movement of great crested newts, and where access was granted, were included within the study (see **Figure 9.1**). A total of 26 waterbodies were tested for great crested newt eDNA between 15-18 April 2019, inclusive.

Reptiles

9.2.24. Approximately 100 roofing-felt tiles were placed in areas of suitable reptile habitat across the application site (road verges, field and woodland margins). Tiles were deployed in May 2019 during temperatures 11°C - 19°C with presence/absence surveys being undertaken in suitable abiotic conditions. Reptile survey locations are presented in **Figure 9.1**.

Breeding birds

9.2.25. Breeding bird surveys were undertaken within the application site by two experienced ecologists on two occasions. Survey dates were 24 April 2019 and 28 June 2019. Transects were carried out across the application site and all birds seen or heard were recorded on a plan, noting their behaviour.

Water vole

9.2.26. All suitable water vole habitat within the application site was assessed. Where possible, surveys extended 50m up-/down- stream of the application site boundary. Areas surveyed for water vole are presented in **Appendix 9.13**.

Wintering birds

9.2.27. All suitable habitat within the application site boundaries has been subject to ongoing wintering bird surveys (see **Figure 9.1**). Between the months of October 2019 – March 2020, a total of two survey visits per month are scheduled. Where no SPA qualifying species have been found using the application site by the second visit in December 2019, which at the time of preparation of this chapter (early December 2019) is the case, then SPA qualifying species will be considered as absent from the application site and agreement from Merseyside Environment Advisory Service will be sought to stop further survey.

ASSESSMENT METHODOLOGY

9.2.28. The assessment has been undertaken following guidance set out by Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) (Ref. 9.16).

SIGNIFICANCE CRITERIA

9.2.29. The significance level attributed to each effect has been assessed based on the sensitivity/value of the affected receptor(s) and the magnitude of change arising from the Proposed Development, as well as a number of other factors that are outlined in more detail in **Chapter 5: Approach to EIA**.

9.2.30. Based upon the desk study and site survey, an ecological evaluation of the key ecological features was undertaken and key evaluation categories are as follows.

Table 9-4 – Ecological evaluation categories

Value	Description
International	An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biogenetic Reserve) or an area which the country agency has determined meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified. A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of an internationally important species, which is threatened or rare in the UK. i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. A regularly occurring, nationally significant population/number of any internationally important species.
National	A nationally designated site (SSSI, ASSI, NNR, Marine Nature Reserve) or a discrete area, which the country conservation agency has determined meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified. A viable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (see local BAP). A regularly occurring, regionally or county significant population/number of any nationally important species. A feature identified as of critical importance in the UK BAP.
Regional	Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole; Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile; Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation; A regularly occurring, locally significant number of a regionally important species;

Value	Description
	Sites which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.
County / Metropolitan	Semi-natural ancient woodland greater than 0.25 ha; County/Metropolitan sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on County / metropolitan ecological criteria (County/Metropolitan sites will often have been identified in local plans); A viable area of habitat identified in County BAP; Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan "red data book" or BAP on account of its regional rarity or localisation; A regularly occurring, locally significant number of a County/Metropolitan important species.
District / Borough	Semi-natural ancient woodland smaller than 0.25 ha; Areas of habitat identified in a sub-County (District/Borough) BAP or in the relevant Natural Area profile; District sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on District/ Borough ecological criteria (District sites, where they exist, will often have been identified in local plans) Sites/features that are scarce within the District/Borough or which appreciably enrich the District/Borough habitat resource; A diverse and/ or ecologically valuable hedgerow network; A population of a species that is listed in a District/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation; A regularly occurring, locally significant number of a District / Borough important species during a critical phase of its life cycle.
Parish / Neighbourhood	Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood, e.g. species-rich hedgerows. Local Nature Reserves selected on Parish ecological criteria.
Site	Ecological resource not meeting any of the above criteria, of importance within the context of the application site only.

9.2.31. In order to maintain consistency with other topic areas within the ES, the magnitude of the impact on the ecological receptor was summarised through a qualified description using the following scale:

- Negligible – the impact is certain not to have an adverse effect on the conservation status of a species or the integrity of a designated site or habitat. In accordance with CIEEM guidance, effects significant at less than Parish value (i.e. at 'Site' level or less) are considered not significant.

- Minor – the impact is on an ecological receptor of low (Parish) value or is considered unlikely to significantly affect the conservation status or integrity of an ecological receptor of higher value (e.g. temporary hedgerow removal).
- Moderate – the impact is on an ecological receptor of medium (District, County or Regional) value or the effect is considered unlikely to have a permanent effect on the overall conservation status or integrity of a receptor of higher ecological value (e.g. loss of 30% of dormouse habitat on a site).
- Major – any significant impact on an ecological receptor of high value (National or International) value; or a permanent and irreversible effect on the conservation status of an ecological receptor of medium value (e.g. loss of an area designated as a Site of Special Scientific Interest, or loss of a viable population of a UK BAP Priority Species).

9.2.32. The sensitivity of the affected receptor is assessed on a scale of high, medium, low and negligible, and the magnitude of change is assessed on a scale of large, medium, small, negligible and no change, as set out in **Chapter 5: Approach to EIA**.

EFFECT SIGNIFICANCE

9.2.33. The following terms have been used to define the significance of the effects identified and apply to both beneficial and adverse effects:

- **Major effect**: where the Proposed Development could be expected to have a substantial improvement or deterioration on receptors;
- **Moderate effect**: where the Proposed Development could be expected to have a noticeable improvement or deterioration on receptors;
- **Minor effect**: where the Proposed Development could be expected to result in a perceptible improvement or deterioration on receptors; and
- **Negligible**: where no discernible improvement or deterioration is expected as a result of the Proposed Development on receptors, including instances where no change is confirmed.

9.2.34. As set out in **Chapter 5: Approach to EIA**, effects that are classified as **moderate or above** are considered to be **significant**. Effects classified as below **moderate** are considered to be **not significant**.

9.2.35. With reference to paragraph 5.5.23 of **Chapter 5: Approach to EIA**, the duration of effects is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, 10-years may appear long-term within a human context but is short-term within a woodland context. The duration of effect for each sensitive receptor is detailed within Section 9.6, where appropriate. This is in accordance with CIEEM (2018).

9.3. BASELINE CONDITIONS

DESK STUDY

Statutory Designated Sites of Nature Conservation Value

9.3.1. The application site is located 7.3km to north west of the River Mersey Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar site. The application site also falls within the impact zones of the Mersey Estuary SSSI. The Mersey Estuary is an internationally important

site for wildfowl and consists of larges areas of intertidal sand and mudflats. The application site also includes an area of reclaimed marshland, saltmarshes, brackish marshes and boulder clay cliffs with freshwater seepages. Throughout the winter the estuary supports large numbers of wildfowl and wafers, where the birds feed on the rich invertebrate fauna of the intertidal sediments as well as plants and seeds from the salt-marsh and adjacent agricultural land.

9.3.2. Two further statutory designated sites of conservation concern are located within 5km of the application site (**Figure 9.3**). Both sites are designated Local Nature Reserves and are detailed below in **Table 9-5**, including a description of the designated site, its connectivity and proximity to the application site.

Table 9-5 - Statutory designated sites within 5km, description, connectivity and distance to the application site

Designated Site	Description	Connectivity	Approximate Distance to Application Site
Mersey Estuary SPA International value	The SPA provides extensive roosting sites for large populations of waterbirds. It is of major importance for duck and wader species and for supporting wader populations in Britain during the spring and autumn migration periods	Poor – moderate connectivity. The application site is separated from Mersey Estuary SPA by a considerable amount of urbanisation to the south and with more extensive agricultural land to the west offering opportunity to wintering birds	7.3km to the south west
Mersey Estuary Ramsar International value	A site recognised for its importance as a wetland and especially for waterfowl	Poor – moderate (as above)	7.3km to the south west
Mersey Estuary SSSI National value	Designated as internationally important for wildfowl, and recognised for large areas of intertidal sand and mudflats, among other quality habitats	Poor – moderate (as above)	7.3km to the south west
Colliers Moss Common (LNR) County value	Three areas of relict mosslands, with lagoons, grassland, heathland, woodland and untreated colliery spoil.	Poor connectivity, with the M62 urbanisation and agricultural land between the application site and Colliers Moss Common.	2.8km to the north
Thatto Heath Meadows (LNR)	Field patterns dating back to 1843. Main	Poor connectivity. Highly urbanised habitat	4.4km to the north west

Designated Site	Description	Connectivity	Approximate Distance to Application Site
County value	habitats included stream, acid and neutral grassland, dense scrub and hedgerows.	between the application site and Thatto Heath Meadows.	

Non-Statutory Designated Sites of Nature Conservation Value

9.3.3. A total of six non-statutory sites are located within 2km of the application site (**Figure 9.4**). All of these sites are located within St. Helens district, and none are located within Warrington. A description of each site along with its connectivity and proximity to the application site is presented in **Table 9-6**. Citation sheets for non-statutory sites are presented in **Appendix 9.4**.

Table 9-6 - Non-statutory designated sites within 5km, description, connectivity and distance to the application site

Designated Site	Description	Connectivity	Approximate Distance to Site
Booth's Wood (LWS) County value	Deciduous plantation woodland dominated by sycamore, horse chestnut and oak. A stream and ditch network runs through the woodland. The large pond in the south of the woodland is surrounded by rush pasture providing wetland habitat for locally rare wetland species.	Located immediately adjacent to the western boundary of the application site. Part of Booth's Wood extends onto the application site.	0m west
Dog Kennel Plantation (LWS) County value	A mature plantation of beech, oak and sycamore providing an important bird breeding site.	Poor connectivity. Separated from the application site by the M62.	219m to the north
Mersey Valley Golf Course (LWS) County value	Golf course containing a number of hedgerows and ponds. Ponds provide habitat for regionally important species (rigid hornwort)	Moderate connectivity. Woodland and intensely managed arable fields separate the two sites.	382m south west
Clock Face Country Park Pond (LWS) County value	A pond with previous recorded populations of great crested newts. Suitable terrestrial	Poor connectivity. Separated from the application site by the M62.	0.7km north west

Designated Site	Description	Connectivity	Approximate Distance to Site
	habitat for great crested newt is also present.		
Whittle Brook (LWS) County value	A stretch of Whittle Brook providing habitat for water voles.	Moderate connectivity. Intensely managed arable land and minor	1.4km south west
Sutton Manor (LWS) County value	Extensive mosaic of grassland, scrub, woodland and wetland managed by the Forestry Commission habitats created on a former colliery.	Poor connectivity. Separated from the application site by the M62.	1.4km north west

Priority Habitat

9.3.4. Lowland Mixed Deciduous Woodland Priority Habitat has been identified on and within 1km of the application site, as shown in **Figure 9.5**.

Records of Protected & Notable/Priority Species

9.3.5. A number of notable and protected species have been recorded within the study area, as outlined below. A map detailing notable and protected species distribution relative to the application site is shown in **Figure 9.6**.

Plants

9.3.6. Bluebell *Hyacinthoides non-scripta* (protected by the Wildlife and Countryside Act 1981 (as amended), and Schedule 8 of the Act, also a local Priority Species) has been recorded within the study area.

Mammals

9.3.7. The following terrestrial mammals have been recorded within the study area:

- Brown hare *Lepus europaeus* (a local and UK Priority Species);
- Water vole *Arvicola amphibius* (a local and Priority Species, and protected by the Wildlife and Countryside Act 1981 (as amended)); and
- Western hedgehog *Erinaceus europaeus* (a UK Priority Species and afforded some protection under the Wildlife and Countryside Act 1981 (as amended)).

9.3.8. In addition, the following bat species have been recorded within the study area (all bats are European Protected Species and listed as local and UK Priority Species):

- Common pipistrelle *Pipistrellus pipistrellus;*
- Soprano pipistrelle *P. pygmaeus;*
- Brown long-eared bat *Plecotus auritus*;
- Noctule *Nyctalus noctula;* and
- Serotine *Eptesicus serotinus*.

Birds

9.3.9. No records were retrieved from the St. Helens district for birds within the study area from the last 10 years. The following notable and protected species have been recorded within Warrington in the last 10 years:

- Swift *Apus apus* (Amber BoCC [Ref. 9.17]);
- Grey partridge *Perdix perdix* (local and UK Priority Species);
- Pink-footed goose *Anser brachyrhynchus* (Amber BoCC);
- Swallow *Hirundo rustica* (Amber BoCC);
- Kestrel *Falco tinnunculus* (Amber BoCC); and
- Mistle thrush *Turdus viscivorus* (Amber BoCC).

9.3.10. The following additional notable bird species were recorded during surveys for the 2013 South Omega assessment (Arnott-Mann):

- Lesser redpoll *Acanthis cabaret* (Red BoCC);
- Linnet *Carduelis cannabina* (Red BoCC);
- Meadow pipit *Anthus pratensis* (Amber BoCC);
- Green woodpecker *Picus viridis* (Amber BoCC);
- Redshank *Tringa totanus* (Amber BoCC);
- Reed bunting *Emberiza schoeniclus* (Amber BoCC);
- Short-eared owl *Asio fammeus* (Amber BoCC);
- Whitethroat *Sylvia communis* (Amber BoCC); and
- Willow warbler *Phylloscopus* (Amber BoCC).

Invertebrates

9.3.11. The following invertebrates have all been recorded within the study area and are local Priority Species:

- Black-tailed skimmer *Orthetrum cancellatum;*
- Broad-bodied chase *Libellula depressa*;
- Common darter *Sympetrum striolatum*;
- Emperor dragonfly *Anax imperator;*
- Four-spotted chaser *Libellula quadrimaculata;*
- Blue-tailed damselfly *Ischnura elegans*;
- Large red damselfly *Pyrrhosoma nymphula*;
- Migrant hawker *Aeshna mixta*;
- Ruddy darter *Sympetrum sangineum*;
- Common blue damselfly *Enallagma cythigerum*; and
- Azure damselfly *Coenagrion puella.*

Fish

9.3.12. No records were retrieved for notable or protected fish species within the study area.

Amphibians and reptiles

9.3.13. The following herptiles have been recorded within the study area:

- Common frog *Rana temporaria*;
- Common toad *Bufo bufo* (a UK Priority Species);
- Smooth newt *Lissotriton vulgaris;* and
- Great crested newt *Triturus cristatus* (a European Protected Species / local Priority Species).

9.3.14. The following additional great crested newt records were made during surveys for the 2013 South Omega assessment (Arnott-Mann):

- A decreasing population (from medium-sized to small) of great crested newts within 'Pond N' (~1.6 km east of the application site).

Invasive species

9.3.15. The following invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), have been recorded within the study area in the last 10 years:

- Canadian waterweed *Elodea canadensis*;
- Himalayan balsam *Impatiens glandulifera*;
- Japanese knotweed *Fallopia japonica;*
- Japanese rose *Rosa rugosa;*
- Montbretia *Crocosmia x crocosmiiflora;*
- Rhododendron *Rhododendron ponticum;* and
- Grey squirrel *Sciurus carolinensis*.

Site Survey

Habitats

9.3.16. The habitats identified on within the application site are described below and mapped as shown in **Figure 9.1**. Target notes (TNs) highlight ecological features of interest and are presented in **Appendix 9.3**. A list of species found within the application site is presented within **Appendix 9.2**, along with scientific names; nomenclature follows Stace 2010 (Ref. 9.18). Only common names are referred to below for ease of reading.

Woodland

9.3.17. Broad-leaved woodland was present across the application site, forming distinct woodland blocks. It occupies a total area of approximately 61,533 m^2 and largely consists of old, plantation woodland. Frequently occurring species included sycamore, pedunculate and sessile oak, hawthorn, elder, alder, silver birch, beech, horse chestnut, lime and ash (among others). Booth's Wood, also a Local Wildlife Site, was noted as containing a greater diversity of tree species than other areas of woodland on site.

9.3.18. All woodland blocks within the application site are covered by TPOs (W5-8, W16 and W17, **Appendix 9.5**), and aboriculturally, were mostly considered to be of 'high quality', as evidenced in **Figure 9.7**, **Appendix 9.6** and **Appendix 9.7**.

9.3.19. Ground flora within all woodlands was generally quite poor in terms of species diversity, being largely characterised by bramble, bracken and/or ivy throughout. At times immature sycamore, hawthorn and silver birch was noted within the understorey. Duck Wood and Plain Plantation were noted as containing much rhododendron which prevents the establishment of ground flora further.

9.3.20. All woodlands contained either a wet pond and/or a wet ditch.

9.3.21. All woodland within the application site is classified as Lowland Mixed Deciduous Woodland and is therefore a local and UK Priority Habitat and of National value as a receptor.

Scattered trees

9.3.22. Scattered trees total an area of ~18,439 m^2 across the application site and were largely present at wet and dry ditches and pond edges. Species included hawthorn, ash, sycamore, pedunculate and sessile oak, horse chestnut, alder and elder (among others).

9.3.23. This habitat has site value as a receptor.

Improved grassland

9.3.24. Two areas of distinct species-poor improved grassland were present on-site totalling an area of ~104,898 m^2. A large improved grassland field (TN 12) exists to the south east of the application site and contained common agricultural grasses such as perennial ryegrass, Yorkshire fog and false-oat grass. Other flora noted included spear thistle, broad-leaved dock and creeping thistle. During the Phase 1 Habitat Survey, the grassland was cut for haylage/silage.

9.3.25. The improved grassland, while not considered to be particularly valuable, in conjunction with the three (3) in-field ponds, offers some potential for wintering wading birds.

9.3.26. A small area of improved grassland was located to the north of the application site immediately west of the bridge crossing upon a bank sloping to the west. The grassland contained a similar species composition.

9.3.27. Overall, this habitat has site value as a receptor.

Poor semi-improved grassland

9.3.28. A motorway grassland verge runs adjacent to the northern boundary of the application site. A strip of poor semi-improved grassland was present along the eastern extent of the northern boundary and extends into the application site no more than 1m (TN 32) (too narrow to map). Species composition was generally poor and dominated by false-oat grass, however a small section (approximately 15m-20 long and 1m wide at TN 32) contained a greater species diversity including; oxeye daisy, mugwort, and cat's ear. Additionally, purple ramping-fumitory was recorded within this area (see paragraph 9.3.55).

9.3.29. Overall, this habitat has site value as a receptor.

Hedgerow

9.3.30. Two species-poor intact hedgerows were present within the application site. The first was located near the centre of the application site (HR 2; TN 11) separating the improved grassland field from arable to the north. The second (HR 1; TN 17) was located to the centre-south of the application site

and separates the improved grassland from arable land to the west. While this hedgerow is species-poor, it was noted as containing a diverse and abundant array of bird species (outside of the breeding season) where at least four yellowhammer *Emberiza citronella* were noted using the hedgerow during subsequent site visits during October 2019.

9.3.31. The northernmost intact hedgerow (HR 3; TN 8) was a single species, hawthorn dominant hedgerow. The southernmost intact hedgerow was hawthorn dominant with a single elder shrub present. Neither hedgerow is considered to be 'Important' following a hedgerow assessment according to Defra 2007 (Ref. 9.2), but qualifies as 'Priority Habitat'. See **Appendix 9.8**.

9.3.32. Intact hedgerow existed immediately off-site along the northern boundary (TN 30). The hedgerow was hawthorn dominant, with a small amount of sessile oak. Scattered sycamore trees were present along its length.

9.3.33. A species-poor defunct hedgerow was observed to the centre-north of the application site (TN 8). The hedgerow contained hawthorn only, and gaps of up to 10m were present.

9.3.34. No hedgerows are classed as 'Important' however, they are all considered to be local and UK Priority Habitat. All hedgerows are classed as regional value receptors.

Dense scrub

9.3.35. Dense scrub was present, totalling ~2000m^2, throughout the application site. It was largely confined to woodland edges and ditches, and almost exclusively dominated by bramble. However, other common species were noted occasionally such as grey willow, common nettle and field rose.

9.3.36. Overall, this habitat has site value as a receptor.

Scattered scrub

9.3.37. Scattered scrub, totalling ~2,250 m^2, was recorded across the application site. Scattered scrub was exclusively found along dry and wet ditches, the watercourse and ponds. It was often found intermingled with tall ruderal or marginal vegetation. Again, bramble was the dominant species noted, but several other common species were also noted including (among others); nettle, common hogweed, cleavers, creeping thistle and spear thistle.

9.3.38. Overall, this habitat has site value as a receptor.

Tall ruderal

9.3.39. Tall ruderal vegetation existed at some woodland and ditch edges. It was too small in area to measure coverage within the application site. Tall ruderal largely consisted of rosebay willowherb and nettle, with hogweed and cleavers frequently occurring. Other species such as greater plantain, redshank and scarlet pimpernel were noted. Species noted at TN 29 were typical within the composition. Tall ruderal areas typically ran at ditch/watercourse bank tops extending between 1m-5m, and often grew with scattered scrub habitats. They were noted as often the result of disturbance of neighbouring field margins.

9.3.40. Overall, this habitat has site value as a receptor.

Marginal vegetation

9.3.41. Three distinct areas of marginal vegetation were noted within the application site. All were along wet ditches at TN 33, TN 21 and TN 7. This vegetation type was dominated by reed canary grass, with species indicative of high nutrient levels frequently occurring, such as nettle and cleavers. These areas were noted for their potential to support populations of water vole.

9.3.42. Overall, this habitat has site value as a receptor.

Running water

9.3.43. Whittle Brook runs form the northwest corner of the application site, along the western boundary and through part of Booth's Wood where it turns south east towards the centre of the southern portion of the application site. The brook finally joins the southern boundary of the application site. Generally, the watercourse contained a large amount of siltation throughout, no doubt in part due to the high level of agricultural activity in the neighbouring land.

9.3.44. The section northwest of Booth's Wood contained step-sided earth banks, which were generally well vegetated (TN 29). The width of the watercourse was approximately 1m along this section and up to 2m in bank depth. As the watercourse extends through Booth's Wood, the banksides become less vegetated due to woodland cover, and the watercourse widens to between 2-3m. The watercourse substrate turns to silt and loose pebbles/stones, where small riffles were present.

9.3.45. Upon leaving Booth's Wood, the watercourse becomes narrower and silted again (fewer stones/pebbles) and meanders slightly through the application site. The vegetated banks (TN 19) become mostly shallow, with some steeper areas, but the banksides were thickly vegetated with bramble scrub and tall ruderal vegetation at the time of survey.

9.3.46. Small fish were noted within the watercourse here (likely minnow) and a heron was observed foraging during the Phase 1 Habitat Survey.

9.3.47. Himalayan balsam was noted throughout the extent of the watercourse (TN 3), seemingly absent along the southern boundary of the application site. In areas, it was locally frequent.

9.3.48. As the watercourse adjoins the southern boundary of the application site, it again widens, and pebbles/stones become more frequent with occasional riffles.

9.3.49. The water depth fluctuated between 5cm-30cm throughout during the Phase 1 Habitat Survey but will rise during times of heavy rainfall and the winter period.

As a meandering, lowland river this priority habitat is regarded as a national receptor.

Standing water

9.3.50. A total of 16 ponds were located within the application site (totalling 11147 m^2). Ponds were located within woodland and open arable fields.

9.3.51. All woodland ponds were highly shaded and offered little quality in terms of macrophyte or invertebrate diversity during Habitat Suitability Index surveys (see **Appendix 9.9**). In field ponds (TN 13, TN 14, TN 15) were found to be prone to silting/soil runoff from surrounding arable land and created poor conditions for biodiversity.

9.3.52. A large number of mallards (≥70 no.) and a small number (<5 no.) of Canada geese *Branta canadensis* were found to be present within the ponds to the south east (TN 13 & TN 14), where broken/eaten eggs were noted at the pond edges within the improved grassland at the time of the Phase 1 Habitat Survey.

9.3.53. All ponds within the application site (except for Booth's Wood pond TN 28) were tested for great crested newt eDNA (detailed in paragraph 9.3.58).

9.3.54. While there was a fairly large number of ponds scattered around the application site within close proximity, they were mostly isolated from one another by intensive agricultural practices (such as ploughing and planting/harvesting of crops). They are a priority habitat and are therefore of national value as a receptor.

Protected and Notable Species

Plants

9.3.55. Purple ramping-fumitory *Fumaria purpurea* was recorded in a small area along the northern boundary of the application site (TN 32). This plant is a Local and UK Priority Species (S41), is Nationally Scarce, endemic and listed as 'Vulnerable' on the vascular plant red list for England (Ref. 9.19). See **Appendix 9.10** and **Appendix 9.11**.

9.3.56. As a priority species it is an ecological receptor of national value.

Alien plant species

9.3.57. Himalayan balsam, a non-native invasive species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), was recorded at several locations across the application site (TN 3), notably along the extent of Whittle Brook, in places becoming quite dense.

Great crested newts

9.3.58. A total of 37 waterbodies were identified within 500m of the application site boundary. Of these, eight were denied access and two were considered unsuitable for great crested newts. The remaining 27 ponds were included within the assessment, as documented in **Appendix 9.9**.

9.3.59. A total of 26 ponds were subject to eDNA surveys, all scoring as 'Negative' for great crested newt presence. The pond within Booth's Wood was later included within the application site boundary and thus not included in the eDNA testing of ponds. However, the pond was assessed for its suitability to support great crested newts and scored as being 'below average'. Due to its location, with Whittle Brook to the west acting as a barrier to newt movement and intensely managed arable land to the east acting as a further barrier, the pond was considered as largely isolated from other waterbodies, and highly unlikely to contain populations of great crested newts.

9.3.60. During the surveys, a single male smooth newt *Lissotriton vulgaris* was observed within pond K.

9.3.61. While a series of ponds are located on or near to the application site, the majority of ponds are considered to be isolated from one another due to intensive land management. Great crested newts are considered to be absent from the application site and are not considered further within this assessment.

Badgers

9.3.62. No evidence of badgers using the application site was observed. A disused badger sett was observed within woodland within the application site (**Figure 9.8**). The disused sett contained four observable entrances, however all entrances had evidently not been in use for many years becoming infilled with vegetation, debris or collapsed earth. No records were retrieved for badger within the study area. Therefore, badgers are not considered further within this assessment.

Reptiles

9.3.63. The application site generally offers poor suitability for reptiles. Agricultural field margins generally extend to the woodland and field edges, with very little opportunity for basking present. While woodland belts offer potential refuge, basking opportunity is limited, and intensive land management isolates these areas of habitat. Some opportunity for reptiles was observed within the improved grassland to the south east of the application site, along hedgerow, woodland and scrub, and a small strip of poor semi-improved grassland along the northern boundary of the application site.

9.3.64. Reptile surveys were carried during suitable conditions and were discontinued after five visits due to no animals being observed (see **Appendix 9.12**). Reptiles are considered to be absent from the application site and are not considered further within this assessment.

Water voles

9.3.65. A number of wet ditches and ponds were identified across the application site offering potential habitat for water vole. All areas of suitable habitat were surveyed, and the findings are presented in **Appendix 9.13**. Two surveys were carried out where suitable habitat exists: Visit 1: all potential habitat. Visit 2: Pond A, Pond B, Pond K, Pond Ki, Ditch 1, Ditch 2, Ditch 3, Ditch 6, Ditch 7, Ditch 9 and Ditch 10. No evidence of water voles was observed and they are considered to be absent from the application site. By the time of the second survey, most habitat was either dry or fully occupied by brown rat and there was no evidence of water voles throughout. Therefore, water voles are not considered further within this assessment.

Bats

9.3.66. All bats are European Protected Species and are therefore International valued receptors.

9.3.67. No built structures currently exist within the application site. Much of the application site is covered by woodland and scattered trees (totalling 79,992 m^2) offering potential roosting habitat and foraging and commuting opportunity. During the initial Ground Level Tree Survey, a total of 169 trees were identified as containing either ‘Low’, ‘Moderate’ or ‘High’ potential for roosting bats. Trees containing ‘Moderate’ and ‘High’ potential were subject to further assessment, including endoscope surveys and/or dusk and dawn activity surveys.

9.3.68. A total of three confirmed roosts were identified on or near to the application site boundary. Two of these roosts are located off-site but within 30m of the application site, and a single roost was identified within the application site within Duck Wood (see **Figure 9.9**). All roosts have been classified in accordance with Bat Conservation Trust guidelines (Ref. 9.3).

9.3.69. A summary of the identified roosts is detailed below:

- Roost 1 (day roost) was identified in T23 within the eastern woodland belt, off-site. A single common pipistrelle was observed emerging from a bat box during the third and final bat survey of this roost feature.;
- Roost 2 (day roost) was identified in T32 within Finches Plantation to the south of the application site. A single common pipistrelle was observed emerging from a tear-out feature on the tree;
- Roost 3 (day roost) was identified in T115 within Duck Wood. Two soprano pipistrelles were observed emerging from a tear-out feature during the first bat activity survey. No further evidence of bats using the roost was observed during subsequent visits.

9.3.70. An assessment of the habitat on site was deemed as being of 'Moderate' suitability for commuting and foraging bats. A series of transect surveys were undertaken and found that overall, bat activity was relatively low across the application site when considering its size and extent of woodland.

9.3.71. Across five transects, involving two routes, a total of 278 bat passes were recorded. 73% of these passes were common pipistrelle, 17% were soprano pipistrelle, 8% were noctule and 1% were Myotis species.

9.3.72. Bat activity was mostly observed at woodland edges, being concentrated towards the central and southern portions of the application site, notably around Woodland 'B' and Big Belt Wood. A limited amount of foraging activity was noted along the northern boundary of Booth's Wood, with only common species being noted. Increased activity was occasionally noted along Whittle Brook, and the southern edge of Booth's Wood exhibited a higher level of activity during some transect surveys. Hedgerows exhibited very little use by bats. Limited bat activity was noted towards the north of the application site and near the M62, again at woodland edges (Plain Plantation and Woodland 'A'). See **Appendix 9.14**.

9.3.73. Two static bat detectors were deployed in areas perceived to exhibit the highest levels of bat activity within the application site (to the west and east of Woodland 'B'; **Appendix 9.15**). Static detectors recorded a minimum of eight bat species during the course of deployment.

9.3.74. Static detectors were left *in situ* a total of 43 days between May – August, inclusive, and October 2019. Static Detector 1 recorded an average of 145 bat passes per night during this period. Static Detector 2 recorded an average of 199 bat passes per night during the same period. See **Appendix 9.15**.

9.3.75. Static 1 recorded the following average species activity:

- Common pipistrelle: 89%
- Soprano pipistrelle: 3%
- Brown long-eared: 0.16%
- Noctule: 1.75%
- Leisler's bat *Nyctalus leisleri*: 0.11%
- Whiskered bat *Myotis mystacinus*: 0.11%
- Daubenton's bat *Myotis daubentonii*: 0.07%

9.3.76. Static 2 recorded the following percentage of species activity:

- Common pipistrelle: 83%
- Soprano pipistrelle: 13%

- Brown long-eared: 0.10%
- Noctule: 2%
- Leisler's bat: 0.18%
- Whiskered bat: 0.18%
- Natterer's bat *Myotis nattererii*: 0.02%

Breeding birds

9.3.77. All breeding birds listed by BOCC (Red) are regarded as National receptors. Those Amber are regarded as county receptors and others are site receptors.

9.3.78. During the bird breeding survey visits, a total of 28 species were recorded using the application site, or close to the application site boundary (see **Appendix 9.16**). Of these, at least 18 were considered to be within suitable breeding habitat and/or displayed breeding behaviour. The following notable species were recorded potentially breeding on site:

- Lapwing *Vanellus vanellus* (Red BoCC and Local and UK Priority Species);
- Oystercatcher *Haematopus ostralegus* (Amber BoCC);
- Dunnock *Prunella modularis* (Amber BoCC and UK Priority Species); and
- Song thrush *Turdus philomelos* (Red BoCC and UK Priority Species).

9.3.79. Additionally, the following species were recorded within 50m of the application site boundary:

- Yellowhammer *Emberiza citrinella* (Red BoCC); and
- Skylark *Alauda arvensis* (Red BoCC and UK Priority Species).

9.3.80. During other separate non-bird species-specific surveys, an additional observation was made of grey partridge *Perdix perdix* (Red BoCC and Local and UK Priority Species) using the application site.

Wintering birds

9.3.81. At the time of writing this chapter, a total of five wintering bird surveys have been undertaken. To date, no wintering birds (Mersey Estuary SPA qualifying species) have been observed using the application site. Subject to agreement with Merseyside Environmental Advisory Service, surveys will cease after December 2019 if no evidence of wintering birds using the application site has been obtained. At this juncture, wintering birds are considered as highly unlikely to be using the application site and are not considered further within this assessment.

Other species

9.3.82. Brown hare *Lepus europaeus* was noted several times across most of the application site during a number of visits. Brown hare is a Local and UK Priority Species. It is considered as a national valued receptor.

9.3.83. During a site walkover of Whittle Brook by WSP (September 2019), an assessment was made of habitat suitability for aquatic invertebrates and fish. Further Phase 2 surveys were recommended during a suitable time of year where impacts to the brook are likely to take place. It is recommended that where brook diversion is required in the future, these surveys are undertaken at appropriate times of year. Aquatic invertebrates and fish are not considered further within this assessment.

FUTURE BASELINE

9.3.84. The future baseline is considered to remain largely as current. Bird species diversity and abundance is likely to fluctuate on an annual basis depending upon the type of crops grown, the timing of planting and harvest, and the management practices associated with growing such crops. While the pond features within the application site are generally of poor quality, it is perceived that these features can only continue to degrade due to agricultural run-off, heavy siltation and continued over-shading. In the short- and long-term, bat foraging and commuting habitat will likely remain as is current on site. Bat roosting opportunity will likely increase over time as trees produce roosting opportunity with age.

9.4. SENSITIVE RECEPTORS

9.4.1. The following sensitive receptors have been identified within the application site:

Habitat

- Woodland and trees (including those covered by TPOs);
- Hedgerows;
- Ponds;
- Booth's Wood (LWS); and
- Whittle Brook.

Species

- Bats;
- Breeding birds;
- Brown hare; and
- Purple ramping-fumitory.

9.4.2. All key sensitive receptor locations are shown on **Figure 9.10**.

9.5. LEGISLATIVE FRAMEWORK, POLICY AND GUIDANCE

LEGISLATIVE FRAMEWORK

9.5.1. The applicable legislative framework is summarised as follows (refer to full details in **Appendix 9.17**):

- The Wildlife and Countryside Act 1981 (as amended);
- Protection of Badgers Act 1992;
- Countryside and Rights of Way (CRoW) Act 2000;
- Natural Environment and Rural Communities (NERC) Act 2006; and
- The Conservation of Habitats and Species Regulations 2017.

POLICY

Local Policy Documents

- Core Strategy Local Plan (adopted October 2012);
- St. Helens Draft Local Plan (2020 – 2035);

- Saved Polices of the 1998 Unitary Development Plan; and
- Bold Forest Park Area Action Plan (adopted July 2017).

9.5.2. In addition, this chapter has been prepared in accordance with the Government's National Planning Policy Framework 2019 (Ref. 9.20).

GUIDANCE

9.5.3. The following guidance documents have been used during the preparation of this chapter:

- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester;
- BS 42020:2013 Biodiversity — Code of practice for planning and development (Ref. 9.21);
- CIEEM, CIRIA & IEMA 2016 Biodiversity Net Gain: Good practice principles for development (Ref. 9.22);
- Birds of Conservation Concern 4: the populations status of birds in the UK, Channel Islands and Isle of Man;
- Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition; and
- The Biodiversity Metric 2.0: auditing and accounting for biodiversity value. Natural England, 2019.

9.6. ASSESSMENT OF POTENTIAL EFFECTS, MITIGATION AND RESIDUAL EFFECTS[1]

9.6.1. Locations of specific habitat (i.e. woodland blocks, pond names etc.) and habitat calculations split between the detailed planning application site and the outline planning application site are presented in **Appendix 9.18**.

9.6.2. Additionally, Defra's Biodiversity Metric 2.0 (referred to hereafter as 'the Metric') has been used to further aid the assessment of impacts for those receptor habitats considered to be of greater significance to the Proposed Development (e.g. woodland). The Metric uses the baseline information as reported in Section 9.3 above to determine a value, or Biodiversity Unit figure, for the total net change in habitat. This is achieved by assessing the area, quality and condition of existing habitat against the habitat status in the operational phase, following mitigation measures (but excluding off-site compensation). The Metric has been undertaken separately for the detailed planning application site and the outline planning application site; however, the two Biodiversity Units scores can be condensed to provide a single value. Note that in the absence of any legislation, policy or guidelines, the way in which a single Biodiversity Unit (BU) is then interpreted is not dealt

[1] Landscaping mitigation has been included wholly as part of the Construction Phase since, although magnitude of change will increase positively over time into the operational time-line as the habitat matures, the original mitigation provided (e.g. planting) was to mitigate of Construction impacts.

with further within this chapter and is a matter of negotiation between St. Helens Council and the Applicant.

CONSTRUCTION PHASE

Table 9-7 - Assessment of potential effects, additional mitigation, residual effects and monitoring during construction

Sensitive receptor	**Woodland and Trees (Priority Habitat - National Receptor)**
Potential effects	Potential effects upon woodland and trees (Priority Habitat and TPOs) during construction include: • A permanent loss of woodland and trees totalling an area of ~56,339 m^2. Much of the woodland that would be lost is covered by TPOs. Scattered trees, mostly present along dry and wet ditches and ponds, are included within the above calculation. Damage to woodland/trees, including those covered by TPOs.
Additional mitigation	Tree and woodland planting is proposed within the landscape and ecological area and the western boundary of the application site (ecological mitigation areas), as detailed within the wider Landscape Scheme (INFRA DWG.16; INFRA DWG.17)). Newly planted woodland would provide a total area of 80,639 m^2 within these areas. To conform with Policy CQL2, off-site planting / compensation would be provided in addition to on site mitigation so that a total 2:1 replacement of trees is met (providing a minimum of 112,678 m^2 woodland habitat). Omitting potential future planting within the outline planning areas application site, off-site compensation totalling 32,039 m^2 (or an agreed biodiversity compensation payment) and on-site mitigation totalling 80,639 m^2 would ensure that a clear net gain would be achieved by way of tree planting at a ratio of 2:1. Species would all be native and, where possible, be of local provenance. Species lists show that an increase in native tree species diversity also would be provided. An agreement is to be reached over the amount of contribution required for the full part of this application based on these figures above. Where off-site habitat creation is required, it is important that this is suitably designed to be ecologically and functionally similar to the habitat being lost on site. Additionally, compensation should be provided as close as possible to the location where habitat loss has occurred and benefit the same (and more) species as those affected. Additional mitigation for retained woodland and trees within the detailed planning application site is to be covered within a CEMP, which will further cover Tree Protective Fencing (see **Appendix 9.19**) to be installed prior to construction works commencing on site. The Tree Constraints Plan is presented in **Appendix 9.20**, which details RPAs, restricting certain works. All construction works would be undertaken in accordance with BS 5837 'Trees in relations to construction'. Any tree or area of woodland covered by a TPO would be included within these protective measures. All construction activities would be designed as to avoid woodland and RPAs where possible, and otherwise restricted to agreed Method Statements. A CEMP is recommended for all future works within the outline planning application site as detailed proposals emerge.

	For trees covered by a TPO and requiring removal, these would only be removed only once full planning permission is granted (as to comply with legislation) and tree removal would only take place outside the bird breeding season (1 March – 31 August, inclusive). It is considered that the current woodland is of high quality due to size/age but not to species composition which is poor. While newly planted woodland would not immediately be of the same value/quality in the short-term, it would however progress to be an enhanced, quality in the long-term providing a 2:1 coverage off wooded area. In the context of woodland, long-term can be considered as c.50+ years, and short-term can be considered c.0 - 20 years. **Habitat Loss/Creation Summary** Total woodland/tree loss = 56,339 m^2 Total woodland/tree creation = 80,639 m^2. Area of on-site woodland planting additional to that being lost is therefore 80,639 – 56,339 = **24,300 m^2**. **<u>Biodiversity Metric</u>** The Metric results in a -22.48BU loss of lowland mixed deciduous woodland following on-site mitigation. To provide a net gain, +22.49BU must be provided in off-site compensation. It should be noted that the Metric included additional woodland planting (~3ha) within the outline planning application site, following landscape drawing reference: OPP.DWG10.POE_199_011). Refer to **Appendix 9.18** for habitat loss calculations and maps, including the Metric results. Mitigation would be secured via approved Landscape Schemes and agreed compensation with St. Helens Council. It will be implemented and delivered by the project landscape contractor with compliance visits undertaken by a suitably qualified ecologist.
Residual effects and monitoring	Woodland and trees are Priority Habitats and therefore national value receptors, and the magnitude of change, following mitigation, is initially large at the point of felling wooded areas, but since the newly planted areas will increasingly provide a mature area, this change will reduce in magnitude over time from large (negative) to eventually provide a **moderate-major beneficial** effect which at 2:1 in extent, and with an improved species richness, will be **significant** following the implementation of mitigation measures (which must include off-site compensation). Monitoring in accordance with long-term management plans would be required to ensure the successful establishment of planted woodland.

Sensitive receptor	**Hedgerow (Priority Habitat)**
Potential effects	Potential effects upon hedgerows (Priority Habitat) during construction include: • Permanent loss of species-poor, intact and defunct hedgerow totalling 534 linear metres across the entire application site.
Additional mitigation	Additional species-rich native hedgerow would be planted within the ecological mitigation areas (Green Wedge / western boundary) totalling 770 linear meters, as detailed within the Place on Earth Landscape Scheme (INFRA DWG.17).

	The on-plot detailed landscape scheme (by J B Landscape Associates; UNIT 1 DWG.13) would provide an additional 938 linear metres of species-rich native hedgerow. All native hedgerow planting is to be of local provenance, where possible. A net gain of 1,174 linear metres of species-rich hedgerow would be achieved under these proposals. It is recommended that species-rich native hedgerow is included within future on-plot Landscape Schemes for the outline planning application site, and to be dealt with in reserved matters. Significant opportunity for further hedgerow exists within the outline planning application site. **Habitat Loss/Creation Summary** Total hedgerow loss = 534 lin.m Total hedgerow creation = 1,708 lin.m Additional hedgerow creation = **1,174 lin.m** **Biodiversity Metric** The Metric results in a +14.57 gain in hedgerow units following on-site mitigation. No further mitigation would be required. It should be noted that the Metric included additional hedgerow planting (~1.4km) within the outline planning application site, following landscape drawing reference: OPP.DWG10.POE_199_011). Mitigation would be secured via approved Landscape Schemes. It will be implemented and delivered by the project landscape contractor with compliance visits undertaken by a suitably qualified ecologist.
Residual effects and monitoring	Hedgerows are a national receptor and the magnitude of change, following mitigation, is medium. There is likely to be a direct, permanent **moderate** long-term **beneficial** residual effect on hedgerow (**significant**) following the implementation of mitigation measures since the species diversity and extent will increase.

Sensitive receptor	**Ponds (Priority Habitat)**
Potential effects	A total of 13 ponds would be permanently lost, totalling an area of 10,316 m^2. Pond 1, Pond 4, Pond A, Pond C, Pond D and Pond AZ are to be lost within the detailed planning application site. Pond B, Pond S, Pond G, Pond I, Pond X, Pond Ki and Pond K will be lost within the outline planning application site. Potential fish occupying the ponds may be harmed during pond drainage. Refer to **Appendix 9.18** for habitat loss calculations and maps, including the Metric results.
Additional mitigation	Proposed attenuation features (within detailed plot) total ~12,031 m^2 and would be designed as to hold permanent water (see Drainage Strategy ref: INFRA DWG.5) and to provide high-quality wet grassland and aquatic planting (see detailed Landscape Strategy (UNIT 1 DWG.13). This would significantly enhance the pond habitat that currently exists within the application site.

	A total area of 3,711 m^2 of newly created pond habitat is proposed for the landscape and ecological area (see Landscape Scheme ref: INFRA DWG.16; INFRA DWG.17). Ponds are designed to hold permanent water and will provide high-quality grassland habitat and aquatic plant species. Newly created ponds/attenuation features will offer enhanced habitat for notable and future colonisation of notable and protected species on site and will significantly enhance the value of aquatic habitat that currently exists. **Habitat Loss/Creation Summary** Total pond loss = 10,316 m^2 Total new pond habitat across the application site = 15,742 m^2. Additional pond area = **5,426 m^2**. For the outline planning application site, further mitigation will be dealt with in reserved matters once details emerge. However, it is recommended that attenuation features are also designed to hold permanent water and to provide high-quality wet grassland and aquatic habitat, as above. **Biodiversity Metric** The Metric results in a +12.69BU gain for ponds following on-site mitigation. No further mitigation would be required. It should be noted that the Metric included additional pond coverage (~1.22ha) within the outline planning application site, following landscape drawing reference: OPP.DWG10.POE_199_011). A Method Statement detailing fish capture and translocation should accompany the CEMP and be carried out by suitably qualified persons during pond drainage. Mitigation would be secured via approved Landscape and Drainage Schemes. It will be implemented and delivered by the project landscape contractor and site contractor. A fish-rescue methodology, approved by St. Helens Council, will be delivered by an appointed ecological specialist.
Residual effects and monitoring	Ponds are national receptors, and initially the magnitude of change, following mitigation, is adversely large. Ponds are known to be colonised rapidly and this change will reduce in magnitude over time from large (negative) to eventually provide a moderate beneficial effect. There is likely to be a direct, permanent **moderate** to **major** long-term **beneficial** residual effect on ponds (**significant**) following the implementation of mitigation measures.

Sensitive receptor	**Booth's Wood (LWS)**
Potential effects	Potential effects on Booth's Wood LWS during construction include: • Removal of vegetation / damage to trees and/or their roots during drainage connection to Whittle Brook through Booth's Wood LWS; • Soil compaction from stored materials / heavy machinery during construction; • Soil compaction / damage to roots and trees during construction of cycleway/footpath
Additional mitigation	A CEMP is recommended in accordance with BS 42020:2013. The CEMP should detail the following measures for the detailed planning application site:

	• The erection of tree protective fencing in accordance with the Aboricultural Assessment (**Appendix 9.7**) and **Appendix 9.19**; • A written working methodology to be agreed with St. Helens Council and strictly adhered to during any vegetation removal or digging within Booth's Wood LWS or associated RPA (including installation of drainage discharge and outfall into Whittle Brook); • No entry within RPAs unless prior written agreement from the project ecologist; • An agreed methodology for any cycleway/footpath construction works; • Allocated areas for storage of materials, away from sensitive receptors and confined within Heras fencing. It is further recommended that a CEMP is provided when dealing with reserved matters for the outline planning application site to mitigate potential effects on areas of Booth's Wood LWS within, and neighbouring, this area of the Proposed Development. Mitigation would be secured via approved CEMP. It will be implemented and delivered by the appointed site contractor with compliance visits undertaken by a suitably qualified ecologist.
Residual effects and monitoring	Booth's Wood LWS is a county valued receptor., and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a **negligible** residual effect on Booth's Wood LWS (**not significant**) following the implementation of mitigation measures.

Sensitive receptor	**Whittle Brook**
Potential effects	Potential effects on Whittle Brook during construction include: • Potential pollution of watercourse during construction activities; • Unnecessary damage to brook banks during outfall creation for discharge for Unit 1 (detailed planning application site); • Degradation in ecological quality of watercourse during brook diversion (outline planning application site).
Additional mitigation	A CEMP is recommended in accordance with BS42020. The CEMP should detail the following measures for the detailed planning application site: • Protective fencing (such as Heras fencing) along all sensitive areas of the watercourse where construction works must not encroach; • Designated compounds for storage of potentially hazardous materials to water (including wet concrete), to be situated away from the watercourse, and suitably bunded where necessary; • All construction workers should be made aware of sensitive receptors during site induction. • A Method Statement should accompany the CEMP detailing a suitable methodology of works to connect drainage to the watercourse.

	A Water Framework Directive assessment has been undertaken and takes into consideration potential impacts on the ecological quality of Whittle Brook during the watercourse diversion. Mitigation would be secured via a CEMP. It will be implemented delivered by the project ecologist in conjunction with the appointed site contractor with compliance visits undertaken by a suitably qualified ecologist.
Residual effects and monitoring	Whittle Brook is a county valued receptor, and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a **negligible** residual effect on Whittle Brook (**not significant**) following the implementation of mitigation measures.

Sensitive receptor	**Bats (European Protected Species)**
Potential effects	Potential impacts on bats during construction include: **1. Bat Roosts** ***Bat Roost Loss*** There are no bat roosts within the detailed planning application site. A day bat roost would be lost within the outline planning application site (Roost 3 [T115], Duck Wood; **Figure 9.9**). ***Noise and Vibration*** There is potential for noise and vibration disturbance to Roost 1 and Roost 2 in the outline planning application site (**Figure 9.9**). ***Loss of Potential Roosting Habitat for the Future*** Through loss of woodland there would be a loss of potential roosting habitat in the future. **2. Foraging and Commuting Habitat** ***Loss of Foraging and Commuting Habitat*** There would be permanent loss of bat foraging and commuting habitat within the detailed and outline planning application sites.
Additional mitigation	**Bat Roost Loss** Where the removal of Roost 3 cannot be avoided, a licence must be obtained for the removal of the roost. Roost removal should be undertaken during a suitable time of year (i.e. during the winter period – November – February, inclusive, or when bats are proven absent), and would involve soft-felling techniques, following best practice guidelines. Further considerations and mitigation should be explored when determining reserved matters for the outline planning application site to ensure appropriate licences are secured and unlawful practices during construction are avoided. A Bat Box Proposals Map (**Figure 9.11**) has been provided to enhance bat roosting opportunity within the detailed planning application site. This includes the provision of 17 bat boxes, suitable for a range of species identified on site and within the local area. Bat boxes will also provide habitat for a range of roost types.

	Noise/Vibration Disturbance to Bats Further considerations and mitigation should be explored when determining reserved matters for the outline planning application site to ensure appropriate licenses are secured and unlawful practices during construction are avoided. **Loss of Foraging and Commuting Habitat (both detailed and outline planning application sites)** ***Habitat Creation*** The Landscape Scheme and design of the landscape and ecological area propose woodland and hedgerow habitat provision which will develop into suitable bat foraging and commuting habitat. The design of newly planted woodland ensures suitable connectivity to Booth's Wood LWS, and beyond along the western boundary to the wider landscape off-site. Native hedgerow planting would run adjacent to Whittle Brook, strengthening the commuting corridor and enhancing foraging opportunity. Newly planted woodland has been designed to increase foraging and commuting opportunity by creating a diverse woodland edge effect in terms of spatial design. Mitigation would be secured via approved Landscape Schemes and agreed compensation with St. Helens Council. It will be implemented and delivered by the project landscape contractor with compliance visits undertaken by a suitably qualified ecologist.
Residual effects and monitoring	Bats are International receptors, but the application site does not host an important assemblage (roosting or foraging/commuting). The magnitude of change, following mitigation, is minor (adverse) with the loss of a non-important roost removed lawfully under a licence. Provision of bat boxes (Figure 9.11) and additional hedgerow habitat means that there is likely to be a direct permanent **moderate** long-term **beneficial** residual effect on bats (**significant**) following the implementation of mitigation measures.

Sensitive receptor	**Breeding Birds**
Potential effects	Potential impacts on breeding birds during construction include: • Loss of woodland, hedgerow and scrub habitat across the application site suitable for a range of common breeding bird species and Priority Species (dunnock and song thrush) • Loss of potential habitat for ground-nesting birds, including Priority Species – Lapwing and grey partridge • Potential impact on wild birds, their nests and eggs during vegetation clearance
Additional mitigation	Habitat loss is mitigated through the provision of bird breeding habitat within the ecological mitigation areas and the detailed Landscape Schemes. Newly created bird breeding habitat includes (excluding the outline planning application site): • 1,708 lin.m of species-rich native hedgerow; • 80,639 m^2 of newly created native woodland (plus off-site compensation to be agreed);

	• 14,148 m^2 mixed native plantings within detailed plot (refer to INFRA DWG.13). Additionally, high-quality grassland has been designed to feature around newly created pond and attenuation features (totalling 69,222 m^2 [excluding the detailed planning application site]), with additional wildflower meadow and wetland grassland proposed for the detailed planning application site (totalling 22,312 m^2), providing potential habitat for ground-nesting birds. Removal of vegetation during site clearance should be controlled through the provision of a CEMP, prepared to BS42020 standard. Works will not affect bird breeding habitat between the 1 March to 31 August, or if this unavoidable, a Method Statement must be prepared by a suitable qualified ecologist prior to any works taking place. Bird boxes targeted for a range of species noted using the application site, with additional starling and owl boxes would be provided, totalling 19 boxes, as evidenced within **Figure 9.12**. Additional mitigation would be established for the outline planning application site in reserved matters as details emerge. Mitigation would be secured via approved Landscape Schemes. It will be implemented and delivered by the project landscape contractor with compliance visits undertaken by a suitably qualified ecologist. Nest boxes mitigation would be undertaken by the appointed site contractor, under the guidance of a suitably qualified ecologist.
Residual effects and monitoring	All breeding birds listed by BOCC (Red) are regarded as national receptors. Those Amber are regarded as county receptors and others are site receptors. The magnitude of change, following mitigation, for ground nesting birds will be adversely minor since they are locally common species. Once landscaping has matured there will still be a deficit in ground nesting habitat and we still consider there will be a direct, permanent **minor** adverse residual effect on breeding birds (**not significant**) following the implementation of mitigation measures.

Sensitive receptor	**Brown Hare (UK and Local BAP)**
Potential effects	Potential effects on brown hare (Local and UK BAP) during construction include: • There would be a loss of ecologically poor improved grassland habitat, suitable for brown hare (totalling 104,898 m^2); • Brown hare may be injured/killed during vegetation clearance
Additional mitigation	Additional grassland creation within the ecological mitigation areas and detailed planning application site would provide suitable habitat for brown hare, while remaining connected to the wider landscape to the west. It is recognised that a total net loss of 17,032 m^2 will result from the construction of the Proposed Development. However, newly created grassland will be of much high quality and species diversity compared to the species-poor grassland currently on site. Newly created habitat will be of much greater ecological value. It is recommended that further suitable habitat is created where possible within the outline planning application site, via a Landscape Scheme, as details emerge.

	Habitat removal would be controlled by the provision of a CEMP and should include removing habitat in non-concentric movements to allow animals to escape. Mitigation would be secured via approved Landscape Schemes and a CEMP. Habitat creation will be implemented and delivered by the project Landscape Contractor. Welfare of brown hare will be implemented by the appointed site contractor delivered via site induction to all staff removing vegetation.
Residual effects and monitoring	Brown hare are a priority species and are therefore regarded as a national receptor. The magnitude of change, following mitigation, is small. Therefore, there is likely to be a direct permanent **minor** long-term **adverse** residual effect on brown hare (**not significant**) following the implementation of mitigation measures.

Sensitive receptor	**Purple ramping-fumitory (UK and Local BAP, endemic and 'vulnerable' in England)**
Potential effects	Potential effects on purple ramping-fumitory (UK and Local BAP, endemic and 'vulnerable' in England) during construction include: • Damage/loss of plant within the detailed application site.
Additional mitigation	Protective measures for the plant are to be dealt with within the CEMP. This includes a provision of a minimum 5m buffer from any development and the grassland strip, which must not be encroached upon, to ensure that purple ramping-fumitory is not negatively impacted. The detailed Landscape Scheme (UNIT 1 DWG.13) details the retained area of grassland containing this sensitive plant. During construction, the grassland area containing the sensitive plant would be staked out and clearly demarked with construction tape, by an ecologist, so that workers are fully aware of its presence. Additionally, all site workers would be made aware of the plants' location and importance during induction. Mitigation would be secured via approved Landscape Schemes and a CEMP. The project ecologist would be responsible for implementing the buffer zone and providing information for site induction, which would be delivered by the appointed site contractor.
Residual effects and monitoring	Purple ramping-fumitory is a priority species and is therefore a national receptor. The magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a **negligible** residual effect on purple ramping-fumitory (**not significant**) following the implementation of mitigation measures.

OPERATIONAL PHASE

Table 9-8 – Assessment of potential effects, additional mitigation, residual effects and monitoring during operation

Sensitive receptor	**Woodland and Trees**
Potential effects	Potential effects upon woodland and trees (Priority Habitat and TPOs) during the operational phase include: • Illumination of woodland and trees within the outline planning application site.

Additional mitigation	A Landscape Strategy (UNIT 1 DWG.16) has been provided for the detailed planning application site and avoids illuminating Booth's Wood LWS and sensitive habitat by more than 1 lux. It is recommended that a Lighting Strategy is provided as details emerge for reserved matters within the outline planning application site. The Lighting Scheme should be designed as to not illuminate woodland and trees and should be designed in accordance with the latest guidance with regards to bats at the time of production.
Residual effects and monitoring	Woodland and trees are a national receptor as priority habitat. The magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a **negligible** residual effect on woodland and trees (outline planning application site) (**not significant**) following the implementation of mitigation measures.

Sensitive receptor	**Ponds (Priority Habitat)**
Potential effects	Potential effects upon ponds (Priority Habitat and TPOs) during the operational phase include: • Illumination of retained ponds (Pond H & Booth's Wood Pond) and newly created ponds and attenuation features.
Additional mitigation	It is recommended that a Lighting Strategy is provided as details emerge for reserved matters within the outline planning application site. The Lighting Scheme should be designed as to not illuminate pond habitat by more than 1 lux.
Residual effects and monitoring	Ponds are a Priority habitat and are therefore regarded as a national receptor. The magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a **negligible** residual effect on ponds (**not significant**) following the implementation of mitigation measures.

Sensitive receptor	**Booth's Wood LWS**
Potential effects	Potential effects to Booth's Wood LWS during the operational phase include: • Soil compaction / damage to roots and trees during operation of cycleway/footpath; • Potential lighting spill from cycleway/footpath illuminating Booth's Wood LWS; • Potential lighting spill from the detailed planning application site (dealt with within primary mitigation); • Potential lighting spill from the outline planning application site.
Additional mitigation	Careful consideration should be given as to the materials and methods used to create the cycleway/footpath adjacent to Booth's Wood LWS. An ecologist/aboriculturalist should be consulted to determine potential impacts when details of materials and methods of construction of the cycleway/footpath emerge. Where potential damage to trees and/or their roots is deemed likely to take place, then materials such as Geocellular tree protector should be utilised, with guidance of an aboriculturalist.

	A Lighting Scheme should be submitted as part of the detailed design for the cycleway/footpath, where lighting is to be used. This should evidence how Booth's Wood LWS will not be illuminated. A Lighting Scheme should be submitted for all areas of the outline planning application site in reserved matters as details emerge.
Residual effects and monitoring	Booth's Wood LWS is a county valued receptor, and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a **negligible** residual effect on Booth's Wood LWS (**not significant**) following the implementation of mitigation measures.

Sensitive receptor	**Whittle Brook**
Potential effects	Potential effects upon Whittle Brook during the operational phase include: • Degradation in water quality of watercourse; • Degradation in flow rates of watercourse; and • Illumination of Whittle Brook.
Additional mitigation	The integrated SuDs / attenuation design ensures that there is no net adverse impact upon Whittle Brook with regard to water quality and flow rates. It is recommended that a Lighting Strategy is provided as details emerge for reserved matters within the outline planning application site. The Lighting Scheme should be designed as to not illuminate Whittle Brook by more than 1 lux.
Residual effects and monitoring	Whittle Brook is a priority habitat, and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a **negligible** residual effect on Whittle Brook (**not significant**) following the implementation of mitigation measures.

CUMULATIVE EFFECTS

9.6.3. There are no likely impacts foreseen from cumulative effects.

9.7. OPPORTUNITIES FOR ENHANCEMENT

9.7.1. Two ponds are being retained on site (Pond H and Booth's Wood Pond; see **Appendix 9.18**). Opportunity exists to enhance the quality of these ponds. Such enhancement works could include reducing shading, pond dredging and planting of ponds with aquatic plants.

9.7.2. Opportunity exists for the provision of bat and bird boxes within the outline planning application site and within mature trees within and/or immediately adjacent to the application site

9.7.3. Additionally, opportunity to enhance Whittle Brook exists within the outline planning application site, pending further details. The watercourse could benefit from native tree planting, such as black poplar *Populus nigra*, and seeding of the watercourse banks with high quality grassland species mixes. Planting within the watercourse with reeds and coir rolls, for example, would help reduce the levels of siltation currently experienced. Whittle Brook may further be enhancement for water vole by way of planting the banks with a diverse range of suitable water vole foodplants.

9.7.4. Further opportunity for enhancement exists through the control of Himalayan balsam along, and near to Whittle Brook across the application site.

9.8. LIMITATIONS AND ASSUMPTIONS

9.8.1. There were no limitations in making this assessment.

9.9. SUMMARY

9.9.1. **Table 9-9** provides a summary of the findings of the assessment.

Table 9-9 - Summary of Biodiversity effects

Receptor	Potential Effects	Additional Mitigation	Residual Effects	Monitoring
Construction Phase				
Woodland and Trees (Priority Habitat and TPOs)	Permanent loss of woodland and tree cover totalling 56,339 m^2 Much of the woodland that would be lost under the Proposed Development is covered by TPOs. Damage to woodland/trees covered by TPO. A loss of woodland totalling -22.48BU following on-site mitigation in the Metric.	Mitigation planting within ecological mitigation areas totalling 80,639 m^2. A net gain in area on-site of 24,300 m^2. Off-site compensation planting/contribution to secure 2:1 replacement. Off-site compensation to total +22.48BU to ensure no net loss within the Metric. Works to TPOs undertaken only once full planning permission granted. Tree protective measures detailed within a CEMP.	**Moderate – Major beneficial (significant)** P / D / LT	Monitoring in accordance with long-term management plans would be required in ensure the successful establishment of planted woodland.
Hedgerow (Priority Habitat)	Permanent loss of species-poor intact and defunct hedgerow totalling 534 linear metres.	Mitigation planting within ecological mitigation areas totalling 770 linear metres. Newly created hedgerow within detailed planning area totalling 938 linear metres.	**Minor beneficial (not significant)** P / D / LT	N/A

Receptor	Potential Effects	Additional Mitigation	Residual Effects	Monitoring
		Newly created habitat provides a net gain in area of 1,174 linear metres. A gain of +14.87 hedgerow units is achieved in the Metric following on-site mitigation. Recommended species-rich native hedgerow planting within outline planning area as details emerge.		
Ponds (Priority Habitat)	Permanent loss of poor-quality pond habitat totalling 10,316m^2. Loss / damage to fish populations within ponds during pond drainage.	Additional pond creation within Green Wedge totalling 3,711 m^2. Attenuation features to be permanently wet and designed for ecology, totalling 12,031 m^2. Additional pond habitat provides a net gain in area of 5,426 m^2. A gain of +12.69BU is achieved in the Metric following on-site mitigation. Provision of high-quality wet grassland and aquatic planting to significantly enhance current	**Moderate – Major beneficial (significant)** P / D / LT	N/A

Receptor	Potential Effects	Additional Mitigation	Residual Effects	Monitoring
		pond habitat on the application site.		
Booth's Wood LWS	Vegetation removal / damage to trees and/or roots including during drainage works. Soil compaction from stored materials / heavy machinery during construction. Soil compaction / damage to roots and trees during construction of cycleway/footpath.	Provision of a CEMP detailing Tree Protective Fencing and agreed methodology for digging within RPAs; cycleway/footpath construction works; and allocated areas for storage of materials, away from sensitive receptors and confined within Heras fencing.	**Negligible (not significant)**	N/A
Whittle Brook	Pollution of watercourse Damage to watercourse bank during drainage works Degradation in ecological quality of watercourse during brook diversion.	Provision of a CEMP detailing Protective Fencing. Designated compounds for storage of potentially hazardous materials to water and agreed methodology for connecting outfall into the brook.	**Negligible (not significant)**	N/A
Bats	Bat roost loss (outline planning application site)	Obtain necessary licenses when dealing with reserved matters for the outline planning application site.	**Moderate beneficial (significant)** P / D / LT	N/A

Receptor	Potential Effects	Additional Mitigation	Residual Effects	Monitoring
	Noise/vibration disturbance (outline planning application site) Loss of potential roost habitat (application site) Loss of foraging and commuting habitat	Assessment of potential disturbance to bat roosts when dealing with reserved matters for the outline planning application site. Provision of bat boxes for the detailed planning application site. Provision of newly created habitat within Green Wedge and western boundary, connecting to the wider landscape.		
Breeding Birds (including Priority Species)	Loss of bird breeding habitat for aerial nesting (woodland, hedgerow, scrub) Loss of ground nesting bird habitat (grassland / arable) Potential impact on wild birds, their nests and eggs during vegetation clearance.	Works will not affect bird breeding habitat between the 1 March to 31 August, or if this unavoidable, a Method Statement must be prepared by a suitably qualified ecologist prior to any works taking place. Removal of vegetation during site clearance should be controlled through the provision of a CEMP. Additional woodland and hedgerow creation within ecological mitigation areas and	**Minor adverse (not significant)** P / D / LT	N/A

Receptor	Potential Effects	Additional Mitigation	Residual Effects	Monitoring
		detailed planning application site. Provision of high-quality grassland, wildflower meadow and wetland grassland to provide potential habitat for ground nesting birds.		
Brown Hare (Local and UK BAP)	Potential killing/injury Permanent loss of habitat	CEMP detailing sensitive vegetation removal Grassland creation within ecological mitigation areas providing suitable habitat connected to the wider landscape.	**Minor adverse (not significant)** P / D / LT	N/A
Purple Ramping-Fumitory (Local and UK BAP)	Potential damage / loss of sensitive plant	CEMP detailing creation of buffer	**Negligible (not significant)**	N/A
Operational Phase				
Woodland and Trees (Priority Habitat and TPOs)	Illumination of sensitive habitat during operation	Provision of Lighting Strategy for outline planning application site as details emerge.	**Negligible (not significant)**	N/A
Ponds (Priority Habitat)	Illumination of sensitive habitat during operation	Provision of Lighting Strategy for outline planning application site as details emerge.	**Negligible (not significant)**	N/A

Receptor	Potential Effects	Additional Mitigation	Residual Effects	Monitoring
Booth's Wood LWS	Illumination of sensitive habitat during operation Soil compaction / tree and root damage due to pedestrian use of cycleway / footpath	Provision of Lighting Strategy for outline planning application site as details emerge. Seek advice from ecologist / aboriculturalist for design of cycleway/footpath, including the provision of any lighting.	**Negligible (not significant)**	N/A
Whittle Brook	Potential illumination of watercourse. Degradation of water quality and flow rates.	Provision of Lighting Strategy for outline planning application site as details emerge. Detailed SuDs / attenuation design.	**Negligible (not significant)**	N/A

Key to table:

P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N/A = Not Applicable

9.10. REFERENCES

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