HyNet North West

ENVIRONMENTAL STATEMENT (VOLUME III)

Appendix 9.1 Habitats and Designated Sites Survey Report (Tracked) ~~(Clean)~~

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulations 8(1)(c)

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1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1. This technical appendix includes the results of extended Phase 1 habitat surveys and subsequent National Vegetation Classification surveys, and supports the assessment contained in **Chapter 9: Biodiversity (Volume II)**.

~~1.1.2. This **Revision CB** of **Appendix 9.1 – Habitats and Designated Sites Survey Report** replaces and supersedes **Revision BA** (**CR1-054 – CR1-055** and **REP4-091 – REP4-092APP-091** to **APP-093**). **Appendix 9.1 (Revision CB)** provides updated baseline information in response to the proposed design change request 3 (**CR3-019**) s as outlined in **Table i.i** of **Chapter I** of the ES Addendum.~~

~~1.1.3.~~1.1.2. The Applicant intends to build and operate a new underground carbon dioxide (CO_2) pipeline from Cheshire, England to Flintshire, Wales with necessary Above Ground Installations (AGIs) and Block Valve Stations (BVSs). It is classed as a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO) under the Planning Act 2008 ('PA2008') granted by the Secretary of State for the Department for Energy Security and Net Zero (DESNZ).

~~1.1.4.~~1.1.3. The DCO Proposed Development will form part of HyNet North West ('the Project'), which is a hydrogen supply and Carbon Capture and Storage ('CCS') project. The goal of the Project is to reduce CO_2 emissions from industry, homes and transport and support economic growth in the North West of England and North Wales. The wider Project is based on the production of low carbon hydrogen from natural gas. It includes the development of a new hydrogen production plant, hydrogen distribution pipelines, hydrogen storage and the creation of CCS infrastructure. CCS prevents CO_2 entering the atmosphere by capturing it, compressing it and transporting it for safe, permanent storage.

~~1.1.5.~~1.1.4. The DCO Proposed Development is a critical component of HyNet North West which, by facilitating the transportation of carbon, enables the rest of the Project to be low carbon. The hydrogen production, distribution, and CO_2 capture and storage elements of the Project do not form part of the DCO Proposed Development and will be delivered under separate consenting processes.

~~1.1.6.~~1.1.5. The DCO Application will seek consent for the construction, operation and maintenance of the following components which are part of the DCO Proposed Development, namely:

- **Ince Above Ground Installation (AGI) to Stanlow AGI Pipeline** – a section of new underground onshore pipeline (20" in diameter) to transport CO_2;

- **Stanlow AGI to Flint AGI Pipeline** – a section of new underground onshore pipeline (36" in diameter) to transport CO_2;
- **Flint AGI to Flint Connection Pipeline** – a section of new underground onshore pipeline (24" in diameter) to transport CO_2;
- **Flint Connection to Point of Ayr (PoA) Terminal Pipeline** – a section of existing Connah's Quay to Point of Ayr (PoA) underground onshore pipeline (24" in diameter) which currently transports natural gas but would be repurposed and reused to transport CO_2. The Flint Connection to PoA Terminal Pipeline is scoped out of the EIA, except for the areas adjacent to the three BVSs that are within the Newbuild Infrastructure Boundary;
- **Four AGIs** - Ince AGI, Stanlow AGI, Northop Hall AGI, and Flint AGI;
- **Six Block Valve Stations (BVSs)** - located along:
  - The new Stanlow AGI to Flint AGI Pipeline (three in total);
  - the existing Flint Connection to PoA Terminal Pipeline (three in total);
- **Other above ground infrastructure**, including Cathodic Protection (CP) transformer rectifier cabinets and pipeline marker posts;
- **Utility Connection infrastructure**, including power utilities and Fibre Optic Cable (FOC); and
- **Temporary ancillary works** integral to the construction of the Carbon Dioxide Pipeline, including Construction Compounds and temporary access tracks.

~~1.1.7.~~1.1.6. Further details of each element of the DCO Proposed Development are set out in **Chapter 3: Description of the DCO Proposed Development (Volume II)**~~ and subsequent addenda.~~.

1.2. BRIEF SCOPE AND OBJECTIVES

1.2.1. The Applicant commissioned extended Phase 1 habitat surveys to be undertaken across the Newbuild Infrastructure Boundary. The scope of the extended Phase 1 habitat surveys was:

- To record habitats within the Newbuild Infrastructure Boundary and provide baseline ecological information on each habitat; and
- To determine the presence or likely presence of protected and/or notable flora, and floristically valuable areas, which may pose constraints upon the construction of the DCO Proposed Development and may require additional habitat specific surveys i.e. National Vegetation Classification (NVC).

1.2.2. Where NVC surveys were subsequently undertaken, the scope was:

- To provide more detailed (Phase 2) data relating to habitats and floral communities within or adjacent to Local Wildlife Sites (LWS) and Wildlife

Sites (WS) (hereafter defined as the 'NVC Survey Area') and assign each area to particular NVC communities where this was possible.

- Identify habitats that have been recorded within the NVC Survey Area which may qualify as Groundwater Dependant Terrestrial Ecosystems (GWDTE). These habitats/plant communities are further assessed, using available hydrological and geological information which is detailed in **Chapter 18: Water Environment and Flood Risk (Volume II)** and **Appendix 18.2 – Assessment of Effects (Volume III)**

1.2.3. The results of the extended Phase 1 Habitat surveys and NVC surveys completed in 2021 and 2022 are presented within this report. The impact assessment and recommendations for compensation and mitigation are presented within **Chapter 9: Biodiversity** (**Volume II**).

1.3. RELEVANT LEGISLATION AND POLICY

1.3.1. A summary of the international, national, and local legislation, planning policy and guidance relevant to the biodiversity assessment for the DCO Proposed Development is set out below.

- The Conservation of Habitats and Species 2017 (as amended) (**Ref. 1**);
- The Wildlife and Countryside Act 1981 (as amended) (WCA) (**Ref. 2**);
- Environment Act Wales (2016) (**Ref. 3);**
- Countryside Rights of Way Act 2000 (**Ref. 4);**
- The Natural Environment and Rural Communities (NERC) Act 2006 (**Ref. 5);**
- The Protection of Badgers Act 1992 (**Ref. 6**);
- National Planning Policy Framework (NPPF) (2021) (**Ref. 7**);
- The Planning Policy Wales (PPW) (2021) (**Ref. 8**);
- The Hedgerows Regulations 1997 (**Ref. 9**);
- The Wild Mammals (Protection) Act 1996 (**Ref. 10**); and
- The Environment Act 2021 (**Ref. 11**).

2. BASELINE METHODOLOGY

2.1. OVERVIEW

2.1.1. A desk study was undertaken in 2020 to review existing ecological information relating to the Newbuild Infrastructure Boundary. Field surveys were undertaken in 2021 and into 2022 to classify and map habitats present within the Newbuild Infrastructure Boundary.

2.1.2. All surveys were carried out, and this report prepared, in line with current best practice guidance published by Chartered Institute of Ecology and Environmental Management (CIEEM) (**Ref. 12**) and the Joint Nature Conservation Committee (JNCC) (**Ref. 13**).

2.2. DESK STUDY AND DATA SEARCH

2.2.1. A desk study was undertaken to identify nature conservation designations and protected and notable habitats and species potentially relevant to the Newbuild Infrastructure Boundary, in line with the CIEEM Preliminary Ecological Appraisal guidelines (**Ref. 12**) and guidelines for assessing biological data (**Ref. 14**). The desk study included a review of publicly available resources and databases, such as the Multi Agency Geographic Information for the Countryside (MAGIC) website (**Ref. 27)** and the following third-party data sources:

- British Trust for Ornithology (BTO);
- Cheshire Wildlife Trust;
- rECOrd;
- Cofnod- North Wales Environmental Information Service; and
- Natural Resources Wales (NRW) (**Ref. 28)** and National Biodiversity Network (NBN) Atlas Wales (**Ref. 29)**.

2.2.2. The following search distances and parameters were applied:

- Up to 10km from Newbuild Infrastructure Boundary for statutory designated sites of international importance[1] and those listed within the National Site Network (extended to 30km for Special Areas of Conservation (SAC) designated for bat species);
- Statutory designated sites of national importance within 2km of the Newbuild Infrastructure Boundary[2];
- Statutory designated sites of international or national importance hydrologically linked to watercourses within the Newbuild Infrastructure Boundary;

[1] Special Areas of Conservation (SAC), candidate SAC (cSAC), Special Protection Areas (SPA), potential SPA (pSPA) and Ramsar sites.
[2] Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

- Priority habitats and woodland listed on the Ancient Woodland Inventory (AWI) and within 1km of the Newbuild Infrastructure Boundary;
- Records of historic protected species licences within 2km of the Newbuild Infrastructure Boundary;
- Records of protected and/or notable species within 2km of the Newbuild Infrastructure Boundary, within the last 10 years;
- Records of bat species within 5km of the Newbuild Infrastructure Boundary; and
- Locations of non-statutory designated sites[3] within 1km of the Newbuild Infrastructure Boundary.

2.2.3. Desk study results associated with protected and or notable faunal species are provided within the relevant technical appendices (**Appendices 9.2 to 9.8, Volume III**) and **Chapter 9: Biodiversity ES** (**Volume II**). Only those desk study results associated with designated sites, habitats and plants are presented below.

2.2.4. For the purposes of the NVC survey, records of protected and/or notable plant species within 1km of the Newbuild Infrastructure Boundary were reviewed and are provided in Table 8~~Table 8~~ of this document. Records occurring within 100m of the Newbuild Infrastructure Boundary are also summarised in Table 8~~Table 8~~.

2.2.5. Protected and/or notable species are those vascular plants which are Wildlife and Countryside Act (WCA) 1981 Schedule 8 species or listed within either the Vascular Red Data List for Great Britain (**Ref. 15**), the Vascular Plant Red List for England (**Ref. 16**) or the Vascular Plant Red Data List for Wales (**Ref. 17**) under the following International Union for Conservation of Nature (IUCN) threat categories:

- Near Threatened (NT);
- Vulnerable (VU);
- Endangered (EN); or
- Critically Endangered (CR).

2.3. FIELD SURVEY

PHASE 1 HABITAT SURVEY

2.3.1. Field surveys encompassed all land within the Newbuild Infrastructure Boundary (**Figure 3-2 DCO Proposed Development**, **Volume IV**) where access allowed, with surveys commencing in 2020 and continuing through 2021

[3] Local Wildlife Sites (LWS) (England) and Wildlife Sites (WS) (Wales).

and 2022. The surveys were undertaken by experienced ecologists, all of whom are members of CIEEM.

2.3.2. Habitats were described and mapped following the standard Phase 1 habitat survey methodology (**Ref. 13**). Phase 1 habitat survey is a standard technique for classifying and mapping British habitats. The dominant plant species are recorded, and habitats are classified according to their vegetation types, structure and composition. Where appropriate, consideration was given to whether habitats qualify, or could qualify, as a Habitat of Principal Importance (HPI) following habitat descriptions published by the Joint Nature Conservation Committee **(Ref. 30).** Floristic nomenclature followed that of Stace, 2019 (**Ref. 18**).

2.3.3. Habitats were marked on tablet computers and were subsequently digitised using a Geographical Information System (GIS).

2.3.4. Target notes were made to provide information on specific features of ecological interest (e.g., a badger *Meles meles* sett) or habitat features too small to be mapped. Any invasive plant species listed on Schedule 9 of the WCA 1981 (as amended) which were evident during the Phase 1 habitat survey were also target noted. A full list of all Target Notes can be found in **Annex B,** however, target notes related to badgers have been excluded due to confidentiality and are detailed within **Appendix 9.5 Badger Survey Report (Confidential) (Volume III).**

2.3.5. Habitat condition is defined as the quality of a particular habitat. For example, a habitat is in poor condition if it fails to support the rare or notable species for which it is valued, or if it is degraded as a result of erosion, pollution, invasive species or other factors. A condition assessment of habitats was undertaken in the field using the Farm Environment Plan (FEP) (**Ref. 19**) guidance. Habitats were categorised into ‘Good’, ‘Moderate’ or ‘Poor’ based on the pass/failing of criterion in the appropriate FEP Condition Assessment Table presented for each habitat type.

2.3.6. During field survey visits, the Phase 1 habitat survey was ‘extended’ in accordance with guidance for Preliminary Ecological Appraisal (**Ref. 12**). Habitats were assessed for their potential to support protected and/or notable species with any evidence of such species recorded as Target Notes (TN). Given the habitats present across the Newbuild Infrastructure Boundary, surveyors paid particular attention to whether habitats could support: badger, bats, water vole *Arvicola amphibius*, otter *Lutra lutra*, breeding birds, great crested newt *Triturus cristatus* and reptile species. Observations of an Invasive Non-Native Species (INNS) were also recorded where incidentally encountered.

2.3.7. For the purposes of this report, protected species are considered to comprise plant and animal species which are afforded legal protection. These include animals and plants protected by relevant Schedules of The Conservation of Habitat and Species Regulations 2017 (as amended) (referred to as 'the Habitat Regulations') (**Ref. 1)**, the Wildlife and Countryside Act 1981 (as amended) (**Ref. 2**), the Protection of Badgers Act 1992 (**Ref. 6**) and species listed on Section 41 of the NERC Act 2006 (**Ref. 5**), and the Environment (Wales) Act 2006 (**Ref. 3**).

NVC SURVEY

2.3.8. The NVC survey was undertaken with reference to the NVC guidelines (**Ref. 20**). Methods were modified to enable a rapid assessment of habitat types present. During the survey work, areas of greater botanical interest (determined using professional judgement) were focused on, particularly including potential habitats of principal importance. These areas were subject to quadrat sampling.

2.3.9. A site walkover of the NVC Survey Areas was undertaken to identify homogeneous stands of vegetation. Stand boundaries were hand drawn onto field maps and subsequently digitised. Quadrats, a standard NVC sampling method, are a randomly selected smaller area within the wider homogeneous stand of vegetation. All plants within the quadrat are recorded to allow assessment and confirmation of the overall botanical community.

2.3.10. As per NVC guidelines (**Ref. 20**), it is usual for NVC survey analysis to take a minimum of five quadrats in each homogeneous stand of vegetation. This was adapted into a rapid assessment where vegetation was sampled using three quadrats per homogeneous area, and within small habitat patches vegetation was sampled by collating an overall species list only (no quadrats were taken).

2.3.11. This rapid assessment and targeted quadrat locations approach is considered reasonable, given that poorer quality habitats would not usually be subject to NVC detail. An experienced surveyor can identify, and using professional judgement, assess where a more detailed survey is required. The more detailed quadrat survey would enable assessment and analysis to identify, for example, habitats of principal importance.

2.3.12. An overall qualitative description and photographs were collected for each vegetation type. These descriptions are provided in **Section 3.3.**

2.3.13. For the overall species lists, plant species abundance was recorded using the DAFOR scale, as follows:

- D: Dominant.
- A: Abundant.
- F: Frequent.
- O: Occasional.
- R: Rare.

2.3.14. Where a species had a markedly local distribution within a vegetation stand, the prefix 'L' was used.

2.3.15. For quadrat sampling, a 2m x 2m quadrat was used for short grassland and a 4m x 4m quadrat was used for tall grassland and forbs[4] or for swamp vegetation. Woodland was sampled at different scales for different layers of vegetation. Canopy and understorey was sampled using 10m x 10m quadrats and the ground layer using 4m x 4m quadrats. Canopy layers within woodland are normally sampled using 50m x 50m quadrats, but due to the small size of the surveyed woodlands this was reduced to 10m x 10m. Cover was estimated using the Domin scale (Table 1~~Table 1~~). The collected data was assembled in a floristic table and frequency calculated.

Table 1 – Domin Scale

Cover %	Domin Value
91-100	10
76-90	9
51-75	8
34-50	7
26-33	6
11-25	5
4-10	4
<4 with many individuals	3
<4 with several individuals	2
<4 with few individuals	1

2.3.16. Frequency was used in conjunction with abundance when determining the community type, either using dichotomous keys within British Plant Communities (**Refs. 21, 22 & 23**) or the MATCH (v.2.16) computer program (**Ref. 24**). Roman numerals I-V are used to measure frequency with:

- I signifying a species present in 1-20% of samples (scarce);
- II signifying a species present in 21-40% of samples (occasional);
- III signifying a species present in 41-60% of samples (frequent);
- IV signifying a species present in 61-80% of samples (constant); and
- V signifying a species present in 81-100% of samples (constant).

[4] A forb is a herbaceous (non-woody) flowering plant that is not a graminoid (grass, sedge or rush).

Determining Vegetation Community Type

2.3.17. Shortlists of possible communities were identified using the MATCH (v.2.16) computer program. This program compares the survey data with floristic tables of NVC communities. The shortlists were subsequently refined using NVC keys and the appropriate community descriptions as given in British Plant Communities Volumes 1, 3 and 4 (**Refs. 21, 22 & 23**).

2.3.18. The coefficient of similarity generated by MATCH (calculated as a percentage) was used to improve the confidence with which data collected could be assigned to a particular NVC community. In line with the published guidance, however, the MATCH assessments were not used in isolation: a combination of the keys and descriptions within the published NVC handbooks, MATCH assessment, and surveyor experience was used to determine community types.

2.3.19. Within this report, MATCH coefficients below 40% were considered to represent particularly poor fits, while those over 50% were considered particularly good fits. Coefficients between 40% and 49% inclusive were not considered to provide a definitive result with confidence, and in these cases, the published keys and descriptions, plus surveyor experience was used as a favoured method. In some cases, even particularly good fits for MATCH assessments were disregarded where the result was not considered to be a true reflection of the existing conditions by the surveyor. This judgement may have been made because of the absence of one or more species at the survey site, which are normally constant species within the community with the highest percentage similarity coefficient, using the MATCH program.

2.3.20. Where there was ambiguity regarding NVC classification, these cases were noted. Not all habitats are well covered by the NVC system and in some cases no NVC classification was assigned.

Groundwater Dependant Terrestrial Ecosystems (GWDTE)

2.3.21. GWDTE are wetlands such as springs, flushes and fens which are fed by groundwater rather than rainfall or surface runoff. They are particularly sensitive to hydrological and ecological changes caused by development and are safeguarded by the Water Framework Directive (WFD). Foundations, borrow pits and linear infrastructure such as roads, tracks and trenches can disrupt groundwater flow and impact upon these sensitive habitats. The Environment Agency (EA) have a responsibility to protect GWDTE and regulate development which may have a negative impact on GWDTE.

2.3.22. Presence of groundwater dependent plant communities can be used to identify potential GWDTE. Some plant communities are highly dependent upon groundwaters, whilst others can use several irrigating sources.

2.3.23. Annex 1 of the UK TAG guidance (**Ref. 25**) presents the NVC plant communities that are of most use for identifying groundwater dependency. The Annex 1 table, which was updated in 2009, gives groundwater dependency scores for the UK as a whole and as separate scores for Scotland and England/Wales. The scores for England/Wales are used within this report. Each plant community is assigned a score indicating dependency on groundwater (i.e., 3=low, 2=moderate and 1=high). All of the relevant plant communities in Annex 1 (**Ref. 25)** are used to indicate the potential presence of GWDTE and were subsequently screened hydro-geologically to further confirm or discount the presence of a GWDTE and help identify its location within large, designated sites. The results of this further assessment are detailed in **Chapter 18 – Water Environment and Flood Risk (Volume II)** and **Appendix 18.2 – Assessment of Effects (Volume III).**

2.4. NOTES AND LIMITATIONS

DESK STUDY

2.4.1. Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in the recording coverage.

PHASE 1 HABITAT SURVEY

2.4.2. Whilst efforts to undertake surveys during optimal periods was made, areas of the Newbuild Infrastructure Boundary were surveyed during sub-optimal times of year for botanical surveys (optimal survey timing is generally recognised as being April to September (inclusive)). Botanical surveys are seasonally limited and throughout the spring and summer period certain species will be more or less evident at different times. Whilst certain areas have been subject to survey during sub-optimal times of the year, the Newbuild Infrastructure Boundary is dominated by agricultural grazing pasture and arable farmland with low species diversity. It is considered that sufficient data on species present, structure and cover was collected, and it is therefore considered that sufficient information has been gathered in order to enable an assessment of the habitat types present. Where areas were considered to have the potential for high floristic diversity, these were subsequently subject to further targeted NVC surveys during the optimal season.

2.4.3. There were small areas within the Newbuild Infrastructure Boundary which were not surveyed due to access not being permitted by landowners, or where it was unsafe to access, including residential gardens, railway sidings and embankments, and roadside verges along major carriageways. Areas where no direct access was possible are shown on **Figure 9.1.3 (Annex A~~Annex A~~)**. In these circumstances, where appropriate, assessment of the habitats within these sections were made from adjoining land (where access was granted) and from Public Rights of Way (PRoW). In these instances where access was not possible, aerial imagery was used to assess the broad habitat types present in the absence of field survey data. Therefore, this is not considered to have adversely impacted the results or conclusions of surveys.

2.4.4. Ecological survey data is typically valid for two years (**Ref. 26**), unless otherwise specified, for example, if conditions are likely to change more quickly due to ecological processes or anticipated changes in management.

NVC SURVEY

2.4.5. The survey approach implemented a modified rapid approach to NVC survey where surveyor experience and professional judgement deemed that it was proportionate to the habitats present, i.e., those habitats with less botanical interest. A full NVC survey would involve taking at least five quadrats in homogeneous vegetation stands where possible. It is considered that, given surveyor experience, it was possible to accurately classify communities to NVC community level using the modified approach, whilst the more complex habitats, including potential habitats of principal importance, were subject to standard NVC methods.

2.4.6. The NVC community maps (**Figure 9.1.4, Annex A~~Annex A~~)** have been reproduced from field notes and plans. Whilst this provides a sufficient level of detail to support this ES, the plans are not intended to provide exact locations of key habitats.

2.4.7. One location intended to be subject to NVC survey, Brook Park Farm Wood WS, was not able to be accessed following the initial extended Phase 1 habitat survey.

2.4.8. All NVC surveys were completed during the optimal survey season for botanical surveys, generally accepted to be from April-September (inclusive). It should however be noted that throughout the spring and summer period certain species will be more or less evident at different times (i.e., depending on the flowering season). It is however considered that sufficient information was gathered to enable an assessment of the habitat types present.

3. RESULTS

3.1. DESK STUDY AND DATA SEARCH

STATUTORY DESIGNATED SITES

3.1.1. A total of nine internationally designated sites were recorded within 10 km of the DCO Proposed Development; five SACs, two SPAs, both with associated Ramsar designations, and two further Ramsar sites. These are detailed in Table 2~~Table 2~~ below. No SACs designated for bat species were recorded within 30 km of the DCO Proposed Development.

3.1.2. The closest of these designated sites was the River Dee and Bala Lake SAC, which is spanned by the Newbuild Infrastructure Boundary, and Deeside and Buckley Newt SAC which lies adjacent to the Newbuild Infrastructure Boundary. Statutory designated sites are shown on **Figure 9.1.1 (**Annex A~~Annex A~~**)**.

Table 2 – Internationally Designated Sites within 10km of the DCO Proposed Development

Site name and Designation	Approximate Size (ha)	Reasons for designation	Distance from Newbuild Infrastructure Boundary
River Dee and Bala Lake SAC	1,309	The SAC is designated under Annex I for its watercourses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Btrachion* vegetation. The site is additionally designated for supporting Annex II species: sea lamprey *Petromyzon marinus*, river lamprey *Lampetra* fluviatilis, brook lamprey *Lampetra planeri,* Atlantic salmon *Salmo salar,* bullhead *Cottus gobio*, otter *Lutra lutra* and floating water-plantain *Luronium natans*.	Spanned by the Newbuild Infrastructure Boundary
Deeside and Buckley Newt Sites SAC	208	The SAC is designated under 'Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site' for Old sessile oak woods with Ilex and Blechnum in the British Isles. In addition, the Site is additionally designated for supporting Annex II species Great crested newt *Triturus cristatus*.	Shares a boundary with the north of the Newbuild Infrastructure Boundary
Halkyn Mountain (Mynydd Helygain) SAC	611	The SAC is designated under Annex I for Calaminarian grasslands of the *Violetalia calaminariae*. Annex I habitats also present in the site include European dry heaths, Semi-natural dry grasslands and scrubland facies on calcareous substrates Festuco-Brometalia and Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae*. The site is also designated for Annex II species Great crested newt *Triturus cristatus*.	248 m north

Site name and Designation	Approximate Size (ha)	Reasons for designation	Distance from Newbuild Infrastructure Boundary
The Mersey Estuary SPA & Ramsar	5024	The SPA supports overwintering golden plover *Pluvialis apricaria*, redshank *Tringa totanus*, shelduck *Tadorna tadorna*, teal *Anas crecca*, pintail *Anas acuta*, dunlin *Calidris alpina alpina* and black-tailed godwit *Limosa limosa islandica*. The site also supports on passage redshank, as well as an internationally important waterbird assemblage.	840 m north
Dee Estuary / Aber Dyfrdwy SAC	15,806	The SAC is designated for Annex I habitats Mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonizing mud and sand and Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*). Other Annex I habitats present include 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"), and humid dune slacks. Annex II species present, as a qualifying feature but not as a primary reason for site selection include; sea lamprey, river lamprey and petalwort *Petalophyllum ralfsii*.	1.02 km north
The Dee Estuary SPA & Ramsar	14,292	The site has been designated as an SPA for supporting the following over wintering species: bar-tailed godwit, black-tailed godwit curlew *Numenius arquat*, dunlin *Calidris alpina alpina*, grey plover *Pluvialis squatarola*, knot *Calidris canutus,* oystercatcher *Haematopus ostralegus*, pintail *Anas acuta*, redshank *Tringa totanus*, shelduck *Tadorna tadorna* and teal *Anas crecca*. The site has also supported breeding common tern *Sterna hirundo* and little tern *Sterna albifrons*, as well as supporting on passage sandwich tern *Sterna sandvicensis* and redshank. The SPA also regularly supports at least 20,000 waterfowl.	1.02 km north

Site name and Designation	Approximate Size (ha)	Reasons for designation	Distance from Newbuild Infrastructure Boundary
Alyn Valley Woods SAC	167	The SAC is designated for Annex I Tilio-Acerion forests of slopes, screes and ravines habitat. Other Annex I habitats present as a qualifying feature, but not as primary reason for designation include Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) and Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae).	5.9 km south west
Midland Meres & Mosses Phase 1 Ramsar	511	A series of lowland open water and peatland sites set in depressions in glacial drift left by receding ice sheets. The 16 component sites include nutrient-rich water bodies (meres), associated fringing habitats of reed swamps, fen, carr and damp pasture, and floating quaking bog (schwingmoor). The wide range of resulting habitats supports numerous rare species of plants and invertebrates.	8.6 km east
Midland Meres & Mosses Phase 2 Ramsa	1594	A series of 18 sites made up of nutrient-rich open water bodies (meres) with fringing habitats of reed swamp, fen, carr and damp pasture, and peatlands. The landscape features developed in depressions in the glacial drift left by receding ice sheets. The wide range of habitats supports nationally important flora and fauna.	8.9 km east

3.1.3. Twelve nationally designated sites were recorded within 2 km of the DCO Proposed Development including 11 SSSIs and one LNR. These are shown in Table 3~~Table 3~~ below.

3.1.4. The closest of these sites are the River Dee SSSI which is spanned by the Newbuild Infrastructure Boundary, and Connah's Quay Ponds and Woodland, which lies adjacent to the Newbuild Infrastructure Boundary. Statutory designated sites are shown on **Figure 9.1.2 (Annex A~~Annex A~~).**

Table 3 – Nationally Designated Sites within 2km of the DCO Proposed Development

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Afon Dyfrdwy (Wales) / River Dee (England) SSSI	1,490	Afon Dyfrdwy (River Dee) is of special interest for its fluvial geomorphology and range of river habitat types, as well as saltmarsh transition habitats. It is also of special interest for populations of floating water plantain, slender hare's-ear *Bupleurum tenuissimum*, sea barley *Hordeum marinum*, hard-grass *Parapholis strigosa*, otter *Lutra lutra*, salmon, bullhead *Cottus gobio*, brook lamprey, river lamprey *Lampetra fluviatilis*, sea lamprey, club-tailed dragonfly *Gomphus vulgatissimus* and other aquatic invertebrates. The River Dee is of special interest for Atlantic salmon for which it is one of the Environment Agency's index rivers. The Mynach, Meloch and Ceiriog tributaries are the most important salmon spawning tributaries in the Dee catchment and are included within the Afon Dyfrdwy SSSI. The lower reaches of the River Dee support Britain's only known population of the stonefly *Isogenus nubecula*, which is classified as vulnerable in the Red Data Book. Furthermore, the nationally scarce weevil *Baris lepidii* has been recorded along the lower Dee and has not been recorded on any other Welsh river.	Spanned by the Newbuild Infrastructure Boundary
Connah's Quay Ponds and Woodland SSSI	94	Part of 'The Deeside and Buckley Newts Site SAC'; this SSSI includes Broadoak Wood, Wepre Country Park, Gathering Grounds Wood and Llwyni Pond Local Nature Reserve. The site is of special interest for its population of great crested newt' its assemblage of widespread amphibian species, and for its semi-natural broadleaved woodland.	Shares a boundary with the Newbuild Infrastructure Boundary
Halkyn Common and Holywell Grasslands/Comin Helygain a	699.3	Halkyn Common and Holywell Grasslands is of special interest for the mineralisation associated with the Carboniferous Limestone and cherts which is found in spoil tips and in situ exposures; open vegetation on soils rich in heavy metals; calcareous grassland; dry heath; fen meadow; base-rich flush; and populations of spring sandwort *Minuartia verna* and	248 m north east

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Glaswell Tiroedd Treffynnon SSSI		stemless thistle *Cirsium acaule*. An assemblage of widespread amphibian species including great crested newt are also present.	
Buckley Claypits and Commons SSSI	100	This SSSI forms part of the Deeside and Buckley Newt Sites SAC and is notable due to its presence of great crested newt. Breeding reed bunting *Emberiza schoeniclus* and water vole are also present.	540 m south
Flint Mountain (Mynydd Y Fflint) SSSI	26	The SSSI is of special interest for its stands of unimproved neutral grassland and semi-natural broadleaved woodland, which occur in association with scrub, fen-meadow and swamp vegetation. Notable species include pale flax *Linum bienne,* restharrow *Ononis repens,* figwort *Scrophularia nodosa* and hemp agrimony *Eupatorium cannabinum.*	500 m north west
Maes Y Grug SSSI	18	The SSSI is of special interest for its population of great crested newt and forms part of the Deeside and Buckley Newts Site SAC. Habitats comprise a mosaic of grassland, scrub and woodland habitats surrounding waterbodies that have been managed or allowed to develop naturally.	870 m south
Mersey Estuary SSSI	6,715	The Mersey Estuary is an internationally important site for wildfowl and consists of large areas of intertidal sand and mudflats. The site also includes an area of reclaimed marshland, saltmarshes, brackish marshes and boulder clay cliffs with freshwater seepages. Notable species include curlew *Numenius arquata* and golden plover *Pluvialis apricaria.*	840 m north
Dee Estuary SSSI	13,680	The Dee Estuary is a large, sheltered estuary which is internationally important due to the number of waterfowl and waders it supports. Habitats include intertidal mud and sandflats, rocky sandstone cliffs of Hilbre Island and Middle Eye with species including sandhill rustic moth *Luperina nickerlii gueneei,* a Red Data Book species. River lamprey, sea lamprey and European smelt *Osmerus eperlanus* are also of note.	1.02 km north

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Parc Linden SSSI	10.2	Parc Linden is an area of enclosed pasture located close to the village of Lixwm on a shallow glacial drift over carboniferous limestone. The site supports unimproved calcareous grassland, acid grassland, limestone pavement, bracken and scrub. Parc Linden is of special interest for its unimproved calcareous grassland which is the best-known example of its type in Clwyd (Flintshire). A small partially wooded limestone pavement occurs in the northern part of the site.	1.2 km south east
Coed Trefraith SSSI	11	Designated for its botanical interest. One of the best examples in Clwyd (Flintshire) of a woodland type found mainly in Wales and south-west England but also in the Midlands and north-east England. In north Wales the majority of the examples are in Clwyd at low altitudes, the remainder being in West Gwynedd.	1.4 km south west
Gathering Grounds Woods & Llwyni Pond Local Nature Reserve (LNR)	3	This LNR is within the Connah's Quay Ponds and Woodland SSSI and The Deeside and Buckley Newts Site SAC. The LNR is notable due to the presence of great crested newt. Other notable species include, badger, field vole *Microtus agrestis*, blue tit *Cyanistes caeruleus,* chaffinch *Fringilla coelebs*, tawny owl *Strix aluco,* redwing *Turdus iliacus and* dunnock *Prunella modularis*.	1.2 km north
Parc Bodlondeb and Gwenallt-Parc SSSI	17.5	Parc Bodlondeb and Gwenallt-Parc is an area of enclosed pasture located close to the village of Lixwm, on a shallow glacial drift over Carboniferous Limestone. The SSSI supports a mosaic of unimproved calcareous, acid and neutral grasslands together with limestone heath and stands of bracken, scrub and broadleaved woodland. It is of special interest for its unimproved calcareous grassland, limestone heath and species-rich acid grassland. All these types have highly localised national distributions. Additional interest is provided by the neutral grassland, scrub and woodland communities.	2.0 km south

NON-STATUTORY DESIGNATED SITES

3.1.5. Thirty-eight non-statutory designated sites were recorded within 1km of the DCO Proposed Development including 23 LWS (England) and 15 WS (Wales). These are shown in Table 4~~Table 4~~ and Table 5~~Table 5~~ below, and are shown on **Figure 9.1.2**. Annex A~~Annex A~~.

3.1.6. A total of eight non-statutory designated sites, five in England and three in Wales, are located within the Newbuild Infrastructure Boundary.

Table 4 – Non - Statutory designated sites within 1km of the DCO Proposed Development, in England

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Frodsham Helsby and Ince Marshes LWS	1150	An extensive area of coastal floodplain, used for agricultural purposes. The wider landscape includes Ince Banks and the Mersey Estuary SPA and Ramsar to the north. The site provides a mosaic of habitats including grassland, a complex ditch system, semi-natural plantation woodland, scrub, tall ruderal vegetation, hedgerows, reed beds and an area of developing salt-marsh. It is of county, national and international ornithological importance for breeding, wintering and passage species. It is also of botanical interest at county and national levels, with yellow-vetch Vicia lutea, a nationally scarce species, recorded. There is a good-sized water vole population within the ditch system.	Within the Newbuild Infrastructure Boundary
Saughall Bank LWS	3.80	Species-rich grassland on the south-west facing old bank of the River Dee over 2km from the river, containing plants rare in Cheshire including restharrow *Ononis sp*, agrimony and dyer's greenweed *Genista tinctoria.*	Within the Newbuild Infrastructure Boundary
Shropshire Union Canal (Main Line) LWS	14.12	A 1.9km length of the Shropshire Union Canal main line, south-east of Huxley between Williamson's Bridge and Bate's Mill Bridge, including the canal, towpath and boundary hedgerows. Bird species recorded include yellowhammer *Emberiza citrinella*, chaffinch, house martin *Delichon urbicum* and great spotted woodpecker *Dendrocopos major.*	Within the Newbuild Infrastructure Boundary
Gowy Meadows and Ditches LWS	193	A large group of fields with an interconnecting ditch system which is part of the eastern floodplain of the River Gowy. Some areas of good semi-improved, neutral and marshy grassland. Native black poplar Populus nigra is present and the ditches in particular are of high conservation value, supporting rare/scarce flora and a water vole population. The site is of	Within the Newbuild Infrastructure Boundary

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
		significant ornithological interest, supporting a number of red and amber list species and breeding snipe *Gallinago gallinago*.	
Wood West of Crabwell Manor LWS	0.94	A narrow strip of broadleaved woodland along a stream. The canopy consists of ash, pedunculate oak, sycamore Acer pseudoplatanus and beech, with an understory of hawthorn *Crataegus monogyna*, hazel, field-rose *Rosa arvensis* and wild cherry *Prunus avium*. Common ground flora species are present, such as bramble *Rubus fruticosus*, common nettle *Urtica dioica* and wood avens *Geum urbanum.*	Within the Newbuild Infrastructure Boundary
Collinge Wood & Meadow LWS	4.67	Two adjoining areas of woodland and a wet meadow with reed bed, adjacent to the Shropshire Union Canal. Silver birch Betula pendula is abundant in the woodland, with pedunculate oak and sycamore. Wetland species in the meadow include gipsywort *Lycopus europaeus*, common marsh bedstraw *Galium palustre,* wild angelica *Angelica sylvestris* and yellow iris *Iris pseudacorus.*	5m south
Chester Zoo (Butterhill – Millenium Cycle Route) LWS	0.89	A section of the Millenium Cycle Way between Butter Hill and Chester Zoo, comprising of a surfaced track/cycle route with a steep hedge bank in the northern section and deep ditches along the southern section. Common tree and shrub species line the track, including sessile and pedunculate oak, ash Fraxinus excelsior, hawthorn and hazel *Corylus avellana*. In the ditches hard shield fern *Polystichum aculeatum* and greater burdock *Arctium lappa* are present, which are locally scare species, along with ground flora such as yellow iris, brooklime V*eronica beccabunga*, duckweed *Lemna minor* and red *campion Silene dioica.*	14m west

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Shropshire Union Canal (Little Staney to Waverton) LWS	4.6	A long section of canal passing through Chester and ending near Ellesmere Port. The section between bridges 138 and 141 is of greatest botanical interest, with hedgerows, extensive marginal-emergent vegetation, aquatic vegetation and other wetland flora species.	15m south
Lea by Backford Railway Cutting LWS	3.20	A narrow strip of regenerating mixed woodland, scrub and neutral grassland north-east of Mollington. Contains notable species for Cheshire, including agrimony, yellow wort *Blackstonia perfoliata* and common spotted orchid *Dactylorhiza fuchsii.*	34m north
Viaduct Wood LWS	2.34	A narrow section of woodland on the slopes of a brook, adjacent to the Chester to Liverpool Railway line. Canopy and shrub layer consists of common woodland species such as beech Fagus sylvatica, hazel, field rose Rosa arvensis and bramble *Rubus sp*. Ground flora includes wood anemone *Anemone nemorosa*, bluebell *Hyacinthoides non-scripta,* and common dog violet *Viola riviniana*.	40m south
Wervin Meadows LWS	35.83	Predominantly a grazed floodplain adjacent to the River Gowy, consisting of a mosaic of grassland, wetland and tall ruderal vegetation with numerous ditches. The grassland provides important habitat for ground nesting birds, in particular lapwing *Vanellus vanellus*. The ditches and wet areas are botanically rich. The site supports brown hare *Lepus europaeus*.	57m north
Chester Zoo Ponds LWS	0.35	A cluster of seven ponds within permanent pasture, grazed by cattle. Important in the wider region due to supporting aquatic invertebrates and rare plants, including 24 wetland indicator species and regionally rare species.	108m south from closest pond

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Backford Brook Fields LWS	8.15	A section of Backford Brook Valley. Species within the grassland include cat's-ear *Hypochaeris radicata*, selfheal *Prunella vulgaris*, yarrow *Achillea millefolium* and pignut *Conopodium majus*. There is a large mature black poplar along the brook's banks. There is a pond within the site, with common bird's-foot-trefoil *Lotus corniculatus* nearby.	283m north
Picton Green Lane LWS	0.92	An area of damp neutral unimproved grassland and adjacent green lane, with a gully leading to a spring and associated wet flush. Scattered trees present include crack *Salix fragilis* and goat willow *Salix caprea* , ash and crab apple *Malus sylvestris.* In the flush species include marsh marigold *Caltha palustris and* black knapweed *Centaurea nigra,* and in the grassland ragged-robin *Silene flos-cuculi*, glaucous sedge *Carex flacca* and meadowsweet *Filipendula ulmaria* are present.	300~~290~~m south east
Canal Wood LWS	3.6	The site lies several metres below the Shropshire Union Canal and comprises of woodland, wet grassland, swamp and drainage ditches. The canopy and shrub layer consist of common woodland species such as sycamore, oak, hawthorn and elder *Sambucus nigra*. Wood melick *Melica uniflora*, an Ancient Woodland indicator species in Cheshire, is present in the ground flora. The grassland is of varying quality and is more diverse to the south.	270m south
Station Road Railway Site LWS	0.5	An area of open mosaic habitat at a disused former railway site. Reptiles are present in the vicinity.	27~~9~~0m southeast
The Greenway Millenium Cycle Route LWS	11.4	A section of the Millenium Cycle Way between Blacon and Newton which was a former railway line. The site consists of a surfaced track/cycle route with amenity grassland and planted trees. Grassland flora of note include	350m south east

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
		tor-grass *Brachypodium pinnatum* and thrift *Armeria maritima*, which are locally rare and scarce species, respectively.	
Blacon Wood Escarpment LWS	11.19	An area of broadleaved woodland along the old sea cliffs of the Dee Estuary. The woodland canopy includes ash, sycamore and pedunculate oak, with understory of hawthorn and hazel.	520m south
Hoblane Ponds LWS	0.3	A series of small ponds north of Cottage Farm, west of Dunham on the Hill. Notable species within the ponds include water forget-me-not *Myosotis scorpioides*, tubular water dropwort *Oenanthe fistulosa L.*, greater spearwort *Ranunculus lingua*, yellow iris and marsh figwort *Scrophularia auriculata*.	670m east
Bridge Trafford North LWS	13.34	The site consists of planted woodland, ponds, grassland and tall ruderal vegetation, as well as scrub and a small area of swamp. The site is adjacent to the River Gowy. The woodland has abundant ash and field maple *Acer campestre*, with spindle *Euonymus europaeus* (a locally scarce species). Bulrush *Typha latifolia is* present in the wetland area, and the grassland supports flora such as ribwort plantain *Plantago lanceolata*, red clover *Trifolium pratense* and black medick *Medicago lupulina*. Bird species present include Bullfinch *Pyrrhula pyrrhula.*	750m east
Old River Dee Escarpment LWS	16.28	A mosaic of habitats including broadleaved semi-natural woodland, broadleaved plantation, scrub, semi-improved neutral grassland, running water and an area of marsh. A strip of woodland in the south-east contains some Ancient Woodland indicator species such as wood melick *Melica uniflora*, wood sedge *Carex sylvatica*, soft shield fern *Polystichum setiferum*, sanicle *Sanicula europaea*, bluebell, wood millet *Milium effusum* and common dog violet.	770m northwest

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Field North of Hadrian Drive LWS	4.2	A shallow valley with a stream, consisting of several fields, hedgerows and a pond. Grassland quality varies but the presence of thrift, a locally scarce species, is notable.	800m south
Knolls Bridge Field LWS	11.31	Site includes restorable grassland, fens, swamps, bogs and reedbeds, wildlife corridors and is accessible natural greenspace.	890m south

Table 5 – Non-Statutory Designated Sites within 1km of the DCO Proposed Development, in Wales

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Leadbrook Wood WS	35.1	Semi-natural broadleaved woodland occupying the dingles in which the Lead Brook and its tributaries flow. In several areas drainage is impeded. The woodland canopy is mainly dominated by ash and sycamore with some oak alder, beech, common lime *Tilia x europaea* and silver birch. The shrub layer has abundant holly, hazel and wych elm *Ulmus glabra*. Near Ty'n-y-coed there is semi-improved and species-rich marshy grassland, with oval sedge *Carex leporina*, ragged robin *Lychnis flos-cuculi*, and common spotted orchid *Dactylorhiza fuchsii.*	Shares a boundary with ~~Within~~ the Newbuild Infrastructure Boundary
Brook Park Farm Wood WS	6.7	Semi-natural broadleaved woodland and mixed broadleaved and coniferous plantation along a stream valley. The mixed woodland includes sycamore,	Within the Newbuild

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
		larch Larix decidua and Corsican pine Pinus nigra with a shrub layer of wych elm, elder, blackthorn and hazel. The herb layer has bluebell, wood avens, great wood-rush *Luzula sylvatica* and common centaury *Centaurium erythraea*. Ash and sycamore dominate the broadleaved canopy with some oak, holly and wild cherry.	Infrastructure Boundary
Coed y Cra WS	44.9	Large woodland along the Nant y Fflint and its tributaries, comprising semi-natural broadleaved woodland, mixed and conifer plantation. Part of the wood at the north-west end is wet and the canopy is dominated by ash and alder and some goat willow *Salix caprea*. Here the ground flora is rich with marsh marigold Caltha palustris, yellow flag, meadowsweet *Filipendula ulmaria* and horsetails. The majority of the wood is mixed woodland with conifers, sycamore, oak, silver birch, sweet chestnut *Castanea sativa*, wild cherry, hornbeam *Carpinus betulus*, beech and poplar. The understorey is generally sparse with hazel, holly, hawthorn and elder with patches of laurel *Laurus sp*. and rhododendron *Rhododendron ponticum*. In part of Coed y Felin there is an open wet grassland with common spotted orchid, meadowsweet, marsh valerian *Valeriana dioica,* bugle *Ajuga reptans* and horsetail.	Within the Newbuild Infrastructure Boundary
New Inn Brook Wood WS	4.8	Semi-natural broadleaved woodland in the steep side valley of the New Inn Brook. Parts of the woodland are wet. The woodland canopy is dominated by ash and sycamore with occasional poplar Populus sp. and alder. There	Shares a boundary with the Newbuild

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
		is a small patch of larch. The shrub layer has abundant hazel and elder with some hawthorn and holly. The rich herb layer has frequent male fern *Dryopteris filix-mas,* wood avens, yellow archangel *Lamium galeobdolon*, tufted hair-grass *Dechampsia cespitosa*, ramsons Allium ursinum, bryophytes and ivy *Hedera helix* with occasional hart''s-tongue fern *Asplenium scolopendruim*, dog''s mercury *Mercurialis perennis*, bluebell and wood anemone *Anemonoides nemorosa*.	Infrastructure Boundary
Aston Wetland WS	4.0	Level triangular site of willow *Salix* sp. scrub with marshy grassland mosaic with patches of tall herb fen and birch trees along the railway. The area of scattered grey willow *Salix cinerea* and downy birch *Betula pubescens* is species-rich with common spotted orchid, black knapweed, ragged-robin, greater bird''s-foot trefoil *Lotus penduculatus*, carnation sedge *Carex panicea*, fleabane *Pulicaria dysenterica* and marsh pennywort *Hydrocotyle vulgaris*. The patches of tall herb are dominated by great willow herb *Epilobium hirsutum*, giant horsetail *Equisetum telmateia* and hemp agrimony. Two sides of the site are bounded by a steep embankment with hawthorn, elder, nettle, bramble, rosebay willowherb *Chamerion angustifolium* and cleavers *Galium aparine.*	9m north
Warred Wood WS	14.2	The site comprises broadleaved semi-natural woodland, coniferous plantation and mixed plantation woodland.	41m south

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
Cobbler's and Stoneybeach Woods	12.5	An elongated narrow stand of semi-natural broadleaved woodland in the steep-sided valleys of Alltami Brook and two of its tributaries. Oak, ash and sycamore are the dominant canopy trees with some birch and willow. In the shrub layer there are dense patches of holly with elder, hazel, elm and sycamore saplings. Broad buckler fern *Dryopteris dilatata*, opposite-leaved golden saxifrage *Chrysosplenium oppositifolium*, bramble, yellow archangel, wood avens and bryophytes are abundant in the species-rich herb layer.	141 m south
Sea View Wetland WS	2.3	Wetland habitat with stands of common reed Phragmites australis and bare ground where floating sweet-grass *Glyceria fluitans* and toad rush *Juncus bufonius* have colonised. Marshy grassland habitat is present with frequent glaucous and hairy sedge *Carex hirta*, sweet vernal grass *Anthoxanthum odoratum* and common spotted orchid.	190m northwest
Llwyn-onn	1.0	A complex site consisting of woodland, neutral grassland, scrub and marsh on the slopes of a stream valley. The grassland is semi-improved and has abundant sweet vernal grass, crested dog''s-tail and red fescue. Herbs present include field wood-rush, bulbous buttercup and bird''s-foot trefoil. Dense scrub with some woodland plants borders the grassland. The marsh is situated at the bottom of the valley and is botanically very rich. Sweet-grass, fool''s water-cress, Yorkshire fog, marsh horsetail and meadowsweet are common here with common fleabane, bog stitchwort and water mint occurring. These marshy species continue into the wet woodland. This habitat is dominated by alder with some willow in the understorey. Other	460m west

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
		species found in the wet woodland include valerian and remote sedge. On the slopes the woodland is dry and bluebell, wood anemone, pignut and yellow archangel are found.	
Coed Ffrith	8.2	Elongated, semi-natural broadleaved woodland on the slopes of a stream valley. The woodland canopy is dominated by sycamore with some oak and ash occurring. Wych elm and holly are frequent in the shrub layer with hawthorn abundant in the areas influenced by grazing. The field layer has also been affected by grazing but still retains its diversity. Ramsons, bluebell and lesser celandine *Ficaria verna* are copious within this layer. Woodruff, moschatel *Adoxa moschatellina,* tufted hair-grass and *pignut Conopodium majus* can also be found on the site.	490~~535~~m north
Coed Cae-Crwn	18.0	Broadleaved woodland, conifer plantation and mixed plantation with a marshy grassland. Coed Cae-crwn has a canopy of mainly beech and sycamore with locally frequent sweet chestnut and an area of coniferous plantation. The shrub layer is sparse comprising mainly elder and the ground layer is dominated by bramble with frequent broad buckler fern, bracken, wood sorrel Oxalis acetosella, rosebay willowherb and raspberry *Rubus idaeus.* Coed Bryn-eithin is on a gentle north facing slope with some wet areas. This mixed woodland has a canopy of mainly larch, fir and sycamore with some ash, alder and oak. The shrub layer is elder with some holly. The herb layer comprises frequent bluebell, bracken, soft grass, bramble, wood sorrel and dog's mercury. Along the northern edge of Coed	360m east

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
		Bryn-eithin is a marshy grassland dominated by soft rush with marsh bedstraw, ragged robin, compact rush, greater bird's-foot trefoil and cuckooflower.	
Pentre Moch Pond	2.6	Small swamp and pond. The swamp is dominated by greater reedmace Typha latifolia and tufted sedge *Carex lenticularis*. The hedges around the swamp are formed by hawthorn, blackthorn, elder, willow and sessile oak. Nearby is a small pond surrounded by oak trees with a woodland flora.	645m north
Engineer Park	1.0	Part of old River Dee wildlife site. Semi-improved neutral grassland with scrub, with saltmarsh grading into intertidal mud.	855m west
Soughton Hall & Gorse Wood Ponds	72.9	Over mature lime, oak, sweet chestnut, ash, sycamore and horse chestnut, with occasional dead fallen and hollow trees. Includes two small ponds on the edge of woodland. The ponds are of importance to amphibians, especially great crested newts. The site includes a fringe of woodland and grassland habitat as foraging area.	680m west
Cornist Wood WS	4.1	Broadleaved and mixed woodland in a steep sided stream valley with a pond. The northern part of woodland is predominately beech with some oak and larch, whereas the southern part of the wood is dominated by sycamore with some ash. The shrub layer is mainly elder, holly and hazel with some field maple *Acer campestre* and wild cherry. The ground flora is	720m east

Site Name	Approximate Size (ha)	Reason for Designation	Distance from Newbuild Infrastructure Boundary
		predominantly ivy, bramble, dog's mercury, wood melick, nettle and ferns. The wood has been severed by a trackway.	

HABITATS

3.1.7. No areas of Ancient Woodland were recorded within 1km of the Newbuild Infrastructure Boundary in England. A total of 106 parcels of Ancient Woodland were recorded within 1km of the Newbuild Infrastructure Boundary in Wales. These woodlands comprised: 55 parcels of ancient semi-natural woodland, 6 parcels of plantation on Ancient Woodland site, 44 parcels of restored Ancient Woodland sites, and an Ancient Woodland site of unknown category. One of these areas was located within with the western section of the Newbuild Infrastructure Boundary: a 0.59ha parcel of Ancient Semi-natural woodland located at Northop Hall (SJ 26346 67704); further detail of the woodland composition is provided in **Section 3.2**.

3.1.8. No desk study records of ancient or veteran trees were returned from within the Newbuild Infrastructure Boundary, and no arboricultural features protected by Tree Protection Orders (TPO) were identified during the desk study.

3.1.9. Further consideration is given to trees and woodland, including a list of trees with veteran character and features, within the **Arboricultural Impact Assessment (Appendix 9.11, Volume III).**

3.1.10. Table 6~~Table 6~~ details HPI recorded within 1km of the Newbuild Infrastructure Boundary, in England.

Table 6 – Habitats of Principal Importance within 1km of the Newbuild Infrastructure Boundary, in England

Habitat	Total records	Closest record distance to Newbuild Infrastructure Boundary
Coastal and floodplain grazing marsh	241	Located within the Newbuild Infrastructure Boundary
Deciduous woodland	276	Located within the Newbuild Infrastructure Boundary
Good quality semi-improved grassland	1	Located within the Newbuild Infrastructure Boundary
Lowland meadows	7	0.1km north
Traditional orchards	13	Shares boundary with the Newbuild Infrastructure Boundary
Coastal saltmarsh	5	0.91km north

3.1.11. Table 7~~Table 7~~ details 'Priority Habitats – High Sensitivity', considered as HPIs, as listed in Section 7 of the Environment (Wales) Act **(Ref. 3)** within 1km of the Newbuild Infrastructure Boundary, in Wales.

Table 7 – Habitats of Principal Importance within 1km of the Newbuild Infrastructure Boundary, in Wales

Habitat	Total Records	Closest Record Distance to Newbuild Infrastructure Boundary
Lowland calcareous grassland	1346	0.34km north
Lowland dry acid grassland	32	0.82km north
Lowland fens and reedbeds	5	0.06km north
Lowland meadows	92	0.26km east
Lowland heathland	2	0.51km north
Open mosaic habitat on previously developed land	3	0.87km southwest
Parkland	1	0.25km west
Purple Moorgrass pasture	10	0.3km east
Traditional Orchard	531	Shares boundary with the Newbuild Infrastructure Boundary
Wood pasture	1	0.68km northeast

PROTECTED AND / OR NOTABLE PLANTS

3.1.12. Notable plant species recorded within 1km of the Newbuild Infrastructure Boundary are summarised in Table 8~~Table 8~~. Two notable plant species (charlock *Sinapsis arvensis* and bluebell *Hyacinthoides non*-scripta) were recorded within 100m of the Newbuild Infrastructure Boundary but none of the records occurred within any of the NVC Survey Areas. Bluebell is likely to be present throughout woodland and grassland within the Newbuild Infrastructure Boundary but although this species is listed on Schedule 8 of the Wildlife and Countryside Act, it does not receive full protection and is only protected against being sold.

Table 8 – Notable Plant Species Recorded within 1km of the Newbuild Infrastructure Boundary

Common Name	Scientific Name	Grid Reference	Designation	Distance to Newbuild Infrastructure Boundary
Charlock	*Sinapis arvensis*	SJ2866	RD1(Wales)VU	Located within the Newbuild Infrastructure Boundary
Charlock	*Sinapis arvensis*	SJ3267	RD1(Wales)VU	Located within the Newbuild Infrastructure Boundary
Charlock	*Sinapis arvensis*	SJ273672	RD1(Wales)VU	30m south
Bluebell	*Hyacinthoides non-scripta*	SJ2172	WCA8, LBAP[ANG, CON, FLI, SNP]	38m west
Charlock	*Sinapis arvensis*	SJ3568	RD1(Wales)VU	55m southeast
Charlock	*Sinapis arvensis*	SJ2568	RD1(Wales)VU	65m southwest
Charlock	*Sinapis arvensis*	SJ252712	RD1(Wales)VU	70m north
Welsh Poppy	*Meconopsis cambrica*	SJ2767	RD2(UK)S, LBAP[CON, DEN], LI[VC48, VC49]	130m north
Charlock	*Sinapis arvensis*	SJ30666652	RD1(Wales)VU	170m south
Bluebell	*Hyacinthoides non-scripta*	SJ257677	WCA8, LBAP[ANG, CON, FLI, SNP]	150m southwest
Bluebell	*Hyacinthoides non-scripta*	SJ255692	WCA8, LBAP[ANG, CON, FLI, SNP]	170m east
Bluebell	*Hyacinthoides non-scripta*	SJ256694	WCA8, LBAP[ANG, CON, FLI, SNP]	215m east
Bluebell	*Hyacinthoides non-scripta*	SJ256694	WCA8, LBAP[ANG, CON, FLI, SNP]	215m east

Common Name	Scientific Name	Grid Reference	Designation	Distance to Newbuild Infrastructure Boundary
Tubular Water-dropwort	*Oenanthe fistulosa*	SJ41767082	IUCN Vul, S41, UKBAP	220m south
Tubular Water-dropwort	*Oenanthe fistulosa*	SJ41767082	IUCN Vul, S41, UKBAP	220m south
Tubular Water-dropwort	*Oenanthe fistulosa*	SJ417708	IUCN Vul, S41, UKBAP	235m south
Bluebell	*Hyacinthoides non-scripta*	SJ298675	WCA8, LBAP[ANG, CON, FLI, SNP]	280m northeast
Welsh Groundsel	*Senecio cambrensis*	SJ29156647	RD1(UK)NT, RD1(Wales)CR, RD2(UK)R, LBAP[CON, FLI], LI[VC51]	285m east
Bluebell	*Hyacinthoides non-scripta*	SJ256700	WCA8, LBAP[ANG, CON, FLI, SNP]	315m east
Bluebell	*Hyacinthoides non-scripta*	SJ2571	WCA8, LBAP[ANG, CON, FLI, SNP]	390m north
Welsh Poppy	*Meconopsis cambrica*	SJ2571	RD2(UK)S, LBAP[CON, DEN], LI[VC48, VC49]	380m north
Stinking Chamomile	*Anthemis cotula*	SJ4069970776	IUCN Vul	405m south
Corn Marigold	*Glebionis segetum*	SJ4069970776	IUCN Vul	410m south
Corn Spurrey	*Spergula arvensis*	SJ4069970776	IUCN Vul	410m south
Corn Chamomile	*Anthemis arvensis*	SJ40827073	IUCN En	480m south

Common Name	Scientific Name	Grid Reference	Designation	Distance to Newbuild Infrastructure Boundary
Corn Marigold	*Glebionis segetum*	SJ40827073	IUCN Vul	475m south
Welsh Poppy	*Meconopsis cambrica*	SJ3166	RD2(UK)S, LBAP[CON, DEN], LI[VC48, VC49]	480m southeast
Bluebell	*Hyacinthoides non-scripta*	SJ2567	WCA8, LBAP[ANG, CON, FLI, SNP]	500m southwest
Charlock	*Sinapis arvensis*	SJ2966	RD1(Wales)VU	520m southwest
Bluebell	*Hyacinthoides non-scripta*	SJ416705	LBAP, WCA8, IUCN LC	535m south
Bluebell	*Hyacinthoides non-scripta*	SJ320667	WCA8, LBAP[ANG, CON, FLI, SNP]	540m southwest
Chamomile	*Chamaemelum nobile*	SJ412705	IUCN Vul, S41, UKBAP	550m south
Corn Chamomile	*Anthemis arvensis*	SJ41577046	IUCN En	580m south
Corn Marigold	*Glebionis segetum*	SJ41577046	IUCN Vul	585m south
Bluebell	*Hyacinthoides non-scripta*	SJ41597046	LBAP, WCA8, IUCN LC	580m south
Bluebell	*Hyacinthoides non-scripta*	SJ411705	LBAP, WCA8, IUCN LC	590m south
Bluebell	*Hyacinthoides non-scripta*	SJ292679	WCA8, LBAP[ANG, CON, FLI, SNP]	605m north
Tubular Water-dropwort	*Oenanthe fistulosa*	SJ45457368	IUCN Vul, S41, UKBAP	620m east

Common Name	Scientific Name	Grid Reference	Designation	Distance to Newbuild Infrastructure Boundary
Bluebell	*Hyacinthoides non-scripta*	SJ2668	WCA8, LBAP[ANG, CON, FLI, SNP]	635m north
Welsh Poppy	*Meconopsis cambrica*	SJ2668	RD2(UK)S, LBAP[CON, DEN], LI[VC48, VC49]	635m north
Bluebell	*Hyacinthoides non-scripta*	SJ293680	WCA8, LBAP[ANG, CON, FLI, SNP]	655m north
Bluebell	*Hyacinthoides non-scripta*	SJ2469	WCA8, LBAP[ANG, CON, FLI, SNP]	675m west
Bluebell	*Hyacinthoides non-scripta*	SJ285676	WCA8, LBAP[ANG, CON, FLI, SNP]	640m northwest
Bluebell	*Hyacinthoides non-scripta*	SJ285676	WCA8, LBAP[ANG, CON, FLI, SNP]	640m northwest
Charlock	*Sinapis arvensis*	SJ3367	RD1(Wales)VU	670m northeast
Bluebell	*Hyacinthoides non-scripta*	SJ314661	WCA8, LBAP[ANG, CON, FLI, SNP]	710m southeast
Welsh Poppy	*Meconopsis cambrica*	SJ246685	RD2(UK)S, LBAP[CON, DEN], LI[VC48, VC49]	760m west
Bluebell	*Hyacinthoides non-scripta*	SJ246684	WCA8, LBAP[ANG, CON, FLI, SNP]	820m west
Bluebell	*Hyacinthoides non-scripta*	SJ291681	WCA8, LBAP[ANG, CON, FLI, SNP]	820m north
Bluebell	*Hyacinthoides non-scripta*	SJ291681	WCA8, LBAP[ANG, CON, FLI, SNP]	820m north

Common Name	Scientific Name	Grid Reference	Designation	Distance to Newbuild Infrastructure Boundary
Bluebell	*Hyacinthoides non-scripta*	SJ288680	WCA8, LBAP[ANG, CON, FLI, SNP]	860m north
Bluebell	*Hyacinthoides non-scripta*	SJ28886808	WCA8, LBAP[ANG, CON, FLI, SNP]	880m north
Fringed Heartwort	*Ricciocarpos natans*	SJ2865	RD1(Wales)EN, LI[VC50]	895m south
Bluebell	*Hyacinthoides non-scripta*	SJ227719	WCA8, LBAP[ANG, CON, FLI, SNP]	900m southeast
Charlock	*Sinapis arvensis*	SJ320685	RD1(Wales)VU	915m north
Welsh Poppy	*Meconopsis cambrica*	SJ315659	RD2(UK)S, LBAP[CON, DEN], LI[VC48, VC49]	935m south
Water-soldier	*Stratiotes aloides*	SJ41387007	IUCN NT, NR	950m south

3.2. PHASE 1 SURVEY

HABITATS

3.2.1. HPI and those listed within any Biodiversity Action Plan (BAP) for relevant local authorities, were identified through desk studies. Field surveys have utilised JNCC Phase 1 habitat codes that do not necessarily align with HPI categories. Habitats encountered during the field survey were assessed as to whether they could be considered HPI in the absence of records indicating such.

3.2.2. Table 9~~Table 9~~ below lists the 35 habitats recorded (JNCC alpha numeric reference codes in parenthesis) within the Newbuild Infrastructure Boundary. Habitats have been listed in the order they appear in the JNCC guidance and do not represent importance.

Table 9 – JNCC Phase 1 Habitat Types Recorded within the Newbuild Infrastructure Boundary

Habitat Types	
Broadleaved semi-natural woodland (A1.1.1)	Hardstanding (HS)
Broadleaved plantation woodland (A1.1.2)	Arable cultivated/disturbed land (J1.1)
Mixed semi-natural woodland (A1.3.1)	Amenity grassland (J1.2)
Mixed plantation woodland (A1.3.2)	Ephemeral/short perennial (J1.3)
Dense scrub (A2.1)	Introduced shrub (J1.4)
Scattered scrub (A2.2)	Intact hedge species rich (J2.1.1)
Broadleaved parkland/scattered trees (A3.1)	Intact hedge species poor (J2.1.2)
Coniferous parkland/scattered trees (A3.2)	Defunct hedge species rich (J2.2.1)
Mixed parkland/scattered trees (A3.3)	Defunct hedge species poor (J2.2.2)
Unimproved neutral grassland (B2.1)	Hedgerow with trees species rich (J2.3.1)
Semi-improved neutral grassland (B2.2)	Hedgerow with trees species poor (J2.3.2)
Improved grassland (B4)	Fence (J2.4)
Marshy grassland (B5)	Dry ditch (J2.6)
Semi-improved grassland (species poor) (B6)	Earth bank (J2.8)
Continuous bracken (C1.1)	Buildings (J3.6)
Tall ruderal (C3.1)	Bare ground (J4)

Habitat Types	
Standing water (G1)	Other habitat (J5)
Running water (G2)	

3.2.3. The Block Valve Stations (BVS) locations were all similar in composition, consisting of recently grazed / mown improved grassland habitat, dominated by grazed perennial ryegrass. Two small areas of neutral improved grassland and neutral unimproved grassland were present along with a small stand of broadleaved semi-natural woodland at the Cornist Lane BVS location, and the Nant Y Fflint watercourse was present to the west of the Newbuild Infrastructure Boundary.

Broadleaved semi-natural woodland (A1.1.1)

3.2.4. Areas of broadleaved semi-natural woodland were common across the Newbuild Infrastructure Boundary. The dominant canopy species present included sycamore *Acer pseudoplatanus*, pedunculate oak *Quercus robur*, ash *Fraxinus excelsior*, alder *Alnus glutinosa*, common beech *Fagus sylvatica*, willow sp. *Salix sp.* and silver birch *Betula pendula*. Common scrub layer species included elder *Sambucus nigra,* hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, rose species *Rosa* sp. and bramble *Rubus fruticosus agg.*

3.2.5. Ground flora across woodlands was diverse and included ivy *Hedera helix*, common nettle *Urtica diocia*, dock species *Rumex sp.*, herb Robert *Geranium robertianum*, creeping buttercup *Ranunculus repens*, cleavers *Galium aparine*, lesser celandine *Ficaria verna*, pignut *Conopodium majus*, wood avens *Geum urbanum*, dog's mercury *Mercurialis perennis*, common bluebell *Hyacinthoides non-scripta*, and red campion *Silene diocia*.

3.2.6. Less common tree species recorded across woodland parcels included hazel *Corylus avellana*, lime sp. *Tilia sp.*, English elm *Ulmus procera,* aspen *Poplus tremula*, horse chestnut *Aesculus hippocastanum* and sweet chestnut tree *Castanea sativa.*

3.2.7. As described in **Paragraph 3.1.7**, an area of ancient semi-natural woodland was located within the Newbuild Infrastructure Boundary, spanning the entire width. The woodland was dominated by sessile oak *Quercus petraea* with sycamore, silver birch, ash and hazel, whilst holly, blackthorn and hawthorn were present in the understory. The ground flora comprised bramble with honeysuckle *Lonicera periclymenum*, lords and ladies *Arum maculatum*, germander speedwell *Veronica chamaedrys*, wild carrot *Daucus carota*, common nettle, violet species *Viola sp.*, common bluebell and ground ivy *Glechoma hederacea*. The area was fenced from agricultural and grazing disturbance at the margins and featured open glades with fallen deadwood, however there was no evidence of recent management.

Broadleaved plantation woodland (A1.1.2)

3.2.8. Several parcels of broadleaved plantation woodland were present within the Newbuild Infrastructure Boundary, all of different age ranges. Three young, newly planted plantations containing pedunculate oak, ash and willow were present within the Newbuild Infrastructure Boundary. All other plantations recorded were well established and comprised of a variety of canopy species, including rowan *Sorbus acuparia*, ash, plum *Prunus domestica*, willow, hazel, alder and wild cherry *Prunus avium*.

3.2.9. One of the largest of these parcels was recorded adjacent to the M56 motorway within the Gowy Meadows and Ditches LWS. Species present included hybrid black poplar *Populus x canadensis*, ash, pedunculate oak, Norway maple *Acer platanoides*, Italian alder *Alnus cordata*, grey alder *Alnus incana* and red oak *Quercus rubra*.

Mixed semi-natural woodland (A1.3.1)

3.2.10. One area of mixed semi-natural woodland was present within the Newbuild Infrastructure Boundary. Dominant canopy species within this woodland included pedunculate oak, silver birch and Scott's pine *Pinus sylvestris*.

3.2.11. Brook Park Farm Wood, a Wildlife Site, is an area of semi-natural mixed woodland which was recorded spanning the whole width of the Newbuild Infrastructure Boundary. This section of woodland is being considered as Annex 1 and Ancient Woodland, due to the connectivity to an area of Ancient Woodland 200m northwest of the Newbuild Infrastructure Boundary. Species present within this woodland included dominant pedunculate oak, with silver birch and Scot's pine. Predominant understory species comprised hawthorn, holly and bramble, with ground flora including, cow parsley, lords and ladies, lesser celandine and wood fern.

Mixed plantation woodland (A1.3.2)

3.2.12. Two small parcels of mixed plantation woodland were present across the Newbuild Infrastructure Boundary in arable fields closely adjacent to the River Dee. The species present included ash, beech, Scott's pine, European larch *Larix decidua* and hawthorn.

Dense scrub (A2.1)

3.2.13. Dense scrub habitat was abundant throughout the Newbuild Infrastructure Boundary, commonly associated with ponds. Broadly, dominant species present included hawthorn, blackthorn and bramble.

3.2.14. Common species present associated with dense scrub included common nettle, willow sp., creeping thistle *Cirsium arvense*, hedge bindweed *Calystegia sepium*, rosebay willowherb *Chamerion angustifolium*, dock sp. and common hogweed *Heracleum sphondylium*.

Scattered scrub (A2.2)

3.2.15. Scattered scrub was recorded at various locations across the Newbuild Infrastructure Boundary. Species primarily noted were hawthorn, elder, bramble, rose sp., willow sp., blackthorn and common nettle.

Broadleaved scattered trees (A3.1), Coniferous scattered trees (A3.2) and Mixed scattered trees (A3.3)

3.2.16. Scattered mature and semi-mature, broadleaved and coniferous trees were present throughout the Newbuild Infrastructure Boundary. Species recorded included conifer sp. *Cupressus* sp., Leyland cypress *Cupressus x leylandii,* sycamore, ash, lime sp., horse chestnut, willow sp., pedunculate oak, aspen and alder.

3.2.17. Scattered trees were ubiquitous along boundaries of residential properties, railway corridors and throughout amenity grassland areas.

Unimproved neutral grassland (B2.1)

3.2.18. Unimproved neutral grassland habitat was rare across the Newbuild Infrastructure Boundary, only occurring in two locations. Species present within the stands included perennial ryegrass *Lolium perenne*, cocks foot *Dactylis glomerata*, false oat grass *Arrhenatherum elatius*, cow parsley *Anthriscus sylvestris*, broadleaved dock *Rumex obtusifolius*, hedge mustard *Sisymbrium officinale*, scented mayweed *Matricaria recutita*, sowthistle *Sonchus* sp., lesser burdock *Arctium minus*, field speedwell *Veronica chamaedrys*, montbretia *Crocosmia aurea x pottsii*, clover sp. *Trifolium* sp., meadow foxtail *Alopecurus pratensis*, field pansy *Viola arvensis*, redshank *Persicaria maculosa*, red clover *Trifolium pratense*, and hemp nettle *Galeopsis tetrahit*.

Semi-improved neutral grassland (B2.2)

3.2.19. Semi-improved neutral grassland habitat was one of the dominant habitats recorded throughout the Newbuild Infrastructure Boundary. The management levels of parcels were different throughout the Newbuild Infrastructure Boundary ranging from unmown and tussocky, to grazed pastures and mown roadside verges.

3.2.20. Species present throughout these habitats included cock's-foot, perennial ryegrass, creeping buttercup, meadow foxtail, crested dog's-tail *Cynosurus cristatus*, ribwort plantain *Plantago lanceolata*, Yorkshire fog *Holcus lanatus*, meadow buttercup *Ranunculus acris*, dandelion *Taraxacum officinale agg.*, dock species and yarrow *Achillea millefolium*.

Improved grassland (B4)

3.2.21. Improved grassland habitat was the dominant habitat recorded across the Newbuild Infrastructure Boundary comprising grazing pasture invariably associated with a short, grazed sward (5cm and below). Species present within improved grasslands was largely homogenous being dominated by perennial ryegrass, Yorkshire fog, white clover *Trifolium repens*, meadow and creeping buttercup, but also including species such as creeping thistle, common nettle and.

Marshy grassland (B5)

3.2.22. Marshy grassland habitat was limited across Newbuild Infrastructure Boundary, only located within one location, the Gowy Meadows LWS. Species recorded included wavy hair grass *Deschampsia flexuosa*, Yorkshire fog, false oat grass, soft rush *Juncus effusus*, compact rush *Juncus conglomeratus*, cuckoo flower *Cardamine pratensis*, meadowsweet *Filipendula ulmaria*, common bent *Agrostis capillaris*, perennial ryegrass and reed canary grass *Phalaris arundinacea*.

Species poor semi-improved grassland (B6)

3.2.23. Species poor semi-improved grassland was abundant across the Newbuild Infrastructure Boundary. Species composition across poor semi-improved grassland areas were largely homogenous and included Yorkshire fog, cock's-foot, perennial ryegrass, meadow buttercup, white clover, ribwort plantain, dock species, creeping buttercup and common ragwort *Senecio jacobaea*. The majority of the areas of semi-improved grassland showed signs of management, with short sward heights indictive of recent mowing or grazing by livestock.

Continuous bracken (C1.1)

3.2.24. Continuous or dense bracken *Pteridium aquilinum* was rare within the Newbuild Infrastructure Boundary, only occurring within two locations, along hedgerows and field boundaries within arable fields.

Tall ruderal (C3.1)

3.2.25. Stands of tall ruderal vegetation were common across the Newbuild Infrastructure Boundary, particularly adjacent to field margins and wet ditches. Species present included common nettle, creeping thistle, black knapweed *Centaurea nigra*, great willowherb *Epilobium hirsutum*, rosebay willowherb, cow parsley.

Standing water (G1)

3.2.26. Standing water habitat was abundant throughout the Newbuild Infrastructure Boundary, in the form of ponds and wet ditches.

3.2.27. The majority of ditches showed no signs of recent management, and vegetation had not been cleared out at time of survey, however, communications with some landowners confirmed the management of ditch systems boundary fields (i.e., dredging and clearance).

3.2.28. Ponds were commonly recorded within arable and improved grassland habitats. A total of 42 ponds have been recorded within the Newbuild Infrastructure Boundary. Macrophytes present across standing water habitats included duckweed *Lemna sp.*, brooklime *Veronica beccabunga*, fool's watercress *Helosciadium nodiflorum*, water mint *Mentha aquatica* and floating sweetgrass *Glyceria fluitans*. Standing open water and ponds are listed as UK BAP Priority Habitats.

Running water (G2)

3.2.29. Running water was a commonly recorded habitat across the Newbuild Infrastructure Boundary, varying significantly in size and scale ranging from Main Rivers to Ordinary Watercourses. Bankside habitats present along watercourses included scattered scrub, reed canary grass, scattered trees, tall ruderal vegetation and hedgerows.

3.2.30. The River Dee, River Gowy and Shropshire Union canal were all recorded within the Newbuild Infrastructure Boundary, along with several brooks (including but not limited to Cryer's Lane Brook, Hapsford Brook, Gale Brook and Thornton Brook) are present across the Newbuild Infrastructure Boundary. Rivers are listed as a UK BAP Priority Habitat.

3.2.31. The River Dee is spanned by the DCO Proposed Development, and is designated as a SAC and SSSI, and is hydrologically linked to the Dee Estuary which itself is designated as a SAC, SPA, Ramsar.

Arable (J1.1)

3.2.32. Arable cropland was the second most abundant habitat across the Newbuild Infrastructure Boundary. Crops within fields predominantly comprised cereals, particularly wheat, maize and barley. Other crop in the form of potatoes and cabbages were rare within the Newbuild Infrastructure Boundary. Field margins, where present, were usually of limited botanical value, comprising a strip of improved grassland or tall ruderal vegetation.

Amenity grassland (J1.2)

3.2.33. Amenity grassland was present at various locations within the Newbuild Infrastructure Boundary, predominantly associated with roadside verges, residential gardens, playing fields and a driving range. The majority of this habitat type showed signs of management and were invariably of a short sward, with little botanical variety, comprising dominant perennial ryegrass with dandelion and white clover present occasionally.

Ephemeral/short perennial (J1.3)

3.2.34. Ephemeral/short perennial was rare within the Newbuild Infrastructure Boundary. Only occurring in two locations, one was associated with railway ballast, the other was formerly a gravel driveway, now compacted and predominantly vegetated.

Introduced shrub (J1.4)

3.2.35. Sections of introduced shrub were present within the Newbuild Infrastructure Boundary, predominantly as ornamental plantings within the boundaries of residential properties and gardens and included *Cotoneaster sp*. and laurel *Prunus* sp. Introduced shrub was predominantly confined to urban and suburban areas of the Newbuild Infrastructure Boundary.

Hedgerows:

3.2.36. Table 10~~Table 10~~ below shows approximate lengths and JNCC types of hedgerows recorded within the Newbuild Infrastructure Boundary.

Table 10 – Hedgerows Recorded Within the Newbuild Infrastructure Boundary

JNCC Code	Length (km)
Intact hedge species rich (J2.1.1)	3.3968
Intact hedge species poor (J2.1.2)	16.557.30
Defunct hedge species rich (J2.2.1)	0.514
Defunct hedge species poor (J2.2.2)	4.457
Hedgerow with trees species rich (J2.3.1)	3.03
Hedgerow with trees species poor (J2.3.2)	7.4057

3.2.37. A large number of hedgerows, approximately 354430[5], were recorded within the Newbuild Infrastructure Boundary. Hedgerows present differed in levels of management, ranging from recent or historical management with evidence of topping and facing, to unmanaged and untrimmed resulting in bushy/leggy and overgrown hedgerows.

[5] Number correct at time of writing.

3.2.38. Hedgerows delineated the majority of farmland fields but were also recorded within improved grasslands, and alongside roadsides and ditches within the Newbuild Infrastructure Boundary. Hedgerows of all six Phase 1 categories were recorded across the Newbuild Infrastructure boundary. Defunct hedgerows were less common, comprising a variety gappy hedgerows of varying age and structure invariably with limited species diversity.

3.2.39. Hedgerows with trees were common across the Newbuild Infrastructure Boundary, with sporadic mature trees located within a number of hedgerows across the landscape. Where trees were absent from hedgerow sections within the Newbuild Infrastructure Boundary, any presence of trees within a hedgerow along its length were noted and taken into consideration of the hedgerow categorisation. Mature trees within hedgerows primary comprised ash, sycamore, with oak the most commonly occurring tree within hedgerows.

3.2.40. Hawthorn was the dominant hedge species recorded across all hedgerow types with other species including blackthorn, willow sp., bramble, holly, elder, alder, ash, rose sp. and hazel. Hedgerow understories were predominantly of limited botanical diversity with the majority comprising common grasses (including false oat grass, cock's-foot and perennial ryegrass) common nettle, creeping thistle, garlic mustard *Alliaria petiolate*, cleavers and common hogweed, indicative of improved soils associated within farming practices.

3.2.41. The HPI definition of a hedgerow is any boundary line of trees or shrubs over 20m and less than 5m wide and where any gaps between trees or shrub species are less than 20m wide. Taking this into account, the majority of hedgerows across the Newbuild Infrastructure Boundary conform to the HPI hedgerows habitat.

3.2.42. In England and Wales, the Wildlife and Landscape Criteria in the Hedgerow Regulations 1997 are intended to protect 'Important' countryside hedgerows from destruction or damage. Hedgerows are assessed against a number of criteria in relation to their archaeology, history, and wildlife and landscape value, from which it is determined whether a hedgerow is Important as defined by the Hedgerow Regulations. Information regarding the potential for 'important hedgerows' under the cultural heritage criteria is discussed within **Chapter 8: Cultural Heritage** of the **ES (Volume II)**

Fence (J2.4)

3.2.43. Fences, typically post and wire, were a ubiquitous feature across the Newbuild Infrastructure Boundary present within virtually all improved grassland and arable fields. Typically, these fences were associated with hedgerows and ditches.

Dry Ditch (J2.6)

3.2.44. Dry ditches were a common habitat across the Newbuild Infrastructure Boundary, mostly associated with hedgerow boundaries within arable and improved grassland habitats. The majority of dry ditches encountered were heavily vegetated with such species as willowherbs, common nettle, and grass species including reed canary grass, perennial ryegrass and common bent.

Earth Bank (J2.8)

3.2.45. One, artificially created earth bank was located within the Newbuild Infrastructure Boundary. Seemingly constructed using spoil from an artificially created pond.

Buildings (J3.6)

3.2.46. Buildings present across the Newbuild Infrastructure Boundary were predominantly associated with agriculture, including barns, cattle sheds, and stables. Residential, commercial and industrial buildings were rare within the Newbuild Infrastructure Boundary. The Stanlow Refinery was present to the northwest of the Newbuild Infrastructure Boundary and was made up of multiple industrial buildings.

Bare ground (J4)

3.2.47. Areas of bare ground were present across the Newbuild Infrastructure Boundary, primarily associated with access tracks into arable and improved grassland fields. Occasional ephemeral vegetation, such as butterfly bush *Buddleja davidii* and common ragwort were recorded.

Other habitat (J5) and hard standing

3.2.48. Hard standing was abundant throughout the Newbuild Infrastructure Boundary, associated with roads and highways. Other habitats included gravel/stone roads, railway ballast and railway tracks. These habitats were invariably devoid of vegetation aside from short ephemeral sporadic growth.

INVASIVE SPECIES

3.2.49. Invasive plant species as listed on Schedule 9 of the WCA 1981 (as amended) were recorded within the Newbuild Infrastructure Boundary as Target Notes. A full list of all Target Notes can be found in **Annex B**, and these are represented on **Figure 9.1.3** (**Annex A**). The desk study returned 98 records of 27 individual invasive plant species. The closest record pertained to giant hogweed *Heracleum mantegazzianum* and was located within the Newbuild Infrastructure Boundary.

3.2.50. Invasive species recorded during field surveys are detailed within **Table 11** and included giant hogweed, Himalayan balsam, Japanese knotweed *Reynoutria japonica,* rhododendron *Rhodoendron ponticum* and variegated yellow archangel *Lamiastrum galeobdolon subsp. Argentatum.*

Table 11 – Invasive Non-Native Species Recorded Within the Newbuild Infrastructure Boundary

Species	Location
Himalayan balsam	TN4, located near SJ 4400 7300
Himalayan balsam	TN5, located near SJ 4400 7300
Japanese knotweed	TN10, located near SJ 3522 6764
Japanese knotweed	TN11, located near SJ 3522 6764
Japanese knotweed	TN12, located near SJ 3522 6764
Japanese knotweed	TN13, located near SJ 3522 6764
Japanese knotweed	TN15, located near SJ 3522 6764
Rhododendron sp.	TN96, located near SJ 3164 6727
Giant hogweed	TN130, located near SJ 3792 6971
Giant hogweed	TN131, located near SJ 3792 6971
Giant hogweed	TN132, located near SJ 3792 6971
Variegated yellow archangel	TN159, located near SJ 3797 6967
Japanese knotweed	TN160, located near SJ 37397 69500
Japanese knotweed	TN161, located near SJ 37397 69500
Japanese knotweed	TN162, located near SJ 37397 69500
Variegated yellow archangel	TN163, located near SJ 28592 66446

3.3. NVC SURVEY

3.3.1. The results of the NVC surveys are summarised below, with NVC Survey Areas shown on **Figure 9.1.4 (**Annex A~~Annex A~~**)**.

3.3.2. The summary descriptions given below include each natural or semi-natural habitat within the NVC Survey Areas. An NVC classification is given for each homogeneous stand within the NVC Survey Areas and an assessment of the potential presence of GWDTE is made.

3.3.3. The distribution of these habitats is shown in **Figure 9.1.4 (**Annex A~~Annex A~~**)**, with representative overview photographs provided below. Species lists, floristic tables and quadrat photographs are provided in Annex ~~Annex~~ **C**.

FLINT AGI

Summary Description of NVC Area	The NVC Survey Area consisted of a small stand of woodland along Little Leadbrook, with an area of Ancient Woodland (Flint AGI Ancient Woodland) immediately to the south. Although not within the Ancient Woodland boundary, the surveyed area can be considered to be part of the same woodland as it is directly connected. Little Leadbrook ran along the western edge of the woodland and was heavily shaded by the tree canopy. The most frequent species along the banks of the watercourse included great horsetail *Equisetum telmateia,* common nettle *Urtica dioica*, hemlock water-dropwort *Oenanthe crocata,* cleavers *Galium aparine* and ramsons *Allium ursinum.* The southern section of the NVC Survey Area consisted of a single line of large mature trees including ash *Fraxinus excelsior* and pedunculate oak *Quercus robur*. To the east of the tree line was a narrow strip of grassland, dominated by perennial rye-grass *Lolium perenne*, with a damp, marsh horsetail *Equisetum palustre* dominated hollow further to the east.
NVC Classification	The canopy of the main section of woodland was dominated by alder *Alnus glutinosa,* with an understorey comprising mostly hawthorn *Crataegus monogyna* and grey willow *Salix cinerea.* Quadrat sampling was not undertaken within this narrow stand of woodland as the woodland was heavily disturbed, with tracks of bare ground and littering, including bottles, plastic bags and a sleeping bag. The ground flora mostly consisted of grasses which presumably dominated due to the relatively open nature of the tree canopy, with sunlight also penetrating from both sides of the narrow woodland. A species list was compiled for the ground flora and is shown in Annex ~~Annex~~ **C**, Table 13~~Table 13~~. The non-grass species present included some species more typical of woodland including ramsons, remote sedge *Carex remota,* enchanter's-nightshade *Circaea lutetiana*, dog's-mercury *Mercurialis perennis* and wood speedwell *Veronica montana.* Common nettle was also frequent throughout the woodland. This, along with a dominant alder canopy and grey willow/hawthorn understorey gives the woodland a close affinity to W6 *Alnus glutinosus-Urtica dioica* woodland, although it was a lot drier than would be typical for W6 woodland. It was noted that the ground along the eastern edge of the woodland sloped steeply down towards Little Leadbrook along the western edge, thereby draining water from the woodland.
GWDTE	Although W6 woodland is included with Annex 1 of the UK TAG guidance, it is classed as having low groundwater dependency in England/Wales. The woodland present in the NVC Survey Area was also highly disturbed and was considerably drier than would be typical for W6 woodland. Therefore, it is not considered that GWDTE is present at this location.
Photographs	
Alder-dominated canopy with grassy ground layer, showing steep slope towards Little Leadbrook	

Little Leadbrook along western edge of woodland	
Single line of mature trees at the southern end of the woodland	

Damp hollow to south-east of surveyed woodland, with dominant marsh horsetail	

A494/EWLOE

Summary Description of NVC Area	The woodland at the NVC Survey Area was located immediately north of the A494 near Ewloe. The canopy was dense at the eastern end of the woodland but became more gappy at the western end, eventually giving way to open grassland and scattered scrub. The grassland is sometimes grazed by horses and horses are also able to access the adjoining woodland. NVC quadrats were sampled within the main woodland and within the open grassland to the west. Results of the quadrats are shown in Annex ~~Annex C~~.
NVC Classification	The grassland towards the west of the NVC Survey Area contained frequent common bent *Agrostis capillaris*, perennial rye-grass, crested dog's-tail *Cynosurus cristatus* and Yorkshire-fog *Holcus lanatus.* Prominent forbs included common knapweed *Centaurea nigra*, common ragwort *Jacobaea vulgaris*, red bartsia *Odonites vernus*, selfheal *Prunella vulgaris*, ribwort plantain *Plantago lanceolata*, white clover *Trifolium repens*, creeping cinquefoil *Potentilla reptans* and creeping buttercup *Ranunculus repens*. MATCH analysis gave the highest similarity co-efficient (53.2%) with MG6a *Lolium perenne-Cynosurus cristatus* grassland-typical sub-community. This community does seem to be a good description for the type of grassland at the NVC Survey Area which is the main permanent pasture type on neutral soils in lowland Britain. The eastern edge of the woodland forms the western boundary of a garden and contained a high proportion of non-native tree and shrub species including *Cupressus* x *leylandii* and spotted laurel *Aucuba japonica*. Quadrat sampling was only undertaken in the woodland to the west of the NVC Survey Area. The canopy of this woodland was dominated by sycamore *Acer pseudoplatanus,* with an understorey dominated by hawthorn. The ground layer mostly comprised common nettle and was generally species-poor. This dominance of common nettle probably accounts for MATCH analysis giving the closest community match (36.1%) to W6 *Alnus glutinosus-Urtica dioica* woodland. This is clearly not a good match as alder was not present within the woodland. The high nettle coverage may be as a result of nutrient enrichment from horse droppings. Due to the modified ground flora and the dominance of sycamore within the canopy, there does not appear to be any suitable NVC community description for this vegetation. Therefore, it will remain unclassified.
GWDTE	None present.
Photographs	
Woodland within the NVC Survey Area	

Common nettle-dominated ground flora within the NVC Survey Area woodland	

SAUGHALL BANK LWS

Summary Description of NVC Area	The majority of land within the NVC Survey Area comprised arable land and associated hedgerows and was therefore not included within the NVC survey. Land within Saughall Bank LWS consisted of a wet ditch with a strip of neutral grassland along its northern bank and a narrow stand of dense scrub to the north of the grassland. The wet ditch was steep sided and fenced on both sides with barbed wire. Meadowsweet *Filipendula ulmaria* was frequent along the banks with lesser amounts of broad-leaved dock *Rumex obtusifolius*, lesser celandine *Ficaria verna*, cow parsley *Anthriscus sylvestris*, cleavers and great willowherb *Epilobium hirsutum*. Emergent vegetation consisted of small patches of bulrush *Typha latifolia* growing within the channel. The dense scrub to the north of the grassland was dominated by hawthorn, with occasional blackthorn *Prunus spinosa* and elder *Sambucus nigra*, with a very dense layer of bramble *Rubus fruticosus* agg. below. Due to the density of the scrub, it was not possible to enter this stand. Instead, it was assessed from the northern and southern edges. The narrow strip of tussocky grassland was sampled using three quadrats, with the floristic table and photographs of the quadrats shown in Annex ~~Annex C~~.
NVC Classification	The wet ditch was not assigned an NVC classification as the emergent vegetation within the channel was very sparse and poorly developed at the time of the survey. The scrub was determined as W21 *Crataegus monogyna-Hedera helix* scrub. The grassland to the south of the scrub showed a good fit with the MG1b *Arrhenatherum elatius* grassland-*Urtica dioica* sub-community (50.6% in MATCH). This sub-community is characterised by the constant presence of common nettle, large umbellifers (hogweed *Heracleum sphondyllium* and cow parsley) and cleavers.
GWDTE	None present.
Photographs	
Wet ditch	

MG1b grassland with W21scrub to the north	

WOOD WEST OF CRABWELL MANOR LWS

Summary Description of NVC Area	The NVC Survey Area consisted of large fields of short, species-poor grassland, with a narrow strip of woodland running NW to SE along the western edge. The woodland is designated as Wood West of Crabwell Manor LWS. The large fields within both land parcels were dominated by soft brome *Bromus hordeaceus,* accompanied by perennial rye-grass and meadow foxtail *Alopecurus pratensis,* with very few forbs, the most frequent within both fields being dandelion *Taraxacum officinale* agg. Both fields were sampled using three quadrats, with the floristic tables and photographs of the quadrats shown in Annex ~~Annex C~~. The woodland comprising Wood West of Crabwell Manor LWS was not subject to quadrat sampling due to being very narrow, and difficult to access at the north-western end, with a variable ground-flora throughout. A species list with DAFOR scores was compiled for the woodland canopy/understorey and ground flora and is shown in Annex ~~Annex C~~. Some patches were dominated by common nettle and cleavers, but other areas exhibited a more characteristic woodland flora including species such as wood anemone *Anemone nemorosa*, lord's-and-ladies *Arum maculatum*, hart's-tongue *Asplenium scolopendrium,* false-brome *Brachypodium sylvaticum,* remote sedge, enchanter's nightshade, pignut *Conopodium majus*, lesser celandine, wood avens *Geum urbanum*, dog's mercury, wood sorrell *Oxalis acetosella*, wood dock *Rumex sanguineus* and common dog-violet *Viola riviniana.* The Wildlife and Countryside Act Schedule 9 species giant hogweed *Heracleum mantegazzianum* was present along much of the stream (Finchett's Gutter Trib) running through the woodland, whilst variegated yellow-archangel *Lamiastrum galeobdolon* ssp. *argenteum* was locally abundant at the south-eastern end of the woodland. Spanish bluebell *Hyacinthoides hispanica* was also present in small amounts. The canopy was dominated by sycamore, with hazel *Corylus avellana* and hawthorn being the most frequent understorey species. Stands of very large, mature hazel at the southern end of the wood were also recorded.
NVC Classification	Both grassland fields were determined as being closely related to MG7d *Lolium perenne -Alopecurus pratensis* grassland but differed in the dominance of soft brome, which is normally only present at very low coverage and frequency in MG7. This species can, however, come to dominate where there are bare soil patches between the perennial rye-grass and the seed bank already contains frequent seeds of the annual species soft brome. The woodland canopy was dominated by sycamore which is not a characteristic species of any NVC woodland communities but can occur at high coverage within a wide range of NVC types. The understorey and ground flora, however, seemed to have a close affinity to W8 *Fraxinus excelsior-Acer campestre -Mercurialis perennis* woodland, the type of ash woodland which is typical of lowland south and central Britain. Although ash was rare in the canopy it was frequent as seedings on the woodland floor, showing that it does have the potential to spread within the canopy, given the right conditions and management.
GWDTE	None present.
Photographs	
Grassland within NVC Survey Area	

Grassland within NVC Survey Area	
Woodland LWS with ground flora dominated by common nettle and cleavers	

Woodland LWS with ground flora including wood anemone and lesser celandine	
Large hazels at south of woodland	

LAND ADJACENT TO THE SHROPSHIRE UNION CANAL LWS

Summary Description of NVC Area	The NVC Survey Area consisted of three fields adjacent to the eastern bank of the Shropshire Union Canal, with this section being designated as the Shropshire Union Canal (Main Line) LWS. The three fields consisted of similar grassland habitats with the most frequent grasses being creeping bent *Agrostis stolonifera*, perennial rye-grass, meadow foxtail, Yorkshire-fog and red fescue *Festuca rubra,* with occasional tufted hair-grass *Deschampsia cespitosa.* Tussocks of tall fescue *Schedonorus arundinaceus* were also present but restricted to the most northerly field. Forbs were scarce throughout but included meadow buttercup *Ranunculus acris*, creeping buttercup, cuckooflower *Cardamine pratensis*, common sorrell *Rumex acetosa* and dandelion. The fields were surrounded by lines of mature trees along the eastern and northern boundaries, with dense scrub encroachment along the southern section of the western boundary, dominated by sections of blackthorn *Prunus spinosa* and bramble.
NVC Classification	MATCH analysis gave similar results for the three fields with MG7b showing the greatest similarity with the northern and southern grasslands, whilst for the central grassland MG7b had the second highest similarity co-efficient to MG10a *Holcus lanatus-Juncus effusus* rush-pasture. This is not a good fit for the central grassland as Yorkshire-fog was absent and soft rush *Juncus effusus* was scarce in this area, whereas they are normally constant within MG10. Overall the most suitable community for the grassland as a whole is MG7d *Lolium perenne-Alopecurus pratensis* grassland, with both species prominent across the three fields. The scrub along the western boundary closely matches W24 *Rubus fruticosus-Holcus lanatus* underscrub where bramble is dominant, with the blackthorn dominated areas being closest to W22 *Prunus spinosa-Rubus fruticosus* scrub.
GWDTE	None present.
Photographs	
Northern grassland	

Central grassland	
Southern grassland	

Scrub along western boundary of NVC Survey Area	

GRASSLAND TO THE WEST OF RIVER GOWY (GOWY MEADOWS AND DITCHES LWS)

Summary Description of NVC Area	The NVC Survey Area consisted of grassland to the west of the River Gowy, with three ditches running across the northern section of the land parcel. Although it is not located within the NVC Survey Area, the River Gowy is located adjacent and is therefore briefly described in this section. The large expanse of grassland to the west of the river was cattle-grazed at the time of the survey. It was therefore very short in places with patches of poached ground. The sward was dominated by creeping bent, with frequent marsh foxtail *Alopecurus geniculatus,* with forbs restricted to creeping buttercup, broad-leaved dock and common nettle. Along the eastern edge of the NVC Survey Area the ground was mounded along the line of the river. The grass on the mound was generally longer than the flat areas and contained frequent false oat-grass *Arrhenatherum elatius*, common nettle and cock's-foot*,* similar to the mound following the eastern edge of the river. Thornton Ditch 1 was mostly dry during the survey but was dominated by floating sweet-grass *Glyceria fluitans* and soft rush, with three small hawthorns growing in the ditch. Thornton Ditch 2 contained water at the time of the survey with floating sweet-grass, soft rush and some reed sweet-grass *Glyceria maxima* at the eastern end. This ditch also contained several grey willows *Salix cinerea* growing within the water-filled channel at the eastern end. Between Thornton Ditch 1 and Thornton Ditch 2 there was an un-named ditch which was mostly dry at the time of the survey and contained floating sweet-grass, with abundant tufted hair-grass *Deschampsia cespitosa.* The River Gowy at this point was approximately 5-7m wide with submerged macrophtyes including yellow water-lily *Nuphar lutea* and unbranched bur-reed *Sparganium emersum.* A small amount of emergent branched bur-reed *Sparganium erectum* was present within the channel, whilst reed canary-grass *Phalaris arundinacea* was dominant on the banks at the edge of the river. Further away from the river, on higher ground, the grassland was dominated by false oat-grass and common nettle.
NVC Classification	The flat grassland which comprised most of the NVC Survey Area gave the greatest similarity co-efficient with the MG13 *Agrostis stolonifera-Alopecurus geniculatus* grassland community. This community is characterised by the constant presence of marsh foxtail and creeping bent, sometimes accompanied by soft rush and other grasses typical of moist ground, including tufted hair-grass and floating sweet-grass. It is distributed throughout lowland Britain, where periodic inundation by fresh water occurs.
GWDTE	MG13 is classed as having a low degree of groundwater dependency, within England and Wales, however MG13 is often inundated due to flooding and not usually through the influence of groundwater, therefore is not considered as a GWDTE at this location.
Photographs	
Thornton Ditch 1	

Un-named ditch between Thornton Ditches 1 and 2	
Thornton Ditch 2	

View across NVC Survey Area, facing south-west	
River Gowy, with NVC Survey Area to the right of photo	

GRASSLAND AND SWAMP TO THE EAST OF RIVER GOWY (GOWY MEADOWS AND DITCHES LWS)

Summary Description of NVC Area	The NVC Survey Area consisted of a strip of dry neutral grassland immediately to the south of the M56, with stands of plantation woodland further south. The land was crossed by a series of drainage ditches with marshy grassland to the south of the NVC Survey Area and a mosaic of swamp communities and marshy grassland within the central area. These communities are individually described in more detail below.
NVC Classification	The dry grassland to the south of the M56 was dominated by false oat-grass, with frequent common nettle and constant cleavers. This species-poor grassland closely matches the MG1b *Arrhenatherum elatius grassland-Urtica dioica* sub-community, a widespread community throughout lowland Britain where the sward is not subject to grazing, particularly along roadside verges. This type of grassland was also present along the banks of the River Gowy where the ground is slightly elevated in association with the flood defence bund. The small stands of woodland to the south of the MG1 grassland contained a high proportion of non-native tree species with a ground flora restricted to common nettle, cleavers, bramble, wood avens and red campion *Silene dioica*, with frequent grasses along the woodland edge. Tree and shrub species present included frequent hybrid black-poplar *Populus* x *canadensis* with lesser amounts of ash, pedunculate oak, Norway maple *Acer platanoides,* elder, hawthorn, hazel, Italian alder *Alnus cordata,* grey alder *Alnus incana* and red oak *Quercus rubra.* Due to the plantation origin of the woodland it was not subject to NVC survey. Small strips of scrub were present along drainage ditches in the drier north which were dominated by bramble and are referable to the W24 *Rubus fruticosus-Holcus lanatus* underscrub community. The majority of the central section of the NVC Survey Area, north of Thornton Ditch 5 and south of Thornton Ditches 3 and 4 was dominated by reed canary-grass, with very few other species present. This is typical of the S28 *Phalaris arundinacea* tall-herb fen community, which is characteristic around the margins of fluctuating standing and running water, although is intolerant of permanent flooding. Around the central areas of S28, there were some soft rush-dominated patches. The soft rush was accompanied by constant tufted hairgrass and Yorkshire-fog. The constant presence of these three species indicates either MG9 or MG10 damp grassland. These areas were somewhat intermediate between the two communities but the higher coverage of soft rush than tufted hair-grass and the constant presence of creeping buttercup indicate that these areas are closer to MG10a *Holcus lanatus - Juncus effusus* rush pasture-typical sub-community. A similar MG10a vegetation community, with constant soft rush and Yorkshire-fog also occurred to the south of Thornton Ditch 5 / east of Thornton Ditch 12 and in the northeast corner of the field to the west of Thornton Ditch 12 / south of Thornton Ditch 5. The majority of the field to the west of Thornton Ditch 12 / south of Thornton Ditch 5, however, contained MG9 *Holcus lanatus-Deschampsia cespitosa* grassland with constant tufted hair-grass and Yorkshire-fog, but with only scarce soft rush. The wettest area was the central section between Thornton Ditches 3 & 4 and Thornton Ditch 5. This area was mostly comprised of S28 *Phalaris arundinacea* tall-herb fen, but several patches of wetter swamp vegetation were present, particularly to the east, including S5 *Glyceria maxima* swamp, which is always overwhelmingly dominated by reed sweet-grass. A further small area of reed sweet-grass was located in the south-western corner of the NVC Survey Area. Immediately south of the largest area of S5 vegetation, there was a small area dominated by bulrush *Typha latifolia,* with some standing water present. Quadrat sampling gave the highest similarity co-efficient for S12 *Typha latifolia* swamp, within which bulrush is always dominant.
GWDTE	MG9 grassland and MG10 rush-pasture are not classed as having groundwater dependency within England/Wales according to Annex 1 of UKTAG guidance. S28 tall-herb fen, S5 and S12 swamps are all classed as having low groundwater dependency within the England/Wales.
Photographs	

View across the NVC Survey Area, facing east, with M56 to the north and unclassified woodland to the south	
View across the NVC Survey Area, facing east from area of S5 swamp vegetation	

View across the NVC Survey Area, facing east from area of W24 bramble scrub	
View across the NVC Survey Area, facing north-east	

FRODSHAM AND INCE MARSHES LWS (SOUTH OF RAILWAY)

Summary Description of NVC Area	The NVC Survey Area consisted of a large expanse of marshy grassland with a main drain running north-west to south-east and a series of smaller drainage ditches running south-west to north-east and feeding into the main drain. NVC sampling of the grassland was undertaken using quadrats placed either side of the main drain. The results of quadrat sampling are described below, together with descriptions of vegetation growing within the drainage channels.
NVC Classification	The grassland to the west of the main drain was very species-poor, with only four grass species recorded within the three sampling quadrats. Creeping bent was dominant but was accompanied by some small tussocks of tufted hair-grass, floating sweet-grass and perennial rye-grass but forbs were absent in the quadrats. MATCH analysis gave a very low similarity co-efficient of 38.5% with the MG13 *Agrostis stolonifera-Alopecurus geniculatus* grassland community, with the second closest fit being with MG9 *Holcus lanatus-Deschampsia cespitosa* grassland. The grassland to the east of the main drain was less species-poor but was still dominated by creeping bent. This sward also contained tufted hair-grass, with Yorkshire-fog present in small amounts. A limited number of forb species were also present including curled dock *Rumex crispus,* spear thistle *Cirsium vulgare* and creeping thistle *Cirsium arvense*. MATCH analysis gave the highest similarity co-efficient of 50.3% with MG9 *Holcus lanatus-Deschampsia cespitosa* grassland. Despite the differences in the MATCH analysis, the grassland either side of the main drain is very similar and it is likely that the closest match for MG13 (west of the main drain) was partly due to the very low number of species present. MG13 normally has creeping bent co-dominant with marsh foxtail, but that species was absent from the samples. Tufted hair-grass was also constant, but is rarely so in MG13, and perennial rye-grass was present which is also atypical of MG13. It seems more likely that the species-poor grassland has developed from an MG7 *Lolium perenne* ley but is now showing successional changes towards a wetter grassland community. It seems more reasonable to assign all of this area as MG9 *Holcus lanatus-Deschampsia cespitosa* grassland. The central un-named main drain, which ran from north-west to south-east, was bordered by several smaller trees and scrub along its eastern bank. Sparse common reed growth occurred along most of the length of the drain, although the survey was undertaken in April, before the reeds would have attained full height. Also present within the channel were water horsetail *Equisetum fluviatile,* branched bur-reed*,* reed canary-grass, bulrush, water starwort *Callitriche* sp., water dock *Rumex hydrolapathum,* flag iris *Iris pseudacorus* and water-plantain *Alisma plantago-aquatica.* Elton Marsh 13 drain was very narrow and shallow and dominated by floating sweet-grass, which covered the surface of the water. Also present were branched bur-reed, bulrush, reed canary-grass, soft rush, water-plantain and flag iris. The un-named ditch at the western end of Elton Marsh 13 consisted of an approximately 1m wide wet ditch with common reed and branched bur-reed in the channel, with dominant common nettle along the banks. To the east of the central un-named main drain there were two very narrow and shallow muddy ditches (Elton Marsh 1 & 2) with scattered willow and hawthorn scrub. Emergent vegetation was restricted to dense common reed and soft rush growing in the channels.
GWDTE	MG9 grassland is not classed as having groundwater dependency within England/Wales according to Annex 1 of UKTAG guidance.
Photographs	

Main drainage channel (un-named ditch) running north-west to south-east across NVC survey area	
View across fields to west of main drainage channel	

View across fields to east of main drainage channel	
Elton Marsh 13 drain	

Elton Marsh 2 drain	

FRODSHAM INCE MARSHES LWS (NORTH OF RAILWAY)

Summary Description of NVC Area	The NVC Survey Area consisted of two grassland fields separated by a narrow access road, with a large field to the north of the road and a smaller section of field to the south. Both fields were surrounded by hedgerows, tree lines and ditches which are described below.
NVC Classification	The grassland to the north of the access road was dominated by perennial rye-grass, accompanied by constant meadow foxtail and creeping bent. Forbs were scarce within the sward but included creeping thistle, meadow buttercup, dandelion, common mouse-ear *Cerastium fontanum* and white clover. MATCH analysis gave the highest similarity co-efficient (55.2%) for MG7d *Lolium perenne-Alopecurus pratensis* grassland. This sub-community is characteristic of moist, fertile soils which are subject to occasional flooding but within areas with less frequent inundation than would occur within the MG7c *Alopecurus pratensis-Festuca pratensis* grassland sub-community. This seems a good match with the grassland present. The grassland to the south of the access road was also dominated by perennial rye-grass, but with creeping bent almost as abundant, with slightly lesser amounts of meadow foxtail. Small amounts of soft rush and hard rush *Juncus inflexus* were also present within the sampling quadrats which were not present to the north of the road. A similar set of forbs to the northern field were present but with creeping buttercup the most frequent buttercup species and occasional cuckoo-flower. This community appeared to be a similar damp grassland but MATCH analysis returned the closest community as MG10 *Holcus lanatus-Juncus effusus* rush-pasture. This is assumed to be because of the constant (but sparse coverage) soft rush within the sampling quadrats and the constant creeping bent. Yorkshire-fog, however, was absent from the quadrats and therefore this is not a suitable community to define the vegetation present south of the road. Meadow foxtail was present at slightly higher coverage than in the northern field, therefore the most suitable community to assign this area to would also be MG7d *Lolium perenne-Alopecurus pratensis* grassland. The un-named ditch along the northern edge of L4958 was approximately 2m wide with slow flowing water. The northern bank of this ditch supported a line of large, mature crack willow *Salix fragilis* and poplar *Populus* sp., with frequent common nettle along the southern bank. The channel contained emergent branched bur-reed and bulrush, with common reed present on the banks further west. Elton Lane Ditch 2, along the eastern edge of the NVC Survey Area, consisted of a damp-dry ditch dominated by floating sweet-grass, with common reed dominant further north. Also present within the ditch was great willowherb and flag iris. The ditch was bordered either side by hedge lines dominated by hawthorn. To the south of the road, the northern boundary was formed by a wide, deep ditch (Elton Lane Ditch 4). The channel was dominated by bulrush, with a layer of wood club-rush *Scirpus sylvaticus* below. To the western end of this ditch the channel was more open, with exposed mud colonised by flag iris. A similar ditch was also present directly to the north of the road (Elton Lane Ditch 1), forming the southern boundary. Elton Lane Ditch 4 continued along the eastern boundary. This section was mostly dry at the time of survey, with floating sweet-grass, creeping bent and great willowherb within the channel. The ditch at this location was heavily shaded by a defunct hedge consisting mostly of hawthorn. Elton Lane South Ditch, along the southern boundary, was a wide water-filled ditch which was very sparsely vegetated within the channel due to heavy shading from small trees and dense scrub including grey willow, hawthorn and bramble. Elton Lane Ditch 5 was located within the southern grassland, running north to south across the field, comprising a very narrow and shallow channel which was dry at the time of the survey. Species present included creeping bent, reed canary-grass, soft rush, common nettle, creeping buttercup and great willowherb.
GWDTE	None present.
Photographs	

Elton Lane Ditch 4 to south of access track	
View across grassland at NVC Survey Area	

Double hedge and ditch at Elton Lane Ditch 2, bisecting NVC Survey Area	
View across grassland at NVC Survey Area	

Un-named ditch along forming the northern edge of the NVC Survey Area in this section	

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- **Ref. 23** Rodwell, J. (Ed.). (1995). *British Plant Communities: Volume 4 Aquatic communities, swamps and tall-herb fens*. Cambridge: Cambridge University Press.
- **Ref. 24** University of Lancaster-Unit of Vegetation Science (2000) *MATCH 2.16 for Windows 95/NT.*
- **Ref. 25** UK Technical Advisory Group on the Water Framework Directive (2004). *Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems* (Annex 1: NVC plant communities and dependency on groundwater-table updated 2009).
- **Ref. 26** CIEEM (2019). *Advice Note on the Lifespan of Ecological Reports and Surveys.* CIEEM, Winchester.
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- **Ref. 28** Natural Resource Wales (2021). Request Environmental Data. Available online: https://naturalresources.wales/evidence-and-data/accessing-our-data/request-environmental-data/?lang=en
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ANNEX A

FIGURES

Figure 9.1.1 – Statutory Sites of Nature Conservation

Mersey Estuary (SPA, Ramsar)

Mersey Estuary (SSSI)

C, Ramsar)

Dee Estuary (SSSI)

Gathering Grounds Woods & Llwyni Pond (SAC)

ah's Quay Ponds and Woodland (SSSI)

ypits and Commons (SSSI)

River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales) (SAC)

River Dee (SSSI)

Midland Meres & Mosses Phase 1

Midland Meres & Mosses Phase 2 (Ramsar)

Deeside and Buckley Newt Sites (SAC)

0 2 4 6 8 Kilometres

1:800,000

Key:

- Newbuild Infrastructure Boundary
- 10km Buffer
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Ramsar Site
- Special Protection Area (SPA)

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.1
Statutory Designated Sites of Nature Conservation

DRAWING STATUS
Final for DCO Examination - submitted at Deadline 7

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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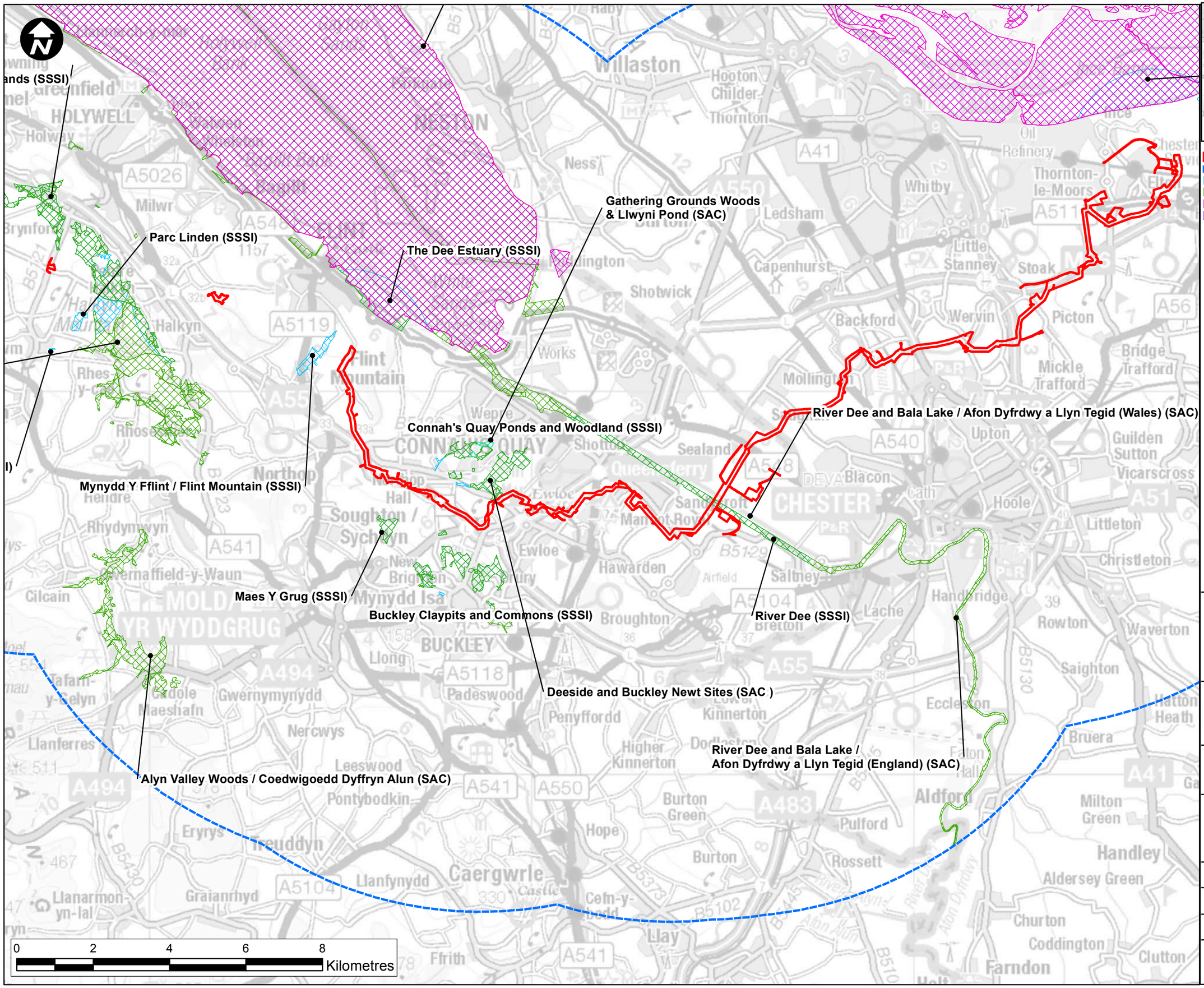
DRAWING NUMBER
EN070007-APP-ES-9.1.1-Sheet 1



HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.1
Statutory Designated Sites of Nature Conservation

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The Dee Estuary (SPA, SAC, Ramsar)

Comin Helygain A Glaswell
Tiroedd Treffynon/Halkyn
Common And Holywell Grasslands (SSSI)

Parc Linden (SSSI)

The Dee Estuary (SSSI)

Gathering Grou
& Llwyni Pond

Coed Trefraith (SSSI)

Halkyn Mountain / Mynydd Helygain (SAC)

Parc Bodlondeb And Gwenall T-Parc, Lixwm (SSSI)

Mynydd Y Fflint / Flint Mountain (SSSI)

Connah's Quay Ponds and Woodland (SSSI)

Maes Y Grug (SSSI)

Buckley Claypits and Commons (SSSI)

Deeside and Buckley Nev

0 2 4 6 8 Kilometres

1:800,000

Key:
- Newbuild Infrastructure Boundary
- 10km Buffer
- Special Area of Conservation (SAC)
- Ramsar Site
- Special Protection Area (SPA)

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
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Statutory Designated Sites of Nature Conservation

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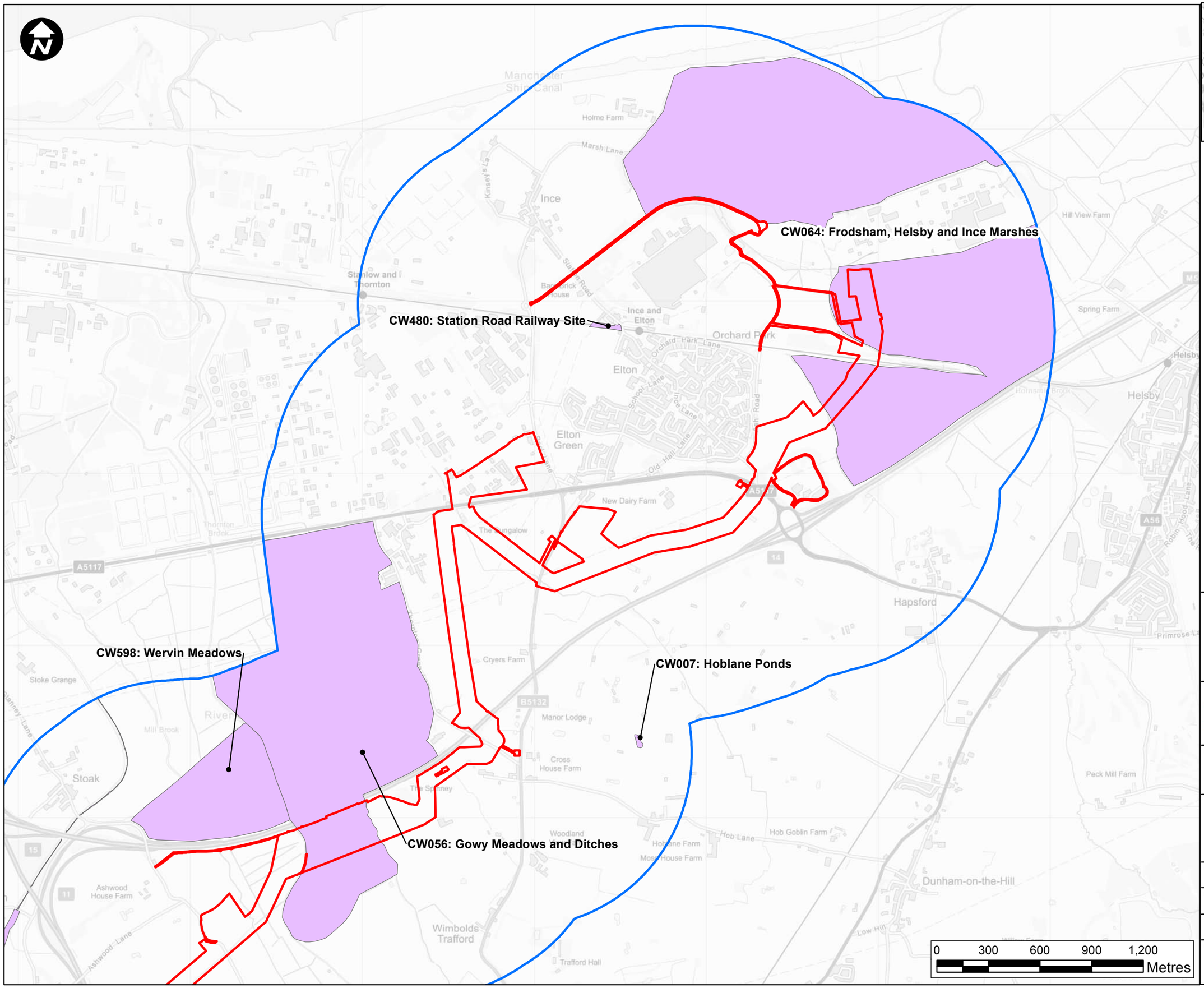
EN070007-APP-ES-9.1.1-Sheet 3

Figure 9.1.2 – Non-Statutory Sites of Nature Conservation



Key:

- Newbuild Infrastructure Boundary
- 1km Buffer
- **Local Wildlife Site (England)**
- Wildlife Sites (Wales)

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.2
Non-Statutory Designated Sites of Nature Conservation

DRAWING STATUS
Final for DCO Examination - submitted at Deadline 7

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DRAWING NUMBER
EN070007-APP-ES-9.1.2-Sheet 1

CW598: Wervin Meadows

CW056: Gowy Meadows and Ditches

CW006: Shropshire Union Canal (Main Line)

ackford Railway Cutting

CW431: Backford Brook Fields

CW457: Collinge Wood and Meadow

CW548: Bridge Trafford North

CW046: Picton Green Lane

CW576: Chester Zoo Ponds

CW251: Shropshire Union
Canal (Little Stanley to Waverton)

CW290: Canal Wood

14: Viaduct Wood

CW520: Chester Zoo
(Butter Hill - Millenium Cycle Route 56)

CW510: Knolls Bridge Fields

Field North of Hadrian Drive

ton -

0 300 600 900 1,200 Metres

1:600,000

Key:

- Newbuild Infrastructure Boundary
- 1km Buffer
- **Local Wildlife Site (England)**
- Wildlife Sites (Wales)

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.2
Non-Statutory Designated Sites of Nature Conservation

DRAWING STATUS
Final for DCO Examination - submitted at Deadline 7

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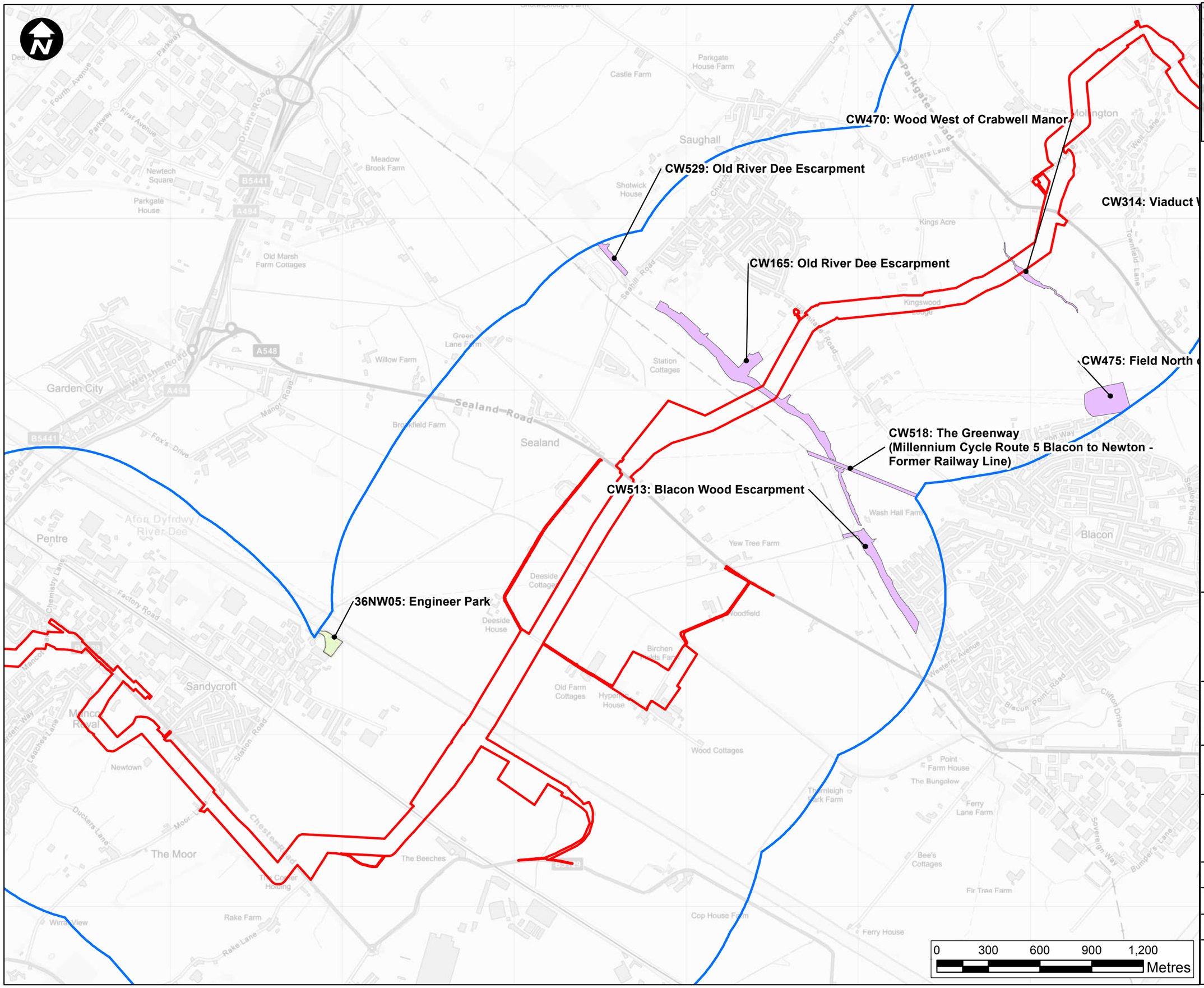
DRAWING NUMBER
EN070007-APP-ES-9.1.2-Sheet 2



Key:

- Newbuild Infrastructure Boundary
- 1km Buffer
- **Local Wildlife Site (England)**
- Wildlife Sites (Wales)

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.2
Non-Statutory Designated Sites of Nature Conservation

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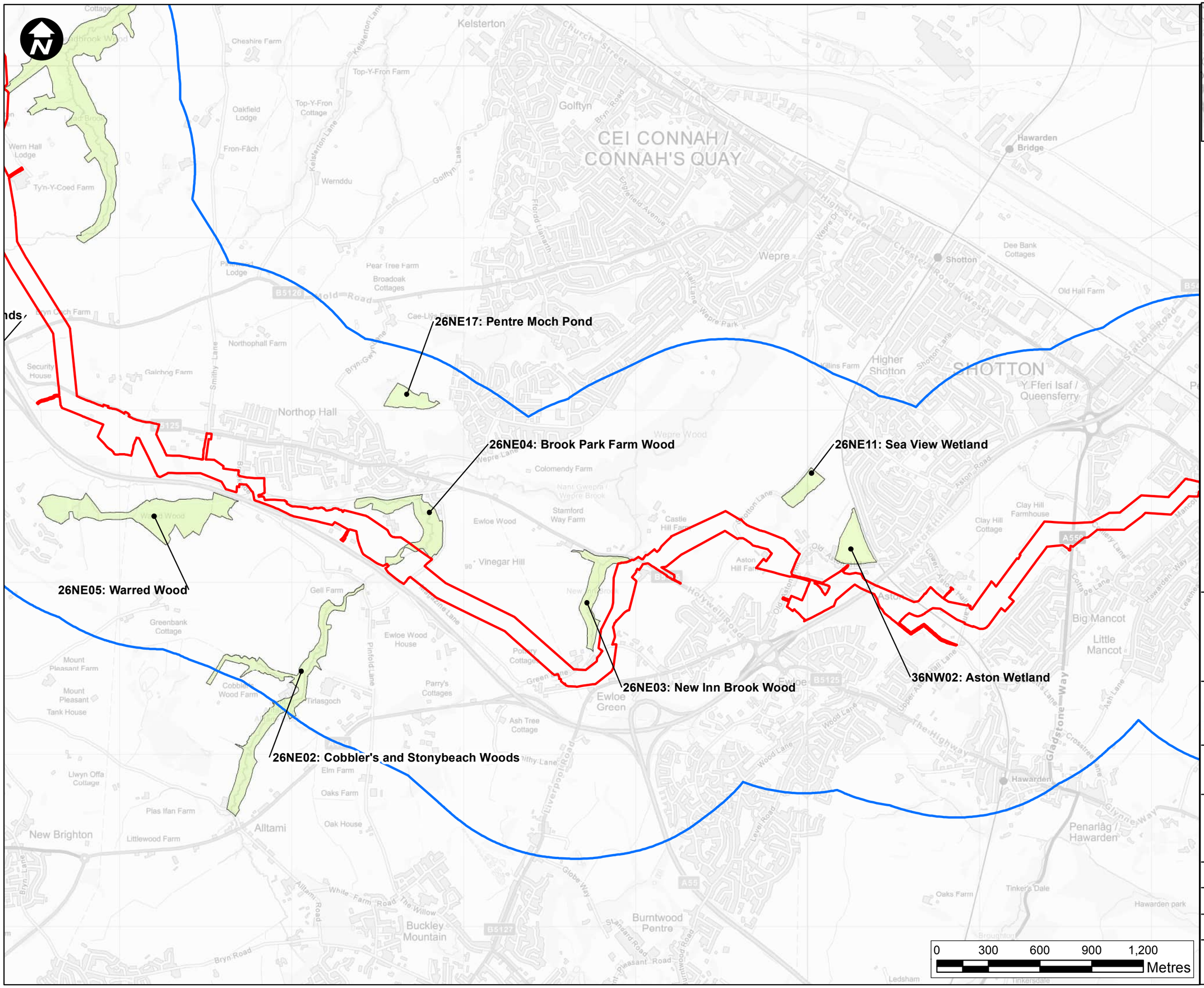
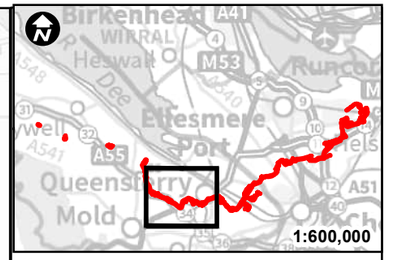
EN070007-APP-ES-9.1.2-Sheet 3





Key:
- Newbuild Infrastructure Boundary
- 1km Buffer
- Wildlife Sites (Wales)

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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Figure 9.1.2
Non-Statutory Designated Sites of Nature Conservation

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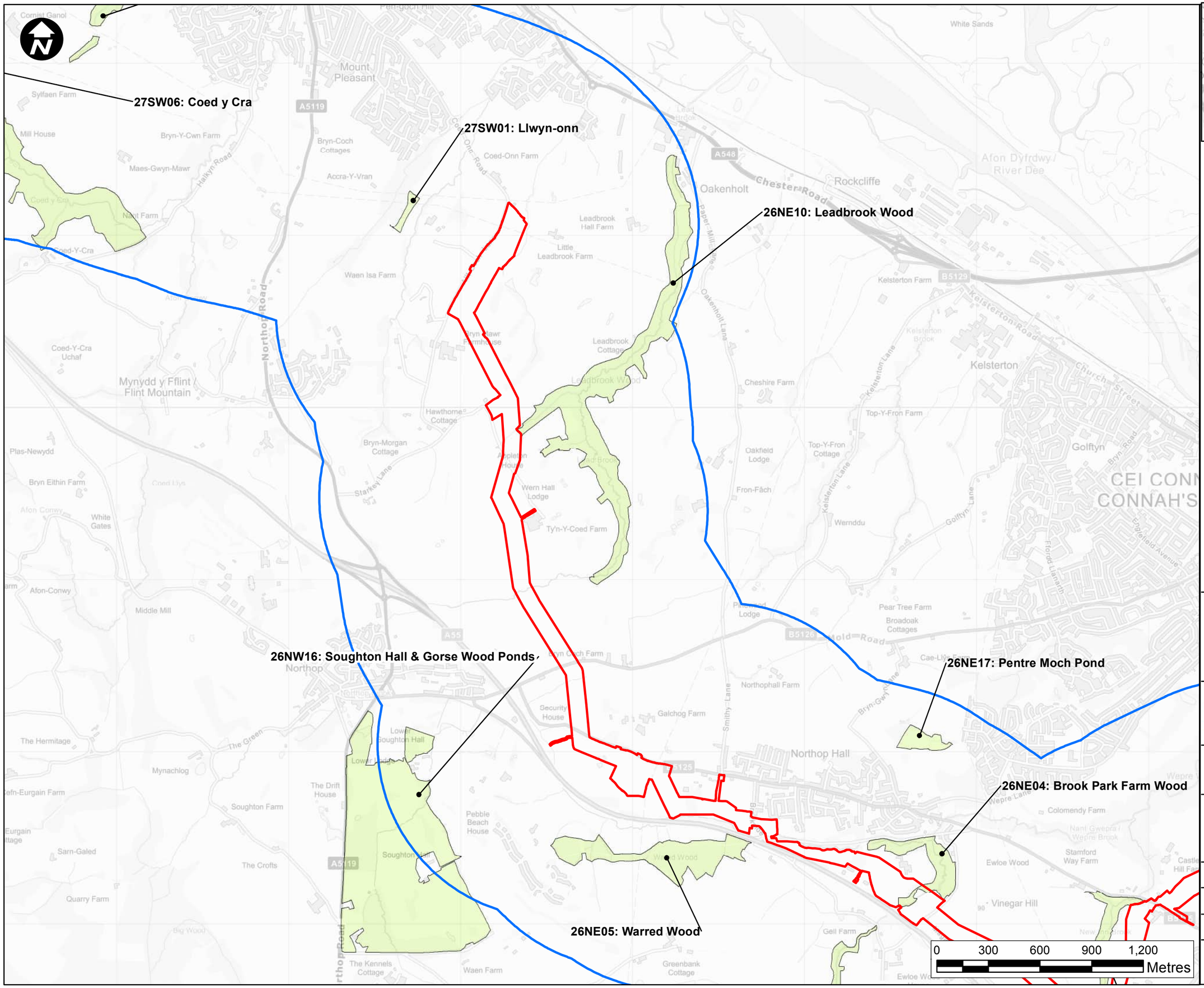

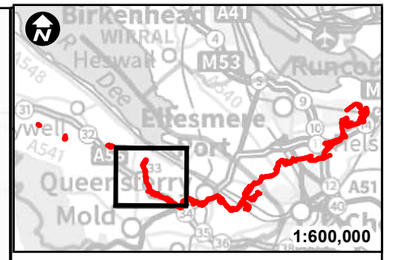

Key:

- Newbuild Infrastructure Boundary
- 1km Buffer
- Wildlife Sites (Wales)

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.2
Non-Statutory Designated Sites of Nature Conservation

DRAWING STATUS
Final for DCO Examination - submitted at Deadline 7

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SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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DRAWING NUMBER
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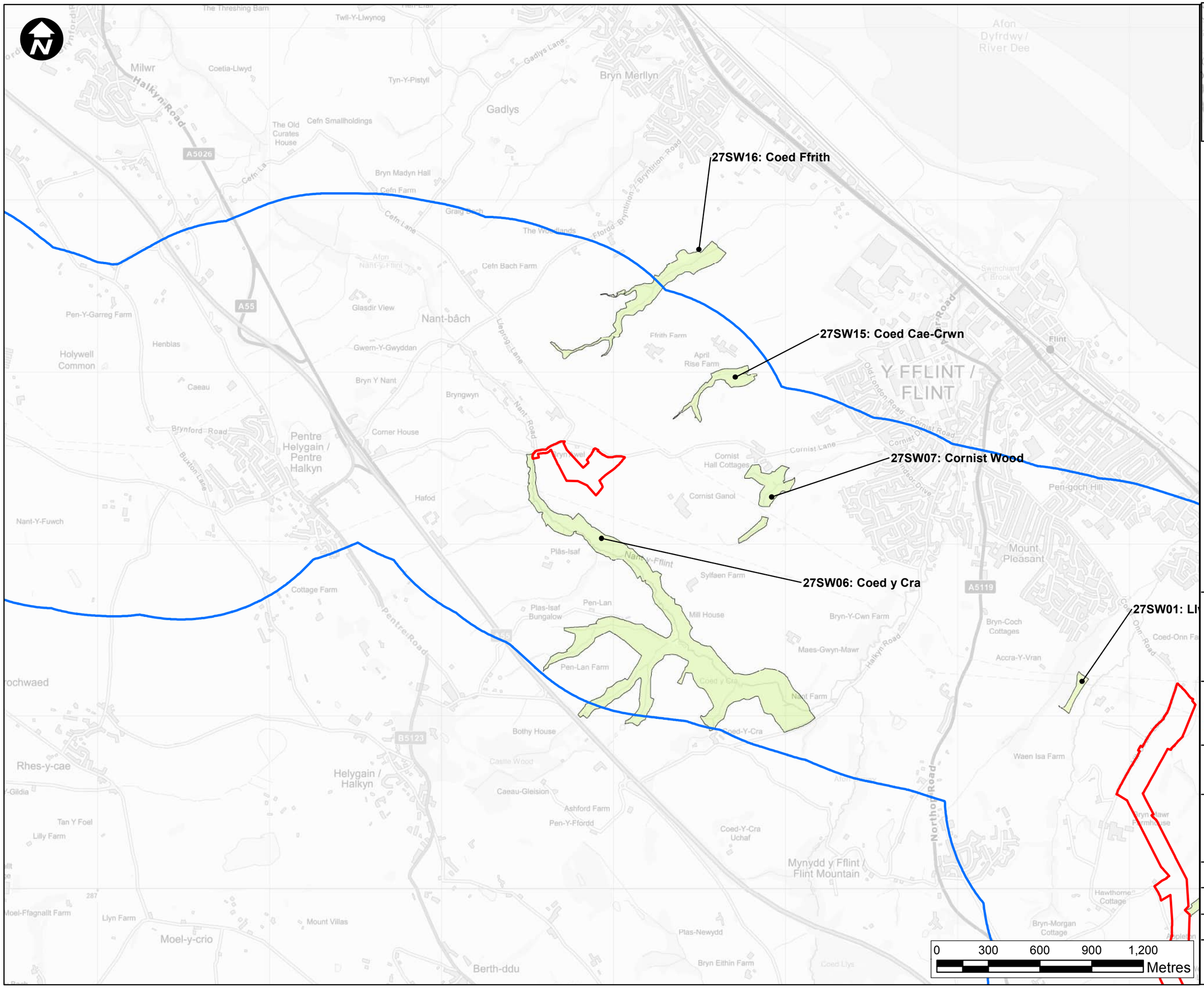

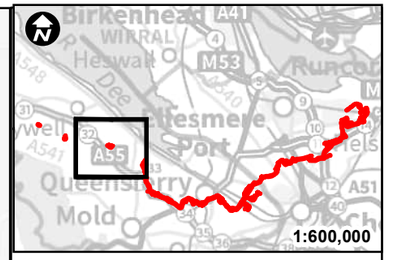

Key:
- Newbuild Infrastructure Boundary
- 1km Buffer
- Wildlife Sites (Wales)

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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Figure 9.1.2
Non-Statutory Designated Sites of Nature Conservation

DRAWING STATUS
Final for DCO Examination - submitted at Deadline 7

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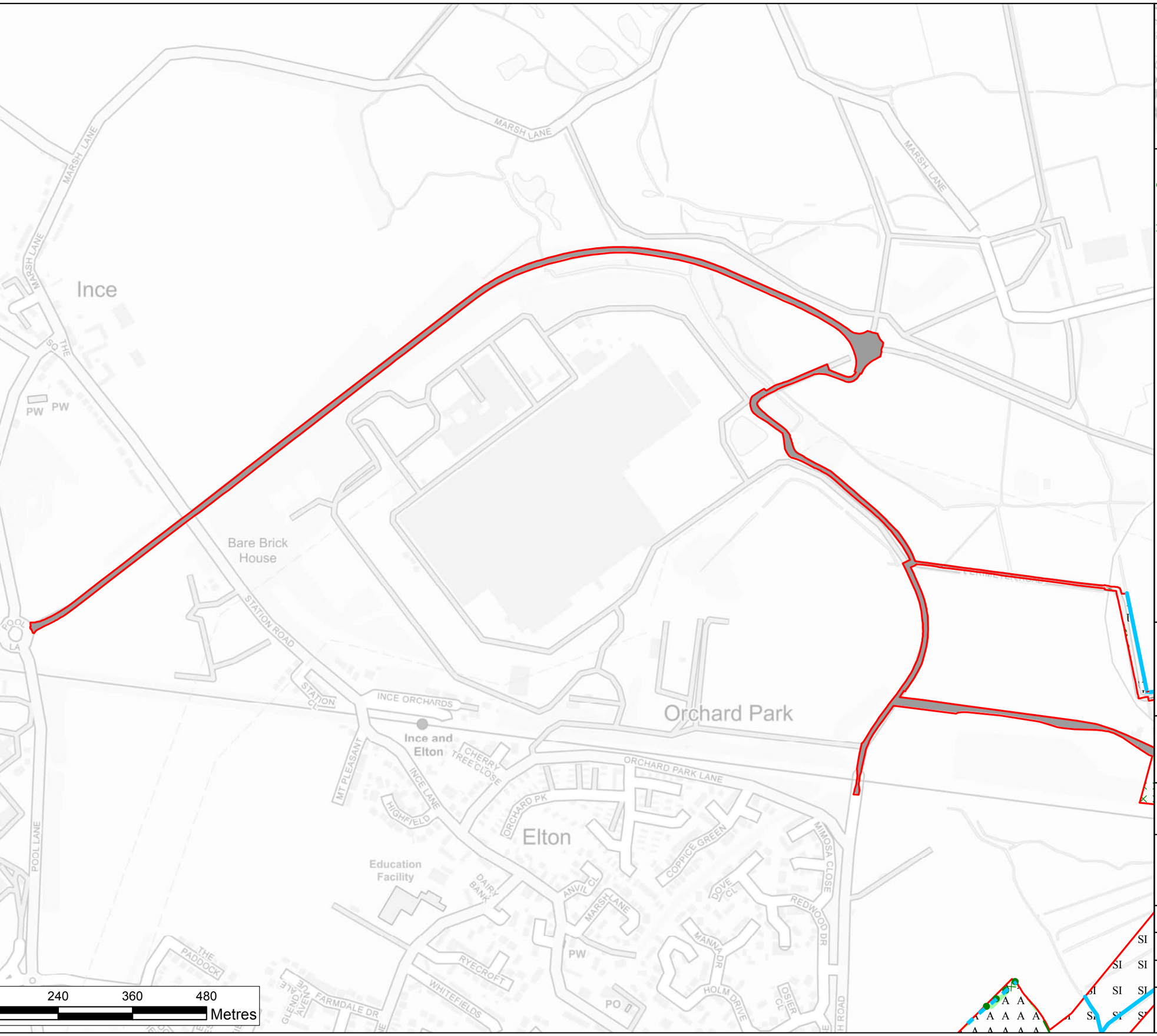
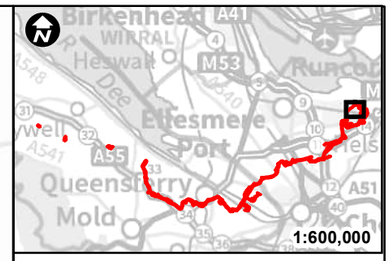
EN070007-APP-ES-9.1.2-Sheet 6

Figure 9.1.3 – Results of Phase 1 Habitat Survey





Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Dry ditch
- Intact hedge - species-poor
- Running water
- Scrub - scattered
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Bare ground
- Other habitat
- Mixed woodland - semi-natural
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 1 of 24

DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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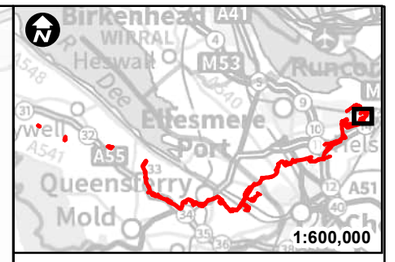
DRAWING NUMBER
EN070007-APP-ES-9.1.3-Sheet 1



Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Scrub - scattered
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Improved grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Bare ground
- Other habitat
- Mixed woodland - semi-natural
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 2 of 24

DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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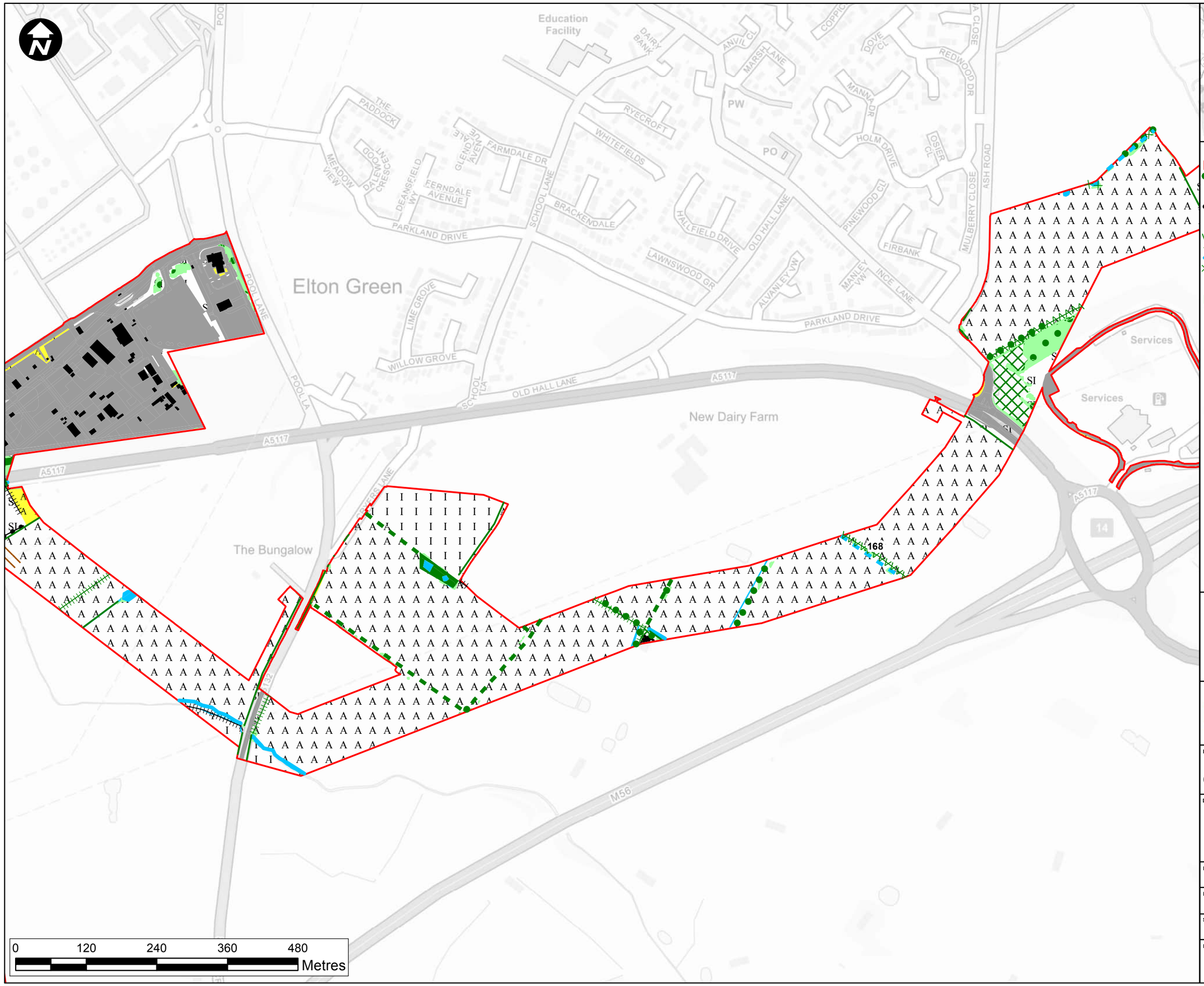

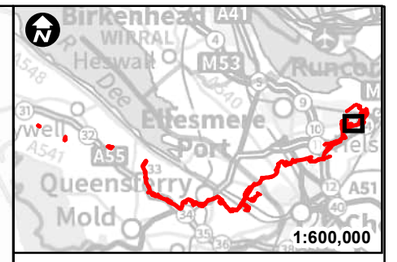

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Earth bank
- Fence
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Scrub - scattered
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Improved grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
- Other habitat
- Mixed woodland - semi-natural

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 3 of 24

DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

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SW	JOK	DC	SP

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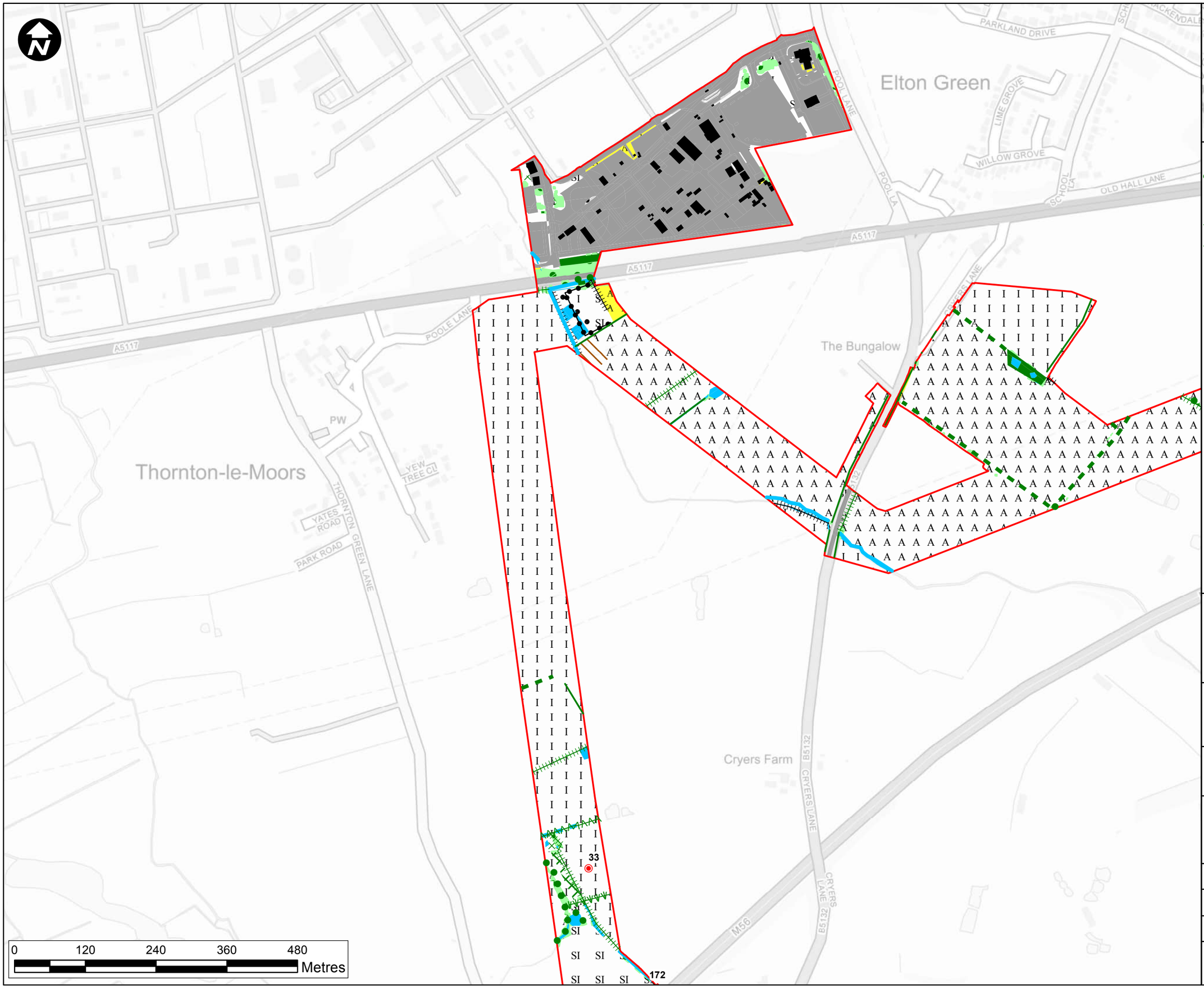

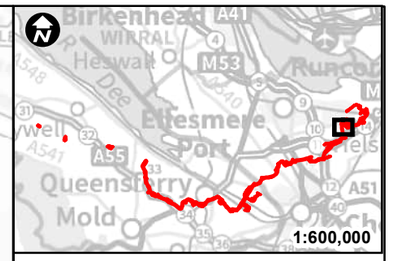

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Earth bank
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Improved grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
- Mixed woodland - semi-natural
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 4 of 24

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Final for DCO Examination - submitted for Deadline 7

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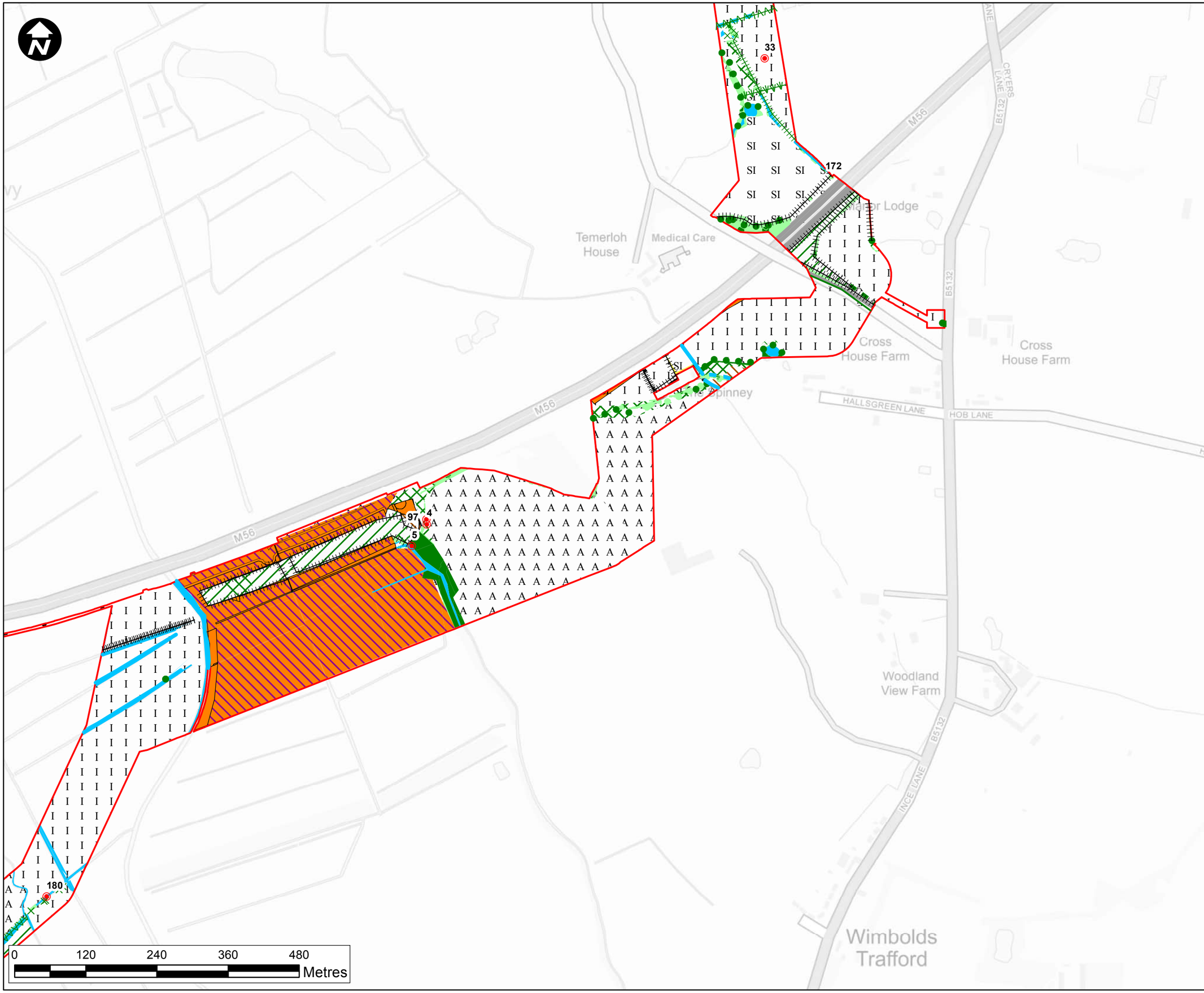

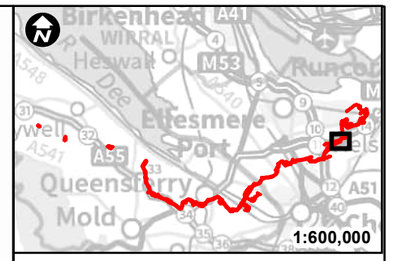

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Coniferous Parkland/scattered trees
- Defunct hedge - native species-rich
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - unimproved
- Neutral grassland - semi-improved
- Improved grassland
- Marsh/marshy grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Cultivated/disturbed land - ephemeral/short perennial
- Buildings
- Bare ground
- Other habitat
- Broad-Leaved Parkland/scattered trees
- Mixed woodland - semi-natural
- Scrub - scattered
- Target Note

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 5 of 24

DRAWING STATUS

Final for DCO Examination - submitted for Deadline 7

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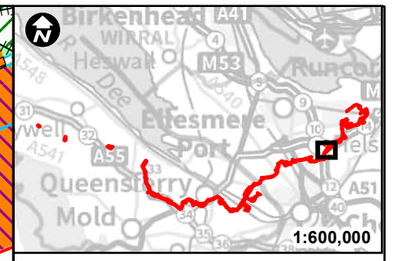

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - native species-rich
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - unimproved
- Improved grassland
- Marsh/marshy grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Standing water - eutrophic
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Bare ground
- Other habitat
- Broad-Leaved Parkland/scattered trees
- Mixed woodland - semi-natural
- Scrub - scattered
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 6 of 24

DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

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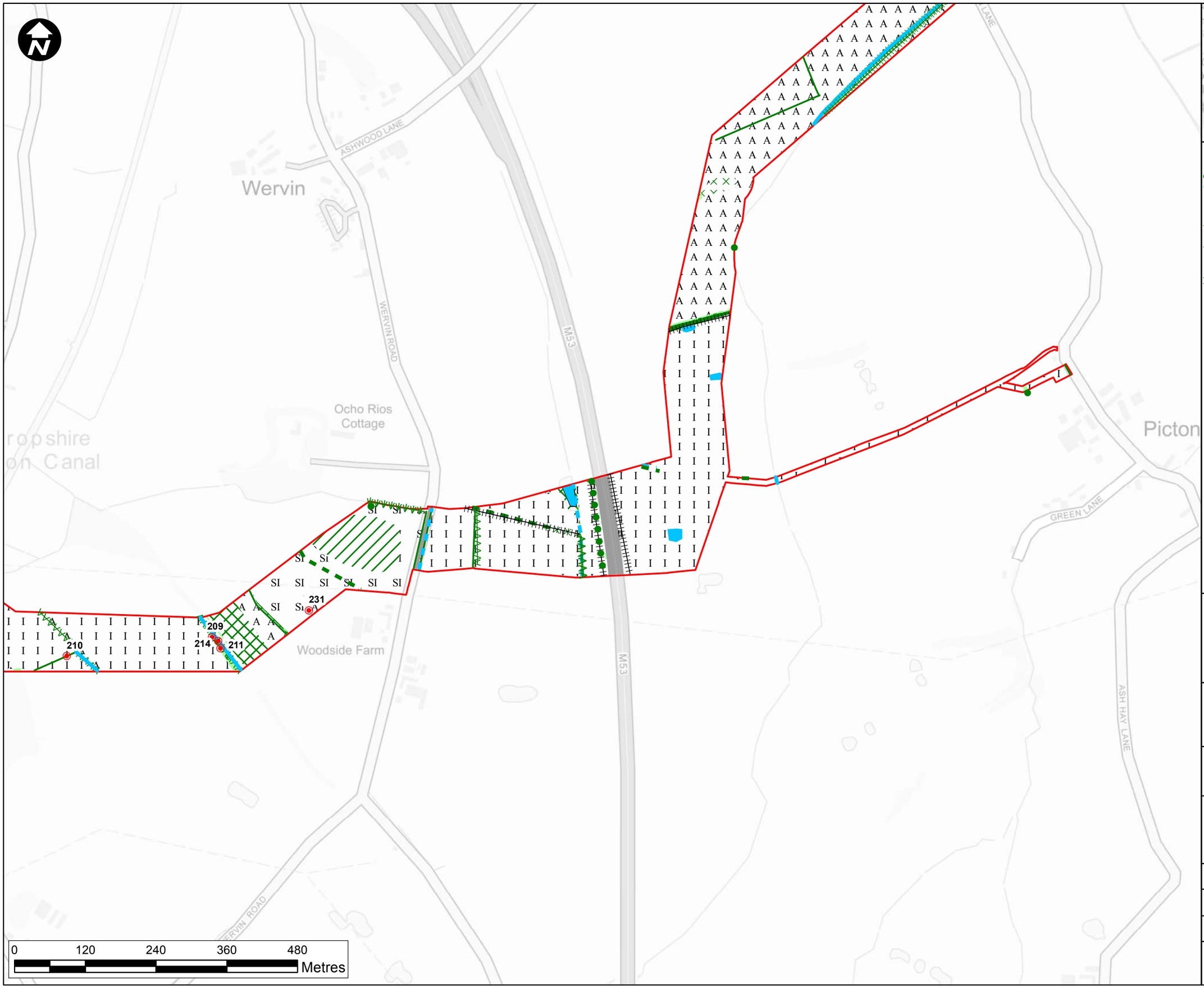

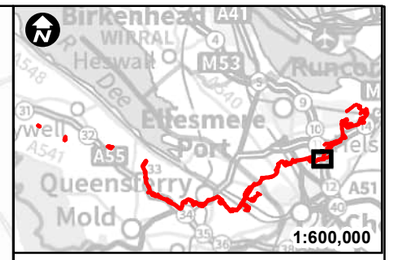

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Coniferous Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Scrub - scattered
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Standing water - eutrophic
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Bare ground
- Other habitat
- Broad-Leaved Parkland/scattered trees
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West
Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
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DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

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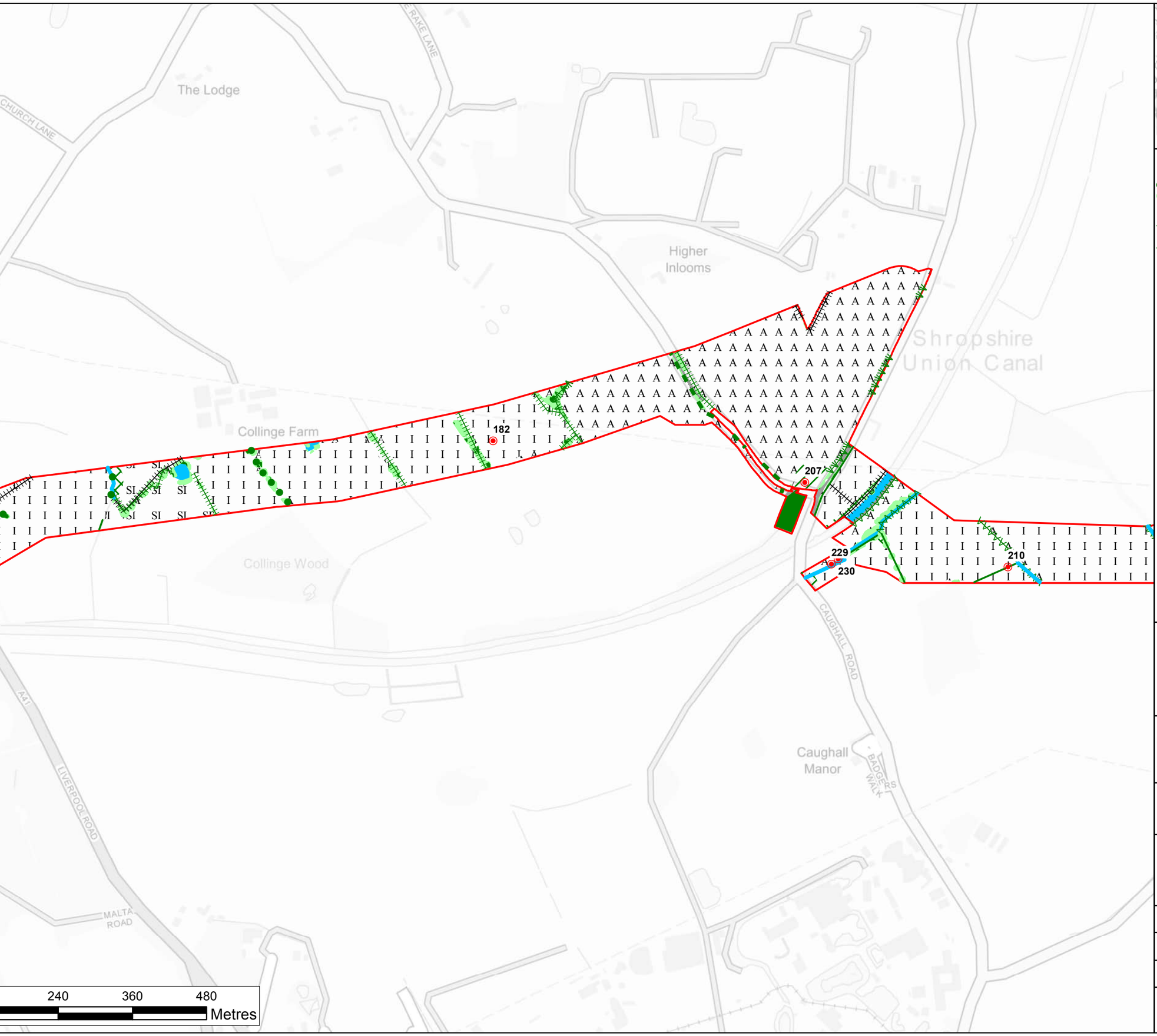
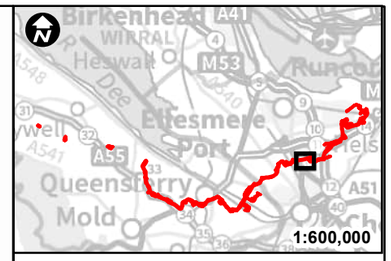
EN070007-APP-ES-9.1.3-Sheet 7





Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Coniferous Parkland/scattered trees
- Defunct hedge - species-poor
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Bare ground
- Other habitat
- Broad-Leaved Parkland/scattered trees
- Mixed woodland - semi-natural
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
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DRAWING STATUS
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SCALE @ A3 SIZE	DATE	REVISION
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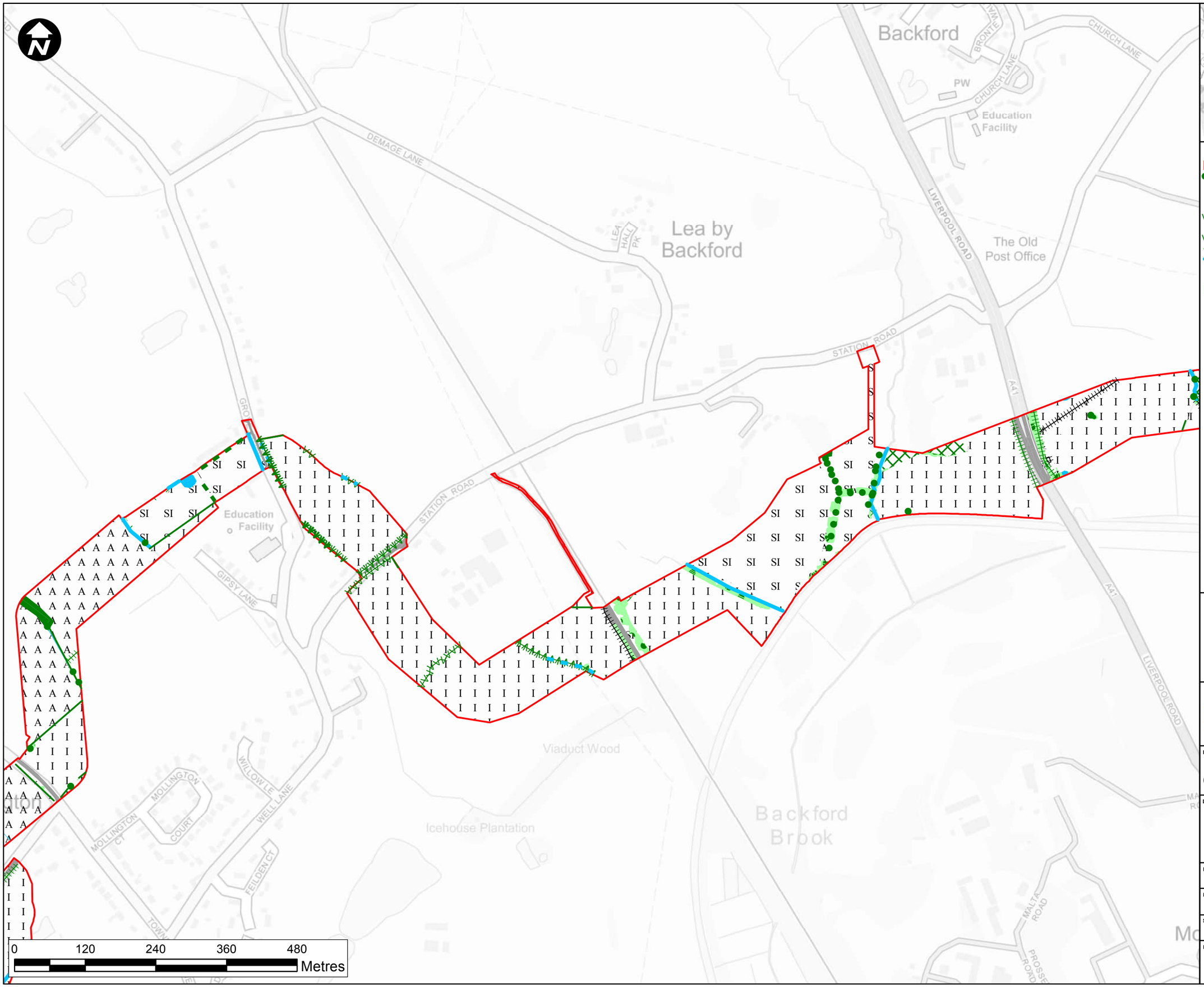

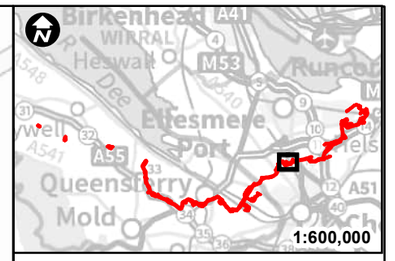

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Bare ground
- Broad-Leaved Parkland/scattered trees
- Mixed woodland - semi-natural

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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SCALE @ A3 SIZE	DATE	REVISION
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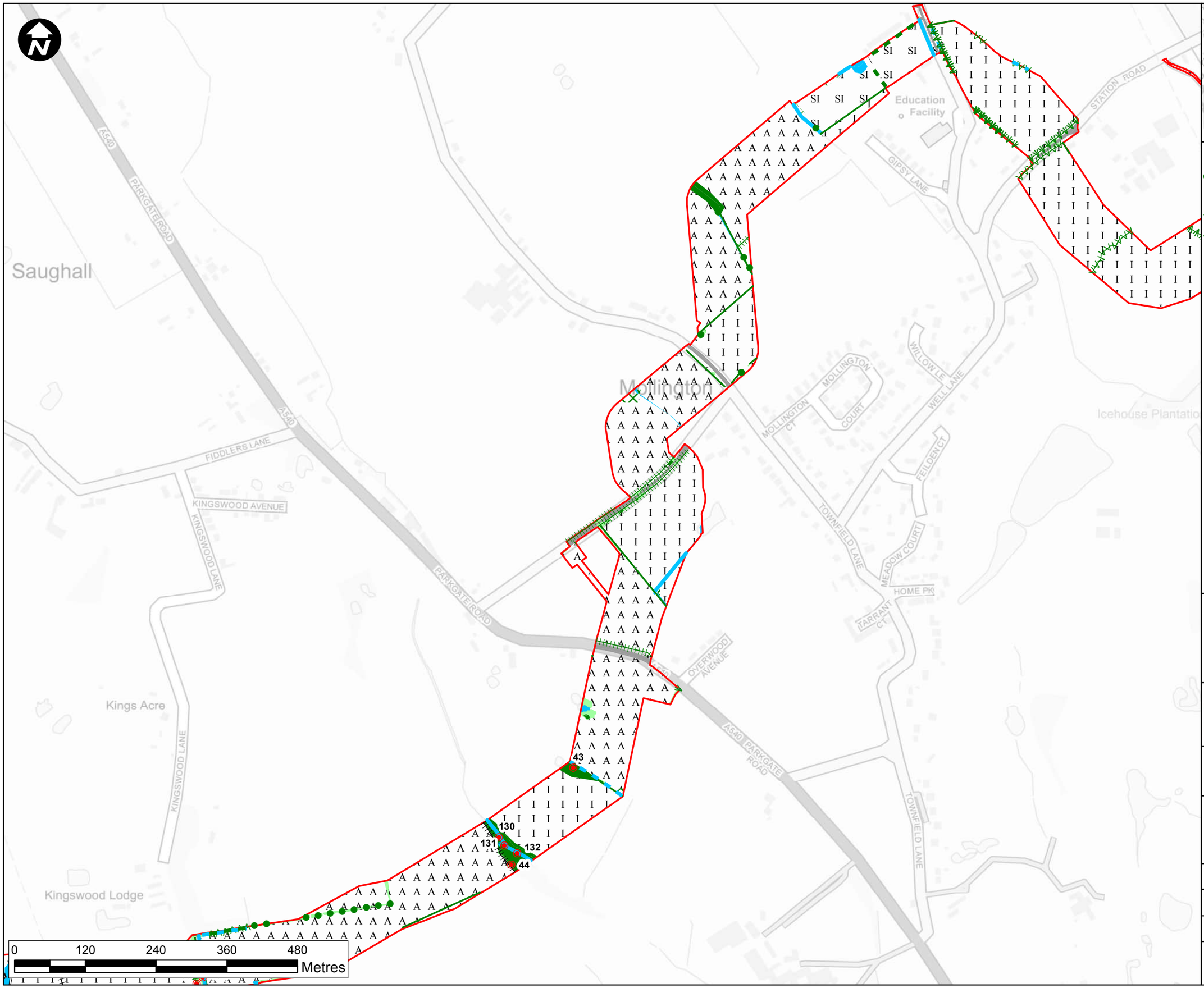

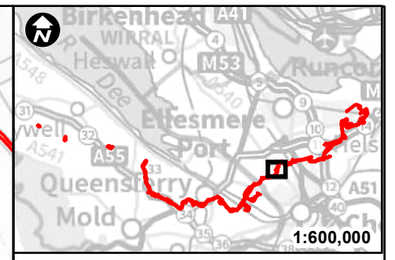

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Broadleaved Parkland/scattered trees
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Bare ground
- Broad-Leaved Parkland/scattered trees
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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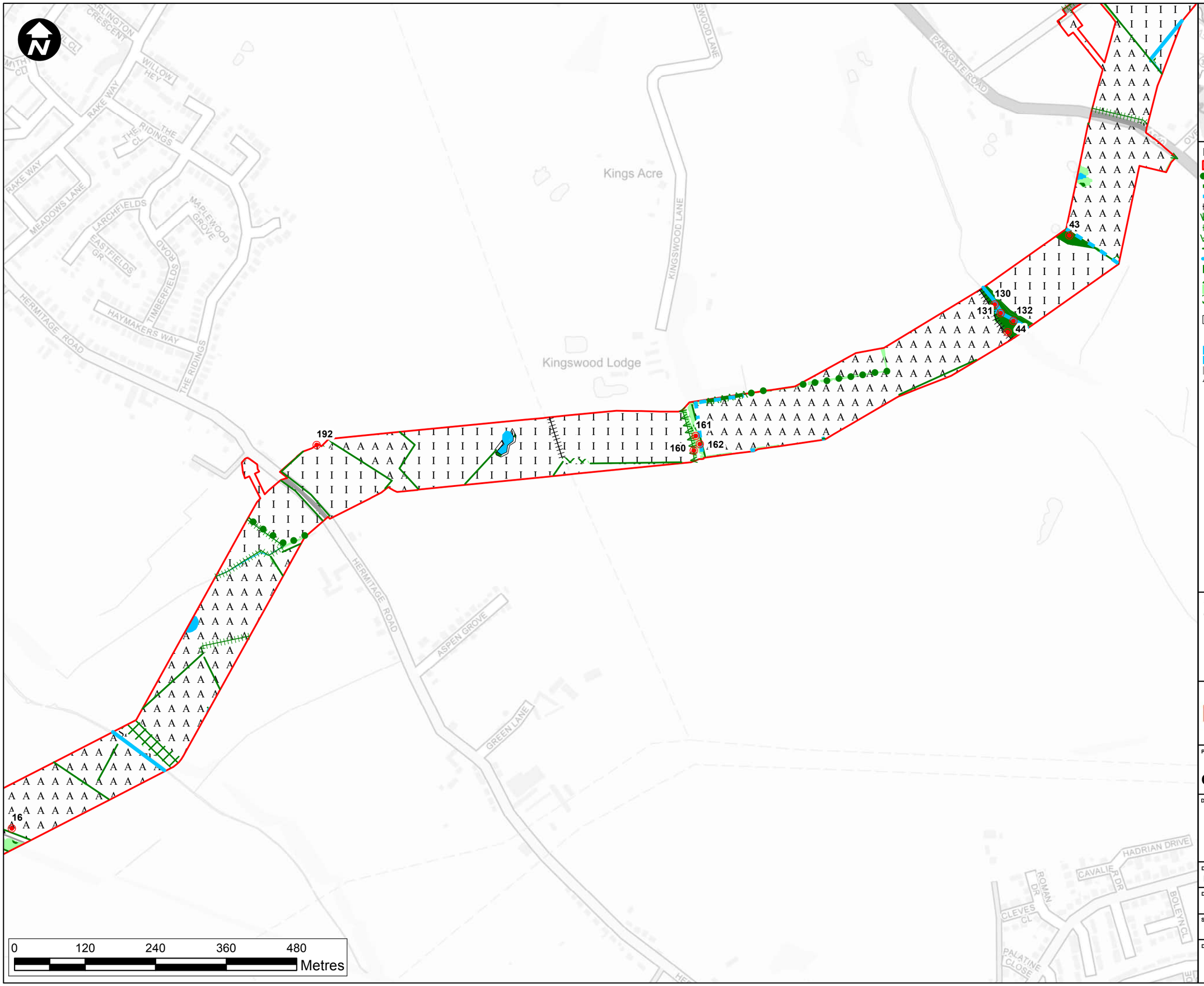

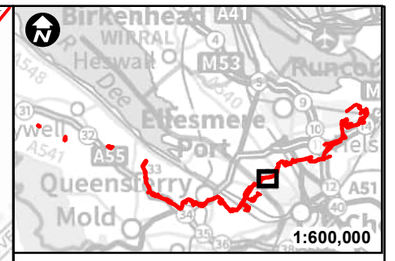

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Broadleaved Parkland/scattered trees
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Bare ground
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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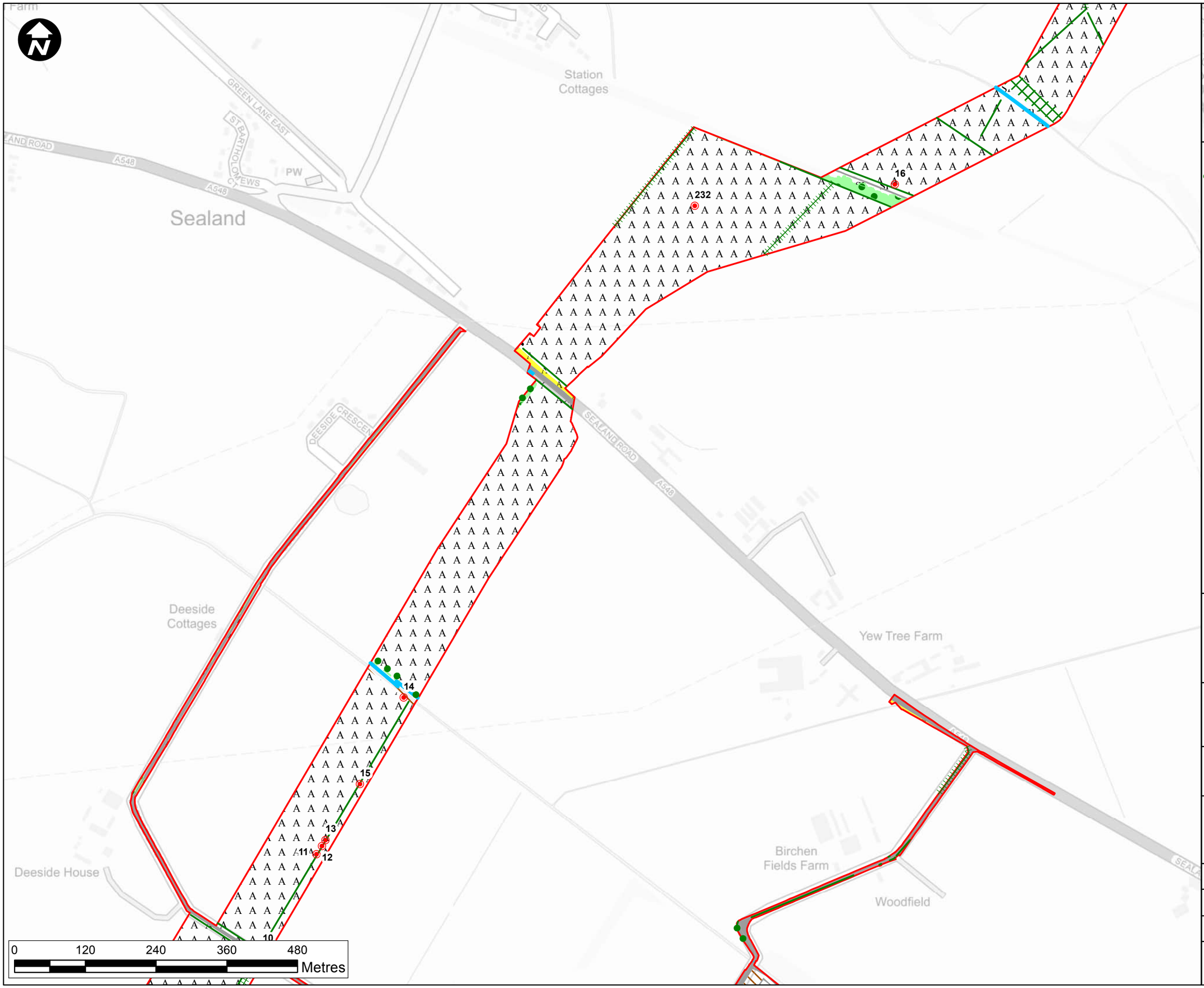

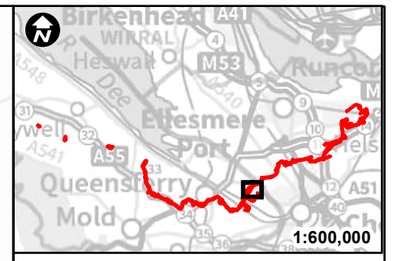

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Dry ditch
- Hedge with trees - species-poor
- Intact hedge - species-poor
- Running water
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Bare ground
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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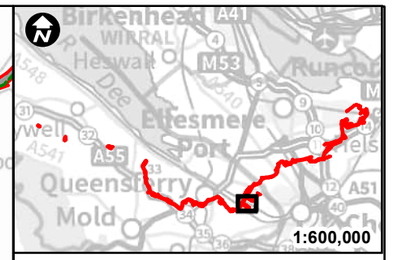

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Coniferous Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - species-poor
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Mixed woodland - semi-natural
- Mixed woodland - plantation
- Scrub - scattered
- Broadleaved Parkland/scattered trees
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
- Other habitat
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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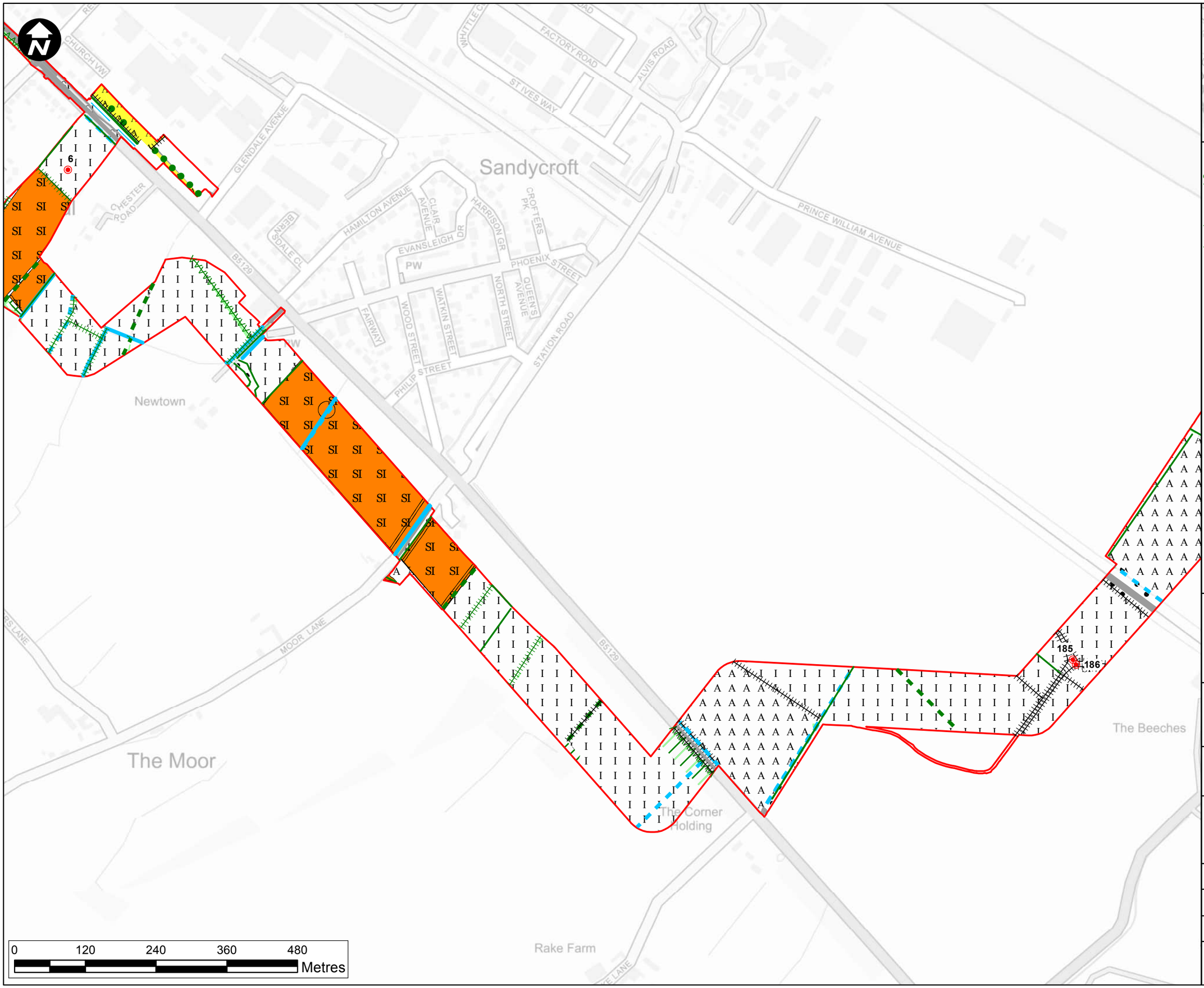

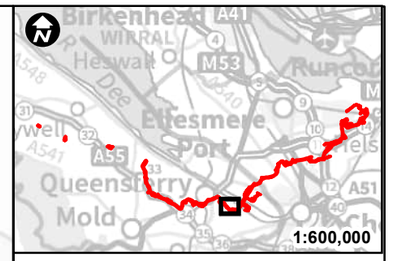

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - native species-rich
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Coniferous woodland - semi-natural
- Mixed woodland - semi-natural
- Mixed woodland - plantation
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
- Other habitat
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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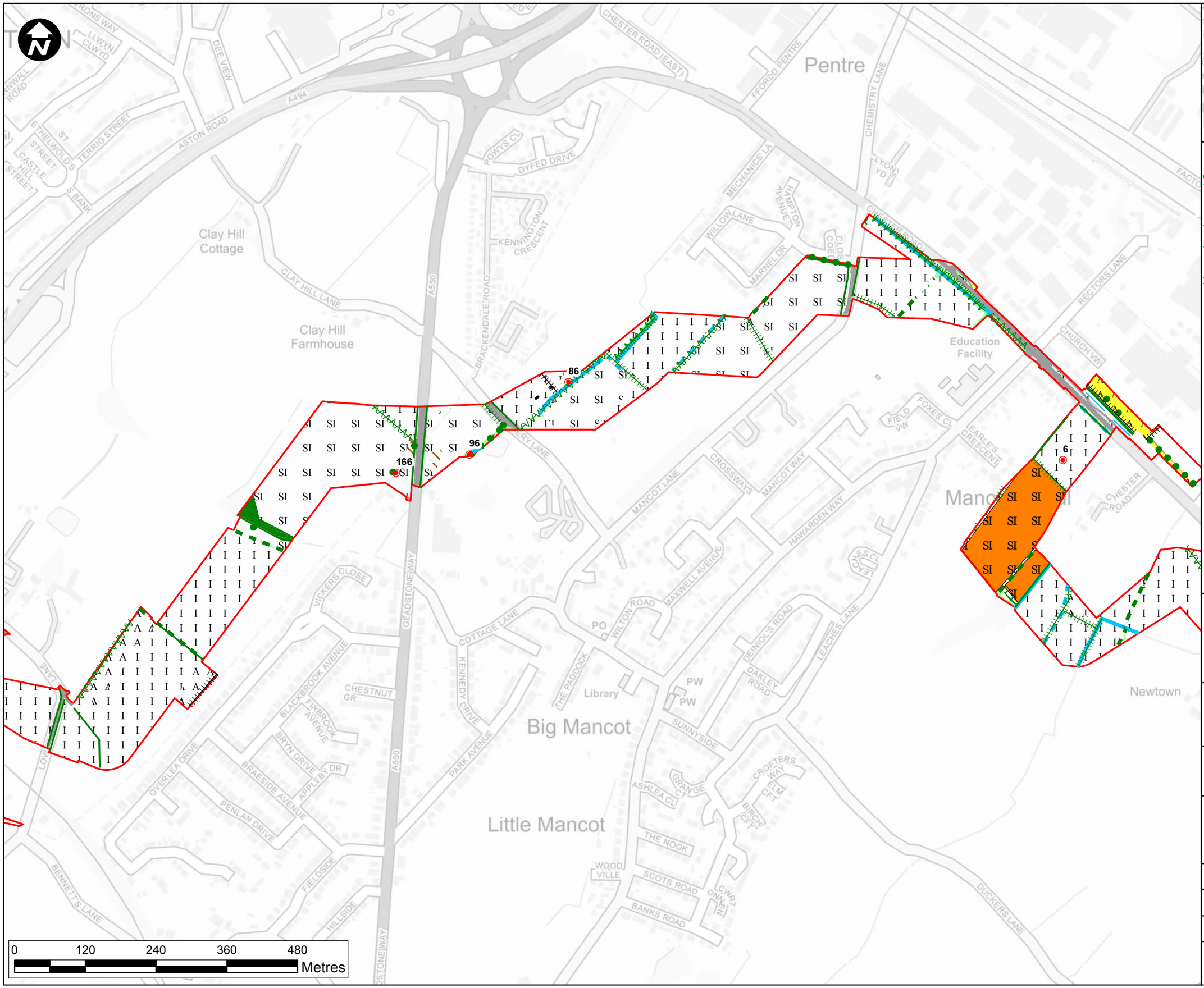

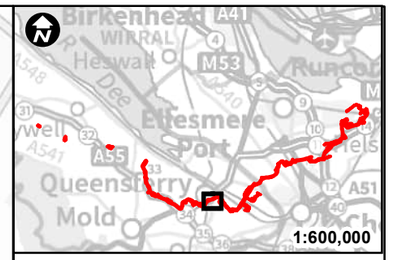

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - native species-rich
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Scrub - scattered
- Broadleaved woodland - semi-natural
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Broadleaved Parkland/scattered trees
- Mixed Parkland/scattered trees
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Buildings
- Bare ground
- Other habitat
- Broad-Leaved Parkland/scattered trees
- Mixed woodland - semi-natural
- Target Note

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

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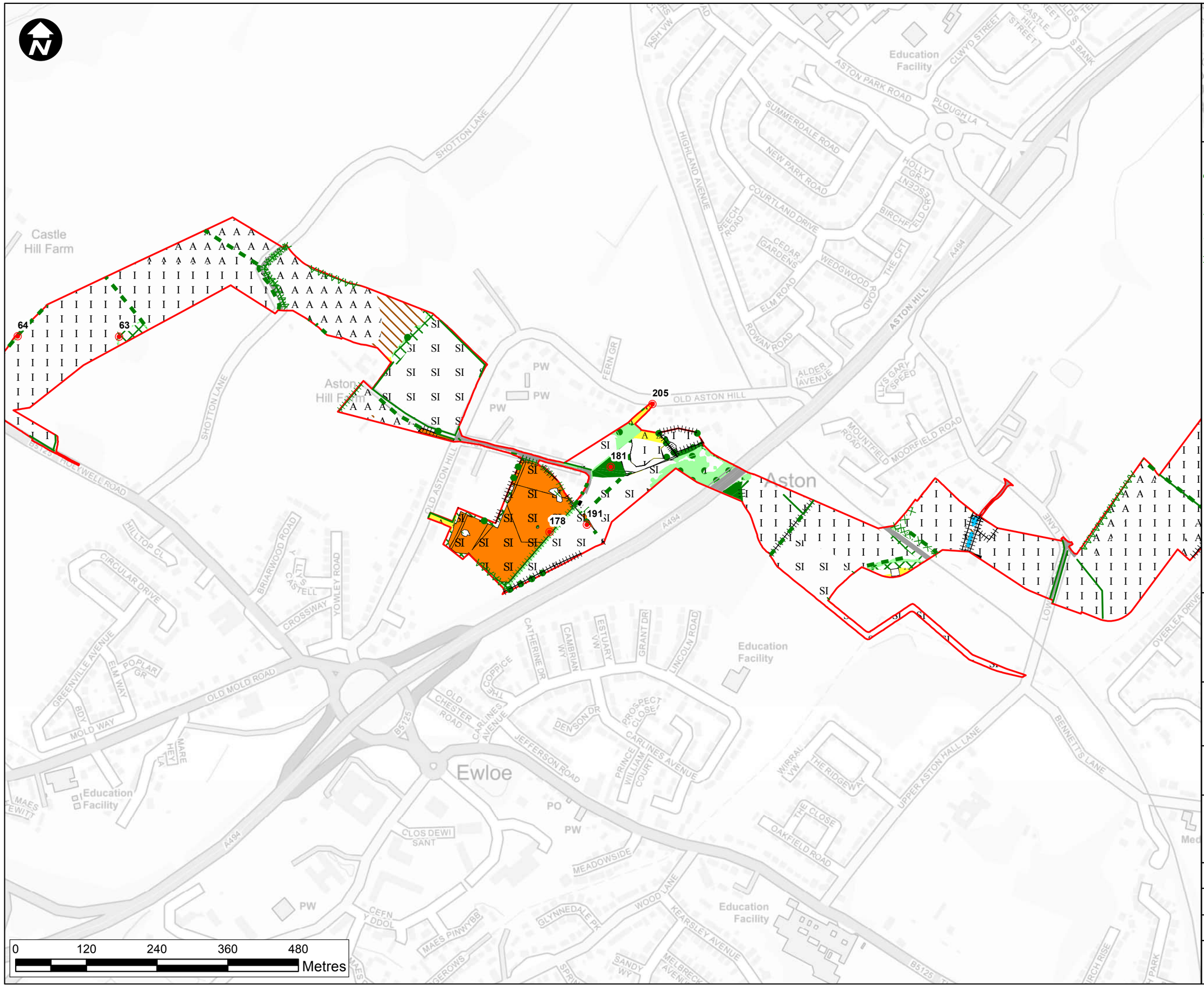

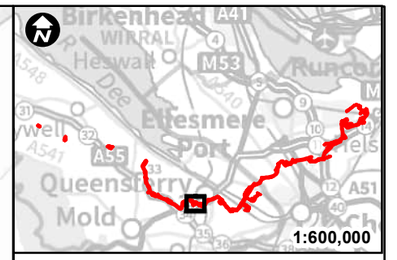

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - species-poor
- Fence
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Mixed Parkland/scattered trees
- Running water
- Scrub - scattered
- Broadleaved woodland - semi-natural
- Coniferous woodland - semi-natural
- Mixed woodland - semi-natural
- Mixed woodland - plantation
- Scrub - dense/continuous
- Scrub - scattered
- Broadleaved Parkland/scattered trees
- Mixed Parkland/scattered trees
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Buildings
- Bare ground
- Other habitat
- Broad-Leaved Parkland/scattered trees
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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DRAWING NUMBER
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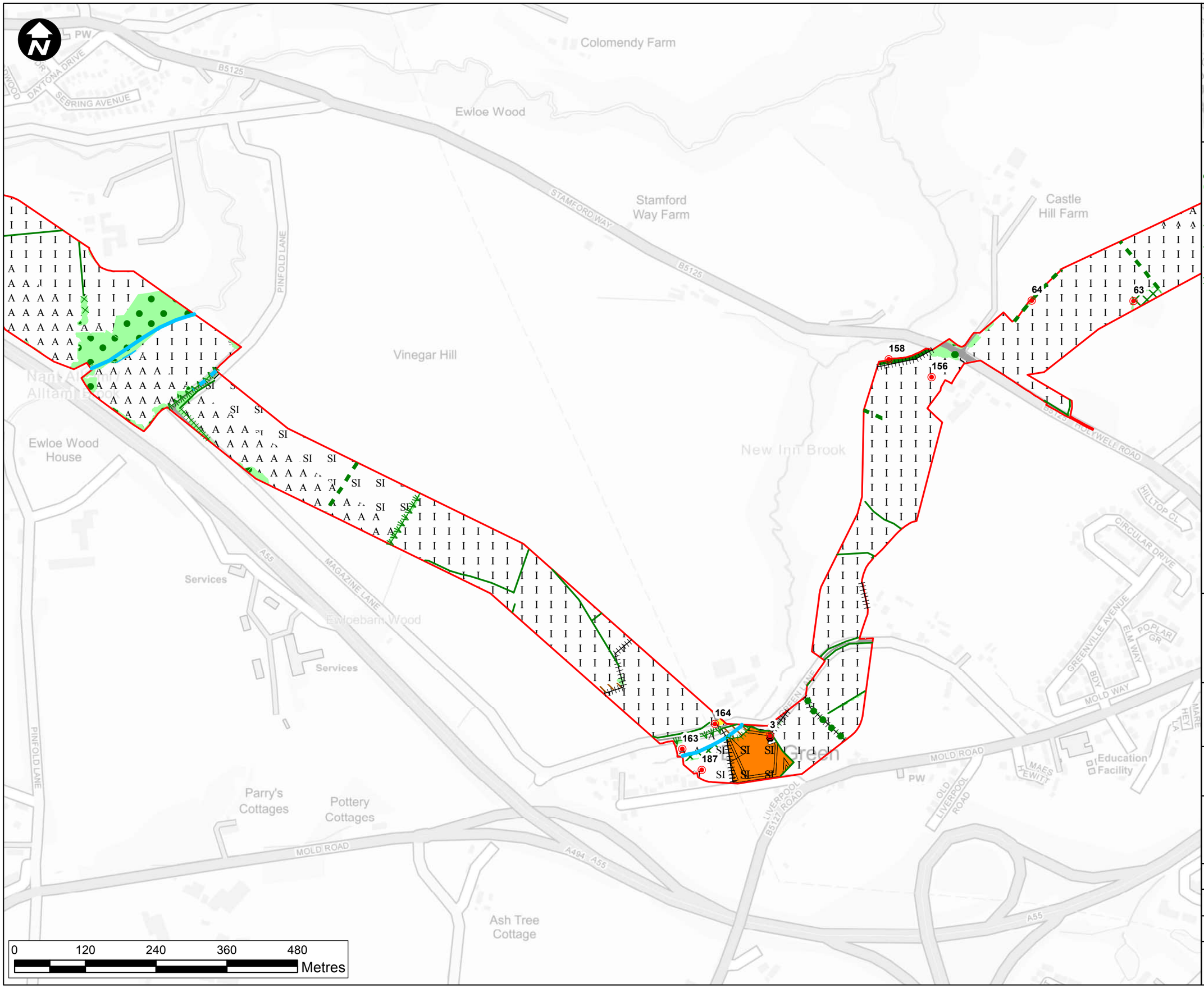

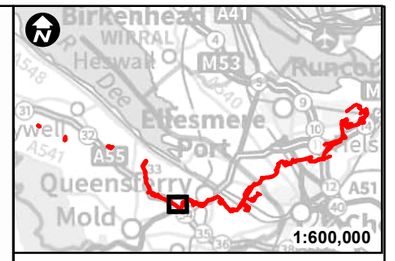

Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Coniferous Parkland/scattered trees
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Scrub - scattered
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Bracken - continuous
- Other tall herb and fern - ruderal
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
- Broad-Leaved Parkland/scattered trees
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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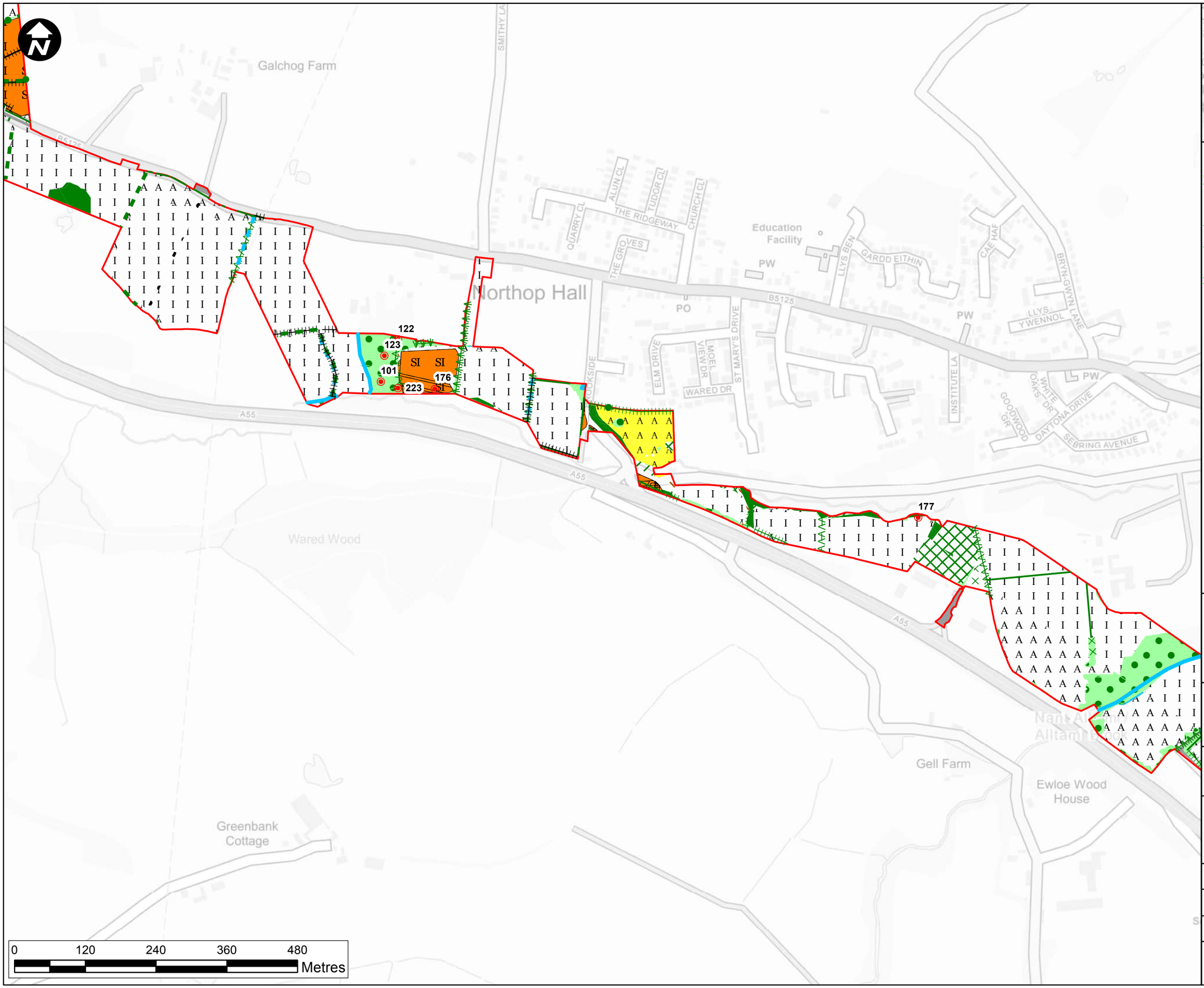

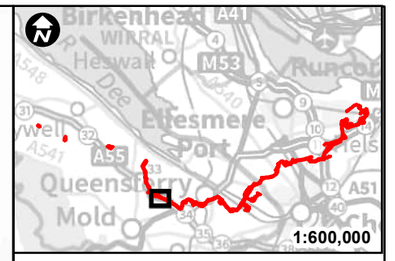

Key:

- Newbuild Infrastructure Boundary
- Coniferous Parkland/scattered trees
- Defunct hedge - native species-rich
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Scrub - scattered
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Bracken - continuous
- Other tall herb and fern - ruderal
- Standing water
- Running water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Buildings
- Bare ground
- Other habitat
- Broad-Leaved Parkland/scattered trees
- Target Note

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

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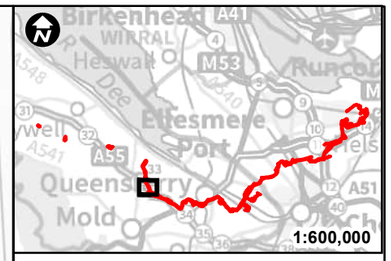

Key:

- Newbuild Infrastructure Boundary
- Defunct hedge - species-poor
- Dry ditch
- Fence
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Broadleaved Parkland/scattered trees
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Standing water
- Hard standing
- Cultivated/disturbed land - arable
- Bare ground
- Broad-Leaved Parkland/scattered trees
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

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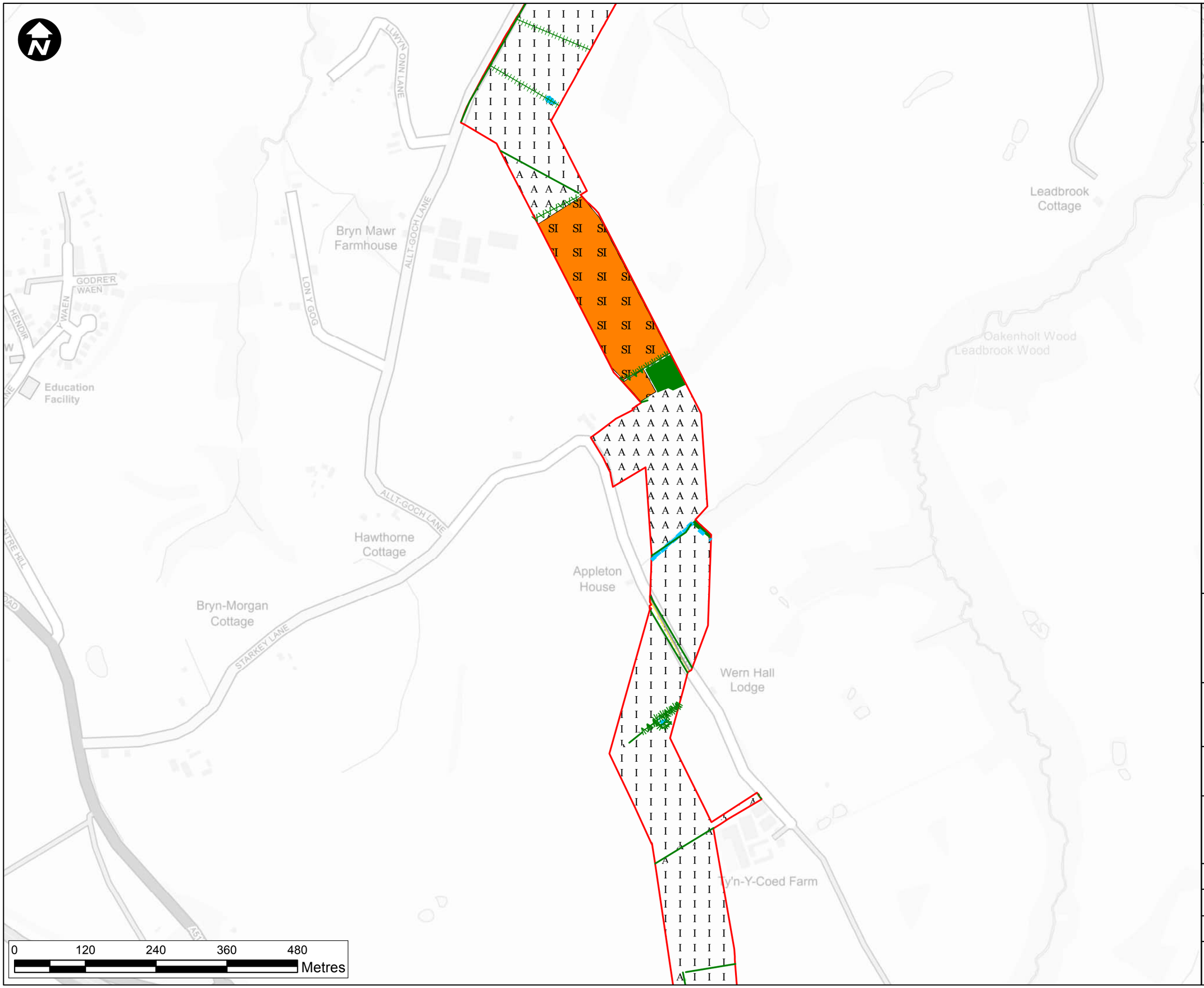
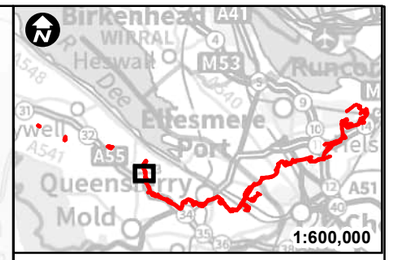
EN070007-APP-ES-9.1.3-Sheet 19





Key:

- Newbuild Infrastructure Boundary
- Dry ditch
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Hard standing
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Bare ground
- Broad-Leaved Parkland/scattered trees
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 20 of 24

DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

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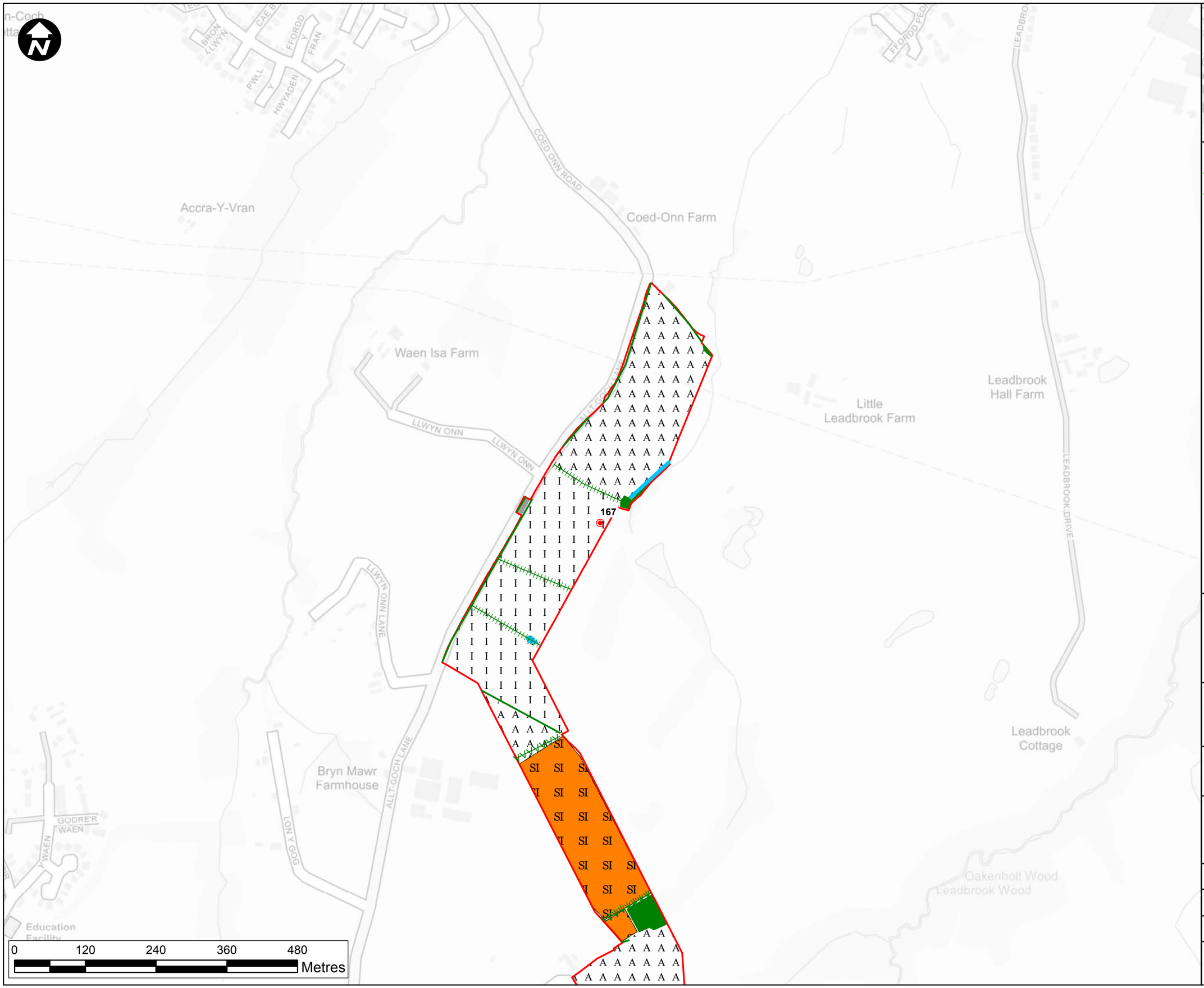
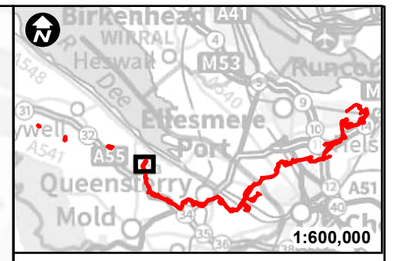
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,844	15/08/2023	C

DRAWING NUMBER
EN070007-APP-ES-9.1.3-Sheet 20





Key:

- Newbuild Infrastructure Boundary
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Running water
- Broadleaved woodland - semi-natural
- Mixed woodland - semi-natural
- Neutral grassland - semi-improved
- Improved grassland
- Poor semi-improved grassland
- Standing water
- Hard standing
- Cultivated/disturbed land - arable
- Bare ground
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 21 of 24

DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

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SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,844	15/08/2023	C

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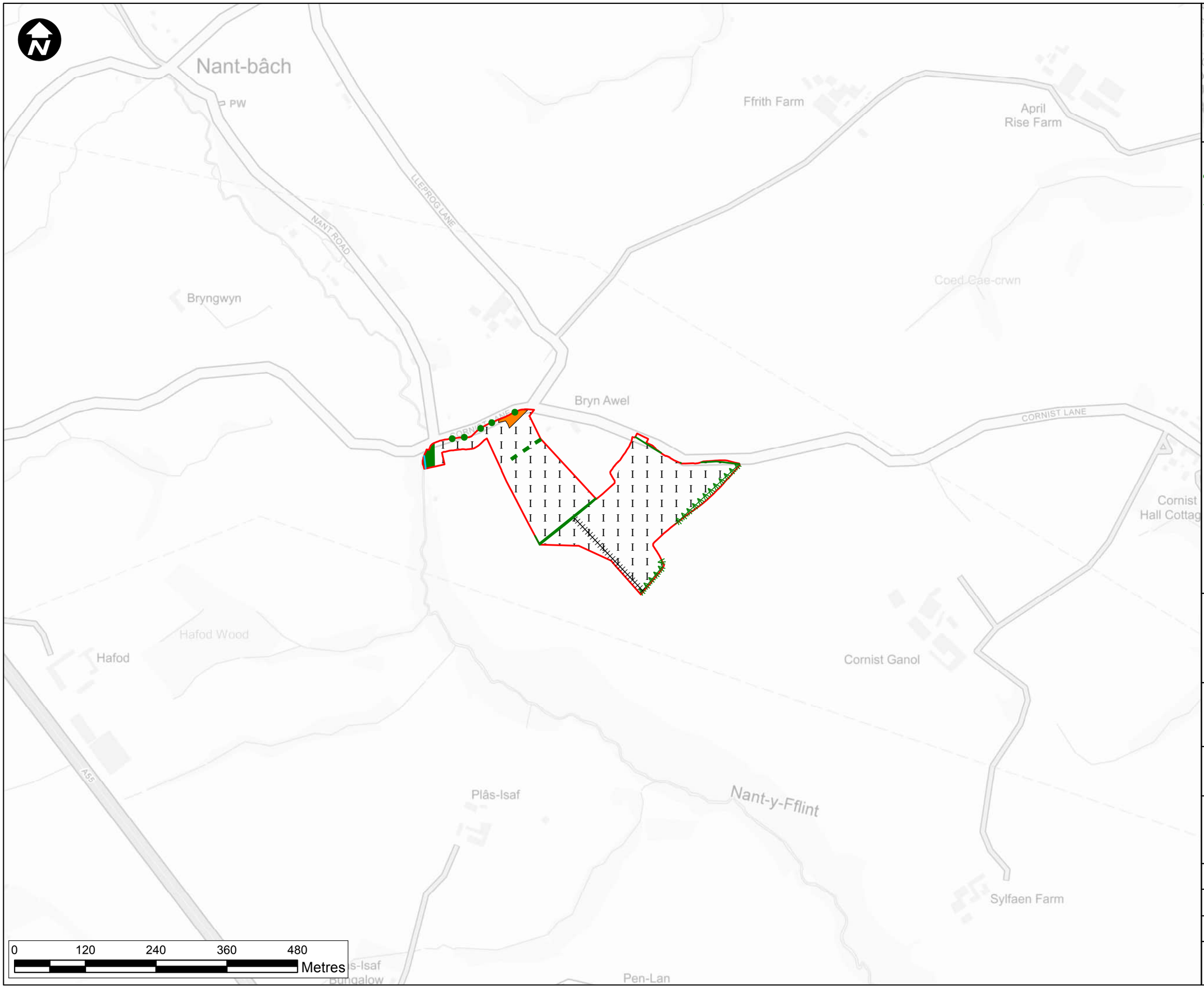
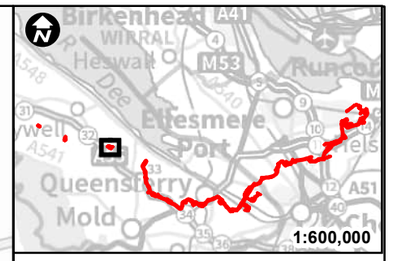




Key:

- Newbuild Infrastructure Boundary
- Broadleaved Parkland/scattered trees
- Defunct hedge - species-poor
- Fence
- Hedge with trees - native species-rich
- Intact hedge - species-poor
- Running water - eutrophic
- Broadleaved woodland - semi-natural
- Neutral grassland - unimproved
- Improved grassland

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

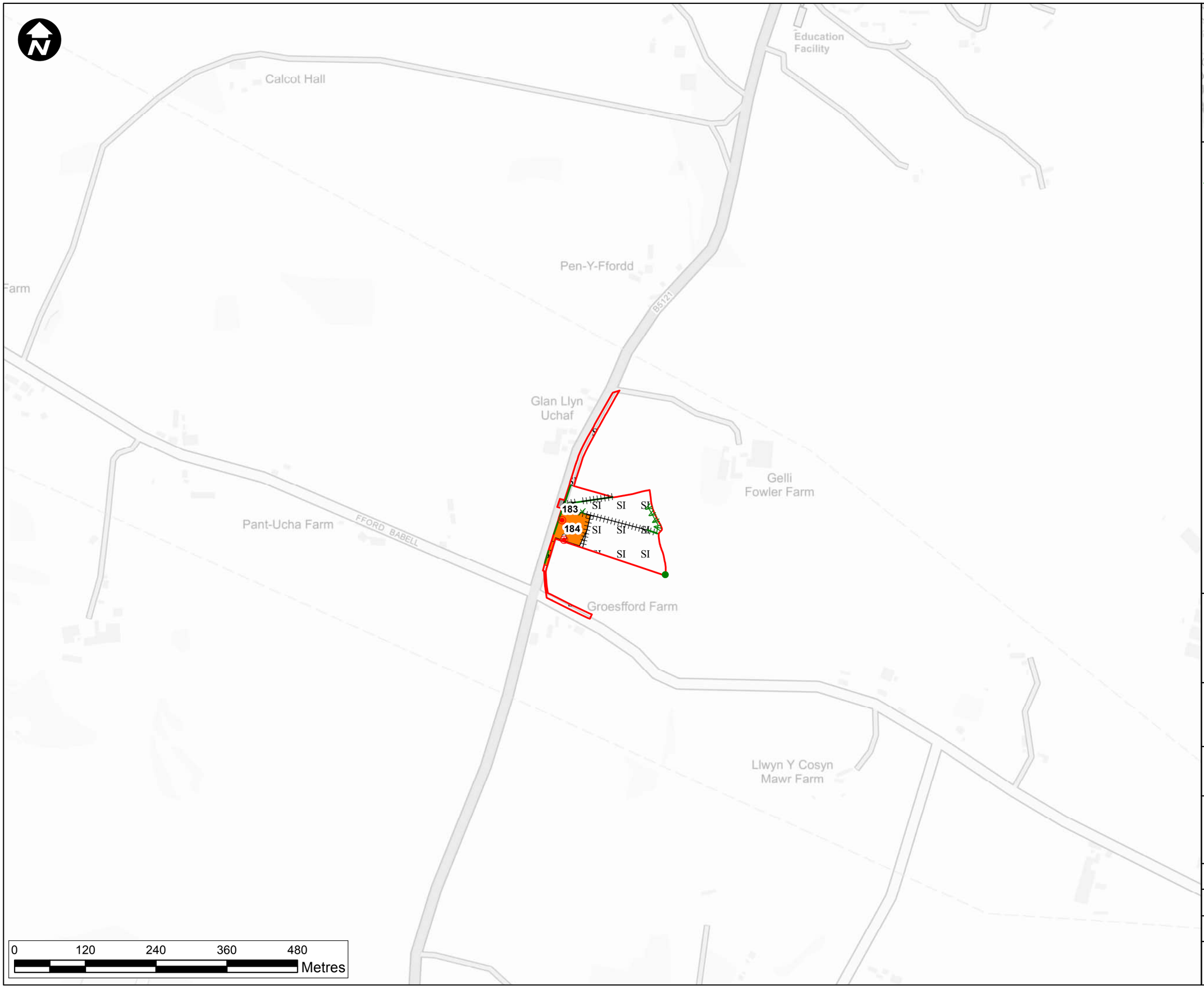
DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 22 of 24

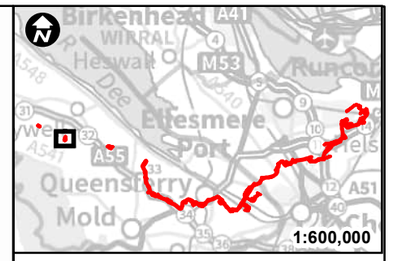
DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,844	15/08/2023	C

DRAWING NUMBER
EN070007-APP-ES-9.1.3-Sheet 22





Key:

- Newbuild Infrastructure Boundary
- Fence
- Hedge with trees - native species-rich
- Intact hedge - species-poor
- Neutral grassland - semi-improved
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Hard standing
- Broad-Leaved Parkland/scattered trees
- Scrub - scattered
- Target Note

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 23 of 24

DRAWING STATUS
Final for DCO Examination - submitted for Deadline 7

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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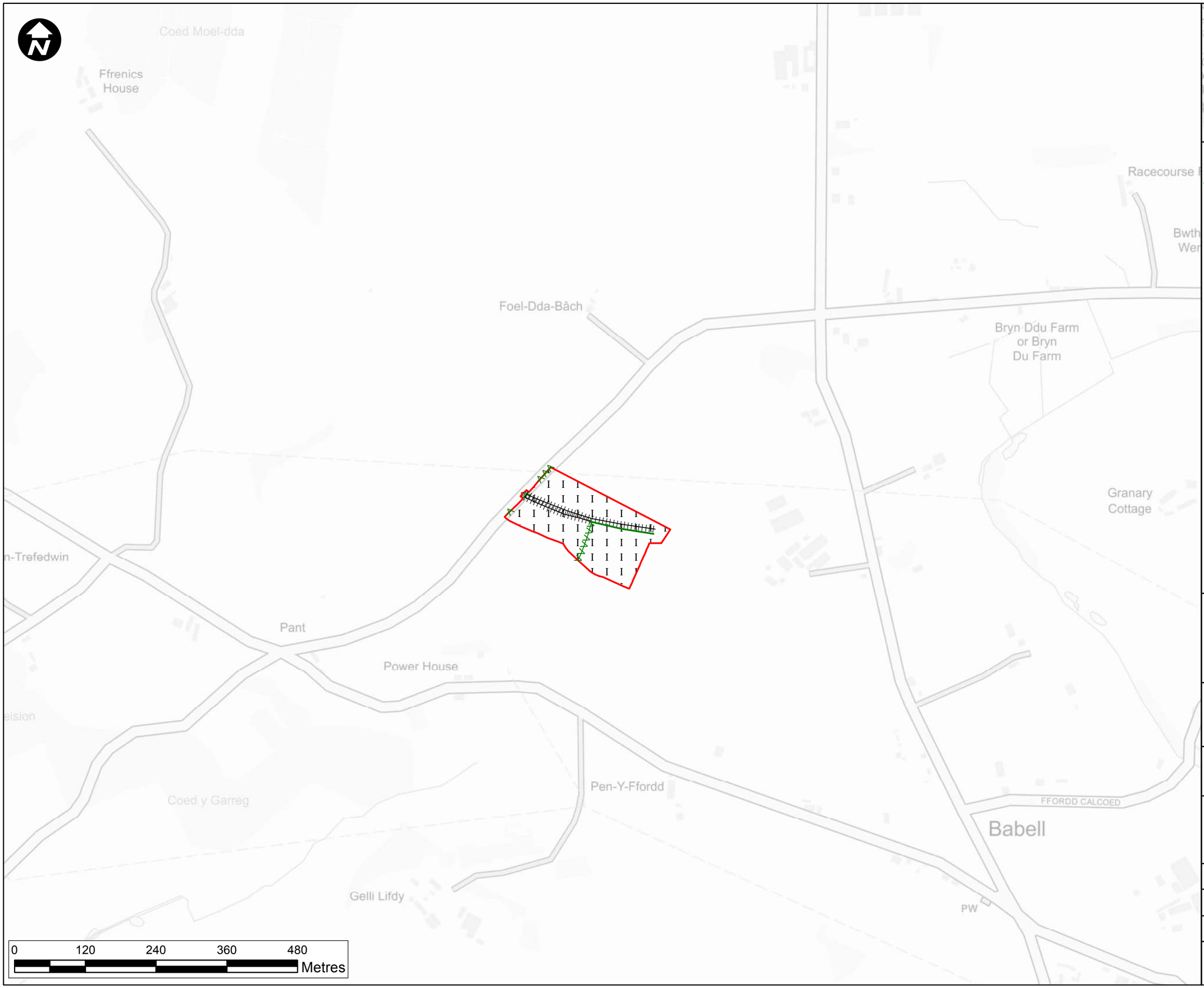
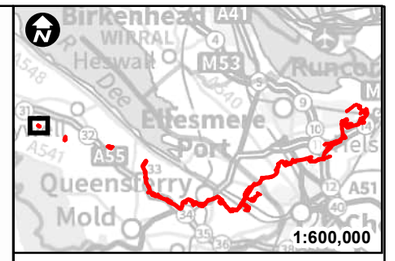
DRAWING NUMBER
EN070007-APP-ES-9.1.3-Sheet 23





Key:

- Newbuild Infrastructure Boundary
- Fence
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Improved grassland
- Hard standing

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.3
Results of Phase 1 Habitat Survey
Page 24 of 24

DRAWING STATUS

Final for DCO Examination - submitted for Deadline 7

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SCALE @ A3 SIZE	DATE	REVISION
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DRAWING NUMBER

EN070007-APP-ES-9.1.3-Sheet 24

Figure 9.1.4 – Results of NVC Surveys

East Central Drain

MG7d

Elton Lane Ditch 2

West Central Drain

Elton Lane Ditch 1

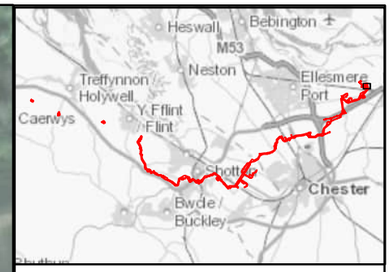
Elton Lane Ditch 4

Elton Lane Ditch 5

MG7d

Elton Lane South Ditch

0 30 60 90 120 Metres



Key

- Ditch
- Newbuild Infrastructure Boundary
- MG7d - Lolium perenne leys and related grasslands, Lolium perenne-Alopecurus pratensis grassland

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.4
NVC Survey Results
Frodsham & Ince Marshes LWS
(North of Railway)

DRAWING STATUS

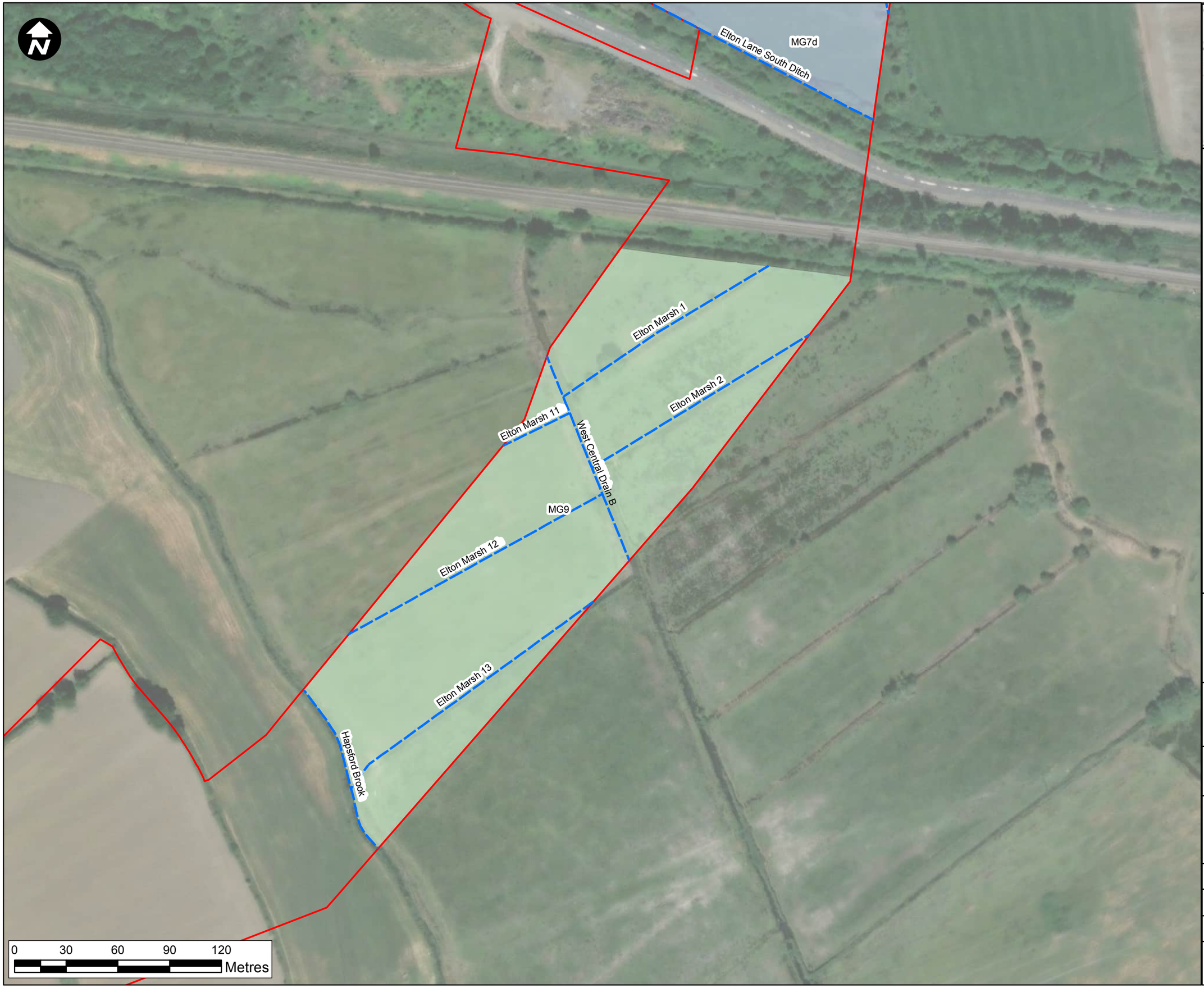
Final for DCO Examination - submitted at Deadline 7

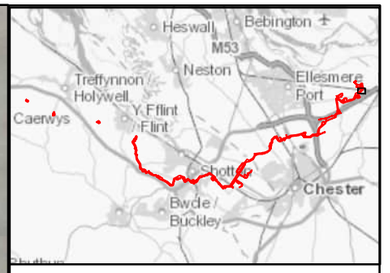
DRAWN	CHECKED	APPROVED	AUTHORISED
ES	JOK	DC	EH

SCALE @ A3 SIZE	DATE	REVISION
1:2,000	18/08/2023	C

DRAWING NUMBER

EN070007-APP-ES-9.1.4-Sheet 1





Key

- Ditch
- Newbuild Infrastructure Boundary
- MG7d - Lolium perenne leys and related grasslands, Lolium perenne-Alopecurus pratensis grassland
- MG9 - Holcus lanatus-Deschampsia cespitosa grassland

HyNet North West

PROJECT TITLE

HyNet North West
Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.4
NVC Survey Results
Frodsham & Ince Marshes LWS
(North of Railway)

DRAWING STATUS

Final for DCO Examination - submitted at Deadline 7

DRAWN	CHECKED	APPROVED	AUTHORISED
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SCALE @ A3 SIZE	DATE	REVISION
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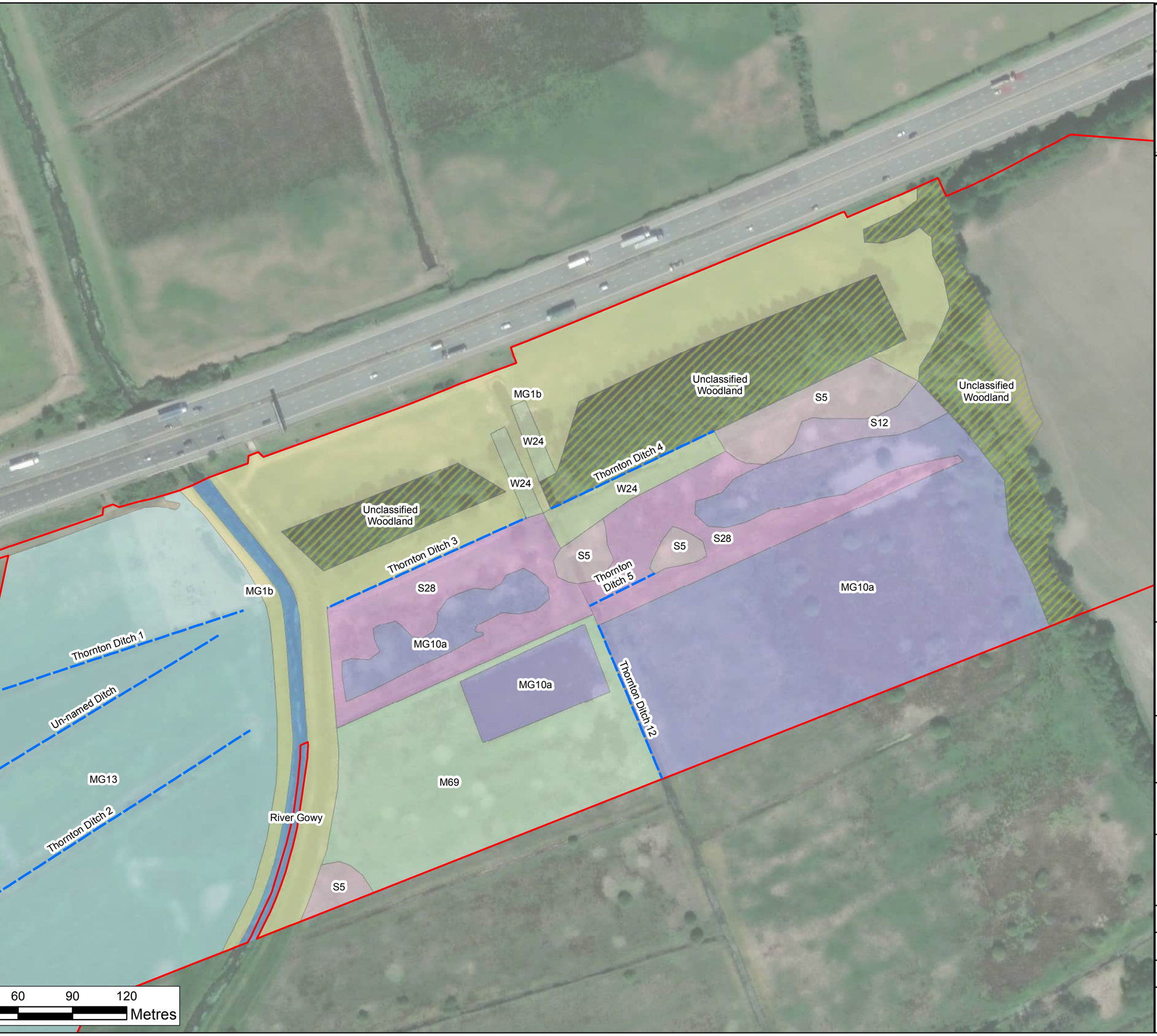
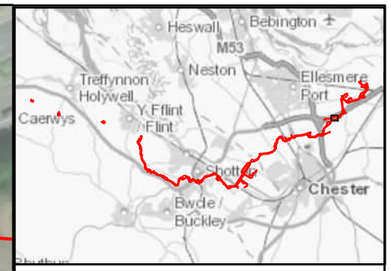
DRAWING NUMBER

EN070007-APP-ES-9.1.4-Sheet 2





Key

- Ditch
- Newbuild Infrastructure Boundary
- MG10a - Holcus lanatus-Juncus effusus rush-pasture, typical sub-community
- MG13 - Agrostis stolonifera-Alopecurus geniculatus grassland
- MG1b - Arrhenatherum elatius grassland, Urtica dioica sub-community
- MG9 - Holcus lanatus-Deschampsia cespitosa grassland
- River Gowy
- S12 - Typha latifolia swamp
- S28 - Phalaris arundinacea tall-herb fen
- S5 - Glyceria maxima swamp
- Un classified Woodland
- W24 - Rubus fruticosus-Holcus lanatus underscrub

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

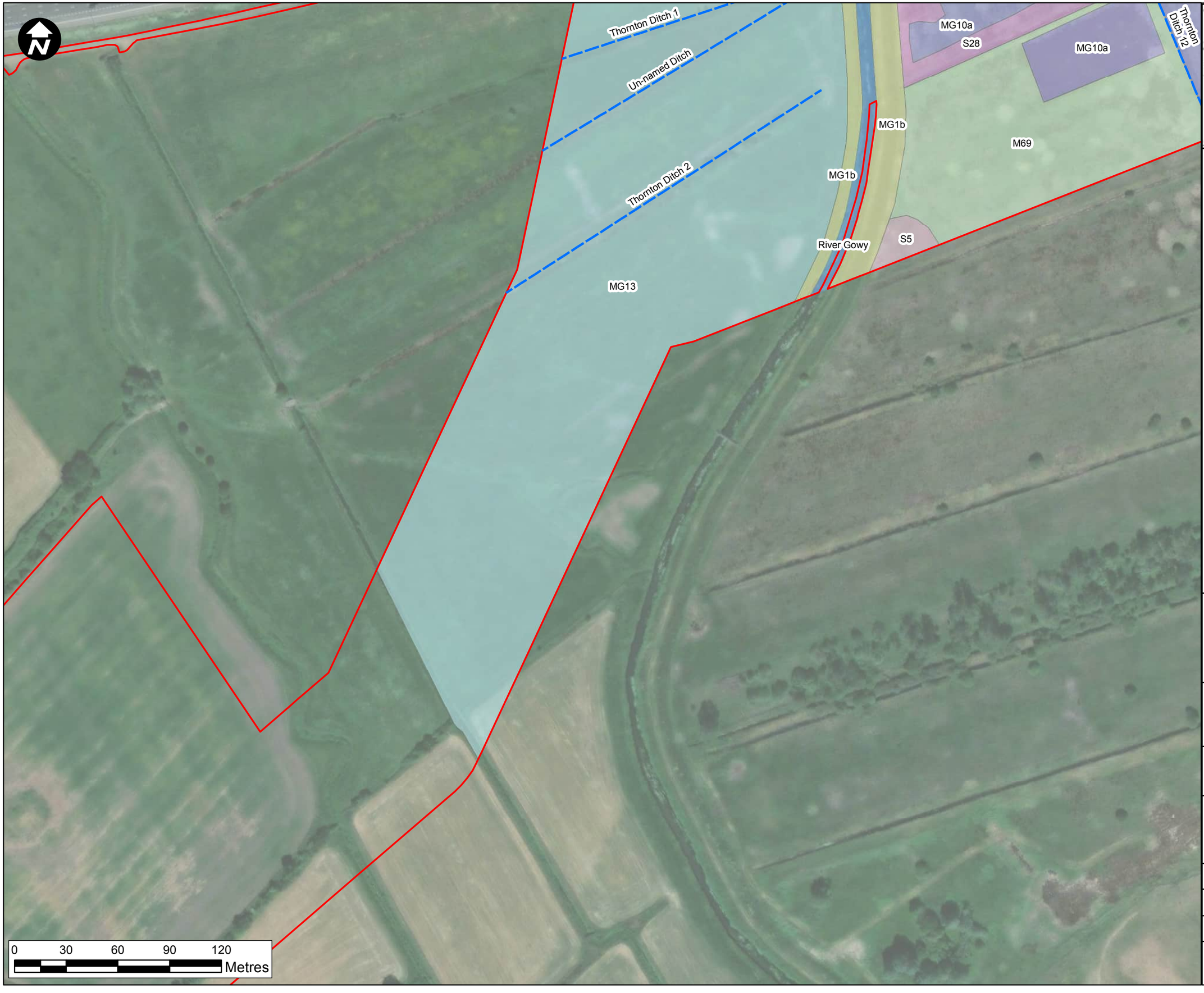
DRAWING TITLE
Figure 9.1.4
NVC Survey Results
Gowy Meadows & Ditches LWS
East of River

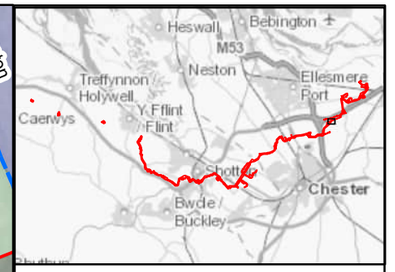
DRAWING STATUS
Final for DCO Examination - submitted at Deadline 7

DRAWN	CHECKED	APPROVED	AUTHORISED
ES	JOK	DC	EH

SCALE @ A3 SIZE	DATE	REVISION
1:2,000	18/08/2023	C

DRAWING NUMBER
EN070007-APP-ES-9.1.4-Sheet 3





Key

- Ditch
- Newbuild Infrastructure Boundary
- MG10a - Holcus lanatus-Juncus effusus rush-pasture, typical sub-community
- MG13 - Agrostis stolonifera-Alopecurus geniculatus grassland
- MG1b - Arrhenatherum elatius grassland, Urtica dioica sub-community
- MG9 - Holcus lanatus-Deschampsia cespitosa grassland
- River Gowy
- S28 - Phalaris arundinacea tall-herb fen
- S5 - Glyceria maxima swamp

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.4
NVC Survey Results
Gowy Meadows & Ditches LWS
(West of River)

DRAWING STATUS

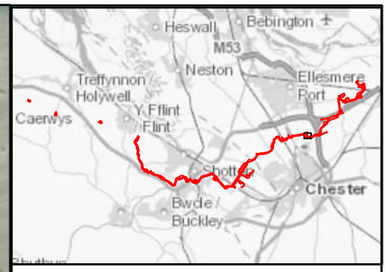
Final for DCO Examination - submitted at Deadline 7

DRAWN	CHECKED	APPROVED	AUTHORISED
ES	JOK	DC	EH

SCALE @ A3 SIZE	DATE	REVISION
1:2,000	18/08/2023	C

DRAWING NUMBER

EN070007-APP-ES-9.1.4-Sheet 4



Key

- Ditch
- Newbuild Infrastructure Boundary
- MG7d - Lolium perenne leys and related grasslands, Lolium perenne-Alopecurus pratensis grassland
- W22 - Prunus spinosa-Rubus fruticosus scrub
- W24 - Rubus fruticosus-Holcus lanatus underscrub

HyNet North West

PROJECT TITLE

HyNet North West
Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.4
NVC Survey Results
Land adjacent to Shropshire Union canal LWS

DRAWING STATUS

Final for DCO Examination - submitted at Deadline 7

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ES	JOK	DC	EH

SCALE @ A3 SIZE	DATE	REVISION
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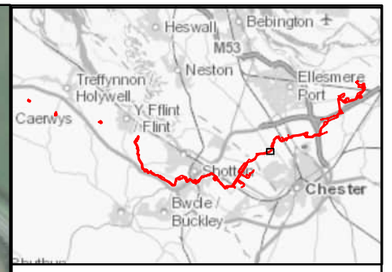
DRAWING NUMBER

EN070007-APP-ES-9.1.4-Sheet 5



Key

- Ditch
- Newbuild Infrastructure Boundary
- MG7 - Lolium perenne leys and related grasslands
- W8 - Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.4
NVC Survey Results
Wood West of
Crabwell Manor LWS

DRAWING STATUS

Final for DCO Examination - submitted at Deadline 7

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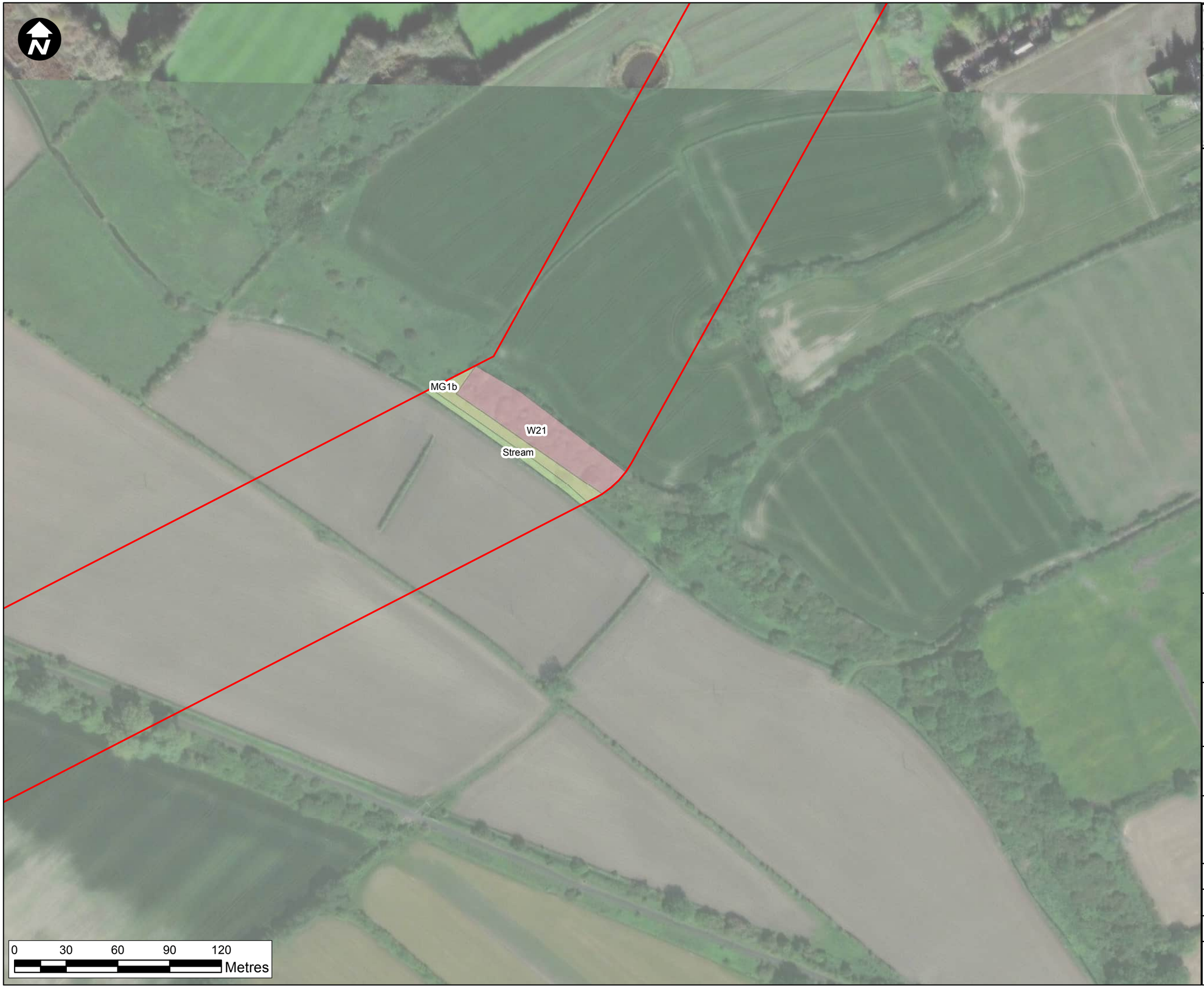
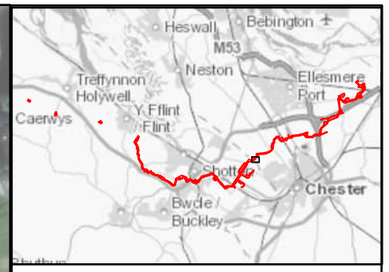
ES	JOK	DC	EH

SCALE @ A3 SIZE	DATE	REVISION
1:2,000	18/08/2023	C

DRAWING NUMBER

EN070007-APP-ES-9.1.4-Sheet 6





Key

- Ditch
- Newbuild Infrastructure Boundary
- MG1b - Arrhenatherum elatius grassland, Urtica dioica sub-community
- Stream
- W21 - Crataegus monogyna-Hedera helix scrub

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.4
NVC Survey Results
Saughall Bank LWS

DRAWING STATUS

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SCALE @ A3 SIZE	DATE	REVISION
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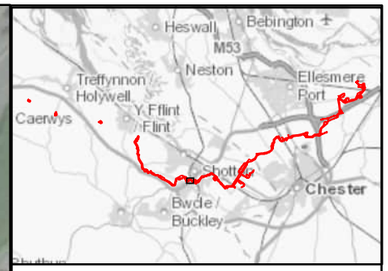
DRAWING NUMBER

EN070007-APP-ES-9.1.4-Sheet 7



Key

- Ditch
- Newbuild Infrastructure Boundary
- MG6a - Lolium perenne-cynosurus cristatus grasslands -typical sub-community
- Un classified Woodland

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.4
NVC Survey Results
A494/ Ewloe Woodland

DRAWING STATUS

Final for DCO Examination - submitted at Deadline 7

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ES	JOK	DC	EH

SCALE @ A3 SIZE	DATE	REVISION
1:2,000	18/08/2023	C

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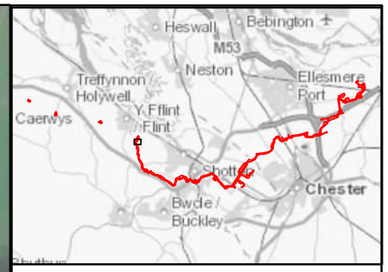
EN070007-APP-ES-9.1.4-Sheet 8



Key

- Ditch
- Newbuild Infrastructure Boundary
- Flint AGI Ancient Woodland
- W6 Alnusglutinosa-Urtica dioica woodland

HyNet North West

PROJECT TITLE

HyNet North West
Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 9.1.4
NVC Survey Results
Flint AGI Woodland

DRAWING STATUS

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SCALE @ A3 SIZE	DATE	REVISION
1:2,000	18/08/2023	C

DRAWING NUMBER

EN070007-APP-ES-9.1.4-Sheet 9

ANNEX B

TARGET NOTES

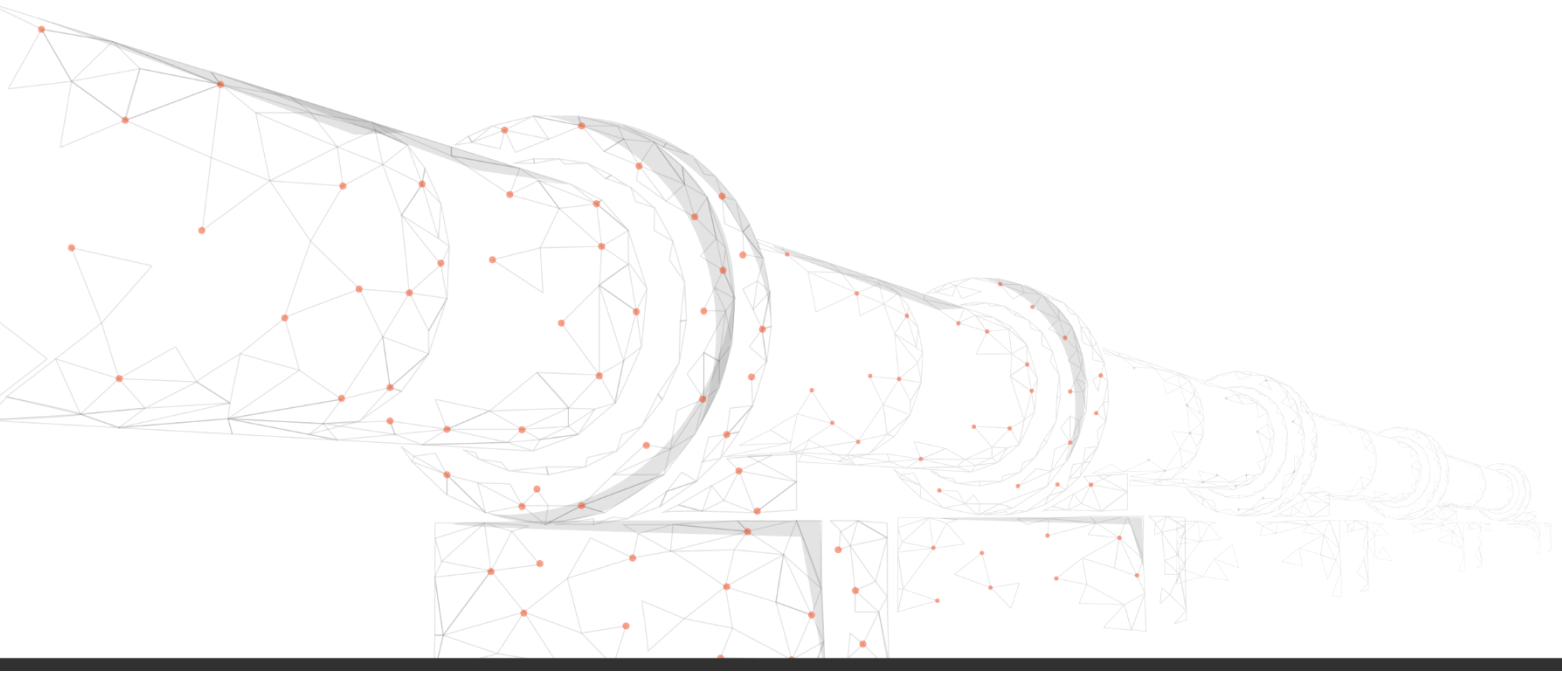

Table 12 – Target Notes

Target Note No.	Description
3	Large pile of debris/fly tipping
4	Stands of Himalayan balsam
5	Stands of Himalayan balsam
6	Area of soft rush within improved grassland habitat
10	Japanese knotweed
11	Japanese knotweed very large within hedge 8m x 4m (LxW)
12	Japanese knotweed, small, 2mx3m
13	Japanese knotweed, small, 1mx1m
14	Dry ditch
15	Large section of hedge is completely dominated by Japanese knotweed, ~50m
16	Crops eaten, 45 degree angle bite marks.
33	Dry pond in west side of field
43	Large pile of dead wood in damp dip, possibly used to be a pond. Rush and willow growing around edge
44	Large pile of deadwood
63	Historic pond, now dry
64	Large, old ash tree. possibly veteran. tree tag 0181
86	Small area of ground where wet ditch has flowed into the field and created a wet area with some hard rush and tall ruderal vegetation. Water appears to flow from here into Pond 2.
88	Pile of cleared wood
89	Pile of cleared wood
90	Pile of debris, overgrown with buddleia, birch sp., and willow sp. scrub.
91	Pile of concrete railway sleepers, overgrown with birch sp., and willow sp. scrub.
93	Pile of cleared wood
96	Rhododendron regeneration. Ornamentally planted throughout wildlife park but starting to feature along watercourse.
97	Dead buzzard. No apparent injuries.
101	Marshy wetland. Inaccessible due to land constraints
122	Three standing dead trees with ivy cover halfway down steep slope adjacent to each other
123	Standing deadwood

Target Note No.	Description
130	Giant hogweed located in ditch. Discovered 27/04/22
131	Giant hogweed located in ditch. Discovered 27/04/22
132	Giant hogweed located in ditch. Discovered 27/04/22
156	Large slurry tank
158	Mammal pass likely fox
159	Variegated yellow archangel located in woodland ditch along stream
162	Japanese knotweed
161	Japanese knotweed
160	Japanese knotweed
163	Variegated yellow archangel
164	Pile of plastic waste in corner of field
166	Large fenced off depression in the ground next to scattered sycamore tree. Potentially was once a pond but now dry and full of rubbish (tyres etc). Common nettle and bindweed present.
167	Hollow within improved grassland field, which appeared to be a possible pond on aerial imagery. This hollow was found to not contain any standing water but did possess elevated moisture levels, evidenced by the frequent presence of soft rush *Juncus effus*
168	Dry depression on land, perhaps once a pond but has been dry for quite a while.
172	Small culvert, appears to lead under the motorway.
176	Pylon
177	Culverted watercourse under road, running through woodland.
178	Damp depression full of soft rush, great willow and hawthorn around the edge, with duckweed and sweet grass found on top. Likely holds more water in winter
180	Marginal vegetation of the grassland field is dominated by reed grass
181	Large shipping container in woodland
182	Brown hare within barley crop
183	Large area of wrapped round silage bales on existing SI grassland
184	Small area of short perennial/ bare ground with pineapple weed and willowherb present
185	Lots of farming equipment e.g old tires, pipes, trailers, other general debris
186	Farming debris and bonfire pit
187	Hibernacula with rubble and deadwood
190	Reed bed

Target Note No.	Description
191	Three holes in sandy bank below fence line. possibly fox.
192	Possible pond here but scrub is too dense to see
205	Recently felled ash trees and brash piles
207	Trees have no features for bats
209	Barn owl box
210	Camera trap on mammal trail
211	Wood pile, potential hibernacula
214	Barn owl box on pole. Fairly new. No evidence of use
222	Standing deadwood
223	Potential iron deposit
229	Bramble scrub encroachment
230	Rush more dominant, boggy area
231	Mound of straw. Like used animal bedding from the zoo. Been there a while as broadleaved dock and grasses growing on side
232	Skylark present in field and adjacent fields

ANNEX C

FLORISTIC TABLES AND SPECIES LISTS

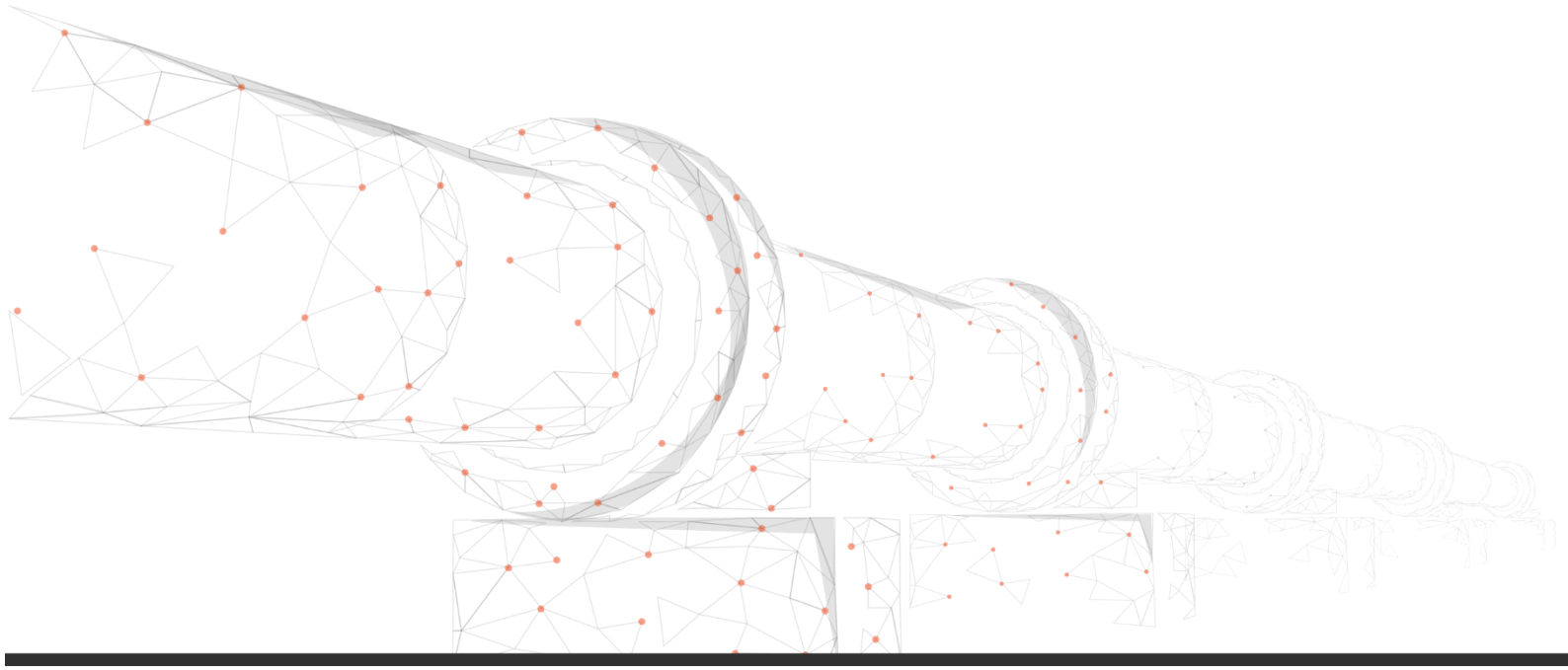

Table 13 – Flint AGI Ancient Woodland/Little Leadbrook Species List

Scientific Name	Common Name	DAFOR
Trees/Shrubs		
Alnus glutinosa	alder	D
Corylus avellana	hazel	R
Crataegus monogyna	hawthorn	F
Fraxinus excelsior	ash	R
Quercus robur	pedunculate oak	R
Rosa sp.	rose	R
Salix cinerea	grey willow	F
Ground Flora		
Agrostis stolonifera	creeping bent	A
Allium ursinum	ramsons	F
Brachypodium sylvaticum	false-brome	R
Carex remota	remote sedge	O
Circaea lutetiana	enchanter's-nightshade	F
Dactylis glomerata	cock's-foot	R
Dryopteris dilatata	broad buckler-fern	R
Dryopteris filix-mas	male fern	R
Equisetum telmateia	great horsetail	O
Galium album	hedge bedstraw	R
Galium aparine	cleavers	R
Geranium robertianum	herb-robert	O
Geum urbanum	wood avens	O
Heracleum sphondyllium	hogweed	R
Holcus mollis	creeping soft-grass	F
Lysimachia nemorum	yellow pimpernel	F
Melica uniflora	wood melick	R
Mercurialis perennis	dog's mercury	O
Oenanthe crocata	hemlock water-dropwort	F

Scientific Name	Common Name	DAFOR
Potentill reptans	creeping cinquefoil	O
Prunella vulgaris	selfheal	O
Ranunculus repens	creeping buttercup	F
Rumex sanguineus	wood dock	F
Solanum dulcamara	bittersweet	R
Stachys sylvatica	hedge woundwort	O
Tamus communis	black bryony	R
Urtica dioica	common nettle	F
Veronica beccabunga	brooklime	R
Veronica montana	wood speedwell	O
Wet Hollow		
Angelica sylvestris	wild angelica	R
Carex hirta	hairy sedge	F
Cirsium palustre	marsh thistle	O
Deschampsia cespitosa	tufted hair-grass	R
Epilobium hirsutum	great willowherb	A
Equisetum palustre	marsh horsetail	D
Eupatorium cannabinum	hemp agrimony	O
Galium palustre	marsh bedstraw	F
Glyceria fuitans	floating sweet-grass	O
Holcus lanatus	Yorkshire-fog	F
Juncus inflexus	hard rush	A
Lathyrus pratensis	meadow vetchling	R
Lotus pedunculatus	greater bird's-foot trefoil	F
Mentha aquatica	water mint	O
Myosotis scorpioides	water forget-me-not	R
Silene flos-cuculi	ragged robin	O

Table 14 – Church Lane Woodland - Grassland

Quadrat Number		**Q1**	**Q2**	**Q3**	
Quadrat Grid Reference		SJ 30238 66910	SJ 30233 66932	SJ 30219 66927	
Scientific Name	**Common Name**	**Cover (Domin)**			**Frequency**
Agrostis capillaris	common bent	7	6	8	V
Centaurea nigra	common knapweed	5	7	5	V
Cynosurus cristatus	crested dog's-tail	4	3	3	V
Holcus lanatus	Yorkshire-fog	6	5	7	V
Jacaobaea vulgaris	common ragwort	2	4	6	V
Lolium perenne	perennial rye-grass	7	6	5	V
Odonites vernus	red bartsia	5	6	5	V
Plantago lanceolata	ribwort plantatin	6	5	7	V
Potentilla reptans	creeping cinquefoil	6	6	7	V
Prunella vulgaris	selfheal	3	5	8	V
Ranunculus repens	creeping buttercup	8	7	6	V
Trifolium repens	white clover	7	7	8	V
Achillea millefolium	yarrow		5	6	IV
Dactylis glomerata	cock's-foot		3	2	IV
Poa trivialis	rough meadow-grass	4	2		IV
Cerastium fontanum	common mouse-ear	3			II
Heracleum sphondyllium	hogweed			2	II
Stellaria graminea	lesser stitchwort	2			II

Trifolium pratense	red clover		4		II
Vicia cracca	tufted vetch	2			II

MATCH Similarity Coefficients %				
MG6a	**MG6**	**MG6b**	**MG7e**	**MG6c**
53.2	52.1	51.4	48.7	47.7

Quadrat 1

Quadrat 2

Quadrat 3

Table 15 – Church Lane Woodland - Woodland

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 30298 67009	SJ 30326 66983	SJ 30292 66990	
Scientific Name	**Common Name**	**Cover (Domin)**			
Canopy					
Acer pseudoplatanus	sycamore	9	9	10	V
Quercus robur	pedunculate oak	4		2	I V
Acer platanoides	Norway maple		2		I I
Understorey					
Acer pseudoplatanus	sycamore	5	4	3	V
Crataegus monogyna	hawthorn	4	7	5	V
Sambucus nigra	elder	3	3	5	V
Acer platanoides	Norway maple	1			I I
	Ground Layer				
Rubus fruticosus agg.	bramble	2	2	2	V
Urtica dioica	common nettle	8	4	8	V
Dryopteris filix-mas	male fern	3	7		I V
Geum urbanum	wood avens	2		2	I V
Rumex sanguineus	wood dock	2		5	I V

Acer platanoides	Norway maple		2		I I
Galium aparine	cleavers		3		I I
Ranunculus repens	creeping buttercup		5		I I
Rumex obtusifolius	broad-leaved dock		2		I I

	MATCH Similarity Coefficients %				
	W6	**W6d**	**W6e**	**W21a**	**W 6 b**
36.1	35.1	33.0	31.9	31.8	

Quadrat 1	**Quadrat 2**

Quadrat 3	

Table 16 – Church Lane Woodland - Woodland And Grassland Additional Species List

Scientific Name	Common Name	DAFOR
Alliaria petiolata	garlic mustard	O
Aquilegia vulgaris	columbine	R
Asplenium scolopendrium	hart's-tongue	R
Aucuba japonica	spotted-laurel	R
Bellis perennis	daisy	R
Buddleja davidii	butterfly-bush	R
Calystegia sepium	hedge bindweed	R
Centaurium erythraea	common centaury	O
Cupressus x *leylandii*	Leyland cypress	R
Deschampsia cespitosa	tufted hair-grass	R
Epilobium montanum	broad-leaved willowherb	F
Fraxinus excelsior	ash	R
Geranium robertianum	herb-robert	O
Glechoma hederacea	ground-ivy	O
Hedera helix	ivy	O
Hypericum perforatum	perforate st john's-wort	R
Hypochaeris radicata	common cat's-ear	O
Leontodon autumnalis	autumn hawkbit	R
Lonicera periclymenum	honeysuckle	R
Lotus corniculatus	common bird's-foot trefoil	O
Lysimachia arvensis	scarlet pimpernel	R
Pinus sylvestris	Scots pine	R
Prunus avium	wild cherry	O
Ranunculus acris	meadow buttercup	O
Reseda luteola	weld	R
Rosa canina	dog rose	O
Stachys sylvatica	hedge woundwort	F
Torilis japonica	upright hedge-parsley	O

Scientific Name	Common Name	DAFOR
Tussilago farfara	colt's-foot	R
Veronica chamaedrys	germander speedwell	O
Veronica montana	wood speedwell	R
Viola riviniana	common dog-violet	O

Table 17 – Saughall Bank LWS - Grassland

Quadrat Number		**Q1**	**Q2**	**Q3**	**R**
Quadrat Grid Reference		SJ 36519 68959	SJ 36477 68971	SJ 36450 68992	
Scientific Name	**Common Name**	**Cover (Domin)**			
Dactylis glomerata	cock's-foot	4	4	6	V
Galium aparine	cleavers	7	7	5	V
Heracleum sphondyllium	hogweed	7	8	3	V
Holcus lanatus	Yorkshire-fog	3	7	9	V
Poa trivialis	rough meadow-grass	8	5	4	V
Ranunculus acris	meadow buttercup	5	4	2	V
Ranunculus repens	creeping buttercup	7	7	6	V
Urtica dioica	common nettle	5	3	6	V
Arrhenatherum elatius	false oat-grass		6	6	I V
Cirsium arvense	creeping thistle		4	5	I V
Epilobium hirsutum	great willowherb	4		5	I V

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 36519 68959	SJ 36477 68971	SJ 36450 68992	
Scientific Name	**Common Name**	**Cover (Domin)**			
Lolium perenne	perennial rye-grass		4	2	
Rumex obtusifolius	broad-leaved dock	6		5	
Alliaria petiolata	garlic mustard	1			
Alopecurus pratensis	meadow foxtail			6	
Anisantha sterilis	barren brome	4			
Anthriscus sylvestris	cow parsley		3		
Lamium purpureum	red dead-nettle	5			
Lathyrus pratensis	meadow vetchling			5	
Leucanthemum vulgare	oxeye daisy		6		
Phragmites australis	common reed			2	
Scrophularia auriculata	water figwort	2			
Veronica chamaedrys	germander speedwell		4		
Vicia sativa	common vetch		5		
	MATCH Similarity Coefficients %				

Quadrat Number		Q1	Q2	Q3	F
Quadrat Grid Reference		SJ 36519 68959	SJ 36477 68971	SJ 36450 68992	
Scientific Name	Common Name	Cover (Domin)			
	MG1b	MG1c	MG1a	MG1	
50.6	49.5	43.9	42.1	38.6	

Quadrat 1	Quadrat 2

Quadrat 3	

Table 18 – Wood West of Crabwell Manow LWS - Grassland (West of Woodland)

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 37780 69665	SJ 37788 69725	SJ 37795 69771	
Scientific Name	**Common Name**	**Cover (Domin)**			
Bromus hordeaceus	soft-brome	9	9	8	
Cerastium fontanum	common mouse-ear	2	3	2	
Cirsium arvense	creeping thistle	2	2	4	
Taraxacum officinale agg.	dandelion	3	5	7	
Lolium perenne	perennial rye-grass	5		5	
Ranunculus repens	creeping buttercup	1	3		
Alopecurus pratensis	meadow foxtail			4	
Rumex acetosa	common sorrel	3			

MATCH Similarity Coefficients %				
MG7d	**MG7b**	**MG7c**	**MG6a**	**M**
39.4	38.5	37.6	36.6	

	
Quadrat 1	**Quadrat 2**
	
Quadrat 3	

Table 19 – Wood West of Crabwell Manor LWS - Grassland (East of Woodland)

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		**SJ 38003 69729**	**SJ 38000 69753**	**SJ 37988 69779**	
Scientific Name	**Common Name**	**Cover (Domin)**			
Bromus hordeaceus	soft-brome	8	9	7	
Cerastium fontanum	common mouse-ear	3	5	2	
Lolium perenne	perennial rye-grass	6	5	7	
Ranunculus acris	meadow buttercup	5	4	5	
Ranunculus repens	creeping buttercup	6	6	5	
Taraxacum officinale agg.	dandelion	6	7	7	
Holcus lanatus	Yorkshire-fog	7		5	
Rumex acetosa	common sorrel		6	6	
Alopecurus pratensis	meadow foxtail			3	
Cirsium arvense	creeping thistle		2		

	MATCH Similarity Coefficients %				
	MG7d	**MG6a**	**MG7c**	**MG7b**	**M**
52.4	49.6	49.1	47.6	46.2	

	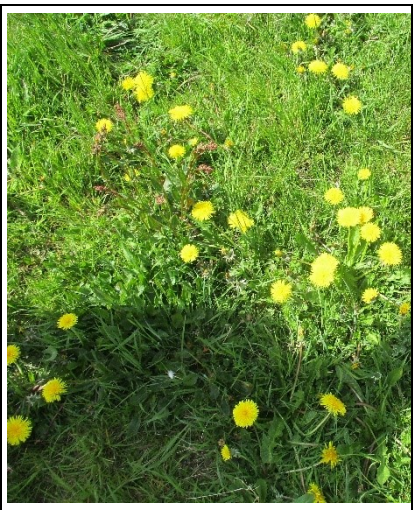
Quadrat 1	**Quadrat 2**
	
Quadrat 3	

Table 20 – Species List for Wood West of Crabwell Manor LWS

Scientific Name	Common Name	DAFOR
Trees/Shrubs		
Acer pseudoplatanus	sycamore	F
Aesculus hippocastanum	horse chestnut	R
Corylus avellana	hazel	F
Crataegus monogyna	hawthorn	F
Fagus sylvatica	beech	O
Fraxinus excelsior	ash	R
Prunus avium	wild cherry	O

Scientific Name	Common Name	DAFOR
Prunus spinosa	blackthorn	R
Quercus robur	pedunculate oak	A
Rosa sp.	rose	R
Salix caprea	goat willow	R
Salix cinerea	grey willow	O
Sambucus nigra	elder	O
Ground Flora		
Aegopodium podagraria	ground-elder	R
Agrostis capillaris	common bent	O
Agrostis stolonifera	creeping bent	R
Alliaria petiolata	garlic mustard	F
Anemone nemorosa	wood anemone	LA
Anthoxanthum odoratum	sweet vernal-grass	R
Anthriscus sylvestris	cow parsley	O
Arum maculatum	lords-and-ladies	O
Asplenium scolopendrium	hart's-tongue	R
Brachypodium sylvaticum	false-brome	R
Cardamine hirsuta	hairy bittercress	R
Carex pendula	pendulous sedge	R
Carex remota	remote sedge	R
Circaea lutetiana	enchanter's-nightshade	R
Conopodium majus	pignut	O
Dactylis glomerata	cock's-foot	R
Dryopteris dilatata	broad buckler-fern	O
Dryopteris filix-mas	male fern	O
Ficaria verna	lesser celandine	LA
Filipendula ulmaria	meadowsweet	R
Fraxinus excelsior	ash seedlings	F
Galium aparine	cleavers	F

Scientific Name	Common Name	DAFOR
Geranium robertianum	herb-robert	O
Geum urbanum	wood avens	O
Hedera helix	ivy	O
Heracleum mantegazzianum	giant hogweed	F
Heracleum sphondyllium	hogweed	O
Hyacinthoides hispanica	Spanish bluebell	R
Hypericum perforatum	perforate st. john's-wort	R
Kindbergia praelonga	common feather-moss	F
Lamiastrum galeobdolon ssp. *argentatum*	variegated yellow archangel	LA
Luzula campestris	field wood-rush	R
Mercurialis perennis	dog's mercury	O
Mnium hornum	swan's-neck thyme-moss	O
Oenanthe crocata	hemlock water-dropwort	R
Oxalis acetosella	wood-sorrel	O
Plagiomnium undulatum	hart's-tongue thyme-moss	O
Pteridium aquilinum	bracken	R
Rubus fruticosus agg.	bramble	O
Rumex obtusifolius	broad-leaved dock	O
Rumex sanguineus	wood dock	F
Scrophularia auriculata	water figwort	R
Silene dioica	red campion	O
Solanum dulcamara	bittersweet	R
Stachys sylvatica	hedge woundwort	O
Stellaria media	common chickweed	R
Symphytum asperum x *officinale* (*S.* x *uplandicum*)	Russian comfrey	R
Urtica dioica	common nettle	LA
Veronica chamaedrys	germander speedwell	R
Veronica hederifolia	ivy-leaved speedwell	O
Viola riviniana	common dog-violet	F

Table 21 – Land Adjacent to the Shropshire Union Canal LWS - Northern Grassland

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 41656 71334	SJ41643 71344	SJ41629 71860	
Scientific Name	**Common Name**	**Cover (Domin)**			
Agrostis stolonifera	creeping bent		5	9	
Alopecurus pratensis	meadow foxtail	9	8		
Lolium perenne	Perennial rye-grass	5		4	
Schedonorus arundinaceus	tall fescue	7	8		
Cerastium fontanum	common mouse-ear	2			
Dactylis glomerata	cock's-foot			6	
Deschampsia cespitosa	tufted hair-grass			6	
Festuca rubra	red fescue		3		
Holcus lanatus	Yorkshire-fog		3		
Ranunculus acris	meadow buttercup			3	
Ranunculus repens	creeping buttercup	5			
Rumex acetosa	common sorrel			7	
Rumex obtusifolius	broad-leaved dock	2			

Taraxacum officinale agg.	dandelion	1			

	MATCH Similarity Coefficients %				
	MG7d	**MG11a**	**MG9**	**MG9a**	
53.8	53.4	49.3	48.5	47.7	

Quadrat 1	**Quadrat 2**

Quadrat 3	

Table 22 – Land Adjacent to the Shropshire Union Canal LWS - Central Grassland

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 41611 71326	SJ 41604 17308	SJ 41591 71292	
Scientific Name	**Common Name**	**Cover (Domin)**			
Agrostis stolonifera	creeping bent	10	8	9	
Alopecurus pratensis	meadow foxtail	8	9	6	
Lolium perenne	perennial rye-grass	6	4		
Rumex acetosa	common sorrel		3	5	
Cardamine pratensis	cuckoo-flower	1			
Juncus effusus	soft rush			3	
Taraxacum officinale agg.	dandelion	3			

	MATCH Similarity Coefficients %				
	MG10a	**MG7d**	**MG13**	**MG10**	**M**
36.8	35.9	33.5	31.3	31.0	

	
Quadrat 1	**Quadrat 2**
	
Quadrat 3	

Table 23 – Land Adjacent to the Shropshire Union Canal LWS - Southern Grassland

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 41576 71249	SJ 41560 71233	SJ 41545 71237	
Scientific Name	**Common Name**	**Cover (Domin)**			
Alopecurus pratensis	meadow foxtail	6	5	4	

Festuca rubra	red fescue	8	8	7	V
Lolium perenne	perennial rye-grass	3	6	2	V
Ranunculus repens	creeping buttercup	5	5	6	V
Agrostis stolonifera	creeping bent		5	7	I V
Cardamine pratensis	cuckoo-flower	1		3	I V
Taraxacum officinale agg.	dandelion	2	2		I V
Carex hirta	hairy sedge		4		I I
Deschampsia cespitosa	tufted hair-grass		5		I I
Ranunculus acris	meadow buttercup	2			I I
Ranunculus repens	creeping buttercup			4	I I

	MATCH Similarity Coefficients %				
	MG7d	**MG10b**	**MG10a**	**MG7c**	**M C s**
45.1	36.4	36.3	36.2	36.0	

Quadrat 1	**Quadrat 2**

Quadrat 3	

Table 24 – Access Track – Western End of River Gowy Species List

Scientific Name	Common Name	DAFOR
Achillea millefolium	yarrow	R
Alliaria petiolata	garlic mustard	F
Anthriscus sylvestris	cow parsley	F
Arrhenatherum elatius	false oat-grass	A
Artemisia vulgaris	mugwort	R
Brassica napus ssp. *oleifera*	oil-seed rape	R
Bromus hordeaceus	soft-brome	R
Cerastium fontanum	common mouse-ear	O
Cirsium arvense	creeping thistle	O
Dactylis glomerata	cock's-foot	A
Epilobium hirsutum	great willowherb	R
Festuca rubra	red fescue	R
Ficaria verna	lesser celandine	O
Galium aparine	cleavers	A
Geranium molle	dove's-foot crane's-bill	O
Geranium pyrenaicum	hedgerow crane's-bill	R
Heracleum sphondyllium	hogweed	F
Holcus lanatus	Yorkshire-fog	O
Hypochaeris radicata	cat's-ear	R
Jacobaea vulgaris	common ragwort	O
Lamium purpureum	red dead-nettle	O
Leontodon autumnalis	autumn hawkbit	R
Lolium perenne	perennial rye-grass	F
Pentaglottis sempervirens	green alkanet	R
Plantago lanceolata	ribwort plantain	F
Plantago major	greater plantain	O
Poa pratensis	smooth meadow-grass	R
Silene dioica	red campion	O

Scientific Name	Common Name	DAFOR
Sonchus oleraceus	smooth sow-thistle	R
Stachys sylvatica	hedge woundwort	O
Taraxacum officinale agg.	dandelion	F
Tragopogon pratensis	goat's-beard	R
Trifolium pratense	red clover	O
Urtica dioica	common nettle	A
Vicia sativa	common vetch	O

Table 25 – River Gowy - Grassland (West of River)

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 43541 72764	SJ 43533 72752	SJ 43504 72733	
Scientific Name	**Common Name**	**Cover (Domin)**			
Agrostis stolonifera	creeping bent	7	8	8	V
Juncus effusus	soft rush	1	3	2	V
Alopecurus geniculatus	marsh foxtail		4	5	I V
Deschampsia cespitosa	tufted hair-grass	4		2	I V
Glyceria fluitans	floating sweet-grass	5		3	I V
Lolium perenne	perennial rye-grass	4			I I
Ranunculus repens	creeping buttercup			1	I I
Rumex obtusifolius	broad-leaved dock	1			I I

Urtica dioica	common nettle			1	I I
	MATCH Similarity Coefficients %				
	MG13	**MG10a**	**MG10**	**MG10c**	**M** **C** **1** **C** **k**
48.8	43.7	40.1	37.5	36.8	

Quadrat 1	**Quadrat 2**

Quadrat 3	

Table 26 – River Gowy - Grassland to South of M56 and Along Banks of River Gowy

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 43686 72917	SJ 43763 72962	SJ43972 73044	
Scientific Name	**Common Name**	**Cover (Domin)**			
Arrhenatherum elatius	false oat-grass	8	7	8	
Brassica napus ssp. oleifera	oil-seed rape	3	1	1	
Galium aparine	cleavers	4	5	2	
Urtica dioica	common nettle	3	5	4	
Dactylis glomerata	cock's-foot	4	2		
Holcus lanatus	Yorkshire-fog	3	2		
Alopecurus pratensis	meadow foxtail	6			
Rumex acetosa	common sorrel			5	
Jacobaea vulgaris	common ragwort		2		
Anthriscus sylvestris	cow parsley		4		
Brachythecium rutabulum	rough-stalked feather-moss			2	
Cardamine hirsuta	hairy bitter-cress		2		
Geranium dissectum	cut-leaved crane's-bill			2	
Heracleum sphondylium	hogweed		1		

Rubus fruticosus agg.	bramble			1	I I
Silene dioica	red campion			1	I I

	MATCH Similarity Coefficients %				
	MG1b	**MG1c**	**MG1**	**MG9b**	**M C 1 a**
51.8	47.7	43.2	39.1	38.4	

Quadrat 1	**Quadrat 2**

Quadrat 3	

Table 27 – River Gowy - Reed Canary-Grass Dominated Areas

Quadrat Number		**Q1**	**Q2**	**Q3**	**R**
Quadrat Grid Reference		SJ 43723 72874	SJ 43734 72883	SJ 43741 72884	
Scientific Name	**Common Name**	**Cover (Domin)**			
Arrhenatherum elatius	false oat-grass	3	4	4	
Phalaris arundinacea	reed canary-grass	9	9	9	
Urtica dioica	common nettle	6	3	5	
Galium aparine	cleavers		2	4	
Brassica napus ssp. oleifera	oil-seed rape		1		
Cirsium palustre	marsh thistle		2		
Deschampsia cespitosa	tufted hair-grass		3		
Epilobium hirsutum	great willowherb			3	
Galeopsis tetrahit	common hemp-nettle		3		
Ranunculus repens	creeping buttercup			2	
Solanum dulcamara	bittersweet			2	

	MATCH Similarity Coefficients %				
	S28	**S28b**	**S28a**	**S26b**	**S**
61.5	61.2	48.8	46.7	45.0	

Quadrat 1	Quadrat 2

Quadrat 3	

Table 28 – River Gowy - Rush Dominated Areas

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 43742 72836	SJ 43766 72853	SJ43789 72856	
Scientific Name	**Common Name**	**Cover (Domin)**			
Deschampsia cespitosa	tufted hair-grass	7	6	8	
Galeopsis tetrahit	common hemp-nettle	2	4	1	
Holcus lanatus	Yorkshire-fog	2	1	2	
Juncus effusus	soft rush	8	9	7	
Ranunculus repens	creeping buttercup	1	3	5	
Rumex crispus	curled dock	4	6	5	
Alopecurus pratensis	meadow foxtail			3	
Cirsium palustre	marsh thistle	3			
Epilobium hirsutum	great willowherb	2			
Galium aparine	cleavers	1			
Rumex acetosa	common sorrel		3		
Rumex obtusifolius	broad-leaved dock	3			
Solanum dulcamara	bittersweet		4		

	MATCH Similarity Coefficients %				
	MG10	**MG10a**	**MG9**	**MG10c**	**M**

43.7	42.1	38.7		37.5	36.9
					
Quadrat 1				**Quadrat 2**	
					
Quadrat 3					

Table 29 – River Gowy - Bulrush Dominated Area

Quadrat Number		**Q1**	**Q2**	**Q3**	
Quadrat Grid Reference		SJ 43930 72934	SJ 43970 72961	SJ 43986 72965	
Scientific Name	**Common Name**	**Cover (Domin)**			**Frequency**
Epilobium ciliatum	American willowherb	2	3	4	V
Galium palustre	marsh-bedstraw	3	4	5	V
Juncus effusus	soft rush	4	6	6	V
Rumex crispus	curled dock	3	4	5	V
Typha latifolia	bulrush	9	6	7	V
Urtica dioica	common nettle		4	4	IV
Calliergonella cuspidata	pointed spear-moss			6	II
Cardamine flexuosa	wavy bitter-cress			5	II
Cardamine pratensis	cuckoo-flower			3	II
Cirsium palustre	marsh thistle			3	II
Deschampsia cespitosa	tufted hair-grass			4	II
Ranunculus repens	creeping buttercup	2			II
Sparganium erectum	branched bur-reed		8		II

MATCH Similarity Coefficients %				
S12	**S12b**	**S12a**	**S15**	**S15b**
43.0	39.7	33.6	32.7	32.6

	
Quadrat 1	**Quadrat 2**
	
Quadrat 3	

Table 30 – River Gowy - Rush Dominated Area (North-East Corner of Field)

Quadrat Number		**Q1**	**Q2**	**Q3**	
Quadrat Grid Reference		SJ 43813 72827	SJ 43803 72811	SJ 43789 72797	
Scientific Name	**Common Name**	**Cover (Domin)**			**Frequency**
Galeopsis tetrahit	common hemp-nettle	2	1	2	V
Holcus lanatus	Yorkshire-fog	2	5	6	V
Juncus effusus	soft rush	8	7	8	V
Persicaria maculosa	redshank	4	3	5	V
Rumex acetosa	common sorrel	7	5	6	V
Ceratocapnos claviculata	climbing corydalis		2		II
Cirsium arvense	creeping thistle		2		II
Deschampsia cespitosa	tufted hair-grass			3	II
Epilobium ciliatum	American willowherb		2		II
Galium palustre	marsh-bedstraw		5		II
Kindbergia praelonga	common feather-moss		2		II
Senecio vulgaris	groundsel			1	II

MATCH Similarity Coefficients %				
MG10a	**MG10**	**MG9a**	**MG9**	**MG9b**
35.1	29.3	26.1	25.6	24.6

	
Quadrat 1	**Quadrat 2**
	
Quadrat 3	

Table 31 – River Gowy - Tufted Hair-Grass Dominated Area (Main Field)

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 43800 72779	SJ 43764 72751	SJ 43749 72754	
Scientific Name	**Common Name**	**Cover (Domin)**			
Deschampsia cespitosa	tufted hair-grass	8	6	8	
Holcus lanatus	Yorkshire-fog	2	8	5	
Rumex acetosa	common sorrel	6	5	4	
Cirsium palustre	marsh thistle		2	1	
Juncus effusus	soft rush	3		3	
Persicaria maculosa	redshank	5		5	
Phalaris arundinacea	reed canary-grass		5		
Potentilla reptans	creeping cinquefoil			4	
Urtica dioica	common nettle			1	

	MATCH Similarity Coefficients %				
	MG10a	**MG9**	**MG9a**	**MG10**	**M**
35.3	31.1	29.1	29.0	26.5	

	
Quadrat 1	**Quadrat 2**
	
Quadrat 3	

Table 32 – Frodsham Ince Marshes LWS - Western Fields

Quadrat Number		**Q1**	**Q2**	**Q3**	**R**
Quadrat Grid Reference		SJ 46678 25423	SJ 46722 75497	SJ 48804 75593	
Scientific Name	**Common Name**	**Cover (Domin)**			
Agrostis stolonifera	creeping bent	8	8	8	

Deschampsia cespitosa	tufted hair-grass	6	7	6	V
Glyceria fluitans	floating sweet-grass	4	2	4	V
Lolium perenne	perennial rye-grass		6	4	I V

	MATCH Similarity Coefficients %				
	MG13	**MG9**	**MG9b**	**MG9a**	**M C 1 a**
38.5	27.6	27.1	25.5	24.6	

Quadrat 1	**Quadrat 2**

Quadrat 3	

Table 33 – Frodsham Ince Marshes LWS - Eastern Fields

Quadrat Number		**Q1**	**Q2**	**Q3**	**F**
Quadrat Grid Reference		SJ 46970 77570	SJ 46948 75589	SJ 46924 75624	
Scientific Name	**Common Name**	**Cover (Domin)**			
Agrostis stolonifera	creeping bent	9	10	8	
Deschampsia cespitosa	tufted hair-grass	4	5	6	
Lolium perenne	perennial rye-grass	7	6	7	
Holcus lanatus	Yorkshire-fog	2		5	
Alopecurus pratensis	meadow foxtail		3		
Cirsium arvense	creeping thistle			3	
Cirsium vulgare	spear thistle			1	
Juncus effusus	soft rush	4			
Rumex crispus	curled dock	2			

	MATCH Similarity Coefficients %				
	MG9b	**MG9**	**MG13**	**MG9a**	**M**
50.3	47.6	46.2	44.4	43.9	

	
Quadrat 1	**Quadrat 2**
	
Quadrat 3	

Table 34 – Frodsham Ince Marshes - Grassland

Quadrat Number		**Q1**	**Q2**	**Q3**	**R**
Quadrat Grid Reference		SJ 46887 75868	SJ 46907 75846	SJ 46932 75823	
Scientific Name	**Common Name**	**Cover (Domin)**			
Agrostis stolonifera	creeping bent	8	7	4	

Alopecurus pratensis	meadow foxtail	6	6	5	V
Juncus effusus	soft rush	4	1	2	V
Lolium perenne	perennial rye-grass	4	8	8	V
Taraxacum officinale agg.	dandelion	1	5	6	V
Trifolium repens	white clover	3	8	4	V
Cardamine pratensis	cuckoo-flower	2	2		I V
Ranunculus repens	creeping buttercup	7	6		I V
Cerastium fontanum	common mouse-ear		2		I I
Cirsium arvense	creeping thistle			3	I I
Glyceria fluitans	floating sweet-grass	5			I I
Juncus inflexus	hard rush		2		I I
Poa trivialis	rough meadow-grass	3			I I
Ranunculus acris	meadow buttercup			6	I I

	MATCH Similarity Coefficients %				
	MG10	**MG10a**	**MG10b**	**MG7d**	**M C 7 c**
59.0	59.0	56.5	52.7	50.5	

Quadrat 1	Quadrat 2

Quadrat 3	

Table 35 – Frodsham Ince Marshes LWS - Grassland

Quadrat Number		**Q1**	**Q2**	**Q3**	
Quadrat Grid Reference		SJ 46785 75961	SJ 46839 75943	SJ 46916 75923	
Scientific Name	**Common Name**	**Cover (Domin)**			**Frequency**
Agrostis stolonifera	creeping bent	2	8	7	V
Alopecurus pratensis	meadow foxtail	6	4	5	V
Cirsium arvense	creeping thistle	3	2	5	V
Lolium perenne	perennial rye-grass	9	6	7	V
Ranunculus acris	meadow buttercup	3	5	6	V
Taraxacum officinale agg.	dandelion	6	5	4	V
Cerastium fontanum	common mouse-ear	2		2	IV
Rumex obtusifolius	broad-leaved dock	2		2	IV
Stellaria media	common chickweed	2	2		IV
Trifolium repens	white clover	7	8		IV
Rumex acetosa	common sorrel			1	II

MATCH Similarity Coefficients %				
MG7d	**MG11a**	**MG7c**	**MG6a**	**MG7b**
55.2	53.9	51.4	47.0	45.9

	
Quadrat 1	**Quadrat 2**
	
Quadrat 3	