e3p

Preliminary Ecological Appraisal Report
Link Logistics Park, Ellesmere Port

Reference:80-411-R1-2
Date: February 2021

PRELIMINARY ECOLOGICAL APPRAISAL REPORT

Link Logistics Park
Ellesmere Port

Prepared for:
Firethorn Developments Ltd

Report Ref: 80-411-R1-2
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E3P

Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

+ 44 (0) 161 707 9612
https://e3p.co.uk/

Registered in England
CRN: 807255262

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QUALIFICATIONS			
SIGNATURE			

EXECUTIVE SUMMARY

Site Address	North Road Industrial Estate, North Road, Ellesmere Port, CH65 1AB
Coordinates	E 338929, N 378705
Site Area	Approximately 15.5 ha
Current Site Use and Adjacent Site Use	The site comprised a disused area of hardstanding, that had been colonised by scattered scrub, with a section of woodland to the west. Previously, the site of the Bridgewater Paper Mill, with the majority of the buildings and structures now demolished. Further industrial developments surrounded the site to the south and east. Adjacent to the west was Booston Wood and Rivacre Brook, with Manchester Ship Canal and the River Mersey to the north.
Designated Sites	The site lies adjacent to the Mersey Estuary Ramsar, SPA and SSSI. HRA screening, to assess any potential impacts of the development on the designated site, is required. Booston Wood LWS lies adjacent to the western site boundary.
Survey Results	The site was found to comprise a large area of hardstanding with smaller areas of broadleaved woodland, semi-improved grassland, dense scrub, scattered scrub and introduced shrub present within the site boundary. The site was found to have the following potential ecological constraints: • B1, B9 and B10 within the site boundary had low bat roosting potential. • B6 and B8 adjacent to the site boundary had low bat roosting potential. • Potential presence of great crested newts within an on-site waterbody and associated terrestrial habitat. • Confirmed records of great crested newts in ponds within 250 m north west of the site. • Potential presence of nesting birds within the broadleaved woodland, dense scrub and introduced shrub. • Confirmed record of nesting peregrines within the site boundary. • Potential presence of badgers within the local area. • Potential presence of otters within the adjacent watercourses. • Potential presence of hedgehogs within the broadleaved woodland, semi-improved grassland, dense scrub and scattered scrub. • Invasive plant species (wall cotoneaster, small-leaved cotoneaster and field horsetail) present on-site.

Conclusions	The following further surveys are recommended: • One nocturnal bat survey on B1, B9 and B10 between May and August. • Great Crested Newt population size class assessments on the on-site pond and three ponds within 250 m of the site boundary. The following mitigation is recommended: • Updated badger walkover prior to start of works. • Precautionary Working Methods for badger. • Precautionary Working Methods for otter. • Precautionary Working Methods for reptiles. • Common amphibians are to be removed by hand from the working area during the clearance phase. • If any vegetation requires removal, it should be removed outside of the breeding bird season (March to September inclusive). If this is not possible, a nesting bird check should be undertaken by a suitably qualified ecologist up to 24 hrs before works commence. If a nest, or nest in construction, is located, then a stand-off distance should be maintained until the young have fledged. • During site clearance, any scrub and debris piles, that require removal, should be demolished by hand to ensure no sheltering hedgehogs are impacted by the works. It is recommended that vegetation clearance takes place outside of December-March to avoid impacting hibernating hedgehogs. • Eradication of invasive species prior to works commencing on-site. In line with the NPPF, the development should strive to achieve no net loss in biodiversity.

Table of Contents

1. INTRODUCTION

1.1. BACKGROUND

E3P were commissioned by Firethorn Developments Ltd to undertake a Preliminary Ecological Appraisal at Link Logistics Park, Ellesmere Port, hereafter referred to as "the site".

This report has been prepared by Huw Morgan BSc (Hons) ACIEEM, Senior Ecologist at E3P, who has seven years professional experience as an ecological consultant. Huw has undertaken multiple Preliminary Ecological Appraisals and condition assessments for various projects across the UK. Huw also holds a class 2 great crested newt Natural England licence, a Natural England barn owl survey class licence and has key experience with birds and plants.

An extended Phase 1 Habitat survey was undertaken by TEP Limited in September 2010 and updated in July 2012 (report reference: NJL Consulting, 2012). TEP Limited also advised on potential impacts associated with decommissioning of plant and demolition of buildings of the former Paper Mill. A bat roost was recorded inside the inking shed DIP#3 which resulted in the production of a Reasonable Avoidance Method Statement to allow removal of the plant and a Natural England licence application (made in May 2011) to allow demolition of the inking shed. This included pre-demolition installation of six bat boxes onto trees on the adjacent Mount Manisty.

1.2. PROPOSED DEVELOPMENT

Development proposals include the demolition of the remaining structures on-site and the construction of an industrial development, with landscape planting and an attenuation pond proposed within the northern western area of the site.

1.3. SITE LOCATION

The site is located north of Ellesmere Port, within a predominantly industrial area of Overpool. North Road lies adjacent to the southern site boundary, with the M53 approximately 110 m south of the site. Rivacre Brook is present approximately 25 m west of the site, within Booston Wood, and a disused railway line forms the northern site boundary, terminating halfway along the northern site boundary. Manchester Ship Canal lies adjacent to the north of the site and railway line, with the River Mersey located beyond this, approximately 170 m north of the site. Please refer to Figure 1.1 for the approximate site location.

FIGURE 1.1 APPROXIMATE SITE LOCATION

1.4. OBJECTIVES

The objectives of the Preliminary Ecological Appraisal are as follows:

- Identify the major habitats present.
- Ascertain the presence or potential presence of any legally protected species and habitats.
- Recommend any further surveys or mitigation that may be required.

The Preliminary Ecological Appraisal comprises a desk study and site walkover. This survey has been completed as a baseline assessment of the site, and as such please see the end of the report for further surveys and mitigation proposed.

2. METHODOLOGY

2.1. DESKTOP STUDY

The following sources of information and ecological records were consulted:

- MAGIC – A web-based interactive mapping system, on which geographic information regarding key environmental schemes and designations are collated, including details of statutory conservation sites, accessed November 2020.
- Aerial mapping and ordinance survey maps.
- Local data records, including RECORD – The Biodiversity Information System for Cheshire, Halton, Warrington and Wirral, received 04th November 2020

A 1 km search area was utilised for the data search, with this being deemed an appropriate distance for the zone of influence of the site. The 1 km search was selected due to the size of the site and the site largely being made up of man-made habitats associated with a former paper mill. The surrounding areas have also been taken into account which is largely made up of industrial estates associated with Ellesmere Port and therefore have limited value for wildlife.

The data search included the request for details of protected and notable species of flora and fauna within 1 km of the central grid reference of the site. In addition, a request was made for any non statutory designated sites within 1 km of the site boundary.

Please note that a lack of up-to-date records does not confirm absence of a species from the area. Lack of records may simply be a result of a lack of protected species surveys being undertaken within the local area.

2.2. VEGETATION AND HABITATS

A Preliminary Ecological Appraisal of the proposed development site was undertaken by Huw Morgan with assistance from Olivia McKechnie on 05th November 2020. The weather was dry, still and overcast.

The walkover survey was undertaken to the standard methodology as detailed by the *JNCC Handbook for Phase 1 Habitat Survey, 2010*. The assessment follows the methodology as per "Guidelines for Preliminary Ecological Appraisal" (CIEEM, 2017).

A vegetation and habitat plan has been produced for the proposed development site and the immediate surrounding area (please refer to Appendix I). The mapping is based on the *Joint Nature Conservation Committee Phase I Habitat Survey Methodology* (JNCC 2010).

Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the Wildlife and Countryside Act 1981 (as amended) and species which are indicators of important and uncommon plant communities. All plant nomenclature follows Stace (2019).

Searches were carried out for the presence of invasive species, including those listed on the revised (April 2010) Schedule 9 of the *Wildlife and Countryside Act 1981 (*as amended*)* including Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*).

2.3. HABITAT CONDITION ASSESSMENT

The Phase 1 habitat types were translated into UKHab habitat types using the UK Habitat Classification User Manual and Field Key (The UK Habitat Classification Working Group, 2018).

Each UKHab habitat type was then assessed using the detailed methodology for assessing condition of habitats outlined in The Biodiversity Metric 2.0 Auditing and Accounting for Biodiversity Technical Supplement (2019).

2.4. FAUNA

A thorough search of the site for signs of protected species of fauna was undertaken during the site walkover. These searches considered the following:

- Suitability of any ponds to support notable amphibians, and the suitability of the site's terrestrial habitats to support amphibians.
- Suitability of the site to support reptiles by way of habitat structure and refuge piles, as well as links to the wider landscape.
- Signs of badgers, by way of setts, mammal paths, foraging signs or latrines to indicate usage of the site by the species.
- Search of any watercourses for signs or suitability for water vole and otter by way of burrows, resting places, holts and foraging signs.
- Suitability of the site to support roosting, foraging and commuting bats.
- Suitability of the site to support notable bird species.
- Suitability of the site to support notable invertebrates.
- Search of the site for any invasive species.

2.5. PRELIMINARY ROOST ASSESSMENT

The Preliminary Roost Assessment (PRA) was undertaken by Huw Morgan and Olivia Mckechnie who holds a Natural England Bat Licence (2020-44631-CLS-CLS) on 05th November 2020.

The survey involved undertaking a systematic search of the structures and trees, searching for signs of bats, or spaces where bats would be able to access. The methodology followed that described in *Bat Surveys for Professional Ecologists, 3rd Edition (Collins, 2016)*.

The structures and trees were categorised for their bat roosting potential as described in Table 2.1 in accordance with Collins (2016).

TABLE 2.1 BAT ROOSTING POTENTIAL CLASSIFICATION OF STRUCTURES AND TREES

CATEGORY	DESCRIPTION
Negligible	A structure or tree with no potential roosting features present or a tree of an age or species that would not support roosting bats.

CATEGORY	DESCRIPTION
Low	A structure or tree with one or more potential roost sites. However, the potential roost sites do not provide suitability for large numbers of bats (i.e. for maternity or hibernation).
Moderate	A structure or tree with one or more potential roosting feature which could support bats but is of a suitability meaning that it would be unlikely to support a roost of high conservation status.
High	A structure or tree with several potential roosting features which would be able to support large number of bats on a regular basis and for longer periods of time.

The survey was undertaken utilising suitable binoculars and ladders to access all areas where safe to do so.

2.6. HABITAT SUITABILITY INDEX

All ponds within a 250 m radius of the site boundary were evaluated using the *Habitat Suitability Index (HSI) (*Oldham et al., 2000*)* which was undertaken by Huw Morgan (2015-101083-CLS-CLS) and Olivia Mckechnie.

The ponds were examined with reference to the ten HSI scoring criteria, which are as follows:

- SI1: Geographical location.
- SI2: Pond area.
- SI3: Pond drying.
- SI4: Water quality (as indicated by the diversity of aquatic plants and invertebrates).
- SI5: Shade.
- SI6: Waterfowl.
- SI7: Fish.
- SI8: Abundance of other ponds within 1 km radius.
- SI9: Quality of terrestrial habitat.
- SI10: Macrophyte cover (i.e. aquatic and emergent plants).

A score is given according to the most appropriate criteria level set within each attribute and a total score is calculated between 0 and 1. Pond suitability is assessed according to the following scale:

- < 0.50 = Poor.
- 0.50–0.59 = Below average.
- 0.60–0.69 = Average.
- 0.70–0.79 = Good.
- > 0.80 = Excellent.

2.7. SURVEY LIMITATIONS

An Ecological Appraisal does not constitute a full botanical survey. Instead, key species are identified to give a representative description of each habitat type.

This survey was undertaken in November and as a result of seasonal vegetation die back, it is possible that some species of flora may have been missed or misidentified. It is possible that some invasive/non-native species could have been missed during the survey.

Internal access to all of the buildings on-site was not possible during survey due to the entrances being boarded up.

Access to all areas within 30 m of the site was not possible due to fencing and walls around the boundary of the site preventing access, therefore, some features may have been missed.

These constraints have been taken into consideration during the assessment.

3. SURVEY RESULTS

3.1. SITE CONTEXT

The site is located at the former Bridgewater Paper Mill which has since been demolished. The site has since been left unmanaged and is currently being used by a neighbouring business to store crushed glass and other materials.

The site comprised mainly hardstanding, surrounded by industrial developments to the east and south, anticipated to have limited ecological value.

Multiple areas of woodland are present in proximity to the site, such as Booston Wood Local Wildlife Site (LWS), which also forms part of the western aspect of the site, Mount Manisty, approximately 95 m north of the site, Rivacre Wood, approximately 800 m south west of the site and Well Wood, Clayhill Wood and Church Wood that together form Rivacre Valley Local Nature Reserve (LNR) approximately 430 m south west of the site. These areas of woodland are connected and anticipated to form foraging, commuting and resting habitat for a variety of local wildlife, as well as nesting and roosting habitat for birds and bats within the trees present. Ancient woodland comprises Clayhill Wood and part of Church Wood, expected to provide unique habitat for communities of flora, fungi, invertebrates and specialist species of birds and mammals.

A railway line is present 1.7 km south of the site, where it crosses the Rivacre Valley LNR. The railway line then branches north, and a disused section of the line forms the northern site boundary, terminating halfway along the northern site boundary. This feature may have important commuting value for local wildlife, connecting the site to the wider landscape.

Rivacre Brook flows through Rivacre Valley LNR. The brook is then culverted to the north under the M53 and emerges in Booston Wood, flowing along the western site boundary approximately 25 m west of the site, before culverting under the Manchester Ship Canal and joining the River Mersey further north. This brook may form a commuting and foraging resource for a variety of terrestrial mammals and birds.

On the northern site boundary is Manchester Ship Canal with the River Mersey beyond. The river is formed of coastal saltmarshes, mudflats and sections of open water, anticipated to form key habitat for wildfowl and wading bird species. The canal and river are expected to act as important commuting and foraging features for a variety of local wildlife.

One waterbody lies within the site boundary and three waterbodies are present within 250 m of the site, approximately 55 m south west (WB2) and 220 m west (WB3) and 216 m west of the site (WB4). All the waterbodies are connected to the site via Booston Wood.

3.2. DESIGNATED SITES

The site is located within the impact risk zone of Mersey Estuary Site Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar, located approximately 90 m north of the site boundary. Mersey Estuary is designated as it is an internationally important site for wildfowl and consists of large areas of intertidal sand and mudflats. The site also includes an area of reclaimed marshland, salt-marshes, brackish marshes and boulder clay cliffs with freshwater seepages.

The Manchester Ship Canal forms part of the southern boundary of the site and separates a series of pools from the main estuary. These pools together with Hale Marsh, located further upstream, are important roosting sites for wildfowl and waders at high tide. Throughout the winter the estuary supports large numbers of wildfowl and waders. 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. The estuary is also a valuable staging post for migrating birds in spring and autumn including golden plover (*Pluvialis apricaria*), redshank (*Tringa tetanus*), shelduck (*Tadorna tadorna*), teal (*Anas crecca*), pintail (*Anas acuta*), dunlin (*Calidris alpine alpine*) and black-tailed godwit (*Limosa islandica*).

Rivacre Valley LNR is located approximately 430 m south west of the site boundary. The LNR comprises ancient woodland with Rivacre Brook running through the site where kingfisher (*Alcedo atthis*) are known to be present.

Booston Wood LWS lies adjacent to the western site boundary.

3.3. HABITATS

The main habitats encountered during the survey are described in the following subsections. Please refer to Appendix I for the Phase 1 Habitat Plan.

3.3.1. BUILDINGS, WALLS AND HARDSTANDING

The site is made up almost entirely of hardstanding with concrete slabs, hardcore, car parks, roads and pavements associated with the former paper mill which has since been demolished. The hardstanding has been left unmanaged and colonised in large areas by flora comprising Canadian fleabane (*Erigeron canadensis*), broad-leaved dock (*Rumex obtusifolius*), yarrow (*Achillea millefolium*), ragwort (*Jacobaea vulgaris*), butterfly bush (*Buddleja davidii*), white melilot (*Melilotus albus*), purple toadflax (*Linaria purpurea*), bramble (*Rubus fruticosus*), bristly oxtongue (*Helminthotheca echioides*), rosebay willowherb (*Chamerion angustifolium*) and saplings of silver birch (*Betula pendula*), goat willow (*Salix caprea*) and grey willow (*Salix cinerea*).

Eleven buildings and two walls were present within and adjacent to the site boundary. A detailed assessment and further photographs of the buildings and walls are outlined within Appendix II.

PLATE 1 SHOWING AREA OF HARDSTANDING

3.3.2. NEUTRAL SEMI-IMPROVED GRASSLAND

Small strips of neutral semi-improved grassland were present in the south-eastern area of the site, located around the former car parking areas. Areas of grassland looked to be previously present in the northern area of the site, however, it has since transitioned into scattered scrub in these areas. The flora in these grassland areas comprised Yorkshire fog (*Holcus lanatus*), Canadian fleabane, broad-leaved dock, butterfly bush, ox-eye daisy (*Leucanthemum vulgare*), bristly oxtongue, rosebay willowherb, bramble, dog-rose (*Rosa canina*), common knapweed (*Centaurea nigra*), ribwort plantain (*Plantago lanceolata*), hawthorn (*Crateagus monogyna*), spear thistle (*Cirsium vulgare*), dogwood (*Cornus sanguinea*), teasel (*Dipsacus fullonum*) and bush vetch (*Vicia sepium*).

PLATE 2 SHOWING NEUTRAL SEMI-IMPROVED GRASSLAND

3.3.3. BROADLEAVED WOODLAND

Areas of broadleaved woodland were present across the site with young self-seeded woodland located in the north-western and south-eastern areas of the site. Small areas semi-mature woodland run along the northern boundary and southern boundaries of the site and a large semi-natural broadleaved woodland associated with Booston Wood lies adjacent to the western boundary of the site. Tree species present comprised silver bitch, grey willow, goat willow, crack willow (*Salix fragilis*), hawthorn, sycamore (*Acer pseudoplatanus*), dog-rose, gorse (*Ulex europaeus*), ash (*Fraxinus excelsior*), oak (*Quercus robur*), alder (*Alnus glutinosa*) and Italian alder (*Alnus cordata*).

PLATE 3 SHOWING AN AREA OF BROADLEAVED WOODLAND

3.3.4. DENSE SCRUB

Small areas of dense scrub were present in the northern area of the site and along the south-western boundary of the site and were associated with the scattered scrub and broadleaved woodland. The species present comprised bramble, dog-rose, rosebay willowherb and grey willow.

PLATE 4 SHOWING DENSE SCRUB

3.3.5. SCATTERED SCRUB

Areas of scattered scrub were present in the northern area of the site, along the south-western boundary of the site and across areas of hardstanding. The scattered scrub appeared to be growing in areas of former semi-improved grassland which has transitioned into scattered scrub due being unmanaged. Large areas of the scattered scrub were waterlogged due to recent heavy rainfall. The scrub species present comprised grey willow, goat willow, crack willow, alder, silver birch, gorse, butterfly bush and bramble with an understorey of grassland species comprising Yorkshire fog, cock's foot (*Dactylus glomerata*), ribwort plantain, red clover (*Trifolium pratense*) and field horsetail (*Equisetum arvense*).

PLATE 5 SHOWING SCATTERED SCRUB

3.3.6. INTRODUCED SHRUB

Small stands of introduced shrub were present in the southern area of the site associated with the former car parking areas. The introduced shrub was likely planted for decorative purposes for the previous buildings on-site. The shrub species present comprised small-leaved cotoneaster (*Cotoneaster microphyllus*), wall cotoneaster (*Cotoneaster horizontalis*), Franchet's cotoneaster (*Cotoneaster franchetii*), daisy bush (*Brachyglottis greyi*), yucca sp. (*Yucca sp.*), evergreen spindle (*Euonymus japonicus*), red-barked dogwood (*Cornus alba sibirica*), laurustinus (*Viburnum tinus*), spotted laurel (*Aucuba japonica*) and barberry species (*Berberis sp.*).

PLATE 6 SHOWING INTRODUCED SHRUB

3.3.7. WATERBODIES

One waterbody was located within the site boundary. A further three waterbodies were identified within 250 m of the site boundary. The on-site waterbody was located in the north-west corner of the site within an area of scattered scrub with grey willow, goat willow and bulrush growing within. The waterbody was shallow and likely dries out during the summer months. The three waterbodies within 250 m of the site comprised a drainage pond for North Road and a large and smaller waterbody located within Booston Wood.

Please refer to Appendix III for full descriptions and photographs of the waterbodies.

3.3.8. RUNNING WATER

Rivacre Brook runs along the western site boundary running from south to north before culverting under the Manchester Ship Canal and entering the Mersey Estuary. The brook runs through Booston Wood and is heavily shaded with sloping muddy banks. The bankside vegetation is limited and is largely comprised of bramble, common nettle and rosebay willowherb. The brook appears to be susceptible to flooding and periods of fast flow with debris and flattened vegetation noted around the banksides.

PLATE 7 SHOWING RUNNING WATER

3.3.9. CONDITION ASSESSMENT

The habitats detailed in the above sections have been translated from Phase 1 habitat types to UK Hab habitat types. Full details of the UK Hab habitat types and the condition assessment are outlined in Table 3.1.

TABLE 3.1 HABITAT BASELINE CONDITION ASSESSMENT RESULTS

HABITAT TYPE (PH1)	HABITAT TYPE (UKHAB)	CONDITION ASSESSMENT	DESCRIPTION
BUILDINGS	Urban; Developed Land; Sealed Surface	N/A	N/A
HARDSTANDING	Urban; Developed Land; Sealed Surface	N/A	N/A
NEUTRAL SEMI-IMPROVED GRASSLAND	Grassland – Modified Grassland	Poor	Most of the condition criteria are being failed. Cover of undesirable species above 15%, usually resulting in a dense scrub or tree cover, or high cover of exotic species.
BROADLEAVED WOODLAND – SEMI-NATURAL	Lowland mixed deciduous woodland	Moderate	Habitat type clearly fails at least 2 of the condition criteria. *3. A diverse age and height structure of the trees, 6. Standing and fallen dead wood of over 20 cm diameter are present including fallen large dead branches/stems and stumps, 8. The area is protected from damage by agricultural and other adjacent operations.*
DENSE SCRUB	Heathland and shrub- Mixed scrub	Moderate	Meets Condition Assessment Criteria for Moderate. The single woody species cover is greater than 75% The age range is missing some size classes. Scrub type of high biodiversity in poor condition.
SCATTERED SCRUB			
INTRODUCED SHRUB	Heathland and shrub- Mixed scrub	Poor	Cover of undesirable and invasive species above 20%
STANDING WATER	Eutrophic standing waters	Moderate	Meets Condition Assessment Criteria for Moderate: There is only moderate water quality. There is insufficient extent of semi natural riparian land. Submerged and floating plants are limited by still presence.

3.3.10. ASSESSMENT OF OPEN MOSAIC HABITAT ON PREVIOUSLY DEVELOPED LAND WITHIN THE SITE

An assessment was undertaken to determine whether Open Mosaic Habitat on Previously Developed Land (open mosaic habitat) was present within the site. This particular habitat is often found on brownfield sites particularly on sites subject to high levels of disturbance. The habitats on-site were assessed against the four criteria that a habitat is required to meet to be assessed as open mosaic habitat. The four criteria and the assessment of the habitats on-site are as follows:

- *1. Known history of disturbance or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials/substrates such as industrial spoil may have been added which in turn has led to a low nutrient environment*. The history of disturbance of the site is known, however, aside from the demolition of the buildings, no further modification of the site has been undertaken. The site currently used for storage of broken glass which is not considered to be of any nutritional value.

- *2. The site contains some vegetation. This will comprise of early successional communities consisting of stress-tolerant species.* The hardstanding lacks successional communities with vegetation comprising only of scattered scrub and poor semi-improved grassland.

- *3. The contains unvegetated, loose bare substrate and pools may be present and desirable*. The hardstanding is well sealed with no loose, bare substrate present. No pools are present within the hardstanding.

- *4. The site shows a spatial variation, forming a mosaic of one or more of the early successional communities plus bare substrate or pools* No mosaic of early successional communities is present within the site with only hardstanding, scattered scrub and poor semi-improved grassland present within the hardstanding area. Bare substrate and pools are also not present.

As a result of the assessment, the four condition criteria for open mosaic habitat are being failed and therefore, this habitat is not present within the site.

3.4. PROTECTED AND NOTABLE SPECIES

3.4.1. AMPHIBIANS

Consultation with RECORD identified records of great crested newts (*Triturus cristatus*) with the 1 km search area, all in association with a pond located approximately 200 m west of the site where a peak count of 279 individuals were recorded in 2018. However, surveys undertaken during the same time period by ERAP (ERAP, 2019) recorded a peak count of 75 within ponds across the same area identified by RECORD.

Consultation with MAGIC identified no great crested newt European Protected Species Licences with the 1 km search area, the closest licence was located approximately 3.1 km south-west of the site, active in 2011 to 2012 for the destruction of a great crested newt resting place. However, consultation with MAGIC has shown three licence returns within 1 km of the site with a pond located within Booston Wood (WB4), approximately 165 m west of the site known to have great crested newts present in 2014. In addition, two ponds to the south of the site within, and adjacent to, Rivacre Valley LNR were also known to have great crested newts present in 2014, located approximately 630 m and 860 m south of the site.

One waterbody was identified on-site (WB1), which was assessed as having good suitability regarding great crested newts. Three waterbodies were identified within 250 m of the site, WB2 was assessed as good and WB3 and WB4 were assessed as average. The habitats surrounding the pond were made up of broadleaved woodland and scattered scrub, providing excellent terrestrial opportunities for the species.

Please refer to Appendix III for full waterbody descriptions and HSI Assessment.

Records of common frog (*Rana temporaria*) were identified within the search area, within an area of woodland, Mount Manisty, adjacent to the Mersey Estuary SSSI and approximately 280 m east of the site, where 21 individuals were identified.

Overall, it is assessed that the site has the potential presence of great crested newts and common amphibians.

3.4.2. BATS

Consultation with RECORD did not identify any records of bats within the search area.

Consultation with MAGIC Mapping identified the presence of a Natural England Bat Mitigation Licence located within the site boundary, which was active in 2011-2013 for the destruction of a common pipistrelle (*Pipistrellus pipistrellus*) non-breeding roost, assumed to be from the demolition of the previous industrial development on-site.

Eleven buildings and two walls were located within or directly adjacent to the site boundary which were assessed for their suitability to support roosting bats, as detailed in Collins (2016). Table 3.2 summarises the results of the inspection. A detailed description of each building and wall with accompanying photographs can be found within Appendix II.

TABLE 3.2 BAT ROOSTING POTENTIAL CLASSIFICATION OF ON-SITE BUILDINGS

BUILDING / WALL NUMBER	DESCRIPTION	SUITABILITY
B1	Single storey red brick building with pitched tiled roof. A small opening in the brickwork on the northern aspect and gaps in the boarded-up windows may provide roosting opportunities for crevice dwelling bat species on an occasional basis.	Low
B2	Small, single room, brick building with wooden barge boards and a flat roof. No features present that could support roosting bats.	Negligible
B3	Single room, red brick building with a pitched tiled roof. No features present that could support roosting bats.	Negligible
B4	A large concrete water tower constructed of concrete and metal. No features present that could support roosting bats.	Negligible
B5	An old metal bike shed with no features that could support roosting bats.	Negligible
B6	A warehouse located adjacent to the eastern site boundary with asbestos sheeting walls and roof. The overlapping sheets and gaps between the walls and roof may provide roosting opportunities for crevice dwelling species on an occasional basis.	Low

BUILDING / WALL NUMBER	DESCRIPTION	SUITABILITY
B7	A large steel storage tank on a brick bund located adjacent to the eastern site boundary. No features that could support roosting bats were identified.	Negligible
B8	A red brick, two storey building with a flat roof located adjacent to the eastern site boundary. Gaps in the barge board around the building may provide roosting opportunities for crevice dwelling bat species on an occasional basis.	Low
B9	Concrete two storey building with a flat roof. A hole in the concrete wall on the western aspect and gaps under the boarded up windows may provide roosting opportunities for crevice dwelling bat species on an occasional basis.	Low
B10	A red brick structure with a mono-pitched corrugated roof, connected to the disused railway. A crack in the brickwork may provide roosting opportunities for crevice dwelling bat species on an occasional basis.	Low
B11	A single room electric substation with no features present that could support roosting bats.	Negligible
W1	A concrete wall located along the northern site boundary. No features were present that could support roosting bats.	Negligible
W2	A concrete wall located along part of the northern site boundary. No features were present that could support roosting bats.	Negligible

No trees within the site boundary were assessed as having bat roosting potential.

The majority of the site is anticipated to have limited foraging value for bats due to the large areas of hardstanding that make up most of the site. However, the semi-improved grassland, broadleaved woodland, dense scrub and scattered scrub located around the boundaries of the site may attract invertebrate prey for bats. The habitats within the site are generally common within the local area but could have value for foraging bats. However, it is anticipated that the bats within the local area will utilise the habitat of greater value in proximity to the site, rather than that present on-site i.e. the Manchester Ship Canal to the north and Booston Wood to the west as the on-site habitats don't provide connectivity to the wider area.

3.4.3. BADGER

Consultation with RECORD identified did not identify any records of badger (*Meles meles)* within the 1 km search area. No badger setts or field signs of badger were located on-site or within 30 m of the site boundary where access was possible.

The site is assessed as having suitability for badger as sett building opportunities are present within the broadleaved woodland, dense scrub and semi-improved grassland around the northern area of the site and within Booston Wood, adjacent to the western site boundary.

3.4.4. OTHER TERRESTRIAL MAMMALS

No records of European hedgehog (*Erinaceus europaeus*) were located within 1 km of the site boundary.

The site was assessed as having suitability for hedgehogs with the broadleaved woodland, semi-improved grassland, dense scrub and scattered scrub providing the most valuable habitat for this species. The surrounding area was also assessed as having suitability due to the presence of Booston Wood to the west of the site.

3.4.5. OTTER AND WATER VOLE

Consultation with RECORD did not identify any records of otter (*Lutra lutra*) or water vole (*Arvicola amphibious*) within the 1 km search area.

No watercourses are present within the site boundary. The Manchester Ship Canal and Rivacre Brook run along the northern and western boundary respectively. Both watercourses were assessed as having suitability for otter. The brook runs through Booston Wood and is likely to act as a commuting feature between the Mersey Estuary and the wider area, there are also holt building opportunities within the woodland close to the brook. The canal is likely to be a key foraging and commuting area for otter due to being directly connected to the Mersey Estuary. Otter holt building opportunities may be present along the banks of the canal. No otter holt building opportunities were present within the site boundary due to a lack of substantial tree roots or other features that could support an otter holt.

Both watercourses were assessed as being unsuitable for water vole due to the size, limited suitable bankside vegetation and poor water quality of the canal and the brook being heavily shaded with limited suitable bankside vegetation. The brook also appears to be susceptible periods high water flow and flooding, with evidence of this observed during the survey.

3.4.6. BREEDING BIRDS

Consultation with RECORD identified numerous records of notable birds within the search area, including barn owl (*Tyto alba*), oystercatcher (*Haematopus ostralegus*), kestrel (*Falco tinnunculus*), peregrine (*Falco peregrinus*), redshank, grey heron (*Ardea cinerea),* skylark (*Alauda arvensis*), reed bunting (*Emberiza schoeniclus*), teal, buzzard (*Buteo buteo),* great black-backed gull (*Larus marinus*), bar-tailed godwit (*Limosa lapponica*), meadow pipit (*Anthus pratensis*), back-headed gull (*Chroicocephalus ridibundus*), herring gull (*Larus argentatus*), dunlin, curlew (*Numenius arquata*), whimbrel (*Numenius phaeopus*), grey wagtail (*Motacilla cinerea*), little egret (*Egretta garzetta*), mallard (*Anas platyrhynchos*), greenshank (*Tringa nebularia*), turnstone (*Arenaria interpres*), cormorant (*Phalacrocorax carbo*), linnet (*Linaria cannabina*), sparrowhawk (*Accipiter nisus*), rock pipit (*Anthus petrosus*), black-tailed godwit, gadwall (*Anas strepera*), golden plover, knot (*Calidris canutus*), lesser whitethroat (*Sylvia curruca*), great crested grebe (*Podiceps cristatus*), green woodpecker (*Picus viridis*), stock dove (*Columba oenas*), ringed plover (*Charadrius hiaticula*), kingfisher (*Alcedo atthis*), snipe (*Gallinago gallinago*), common gull (*Larus canus*), merlin (*Falco columbarius),* great white egret (*Ardea alba),* common sandpiper (*Actitis hypoleucos*), jack snipe (*Lymnocryptes minimus*), lapwing (*Vanellus vanellus*), pochard (*Aythya ferina*), marsh harrier (*Circus aeruginosus*), little grebe (*Tachybaptus ruficollis*), pintail, common tern (*Sterna hirundo*), common scoter (*Melanitta nigra*), dunnock (*Prunella modularis*), water rail (*Rallus aquaticus*), red-breasted merganser (*Mergus serrator*), redstart (*Phoenicurus phoenicurus*), hen harrier (*Circus cyaneus*), shoveler *(Anas clypeata*), wheatear (*Oenanthe oenanthe*), starling (*Sturnus vulgaris*), green sandpiper (*Tringa ochropus*), grey plover (*Pluvialis squatarola*) and lesser black-backed gull (*Larus fuscus*).

The vast majority of the records were associated with the Mersey Estuary, approximately 90 m north of the site.

During the survey, jay (*Garrulus glandarius*), robin (*Erithacus rubecula*), carrion crow (*Corvus corone*), magpie (*Pica pica*), herring gull, feral pigeon (*Columba livia domestica*), long-tailed tit (*Aegithalos caudatus*), snipe, kestrel, sparrowhawk, mistle thrush (*Turdus viscivorus*), pied wagtail (*Motacilla alba*) and grey wagtail were identified within the site boundary. Wigeon (*Anas penelope*) and oystercatcher were identified on the Mersey Estuary, viewed from Booston Wood.

Common bird species are anticipated to be present within the broadleaved woodland, dense scrub, scattered scrub and introduced shrub. The site is assessed as having negligible value for ground nesting birds due to the limited area and the short height of the grassland which would provide no cover from predators. It is also considered that the scattered scrub present across the hardstanding is too sparse to support nesting birds, therefore, the key habitats for nesting birds are considered to be around the boundaries of the site and within the north-west corner.

The site was also assessed for its suitability for little ringed plover (*Charadrius dubius*), due to the species favouring brownfield sites. However, due to the well-sealed hardstanding and lack of suitable areas for nesting within the site such as gravel, shingle or sand (Conway et al., 2019), it is considered that the site is unsuitable for little ringed plover.

A pair of peregrine falcon, a Schedule 1 species is known to nest on the water tower within the site boundary (NJL Consulting, 2012).

3.4.7. REPTILES

Consultation with RECORD did not identify any records of reptiles within the 1 km search area.

The site was found to provide limited value for reptiles, given the majority of the site comprised hardstanding, which lacks the structure and habitat quality to support the species group. The broadleaved woodland and scrub habitats in the northern area of the site could provide some terrestrial cover for the species and is connected to Booston Wood and the wider area.

3.4.8. INVERTEBRATES

The data search identified one notable invertebrate within the search area, ringlet butterfly (*Aphantopus hyperantus*) which is a local BAP species. Numerous other common invertebrates such as common blue butterfly (*Polyommatus icarus*), common carder bee (*Bombus pascuorum*) and orange-tip butterfly (*Anthocharis cardamines*) were also identified within the search area, the majority of which were located within Rivacre Valley LNR approximately 430 m south west of the site boundary.

Overall, the presence of notable invertebrates within the site is reasonably discounted due to a lack of good quality habitat that would support notable invertebrates.

3.5. INVASIVE PLANT SPECIES

Consultation with RECORD identified records of Himalayan balsam (*Impatiens glandulifera*) within the search area, located within a neighbouring industrial development, approximately 170 m south west of the site.

Wall cotoneaster, small-leaved cotoneaster and field horsetail were present within the site boundary, associated with the introduced shrub and semi-improved grassland.

4. ECOLOGICAL CONSTRAINTS AND MITIGATION

4.1. DEVELOPMENT PROPOSALS

Development proposals include the demolition of the remaining structures on-site and the construction of an industrial development, with landscape planting and an attenuation pond proposed within the northern western area of the site.

4.2. DESIGNATED SITES

The site is located within the impact risk zone of the Mersey Estuary SSSI, SPA and Ramsar site, located approximately 90 m north of the site. Manchester Ship Canal present on the northern site boundary also connects to the River Mersey further to the west. The Mersey Estuary is designated as it is an internationally important site for wildfowl and consists of large areas of intertidal sand and mudflats. As per the criteria listed on MAGIC mapping (accessed November 2020), the proposed site will require further consultation with Natural England to proceed. A Habitat Regulations Assessment (HRA) screening assessment will be required to assess whether the proposed development will have any 'likely significant effects' on the designated site.

Rivacre Valley LNR is located approximately 430 m south west of the site boundary and is connected to the site by Rivacre Brook which is present approximately 25 m west of the site boundary. Rivacre Brook also joins the River Mersey further north. Rivacre Brook runs through Booston Wood LWS located adjacent to the western site boundary.

It is recommended that a minimum 10 m buffer zone is maintained around Rivacre Brook, the Manchester Ship Canal and the River Mersey in which no works are permitted. In addition, all best practice guidance relating to pollution will be adhered to in order to protect the watercourses. This will include best practice use of refuelling machinery to avoid fuel spills. Site drainage will need to be considered to ensure that no highly silted or polluted run-off from the site workings will enter the watercourses. All site operatives will undergo a site induction which will brief them as to their working limits and legal responsibilities.

Best practice protection measures as detailed within PPG5 Pollution Prevention Guidelines (2007) are to be put in place to protect the watercourses. The following control measures would be required during any ground works and during the construction phase to ensure there are no impacts on the watercourses and water table or any wildlife utilising it:

- All operational plant will be kept well maintained and should not enter/be stored within the buffer zone.
- Turning off plant when not in use.
- Dampening of the operational areas will be regularly undertaken during dry weather conditions to avoid dust. Dust management will be extended to cover the plant and all operational areas and will be complied with throughout the period of development.

- Measures to prevent pollutants from entering ground and surface water is standard construction practice through the use of a bunded fuel storage and refuelling area at a discrete distance from any watercourses. These measures should be underwritten by spill management equipment being kept on-site and capable of being effectively utilised by trained operatives to contain any accidental spillage within any part of the operational area.

- A toolbox talk should be completed by a qualified ecologist to ensure contractors are aware of Rivacre Brook, Booston Wood LWS, Manchester Ship Canal and the Mersey Estuary SSSI, SPA, Ramsar and their ecological importance.

- During night hours, no lighting is to be located towards Rivacre Brook, Booston Wood LWS, Manchester Ship Canal and the Mersey Estuary SSSI, SPA, Ramsar to ensure no wildlife are deterred from using it.

- A 'Site Tidy' protocol is to be put in place on-site. All litter is to be appropriately controlled, whilst on-site materials are to be adequately stored over-night.

- All excavations will be battened at a 45-degree angle to allow escape should animals become trapped.

No increase in visitor numbers are anticipated on the Mersey Estuary SSSI, SPA, Ramsar, Booston Wood LWS or Rivacre Brook LNR as a result of the proposed industrial development.

4.3. HABITATS

The site comprises habitats that were found to be widespread within the local area; however, they did contain value for wildlife such as bats, birds and terrestrial mammals. The hardstanding is of lowest value for wildlife, with the waterbody, broadleaved woodland and dense scrub comprising the areas of highest value.

4.3.1. BROADLEAVED WOODLAND

It is recommended that, where possible, the broadleaved woodland areas listed as a BAP habitat are retained and protected through development. It is anticipated that some areas may require removal, and where this is needed, the trees should be replaced as soon as practicable. Any replacement planting should endeavour to be on the same aspect as that to be lost.

It is recommended that the landscape planting comprises native species and species known to be of value for the attraction of wildlife. This will include fruiting and flowering species. Species deemed suitable for this development could include berry-bearing native species such as:

- Hawthorn;
- Rowan (*Sorbus aucuparia*);
- Holly (*Ilex aquifolium*);
- Whitebeam (*Sorbus aria*);
- Spindle (*Euonymus europaea*);
- Dog rose;

- Guelder rose (*Viburnum opulus*); and
- Elder (*Sambucus nigra*).

All planting should be from a trusted pest-free source and, where possible, be of local provenance.

Any trees or shrubs within the site or boundary, to be retained, are to be appropriately protected during the construction phase. Temporary protective demarcation fencing will be used to protect the trees and shrubs. The fencing must extend outside the canopy of the retained trees and must remain in position until all plots have been developed to ensure protection is provided throughout the construction phase.

The fencing will be in accordance with BS 5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations*.

4.3.2. WATERBODIES

One waterbody was located within the site boundary, it is currently unknown if this is to be retained or lost to development. Please refer to Section 4.5.1 for specific details on amphibians.

It is recommended that, where possible, the waterbody is retained and enhanced through development to retain open water habitat within the site.

Enhancements to the waterbody would be dependent on results of further amphibian surveys but could broadly include:

- Thinning of over-shading trees;
- Management of nutrient levels within the waterbodies;
- Eradication of fish (if present);
- Planting of emergent vegetation to provide egg-laying material for breeding amphibians; and
- Planting of rough grassland around the perimeters of the ponds to provide terrestrial habitat for amphibians.

If it is not possible to retain and enhance the waterbody within the site, then compensation waterbodies should be created. Waterbody design should follow guidance set out in Froglife and English Nature (2001) for pond design and construction. Ponds should be created to comprise different depths to support different species of wildlife including amphibians and invertebrates. If compensation waterbodies are to be created, it is recommended that a net increase in open water habitat on-site is provided.

4.3.3. NEUTRAL SEMI-IMPROVED GRASSLAND

Small areas of unmanaged semi-improved grassland are present within the site boundary which are anticipated to be removed during the construction works. The areas are grassland have largely been encroached by scattered and dense scrub resulting in poor quality grassland.

It is recommended that new areas of neutral grassland are created and a seed mix is selected based on the soil pH, site aspect, drainage and topography. It is also recommended that the seed mixes will comprise species tolerant of local conditions (standing water, soil type etc.) and comprise a wide range of native species of grasses and wildflowers.

These newly created grassland areas will be of high value for great crested newts, bats, badgers, reptiles, ground nesting birds and invertebrates.

It is recommended that management of the grassland is undertaken, particularly in the first years after creation to allow the grassland to establish.

Management of the grassland could broadly include:

- Control and removal of common competitive weeds such as ragwort and thistle species;
- Annual cutting during the winter months with hand tools to a height of 150 mm;
- No fertilisers being used;
- Any arisings from the management be left in a compost heap to benefit wildlife, and
- Annual removal of noxious and injurious weeds.

4.4. PROTECTED AND NOTABLE SPECIES

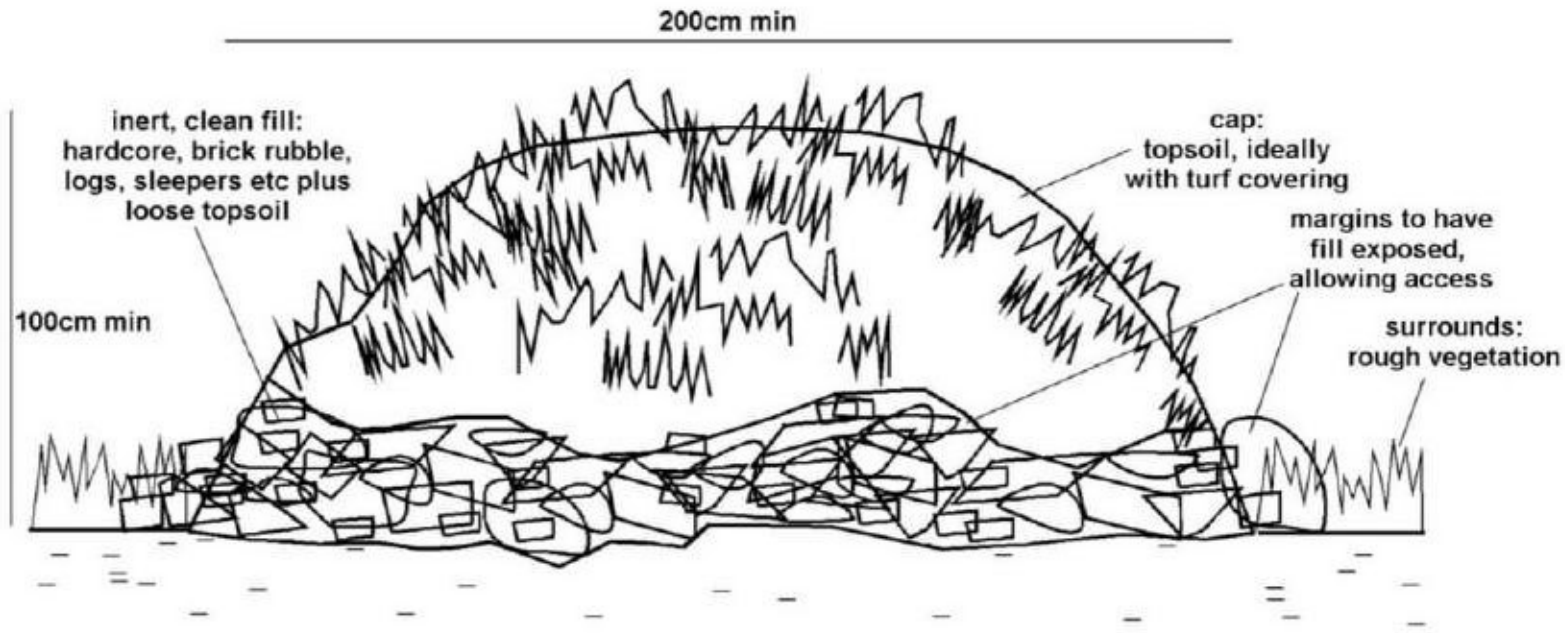
4.4.1. AMPHIBIANS

The site may support small numbers of common amphibians within the broadleaved woodland, semi-improved grassland and scrub habitats on-site. It is recommended that during the clearance phase of works, any common amphibians encountered be moved by hand, away from construction activities.

As described in Section 4.4.2, efforts should be made to retain and enhance the waterbody on-site or provide significantly better habitats for amphibians should this not be possible. Detailed mitigation is dependent on the outcomes of further amphibian surveys within the site.

It is recommended that areas of hibernacula are close to the waterbody to provide suitable terrestrial habitat for amphibians. A suggested hibernaculum design is detailed in Figure 4.1. This design mimics artificial and natural conditions in which great crested newts have frequently been found overwintering. Dimensions should not be below 2m length x 1m width x 1m height. The illustrated design would be suitable for locating on an impermeable substrate. On free-draining substrates, the design is largely similar but the bulk of the fill is sited in an excavated depression in the ground. Hibernacula should ideally be positioned across a site, both close to and distant from breeding ponds, always in suitable terrestrial habitat and above the flood-line.

FIGURE 4.1 SHOWING EXAMPLE HIBERNACULUM DESIGN



4.4.2. BREEDING BIRDS

The site was assessed as having value for passerine species within the broadleaved woodland, dense scrub, scattered scrub and introduced shrub. The broadleaved woodland and dense scrub are of highest value for the species group and it is recommended that these areas are retained and enhanced where possible.

It is recommended that should any vegetation require removal within the breeding bird season (March–September inclusive), that a suitably qualified ecologist inspect the area no more than 24 hours prior to the removal. Should any nests, or nests in construction be located, a suitable stand-off distance should be maintained until the young have fledged. The ecologist will advise on suitable stand off and provide a toolbox talk to all site contractors regarding their working limits and legal implications.

Post-development, bird boxes should be installed throughout the development to enhance the site's value for the species group.

A pair of peregrine falcons, a Schedule 1 species, are known to nest on the water tower within the site boundary. This species has been known to nest on-site since 1953 and is considered to be a species of county importance for Cheshire. It is recommended that this water tower is retained to prevent the destruction of a Schedule 1 species nest site.

It is also recommended that construction works commence outside the peregrine nesting season (March-July inclusive (Hardey, et al, 2006)) to prevent sudden disturbance to any nesting peregrines present. It is also recommended that no construction works be allowed within 50 m of the water tower during the peregrine nesting season to avoid disturbance to the birds while they are on the nest and raising young.

4.4.3. BATS

The site was found to have limited value for foraging and commuting bats due to the large areas of hardstanding that make up most of the site. However, the semi-improved grassland, broadleaved woodland, dense scrub and scattered scrub located around the boundaries of the site provide foraging and commuting routes across the wider landscape. The brook and canal located adjacent north-west and north of the site respectively are likely to act as important commuting and foraging routes for bats within the local area.

Therefore, it is recommended that the proposed lighting plan considers the habitats of highest importance and maintains the broadleaved woodland, scrub, semi-improved grassland and adjacent watercourses as dark areas. It is recommended that any security lighting during construction is appropriately placed to avoid being directed at retained habitats. Lighting should also placed to avoid being directed at the buildings adjacent to the site boundary assessed as having bat roosting potential.

It is recommended that lighting is to be pre-fixed on the proposed buildings, located near retained habitats or proposed habitats, to minimise the impact of lighting. Lighting should follow the protocols outlined in the Institute for Lighting Engineers document "Guidance for the Reduction of Obtrusive Lighting" (2005) and BCT's "Bats and Artificial Lighting in the UK" (2018) to minimise disturbance and sky-glow off site.

It is recommended that any planting within the site be of native fruiting/flowering species in order to enhance the site for foraging bats post-completion. Bat boxes could be installed throughout the site post-construction to enhance the site for the species group.

It is also considered that the creation of the attenuation pond in the north-west corner of the site will increase foraging opportunities for this species and mitigate for the loss of any current on-site foraging habitat.

4.4.4. BADGERS

No badger setts were located during the survey, though the habitats were identified as being suitable for the species. Badgers are highly mobile and can create new setts in a short period of time. It is recommended that an updated site walkover prior to the development is carried out to identify any new badger setts.

If a badger sett is located, a stand-off distance may be required as well as precautionary working methods. If the sett requires closure, a Natural England Badger Licence would be required. Please note that badger licences can only be obtained between July and November each year to avoid potential impact on pregnant females.

The following precautionary working methods will be adhered to during construction phase to ensure that no badgers within the local area are impacted by the proposed development:

- All site operatives will be inducted to the presence of the species and their working limits and legal responsibilities.
- All site operatives will be inducted as to identifying potential badger setts, and should be vigilant if they suspect they locate a new sett during works and inform the project ecologist immediately.
- All excavations will be battened at a 45 degree angle to allow escape should animals become trapped.
- All site machinery and materials will be appropriately stored to avoid harm to the species, notably between July and November each year when extra care is needed to avoid potential impacts on pregnant females.

It is not anticipated that the development will have a significant negative impact on badgers within the local area.

4.4.5. OTTERS

Rivacre Brook and the Manchester Ship Canal located adjacent to the north-west and north of the site respectively were assessed as having suitability for foraging and commuting otters. No otter holt building opportunities were present within the site, but Booston Wood adjacent to the site has opportunities within the roots of trees along Rivacre Brook.

All site operatives will be given a Toolbox Talk on the presence of the species and its legal protection. Site operatives will be required to sign the Toolbox Talk in order to confirm they have understood the details provided. Contact details of the ecologist will be provided to the site operatives.

The following Precautionary Working Methods should be adhered to for all works on-site:

- All site personnel are to be inducted through use of a Toolbox Talk, on the presence of otters, their legal protection and working limits.
- No artificial lighting will be installed, both during the works period and following on from the completion of the project, to ensure the river is maintained as a dark area for otter.
- Any temporarily exposed open pipe system should be capped in such a way as to prevent otters gaining access, as this may happen when contractors are off-site.
- As otters are naturally inquisitive, any excavations that are left overnight will include a ramp of 45° or less on one face to allow otter and other wildlife to climb out should they fall into the excavation.
- Commuting otters may lie-up in stacked pipes or beneath pallets. These features should be inspected daily before the start of works.

4.4.6. REPTILES

The broadleaved woodland, dense scrub and scattered scrub around the northern area of the site was assessed as having some potential for reptiles.

The habitats of suitable value for the species group are to be retained where possible. It is recommended that the following Precautionary Working Methods are to be followed during site clearance of woodland and scrub habitats, to minimise potential impacts on the species:

- All site contractors are to be inducted as to the potential presence of the species group, their legal responsibilities and working limits, by a suitability qualified experienced ecologist.

- Any scrub to be removed will be strimmed to a length of approximately 150 mm under the supervision of the ecologist. It will be checked by an ecologist for the presence of reptiles, and once the area is deemed free, the area will be turfed with a toothed bucket.

- During works the site should be kept tidy of debris and material, and any vegetation within the working areas should be maintained below 50 mm in height to discourage amphibians or reptiles from re-entering these areas

- If a reptile is identified, works should cease and the project ecologist contacted immediately to capture the individual.

4.4.7. HEDGEHOGS

During site clearance, the scrub and debris associated with the broadleaved woodland, semi-improved grassland, dense scrub and scattered scrub should be demolished by hand to ensure no sheltering hedgehogs are impacted by the works. If hedgehogs are located, they should be carefully moved by hand to an area outside of construction workings.

Post-development, a series of hedgehog houses could be installed throughout the site to enhance the site's value for the species group. In addition, gaps in residential fences could be provided to allow the species to commute though the site.

4.5. INVASIVE PLANT SPECIES

Wall cotoneaster and small-leaved cotoneaster were identified during the site walkover. As such, it is recommended, prior to the development, that these species should be eradicated following the most current guidance set out by the Environment Agency by a qualified contractor.

Field horsetail was also identified during the survey and it is recommended that this eradicated due to the damage it can cause to areas of hardstanding. Field horsetail is not listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and therefore does not require removal by an Environment Agency contractor.

5. FURTHER SURVEYS

5.1. GREAT CRESTED NEWTS

The site was assessed as having value for great crested newts within its breeding phase due to a waterbody being located in the north-west corner of the site. Great crested newts are also known to be present within 250 m of the site in ponds within Booston Wood LWS recorded in 2018.

Therefore, it is recommended that a population size assessment is undertaken on the on-site waterbody and on the three waterbodies within 250 m of the site. This would be in the form of bottle trapping surveys undertaken between mid-March and June. Six surveys would be required to establish a population size estimate for great crested newts and to determine further mitigation requirements. Four surveys could be undertaken to confirm absence.

All surveys should be undertaken in line with guidance set out by Natural England and be undertaken by a Natural England licenced surveyor.

A Natural England Mitigation Licence will be required if great crested newts are found to be present within the on-site waterbody or within waterbodies within 250 m of the site boundary and if suitable terrestrial on-site habitat will be lost to development. A licence can only be applied for once planning permission has been granted.

5.2. BATS

Three buildings within the site boundary (B1, B9, B10) and two buildings adjacent to the site (B6, B8) were assessed as having Low bat roosting potential. If any of these buildings are to be demolished, a single nocturnal bat survey is required on each building between May and August. The surveys would be valid for two years to inform a planning application. If bats are identified roosting within the building, three surveys would be required to characterise the roost and a European Protected Species Licence will be required with up to date surveys from the survey season prior to the application submission.

5.3. TABLE OF FURTHER SURVEYS

Please refer to Table 5.1 for a summary of further surveys required to inform a planning application.

TABLE 5.1 FURTHER SURVEYS RECOMMENDED

SURVEY TYPE	TIMESCALES
Nocturnal Bat Surveys	One survey, on buildings to be demolished, between May and August (inclusive)
Great Crested Newt Population Size Class Assessments	Six surveys between mid-April and June (inclusive)

6. BIODIVERSITY NET GAIN

The scheme should strive to achieve biodiversity net gain, as per "Biodiversity Net Gain; Good Practice Principles for Development" CIEEM, CIRIA, IEMA (2016). Full details of this and a calculation of net gain could be completed after detailed landscape plans have been prepared. The following habitat measures will increase the on-site biodiversity:

- Retaining the Broadleaved Woodland;
- Native Hedgerow Planting;
- Native Scrub Planting;
- Wildlife Ponds;
- Broadleaved Trees; and,
- Wildflower Meadows.

Habitat measures should be provided within areas of open space or designated wildlife zones. A 30-year management plan should be produced to ensure biodiversity is secured on-site.

7. REFERENCES

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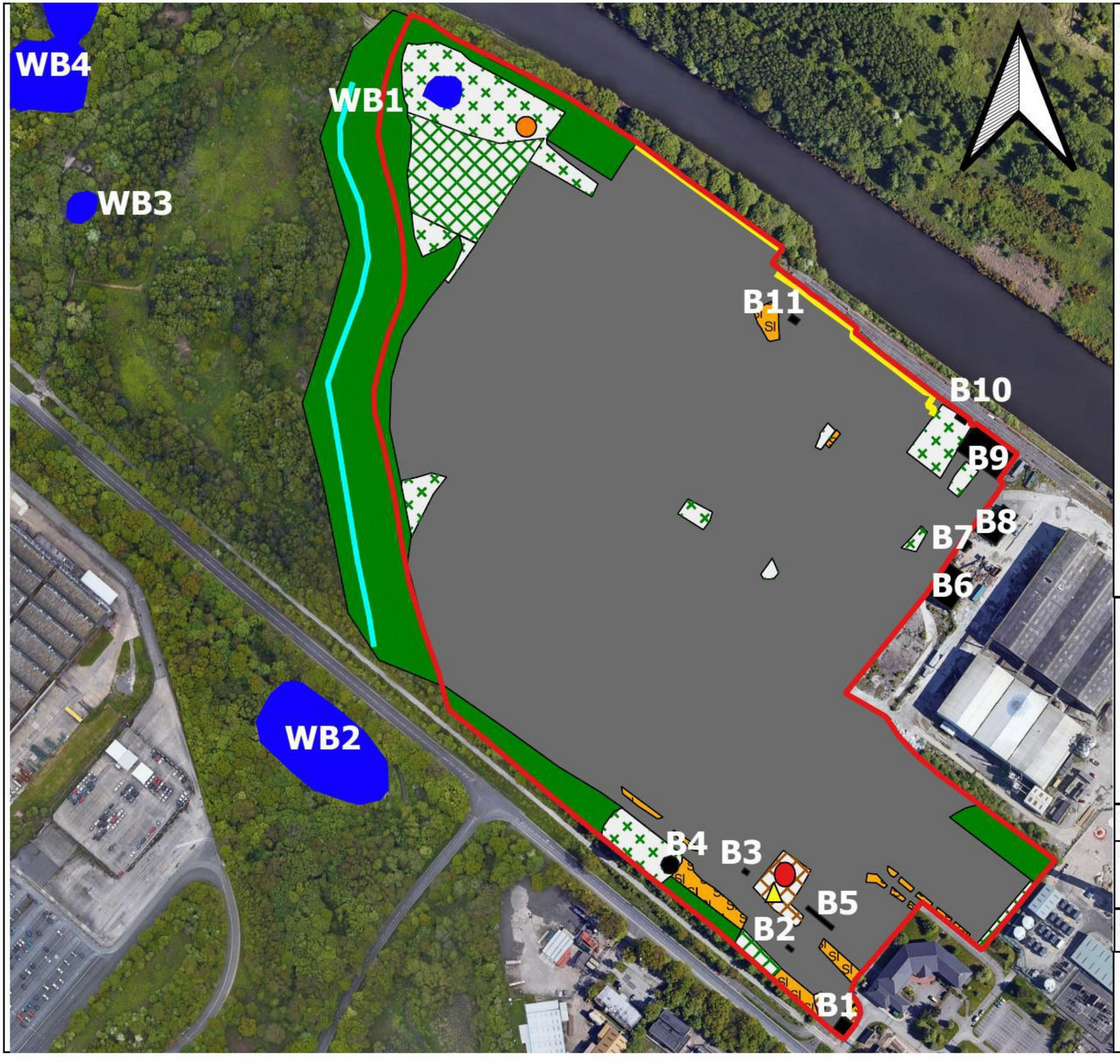
END OF REPORT

APPENDIX I
PHASE 1 HABITAT PLAN



Key:

- Site Boundary
- Wall
- Running Water
- Building
- Hardstanding
- Waterbody
- Broadleaved Woodland
- Dense Scrub
- Scattered Scrub
- Semi-Improved Grassland
- Introduced Shrub

Notes

- Field Horsetail
- Small-Leaved Cotoneaster
- Wall Cotoneaster

Issue	Revision	Date	Drawn	Authorised
2	1	February 2021	LT	HM
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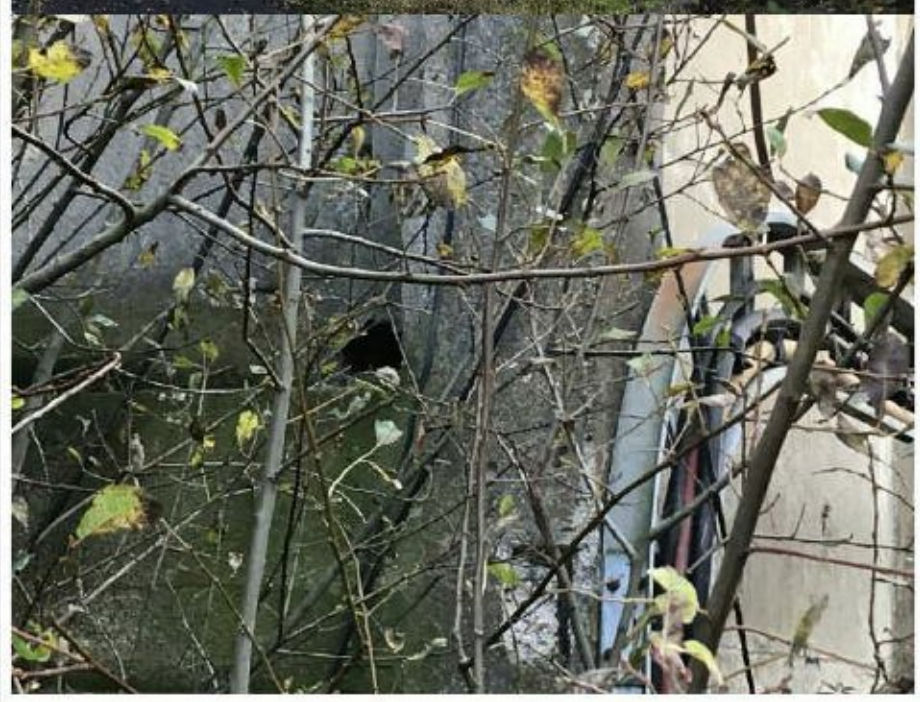
e3p
Environmental Engineering Partnership Ltd
Manchester Office
Taylor Road, Urmston M41 7JQ
Tel: 0161 707 9612
Email: info@e3p.co.uk
Website: www.e3p.co.uk

APPENDIX II
STRUCTURE DESCRIPTIONS

REF.	DESCRIPTION	PHOTOGRAPH
B1	B1 was a single storey red brick building with a pitched tiled roof, located at the site entrance. The roofing tiles and brickwork were found to be in good condition, apart from an opening in the brickwork on the northern aspect of B1, that may provide roosting opportunities for crevice dwelling bats, such as pipistrelle species on an occasional basis. The windows were boarded. The boards were found to be lifted in places, which may provide roosting opportunities for crevice dwelling bats on an occasional basis. B1 was assessed as having **Low** bat roosting potential.	
B2	B2 was a single room brick building with wooden barge board and a flat roof. The roof and windows were broken and damaged, allowing light and weather conditions into the internal structure of the building, reducing its suitability for roosting bats. The brickwork was found to be in good condition, with no potential roosting features present. B2 was assessed as having **Negligible** bat roosting potential.	

B3	B3 was a single room red brick building with pitched tiled roof. The windows were smashed, allowing light and weather conditions into the internal structure of the building, reducing its suitability for roosting bats. The brickwork was found to be in good condition, with no potential roosting features present. B3 was assessed as having **Negligible** bat roosting potential.	
B4	B4 was a large water tower, constructed of concrete and metal. No potential roosting features were present within B4. B4 was assessed as having **Negligible** bat roosting potential.	
B5	B5 was a bike shed constructed of metal sheeting, with no potential roosting features present. B5 was assessed as having **Negligible** bat roosting potential.	

B6	B6 was located adjacent to the eastern site boundary and is to be retained throughout development. B6 was a warehouse with asbestos sheeting walls and roof, with an asbestos sheeting barge board present. The crevices formed between the overlapping sheeting and beneath the barge board may provide roosting opportunities for crevice dwelling bats on an occasional basis. B6 was assessed as having **Low** bat roosting potential but will not be affected by development.	
B7	B7 was located adjacent to the eastern site boundary and is to be retained throughout development. B7 was a steel above ground storage tank on brick bund, with no potential roosting features present. B7 was assessed as having **Negligible** bat roosting potential.	

B8	B8 was located adjacent to the eastern site boundary and is to be retained throughout development. B8 was a red brick two storey building with flat roofing felt roof. There were some broken windows allowing access for bats into the internal structure of the building, however a hung ceiling was visible and the structure was open to light and weather, reducing its suitability for roosting bats. Some of the windows were boarded and a barge board was present, forming crevices beneath the boarding and the barge board, which may provide roosting opportunities for crevice dwelling bats on an occasional basis. B8 was assessed as having **Low** bat roosting potential but will not be affected by development.	
B9	B9 was a concrete two storey structure with a flat roof. The windows were broken allowing access into the internal structure, where potential roosting features may be present. Some windows were boarded, providing crevices beneath the boards which may provide roosting opportunities for crevice dwelling bats on an occasional basis. In addition, a whole in the concrete wall was located on the western aspect, which may provide access into the internal wall structure for bats. B9 was assessed as having **Low** bat roosting potential.	 

B10	B10 was a red brick structure, with a mono-pitched corrugated metal roof, connected to the disused railway. A crack in the brickwork was visible, which may provide roosting opportunities for crevice dwelling bats on an occasional basis. B10 was assessed as having **Low** bat roosting potential.	
B11	B11 was a single room electricity substation constructed of fibre board walls and roof, with no potential roosting features present. B11 was assessed as having **Negligible** bat roosting potential.	

W1	W1 was present along part of the northern site boundary. It was constructed of concrete and was 3 m high with no potential roosting features present. W1 was assessed as having **Negligible** bat roosting potential.	
W2	W2 was present along part of the northern site boundary. It was constructed of concrete and was 1 m high with no potential roosting features present. W2 was assessed as having **Negligible** bat roosting potential.	

APPENDIX III
POND DESCRIPTIONS AND HSI

DISTANCE FROM SITE	DESCRIPTION	HSI CALCULATION											PHOTOGRAPH
		SI1	SI2	SI3	SI4	SI5	SI6	SI7	SI8	SI9	SI10	S	
Pond 1													
Located on-site within scattered scrub	The pond was located within an area of scattered scrub within the north western corner of the site. The waterbody was boggy with moss and grass present under parts of the waterbody. Numerous young willow trees were growing within the waterbody and bull rush (*Scirpoides holoschoenus*) was present. The surrounding habitat comprised scattered scrub and grassland. HSI score=GOOD	1	1	0.5	0.67	0.4	0.67	1	1	1	0.4	0.72	
Pond 2													
Located approximately 55 m south west of the site	The pond was located adjacent to North Road and is assumed to be for drainage of the road. The waterbody was vast and had a large amount of vegetation growing within the centre of the waterbody. Mallards (*Anas platyrhynchos*) were seen using the waterbody and a large woodland margin was present around the waterbody. HSI score=GOOD	1	0.8	0.9	0.67	0.3	0.67	0.67	1	1	0.9	0.75	
Pond 3													

Located approximately 220 m west of the site.	The waterbody was found to be present with Booston Wood, with duckweed (*Lemnoideae sp.*) present over the water surface. Willow were growing throughout the waterbody, with little aquatic vegetation present. HSI score=AVERAGE	1	1	0.5	0.67	0.2	0.67	1	1	1	0.35	0.66	
Pond 4													
Located approximately 216 m west of the site.	From OS mapping Pond 4 appeared to be multiple ponds, however were found to be joined at the time of survey, forming one large waterbody. The waterbody was surrounded by woodland and waterfowl were present. Fish were also seen to be present within the northern aspect of the pond. The northern aspect of the pond was found to be open with some bull rush stands on the edges of the waterbody but little other aquatic vegetation. southern aspect of the pond was found to be smaller and present within an area of trees, with more aquatic vegetation present. HSI score=AVERAGE	1	0.8	0.9	0.67	0.3	0.67	0.33	1	1	0.4	0.65	

NOTES:
HSI calculation components are detailed below:

SI1	Location
SI2	Pond area
SI3	Pond drying
SI4	Water quality
SI5	Shade
SI6	Fowl
SI7	Fish
SI8	Pond
SI9	Terrestrial habitat
SI10	Macrophytes
S	Score