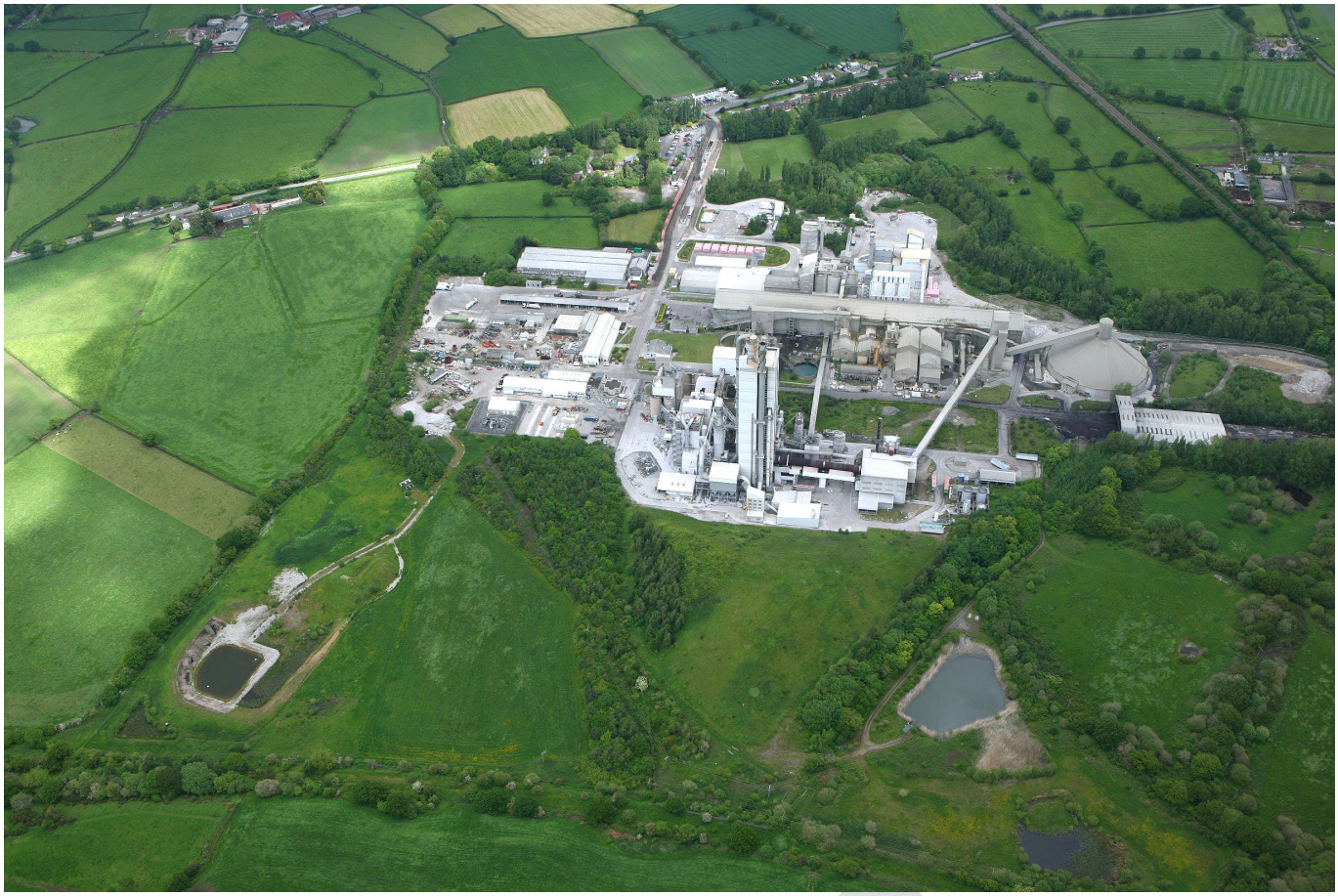

Castle Cement Limited

Carbon Capture and Storage Project – Padeswood, North Wales

Volume 4, Draft Technical Appendix 5.1

Ecological Baseline Report (Botanical)

RSK

JUNE 2024

EXECUTIVE SUMMARY

This report presents the results of botanical surveys carried out by RSK Biocensus between May 2022 and February 2023 on behalf of Castle Cement Limited for the Padeswood Carbon Capture and Storage project where a Carbon Capture Plant and associated infrastructure is proposed.

The Castle Cement Limited landholding (*c.*70.9 ha) in Padeswood is located in Flintshire (OS grid reference: SJ 29127 62227). The site boundaries are defined in **Figure 1** and in **Paragraph 1.1.3** of this report. The Ecological Survey Area is described for each survey type in this report.

Habitats were assessed during a preliminary ecological appraisal (PEA) in May 2022 which presented an update to the original surveys undertaken by AECOM in 2015[1] (but reported in 2017) in relation to the Applicant's Mill 5 planning application. This identified areas which required further botanical assessment.

The works area contained a variety of man-made and natural habitats including buildings, hardstanding, plantation woodland, scrub, hedgerows, grasslands, tall ruderal vegetation, standing water and running water. The wider site contained further examples of these habitats but with large areas of hardstanding and buildings within the central existing cement works.

Habitats in the proposed works area and the wider site qualify as the priority habitats 'hedgerows', 'ponds' and 'lowland meadows' under Section 7 of the Environment (Wales) Act 2016[2].

There are two statutory designated sites within 2km of the wider site, both of which are located *c.*900m away and are primarily designated for their breeding populations of great crested newt. There are a further seven internationally designated sites within 10km.

There are 14 non-statutory designated sites within 2km of the wider site, the closest of which is *c.*230m away.

Further botanical surveys included an invasive non-native species survey, a hedgerow survey and the production of an updated species list for an area of grassland where orchids were incidentally recorded during bat transect surveys.

Three stands of a Cotoneaster species were recorded in the south east of the active site. These were all outside of the proposed works areas. Five species of Cotoneaster are listed as invasive species under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)[3]. Due to the inherent difficulty with identifying this genus down to species level and their ability to readily hybridise, it is prudent to assume that all Cotoneaster species are invasive.

The Japanese Knotweed previously recorded by AECOM in 2015 was not observed during the updated surveys reported here despite a detailed search.

A dense covering of Virginia-creeper was present on the roof of a garage building in the north west of the proposed works area. This is an invasive non-native species listed under Schedule

[1] https://planning.agileapplications.co.uk/flintshire/application-details/61541

[2] https://www.legislation.gov.uk/anaw/2016/3/contents/enacted

[3] https://www.legislation.gov.uk/ukpga/1981/69

9 of the Wildlife and Countryside Act 1981 (as amended)[4]. No other invasive non-native species were recorded in the proposed works area or the wider site.

None of the hedgerows surveyed qualify as 'Important' under The Hedgerows Regulations 1997[5].

Two species of orchid were recorded in the grassland where an updated species list survey was undertaken. The grassland was classified as being neutral semi-improved.

[4] https://www.legislation.gov.uk/ukpga/1981/69

[5] https://www.legislation.gov.uk/uksi/1997/1160/made/data.pdf

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1 INTRODUCTION

1.1 Purpose of this report

1.1.1 This report presents the results of terrestrial botanical surveys (Phase 1 Habitat Survey, hedgerow survey, invasive non-native species survey, and an updated species list survey) carried out by RSK Biocensus between May 2022 and February 2023 on behalf of Castle Cement Limited for the Padeswood Carbon Capture and Storage project (here on referred to as the 'Proposed Development') within Padeswood Cement Works, south of Buckley, Flintshire (OS Grid Reference: SJ 29127 62227).

1.1.2 Ecological surveys were commissioned to provide baseline information on habitats, vegetation and protected species to inform the environmental assessment process and any Habitats Regulations Assessment (HRA) which may be required.

1.1.3 Different areas and site boundaries are referred to in this report. A summary is given below but the Ecological Survey Area is outlined for each survey type in the relevant sections:

- The 'wider site' – the whole Castle Cement Limited landholding (c.70.9 ha), shown as the red line boundary on **Figure 1**. Includes the proposed works areas (see below), ancillary works areas and areas where no works are proposed as part of the Proposed Development.
- The 'proposed works area' – area within which the Proposed Development works will occur (except for ancillary works), shown as the blue line boundary on **Figure 5**.
- 'Ancillary works' – proposed works to facilitate and support the Proposed Development as described in **Section 1.2.5**.

1.1.4 A preliminary ecological appraisal (PEA), including a Phase 1 Habitat Survey was originally carried out by AECOM in 2015 in relation to a different development on the Castle Cement Limited site (AECOM, 2017[6]). This identified the presence of Japanese Knotweed (*Reynoutria japonica*) on the wider site. The surveys presented here provide an update to the original survey undertaken by AECOM.

1.1.5 The results of terrestrial animal surveys are provided in **Volume 4, Technical Appendix 5.2**.

1.2 Proposed Development

1.2.1 The Proposed Development aims to integrate Castle Cement Limited's Padeswood Cement Works into the HyNet North West network through the capture of CO_2 for transportation and subsequent storage in Liverpool Bay CCS Limited's Liverpool Bay storage facilities to ensure that cement production at the cement works is carbon neutral.

[6] https://planning.agileapplications.co.uk/flintshire/application-details/61541

1.2.2 The Proposed Development includes an extensive gas cleaning stage to prepare the emissions from the cement kiln for carbon capture and storage.

1.2.3 Waste heat from the kiln system, supplemented by a Combined Heat and Power (CHP) plant, will provide heat for the Post Combustion Carbon Capture and Compression (PCCCC) plant and nearly all the capture plant electrical power requirements. Amine absorption technology will capture emissions from the kiln and CHP plant.

1.2.4 CO_2 will be cleaned to meet the HyNet CO_2 specification, compressed to and then delivered by a pipeline for storage in Liverpool Bay. Liverpool Bay CCS Limited is responsible for the consenting, construction and operation of the CO_2 pipeline.

1.2.5 The individual components of the development can be summarised as follows:

- A Combined Heat and Power (CHP) plant with 15 MWe (minimum) and 83MW (minimum) thermal of installed capacity, to produce electricity and heat to power the carbon capture equipment;
- A Post Combustion Carbon Capture and Compression (PCCCC) plant, to extract CO_2 from waste gases and compress it for transport and storage; and
- Various temporary and permanent enabling development to support and facilitate the Proposed Development.

1.2.6 A full description of the main Proposed Development's components is presented in **Volume 2, Chapter 1: Introduction, Table 2.1**.

1.2.7 The CHP plant will exceed the 10 MWe threshold specified in the Developments of National Significance (Specified Criteria and Prescribed Secondary Consents) Regulations 2016[7] and therefore is expected to need to be a DNS application for determination by Welsh Ministers.

1.3 Landscape context

1.3.1 The Castle Cement Limited landholding is bordered to the north by the A5118 road, to the west by agricultural fields and to the east and south by railway lines, though the railway line to the south is understood to be disused. These railway lines provide a link to the wider landscape which is predominantly agricultural with the residential areas of Buckley to the north west and Penymynydd to the east.

1.3.2 Both the proposed works area and the wider site contain a variety of man-made and natural habitats including woodland, scrub, grassland, standing and running water, ditches and hedgerows. The centre of the wider site is an active cement works dominated by areas of hardstanding, buildings and industrial structures.

1.4 Validity of data

1.4.1 According to Chartered Institute of Ecology and Environmental Management (CIEEM) advice (CIEEM 2019[8]), survey data are valid for a period of 12 to 18 months

[7] https://www.legislation.gov.uk/wsi/2016/56/contents

[8] https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf

from the date of the survey. The report highlights any circumstances where data may be valid for less than 18 months. Between 18 months and 3 years a professional ecologist will need to undertake a site visit and may also need to update desk study information (effectively updating the PEA) and then review the validity of the report.

2 METHODS

2.1 Overview

2.1.1 The PEA was undertaken in line with guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017[9]), and it therefore included:

- A desk study (including records of designated sites, protected and notable species; a review of aerial photographs; obtaining information from the DEFRA and JNCC websites, and the local authority website; and requesting data from the local records centre) here called a background data search (BDS); and
- A field survey that informed habitat mapping (Phase 1 habitat survey).

2.1.2 The PEA also included an assessment of the possible presence of protected or priority species but this is presented in **Volume 4, Technical Appendix 5.2** and is therefore not duplicated in this report.

2.1.3 The survey was carried out on 11 and 18 May 2022 by Emily Shaw (nee Clark) and Shona Redman, at the time both were employed by RSK Biocensus. Emily is a senior ecological consultant with over seven years' experience in ecological consultant and has botanical skills rated at Field Identification Skills Certificate (FISC) level 4. Shona (no longer working at RSK Biocensus) is a senior ecological consultant with over four years' experience and with botanical skills rated at FISC level 3. Emily is an associate member and Shona is a full member of CIEEM.

2.2 Background data search

2.2.1 A search was made in June 2022 for reference materials relating to the ecology of the Site, and a list of sources is given in **Table 1**.

Table 1 Data sources

Information Obtained	Available From
Designated site locations and citations	Natural Resources Wales website[10] Cofnod – North Wales Environmental Information Service[11]
Details of habitats listed on the LBAP	Local Biodiversity Action Plan (LBAP) currently unavailable

2.2.2 A search was made for information on statutory designated sites (often internationally and nationally important sites for ecology) and non-statutory designated sites (often important in a local context) within 2km of the wider site boundary. The search was

[9] https://cieem.net/wp-content/uploads/2019/02/Guidelines-for-Preliminary-Ecological-Appraisal-Jan2018-1.pdf

[10] https://naturalresources.wales/evidence-and-data/?lang=en

[11] https://www.cofnod.org.uk/Home

extended to 10km for Ramsar sites, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

2.3 Phase 1 Habitat Survey

2.3.1 The field survey was based on the extended Phase 1 habitat survey (Joint Nature Conservation Committee, 2010[12]). The survey involved the following elements:

- Habitat mapping using a set of standard colour codes to indicate habitat types on a Phase 1 Habitat Map (**Figure 2***)*; and
- A description of features of possible ecological or nature conservation interest in notes relating to numbered locations on the Phase 1 habitat map, called 'target notes' (**Appendix A**).

2.3.2 The survey was undertaken over the wider site and updated the habitat information reported in the previous PEA (AECOM, 2017[13]) that was produced in relation to an unrelated development on the Site.

2.3.3 Vascular plant species were recorded during the survey, though at this level of survey, no species lists should be regarded as exhaustive (additional species would almost certainly be found in more detailed surveys or repeat surveys at various times of the year).

2.3.4 Plant nomenclature in this report follows Stace (2019) for native and naturalised species of vascular plant[14], and mosses and liverworts follow Hill et al. (2008)[15]. Introduced species and garden varieties were identified using relevant Floras. Plant names in the text are common names with the scientific names in brackets afterwards on the first occurrence only. Doubtful identifications are preceded by 'cf.' placed before the specific epithet where the plant is very probably the species indicated, but it could not be distinguished from similar members of the genus with certainty.

Survey constraints

2.3.5 May is an optimal time of year for Phase 1 Habitat Survey and the survey was sufficient to identify the habitats present along with a broad list of plant species.

2.3.6 No access was available to the line of residential properties on Padeswood Drive so these have been mapped as 'private properties'. Furthermore, no access was available to the most south eastern field due to the presence of a wet, steep-sided ditch and dense vegetation. However, this area appeared similar in composition to the neighbouring fields and to the habitat previously mapped (AECOM, 2017[16]). None of these areas will be directly affected by the Proposed Development and this is therefore not considered a significant constraint to the survey.

[12] https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf

[13] https://planning.agileapplications.co.uk/flintshire/application-details/61541

[14] https://www.nhbs.com/en/new-flora-of-the-british-isles-book

[15] https://www.nhbs.com/en/a-checklist-and-census-catalogue-of-british-and-irish-bryophytes-book

[16] https://planning.agileapplications.co.uk/flintshire/application-details/61541

2.4 Invasive non-native species (INNS) survey

2.4.1 A walkover of the works area was carried out on 25 July 2022 by Emily Shaw and Shona Redman. It also incorporated areas of the wider site where ancillary works may occur as part of the Proposed Development (**Figure 3**).

2.4.2 A walkover survey was carried out to record the presence of invasive plant species e.g. Giant Hogweed (*Heracleum mantegazzianum*), Himalayan Balsam (*Impatiens glandulifera*) and Japanese Knotweed. Special attention was paid to field boundaries, ponds and areas of tall-herb vegetation, as these are most likely to support the target species. Where invasive plant species were seen during the normal course of other surveys they were noted and recorded.

Survey constraints

2.4.3 July is an optimal time of year for searching for invasive species, therefore no survey constraints were identified.

2.5 Hedgerow survey

2.5.1 A hedgerow survey was undertaken on 25 July 2022 by Emily Shaw and Shona Redman of hedgerows within the works area which may be impacted by the Proposed Development (**Figure 4**). A survey of these hedgerows was undertaken to determine their 'ecological importance' (under the ecological criteria of the Hedgerows Regulations 1997) and to provide baseline information on their structure and species so they can be re-instated appropriately after works.

2.5.2 The hedgerows were surveyed broadly in line with the methodologies found in the following:

- The Hedgerows Regulations 1997[17]
- Hedgerow Survey Handbook (Defra, 2007)[18]

2.5.3 The hedgerow assessments did not attempt to classify a hedgerow's importance based on either historical factors or its use by a protected or red-listed species.

2.5.4 Following an updated work area, an additional hedgerow survey was undertaken on 24 February 2023 by Emily Shaw of hedgerows within the north eastern corner of the Site which may be impacted by the Proposed Development (**Figure 4**). The survey followed the same method outlined above.

Survey constraints

2.5.5 The additional survey of two hedgerows (Hedgerow 5 and 6) was undertaken in February when not all species were readily identifiable. It is considered the information was sufficient to determine the importance of the hedgerows.

[17] https://www.legislation.gov.uk/uksi/1997/1160/made/data.pdf

[18] https://www.hedgelink.org.uk/cms/cms_content/files/89_hedgerow-survey-handbook.pdf

2.6 Updated species list survey

2.6.1 A survey was undertaken on 19 July 2022 by Emily Shaw and Shona Redman to update the plant species list for the grassland mound in the works area that is being managed for reptiles (**Figure 5**). The need for this survey was prompted by the incidental sighting of orchids within the grassland during bat transect surveys which indicated that the grassland was of greater botanical interest than it appeared during the Phase 1 Habitat survey which, although undertaken during the optimal period for Phase 1 Habitat survey, was undertaken slightly too early in the year for an optimal survey of the grassland in particular.

Survey constraints

2.6.2 Although undertaken in the optimal period for surveying grasslands, the survey was undertaken after a period of unusually hot weather which left many of the plant species dead or wilted. Despite this, the majority of species were still readily identifiable and the grassland type could still be accurately assessed so this is not considered a major constraint to the survey.

3 RESULTS

3.1 Background data search

Biodiversity action plans

3.1.1 Habitats in the works area and the wider site qualify as the priority habitats 'hedgerows', 'ponds' and 'lowland meadows' under Section 7 of the Environment (Wales) Act 2016[19].

3.1.2 The latest Flintshire Local Biodiversity Action Plan (LBAP) is unavailable.

Designated sites

Statutory sites

3.1.3 There are two statutory sites within 2km of the wider Site boundary, one is an SSSI, the other is an SAC. The search was extended to 10km for Ramsar sites, SACs and SPAs; with seven sites identified. All sites are listed in **Table 2** with their reasons for designation and distance from the wider site.

Table 2 Statutory designated sites within 2km and 10km of the wider Site boundary

Site Name	Designation	Approximate Distance (m)
Buckley Claypits and Commons	SSSI	900
Description: Of special interest for its population of great crested newts (*Triturus cristatus*), its assemblage of widespread amphibian species and for its mosaic of semi-natural grassland. Other habitats include lowland dry and wet heath, tall herb, bracken, scrub and secondary woodland. The ecological interest of the Site is enhanced by the presence of breeding reed bunting (*Emberiza schoeniclus*) and water vole (*Arvicola amphibius).*		
Deeside and Buckley Newt Sites	SAC	900
Qualifying features: • Annex II species – Great crested newt (*Triturus cristatus*). • Annex I habitat – Old sessile oak woods with Ilex and Blechnum in the British Isles (but not a primary reason for selection).		
River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid	SAC	6,310 (Wales), 9,408 (England)
Qualifying features:		

[19] https://www.legislation.gov.uk/anaw/2016/3/contents/enacted

Site Name	Designation	Approximate Distance (m)

• Annex I habitat – Water courses of plain to montane levels with the *Ranunculuion fluitantis* and *Callitricho-Batrachion* vegetation (rivers with floating vegetation often dominated by water-crowfoot).
• Annex II species:
  ○ Atlantic salmon (*Salmo salar*)
  ○ brook lamprey (*Lampetra planeri*)
  ○ bullhead (*Cottus gobio*)
  ○ Floating Water-plantain (*Luronium natans*)
  ○ otter (*Lutra lutra*)
  ○ river lamprey (*Lampetra fluviatilis*)
  ○ sea lamprey (*Petromyzon marinus)*		

Dee Estuary / Aber Dyfrdwy (Wales)	SAC	6,542

Qualifying features:
• Annex I habitats:
  ○ Mudflats and sandflats not covered seawater at low tide
  ○ Salicornia and other annuals colonizing mud and sand
  ○ Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
• Annex I habitats (but not a primary reason for selection):
  ○ Estuaries
  ○ Annual vegetation of drift lines
  ○ Vegetated sea cliffs of the Atlantic and Baltic Coasts
  ○ Embryonic shifting dunes
  ○ “Shifting dunes along the shoreline with Ammophila arenaria (“white dunes”)”
  ○ “Fixed coastal dunes with herbaceous vegetation (“grey dunes”)”
  ○ Humid dune slacks
• Annex II species (but not a primary reason for selection):
  ○ sea lamprey (*Petromyzon marinus*)
  ○ river lamprey (*Lampetra fluviatilis*)
  ○ Petalwort (*Petalophyllum ralfsii*)		

The Dee Estuary (Wales)	Ramsar	6,542
Qualifying features: • Criterion 1 – The Site contains extensive intertidal mud and sand flats with large expanses of saltmarsh towards the head of the estuary. Contains Annex I habitats as described above. • Criterion 2 - Supports breeding colonies of natterjack toad (*Epidalea calamita*).		

Site Name	Designation	Approximate Distance (m)

• Criterion 5 – Supports internationally important assemblages of non-breeding waterfowl.
• Criterion 6 – Supports internationally important species/populations of:
  ○ redshank (*Tringa totanus*)
  ○ teal (*Anas crecca*)
  ○ shelduck (*Tadorna tadorna*)
  ○ oystercatcher (*Haematopus ostralegus*)
  ○ curlew (*Numenius arquata*)
  ○ pintail (*Anas acuta*)
  ○ grey plover (*Pluvialis squatarola*)
  ○ knot (*Calidris canutus islandica*)
  ○ dunlin (*Calidris alpina alpina*)
  ○ black-tailed godwit (*Limosa limosa islandica*)
  ○ bar-tailed godwit (*Limosa lapponica*)		

Alyn Valley Woods / Coedwigoedd Dyffryn Alun	SAC	7,824

Qualifying features:
• Annex I habitat – Tilio-Acerion forests of slopes, screes and ravines.
• Annex I habitats (but not a primary reason for selection):
  ○ Semi-natural dry grasslands and scrubland facies on calcareous substrates
  ○ Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*		

Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains	SAC	8,802

Qualifying features:
• Annex I habitats:
  ○ European dry heaths
  ○ Blanket bogs
• Annex I habitats (but not a primary reason for selection):
  ○ Semi-natural dry grasslands and scrubland facies on calcareous substrates
  ○ Transition mires and quaking bogs
  ○ Calcareous and calcshist screes of the montane to alpine levels
  ○ Calcareous rocky slopes with chasmophytic vegetation		

Halkyn Mountain / Mynydd Helygain	SAC	9,257
Qualifying features: • Annex I habitat – Calaminarian grassland of the *Violetalia calaminariae* type.		

Site Name	Designation	Approximate Distance (m)

• Annex II species – great crested newt (*Triturus cristatus*).
• Annex I habitats (but not a primary reason for designation):
  ○ European dry heath
  ○ Semi-natural dry grassland and scrubland facies on calcareous substrates
  ○ Molinia meadows on calcareous peaty or clayey-silt-laden soils		

Midland Meres & Mosses Phase 2 (Wales)	Ramsar	9,566
Qualifying features: • Criterion 1 – Site comprises a diverse range of habitats from open water to raised bog. • Criterion 2 – Supports a number of rare species of plants associated with wetlands, including the nationally scarce Cowbane (*Cicuta virosa*) and Elongated Sedge (*Carex elongata*). Also present are the nationally scarce bryophytes *Dicranum affine* and *Sphagnum pulchrum*. Also supports an assemblage of invertebrates including 16 British Red Data Book species.		

Non-statutory sites

3.1.4 There are 14 non-statutory designated sites within 2km of the wider Site boundary, which are all wildlife sites (WSs). These sites are listed in **Table 3** along with their proximity to the wider site.

Table 3 Non-statutory designated sites within 2km of the wider Site boundary.

Site Name	Designation	Approximate Distance (m)
Black Brook Plantation	WS	230
Narrow broad-leaved plantation on the north-east banks of Black Brook. The plantation of widely spaced Eastern Balsam-poplar (*Populus balsamifera*) has no shrub layer, but tall herbs beneath mainly Common Nettle (*Urtica dioica*). There are also large patches of tall herb where Meadowsweet (*Filipendula ulmaria*), Great Willowherb (*Epilobium hirsutum*) and Lesser Pond-sedge (*Carex acutiformis*) are dominant with occasional Common Valerian (*Valeriana officinale*) and Crosswort (*Cruciata laevipes*). There is a very small marshy grassland at the southern end of the Site in which Common Spotted-orchid (*Dactylorhiza fuchsii*), Cuckooflower (*Cardamine pratensis*), Ragged-Robin (*Silene flos-cuculi*) and Oval Sedge (*Carex leporine*) occur. Also in the southern end of the Site is Alder (*Alnus glutinosa*) with some Marsh-marigold (*Caltha palustris*).		
Bistre Wood	WS	585
Broad-leaved woodland along stream valley. Canopy includes Wild Cherry (*Prunus avium*), Oak (*Quercus* sp.), Ash (*Fraxinus excelsior*) and Birch (*Betula* sp.).		

Site Name	Designation	Approximate Distance (m)
Padeswood Pool	WS	625
Large pool surrounded by semi-natural broad-leaved woodland, Willow carr, fen and neutral grassland. The pool is fed by streams from the north west and north east. Alder (*Alnus glutinosa*) is dominant in the woodland, with a shrub layer of Elder (*Sambucus nigra*), Hazel (*Corylus avellana*) and Hawthorn (*Crataegus monogyna*). The herb layer is species-rich and contains Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*), Meadowsweet (*Filipendula ulmaria*), Greater Pond-sedge (*Carex riparia*), Marsh-marigold (*Caltha palustris*), Wild Angelica (*Angelica sylvestris*) and Reed Canary-grass (*Phalaris arundinacea*). The willow carr has a similar herb layer. The Bulrush (*Typha latifolia*)-dominated fen forms dense stands at the western and eastern margins of the pool. Other smaller areas of fen comprise Great Willowherb (*Epilobium hirsutum*), Lesser Pond-sedge (*Carex acutiformis*), Branched Bur-reed (*Sparganium erectum)*, Meadowsweet and Yellow Loosestrife (*Lysimachia vulgaris*). The grassland includes Celery-leaved Buttercup (*Ranunculus sceleratus*), Water Mint (*Mentha aquatica*), Common Mallow (*Malva neglecta*), Great Mullein (*Verbascum thapsus*) and Nodding Bur-marigold (*Bidens cernua*) amongst the dominant grasses. The pool is used as a fishery. The whole site is attractive to bird life. Padeswood pool is part of an important complex of kettle-hole meres.		
Padeswood Marsh	WS	660
Small fen with two pools, a patch of Alder carr and marshy grassland around the edges. The fen is dominated by Lesser Pond-sedge (*Carex acutiformis*) with patches of Common Club-rush (*Schoenoplectus lacustris*) and Bulrush (*Typha latifolia*) around the margins of the pools. Gypsywort (*Lycopus europaeus*), Lesser Water-parsnip (*Berula erecta*) and Skullcap (*Scutellaria galericulata*) are throughout with patches of Sharp-flowered Rush (*Juncus acutiflorus*) and a few scattered Willow (*Salix* sp.) and Alder (*Alnus glutinosa*) bushes. The herb layer in the Alder carr is also rich with Marsh-marigold (*Caltha palustris*), Meadowsweet (*Filipendula ulmaria*) and Ragged-Robin (*Silene flos-cuculi*). The marshy grassland includes Common Spotted-orchid (*Dactylorhiza fuchsii*), Star Sedge (*Carex echinata*), Oval Sedge (*Carex leporine*) and Lesser Spearwort (*Ranunculus flammula*).		
Padeswood Pasture	WS	710
Old rubbish tip with a few man-made pools which are at the bottom of long, steep slopes. There are some Willows (*Salix* sp.) at the sides of the pools and on the small islands. Surrounding the pools is a coarse grassland dominated by False Oat-grass (*Arrhenatherum elatius*) with some Common Knapweed (*Centaurea nigra*) and large areas of tall ruderal herbs. At the west end of the Site on the dismantled railway Grass Vetchling (*Lathyrus nissolia*) occurs. There has been significant disturbance and tipping of soil and rubble.		
Hartsheath	WS	845
Over mature Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*) and Oak (*Quercus robur*) with occasional stag-headed trees.		

Site Name	Designation	Approximate Distance (m)
Price's Hill Wood	WS	945
Semi-natural broad-leaved woodland with some marshy patches. The woodland is secondary with a canopy dominated by Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*) and Birch (*Betula* sp.). The understorey contains the same canopy trees along with Rowan (*Sorbus aucuparia*), Ash (*Fraxinus excelsior*), Elder (*Sambucus nigra*) and Holly (*Ilex aquifolium*). There is a diverse field layer beneath this, with prominent Bluebell (*Hyacinthoides non-scripta*) and frequent Sanicle (*Sanicula europaea*), Bramble (*Rubus fruticosus* agg.), Wood Avens (*Geum urbanum*) and Honeysuckle (*Lonicera periclymenum*).		
Coed Bryn Llys and Marsh	WS	995
Narrow semi-natural broad-leaved woodland and a marsh. The woodland canopy is dominated by Sycamore (*Acer pseudoplatanus*) and Beech (*Fagus sylvatica*) with a shrub layer of Elm (*Ulmus* sp.), Holly (*Ilex aquifolium*), Hawthorn (*Crataegus monogyna*), Hazel (*Corylus avellana*) and Crab Apple (*Malus sylvestris*). The ground flora is grassy with Tufted Hair-grass (*Deschampsia cespitosa*), Wood Melick (*Melica uniflora*), Dog's Mercury (*Mercurialis perennis*), Hedge Woundwort (*Stachys sylvatica*) along with Yellow Archangel (*Lamiastrum galeobdolon*), Bluebell (*Hyacinthoides non-scripta*) and Giant Fescue (*Schedonorus giganteus*). The marsh has patches dominated by Lesser Pond-sedge (*Carex acutiformis*) or areas of Soft-rush (*Juncus effusus*), with Marsh Bedstraw (*Galium palustre*), Marsh Ragwort (*Jacobaea aquatica*), Common Valerian (*Valeriana officinale*) and Tubular Water-dropwort (*Oenanthe fistulosa*). Alders (*Alnus glutinosa*) occur along the waterways.		
Optec Pond	WS	1,020
Small pond on the edge of Bwcle. The pond is an important breeding site for amphibians, especially great crested newts (*Triturus cristatus*). The Site includes a small field of semi-improved neutral grassland and surrounding improved grassland as foraging area.		
Knowl Hill	WS	1,085
Semi-improved neutral grassland, Bracken (*Pteridium aquilinum*) with scattered scrub and trees and a patch of heath. The heath is dominated by Heather (*Calluna vulgaris*) with Wavy Hair-grass (*Avenella flexuosa*), Common Bent (*Agrostis capillaris*), Mat-grass (*Nardus stricta*) and mosses. The grassland is predominantly Common Knapweed (*Centaurea nigra*), Cock's-foot (*Dactylis glomerata*) and Common Bent with some Sweet Vernal-grass (*Anthoxanthum odoratum*) and Bird's-foot-trefoil (*Lotus corniculatus*). The northern half of the Site is Bracken, Bramble (*Rubus fruticosus* agg.) and Common Nettle (*Urtica dioica*) with scattered Oak (*Quercus* sp.), Ash (*Fraxinus excelsior*) and Apple (*Malus* sp.) trees and a scattered scrub of Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), Willow (*Salix* sp.) and Hazel (*Corylus avellana*). There are a few patches of Aspen (*Populus tremula*) and the scrub along the disused railway track is mostly Birch (*Betula* sp.) and Willow.		
Marleyfield Meadow and Copse	WS	1,100

Site Name	Designation	Approximate Distance (m)
A small broad-leaved woodland south of semi-improved grassland. The woodland canopy is dominated by Sessile Oak (*Quercus petraea*) with a small patch of Aspen (*Populus tremula*). The scrub layer is mainly Elder (*Sambucus nigra*), Hawthorn (*Crataegus monogyna*), Holly (*Ilex aquifolium*) and Blackthorn (*Prunus spinosa*). Crab Apple (*Malus sylvestris*) is also present. Bramble (*Rubus fruticosus* agg.) dominates the ground flora with Greater Stitchwort (*Stellaria holostea*), Herb-Robert (*Geranium robertianum*) and Cleavers (*Galium aparine*). The grassland includes abundant Crested Dog's-tail (*Cynosurus cristatus*) and Sweet Vernal-grass (*Anthoxanthum odoratum*) with occasional Oval Sedge (caova), Common Knapweed (*Centaurea nigra*) and scattered Rushes (Juncus sp.). The field has an embankment along the east side with a few trees, Gorse (*Ulex europaeus*) bushes and an acidic ground flora.		
Plas Newydd Farm Lake	WS	1,195
Lake surrounded by swamp and some scattered scrub.		
Pontblyddyn Marsh and Coppa Wood	WS	1,200
The River Alyn runs through the centre of this site with broad-leaved woodland on the east side of the river and marshy grassland on the west. The woodland canopy is mixed, and dominated by Oak (*Quercus* sp.), Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*), Alder (*Alnus glutinosa*), Sycamore (*Acer pseudoplatanus*) and Pine (*Pinus* sp.) with a shrub layer of Elm (*Ulmus* sp.), Holly (*Ilex aquifolium*), Hawthorn (*Crataegus monogyna*) and Cherry (*Prunus* sp.). The steep, upper banks are dry while flat areas alongside the river are wet. On the steep slopes the herb layer is predominantly Dog's Mercury (*Mercurialis perennis*), Tufted Hair-grass (*Deschampsia cespitosa*), Wood Millet (*Milium effusum*) and occasional Yellow Archangel (*Lamiastrum galeobdolon*), ferns and Woodruff (*Galium odoratum*). In the wet parts where Alder (*Alnus glutinosa*) dominates, Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*) and Meadowsweet (*Filipendula ulmaria*) are abundant with Hemlock Water-dropwort (*Oenanthe crocata*) and Butterbur (*Petasites hybridus*) at the riverside. On the west side of the river is a marsh dominated by Pond-sedges (*Carex* sp.) with patches of locally dominant Hard Rush (*Juncus inflexus*) and Tufted Hair-grass in the northern half of the marsh. The southern half of the marsh is dominated by Reed Canary-grass (*Phalaris arundinacea*) and Great Willowherb (*Epilobium hirsutum*). There is a small pool along the ditch with Bulrush (*Typha latifolia*) and Floating Sweet-grass (*Glyceria fluitans*). The embankment across the marsh has a semi-improved neutral grassland in which Yellow-rattle (*Rhinanthus minor*) occurs. Alder (*Alnus glutinosa*) trees and Butterbur occur along the river bank. On the east facing slope near the road there is a coarse grassland with Cock's-foot (*Dactylis glomerata*), Common Knapweed (*Centaurea nigra*) and Common Bent (*Agrostis capillaris*).		
Garth Wood and Hartsheath	WS	1,390
Broad-leaved woodland with some neutral grassland and tall herb. Garth Wood and Upper Garth Wood are in the southern half of the Site on very steep north-		

Site Name	Designation	Approximate Distance (m)
east facing slopes. The canopy is dominated by Sycamore (*Acer pseudoplatanus*) and Oak (*Quercus* sp.) with some Birch (*Betula* sp.), Beech (*Fagus sylvatica*) and Larch (*Larix* sp.). Holly (*Ilex aquifolium*), Hazel (*Corylus avellana*) and Elder (*Sambucus nigra*) form the shrub layer. The ground flora includes frequent Broad Buckler-fern (*Dryopteris dilatata*) with Great Wood-rush (*Luzula sylvatica*), Yellow Archangel (*Lamiastrum galeobdolon*), Wood Millet (*Milium effusum*) and Bluebell (*Hyacinthoides non-scripta*). Hartheath's broad-leaved and mixed woodlands are adjacent to the banks of the River Alyn with open patches of Great Willowherb (*Epilobium hirsutum*), Common Nettle (*Urtica dioica*) and coarse grassland with Wild Angelica (*Angelica sylvestris*). Along the northern edge of the woodland is an area of Bramble (*Rubus fruticosus* agg.) and scrub with planted tree saplings. Alder (*Alnus glutinosa*) is abundant at the river bank with Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica and Meadowsweet (*Filipendula ulmaria*). Along the track leading to the estate there are Beech (*Fagus sylvatica*) and conifer trees. The canopy is dominated by Sycamore with Oak, Beech and Ash (*Fraxinus excelsior*). The shrub layer is sparse, in parts comprising Ash, Hawthorn (*Crataegus monogyna*) and Holly. The ground flora throughout the wood is rich and includes Ivy (*Hedera helix*), Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*), Enchanter's-nightshade (*Circaea lutetiana*) and Dog's Mercury (*Mercurialis perennis*).		

Habitats

3.1.5 There are six areas of ancient woodland within 1km of the wider Site boundary, the closest of which is *c.*188m away.

3.2 Phase 1 habitat survey

3.2.1 The Phase 1 Habitat map is provided as **Figure 2** and shows the location of the target notes referred to in the text below. A full description for each of the target notes is given in **Appendix A**. Photos of each habitat type are provided in **Appendix B**. The following habitat types are present within the works area or the wider site:

- Broadleaved plantation woodland;
- Mixed plantation woodland;
- Scrub (dense and scattered);
- Broadleaved trees (scattered and lines of);
- Semi-improved grassland;
- Neutral grassland;
- Improved grassland;
- Poor semi-improved grassland;
- Tall ruderal;

- Standing water;
- Running water;
- Spoil;
- Refuse-tip;
- Amenity grassland;
- Ephemeral / short perennial;
- Introduced shrub;
- Intact species-poor hedge;
- Hedgerow with trees;
- Buildings;
- Hardstanding; and
- Fence.

Broadleaved plantation woodland

3.2.2 The proposed works area contained two small strips of broadleaved plantation woodland (*Target Note 20*). The strip to the east contained trees up to 15m tall with canopy species limited to Sycamore (*Acer pseudoplatanus*), Ash (*Fraxinus excelsior*) and Pedunculate Oak (*Quercus robur*). The understorey contained additional woody species including Alder (*Alnus glutinosa*), Silver Birch (*Betula pendula*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Bramble (*Rubus fruticosus* agg.) and Grey Willow (*Salix cinerea*). The ground flora was relatively species-poor, limited to Ivy (*Hedera helix*) and common ruderal species. This woodland strip extended into a larger woodland block in the wider site, but the composition remained the same.

3.2.3 The woodland strip in the west of the proposed works area was similar in species composition to the eastern strip but the trees were younger and less dense.

3.2.4 There were two further notable blocks of broadleaved plantation woodland in the wider site. The first was a woodland belt near the Site entrance (*Target Note 3*) which contained semi-mature trees including Hawthorn, Lombardy Poplar (*Populus nigra* 'Italica'), Wild Cherry (*Prunus avium*), Pedunculate Oak and Lime (*Tilia* sp.). The understorey and ground flora contained several garden escapes and ornamental species. The second was a large block to the east of the active site (*Target Note 4)* which had a similar canopy composition to *Target Note 20* but surrounded an active eco-centre used for educational purposes. In areas used by the eco-centre, the understorey and ground flora had largely been cleared and were devoid of vegetation. Even in areas where the understorey had developed, the woody species diversity was low, being limited to mostly Hawthorn, Holly (*Ilex aquifolium*) and Bramble with some Sycamore saplings.

3.2.5 There were some small, isolated patches of woodland to the south west of the woodland denoted by *Target Note 4*. It is likely that these were once connected to the larger block but have become isolated through the construction of roads.

Mixed plantation woodland

3.2.6 The proposed works area contained two areas of mixed plantation woodland (*Target Note 14*), both similar in composition with trees up to 12m and numerous young trees and saplings still in protective tree guards. The canopy was more diverse than the nearby broadleaved plantation woodland (*Target Note 20*), containing Sycamore, Alder, Hazel, Hawthorn, Ash, European Larch (*Larix decidua*), Scots Pine (*Pinus sylvestris*) and Lime. The understorey was dense and impenetrable in places, and contained additional woody species including Silver Birch, Beech (*Fagus sylvatica*), Blackthorn (*Prunus spinosa*), Pedunculate Oak and Maple-leaf Viburnum (*Viburnum acerifolium*). The ground flora was relatively sparse and was mostly comprised of species typical of the neighbouring grassland.

3.2.7 There were no additional areas of this habitat in the wider site.

Scrub (dense and scattered)

3.2.8 The works area and the wider site both contained multiple patches of dense and scattered scrub.

3.2.9 The north west corner of the proposed works area contained several areas of dense scrub (*Target Notes 9, 26* and *31*) with a variety of native and non-native woody species including Field Maple (*Acer campestre*), Sycamore, Horse-chestnut (*Aesculus hippocastanum*), Spotted-laurel (*Aucuba japonica),* Silver Birch, Hawthorn, Ash, Fly Honeysuckle (*Lonicera xylosteum*), Wild Cherry, Pedunculate Oak, Dog-rose (*Rosa canina*), Bramble, Goat Willow (*Salix caprea*), Snowberry (*Symphoricarpos albus*) and Gorse (*Ulex europaeus*). Scattered semi-mature and mature trees were present in some of the scrub including Sycamore and Pedunculate Oak.

3.2.10 The south of the proposed works area contained two large patches of dense scrub. The first was on top of a grassland mound (*Target Note 17*). It was dominated by Blackthorn and Willow (*Salix* sp.) and had started to encroach into the neighbouring grassland. The other was adjacent to a stream along the southern boundary (*Target Note 15*). This area contained greater woody species diversity with Hazel, Hawthorn, Pedunculate Oak, Bramble and Goat Willow all recorded, but tall ruderal vegetation was also more prevalent due to the overgrown nature of the area.

3.2.11 There were further smaller patches of dense and scattered scrub within the proposed works area and wider site, comprised of species already described.

Broadleaved trees (scattered and lines of)

3.2.12 There was a line of broadleaved trees in the north-west of the proposed works area bordering a car park (*Target Note 24*). The trees were up to *c.*12m tall and included Sycamore, Ash and Poplar (*Populus* sp.).

3.2.13 Further broadleaved trees were present in the proposed works area and the wider site, scattered throughout other habitats, and in lines along site or habitat boundaries. Species present were typical of those recorded in other scrub and woodland habitats across the Site.

Semi-improved grassland

3.2.14 There was a large spoil mound in the south of the proposed works area (*Target Note 16)* which has been colonized by grassland. This area has previously been recommended as an area to manage for reptiles (AECOM, 2017[20]). The grassland was originally assessed as being poor semi-improved but this was altered to semi-improved following the updated species list survey. The grassland had a sward height up to 1m and contained the following grass species: Cock's-foot (*Dactylis glomerata*), Red Fescue (*Festuca rubra*), Yorkshire-fog (*Holcus lanatus*) and Annual Meadow-grass (*Poa annua*). A more diverse range of herbs was present compared to the nearby poor semi-improved fields (*Target Note 11*). A full list of plant species recorded during the updated species list survey in this area is provided in **Appendix D**.

Neutral grassland

3.2.15 In the south west of the proposed works area was a neutral grassland field, grown and cut for hay (*Target Note 11*). The sward was *c.*60cm tall and contained a more diverse range of grass species than other fields on the Site, including Meadow Foxtail (*Alopecurus pratensis*), False Oat-grass (*Arrhenatherum elatius*), Soft-brome (*Bromus hordeaceus*), Crested Dog's-tail (*Cynosurus cristatus*), Cock's-foot, Yorkshire-fog and Perennial Rye-grass (*Lolium perenne*). Herb species were less diverse, containing mostly common species typical of improved swards. There were damper patches towards the unused refuse-tip (*Target Note 12)* which contained Cuckooflower (*Cardamine pratensis*), Iris (*Iris* sp.), Soft-rush (*Juncus effusus*) and Hard Rush (*Juncus inflexus*).

Improved grassland

3.2.16 In the north of the proposed works area were two sheep-grazed fields (*Target Note 8*), separated by a Hawthorn hedge. Due to the heavy grazing pressure, few species were visible and identifiable, limited to Creeping Thistle (*Cirsium arvense*), Spear Thistle (*Cirsium vulgare*), Red Fescue, Perennial Rye-grass and Common Nettle (*Urtica dioica*).

3.2.17 The wider site also contained a series of sheep-grazed fields in the north east which were intersected by hedgerows with trees. The species composition was similar to *Target Note 1* and was dominated by species typical of improved grassland. There was a damp area near one of the hedgerows which contained Brooklime (*Veronica beccabunga*).

Poor semi-improved grassland

3.2.18 The unused refuse-tip in the south-west of the proposed works area had largely been colonised by poor semi-improved grassland (*Target Note 12*). It had a species composition similar to *Target Note 11* but with more herb species, particularly ruderals, present.

[20] https://planning.agileapplications.co.uk/flintshire/application-details/61541

3.2.19 The wider site contained several poor semi-improved fields including a series of fields in the south east corner (*Target Note 33*) which appeared similar to *Target Note 11* but with less grass species diversity suggesting that they are not used for hay production. These fields also had a relatively tall sward height of up to 1m and were so overgrown that stands of tall ruderal vegetation were developing in places.

3.2.20 There were also two poor semi-improved grassland fields in the east of the wider site (*Target Note 5*) which were similar to *Target Note 1* but with a longer, less managed sward and additional herb species including Hogweed (*Heracleum sphondylium*), Creeping Cinquefoil (*Potentilla reptans*), Common Field-speedwell (*Veronica persica*) and Thyme-leaved Speedwell (*Veronica serpyllifolia*).

Tall ruderal

3.2.21 The only distinct patches of tall ruderal vegetation in the works area were in the unused refuse-tip (*Target Note 12*), and in the north-west corner around Padeswood Hall (*Target Notes 9* and *25*). Tall ruderal vegetation was also found scattered throughout other habitats but not in an area large enough to map distinctly. Species present typically included Cow Parsley (*Anthriscus sylvestris*), Creeping Thistle, Great Willowherb (*Epilobium hirsutum*), Hogweed and Common Nettle.

3.2.22 The wider site contained a fenced off area of tall ruderal vegetation around two ponds (*Target Note 6*) including Rosebay Willowherb (*Chamaenerion angustifolium*), Creeping Thistle, Cock's-foot, Tufted Hair-grass (*Deschampsia cespitosa*), Teasel (*Dipsacus fullonum*), Rough Meadow-grass (*Poa trivialis*), Broad-leaved Dock (*Rumex obtusifolius*), Common Nettle, and Hawthorn saplings.

Standing water

Ponds

3.2.23 The proposed works area contained four ponds. Three of these were in the unused refuse-tip area (*Target Note 12*) and were largely devoid of aquatic vegetation except the eastern most one which contained extensive stands of Common Reed (*Phragmites australis*). The other pond was a lagoon in the south east corner of the works area (*Target Note 18*) which was surrounded by a thick fringe of Common Reed, with open water in the centre.

3.2.24 The wider site contained 10 more ponds though the majority were too small to constitute a mappable unit. Two of these were in a fenced off area of tall ruderal vegetation (*Target Note 6*). They contained stands of Iris and Bulrush (*Typha latifolia*) and there were scattered log piles and refuge mounds near the ponds. There was a pond associated with the eco-centre within the woodland at *Target Note 4* and the remaining seven ponds were in the network of poor semi-improved grassland fields in the south east (*Target Note 19*) though many of these were dry or only contained shallow water including one of the larger ponds previously recorded by AECOM (2017)[21] which was dry with deeply cracked earth (*Target Note 21*).

[21] https://planning.agileapplications.co.uk/flintshire/application-details/61541

Ditches

3.2.25 The proposed works area contained a wet ditch in the mixed plantation woodland belt denoted by *Target Note 14*. It ran from the cement works to the north to the stream along the southern boundary though no flow was visible during the survey. The ditch contained little water and was found to have almost dried during water vole surveys in August 2022 (**Volume 4, Technical Appendix 5.2**). It was heavily shaded, contained leaf litter and no aquatic vegetation was observed.

3.2.26 A few small ditches were present in the unused refuse-tip (*Target Note 12*) connected to the ponds, but these were too small to constitute a mappable unit. They were dominated by Common Reed with little water present.

3.2.27 The wider site contained a wet ditch to the east of the active areas (starting near *Target Note 4*) which was previously reported as a brook (AECOM, 2017[22]). The ditch had no flow and the water was contained in pools between sections that had dried out. It was heavily shaded by neighbouring woodland and as such had heavy leaf litter and little aquatic vegetation. A second ditch matching this description was present to the east of *Target Note 5*.

3.2.28 Waterbodies are described in more detail in **Volume 4, Technical Appendix 5.2** in relation to great crested newts (*Triturus cristatus*) and water vole (*Arvicola amphibius*).

Running water

3.2.29 There was a small stream running along part of the proposed works area southern boundary which then continued off-site to the west (*Target Note 15*). The stream flowed in a westerly direction, was heavily shaded and appeared to contain no aquatic vegetation though most of the stream was obscured from view by dense scrub.

3.2.30 The stream is described in more detail in **Volume 4, Technical Appendix 5.2** in relation to water vole.

Spoil

3.2.31 There was a series of spoil mounds in the east of the wider site that were becoming colonized by vegetation including ephemerals and scrub.

3.2.32 The unused refuse-tip (*Target Note 12*) contained numerous spoil heaps from when the area was excavated. However, these had become so heavily colonized by vegetation that they have been mapped as the relevant habitat type rather than as spoil.

Refuse-tip

3.2.33 The south west corner of the proposed works area comprised an unused refuse-tip (*Target Note 12*) which at the time of survey was being managed as an eco-park. The area contained spoil mounds and standing open water in bowls that had previously been excavated for refuse. The area had been colonized by vegetation with minimal areas of bare ground and hardstanding remaining, primarily by grassland but stands

[22] https://planning.agileapplications.co.uk/flintshire/application-details/61541

of tall ruderal vegetation and scrub were also present. There were stands of Common Reed and Bulrush in the south east corner where there was damper ground.

Amenity grassland

3.2.34 The proposed works area contained several patches of amenity grassland (*Target Notes 8, 28, 29* and *30*), the majority of which were road verges. These areas appeared to be frequently managed with a short sward of only common grass and herb species including Common Bent (*Agrostis capillaris*), Cock's-foot, Yorkshire-fog, Yarrow (*Achillea millefolium*), Ribwort Plantain (*Plantago lanceolata*), Creeping Buttercup (*Ranunculus repens*), Dandelion (*Taraxacum officinale* agg.) and White Clover (*Trifolium repens*). Scattered trees were found in some of the areas (*Target Notes 28* and *30*) including Sycamore, Horse-chestnut, Sweet Chestnut (*Castanea sativa*), Beech, Poplar, Turkey Oak (*Quercus cerris*), Grey Willow, Lime, Elm (*Ulmus* sp.) and conifers.

3.2.35 The wider site contained multiple small areas of amenity grassland on road verges but also contained two amenity grassland fields in the north east, one of which was managed as a football pitch (*Target Note 1*). Grass species present included Meadow Foxtail, Sweet Vernal-grass (*Anthoxanthum odoratum*), Yorkshire-fog, Perennial Rye-grass and Rough Meadow-grass. Herb species diversity was greater than in some of the other amenity and improved grassland areas on the Site but the species were all common and the sward height was only *c*.5-10cm due to frequent management. There were strips of tall ruderal vegetation around the field margins including Garlic Mustard (*Alliaria petiolata*), Cow Parsley, Rosebay Willowherb, Creeping Thistle, Teasel, Hogweed, Broad-leaved Dock and Common Nettle.

Ephemeral / short perennial

3.2.36 Ephemeral and short perennial species were recorded throughout the proposed works area and the wider site, particularly on spoil mounds and disturbed ground. Species were largely the same as those recorded in the previous survey (AECOM, 2017[23]).

Introduced shrub

3.2.37 Areas of introduced shrub were recorded within active areas of the wider site. These contained mostly ornamental varieties of Field Maple, Silver Birch, Holly, Privet (*Ligustrum* sp.), Willow and Elm (*Target Note 10*).

3.2.38 A single specimen of a Cotoneaster (*Cotoneaster horizontalis*) species was found in ornamental planting in the south east of the active area (*Target Note 23*). This is an invasive non-native species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)[24].

[23] https://planning.agileapplications.co.uk/flintshire/application-details/61541

[24] https://www.legislation.gov.uk/ukpga/1981/69

Intact species-poor hedge

3.2.39 There was an intact hedge dominated by Hawthorn, just beyond the proposed works area northern boundary running parallel to the A5118 road (*Target Note 32*). The hedge was c.2-3m tall and 1.5m wide.

3.2.40 There was one further intact species-poor hedge, within the north west of the works area. It was surveyed further as part of the hedgerow survey (*Hedgerow 3; Figure 4*), results of which are presented in **Appendix C**.

Hedgerow with trees

3.2.41 There was a hedgerow with trees around the edge of amenity grassland at *Target Note 8*. Woody species present included Sycamore, Hawthorn, Arizona Cypress (*Cupressus arizonica*), Beech, Ash, Blackthorn, a Willow and an Elm. This hedgerow was surveyed further as part of the hedgerow survey (*Hedgerow 4; Figure 4*), results of which are presented in **Appendix C**.

3.2.42 There were two further hedgerows with trees in the north west of the works area, both associated with residential properties. They were surveyed further as part of the hedgerow survey (*Hedgerows 1* and *2*; *Figure 4*), results of which are presented in **Appendix C**.

3.2.43 In the east of the wider site was a series of improved grassland fields intersected by hedgerows with trees (*Target Note 7*) which contained species similar to those described above.

Buildings

3.2.44 The land north west of the proposed works area contained a building known as Padeswood Hall which included a derelict residential property and garage block. A residential building known as Padeswood Hall Farm was also present, which was occupied. The wider site contained a variety of buildings and structures including toilet blocks, office buildings, industrial buildings and silos. Those due to be affected by the Proposed Development are described in more detail in **Volume 4, Technical Appendix 5.2** in relation to roosting bats.

Hardstanding

3.2.45 The proposed works area contained access roads/tracks and car parks in the north west associated with Padeswood Hall and Padeswood Hall Farm (*Target Note 27*). These contained only occasional scattered plant species including Daisy (*Bellis perennis*), Butterfly-Bush (*Buddleja davidii*), Greater Plantain (*Plantago major*), Annual Meadow-grass and Bramble.

3.2.46 There was another car park in the proposed works area, north of the amenity grassland at *Target Note 8*). This area contained scattered ephemeral and short perennial species including American Willowherb (*Epilobium ciliatum*), Perforate St John's-wort (*Hypericum perforatum*), Common Bird's-foot-trefoil (*Lotus corniculatus*) and Annual Meadow-grass.

3.2.47 The wider site contained large areas of hardstanding associated with the cement works. These were largely devoid of vegetation but where present, species closely matched those described above.

Fence

3.2.48 Different types of fencing were present across the Site including metal palisade fencing, and post and wire fencing. All were devoid of vegetation and demarcated a boundary.

3.3 Invasive non-native species survey

3.3.1 Japanese Knotweed was previously recorded on a spoil bund in the east of the wider site (AECOM, 2017[25]; *Figure 3*). However, this species was not observed during the updated PEA or the invasive species walkover.

3.3.2 During the updated PEA, three stands of a Cotoneaster species (including Wall Cotoneaster) were identified in ornamental shrub and amenity grassland in the south east of the active site area (*Target Note 23; Figure 3*). However, these are outside of the proposed works areas. Five species of Cotoneaster are listed as invasive non-native species under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)[26]. Due to the inherent difficulties in identifying this genus down to species level and its ability to regularly hybridise, it is prudent to treat all Cotoneaster species as invasive.

3.3.3 A dense covering of Virginia-creeper (*Parthenocissus quinquefolia*) was observed on, and overhanging, the roof of a garage building in the north west of the works area (*Plate 25; Figure 3*). This is an invasive non-native species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)[27].

3.3.4 No other invasive non-native species were observed during the survey.

3.4 Hedgerow survey

3.4.1 None of the hedgerows were identified as ecologically important under the Hedgerow Regulations 1997[28], primarily because of a lack of woody species *(***Appendix C**). Most of the hedges were dominated by a single species and while there were other species present, they were almost always rare or occasional. Hedgerows 1 and 2 form the boundaries of residential properties and therefore do not qualify for assessment under the Hedgerow Regulations (though a survey was still undertaken to compile a species list in case this is required for compensatory planting).

[25] https://planning.agileapplications.co.uk/flintshire/application-details/61541

[26] https://www.legislation.gov.uk/ukpga/1981/69

[27] https://www.legislation.gov.uk/ukpga/1981/69

[28] https://www.legislation.gov.uk/uksi/1997/1160/made/data.pdf

3.5 Updated species list survey

3.5.1 The updated survey of the grassland mound (area shown in *Figure 5*) identified a more diverse plant species composition than during the Phase 1 Habitat Survey including two species of orchid: Common Spotted-orchid (*Dactylorhiza fuchsii*) and Southern Marsh-orchid (*D. praetermissa*). A full species list is provided in **Appendix D**. There were no acidic or calcareous indicator species present suggesting the grassland is of a neutral type. Although a wide range of species were recorded, species characteristic of improvement were recorded including Creeping Thistle, Broad-leaved Dock and Common Nettle though not at the high abundance expected in an improved grassland. The grassland is therefore considered to be neutral semi-improved.

3.5.2 Two species that favour damp conditions; Marsh Thistle (*Cirsium palustre*) and Hoary Willowherb (*Epilobium parviflorum*), were recorded on top of the mound but not on the sides or at the base suggesting that only the top of the mound is frequently damp or waterlogged.

3.5.3 There were some patches of dense ruderal vegetation and encroaching scrub, particularly along the grassland boundaries adjacent to scrub, woodland and the active site. It is therefore likely that the grassland would eventually transition into scrub if left unmanaged.

REFERENCES

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FIGURES

Figure 1 – Site Location Plan

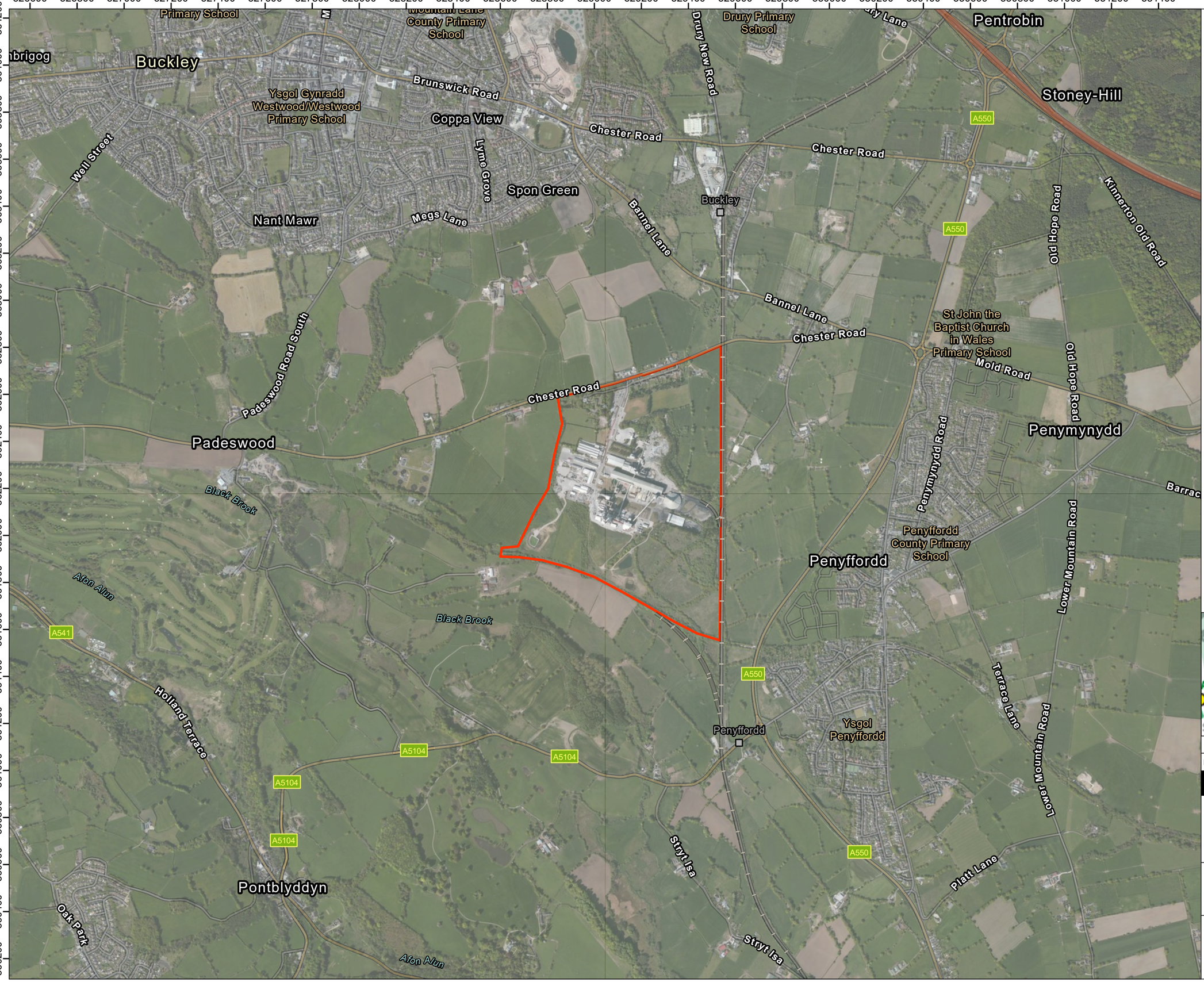
Figure 2 – Phase 1 Habitat Map

Figure 3 – Invasive Species Survey

Figure 4 – Hedgerow Survey

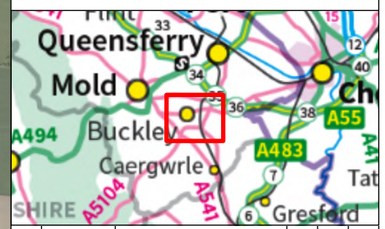
Figure 5 – Updated Species List Survey

Figure 1 - Site Location Plan



Legend:

Site Boundary



Rev	Date	Description	Drn	Chk	App
00	17/07/2023	2483540	TG	SP	KOB

Padeswood Carbon Capture and Storage Project

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Volume 4, Appendix 5.1, Figure 1:

Site Location Plan

0 190 380 570

Metres

SCALE: 1:15,000 @ A3

N W E S

REV 00

Document Path: C:\OneDrive\RSK Biocensus - 06 GIS - 2483540 - CCS Project Padeswood\03 - APRX\2483540 - CCS Project Padeswood - Figure 1 - Site Location Plan.aprx

Figure 2 – Phase 1 Habitats Survey Map

328300 328400 328500 328600 328700 328800 328900 329000 329100 329200 329300 329400 329500 329600 329700 329800

362800 362700 362600 362500 362400 362300 362200 362100 362000 361900 361800 361700 361600

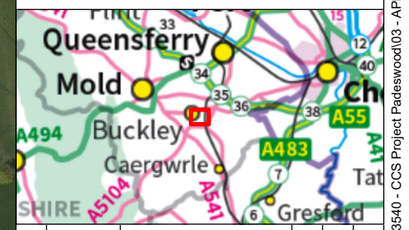
TN32 TN30 TN31 TN30 TN24 TN9 TN27 TN29 TN28 TN27 TN25 TN26 TN25 TN9 TN8 TN10 TN3 TN2 TN1 TN7 TN1 TN4 TN6 TN5 TN20 TN13 TN14 TN12 TN11 TN17 TN16 TN14 TN15 TN18 TN16 TN19 TN23 TN23 TN23 TN20 TN33 TN33 TN21 TN22 TN20 TN33

Legend:

- Site Boundary
- Works Area
- Refuse Tip

Phase 1 Habitats

- Amenity Grassland
- Broadleaved Plantation Woodland
- Building
- Dense Scrub
- Ephemeral Short Perrenial
- Hardstanding
- Improved Grassland
- Mixed Plantation Woodland
- Neutral Grassland
- Ornamental Scrub
- Poor Semi-Improved Grassland
- Private Properties
- Ruderals
- Semi-Improved Grassland
- Spoil
- Standing Water
- Fence
- Hedgerow With Trees
- Line of Broadleaved Trees
- Running Water
- Species Poor Intact Hedge
- Wet Ditch
- Target Notes



Rev	Date	Description	Drn	Chk	App
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Padeswood Carbon Capture and Storage Project

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Volume 4, Technical Appendix 5.1, Figure 2: Phase 1 Habitats Survey Map

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N W E S

REV 00

Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2483540 - CCS Project Padeswood\03 - APRX\2483540 - CCS Project Padeswood - Figure 1 - Site Location Plan (2).aprx

Figure 3 – Invasive Non-native Species Survey

328200 328400 328600 328800 329000 329200 329400 329600 329800

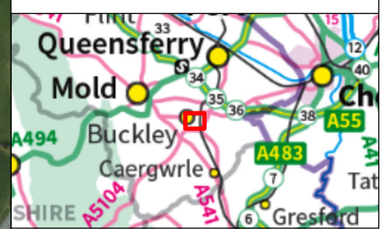
362800 362600 362400 362200 362000 361800 361600

Legend:

- Site Boundary
- Invasive Species Survey Areas

Invasive Records

- Building covered with Virginia-creeper
- Cotoneaster species - RSK Updated PEA 2022
- Japanese Knotweed - AECOM PEA 2017, not recorded during RSK surveys 2022



Rev	Date	Description	Drn	Chk	App
00	31/10/2022	2483540	TG	SP	SR

Padeswood Carbon Capture and Storage Project

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Volume 4, Technical Appendix 5.1, Figure 3: Invasive Species Survey

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Metres
SCALE: 1:5,033 @ A3

N W E S

REV 00

Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2483540 - CCS Project Padeswood\03 - APRX\2483540 - CCS Project Padeswood - Figure 3 - Invasive Species Survey.aprx

Figure 4 – Hedgerow Survey

328850 328900 328950 329000 329050 329100 329150 329200 329250 329300 329350 329400

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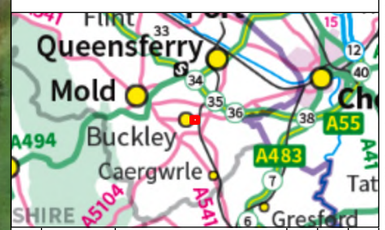
1 2 3 4 5 6

Legend:

Works Area

Hedgerow Survey Result

Not Important



Rev	Date	Description	Drn	Chk	App
00	19/07/2023	2483540	TG	SP	RR

Padeswood Carbon Capture and Storage Project

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Volume 4, Technical Appendix 5.1, Figure 4: Hedgerow Survey Map

0 20 40 60

Metres

SCALE: 1:1,750 @ A3

N W E S

REV 00

Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2483540 - CCS Project Padeswood\03 - APRX\2483540 - CCS Project Padeswood - Figure 4 - Hedgerow Map.aprx

Figure 5 – Updated Species List Survey

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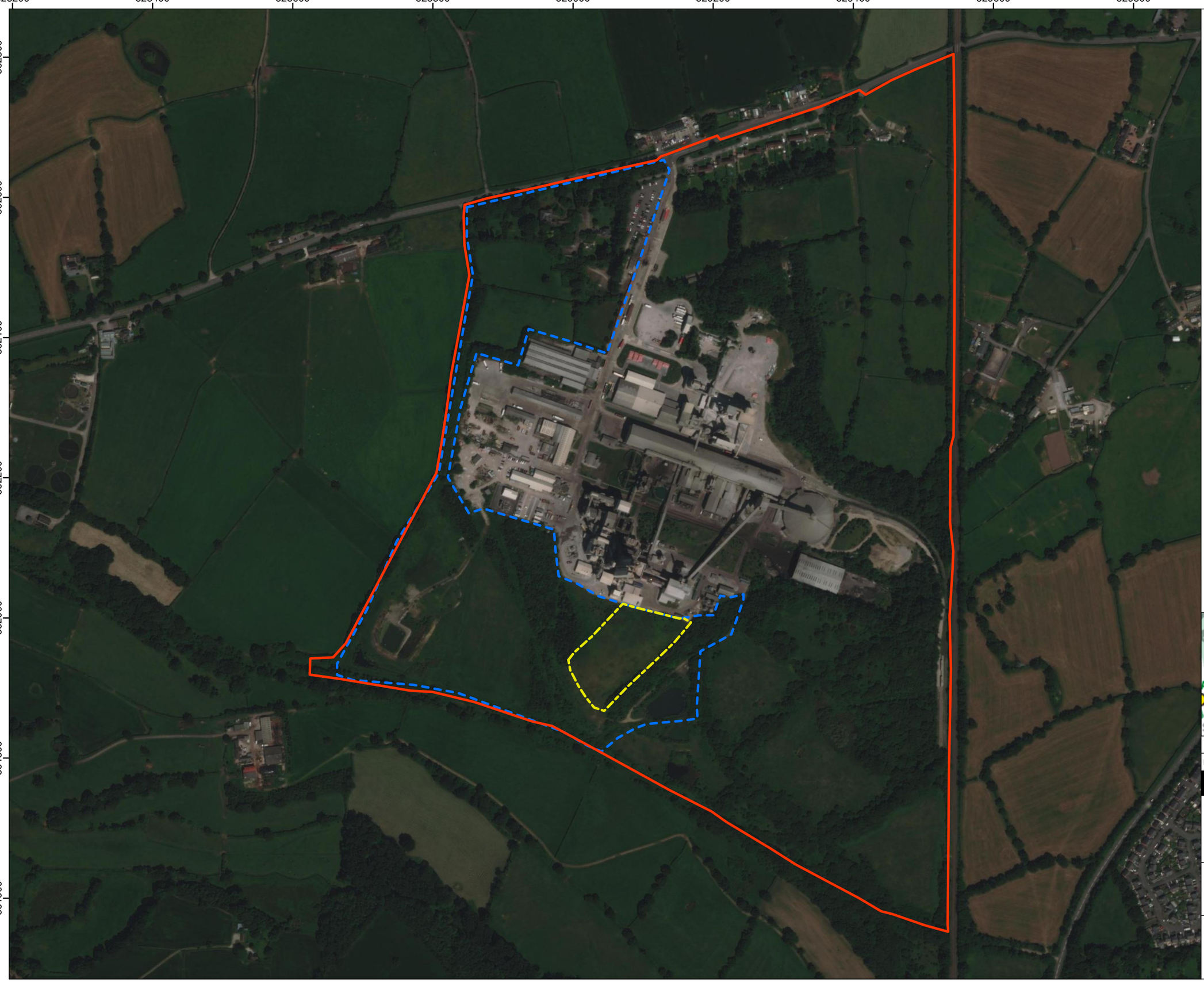
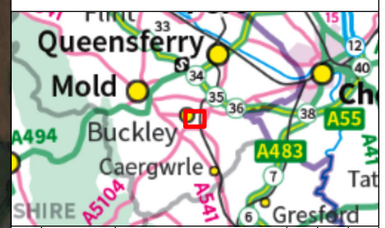


Legend:

- Site Boundary
- Works Area
- Updated Species List Survey Area



Rev	Date	Description	Drn	Chk	App
00	16/09/2022	2483540	TG	SP	SR

Padeswood Carbon Capture and Storage Project

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Volume 4, Technical Appendix 5.1, Figure 5: Updated Species List Survey

0 60 120 180

Metres

SCALE: 1:5,033 @ A3

N W E S

REV 00

Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2483540 - CCS Project Padeswood\03 - APRX\2483540 - CCS Project Padeswood - Figure 5 - Updated Species List Survey aprx

APPENDIX A – TARGET NOTES

Target Note 1. Amenity grassland fields with Meadow Foxtail (*Alopecurus pratensis*), Sweet Vernal-grass (*Anthoxanthum odoratum*), Yorkshire-fog (*Holcus lanatus*), Perennial Rye-grass (*Lolium perenne*) and Rough Meadow-grass (*Poa trivialis*). Herbs present included Yarrow (*Achillea millefolium*), Daisy (*Bellis perennis*), Cuckooflower (*Cardamine pratensis*), Common Mouse-ear (*Cerastium fontanum*), Spear Thistle (*Cirsium vulgare*), Dove's-foot Crane's-bill (*Geranium molle*), Herb-Robert (*Geranium robertianum*), Common Ragwort (*Jacobaea vulgaris*), Creeping Buttercup (*Ranunculus repens*), Common Sorrel (*Rumex acetosa*), Curled Dock (*Rumex crispus*), Lesser Trefoil (*Trifolium dubium*), Red Clover (*Trifolium pratense*), White Clover (*Trifolium repens*), Colt's-foot (*Tussilago farfara*) and Common Field-speedwell (*Veronica persica*).

There were strips of tall ruderal herbs around the field edges including Garlic Mustard (*Alliaria petiolata*), Cow Parsley (*Anthriscus sylvestris*), Rosebay Willowherb (*Chamaenerion angustifolium*), Creeping Thistle (*Cirsium arvense*), Cock's-foot (*Dactylis glomerata*), Teasel (*Dipsacus fullonum*), Red Fescue (*Festuca rubra*), Cleavers (*Galium aparine*), Wood Avens (*Geum urbanum*), Hogweed (*Heracleum sphondylium*), Spanish Bluebell (*Hyacinthoides hispanica*), Ribwort Plantain (*Plantago lanceolata*), Meadow Buttercup (*Ranunculus acris*), Dog-rose (*Rosa canina*), a Rose (*Rosa* sp.), Broad-leaved Dock (*Rumex obtusifolius*), Common Nettle (*Urtica dioica*) and Common Vetch (*Vicia sativa*).

Target Note 2. Line of trees including Hawthorn (*Crataegus monogyna*), Beech (*Fagus sylvatica*), Privet (*Ligustrum* sp.), Lombardy Poplar (*Populus nigra* 'Italica'), Wild Cherry (*Prunus avium*), Pedunculate Oak (*Quercus robur*), Willow (*Salix* sp.), Rowan (*Sorbus aucuparia*), Lime (*Tilia* sp.) and a conifer.

Target Note 3. Plantation woodland with semi-mature trees including Hawthorn (*Crataegus monogyna*), Poplar (*Populus* sp.), Lombardy Poplar (*Populus nigra* 'Italica'), Wild Cherry (*Prunus avium*), Pedunculate Oak (*Quercus robur*) and Lime (*Tilia* sp.). The understorey and ground flora contained Ground-elder (*Aegopodium podagraria*), Cow Parsely (*Anthriscus sylvestris*), Butterfly-bush (*Buddleja davidii*), Cock's-foot (*Dactylis glomerata*), Spanish Bluebell (*Hyacinthoides hispanica*), Honesty (*Lunaria annua*), Blackthorn (*Prunus spinosa*), a Rose (Rosa sp.) and Bramble (*Rubus fruticosus* agg.). Several garden escapes and ornamental species were also noted in the understorey.

Target Note 4. Woodland near eco centre with large sections open and covered with woodchip to be used for educational purposes. These areas had a limited understorey and ground flora. The canopy contained Sycamore (*Acer pseudoplatanus*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Ash (*Fraxinus excelsior*) and a Poplar (*Populus* sp.). There were a low number of scrub species in the understorey in areas that had not been cleared including Hawthorn, Hogweed (*Heracleum sphondylium*), Holly (*Ilex aquifolium*), a Rose (*Rosa* sp.), Bramble (*Rubus fruticosus* agg.), and Sycamore saplings. The woodland contained various ecological enhancement features including bird boxes and log piles.

Target Note 5. Poor semi-improved grassland as per *Target Note 1* but with additional species including Hogweed (*Heracleum sphondylium*), Annual Meadow-grass (*Poa annua*), Creeping

Cinquefoil (*Potentilla reptans*), Common Field-speedwell (*Veronica persica*) and Thyme-leaved Speedwell (*Veronica serpyllifolia*).

Target Note 6. Fenced off area of tall ruderals including Rosebay Willowherb (*Chamaenerion angustifolium*), Creeping Thistle (*Cirsium arvense*), Cock's-foot (*Dactylis glomerata*), Tufted Hair-grass (*Deschampsia cespitosa*), Teasel (*Dipsacus fullonum*), Rough Meadow-grass (*Poa trivialis*), Broad-leaved Dock (*Rumex obtusifolius*), Common Nettle (*Urtica dioica*), and Hawthorn (*Crataegus monogyna*) saplings. The pond contained stands of Iris (*Iris* sp.) and Bulrush (*Typha latifolia*), with Crack-willow (*Salix euxina*) around the edge. There were scattered log piles and refugia mounds for amphibians near the pond.

Target Note 7. Fields similar to *Target Note 1* but classified as improved grassland due to being heavily grazed by sheep. The fields were intersected by hedgerows with trees which contained Sycamore (*Acer pseudoplatanus*), Hawthorn (*Crataegus monogyna*), Beech (*Fagus sylvatica*), Ash (*Fraxinus excelsior*), Holly (*Ilex aquifolium*), Blackthorn (*Prunus spinosa*), Pedunculate Oak (*Quercus robur*) and Elm (*Ulmus* sp.). There was a damp area near one of the hedgerows which contained Brooklime (*Veronica beccabunga*).

Target Note 8. Boundaries comprised of hedgerows with trees including Sycamore (*Acer pseudoplatanus*), Hawthorn (*Crataegus monogyna*), Beech (*Fagus sylvatica*), Ash (*Fraxinus excelsior*), Blackthorn (*Prunus spinosa*), a Willow (*Salix* sp.) and an Elm (*Ulmus* sp.). The southern section of hedgerow was comprised solely of Arizona Cypress (*Cupressus arizonica*). The ground flora contained Cock's-foot (*Dactylis glomerata*), Red Fescue (*Festuca rubra*), Cleavers (*Galium aparine*), Hogweed (*Heracleum sphondylium*), Spanish Bluebell (*Hyacinthoides hispanica*), Rough Meadow-grass (*Poa trivialis*) and Creeping Buttercup (*Ranunculus repens*). The fields to the west were heavily sheep-grazed containing limited species; Creeping Thistle (*Cirsium arvense*), Spear Thistle (*Cirsium vulgare*), Red Fescue, Perennial Rye-grass (*Lolium perenne*) and Common Nettle (*Urtica dioica*).

The car park to the north-east was hardstanding with scattered ephemeral and short perennial species including American Willowherb (*Epilobium ciliatum*), Perforate St John's-wort (*Hypericum perforatum*), Common Bird's-foot-trefoil (*Lotus corniculatus*) and Annual Meadow-grass (*Poa annua*). There was also a line of scattered trees including Sycamore (*Acer pseudoplatanus*), Lombardy Poplar (*Populus nigra* 'italica') and Pedunculate Oak (*Quercus robur*). The ground flora beneath the trees contained Ground-elder (*Aegopodium podagraria*), Cow Parsley (*Anthriscus sylvestris*), Rosebay Willowherb (*Chamaenerion angustifolium*), American Willowherb, Red Fescue, Yorkshire-fog (*Holcus lanatus*) and Common Vetch (*Vicia sativa*).

Target Note 9. Scrub mostly comprised of young Willow (*Salix* sp.) trees but with Hawthorn (*Crataegus monogyna*), Bramble (*Rubus fruticosus* agg.) and Gorse (*Ulex europaeus*) also present along with a small number of scattered mature trees including Sycamore (*Acer pseudoplatanus*) and Pedunculate Oak (*Quercus robur*). The ground flora contained Buck's-beard (*Aruncus dioicus*), Rosebay Willowherb (*Chamaenerion angustifolium*), Bindweed (*Convolvulus* sp.), Dove's-foot Crane's-bill (*Geranium molle*), Hogweed (*Heracleum sphondylium*), Nipplewort (*Lapsana communis*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Fleabane (*Pulicaria dysenterica*), Red Clover (*Trifolium pratense*), Colt's-foot (*Tussilago farfara*), Common Nettle (*Urtica dioica*) and Common Vetch (*Vicia sativa*).

The patch in the north-west of the works area was an overgrown garden with Bramble, Common Nettle and scattered trees including Sycamore (*Acer pseudoplatanus*), Horse-chestnut (*Aesculus hippocastanum*) and Pedunculate Oak. There were also planted beds with introduced shrubs and an overgrown rough grassland which would have been previously managed as an amenity lawn.

Target Note 10. Areas of introduced shrub and amenity grassland including mostly ornamental varieties of Field Maple (*Acer campestre*), Silver Birch (*Betula pendula*), Holly (*Ilex aquifolium*), Privet (*Ligustrum* sp.), Willow (*Salix* sp.) and Elm (*Ulmus* sp.).

Target Note 11. Neutral grassland field with sward up to 60 cm. A more diverse range of grass species was present including Meadow Foxtail (*Alopecurus pratensis*), False Oat-grass (*Arrhenatherum elatius*), Soft-brome (*Bromus hordeaceus*), Crested Dog's-tail (*Cynosurus cristatus*), Cock's-foot (*Dactylis glomerata*), Yorkshire-fog (*Holcus lanatus*) and Perennial Rye-grass (*Lolium perenne*). Herb species were less diverse, containing mostly common species typical of improved swards including Meadow Buttercup (*Ranunculus acris*), Creeping Buttercup (*Ranunculus repens*), Common Sorrel (*Rumex acetosa*), Curled Dock (*Rumex crispus*), Broad-leaved Dock (*Rumex obtusifolius*), Dandelion (*Taraxacum officinale* agg.), White Clover (*Trifolium repens*) and Common Nettle (*Urtica dioica*). The field adjacent to the quarry contained additional species in damper areas including Cuckooflower (*Cardamine pratensis*), an Iris (*Iris* sp.), Soft-rush (*Juncus effusus*) and Hard Rush (*Juncus inflexus*).

Target Note 12. Unused refuse-tip with spoil mounds and standing open water in bowls previously excavated for refuse. The area has been colonized by vegetation with minimal areas of bare ground and hardstanding remaining, primarily by grassland but with stands of tall ruderals and scrub also present. The grassland was similar in composition to *Target Note 11* but with additional species present including Creeping Thistle (*Cirsium arvense*), Smooth Hawk's-beard (*Crepis capillaris*), Great Willowherb (*Epilobium hirsutum*), Meadowsweet (*Filipendula ulmaria*), Downy Oat-grass (*Helictotrichon pubescens*), Hogweed (*Heracleum sphondylium*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Black Medick (*Medicago lupulina*), Ribwort Plantain (*Plantago lanceolata*), Creeping Cinquefoil (*Potentilla reptans*), Red Clover (*Trifolium pratense*), Colt's-foot (*Tussilago farfara*), Germander Speedwell (*Veronica chamaedrys*) and Common Vetch (*Vicia sativa*). There were also stands of Common Reed (*Phragmites australis*) and Bulrush (*Typha latifolia*) in the south-east corner where there was damper ground adjacent to standing water. The standing water itself was largely devoid of aquatic plant species.

Stands of tall ruderals were most common around the field boundaries and on the spoil mounds. Common Nettle (*Urtica dioica*) was the dominant species with Hogweed and Cow Parsley (*Anthriscus sylvestris*) also present. Dense patches of scrub were present along the western boundary, having encroached from the adjacent hedgerow, and scattered patches were present throughout the grassland. Species included Field Maple (*Acer cappadocicum*), Silver Birch (*Betula pendula*), Hawthorn (*Crataegus monogyna*), Pedunculate Oak (*Quercus robur*), a Rose (*Rosa* sp.), Bramble (*Rubus fruticosus* agg.), Grey Willow (*Salix cinerea*), Crack-willow (*Salix euxina*), Elder (*Sambucus nigra*) and Rowan (*Sorbus aucuparia*).

Target Note 13. Pole-mounted barn owl (*Tyto alba*) box on edge of woodland strip overlooking quarry. An inspection for field signs was not possible due to dense scrub surrounding the box.

Target Note 14. Young mixed plantation woodland up to 12 m tall with young trees and saplings still in tree guards. The canopy layer contained Sycamore (*Acer pseudoplatanus*),

Alder (*Alnus glutinosa*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Ash (*Fraxinus excelsior*), European Larch (*Larix decidua*), Scots Pine (*Pinus sylvestris*) and a Lime (*Tilia* sp.). The understorey was dense and impenetrable in places, containing Sycamore, Alder, Silver Birch (*Betula pendula*), Hazel, Hawthorn, Beech (*Fagus sylvatica*), Blackthorn (*Prunus spinosa*), Pedunculate Oak (*Quercus robur*) and Mapleleaf Viburnum (Viburnum acerifolium). The ground flora was relatively sparse, mostly containing species typical of neighbouring habitats including Cow Parsley (*Anthriscus sylvestris*), Cleavers (*Galium aparine*), Ivy (*Hedera helix*), Hogweed (*Heracleum sphondylium*), Wood Forget-me-not (*Myosotis arvensis*), Creeping Cinquefoil (*Potentilla reptans*), Creeping Buttercup (*Ranunculus repens*), Dandelion (*Taraxacum officinale* agg.) and Common Nettle (*Urtica dioica*).

Target Note 15. Area of dense scrub and ruderals including Yarrow (*Achillea millefolium*), Creeping Thistle (*Cirsium arvense*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Meadowsweet (*Filipendula ulmaria*), Ground-ivy (*Glechoma hederacea*), Hogweed (*Heracleum sphondylium*), Pedunculate Oak (*Quercus robur*), Bramble (*Rubus fruticosus* agg.), Goat Willow (*Salix caprea*), Common Nettle (*Urtica dioica*) and Tufted Vetch (*Vicia cracca*). There was a small stream flowing in a westerly direction along the southern edge of this scrub patch. The stream was heavily shaded by the surrounding shrub with no aquatic vegetation observed though the majority of the stream was obscured from view.

Target Note 16. Semi-improved grassland on a steep slope (western section). The area was previously hardstanding with stones showing through in places but has since been colonized by vegetation. The grassland had a sward up to 1 m high and contained the following grass species: Cock's-foot (*Dactylis glomerata*), Red Fescue (*Festuca rubra*), Yorkshire-fog (*Holcus lanatus*) and Annual Meadow-grass (*Poa annua*). A more diverse range of herbs was present compared to the nearby poor semi-improved fields (*Target Note 11*) including Yarrow (*Achillea millefolium*), Parsley-piert (*Aphanes arvensis*), Daisy (*Bellis perennis*), Creeping Thistle (*Cirsium arvense*), Marsh Thistle (*Cirsium palustre*), Smooth Hawk's-beard (*Crepis capillaris*), Great Willowherb (*Epilobium hirsutum*), a Tare species (*Ervum* or *Ervilia* sp.), Cut-leaved Crane's-bill (*Geranium dissectum*), Dove's-foot Crane's-bill (*Geranium molle*), Hogweed (*Heracleum sphondylium*), Common Bird's-foot-trefoil (*Lotus corniculatus*), a Forget-me-not (*Myosotis* sp.), Ribwort Plantain (*Plantago lanceolata*), Broad-leaved Dock (*Rumex obtusifolius*), Red Campion (*Silene dioica*), Hop Trefoil (*Trifolium campestre*), Red Clover (*Trifolium pratense*), Common Vetch (*Vicia sativa*), Common Knapweed (*Centaurea nigra*), Common Spotted-orchid (*Dactylorhiza fuchsii*) and Southern Marsh-orchid (*Dactylorhiza praetermissa*).

Scattered scrub was also present throughout the grassland including Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Pedunculate Oak (*Quercus robur*) saplings and Bramble (*Rubus fruticosus* agg.).

Target Note 17. Dense Blackthorn (*Prunus spinosa*) and Willow (*Salix* sp.) scrub with mammal path leading in. Ground flora was a continuation of the neighbouring grassland (*Target Note 16*) but with Common Spotted-orchid (*Dactylorhiza fuchsii*) also present.

Target Note 18. Pond edged with Common Reed (*Phragmites australis*) and surrounded by a ring of scrub containing Sycamore (*Acer pseudoplatanus*), Silver Birch (*Betula pendula*), Hawthorn (*Crataegus monogyna*), Pedunculate Oak (*Quercus robur*), Field-rose (*Rosa arvensis*), Elder (*Sambucus nigra*) and Willow (*Salix* sp.).

Target Note 19. Pond with stands of an Iris (*Iris* sp.) and Common Reed (*Phragmites australis*) which was encroaching into neighbouring grassland. Willow (*Salix* sp.) was abundant on the pond banks.

Target Note 20. Broadleaved plantation woodland up to 15 m. The canopy was less diverse than that of the mixed woodland on-site (Target Note 14), appearing to contain only Sycamore (*Acer pseudoplatanus*), Ash (*Fraxinus excelsior*) and Pedunculate Oak (*Quercus robur*). The understorey contained additional woody species including Alder (*Alnus glutinosa*), Silver Birch (*Betula pendula*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Bramble (*Rubus fruticosus* agg.) and Grey Willow (*Salix cinerea*). The ground flora was also relatively species-poor being mostly dominated by Ivy (*Hedera helix*), Broad-leaved Dock (*Rumex obtusifolius*) and Common Nettle (*Urtica dioica*) with Cow Parsley (*Anthriscus sylvestris*), Hedge Woundwort (*Stachys sylvatica)* and Greater Stitchwort (*Stellaria holostea*) also present.

Target Note 21. Previously large pond but now completely dry with deeply cracked earth. There were remnant stands of Iris (*Iris* sp.), Soft-rush (*Juncus effusus*) and Common Reed (*Phragmites australis*), and Willow (*Salix* sp.) trees in the centre.

Target Note 22. Hibernaculum adjacent to pond.

Target Note 23. Stands of a Cotoneaster (*Cotoneaster* sp.) species. Five Cotoneaster species are listed as invasive non-native under Schedule 9 of the Wildlife and Countryside Act 1981, as amended, and they are known to readily hybridise.

Target Note 24. Line of broadleaved trees up to *c.*12 m tall including Sycamore (*Acer pseudoplatanus*), Ash (*Fraxinus excelsior*) and Poplar (*Populus* sp.) species.

Target Note 25. Patch of tall ruderal vegetation with scattered scrub. Species included Creeping Thistle (*Cirsium arvense*), Bindweed (*Convolvulus* sp.) species, Great Willowherb (*Epilobium hirsutum*), Ivy (*Hedera helix*), Field-rose (*Rosa arvensis*), Bramble (*Rubus fruticosus* agg.) and Common Nettle (*Urtica dioica*).

Target Note 26. Dense scrub with young tees up to *c.*7 m. Woody species included a mixture of native and non-native species: Sycamore (*Acer pseudoplatanus*), Silver Birch (*Betula pendula*), Hawthorn (*Crataegus monogyna*), Ivy (*Hedera helix*), Wilson's Honeysuckle (*Lonicera nitida*), Fly Honeysuckle (*Lonicera xylosteum*), Sweet-briar (*Rosa rubiginosa*) and an Elm (*Ulmus* sp.) species. The ground flora was limited and contained Cow Parsley (*Anthriscus sylvestris*), Wood Avens (*Geum urbanum*), Ivy and Common Nettle (*Urtica dioica*).

Target Note 27. Hardstanding roads and parking areas with occasional scattered plants including Daisy (*Bellis perennis*), Butterfly-bush (*Buddleja davidii*), Greater Plantain (*Plantago major*), Annual Meadow-grass (*Poa annua*) and Bramble (*Rubus fruticosus* agg.).

Target Note 28. Private residential garden partially visible through boundary fence. It appeared to comprise amenity grassland with scattered trees and patches of scrub. Species in the grassland are assumed to be similar to *Target Note 29*. Tree and scrub species observed were Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*), Apple (*Malus domestica*), Grey Willow (*Salix cinerea*), Crack-willow (*Salix euxina*), Elm (*Ulmus* sp.) species and conifers that were unidentifiable from distance.

Target Note 29. Amenity grassland verge with sward up to *c.*30 cm. Grasses present included Common Bent (*Agrostis capillaris*), Cock's-foot (*Dactylis glomerata*) and Yorkshire-fog

(*Holcus lanatus*). Herbs present included Yarrow (*Achillea millefolium*), Great Willowherb (*Epilobium hirsutum*), Cut-leaved Crane's-bill (*Geranium dissectum*), Ribwort Plantain (*Plantago lanceolata*), Creeping Buttercup (*Ranunculus repens*), Dandelion (*Taraxacum officinale* agg.) and White Clover (*Trifolium repens*).

Target Note 30. Amenity grassland verge as per *Target Note 29* but with scattered trees throughout including Sycamore (*Acer pseudoplatanus*), Horse-chestnut (*Aesculus hippocastanum*), Sweet Chestnut (*Castanea sativa*), Beech (*Fagus sylvatica*), Poplar (*Populus* sp.) species, Turkey Oak (*Quercus cerris*) and Lime (*Tilia* sp.) species.

Target Note 31. Dense scrub containing a mixture of native and ornamental species including Field Maple (*Acer campestre*), Sycamore (*Acer pseudoplatanus*), Horse-chestnut (*Aesculus hippocastanum*), Spotted-laurel (*Aucuba japonica*), Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Ivy (*Hedera helix*), Fly Honeysuckle (*Lonicera xylosteum*), Wild Cherry (*Prunus avium*), Pedunculate Oak (*Quercus robur*), Dog-rose (*Rosa canina*), Bramble (*Rubus fruticosus* agg.), Goat Willow (*Salix caprea*) and Snowberry (*Symphoricarpos albus*).

Target Note 32. Roadside intact species-poor hedgerow dominated by Hawthorn (*Crataegus monogyna*). The hedgerow appears to be off-site but runs adjacent to the northern works area boundary. It was *c.*2-3 m tall and 1.5 m wide.

Target Note 33. A series of poor semi-improved grassland fields with sward height up to 1 m and becoming overgrown with stands of tall ruderal vegetation prevalent. Species were similar to *Target Note 11* but with less grass species diversity and increased abundance of ruderals including Common Nettle (*Urtica dioica*) and Hogweed (*Heracleum sphondylium*).

APPENDIX B – SITE PHOTOS

Plate 1: Broadleaved plantation woodland in north-east of wider site at *Target Note 4*

Plate 2: Mixed plantation woodland in works area at *Target Note 14*

Plate 3: Dense scrub in south of works area at *Target Note 15*

Plate 4: Line of broadleaved trees at *Target Note 24*

Plate 5: Semi-improved grassland mound in south of works area at *Target Note 16*

Plate 6: Neutral grassland at *Target Note 11*

Plate 7: Sheep-grazed improved grassland field in north-west of works area

Plate 8: Poor semi-improved grassland located at *Target Note 5*

Plate 9: Tall ruderal vegetation around ponds at *Target Note 6*

Plate 10: Lagoon fringed by Common Reed at *Target Note 18*

Plate 11: Stream along part of works area southern boundary

Plate 12: Spoil heaps in east of the wider site with scattered ephemeral species and scrub

Plate 13: Unused refuse-tip in south-west corner of works area (*Target Note 12*)

Plate 14: Amenity grassland field, managed as a football pitch, at *Target Note 1*

Plate 15: Ephemeral / short perennial vegetation on small spoil mound near *Target Note 9*

Plate 16: Introduced shrubs on road verge at *Target Note 10*

Plate 17: Hedgerow 1, a hedge with trees

Plate 18: Hedgerow 2, a hedge with trees

Plate 19: Hedgerow 3, an intact species-poor hedge

Plate 20: Hedgerow 4, a hedge with trees

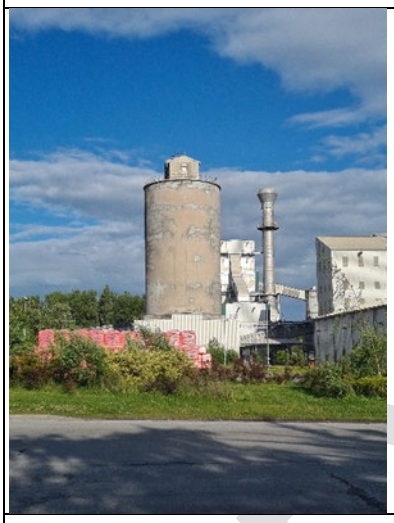


Plate 21: Example of industrial buildings within the active part of the wider site

Plate 22: Hardstanding mostly devoid of vegetation near *Target Note 9*

Plate 23: Example of post and wire fence found across the Site

Plate 24: Cotoneaster species at *Target Note 23*

	
Plate 25: Dense Virginia-creeper on a garage roof in the north-west of the works area	**Plate 26: Hedgerow 5, a hedge with trees**

APPENDIX C - HEDGEROW SURVEY RESULTS

Table 4 Hedgerow survey data for Hedgerow 1.

Hedge number:	**Hedgerow 1**			
Status:	**Not important**			
Length x Height x Width (m):	120 x 4 x 2			
Schedule 3 woody species	In whole hedge	In 30 m sample stretches		
		1	**2**	**3**
Betula pendula (Silver Birch)	ü	-	ü	N/A
Crataegus monogyna (Hawthorn)	ü	-	ü	N/A
Quercus robur (Pedunculate Oak)	ü	ü	-	N/A
Taxus baccata (Yew)	ü	ü	-	N/A
Total - Schedule 3 species:	**4**	**2**	**2**	**N/A**
Other woody species				
Acer pseudoplatanus (Sycamore)	ü	N/A	N/A	N/A
Lonicera nitida (Wilson's Honeysuckle)	ü	N/A	N/A	N/A
Populus nigra 'Italica' (Lombardy Poplar)	ü	N/A	N/A	N/A
Total - All Woody Species:	7			
Associated Features				
Supporting bank or wall:	û			
Less than 10% gaps:	ü			
≥1 standard tree per 50 m:	û (2 in the whole hedge)			
Ditch for >50% of hedgerow length:	û			
Parallel hedge within 15 m:	û			
Four or more connection points:	û (0)			
Three or more Schedule 2 species:	û (0)			
Schedule 2 (woodland) Species:	None. Others include Ivy (*Hedera helix)*, *Wilson's Honeysuckle (Lonicera nitida),* Bramble (*Rubus fruticosus* agg.), Common Nettle *(Urtica dioica)* and Common Sorrel *(Rumex acetosa).*			
Conclusion				
Average Number of Schedule 3 Species per 30 m:	2			
Special Qualifying Species:	None			
Adjacent to Footpath or Bridleway:	No			
Number of Qualifying Associated Features:	1			
Reason for Important Status:	N/A – Not enough species in sections			

Notes: Overgrown and unmanaged hedgerow dominated towards the eastern end by Yew (*Taxus baccata*). However, it demarcates a residential property boundary and therefore the Hedgerow Regulations do not apply.

Table 5 Hedgerow survey data for Hedgerow 2.

Hedge number:	Hedgerow 2			
Status:	**Not important**			
Length x Height x Width (m):	55 x 4 x 1.5			
Schedule 3 woody species	In whole hedge	In 30 m sample stretches		
		1	**2**	**3**
Fagus sylvatica (Beech)	ü	ü	N/A	N/A
Total - Schedule 3 species:	**1**	**1**	**N/A**	**N/A**
Other woody species				
Acer pseudoplatanus (Sycamore)	ü	N/A	N/A	N/A
Aesculus hippocastanum (Horse-chestnut)	ü	N/A	N/A	N/A
Cupressus x leylandii (Leyland Cypress)	ü	N/A	N/A	N/A
Total - All Woody Species:	4			

Associated Features	
Supporting bank or wall:	û
Less than 10% gaps:	ü
≥1 standard tree per 50 m:	ü (2 in the whole hedge)
Ditch for >50% of hedgerow length:	û
Parallel hedge within 15 m:	û
Four or more connection points:	û (0)
Three or more Schedule 2 species:	û (0)
Schedule 2 (woodland) Species:	None. Others include Bramble (*Rubus fruticosus* agg.), Ground-elder (*Aegopodium podagraria*) and Horse-chestnut (*Aesculus hippocastanum*) seedlings.

Conclusion	
Average Number of Schedule 3 Species per 30 m:	1
Special Qualifying Species:	None
Adjacent to Footpath or Bridleway:	No
Number of Qualifying Associated Features:	2
Reason for Important Status:	N/A – Not enough species in sections

Notes: Leggy and unmanaged hedgerow with no one woody species dominant. However, it demarcates a residential property boundary and therefore the Hedgerow Regulations do not apply.

Table 6 Hedgerow survey data for Hedgerow 3.

Hedge number:	Hedgerow 3			
Status:	**Not important**			
Length x Height x Width (m):	140 x 1.5 x 1			
Schedule 3 woody species	In whole hedge	In 30 m sample stretches		
		1	**2**	**3**
Crataegus monogyna (Hawthorn)	ü	ü	ü	N/A
Fraxinus excelsior (Ash)	ü	-	ü	N/A
Rosa sp. *(Rose species)*	ü	-	ü	N/A
Total - Schedule 3 species:	**3**	**1**	**3**	**N/A**
Other woody species				
Total - All Woody Species:	3			
Associated Features				
Supporting bank or wall:	û			
Less than 10% gaps:	ü			
≥1 standard tree per 50 m:	û (0 in the whole hedge)			
Ditch for >50% of hedgerow length:	û			
Parallel hedge within 15 m:	û			
Four or more connection points:	û (1)			
Three or more Schedule 2 species:	û (0)			
Schedule 2 (woodland) Species:	None. Others include Common Nettle (*Urtica dioica*), Spear Thistle (*Cirsium vulgare*) and Creeping Thistle (*Cirsium arvense*).			
Conclusion				
Average Number of Schedule 3 Species per 30 m:	2			
Special Qualifying Species:	None			
Adjacent to Footpath or Bridleway:	No			
Number of Qualifying Associated Features:	1			
Reason for Important Status:	N/A – Not enough species in sections			
Notes: Managed hedgerow in between two sheep pastures so ground flora is heavily grazed with limited species present. Hedgerow dominated by Hawthorn (*Crataegus monogyna*).				

Table 7 Hedgerow survey data for Hedgerow 4.

Hedge number:	Hedgerow 4			
Status:	**Not important**			
Length x Height x Width (m):	164 x 4 x 1.5			
Schedule 3 woody species	In whole hedge	In 30 m sample stretches		
		1	**2**	**3**
Corylus avellana (Hazel)	ü	ü	-	N/A
Crataegus monogyna (Hawthorn)	ü	ü	ü	N/A
Fagus sylvatica (Beech)	ü	-	ü	N/A
Prunus spinosa (Blackthorn)	ü	ü	-	N/A
Sambucus nigra (Elder)	ü	-	ü	N/A
Total - Schedule 3 species:	**5**	**3**	**3**	**N/A**
Other woody species				
Acer pseudoplatanus (Sycamore)	ü	N/A	N/A	N/A
Total - All Woody Species:	6			

Associated Features	
Supporting bank or wall:	û
Less than 10% gaps:	ü
≥1 standard tree per 50 m:	ü (4 in the whole hedge)
Ditch for >50% of hedgerow length:	û
Parallel hedge within 15 m:	û
Four or more connection points:	û (1)
Three or more Schedule 2 species:	û (0)
Schedule 2 (woodland) Species:	None. Others include Bramble (*Rubus fruticosus* agg.), Ivy (*Hedera helix*), Ribwort Plantain (*Plantago lanceolata*), Dove's-foot Crane's-bill (*Geranium molle*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Nettle (*Urtica dioica*), False Oat-grass (*Arrhenatherum elatius*), Spear Thistle (*Cirsium vulgare*), Curled Dock (*Rumex crispus*), Perforate St John's-wort (*Hypericum perforatum*), Cock's-foot (*Dactylis glomerata*), Wood Avens (*Geum urbanum*), Hogweed (*Heracleum sphondylium*), Yarrow (*Achillea millefolium*), Garlic Mustard (*Alliaria petiolata*), Broad-leaved Dock (*Rumex obtusifolius*) and Horse-chestnut (*Aesculus hippocastanum*) seedling.

Conclusion	
Average Number of Schedule 3 Species per 30 m:	3
Special Qualifying Species:	None
Adjacent to Footpath or Bridleway:	No
Number of Qualifying Associated Features:	2
Reason for Important Status:	N/A – Not enough species in sections

Notes: Tall, leggy ‘L’ shaped hedgerow with no one woody species dominant and a more diverse ground flora than the other surveyed hedgerows.

Table 8 Hedgerow survey data for Hedgerow 5.

Hedge number:	Hedgerow 5			
Status:	**Not important**			
Length x Height x Width (m):	85 x 20 x 12			
Schedule 3 woody species	In whole hedge	In 30 m sample stretches		
		1	**2**	**3**
Crataegus monogyna (Hawthorn)	ü	ü	N/A	N/A
Populus sp (Poplar species)	ü	ü	N/A	N/A
Quercus robur (Pedunculate oak)	ü	ü	N/A	N/A
Sambucus nigra (Elder)	ü	ü	N/A	N/A
Total - Schedule 3 species:	**4**	**4**	**N/A**	**N/A**
Other woody species				
N/A	N/A	N/A	N/A	N/A
Total - All Woody Species:	6			
Associated Features				
Supporting bank or wall:	û			
Less than 10% gaps:	ü			
≥1 standard tree per 50 m:	ü			
Ditch for >50% of hedgerow length:	û			
Parallel hedge within 15 m:	û			
Four or more connection points:	û (0)			
Three or more Schedule 2 species:	û (0)			
Schedule 2 (woodland) Species:	None. Others include Bramble (*Rubus fruticosus* agg.), Ivy (*Hedera helix*), Common Nettle (*Urtica dioica*), Broad-leaved Dock (*Rumex obtusifolius*) Snowdrop (*Galanthus nivalis*), Cleavers (*Galium aparine*), Ivy (*Hedera helix*) and oak seedling.			
Conclusion				
Average Number of Schedule 3 Species per 30 m:	3			
Special Qualifying Species:	None			
Adjacent to Footpath or Bridleway:	No			
Number of Qualifying Associated Features:	2			
Reason for Important Status:	N/A – Not enough species in sections			
Notes: Three lines of trees. Survey undertaken on 24th February so limited ground flora present at time of survey.				

Table 9 Hedgerow survey data for Hedgerow 6.

Hedge number:	Hedgerow 6			
Status:	**Not important**			
Length x Height x Width (m):	105 x 12 x 1.5			
Schedule 3 woody species	In whole hedge	In 30 m sample stretches		
		1	**2**	**3**
Crataegus monogyna (Hawthorn)	ü	ü	ü	N/A
Prunus spinosa (Blackthorn)	ü	ü	ü	N/A
Quercus robur (Pedunculate oak)	ü	ü	ü	N/A
Total - Schedule 3 species:	**3**	**3**	**3**	**N/A**
Other woody species				
Acer pseudoplatanus (Sycamore)	ü	N/A	ü	N/A
Total - All Woody Species:	4			
Associated Features				
Supporting bank or wall:	û			
Less than 10% gaps:	ü			
≥1 standard tree per 50 m:	ü			
Ditch for >50% of hedgerow length:	û			
Parallel hedge within 15 m:	û			
Four or more connection points:	û (3)			
Three or more Schedule 2 species:	û (0)			
Schedule 2 (woodland) Species:	None. Others include Bramble (*Rubus fruticosus* agg.), Ivy (*Hedera helix*), Cleavers (*Galium aparine*), Ivy (*Hedera helix*) , Yorkshire Fog (*Holcus lanatus*), Common Nettle (*Urtica dioica*),			
Conclusion				
Average Number of Schedule 3 Species per 30 m:	3			
Special Qualifying Species:	None			
Adjacent to Footpath or Bridleway:	No			
Number of Qualifying Associated Features:	2			
Reason for Important Status:	N/A – Not enough species in sections			
Notes: Tall, leggy hedgerow with trees. Hawthorn is dominant with mature oak and sycamore trees present. Survey undertaken on 24th February so limited ground flora present at time of survey.				

APPENDIX D – UPDATED GRASSLAND SPECIES LIST

The table below contains the full list of plant species recorded within the grassland (area shown in *Figure 5*) during the updated species list survey.

Table 10 Plant species recorded in the grassland on 19 July 2022.

Common name	Latin name
Grasses and sedges	
Creeping Bent	*Agrostis stolonifera*
False Oat-grass	*Arrhenatherum elatius*
Common Sedge	*Carex nigra*
Crested Dog's-tail	*Cynosurus cristatus*
Cock's-foot	*Dactylis glomerata*
Red Fescue	*Festuca rubra*
Yorkshire-fog	*Holcus lanatus*
Herbs	
Yarrow	*Achillea millefolium*
Agrimony	*Agrimonia eupatoria*
Common Knapweed	*Centaurea nigra*
Common Centaury	*Centaurium erythraea*
Common Mouse-ear	*Cerastium fontanum*
Creeping Thistle	*Cirsium arvense*
Marsh Thistle	*Cirsium palustre*
Spear Thistle	*Cirsium vulgare*
Common Spotted-orchid	*Dactylorhiza fuchsii*
Southern Marsh-orchid	*Dactylorhiza praetermissa*
Wild Carrot	*Daucus carota*
Great Willowherb	*Epilobium hirsutum*
Hoary Willowherb	*Epilobium parviflorum*
Hogweed	*Heracleum sphondylium*
Common Ragwort	*Jacobaea vulgaris*
Meadow Vetchling	*Lathyrus pratensis*
Fairy Flax	*Linum catharticum*
Bird's-foot-trefoil	*Lotus corniculatus*

Common name	Latin name
Black Medick	*Medicago lupulina*
Ribwort Plantain	*Plantago lanceolata*
Creeping Cinquefoil	*Potentilla reptans*
Self-heal	*Prunella vulgaris*
Meadow Buttercup	*Ranunculus acris*
Common Sorrel	*Rumex acetosa*
Broad-leaved Dock	*Rumex obtusifolius*
Dandelion	*Taraxacum officinale* agg.
Upright Hedge-parsley	*Torilis japonica*
Red Clover	*Trifolium pratense*
Common Nettle	*Urtica dioica*
Tufted Vetch	*Vicia cracca*
Common Vetch	*Vicia sativa*
Woody species	
Ash (saplings)	*Fraxinus excelsior*
Pedunculate Oak (saplings)	*Quercus robur*
Bramble	*Rubus fruticosus agg.*

APPENDIX E – NATURE CONSERVATION LEGISLATION AND POLICY

International Legislation

The following international conventions and directives apply to biodiversity protection in the UK. Post-'Brexit', even though European Union (EU) directives no longer directly apply to the UK, the provisions therein are enshrined in both domestic legislation and international agreements. Legislation has been enacted to ensure the regulations derived from these remain in force[29].

The Convention on Biological Diversity 1992 *et seq.*

This multilateral treaty (https://www.cbd.int/doc/legal/cbd-en.pdf), signed by 150 government leaders at the 1992 Rio Earth Summit, has three main goals, of which one is the conservation of biological diversity. Article 6 requires countries to develop national biodiversity strategies, plans or programmes. In response, the UK developed the UK Biodiversity Action Plan (BAP) 1994 (https://jncc.gov.uk/our-work/uk-bap/) as well as county-specific BAPs. Subsequent to this, parties of the convention agreed the supplementary Nagoya Protocol 2010 (available at https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf), adopting the Strategic Plan for Biodiversity 2011-2020. The purpose of this Strategic Plan was to provide a framework for establishing national and regional biodiversity targets (https://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf).

Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (Birds Directive) 2009
https://www.legislation.gov.uk/eudr/2009/147

The Birds Directive 2009 relates to the conservation of all species of naturally occurring birds in their wild state in the territory of the EU Member States (MSs) to which the treaty applies. Under the Birds Directive, the most suitable areas of conservation of the Annex I species are to be designated as Special Protection Areas (SPAs), as part of the European Natura 2000 network. Post Brexit, SPAs are no longer considered part of Natura 2000 and are instead components of the UK's 'national site network', but their highly protected status is unchanged. Maintaining a coherent network of protected sites with overarching conservation objectives is still required in order to fulfil the commitment made by government to maintain environmental protections and continue to meet the UK's international legal obligations.

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) 1992
https://www.legislation.gov.uk/eudr/1992/43

The Habitats Directive 1992 requires EU MSs to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of community interest, which are listed under Annex I, II, IV and/or V. Species listed under Annex IV are known as

[29] Further information relating to England and Wales can be found here: https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017. A similar exercise has been undertaken in Scotland and Northern Ireland.

'European Protected Species' (EPS), and have retained their protected status in UK domestic legislation post-Brexit.

Under the Habitats Directive, EU Member States are required to contribute to the Natura 2000 network through the designation of Special Areas of Conservation (SACs) for natural habitat types listed in Annex I and habitats of species listed in Annex II. Post Brexit, SACs are no longer considered part of the European Natura 2000 network and are instead components of the UK's 'national site network', but their highly protected status is unchanged.

The Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1971: the Ramsar Convention

Accessible via https://jncc.gov.uk/our-work/ramsar-convention/

The Ramsar Convention is an intergovernmental treaty focused on the conservation and sustainable use of wetland, primarily as habitats for water birds. Under the convention, each ratified country is required to identify and designate sites (Ramsar sites) that meet the criteria for identifying a wetland of international importance, i.e. containing representative, rare or unique wetland types. In addition, the convention promotes international co-operation to promote the wise use of all wetlands and their resources.

Habitats Regulations Assessment (HRA): a note

There is a requirement under the EU nature directives, and enshrined in country-specific domestic legislation[30] (see below), to undertake a screening exercise to determine whether any sites that form part of the 'national site network' (formerly Natura 2000) are likely to be significantly affected by any proposal (project or plan). The assessment must consider the proposals alone and also in combination with other plans and projects, if they result from activities that are not directly connected with, or necessary to, the management of the designated sites. If significant effects are likely, an Appropriate Assessment (AA) will need to be carried out. The screening, any AA, and any subsequent assessment, are collectively known as a Habitats Regulations Assessment (HRA). The HRA needs to take into account each of the 'Qualifying Features' (habitats or species) that justified the Site being designated. Ramsar sites are treated in the same way as SACs and SPAs in HRAs, as are sites which have not been fully adopted i.e. candidate SACs (cSACs) and potential SPAs (pSPAs).

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1979

https://www.coe.int/en/web/bern-convention

The principal aims of the Bern Convention 1979 are to ensure the conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix III. To this end, the Bern Convention imposes legal obligations on contracting parties, protecting over 500 wild

[30] In England and Wales: the Conservation of Habitats and Species Regulations 2017 (as amended).
In Scotland: the Conservation (Natural Habitats &c.) Regulations 1994 (as amended).
In Northern Ireland: the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended). .
In the UK offshore area: the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended).

plant species and more than 1,000 wild animal species. The UK Government ratified the Bern Convention in 1982.

National Legislation

The following pieces of domestic legislation apply to biodiversity protection in the UK.

The Wildlife and Countryside Act (WCA) 1981
https://www.legislation.gov.uk/ukpga/1981/69

The Wildlife and Countryside Act 1981 (as amended) is the primary piece of legislation relating to nature conservation in the UK, though it has been adapted in different ways in the devolved administrations. It was initially enacted to implement the Bern Convention, Bonn Convention and the Birds Directive (described above).

The act is supplemented by provisions in the Countryside and Rights of Way (CRoW) Act 2000 and the Natural Environment and Rural Communities (NERC) Act 2006, and extended in Scotland by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2011). Its equivalent in Northern Ireland is the Wildlife (Northern Ireland) Order 1985 (as amended and similarly extended). In addition to the Habitat Regulations (described below), the WCA provides protection for species listed in Schedules 1 (birds), 5 (other animals) and 8 (plants) of the Act. It provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) in England and Wales[31]. It also sets out, in other schedules, important and invasive species which are legally protected or require management.

Section 14(2)[32] states that it is an offence to plant or otherwise cause to grow any plant in the wild at a place outside its native range.

There is no provision within the Act for derogation licences to be issued for the purposes of development, although Section 10 provides a defence in cases that may be considered to be: *"the incidental result of a lawful operation and could not reasonably have been avoided"* if certain conditions are met.

Section 16(i) of the Act does make provision for derogation licences to be issued *"for the purposes of preserving public health or public … safety"*. For confirmation of this, it would be appropriate to consult the relevant statutory nature conservation body (SNCB)[33].

Countryside and Rights of Way Act 2000
https://www.legislation.gov.uk/ukpga/2000/37

The Countryside and Rights of Way (CRoW) Act 2000 provides for public access on foot to certain land types, amends the law for public rights of way, increases protection for SSSIs, and strengthens wildlife enforcement legislation. It applies only in England and Wales.

The Natural Environment and Rural Communities (NERC) Act 2006; The Environment (Wales) Act 2016
https://www.legislation.gov.uk/ukpga/2006/16

[31] Duty replaced by the Nature Conservation (Scotland) Act 2004 (as amended) and the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (as amended) in those countries.

[32] In Scotland, as amended by Section 14 of the Wildlife and Natural Environment (Scotland) Act 2011.

[33] SNCBs are - in England: Natural England; in Wales: Natural Resources Wales; in Scotland: NatureScot; in Nortern Ireland: Department of Agriculture, Environment and Rural Affairs (DAERA).

The Natural Environment and Rural Communities (NERC) Act 2006, Section 40 requires that any public body or statutory undertaker in England must have regard to the purpose of conservation of biological diversity in a manner that is consistent with the exercise of their normal functions. This may include enhancing, restoring or protecting a population or a habitat. The intention is to help ensure that biodiversity becomes an integral consideration in the development of policies, and that decisions of public bodies work with the grain of nature and not against it. In Wales, a similar duty has been moved to Section 6 of the Environment (Wales) Act 2016.

As part of this duty, statutory undertakers must have regard to the list of habitats and species which are of principal importance for the purpose of maintaining and enhancing biodiversity. For England, the duty to compile such a list is captured under Section 41 of the NERC Act; in Wales, under Section 7 of the Environment (Wales) Act. The lists for England are accessible online via the National Archive[34]; for Wales via https://www.biodiversitywales.org.uk/.

The Hedgerows Regulations 1997
https://www.legislation.gov.uk/uksi/1997/1160/made

The Hedgerows Regulations 1997 provide protection for 'important' hedgerows for which replanting is not a substitute. The 'importance' of a hedgerow depends upon several archaeological, wildlife and landscape criteria (which are outlined in the Regulations). The regulations deem it an offence to remove an 'important hedgerow' without prior notification to the relevant local planning authority.

Invasive Alien Species (Enforcement and Permitting) Order 2019
(https://www.legislation.gov.uk/uksi/2019/527/contents/made)

The Invasive Alien Species (Enforcement and Permitting) Order applies principally in England and Wales and the UK's offshore marine area, but also controls imports and exports from the UK (including Scotland and Northern Ireland). It lists species of concern which cannot be imported, kept, bred/grown, transported, sold, used, allowed to reproduce, or released into the environment. This Order replaces some elements relating to invasive species in the Wildlife and Countryside Act 1981 (as amended).

National, regional and local policy and guidance of relevance

Planning policy relating to ecology and nature conservation is set out below.

Government's 25-Year Environment Plan 2018
Accessed via: https://www.gov.uk/government/publications/25-year-environment-plan

The Government's 25-Year Environment Plan 2018 sets out how the UK Government intends to improve the natural health of the UK through improving land, air and water quality, as well as setting out how the effects of climate change will be tackled. The plan promotes the creation or restoration of wildlife-rich habitat outside the protected site network and seeks to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human induced extinction or loss of known threatened species in England. The plan sets out a number of goals and corresponding policies that look at managing land sustainably, improving and enhancing landscapes and biodiversity for both marine and

34 https://webarchive.nationalarchives.gov.uk/ukgwa/20140712055944/http:/www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx

terrestrial environments, improving resource efficiency and reducing waste and pollution, whilst also examining the UK's contribution to improving the global environment.

Flintshire County Council Unitary Development Plan 2000-2015

Accessed via: http://www.cartogold.co.uk/flintshire/text/english/00_contents.htm

Flintshire Council's Unitary Development Plan contains Policies WB1 to WB6 which set out measures to conserve sites of nature conservation value and prevent loss of important species and habitats, and to enhance and create new wildlife habitats and nature conservation resources.

A new Flintshire Local Plan is currently being consulted on but has not been adopted yet. It is likely to contain similar policies relating to biodiversity.