ARBOR VITAE

ECOLOGY • FORESTRY • LAND USE

PRELIMINARY ECOLOGICAL APPRAISAL

ELLESMERE WHARF

Arbor Vitae Environment Ltd, Lower Betton Farm, Cross Houses, Shrewsbury, Shropshire, SY5 6JD

Project name: **Ellesmere Wharf, Ellesmere, Shropshire**

Grid Reference: SJ39423408

Date: 14/04/2023

Prepared by: Phillipa Stirling BSc MSc ACIEEM

Reviewed by: William Prestwood BSc Director

Requested by: Nigel Thorns Planning Consultancy

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1 INTRODUCTION

1.1 BACKGROUND TO DEVELOPMENT

Planning permission will be sought for the "Formation of Link Road with Footway and Cycleway Provision between the Ellesmere Business Park Roundabout on the A495 and Canal Way, including Associated Modification to the Ellesmere Business Park Roundabout, Re-contouring and Earthworks throughout the Site and Formation of Flood Compensation Areas".

Arbor Vitae were commissioned by Nigel Thorns Planning Consultancy to undertake a Preliminary Ecological Appraisal in order to assess the impact of the development on habitats and protected species.

1.2 SCOPE OF SURVEY

The survey is primarily designed to:

- Identify and record habitats and important ecological features on site;
- Evaluate the potential of the proposed development site to provide opportunities for protected species;
- Determine any likely impact which the development and landscape proposals may have on these.
- Identify opportunities for the enhancement of habitats and biodiversity features on site.

1.3 KEY PRINCIPLES

All ecological surveys conducted by Arbor Vitae Environment Ltd are underpinned by the following key principles, as outlined by CIEEM (2018):

Avoidance - Seek options that avoid harm to ecological features (for example, by locating on an alternative site).

Mitigation - Adverse effects should be avoided or minimized through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.

Compensation - Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.

Enhancements - Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

2 SITE DESCRIPTION

2.1 LOCATION, LANDSCAPE, AND BACKGROUND

The land to be developed sits between a branch of the Shropshire Union Canal and the A495 at the southern edge of Ellesmere in Shropshire. Ongoing residential development is underway at the north-east boundary of the proposed development site and further development is planned at the north boundary.

The land comprises mainly improved agriculturally grassland and native hedgerow systems, used for grazing livestock. The wider landscape is characterised by intensively managed arable field systems to the south, agricultural grazing land to the east, and the built-up areas associated with the town of Ellesmere to the north.

Previous ecological assessment was carried out in 2013 to survey the land for signs of protected/priority species and habitats (Greenscape Environmental Ltd, July 2013).

3 SURVEY METHODOLOGY

3.1 DESK STUDY

An initial desk study was composed to gain background information regarding any protected species or designations within the area. The main sources of information were MagicMap, Shropshire Environmental Network, and NBN Atlas.

3.2 SITE SURVEY

An initial site visit was carried out on 11/10/2022 in order to complete a walkover survey and initial ecological assessment of habitats on site.

Surveys were carried out in accordance with CIEEM (2017) best practice guidelines. The objective of the surveys was to find and record any signs of use by protected species and to note the habitat features present.

An assessment of the available habitats both on and adjacent to the site led to consideration of the potential of the site for the following protected species:

- Badger
- Bats
- Breeding birds
- Great Crested Newt
- Otter
- Reptiles

The survey methodology was tailored to evaluate the area for these species in the following ways:

Badger

An area within 50 metres of the site was closely searched for the following signs of badger activity:

- Setts,
- Tracks and footprints,
- Latrines,
- Snuffle holes.

Bats

The objective of the survey was to find and record any signs of use by bats, for example:

- Droppings, sometimes in concentrations below roost sites,
- Feeding signs such as butterfly and moth wings,
- Staining of timber, brickwork around access points.

The general structure of buildings on site were assessed for their potential to provide bats with roosting opportunities. The site was assessed in terms of its suitability to support bat species. Hedgerow habitat and nearby potential habitat were assessed and recorded and potential impacts from the proposals considered.

Breeding birds

The site was assessed in terms of its suitability to support breeding bird populations. Hedgerow habitat and nearby potential habitat were assessed and recorded.

Great crested newt

A desk study and a ground search were conducted to search for any areas of open water within 500 metres. Waterbodies were then assessed based on the Habitat Suitability Index for great crested newts (Oldham et al., 2000 and ARG UK, 2010).

Otter

Any water courses within the area and appropriate terrestrial land were searched for the following field signs:

- Spraint,
- Footprints,

- Feeding remains.

Reptiles

The site was assessed based on its suitability to support reptile populations including connections to terrestrial land from water and suitable resting habitat nearby.

3.3 PERSONNEL

The preliminary survey was carried out by Phillipa Stirling MSc ACIEEM: Ecologist. Natural England bat licence number: 2021-52205-CLS-CLS, GCN licence number: 2019-42631-CLS-CLS.

3.4 CONSTRAINTS

There were no constraints to the survey being carried out.

4 SURVEY RESULTS

4.1 DESK STUDY

The desk study found that within 1km of the site there were the following designations:

Name	Designation	Distance from site
The Mere, Ellesmere	Local Wildlife Site	0.7km
Ellesmere	LNR	0.2km
The search included Ramsar, SSSI, SAC, SPA, NNR and LNR. [1]		

Results from the desk study revealed that within a 2km radius of the proposed development site the following protected species have been recorded:

Species	Distance	Protection
Mammals		
Badger	0km	Protection of Badgers Act 1992, Wildlife and Countryside Act 1981.
Water vole	0.9km	Wildlife and Countryside Act 1981.

[1] **SSSI**: Site of Special Scientific Interest, **SAC**: Special Area of Conservation, **SPA**: Special Protection Area, **LWS:** Local Wildlife Site **NNR:** National Nature Reserve, **LNR**: Local Nature Reserve.

Otter	0.5km	European Protected Species, Wildlife and Countryside Act 1981.
Common pipistrelle Soprano pipistrelle Daubenton's Whiskered Natterer's Brown long-eared Lesser horseshoe	0.7km	European Protected Species, Wildlife and Countryside Act 1981.
Brown hare	2km	s.41 NERC, BAP 2007
Birds		
Kingfisher Merlin Little ringed plover Whooper swan Peregrine Black tailed godwit Firecrest Brambling Redwing Greenshank Green sandpiper Black tern Cetti's Warbler Redstart Slavonian grebe Whimbrel Fieldfare Barn owl Hoopoe	0.1-2km	Schedule 1- Wildlife and Countryside Act 1981.
Amphibians		
Great crested newt	0.5km	European Protected Species, Wildlife and Countryside Act 1981.
Toad	0.5km	Wildlife and Countryside Act 1981.
Common frog	0.1km	Wildlife and Countryside Act 1981.
Smooth newt	1km	Wildlife and Countryside Act 1981.

4.2 HABITATS ON SITE

All habitats are classified using JNCC's Phase 1 Habitat Survey.

Species poor semi-Improved grassland/modified

Field 1: 1.16ha. Used for grazing livestock, sward height fairly uniform with some rougher patches around edges noted. Species limited to: Yorkshire fog, annual meadow grass, red fescue, cock's foot, creeping bent, meadow buttercup, chickweed, creeping thistle, ribwort plantain, dandelion, common sorrel. Species density at less than 9 per m2. There is a thin strip of damp grassland between Field 1 & 2 which is dominated by creeping buttercup.

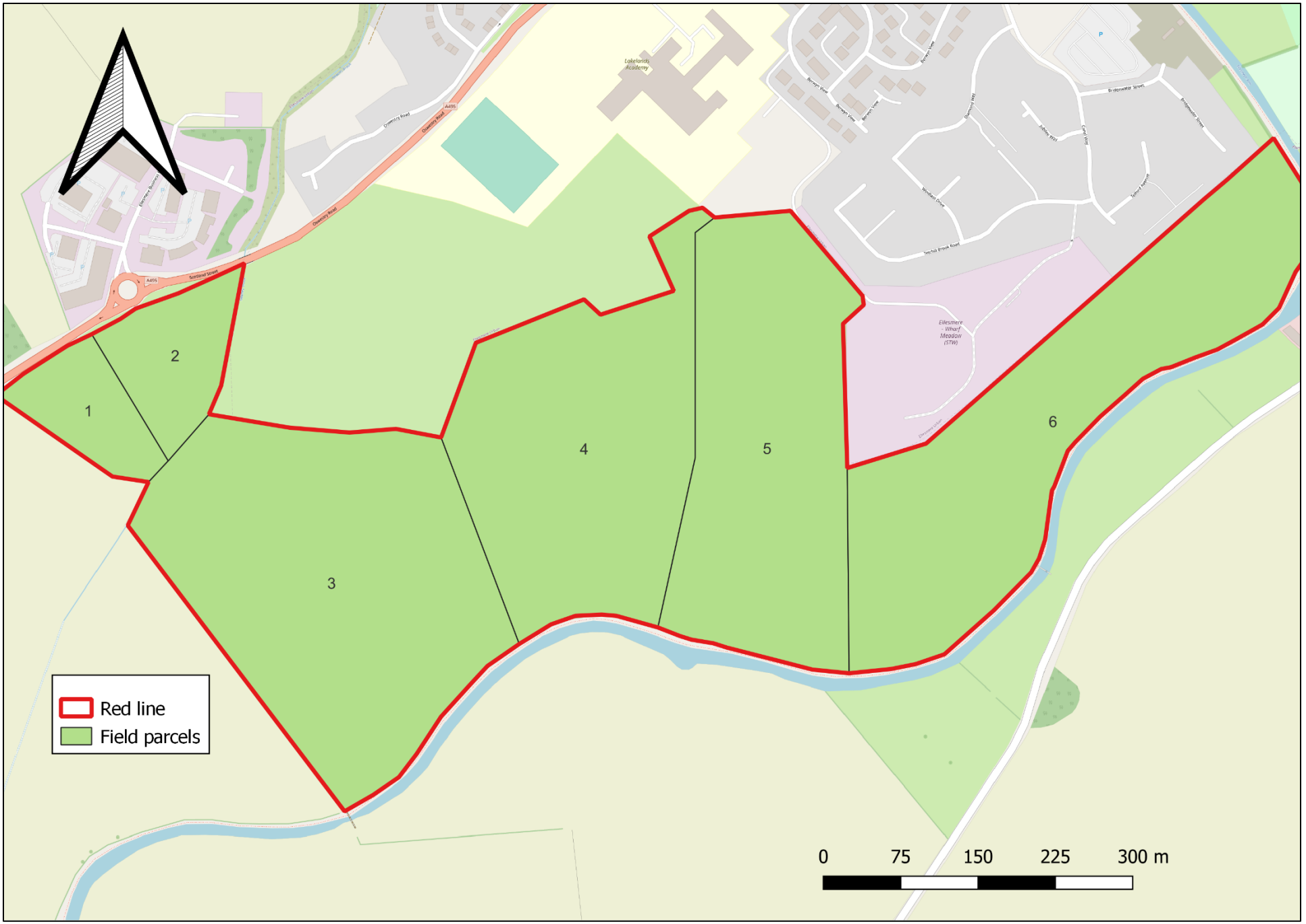
Field 2: 1.43ha. Used for grazing livestock, sward height fairly uniform with some rougher patches around edges noted. Species limited to: Yorkshire fog, annual meadow grass, red fescue, cock's foot, creeping bent, meadow buttercup, chickweed, creeping thistle, ribwort plantain, dandelion, common sorrel. Species density at less than 9 per m2.

Field 3: 8.76ha. A large open field with undulating topography. Several in-field trees and hedgerow along at least two sides. Used for grazing livestock, sward height short and uniform at the time of the survey. Species limited to: Yorkshire fog, perennial ryegrass, cock's foot, common sorrel, white clover, yarrow, chickweed, common nettle, spear thistle, creeping thistle, ribwort plantain and meadow buttercup. Species density at less than 9 per m2.

Field 4: 6.54ha. A large field with a gently sloping profile. Used for grazing livestock, sward height short and uniform at the time of the survey. Species limited to: Yorkshire fog, perennial ryegrass, cock's foot, common sorrel, white clover, yarrow, chickweed, common nettle, spear thistle, creeping thistle, ribwort plantain and meadow buttercup. Species density at less than 9 per m2.

Field 5: 6.5ha. A large open field bounded by hedgerow. Species limited to: Yorkshire fog, annual meadow grass, red fescue, cock's foot, creeping bent, meadow buttercup, chickweed, creeping thistle, ribwort plantain, dandelion, common sorrel and soft rush. Species density at less than 9 per m2.

Field 6: 7.58ha. A large open field bounded by hedgerow. Species limited to: Yorkshire fog, annual meadow grass, red fescue, cock's foot, creeping bent, meadow buttercup, chickweed, creeping thistle, ribwort plantain, dandelion, common sorrel and soft rush. Species density at less than 9 per m2.



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Buildings

There is a residential property/smallholding present at the north-west edge of the site.

No.	Description	Image
1	Residential property, bungalow. Rendered brick, clay tiled roof. Eaves failing and several PRF's associated with the roof. Surrounded by hardstanding and served by private drive from A495.	
2	Residential property, two storey. Ground floor rendered, clay roof with dormer windows. Clay tiled canopy overhanging ground floor. Eaves in good condition, small number of PRF's associated with the roof. Surrounded by hardstanding and improved grassland. Agricultural building adjoins.	
3	Agricultural. Single storey block work and timber framed section. Timber cladding to part, fibre cement roof. No voids or cavities. Roof sheets missing in places. Improved grassland and G5 trees adjacent.	
4	Agricultural. Single storey, block base and Yorkshire boarding above. Fibre cement roof, no cavities or voids. Roof intact. Improved grassland and G5 trees adjacent.	

Individual and groups of trees

There are numerous individual and groups of trees present on and around the site. Details are provided in Appendix 2. A separate Arboricultural Assessment has been carried out.

Hedgerow

See Figure 4 for hedgerow layout on site.

No.	Description	Length (m)	Image
1	Hawthorn dominant. Elder, hazel & sycamore present. Foliage to ground, dense growth.	227	
2	Hawthorn dominant, dog rose also present. Dense foliage to ground.	344	
3	Mixed hedge along canal. Hawthorn, holly, oak, elder, cherry, crab apple, elder, sycamore, elm, dog rose. Dense, cut to A profile. Individual and small groups of trees are present.	1340	
4	Line of trees developed. Hawthorn, holly, dog rose and hazel.	210	

5	Line of trees developed. Hawthorn, ash, sycamore and holly.	170	
6	Shrubby hawthorn hedge, giving way to a line of small trees. Hawthorn, ash and holly. 2m to canopy of trees, hedge foliage to ground.	409	
7	Line of hawthorn trees, overgrown hedge. Regular gaps between.	338	
8	Shrubby hawthorn hedge, roadside. Some holly, dense foliage to ground.	274	
9	Hawthorn with some holly. Shrubby and dense, foliage to the ground.	219	

10	Hawthorn, elder & holly. Dense foliage to the ground. Mature ash.	143	
11	Gappy hawthorn hedge with overgrown individuals.	48	

Watercourses

A short section of Newnes Brook runs between Field 2 & 3, along G5 and past the existing small-holding at the west side of the site. The brook is less than 1m wide and is densely shaded by mature trees and vegetation growing along the banks.

Tetchill Brook is largely culverted beneath the site except for a short exposed section at the north-east boundary of the site. The banks of the watercourse are heavily engineered with some areas retaining natural features. Vegetation recorded along the banks of the watercourse include: reedmace, rosebay willow herb, Yorkshire fog, cock's foot, ragwort and bramble. Water forget-me-not is also present in low density.

4.3 ADJACENT HABITATS

Watercourses

The Shropshire Union Canal forms the southern boundary of the whole site. The site itself is separated from the canal corridor by a well-established tree/hedge line (Hedge 3). This stretch of canal has a concrete tow/footpath and reinforced banks.

Improved grassland

Field systems adjacent to the north-west boundary appear to be partly down to perennial ryegrass pasture.

Arable

Land to the west and south west is made up of arable agricultural land.

4.4 PROTECTED SPECIES

Badger

An active outlying badger sett is located along Hedge 1, with several entrance holes identified during the survey.

Well-worn paths can be seen heading both north and south from a central point beneath T18. Latrines and snuffle holes were also identified along the hedge line.

Bats

Individual trees were assessed for their suitability as a bat roost. Details can be found in Appendix 2. Given the results of the initial assessment, further bat activity surveys will be carried out on site. Walked transects will be used to capture an overall impression of the site's usage by bat species. The buildings on site will also be surveyed.

Breeding birds

The field systems on site do not provide many suitable opportunities for breeding birds given the current management regime.

Hedgerows and groups of trees at the peripheries of the site offer nesting opportunities for breeding birds.

Species recorded whilst surveying the site included: great spotted woodpecker, magpie, woodpigeon, great tit, blue tit, swallow, carrion crow and mistle thrush. The majority of Schedule 2 birds recorded within 2km of the site is are found at The Mere, to the east of the site.

The extent to which the agricultural buildings at the west of the site are being used by breeding birds will require further investigation.

Great crested newt

The east and south boundary of the site are separated from the wider landscape by the Shropshire Union Canal. The northern boundary of the site is met with the main A495, forming a significant terrestrial barrier from this direction. The only boundary which is open to the wider landscape, in terms of movement of amphibians, is the west. There are no ponds present to the west, within 500m of the site boundary.

Furthermore, the habitats on site represent sub-optimal terrestrial land for GCN. There are no ponds on the site and records for GCN within 1km are limited to a single record from 2005.

As a precaution, the ponds to the north-west of the site were investigated.

Pond 1 is a small man-made pond located in the centre of a caravan park. This waterbody provides poor suitability as a breeding site for GCN.

Pond 2 is a small pond, shaded by mature oak trees. The pond is overgrown and unmanaged. Pond 2 provides below average suitability as a breeding site.

Otter

During the survey, no field signs of otter were recorded on the site. The south boundary, adjacent to the canal, is fenced and heavily vegetated. The areas of canal adjacent to the site also have concrete reinforced banks, reducing the likelihood that otter would be using the watercourse for more than occasional feeding. The site itself does not provide any suitable terrestrial habitat for otter e.g. resting up places, couches or holt potential.

Reptiles

The grazed fields on site do not offer suitable enough terrestrial opportunities for reptile species to be found in any significant number. The wider landscape of expanding residential development and arable agriculture further reduce the likelihood of reptiles being found on site. There are no existing records of reptile species within 1km of the site.

5 POTENTIAL ECOLOGICAL IMPACT

5.1 HABITAT ASSESSMENT

Species poor semi-*improved grassland*

The proposed planning application will include full-scale engineering works in order to provide 'developable' levels throughout the site. It is likely that the majority of the field systems on site will be significantly altered, resulting in the loss of this habitat type from site.

The modified grassland habitat on site provides negligible value as an ecological feature and the proposals will not result in the loss or damage to protected/priority habitats.

During later phases of development, it will be necessary to demonstrate an overall increase in biodiversity on site through the BNG Metric system. All baseline data for this

process will use the grassland as existing (condition assessments will be completed May 2023).

Hedgerow

A short section of trees will require removal at tree group G5 to allow the proposed road to run through this section. This will result in the loss of a small number of ash and sycamore trees.

Watercourses

The section of Tetchill Brook will remain undisturbed by the development work to install the access road. An 8m watercourse buffer will be implemented and the remaining land in between will be included within native landscaping plans as part of future development.

The Newnes Brook will be culverted where the new road passes over, between Field 2 & 3. This is likely to result in the removal of a small number of ash and sycamore trees.

At present, livestock have access to the brook and their impact upon the water quality is evident. Removing this source of pollution will be beneficial for the overall health of local waterways.

5.2 PROTECTED SPECIES ASSESSMENT

Badger

The proposed roadway and engineering works on site have the potential to disturb badger setts located along Hedge 1. Appropriate working buffers and protection zones will be required to avoid any disturbance.

Bats

Activity transect surveys will be required on site to ascertain the extent to which bat species use the site and any features within the development boundary.

Breeding birds

The majority habitat type on site is grazed modified grassland with very little species diversity or variation in sward height. The routine agricultural usage reduces the lands suitability as a nesting site for breeding birds, as well as the presence of public footpath routes used by dog walkers.

Work to remove any mature vegetation including hedgerow and trees has the potential to disturb breeding birds, if done so during the nesting season.

Mitigation and precautionary measures will be adopted on site.

Great crested newt

The grazed grassland field parcels offer no suitable terrestrial opportunities for GCN as there are no foraging or resting places available on the land. Hedge and tree bases offer some suitability for shelter and/or brumation but the overall lack of terrestrial habitat significantly reduces the changes of GCN being present within the vicinity of the site.

GCN have been recorded at 0.5km distance from the site at Newnes in 2005. The pond has since remained unmanaged and now provides below average suitability for GCN. The record lies beyond the main A495 road, acting as a terrestrial barrier to dispersal.

Studies have demonstrated that 95% of all summer refuges of GCN fall within 63m of their summer breeding pond (Jehle, 2000). Subsequent studies also found that capture rates of GCN were at their highest within 50m of a breeding site with a significant reduction in capture rates beyond 100m (Cresswell and Whitworth, 2004).

All ponds assessed within 500m of the site provide 'poor' and 'below average' suitability as a breeding site for GCN and it is unlikely that the species is present within the environs of the site. The proposed development is unlikely to cause an offence to GCN under current relevant legislation but precautionary measures will be adopted to remove any residual risk.

Otter

The construction of the main road infrastructure though the site is not expected to have any impact upon major aquatic corridors which are likely to be in use by otter. Watercourse culverts have a low likelihood of disturbing otter activity given the relative size and location of the features.

Pre-commencement inspections will be carried out to check for any fresh signs of otter activity at the site.

Reptiles

It is unlikely that reptile species are active on or adjacent to the site given the poor suitability of the existing land use and surrounding areas. The proposals will have no impact upon reptile species.

6 AVOIDANCE, MITIGATION AND ENHANCEMENT

6.1 HABITAT MITIGATION

Tree protection measures

A separate Arboricultural Impact Assessment has been carried out to accompany the development and provides specific detail on tree protection measures for the site.

Watercourse protection measures

An 8m watercourse buffer will be implemented along the Tetchill Brook at the east edge of the site.

Pollution Prevention Measures will be adopted on site where all work in close proximity to watercourses is being carried out. See Appendix 3.

6.2 PROTECTED SPECIES MITIGATION

Badger

A minimum distance of 30m will be retained between Hedge 1 and all excavation/machinery on site.

Bats

Bat activity transect surveys will be required before work begins on site.

As a minimum, a Wildlife Sensitive Lighting Plan will be implemented during construction.

Full details of planned lighting will be produced to follow the guidance from The Bat Conservation Trust: Bats and artificial lighting in the UK (2018).

The following general guidelines will be observed:

- Key habitat features including mature trees at the periphery of the site will not be illuminated in order to retain dark movement corridors for nocturnal wildlife.
- Any exterior security lights to be installed on the development site will be less than 3m from the ground and fitted with hoods to direct the light below the horizontal plane, at an angle of less than seventy degrees from vertical.
- Security lighting will be set on motion sensors with short timers (<1 minute) and will be LED with a passive infrared trigger.
- A warm white spectrum will be adopted throughout the scheme to reduce blue light component (<2700Kelvin).

- Internal luminaires will be recessed where installed in proximity to windows to reduce glare and light spill. LED luminaires will be used internally where possible due to their sharp cut-off, lower intensity, and dimming capability.
- Luminaires will always be mounted horizontally with an upward light ratio of 0%.

Breeding birds

All essential vegetation clearance will be carried out between September and February in a given date range to avoid the bird nesting season.

Work on site will be strictly contained within clearly demarcated areas and storage of materials or machinery will not be allowed within scrub or surrounding vegetation to be retained (e.g., tree line at boundaries).

Great crested newt

Precautionary measures to be adopted on site:

- All grassland to be disturbed on site will be cut to, and maintained at, a height of 10cm before March (in any given year) in order to reduce the number of potential resting/feeding opportunities on site. Or continued grazing.
- Any stored materials will be removed from site during the GCN active season- this is from March until October or when nighttime temperatures are 5°C or above. This will aim to remove any materials which could act as a refuge for GCN.
- The site compound will be situated on an area of existing hard-standing to avoid creating GCN resting places beneath stored materials etc.
- All site materials will be stored on pallets or other raised objects to avoid creating resting places/refuges for GCN.
- Any toxic or poisonous materials will be safely stored within a locked container.
- All excavations on site will be covered at night or ramps will be provided to allow amphibians to exit excavations. All excavations will be checked for amphibians each morning prior to the re-commencement of works.
- All exposed new pipework and drains will be capped at night so as to avoid trapping amphibians.
- All excavated materials/waste will be stored in skips or similar and not on the ground where it could be used as a refuge/resting area by amphibians. Alternatively, all waste will be removed from site daily.
- All stored building materials that might be used as temporary resting places by amphibians will be stored off the ground on pallets or similar.

- If GCN are found at any point during the development or activities outlined above, works must stop and an appropriately qualified ecologist will be contacted for advice. Contractors are prohibited from handling GCN.

6.3 ECOLOGICAL ENHANCEMENT

The proposed development will result in extensive engineering works in order to provide a developable landscape for future site plans. This will essentially create bare earth habitats on much of the site. The site lies wholly within the settlement boundary of the 'Shropshire Local Plan 2006 to 2026'. Enhancement measures are not realistically deliverable at the end of the engineering works as this is a preparatory phase.

Once the site-wide engineering activity is complete, compartmentalised development of the land will ensue under separate planning applications. Any subsequent planning applications will be subject to Biodiversity Net Gain and will use the pre-engineering works baseline condition of on-site habitats in order to calculate all required enhancements (e.g. habitat to be used as baseline will be species-poor semi improved grassland *rather than* bare earth).

Plans which will provide significant ecological enhancement for the site will include; diversion of an existing culverted watercourse onto an over ground basin, the creation of a large floodplain attenuation area with all appropriate landscaping, vegetated SUDS basins throughout the site and native tree planting. Each area of development will provide specific details for its own phase.

The overall development will deliver substantial ecological enhancement, particularly the planned watercourse diversion.

7 SUMMARY

Planning permission will be sought for the "Formation of Link Road with Footway and Cycleway Provision between the Ellesmere Business Park Roundabout on the A495 and Canal Way, including Associated Modification to the Ellesmere Business Park Roundabout, Re-contouring and Earthworks throughout the Site and Formation of Flood Compensation Areas".

Arbor Vitae were commissioned by Nigel Thorns Planning Consultancy to undertake a Preliminary Ecological Appraisal in order to assess the impact of the development on habitats and protected species. Key findings of the assessment are:

- The proposed planning application will include full-scale engineering works in order to provide 'developable' levels throughout the site. It is likely that the majority of the field systems on site will be significantly altered, resulting in the loss of this habitat type from site. The modified grassland habitat on site provides negligible value as an ecological feature and the proposals will not result in the loss or damage to protected/priority habitats.
- A short section of trees will require removal at tree group G5 to allow the proposed road to run through this section. This will result in the loss of a small number of ash and sycamore trees.
- The section of Tetchill Brook will remain undisturbed by the development work to install the access road. An 8m watercourse buffer will be implemented and the remaining land in between will be included within native landscaping plans as part of future development.
- The Newnes Brook will be culverted where the new road passes over, between Field 2 & 3. This is likely to result in the removal of a small number of ash and sycamore trees. At present, livestock have access to the brook and their impact upon the water quality is evident. Removing this source of pollution will be beneficial for the overall health of local waterways.
- The proposed roadway and engineering works on site have the potential to disturb badger setts located along Hedge 1. Appropriate working buffers and protection zones will be required to avoid any disturbance. A minimum distance of 30m will be retained between Hedge 1 and all excavation/machinery on site.
- Activity transect surveys will be required on site to ascertain the extent to which bat species use the site and any features within the development boundary. As a minimum, a Wildlife Sensitive Lighting Plan will be implemented during construction. Full details of planned lighting will be produced to follow the guidance from The Bat Conservation Trust: Bats and artificial lighting in the UK (2018).

- The majority habitat type on site is grazed modified grassland with very little species diversity or variation in sward height. The routine agricultural usage reduces the lands suitability as a nesting site for breeding birds, as well as the presence of public footpath routes used by dog walkers. Work to remove any mature vegetation including hedgerow and trees has the potential to disturb breeding birds, if done so during the nesting season.
- The grazed grassland field parcels offer no suitable terrestrial opportunities for GCN as there are no foraging or resting places available on the land. Hedge and tree bases offer some suitability for shelter and/or brumation but the overall lack of terrestrial habitat significantly reduces the changes of GCN being present within the vicinity of the site. The proposed development is unlikely to cause an offence to GCN under current relevant legislation but precautionary measures will be adopted to remove any residual risk.
- The construction of the main road infrastructure though the site is not expected to have any impact upon major aquatic corridors which are likely to be in use by otter. Watercourse culverts have a low likelihood of disturbing otter activity given the relative size and location of the features. Pre-commencement inspections will be carried out to check for any fresh signs of otter activity at the site.
- It is unlikely that reptile species are active on or adjacent to the site given the poor suitability of the existing land use and surrounding areas. The proposals will have no impact upon reptile species.
- Enhancement measures are not realistically deliverable at the end of the engineering works as this is a preparatory phase.
- Once the site-wide engineering activity is complete, compartmentalised development of the land will ensue under separate planning applications. Any subsequent planning applications will be subject to Biodiversity Net Gain and will use the pre-engineering works baseline condition of on-site habitats in order to calculate all required enhancements (e.g. habitat to be used as baseline will be species-poor semi improved grassland *rather than* bare earth).
- Plans which will provide significant ecological enhancement for the site will include; diversion of an existing culverted watercourse onto an over ground basin, the creation of a large floodplain attenuation area with all appropriate landscaping, vegetated SUDS basins throughout the site and native tree planting. Each area of development will provide specific details for its own phase.

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FIGURE 1 LOCATION

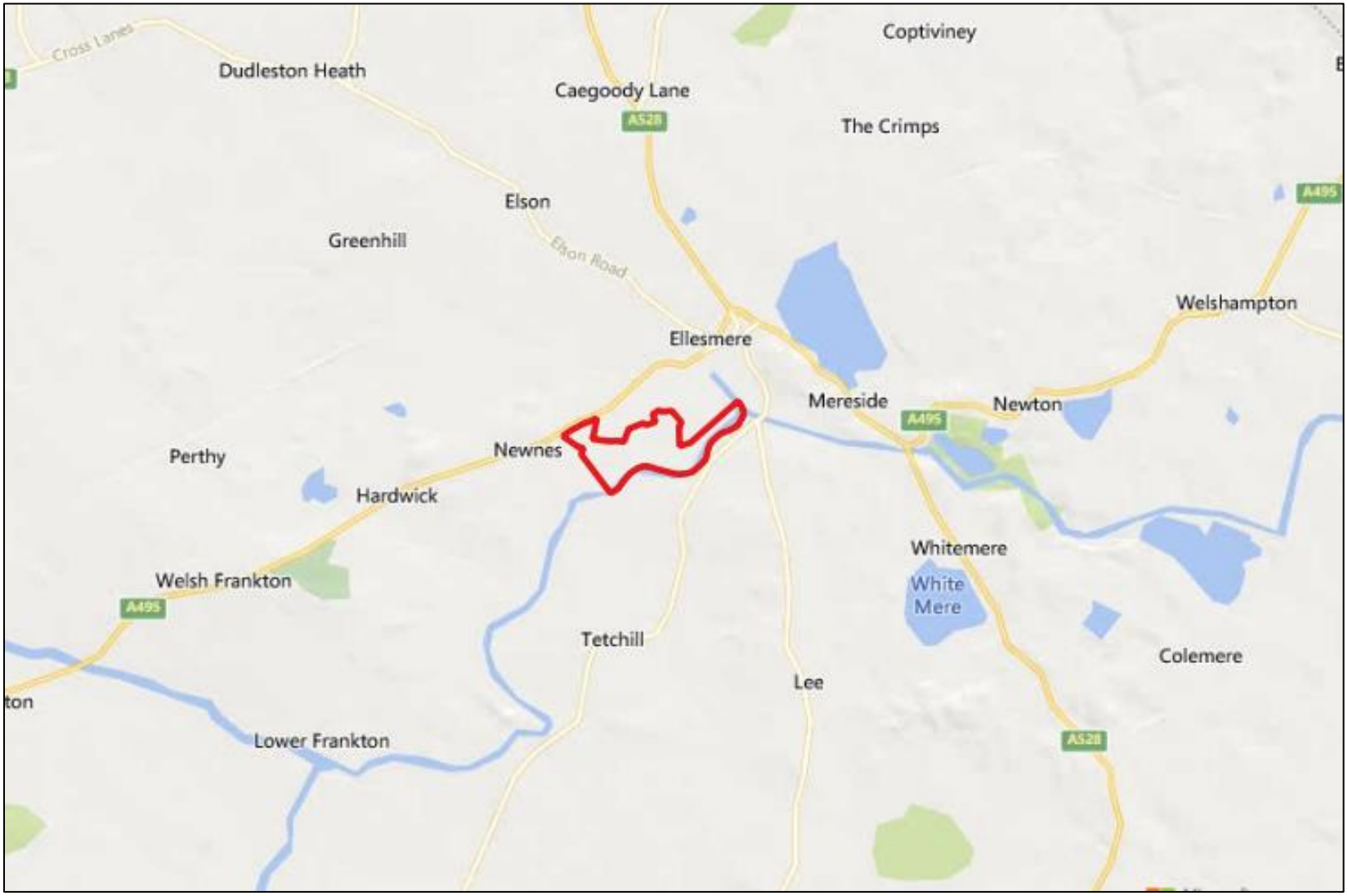

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FIGURE 2 AERIAL PHOTOGRAPH

FIGURE 3 PONDS WITHIN 500M

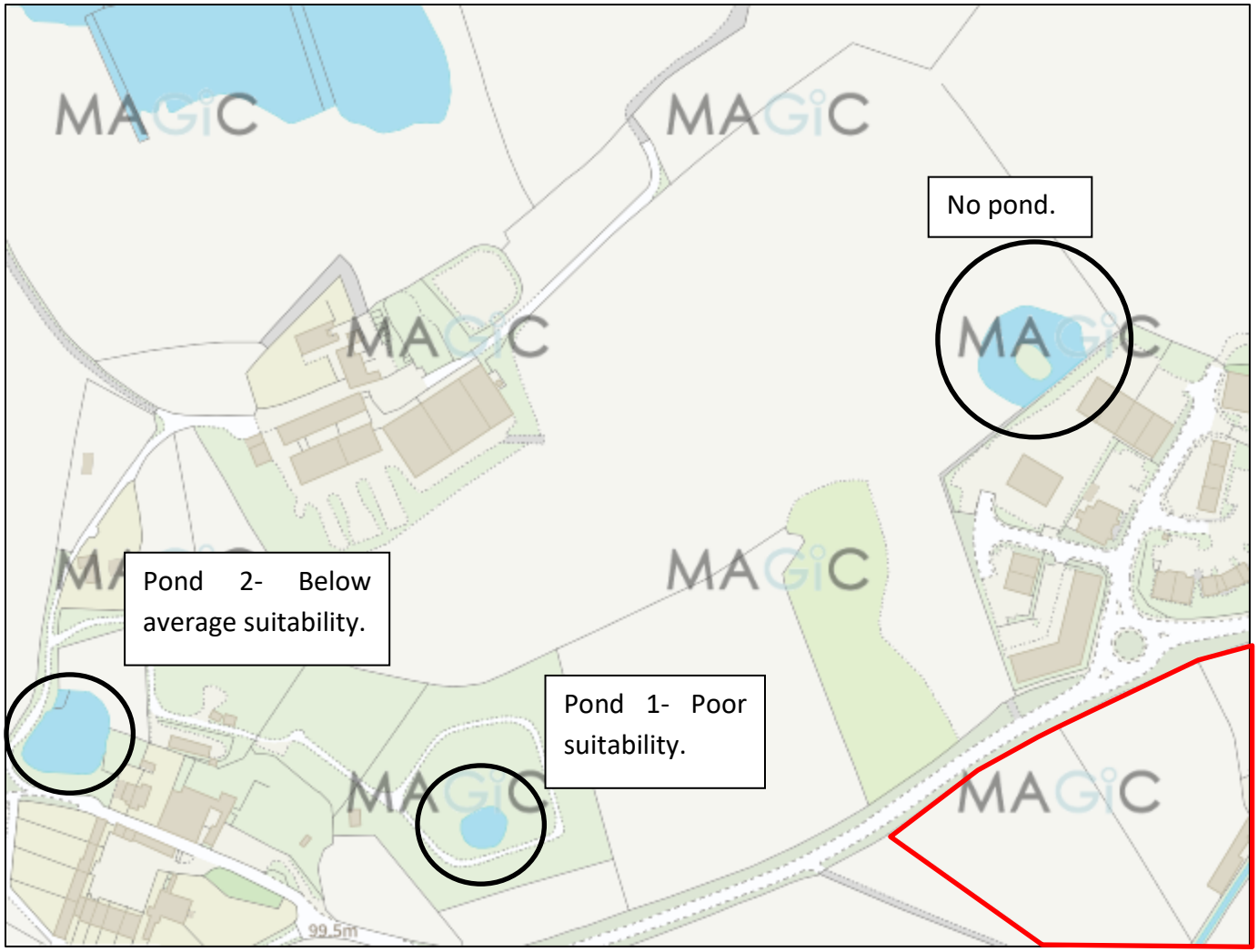

FIGURE 4 HEDGEROW ON SITE

FIGURE 5 TREES AND TREE GROUPS

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FIGURE 6 HABITAT MAP 1 OF 2

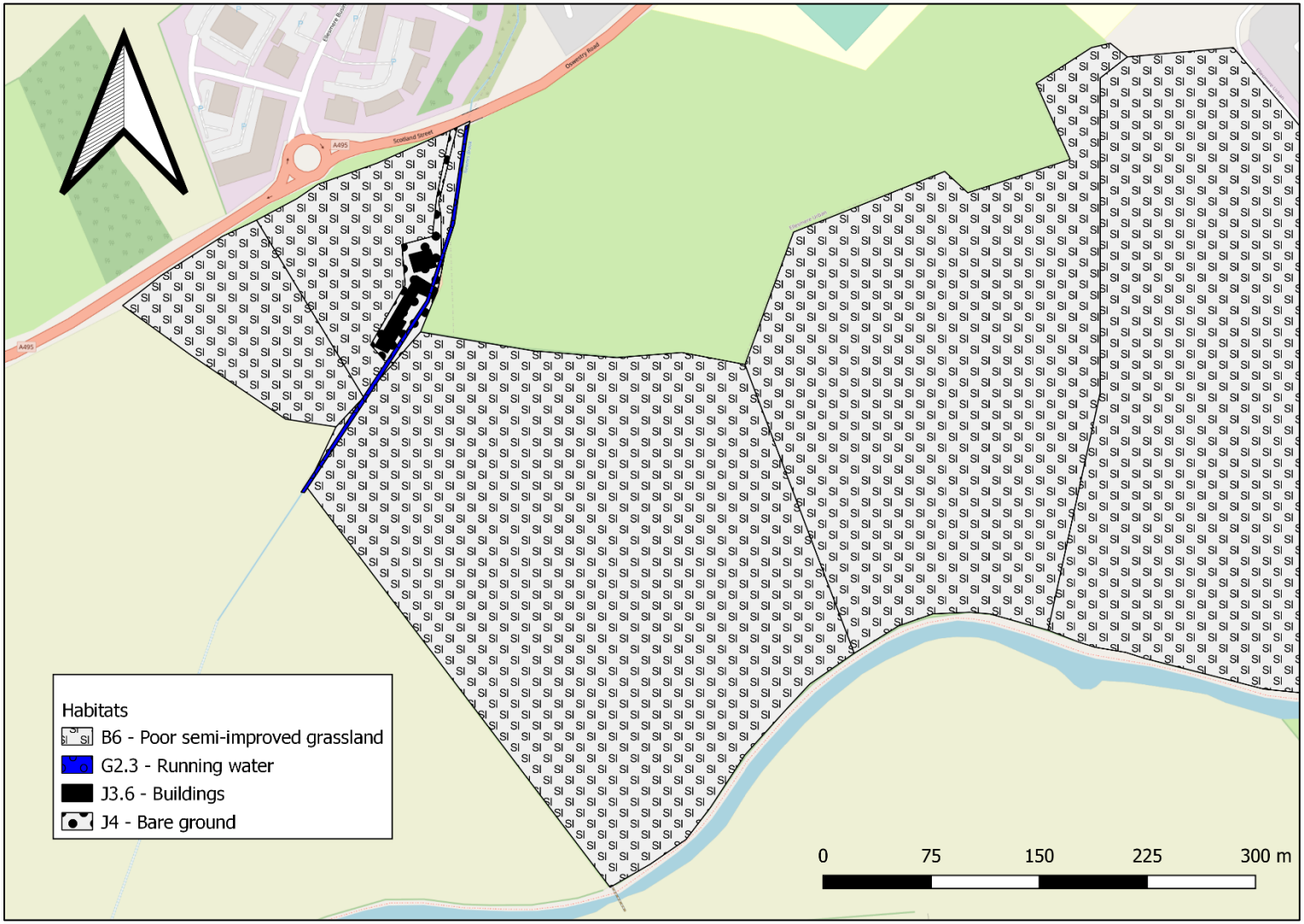

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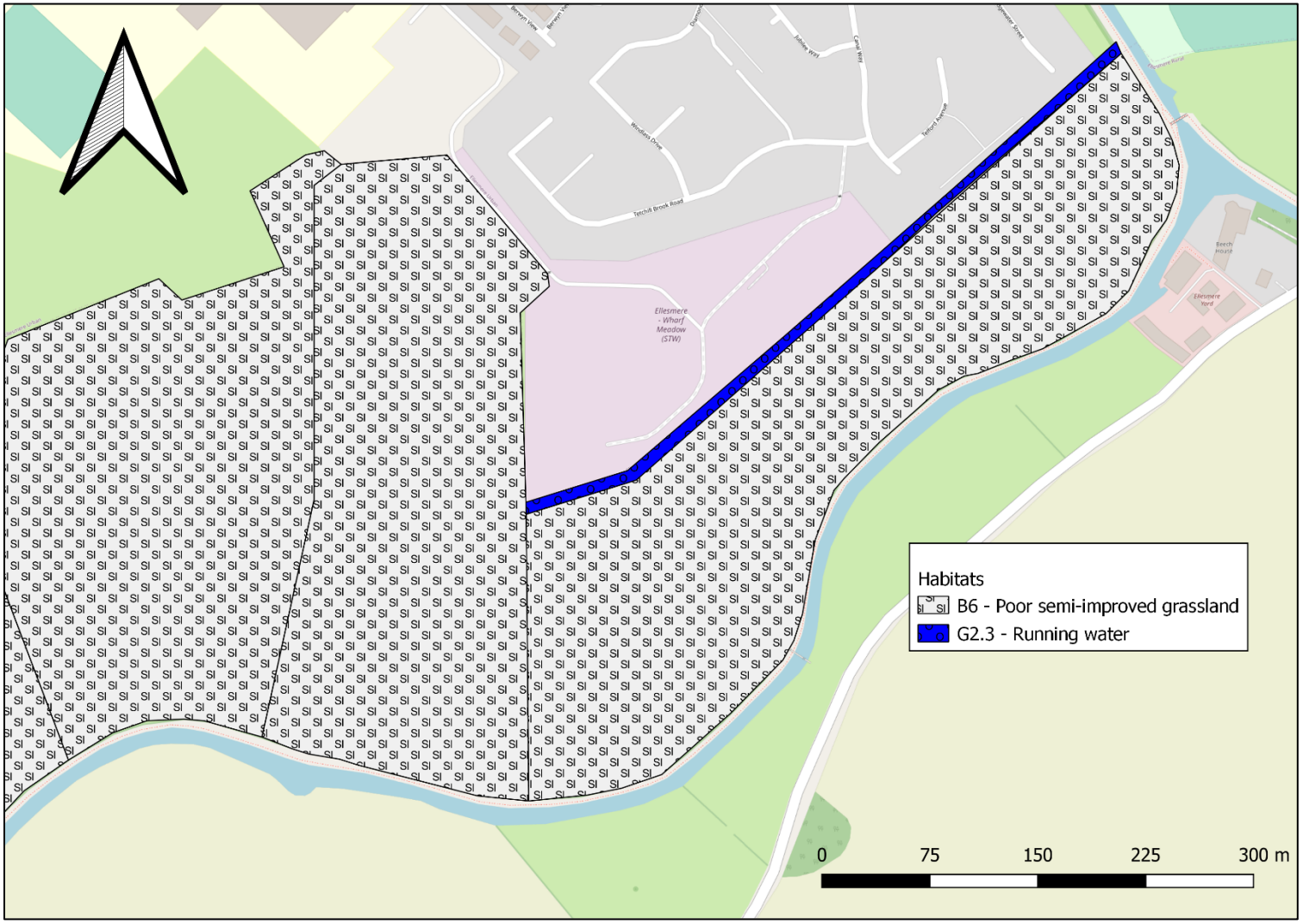
FIGURE 7 HABITAT MAP 2 OF 2



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APPENDIX 1 ADDITIONAL PHOTOGRAPHS

Field 2, general grassland.

Field 4.

Field 3.

Tetchill Brook section.

Newnes Brook cattle access.

General site overview.

APPENDIX 2. INDIVIDUAL AND GROUPINGS OF TREES ON SITE

ID	Species	Description	Potential for roosting
1	Oak	Mature tree with some crevices present in bark and between limbs.	Moderate
2	Oak	Mature tree with ivy growth around main trunk.	Moderate
3	Lime	Roadside tree, poor condition. Limbs missing.	Moderate
4	Horse chestnut	Dense ivy growth, multiple limbs.	Moderate
5	Horse chestnut	Mature tree in good condition. Some ivy but previously severed.	Low
6	Ash	Multi stemmed tree, some ivy growth but mainly good condition.	Negligible
7	Ash	Multi stemmed tree, some ivy growth but mainly good condition.	Negligible
8	Ash	Multi stemmed tree, some ivy growth but mainly good condition.	Low
9	Ash	Multi stemmed tree, some ivy growth but mainly good condition.	Low.
10	Oak	Mature tree with some holes/crevices from a lost limb.	Moderate.
11	Oak	Mature tree, partly hollow with dead limbs and branches.	High.
12	Oak	Mature oak, part of a tree line. Crevices and holes in main stem.	Moderate.
13	Oak	Mature oak, complicated growth form.	High.
14	Oak	Mature tree, dead wood in crown.	Low.
15	Oak	Mature tree, good condition.	Low.
16	Oak	Mature in-field tree, crevices and gaps in main stem.	Moderate.
17	Ash	Hedge tree, multi-stem, no aged features.	Negligible.
18	Oak	Large mature oak, numerous PRF's.	High.
19	Hawthorn	Former hedge plant. No aged features.	Negligible.
20	Hawthorn	Former hedge plant. No aged features.	Negligible.
21	Hawthorn	Former hedge plant. No aged features.	Negligible.
22	Hawthorn	Former hedge plant. No aged features.	Negligible.
23	Hawthorn	Former hedge plant. No aged features.	Negligible.
24	Hawthorn	Former hedge plant. No aged features.	Negligible.
25	Oak	Young oak, on sloping gradient. Some crevices at limb junctions.	Low.
26	Hawthorn	Small shrub. No PRF's.	Negligible.
27	Hawthorn	Small shrub. No PRF's.	Negligible.
28	Oak	Mature tree, some dead wood in upper parts.	Moderate.
29	Sycamore	Along canal side, mature but good condition.	Low.
30	-	Tree no longer standing.	-
31	Ash	Hedge tree, young.	Negligible.
32	Oak	Mature tree, numerous PRF's.	High.

33	Oak	Mature tree, numerous PRF's, limbs missing.	High.
34	-	Tree no longer standing.	-
35	Sycamore	Hedge tree, uniform growth.	Negligible.
36	-	Tree no longer standing.	-
37	Ash	Two main stems, good condition.	Low.
38	Ash	Complicated growth form, some PRF's.	Moderate.
39	Ash	Part of hedge line, some dead wood. Minimal PRF's.	Low.
40	Oak	Growing in hedge line, good condition.	Low.
41	Oak	In hedge line, some dead wood in canopy.	Moderate.
42	Oak	Mature tree in good condition. Some PRF's.	Moderate.
43	Oak	TPO. Large tree with ivy and some deadwood.	Moderate.
44	Oak	TPO. Mature tree, good condition.	Moderate.
45	Oak	Vandalised. Hollow present and standing dead wood.	Low.
46	Oak	Straight growth form, PRF's limited.	Low.
47	Oak	Mature tree on boundary, limited PRF's.	Low.
48	Oak	Mature tree on boundary, limited PRF's.	Low.
49	Oak	Mature tree on boundary, limited PRF's.	Low.
50	Oak	Not on site.	-
51	Ash	Small group of trees, coppiced. No PRF's.	Negligible.
52	Beech	Multi stem, no PRF's.	Negligible.
53	Ash	Hedge tree, poor growth form, dead wood.	Negligible.
54	Ash	Hedge tree, poor growth form, ivy growth.	Negligible.
55	Oak	In-field tree, mature, split stem.	Low.
56	Oak	Hedge tree, mature. Ivy and dead wood present.	Low.
57	Oak	In-field tree, dieback in crown and stunted growth.	Low.
58	Oak	In-field tree, large. Limb missing and some PRF's.	Low.
59	Oak	Three young oaks. No PRF's.	Negligible.
60	Oak	Hedge tree next to canal. Mature with some PRF's.	Moderate.
61	Oak	Young tree with partly hollow base.	Low.
G1	Alder, ash & oak	10-15 trees at east boundary, between site and canal. Mostly young/simple growth forms.	Negligible.
G2	Oak, whitebeam & cherry	11 individual trees at east boundary by towpath. Mostly simple growth form due to tight growing conditions.	Negligible.
G3	Beech & elder	5 trees along canal, overgrown hedge plants.	Negligible.
G4	Beech, elder & oak	4 trees along canal, mostly overgrown hedge plants. 1 young oak.	Negligible.
G5	Ash, alder & sycamore	5 trees, coppiced. Adjacent residential property and watercourse.	Negligible.
G6	Ash & maple	4 trees on neighbouring land, adjacent engineered watercourse.	Negligible.

APPENDIX 3. POLLUTION PREVENTION MEASURES

All works will adhere to the Pollution Prevention Guidance set out in GPP 1: A General guide to preventing pollution and GPP 5: Works and maintenance in or near water.

The following specific measures will be implemented throughout the duration of the construction phase:

Storage and waste products

- A waste hierarchy will be adopted on site which consists of five principles: Reduce, reuse, recycle, recover and dispose of.
- If any hazardous liquids such as oils and fuels need to be stored on site they will be stored within bunded storage drums and containers.
- All hazardous waste will be stored, handled and disposed of separately to normal waste. The site manager should keep a record of waste disposal to ensure it is being properly managed.

Spills & leaks

- Spill kits will be stored within the site compound during and post construction and all spills will be cleaned up accordingly and if necessary reported.
- All chemical substances and hazardous materials will be stored in accordance with EA guidelines with all diesel fuel and other lubricants being stored in appropriate containers and within double bunded storage areas.
- Any washing of concreting vehicles will be done well away from any watercourses and/or drainage systems. Preferably this will not be carried out on site at all but at an approved yard.
- Any re-fuelling and re-lubrication will only be completed in an approved area in which a spill kit is available.

General

- All construction works must take place within the red line boundary.
- All arisings from the site, both vegetative and construction related, will be cleared on a daily basis and disposed of through correct methods. The site manager should keep a record of waste disposal to ensure it is being properly managed.