

ENVIRONMENTAL STATEMENT (VOLUME III)

Appendix 8.1 Historic Environment Desk Based Assessment

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

**The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 –
Regulations 5(2) (m)**

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1. INTRODUCTION

- 1.1.1. This technical appendix includes an Historic Environment Desk Based Assessment (HEDBA) for a Newbuild Carbon Dioxide (CO₂) Pipeline from Stanlow, Cheshire, to Flint, Flintshire and associated above ground infrastructure (hereafter, the 'DCO Proposed Development'), and supports the assessment contained in **Chapter 8 – Cultural Heritage (Volume II)**.
- 1.1.2. The Applicant intends to build and operate a new underground carbon dioxide (CO₂) 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 Business, Energy and Industrial Strategy (BEIS) via the Planning Inspectorate (PINS).
- 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 CO₂ 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 CO₂ entering the atmosphere by capturing it, compressing it and transporting it for safe, permanent storage.
- 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 and CO₂ capture and storage elements of the Project do not form part of the DCO Proposed Development and will be delivered under separate consenting processes.
- 1.1.5. 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 CO₂;
 - **Stanlow AGI to Flint AGI Pipeline** – a section of new underground onshore pipeline (36" in diameter) to transport CO₂;
 - **Flint AGI to Flint Connection Pipeline** – a section of new underground onshore pipeline (24" in diameter) to transport CO₂;

- **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 CO₂. 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); and
 - 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.
- Further details of each element of the DCO Proposed Development are set out in **Chapter 3 – Description of the DCO Proposed Development (Volume II)**.

1.1.6.

The DCO Proposed Development extends from the jurisdiction of the Cheshire West and Chester council within the county of Cheshire, England in the east (NGR 346900, 376156) to Flintshire in Wales in the west (NGR 325108, 370798). As such, this document recognises national policy, standards and guidance for England and Wales. In order to maintain consistency, where there are differences in terminology between the nations, these have defaulted to English references unless directly quoting policy. For example, use of the term ‘heritage assets’ is used throughout this document despite those in Wales being referred to as ‘historic assets’. Similarly the values of assets are based on those criteria outlined in the National Planning Policy Framework (NPPF) for the Historic Environment (MHCLG 2021), namely - archaeological, historical, architectural and artistic values for assessing heritage significance. This approach was agreed in the responses to the Scoping Opinion dated July 2021.

1.2. SCOPE

- 1.2.1. This report provides a baseline of known and potential buried heritage assets (archaeological remains) and above ground heritage assets (structures and landscapes of heritage interest) within or immediately around the Newbuild Infrastructure Boundary. Professional expert opinion has been used to assess heritage value, based on archaeological, historical, architectural and artistic values, taking into account past ground disturbance which may have compromised survival.
- 1.2.2. This report assesses the impact of the DCO Proposed Development on the historic character and setting of designated assets within and beyond the DCO Proposed Development (e.g., views to and from Listed Buildings and Conservation Areas) that are potentially affected by the proposals. This report includes recommendations to mitigate any adverse effects (e.g., site-based investigation and/or design changes), where appropriate.
- 1.2.3. An assessment of operational phase effects on buried heritage has been scoped out on the basis that once the construction of the DCO Proposed Development has been completed, no further ground disturbance would occur and consequently there will be no additional impacts upon buried heritage assets.

1.3. AIMS AND OBJECTIVES

- 1.3.1. The Historic Environment is a material consideration in the planning process and its value is recognised in national and local planning policy. The aim of this report is to assess the impact of the DCO Proposed Development and to provide a suitable strategy to mitigate any adverse effects, if required, as part of the DCO Application. The aim is achieved through six objectives:
- Identify the presence of any known or potential heritage assets that may be affected by the proposals;
 - Describe the value of such assets, in accordance with the National Planning Policy Framework (NPPF; **Ref. 8.1**) and Planning Policy Wales (**Ref. 8.2**), taking into account factors which may have compromised asset survival;
 - Determine the contribution to which setting makes to the value of any sensitive (i.e. designated) heritage assets;
 - Assess the likely impacts upon the value of the assets arising from the proposals;
 - Assess the impact of the DCO Proposed Development on how designated heritage assets are understood and experienced through changes to their setting; and
 - Provide recommendations for further investigation and/or mitigation where required, aimed at reducing or removing completely any adverse effects.

1.4. KEY HERITAGE CONSTRAINTS

- 1.4.1. The Newbuild Infrastructure Boundary does not contain any nationally designated (protected) heritage assets, such as Scheduled Monuments, listed buildings or registered parks and gardens. The Newbuild Infrastructure Boundary extends into two conservation areas and a registered historic landscape, comprising:
- Chester Canal Conservation Area;
 - Thornton-le-Moors Conservation Area; and
 - Holywell Common and Halkyn Mountain Registered Historic Landscape (Cadw Reference number: HLW (C) 2).

1.5. ASSUMPTIONS AND LIMITATIONS

- 1.5.1. The information presented in this report has been drawn from data obtained from a variety of sources and includes secondary information. It is assumed that this information is accurate.
- 1.5.2. The data provided by local Historic Environment Record searches are not a record of all surviving heritage assets, but a record of the discovery of a wide range of archaeological and historical components of the historic environment. There is a potential for the presence of further, unrecorded, heritage assets and components of the historic environment to be present.
- 1.5.3. Due to the nature of below-ground archaeological remains, buried and not visible from the surface, there is an element of uncertainty regarding the survival, condition, nature and extent of the known assets identified within the Newbuild Infrastructure Boundary. This will be addressed by further site-based archaeological investigation where appropriate.
- 1.5.4. Notwithstanding the limitations, the methodology is robust, utilising available information, and conforming to the requirements of local and national guidance and planning policy. A range of sources have informed the desk-based assessment, including documentary sources, cartographic evidence and archaeological geophysical and remote sensing assessment results. As such, a reasonable assessment of the potential archaeological resource has been presented.

1.6. COPYRIGHT

- 1.6.1. This report may contain material which WSP does not hold the copyright or the intellectual property of third parties and cannot be transferred to other parties.

2. PLANNING FRAMEWORK

2.1. STATUTORY PROTECTION

SCHEDULED MONUMENTS

- 2.1.1. There are no Scheduled Monuments within the Newbuild Infrastructure Boundary but there are 18 scheduled monuments located within 1 km of the Newbuild Infrastructure Boundary.
- 2.1.2. Nationally important archaeological sites (both above and buried remains) may be identified and protected under the Ancient Monuments and Archaeological Areas Act 1979 (**Ref. 8.3**) and the Ancient Monuments and Archaeological Areas Act 1979 (as amended by the Historic Environment (Wales) Act 2016 (**Ref. 8.4**)). An application to the Secretary of State is required for any works affecting a Scheduled Monument in England. Prior written permission, known as Scheduled Monument Consent (SMC) is required from the Secretary of State for works physically affecting a Scheduled Monument. Prior written permission is required from The Welsh Ministers for works physically affecting a scheduled monument in Wales. SMC is separate from the statutory planning process. SMC is separate from the statutory planning process.
- 2.1.3. Development affecting the setting of a Scheduled Monument is dealt with wholly under the planning system and does not require SMC.

LISTED BUILDINGS AND CONSERVATION AREAS

- 2.1.4. There are no listed buildings within the Newbuild Infrastructure Boundary but there are 127 listed buildings within 1 km of the Newbuild Infrastructure Boundary.
- 2.1.5. The Planning (Listed Buildings and Conservation Areas) Act 1990 (**Ref. 8.5**) and The Planning (Listed Buildings and Conservation Areas) Act 1990 (as amended by the Historic Environment (Wales) Act 2016 (**Ref. 8.4**)) sets out the legal requirements for the control of development and alterations which affect buildings, including those which are Listed or in Conservation Areas.

PROTECTION OF MILITARY REMAINS ACT

- 2.1.6. The Protection of Military Remains Act 1986 (**Ref. 8.6**) provides protection for the wreckage of military aircraft and vessels that have crashed, sunk or been stranded including any associated human remains.
- 2.1.7. In relation to this assessment, the Act applies to any aircraft which has crashed (whether before or after the passing of the Act) while in military service, and makes it an offence to interfere with any such remains without a licence.

HISTORIC HEDGEROWS

2.1.8.

The Newbuild Infrastructure Boundary contains 21 hedgerows considered important under the Hedgerow Regulations (**Ref. 8.7**). Aside from the planning system, hedgerows are offered some protection under the Hedgerow Regulations Act 1997. Under these rules, a hedgerow is “important” if it, or the hedgerow of which it is a stretch has existed for 30 years or more; and satisfies at least one of the criteria summarised below:

- The hedgerow marks the boundary, or part of the boundary, of at least one historic parish or township and for this purpose "historic" means existing before 1850.
- The hedgerow incorporates an archaeological feature which is: (a) included in the schedule of monuments compiled by the Secretary of State under section 1 (schedule of monuments) of the Ancient Monuments and Archaeological Areas Act 1979(7); or (b) recorded at the relevant date in a Sites and Monuments Record (Now referred to as the Historic Environment Record).
- The hedgerow is: (a) is situated wholly or partly within an archaeological site included or recorded as mentioned in paragraph 2 or on land adjacent to and associated with such a site; and (b) is associated with any monument or feature on that site.
- The hedgerow: (a) marks the boundary of a pre-1600 AD estate or manor recorded at the relevant date in a Sites and Monuments Record or in a document held at that date at a Record Office; or (b) is visibly related to any building or other feature of such an estate or manor.
- The hedgerow is: (a) recorded in a document held at the relevant date at a Record Office as an integral part of a field system pre-dating the Inclosure Acts (8); or (b) is part of, or visibly related to, any building or other feature associated with such a system, and that system is (i) substantially complete; or (ii) is of a pattern which is recorded in a document prepared before the relevant date by a local planning authority, within the meaning of the 1990 Act(9), for the purposes of development control within the authority's area, as a key landscape characteristic.

2.2.

NATIONAL POLICY STATEMENT FOR ENERGY (EN1)

2.2.1.

The National Policy Statement for Energy (EN-1), Department of Energy and Climate Change (**Ref. 8.8**), published in July 2011 sets out the overarching national policy for major energy infrastructure projects within England and Wales in order to meet future demand, deliver on obligations to reduce greenhouse gas emissions and ensure a secure energy supply through a diverse range of energy sources.

2.2.2.

Section 5.8 contains the following statements which are relevant:

- *“The construction, operation and decommissioning of energy infrastructure has the potential to result in adverse impacts on the historic environment”* (paragraph 5.8.1);
- *“The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, landscaped and planted or managed flora”* (paragraph 5.8.2);
- *“The applicant should ensure that the extent of the impact of the proposed development on the significance of any heritage assets affected can be adequately understood from the application and supporting documents”* (paragraph 5.8.10);
- *“In considering the impact of a proposed development on any heritage assets, the IPC should take into the account the particular nature of the significance of the heritage assets and the value they hold for this and future generations”* (paragraph 5.8.12);
- *“There should be a presumption in favour of the conservation of designated heritage assets and the more significant the designated heritage asset, the greater the presumption in favour of its conservation should be. Once lost heritage assets cannot be replaced and their loss has a cultural, environmental, economic and social impact. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. Loss affecting any designated heritage asset should require clear and convincing justification. Substantial harm to or loss of a grade II listed building park or garden should be exceptional. Substantial harm to or loss of designated assets of the highest significance, including Scheduled Monuments; registered battlefields; grade I and II* listed buildings; grade I and II* registered parks and gardens; and World Heritage Sites, should be wholly exceptional”* (paragraph 5.8.14);
- *“Any harmful impact on the significance of a designated heritage asset should be weighed against the public benefit of development, recognising that the greater the harm to the significance of the heritage asset the greater the justification will be needed for any loss”* (5.8.15); and
- *“Where the loss of the whole or a material part of a heritage asset’s significance is justified, the IPC should require the developer to record and advance understanding of the significance of the heritage asset before it is lost”* (paragraph 5.8.20).

2.2.3.

An update of the National Policy Statement for Energy EN1 (Ref. 8.9) was published for consultation on 6 September 2021. The consultation period is now closed but the draft has not yet been accepted. The relevant policies are set out in Section 5.9 of the statement.

2.3. NATIONAL PLANNING POLICY FRAMEWORK

ENGLAND

- 2.3.1. The Government issued a revised version of the National Planning Policy Framework (NPPF) in July 2021 (**Ref. 8.1**) and supporting revised Planning Practice Guidance in 2018 (**Ref. 8.10**). The NPPF does not contain specific policies for NSIPs, which are determined in accordance with the Planning Act 2008 and relevant National Policy Statements for major infrastructure as well as matters that are relevant.
- 2.3.2. The purpose of the planning system is to contribute to the achievement of sustainable development, and the NPPF has a presumption in favour of such, where it meets needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development is achieved within the context of economic, social and environmental objectives.
- 2.3.3. Section 16 of the NPPF deals with 'Conserving and Enhancing the Historic Environment'. The NPPF recognises that heritage assets are an irreplaceable resource which 'should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations' (para 189).
- 2.3.4. The NPPF requires the significance of heritage assets to be considered in the planning process, whether designated or not. NPPF Section 16 is reproduced in full below:

***189.** Heritage assets range from sites and buildings of local historic value to those of the highest significance, such as World Heritage Sites which are internationally recognised to be of Outstanding Universal Value⁶⁶. These assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations.*

***190.** Plans should set out a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. This strategy should take into account:*

a) the desirability of sustaining and enhancing the significance of heritage assets, and putting them to viable uses consistent with their conservation;

b) the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring;

c) the desirability of new development making a positive contribution to local character and distinctiveness; and

d) opportunities to draw on the contribution made by the historic environment to the character of a place.

191. *When considering the designation of conservation areas, local planning authorities should ensure that an area justifies such status because of its special architectural or historic interest, and that the concept of conservation is not devalued through the designation of areas that lack special interest.*

192. *Local planning authorities should maintain or have access to a historic environment record. This should contain up-to-date evidence about the historic environment in their area and be used to:*

a) assess the significance of heritage assets and the contribution they make to their environment; and

b) predict the likelihood that currently unidentified heritage assets, particularly sites of historic and archaeological interest, will be discovered in the future.

193. *Local planning authorities should make information about the historic environment, gathered as part of policy-making or development management, publicly accessible.”*

Proposals affecting heritage assets

194. *In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets’ importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.*

195. *Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset’s conservation and any aspect of the proposal.*

196. *Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the deteriorated state of the heritage asset should not be taken into account in any decision.*

197. *In determining applications, local planning authorities should take account of:*

a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;

b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and

c) the desirability of new development making a positive contribution to local character and distinctiveness.

198. *In considering any applications to remove or alter a historic statue, plaque, memorial or monument (whether listed or not), local planning authorities should have regard to the importance of their retention in situ and, where appropriate, of explaining their historic and social context rather than removal.”*

Considering potential impacts

“199. *When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset’s conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.*

200. *Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:*

a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional;

b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.*

201. *Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:*

a) the nature of the heritage asset prevents all reasonable uses of the site; and

b) no viable use of the heritage asset itself can be found in the moderate term through appropriate marketing that will enable its conservation; and

c) conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and

d) the harm or loss is outweighed by the benefit of bringing the site back into use.

202. *Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.*

203. *The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.*

204. *Local planning authorities should not permit the loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred.*

205. *Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible⁶⁹. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.*

206. *Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.*

207. *Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 200 or less than substantial harm under paragraph 201, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.*

208. *Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies.”*

- 2.3.5. The web-based National Planning Policy Guidance (MHCLG, 2019) provides supporting information in respect of conserving and enhancing the historic environment.

WALES

Planning Policy Wales (PPW) Edition 11, Chapter 6: Distinctive and Natural Places (February 2021)

- 2.3.6. PPW Chapter 6 (Ref. 8.2) outlines policies for the historic environment and planning applications in relation to Archaeological Remains, Listed Buildings, Locally Listed Assets, Historic Landscapes including the significance and setting of historic assets. There are no World Heritage Sites within or lying close to the Study Area. The relevant policies of PPW are detailed below:

Listed Buildings

*“**Paragraph 6.1.10** There should be a general presumption in favour of the preservation or enhancement of a listed building and its setting, which might extend beyond its curtilage. For any development proposal affecting a listed building or its setting, the primary material consideration is the statutory requirement to have special regard to the desirability of preserving the building, its setting or any features of special architectural or historic interest which it possesses.*

*“**Paragraph 6.1.11** For listed buildings, the aim should be to find the best way to protect and enhance their special qualities, retaining them in sustainable use. The continuation or reinstatement of the original use should generally be the first option, but not all original uses will now be viable or appropriate. The application of planning and listed building controls should recognise the need for flexibility where new uses have to be considered in order to secure a building’s survival or provide it with a sound economic future.*

*“**Paragraph 6.1.12** The demolition of any listed building should be considered as exceptional and require the strongest justification.*

*“**Paragraph 6.1.13** Applicants for listed building consent must be able to justify their proposals, show why the alteration or demolition of a listed building is desirable or necessary and consider the impact of any change upon its significance. This must be included in a heritage impact statement, which will be proportionate both to the significance of the building and to the degree of change proposed.”*

Conservation Areas

*“**Paragraph 6.1.14** There should be a general presumption in favour of the preservation or enhancement of the character or appearance of conservation areas or their settings. Positive management of conservation areas is*

necessary if their character or appearance are to be preserved or enhanced and their heritage value is to be fully realised. Planning authorities should establish their own criteria against which existing and/or new conservation areas and their boundaries should be reviewed. The preparation of conservation area appraisals and management plans can assist planning authorities in the exercise of their development management functions.

Paragraph 6.1.15 *There is a strong presumption against the granting of planning permission for developments, including advertisements, which damage the character or appearance of a conservation area or its setting to an unacceptable level. In exceptional cases, the presumption may be overridden in favour of development considered desirable on public interest grounds.*

Paragraph 6.1.16 *Preservation or enhancement of a conservation area can be achieved by a development which either makes a positive contribution to an area's character or appearance or leaves them unharmed. Mitigation measures can also be considered which could result in an overall neutral or positive impact of a proposed development in a conservation area.*

Paragraph 6.1.17 *Conservation area designation introduces control over the total or substantial demolition of unlisted buildings within these areas, but partial demolition does not require conservation area consent. Procedures are essentially the same as for listed building consent. When considering an application for conservation area consent, account should be taken of the wider effects of demolition on the building's surroundings and on the architectural, archaeological or historic interest of the conservation area as a whole. Consideration should also be given to replacement structures. Proposals should be tested against conservation area appraisals, where they are available."*

Historic Parks and Gardens

Paragraph 6.1.18 *Planning authorities should value, protect, conserve and enhance the special interest of parks and gardens and their settings included on the register of historic parks and gardens in Wales. The register should be taken into account in planning authority decision making. Green Infrastructure Assessments should be used to explore the role of historic parks and gardens and the findings of other landscape character assessments should be fed into historical and cultural assessments to ensure consistency of information.*

Paragraph 6.1.19 *The effect of a proposed development on a registered park or garden, or its setting, is a material consideration in the determination of planning applications."*

Historic Landscapes

Paragraph 6.1.20: *The Welsh Government seeks to protect areas on the register of historic landscapes in Wales.*

Paragraph 6.1.21: *Planning authorities should protect those assets included on the register of historic landscapes in Wales. As above, the sharing and use of evidence and assessments undertaken for wider reasons, such as Green Infrastructure Assessments, should be used to identify and better understand historic landscapes and ensure their qualities are protected and enhanced. The register should be taken into account in decision making when considering the implications of developments which meet the criteria for Environmental Impact Assessment or, if on call in, in the opinion of the Welsh Ministers, the development is of a sufficient scale to have more than a local impact on the historic landscape. An assessment of development on a historic landscape may be required if it is proposed within a registered historic landscape or its setting and there is potential for conflict with development plan policy.”*

Archaeological Remains

“Paragraph 6.1.23: *The planning system recognises the need to conserve archaeological remains. The conservation of archaeological remains and their settings is a material consideration in determining planning applications, whether those remains are a Scheduled Monument or not.*

Paragraph 6.1.24: *Where nationally important archaeological remains are likely to be affected by proposed development, there should be a presumption in favour of their physical protection in situ. It will only be in exceptional circumstances that planning permission will be granted if development would result in a direct adverse impact on a Scheduled Monument (or an archaeological site shown to be of national importance).*

Paragraph 6.1.25: *In cases involving less significant archaeological remains, planning authorities will need to weigh the relative importance of the archaeological remains and their settings against other factors, including the need for the proposed development.*

Paragraph 6.1.26: *Where archaeological remains are known to exist or there is a potential for them to survive, an application should be accompanied by sufficient information, through desk-based assessment and/or field evaluation, to allow a full understanding of the impact of the proposal on the significance of the remains. The needs of archaeology and development may be reconciled, and potential conflict very much reduced, through early discussion and assessment.*

Paragraph 6.1.27: *If the planning authority is minded to approve an application and where archaeological remains are affected by proposals that alter or destroy them, the planning authority must be satisfied that the developer has secured appropriate and satisfactory provision for their recording and investigation, followed by the analysis and publication of the results and the deposition of the resulting archive in an approved repository. On occasions, unforeseen archaeological remains may still be discovered during the course of*

a development. A written scheme of investigation should consider how to react to such circumstances or it can be covered through an appropriate condition for a watching brief. Where remains discovered are deemed to be of national importance, the Welsh Ministers have the power to schedule the site and in such circumstances Scheduled Monument consent must be required before works can continue.”

Historic assets of special local importance

“Paragraph 6.1.29: Where planning authorities may develop lists of historic assets of special local interest, that do not have statutory protection, but that make an important contribution to local distinctiveness and have the potential to contribute to public knowledge. Where a planning authority chooses to identify historic assets of special local interest, policies for the conservation and enhancement of those assets must be included in the development plan.”

2.4. LOCAL POLICY

THE CHESHIRE WEST AND CHESTER LOCAL PLAN (PART ONE) STRATEGIC POLICIES (2015) AND (PART TWO) LAND ALLOCATIONS AND DETAILED POLICIES (2019)

2.4.1. The Cheshire West and Chester Local Plan (**Ref. 8.11**) was adopted on 29 January 2015 and forms part of the statutory development plan for the borough. Those policies relevant to the DCO Proposed Development are reproduced below:

ENV 5 Historic Environment

- *The Local Plan will protect the borough's unique and significant heritage assets through the protection and identification of designated and non-designated heritage assets* and their settings.*
- *Development should safeguard or enhance both designated and non-designated heritage assets and the character and setting of areas of acknowledged significance. The degree of protection afforded to a heritage asset will reflect its position within the hierarchy of designations.*
- *Development will be required to respect and respond positively to designated heritage assets and their settings, avoiding loss or harm to their significance. Proposals that involve securing a viable future use or improvement to an asset on the Heritage at Risk register will be supported.*
- *Development which is likely to have a significant adverse impact on designated heritage assets and their settings which cannot be avoided or where the heritage asset cannot be preserved in situ will not be permitted.*

- *Where fully justified and assessed, the Council may consent to the minimal level of enabling development consistent with securing a building's future in an appropriate viable use.*
- *Development in Chester should ensure the city's unique archaeological and historic character is protected or enhanced.*
- **Heritage assets are defined as a building, monument, site, place, structure, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage assets include designated heritage assets and non-designated heritage assets identified in the Cheshire Historic Environment Record, including local assets.*

2.4.2. The Local Plan (Part Two) (Cheshire West and Chester, 2019) was adopted on 18 July 2019 and provides further detailed policies supporting those set out in the Local Plan (Part One). Those relevant to the DCO Proposed Development are outlined below:

Policy DM 47 Listed Buildings

- *In line with Local Plan (Part One) policy ENV 5, development proposals or works, including alterations, extensions and changes of use shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.*

Policy DM 48 Non-designated heritage assets

- *The significance of non-designated heritage assets and their setting should be assessed in development proposals or works, against the following criteria, namely the:*
 - *Special qualities of architectural and historic interest;*
 - *Features of interest and the setting of the non-designated historic asset;*
 - *Contribution the non-designated historic asset makes to local distinctiveness; local townscape; or rural character; and*
 - *Conservation of interesting or unusual features; architectural detail; materials; construction; or historic interest.*
- *Development which would remove, harm or undermine the significance of such non-designated heritage assets, or their contribution to the character of a place, will only be permitted where the benefits of the development outweigh the harm having regard to the scale of the harm and significance of the non-designated heritage asset.*
- *Prior to the loss of the non-designated heritage asset, an appropriate level of survey and recording will be expected including where appropriate archaeological investigation. The results of which should be deposited on the Historic Environment Record.*

- *It is recognised that not all buildings, structures or landscapes of significance are captured on either the national lists or local lists and these are termed undesignated heritage assets. Where the significance of these buildings, structures or landscapes can be demonstrated, the above policy consideration should be applied.*

Policy DM 50 Archaeology

- *Development proposals will need to take into account the significance of the heritage asset and their setting, and the scale of any loss or harm.*
- *For sites of known or potential archaeological interest, applications must be accompanied by an appropriate archaeological assessment of the archaeological impact of the development. A field evaluation prior to determination of the planning application may also be required. Where remains are of national significance e.g., within a Primary Archaeological Zone as defined by the Chester Archaeological Plan, detailed agreement on ground impacts should be secured before planning permission is granted.*
- *Where necessary to secure the protection of the heritage asset or a programme of archaeological mitigation, conditions will be attached to permissions. These may include requirements for detailed agreement on ground impacts and programmes of archaeological investigation, building recording, reporting and archiving.*

FLINT LOCAL PLANNING POLICY: FLINTSHIRE UNITARY DEVELOPMENT PLAN (UDP) 2000-2015, CHAPTER 9

2.4.3.

The Flintshire Unitary Development Plan (**Ref. 8.12**) was adopted 28 September 2011 and remains in force as of the date of this report. The Flintshire Local Plan is currently in development and is not in force. It will replace the Unitary Development Plan following its approval and adoption. The relevant UDP policies are reproduced below:

HE1 Development Affecting Conservation Areas

Development in or affecting the setting of conservation areas will only be permitted if it preserves or enhances the character or appearance of the designated area.

HE2 Development Affecting Listed Buildings and their Settings

Any development affecting listed buildings or their settings, including internal or external alterations or change of use will be permitted only where:

- *There is no adverse effect on the building's special architectural or historic character and appearance and the setting of a listed building;*
- *It can be demonstrated that the loss of, or damage to its historic fabric is unavoidable, has been minimised and that works which would result in the*

loss of, or which would conceal parts of a listed building, and which contribute to its interest, will be recorded by a photographic or drawn survey; and

- *A change of use of a listed building or structure would increase the likelihood of the survival of the building and where alterations do not harm its character or special interest.*

HE4 Buildings of Local Interest

The demolition or alteration of any building or structure that is included on the List of Buildings of Local Interest will only be permitted where the following criteria apply:

- *In the case of demolition that the building is structurally unsound, it cannot be made safe without extensive alteration or rebuilding and is incapable of refurbishment at a cost which is reasonable in relation to its degree of interest. The design of the replacement building should match or exceed that which has been demolished; or*
- *In the case of alteration and extension that the works do not adversely affect the architectural or historic character of the building.*

HE5 Protection of Registered Landscapes, Parks and Gardens of Special Historic Interest.

Development affecting land in the Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales and adjacent areas, particularly their zones of essential setting and significant views, along with historic parks and gardens of local interest, will be permitted only where there is no adverse effect on their special historic character, appearance or setting.

HE6 Scheduled Ancient Monuments and other Nationally Important Archaeological Sites

Development that would remove, damage or obscure a Scheduled Ancient Monument or other nationally important archaeological site, or its setting, will not be permitted.

HE7 Other Sites of Lesser Archaeological Significance

Development that affects sites of either known or suspected local and/or regional archaeological interest and their settings will be permitted only where:

- *An archaeological assessment has been carried out, before a decision is made on the proposal, to the satisfaction of the Council which evaluates the intrinsic importance of the remains; and*
- *The need to retain the interest that has been identified is outweighed by the need for the proposed development.*

Where remains are affected but preservation in situ is not merited, excavations and/ or recording must be carried out to the satisfaction of the Council in advance of development commencing.

HE8 Recording of Historic permitted Features

Development will be only where there is provision for adequate recording of any historic features likely to be affected by the development.

3. METHODOLOGY AND SOURCES

3.1. DESK-BASED ASSESSMENT

- 3.1.1. The appraisal has been carried out in accordance with the requirements of Planning Policy Wales (PPW) (Ref. 8.2), National Planning Policy Framework (NPPF) (Ref. 8.1), National Policy Statement for Energy EN-1 (Ref. 8.8), the Technical Advice Note 24 (Ref. 8.14) and to standards specified by the Chartered Institute for Archaeologists (Ref. 8.15, Ref. 8.16), Historic England (Ref. 8.17) and Cadw (Ref. 8.18, Ref. 8.19).
- 3.1.2. In order to determine the full historic environment potential of the Newbuild Infrastructure Boundary, a broad range of standard documentary and cartographic sources, including results from any archaeological investigations, have been assessed. A 500 m radius Study Area around the Newbuild Infrastructure Boundary was applied in order to determine the likely nature, extent, preservation and value of any known or possible buried heritage within and around the Newbuild Infrastructure Boundary, whilst a 1 km Study Area for any designated heritage assets, and an assessment of their setting, was examined. **Table 3.1 - Summary of Data Sources**
- 3.1.3. below provides a summary of the data sources consulted.

Table 3.1 - Summary of Data Sources

Source	Data	Comment
Cadw (Ref. 8.20)	National Historic Assets of Wales with information on statutorily designated heritage assets Consultation	Statutory designations (Scheduled Monuments; statutorily Listed Buildings; Registered Parks and Gardens; Historic Battlefields) can provide a significant constraint to development.
Historic England (Ref. 8.21)	National Heritage List for England with information on statutorily designated heritage assets Consultation	Statutory designations (Scheduled Monuments; statutorily Listed Buildings; Registered Parks and Gardens; Historic Battlefields) can provide a significant constraint to development.
British Geological Survey (BGS; Ref. 8.22)	Solid and drift geology digital map; online BGS geological borehole record data.	Subsurface deposition, including buried geology and topography, can provide an indication of potential for early human settlement, and potential depth of archaeological remains.

Source	Data	Comment
Clwyd-Powys Historic Environment Record	Historic Environment Record (HER) Consultation	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources.
Cheshire Historic Environment Record (CHER)	Historic Environment Record (HER) Consultation	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources.
Groundsure Limited	Historical Mapping	Ordnance Survey mapping from the 1st edition to the present day was used to provide a background to the historical development of the Study Area.
Chester Archives	Historic maps (e.g., Tithe, enclosure, estate), published journals and local history	Baseline information on the historic environment
North East Wales Archives	Historic maps (e.g., Tithe, enclosure, estate), published journals and local history	Baseline information on the historic environment
Lle Geo-portal for Wales (Ref. 8.23)	LiDAR data for Wales and RCAHMW maritime historic asset data	The Lle Geo-Portal is a repository for data developed by the Welsh Government and Natural Resources Wales. Contains publicly accessible LiDAR and other data predominately pertaining to the natural environment.
DEFRA (Ref. 8.24)	LiDAR data	The DEFRA Survey Data Download is a repository for the National LIDAR Programme and other UK government funded programmes. Contains publicly accessible Environmental Agency (EA) LiDAR and other data predominately pertaining to the natural environment.

Source	Data	Comment
Magnitude Surveys Ltd (Ref. 8.25)	Geophysical Survey Report and Data (see Appendix 8-4).	Geophysical Survey data is used to determine, as far as is reasonably possible, the nature of the detectable archaeological resource to inform a suitable mitigation strategy for archaeological remains.
Applicant	Project acquired Geotechnical data	The information can aid in enhancing understanding of the nature and depth of natural geology (see above) and any made ground, whether it is modern or of potential archaeological interest.
	Topographical survey data	Survey data can provide an indication of the impact of past land use, e.g., ground raising or lowering, which is useful for understanding possible truncation and likely depth of archaeological remains.
Chapters 9 (Biodiversity), 11 (Land and Soils), 12 (Landscape and Visual) and 18 (Water Resources and Flood Risk) (Volume II) of the ES	Ecology (Ancient Woodland); Landscape and Visual (ZTV); Ground Investigation; Hydrology	Liaison with Biodiversity, Land and Soils, Landscape and Visual, and Water Resources and Flood Risk project teams to share relevant information.
Royal Commission of Ancient and Historic Monuments of Wales (RCAHMW; Ref. 8.26 and Ref. 8.27)	Aerial Photographs Coflein Consultation	Cropmarks formed by moisture variations due to subsurface features can indicate the presence of archaeological remains. Aerial photographs can also sometimes provide information on ground disturbance. Historic asset online database (Coflein)
Historic England Archive, Swindon (Ref. 8.28)	Aerial Photographs	Aerial photographs can also sometimes provide information on ground disturbance.

3.2. STUDY AREA

- 3.2.1. The primary Study Area comprises a 500 m buffer around the Newbuild Infrastructure Boundary, to identify and assess the potential for buried heritage assets (i.e. archaeological remains) to be present.
- 3.2.2. Where appropriate, there may be reference to assets beyond the 500 m Study Area, e.g., where such assets are of a particularly high heritage significance and/or where they are large contributors to the understanding of the Historic Environment.
- 3.2.3. The Study Area has been extended to a 1km buffer around the Newbuild Infrastructure Boundary at the confirmed locations of the Above Ground Installations (AGIs), Block Valve Stations (BVSs) and any other above ground structures required, in order to identify any designated heritage assets that could be impacted by the DCO Proposed Development through a change in setting.
- 3.2.4. These Study Areas were selected using professional judgement, considering factors such as the topography of the area and existing intervening topography, and through consultation with the LPA's archaeological advisors.
- 3.2.5. A full gazetteer of all heritage assets in is presented in **Appendix 8-2 - Gazetteer (Volume III)** and locations presented in **Figures 8.1.2 - Designated Heritage Assets** and **Figure 8.1.3 - Non-designated Heritage Assets** in **Annex A**. For a full gazetteer of features identified within the Aerial Photograph and LiDAR Assessment refer to **Annex A: Aerial Photograph and LiDAR Gazetteer of features identified in Appendix 8-3 – Aerial Photograph and LiDAR review**. Each feature of the historic environment has a unique reference number though due to the range of data sources the format varies. Throughout this report, the data sources are referred to as follows:
- National Heritage Listing Entry (NHLE): (NHLE 1130679);
 - CADW listing (i.e. 87601 (for Listed Buildings) and FL002 (for Scheduled Monuments));
 - 'ECH3547' and 'MCH9994': CHER reference number. (i.e. EHRXXXX for event and MCHXXXX for monuments);
 - CHER ref number (i.e. 99059);
 - WSP: WSP feature number. Potential asset identified during the walkover surveys;
 - AP: Aerial photograph feature number. Potential asset identified during the Aerial Photograph assessment (See Figure 8.3.4 Sheets 1–7 in Appendix 8-3 – Aerial Photograph and LiDAR review for locations of identified potential assets);and

- L: LiDAR feature number. Potential asset identified during the LiDAR assessment.

3.2.6. All distances quoted in the text are approximate (within 5m) and measured from the nearest section of the Newbuild Infrastructure Boundary.

3.3. SITE VISIT

3.3.1. Four site visits have been conducted within the Newbuild Infrastructure Boundary:

- A rapid visual survey of the route of the Proposed DCO Development, was undertaken by car on the 20 September 2021. This was to assess access for the proposed geophysical survey, to identify any potential non-archaeological constraints for the non-intrusive survey.
- A site walkover was undertaken between 11–15 October 2021, to determine the topography and existing land use, identify any visible heritage assets (e.g., structures and earthworks), and assess any possible factors which may affect the survival or condition of any known or potential heritage assets.
- A site walkover undertaken to the BVS and AGI locations and to complete the setting assessments for heritage assets within 1km along the Newbuild Carbon Dioxide Pipeline route on the 24 and 25 February 2022. This was undertaken per Historic England guidance (Historic England, 2016).
- A further site walkover was carried out on 3 June 2022 for the purposes of baseline assessment and revised settings appraisal for an additional site parcel located at Deeside Lane in Sealand, Flintshire.

3.4. ENGAGEMENT

3.4.1. Engagement with Historic England, Cadw, the Archaeology Planning and Advisory Service (APAS) for Cheshire West and Chester, and Clwyd-Powys Archaeological Trust (CPAT) was undertaken on 27 May 2021 to present the DCO Proposed Development and discuss the proposed assessment methodology and review the key heritage constraints.

3.4.2. Further engagement was undertaken (by email) in January 2022 to agree the rationale and scope for the Geophysical Survey. The Written Scheme of Investigation (WSI) for this element of work was approved on 25 January and 8 February 2022, by APAS and CPAT respectively.

- 3.4.3. Following completion of the Geophysical Survey, the results were shared with both CPAT and APAS on 22 June 2022. The results of the survey were discussed in email exchanges and the archaeological advisors noted features of interest that warranted investigation within the strategy for targeted evaluation. Further information regarding a particular feature of interest, a possible enclosure, within the Cheshire section of the Newbuild Infrastructure Boundary was also provided by APAS as part of these discussions.
- 3.4.4. Engagement with Cadw, the APAS for Cheshire West and Chester, Cheshire West and Chester conservation officers, Royal Commission of Ancient and Historical Monuments of Wales (RCAHMW), and Clwyd-Powys Archaeological Trust (CPAT) was undertaken on 18 August 2022 to discuss the changes to the DCO Proposed Development, review the key heritage constraints and assessments undertaken to date, and discuss the proposed next steps.

3.5. ASSESSING HERITAGE VALUE

- 3.5.1. The Overarching National Policy Statement for Energy (**Ref. 8.8**) defines significance as '*The sum of the heritage interests that a heritage asset holds*'. That interest may be historic, archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.
- 3.5.2. The determination of the significance is based on statutory designation and/or professional judgement against the below values, identified in Historic England Conservation Principles
- 3.5.3. This document recognises national policy, standards and guidance from two countries (England and Wales). For consistency, this assessment will use the NPPF assessment criteria (as agreed by CADW in **Appendix 1-3 – EIA Scoping Opinion Responses (Volume III)**). Where there are differences in terminology between the nations, these have defaulted to NPPF (England), references unless directly quoting policy.

NPPF SIGNIFICANCE ASSESSMENT CRITERIA

- 3.5.4. Value lies in the significance of a heritage asset to this and future generations because of its heritage interest, which may be historic, archaeological, architectural or artistic. Known and potential heritage assets within the DCO Proposed Development and its vicinity have been identified from national and local designations, HER data and expert opinion. Throughout this report the term 'value' has been used. The determination of the value of these assets is based on statutory designation and/or professional judgement against the following values referred to in the NPPF (**Ref. 8.1**):
- *Historic Interest*: the ways in which the asset can illustrate the story of past events, people and aspects of life (illustrative value or interest). This can

hold communal value when associated with the identity of the current community. Historical interest considers whether the asset is the first, only, or best surviving example of an innovation of consequence, whether related to design, artistry, technology or social organisation. It also considers an asset's integrity (completeness), current use/original purpose, significance in place making, associative value with a notable person, event, or movement.

- *Archaeological Interest*: the potential of the physical remains to yield evidence of past human activity and the interest in carrying out an expert investigation at some point in the future and may apply to standing buildings or structures as well as buried remains. This includes above-ground structures and landscapes, earthworks and buried or submerged remains, palaeoenvironmental deposits, and takes into account date; rarity; state of preservation; diversity/complexity; contribution to published priorities (research value); supporting documentation; collective value and comparative potential, and sensitivity to change.
- *Architectural and Artistic Interest*: derive from a contemporary appreciation of an asset's aesthetics. The former is associated with the art or science of design, construction, craftsmanship and decoration of buildings and structures. The latter is derived from creative expression which might use, represent or influence historic places or buildings through art (contributing to their value through their association with art), as well as the meaning, skill and emotional impact of works of art that are either part of heritage assets or assets in their own right.

- 3.5.5. Although differing slightly with Historic England and Cadw's criteria as set out in their respective *Conservation Principles* statements (**Ref. 8.29**, **Ref. 8.30** and **Ref. 8.18**) encompass the criteria that the two bodies are obliged to consider when statutorily designating heritage assets. There is no single defining criterion that dictates the overall asset value; each asset has to be evaluated against the range of criteria listed above on a case-by-case basis.
- 3.5.6. In relation to Designated Heritage Assets, the assessment considers the contribution which the historic character and setting makes to the overall significance of the asset.
- 3.5.7. Unless the nature and exact extent of buried archaeological remains within any given area has been determined through prior investigation, significance is often uncertain.
- 3.5.8. **Table 3.2** gives examples of the significance of designated and non-designated heritage assets.

Table 3.2 - Criteria to Assess the Value of Heritage Assets

Heritage asset description	Value
World Heritage Sites	Very High
<p>Scheduled Monuments</p> <p>Grade I Listed Buildings</p> <p>Grade II* Listed Buildings</p> <p>Grade II Listed Buildings which can be shown to have exceptional qualities in their fabric or historical associations, or which are clearly associated with heritage assets of high, national significance</p> <p>Conservation Areas containing buildings of great importance</p> <p>Undesignated structures of clear national importance.</p> <p>Undesignated below ground heritage assets of clear national importance</p>	High
<p>Grade II Listed Buildings which can be shown to have qualities in their fabric or historical association of regional importance only</p> <p>Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations</p> <p>Conservation Areas containing buildings that contribute significantly to its historic character</p> <p>Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings</p> <p>Known buried heritage assets of regional importance</p>	Moderate
<p>Locally Listed Buildings</p> <p>Historic (unlisted) buildings of modest quality in their fabric or historical association.</p> <p>Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings</p> <p>Known buried heritage assets of local importance</p>	Low
Buildings of no architectural or historical note; buildings of intrusive character	Negligible
<p>Buildings with some hidden (i.e. inaccessible) potential for historical significance</p> <p>Unknown buried heritage assets</p>	Uncertain

3.6. ASSESSING MAGNITUDE OF IMPACT

3.6.1. The assessment of the magnitude of impact (i.e. change) is the identification of the degree of the impact of the DCO Proposed Development on the value of the heritage assets. There is no standard scale of comparison against which the severity of effects on heritage assets may be judged, because of the great variety of resources and assets, but it is based on the deviation from baseline conditions. The assignment of a magnitude of impact is a matter of professional judgement and is summarised in **Table 3.3**.

Table 3.3 - Magnitude of Impact Criteria

Impact	Description
Major	Change to most or all key archaeological materials or key historic building elements, such that the resource is totally altered Comprehensive changes to setting
Moderate	Changes to many key archaeological materials or key historic building elements, such that the resource is clearly modified Considerable changes to setting that affect the character of the asset
Minor	Changes to key archaeological materials or key historic building elements, such that the asset is slightly altered Slight changes to setting
Negligible	Very minor changes to archaeological materials or historic building elements, or setting
No Change	No change

3.6.2. The assessment of likely significant effects has considered the Construction, Operational, and Decommissioning stages. The significance level attributed to each effect has been assessed based on the heritage significance (value) of the affected receptor (heritage asset) and the magnitude of change (impact) to the heritage significance of the receptor due to the DCO Proposed Development.

3.6.3. The matrix for determining environmental effects is outlined in **Table 3.4**. Effects may be either negative (adverse) or positive (beneficial) and are defined initially without mitigation. The table is a guide, so that the process is transparent and the rationale for the effect scores is provided in the relevant sections. Where the resulting effect comprises two separate levels (i.e. 'moderate or minor' or 'minor or negligible'), professional judgement has been applied to select the most appropriate significance of effect.

3.6.4. Where information is insufficient to be able to quantify either the asset significance or magnitude of change with any degree of certainty, the effect is given as 'uncertain'. This might be the case for possible buried heritage assets, the presence, nature, date, extent, and significance of which is uncertain due to the absence of any site-based investigation.

Table 3.4 - Matrix for Determining Significance of Effect

		Magnitude of Impact				
		Major	Moderate	Minor	Negligible	No Change
Value	Very High	Very Large	Large/Very Large	Moderate/Large	Slight	Neutral
	High	Large/Very Large	Moderate/Large	Moderate/Slight	Slight	Neutral
	Medium	Moderate/Large	Moderate	Slight	Neutral/Slight	Neutral
	Low	Slight/Moderate	Slight	Neutral/Slight	Neutral/Slight	Neutral
	Negligible	Slight	Neutral/Slight	Neutral/Slight	Neutral	Neutral
	Uncertain	Unknown	Unknown	Unknown	Unknown	Unknown

3.6.5. Effects that are classified as moderate or above are considered to be 'significant' in EIA terms. Effects classified as minor or below are considered to be 'not significant'. The language used in the NPPF (for example, substantial or less than substantial harm) has been correlated with the standard EIA methodology (**Ref. 8.1**). A very large or large effect equates to 'substantial harm' whilst all the lesser effects are considered 'less than substantial harm'.

3.7. ASSESSING THE CONTRIBUTION OF SETTING

3.7.1. In relation to designated heritage assets, the assessment considers the contribution that setting makes to the overall value of the asset.

- 3.7.2. Setting is the way in which the asset is understood and experienced. It is not an asset in itself. It differs from curtilage (historic/present property boundary); context (association with other assets irrespective of distance) and historic character (sum of all historic attributes, including setting, associations, and visual aspects).
- 3.7.3. Guidance produced by Historic England (**Ref. 8.31**) and the Landscape Institute and Institute of Environmental Management and Assessment (**Ref. 8.32**) has been used to adopt a stepped approach for settings assessment. The Cadw guidance (**Ref. 8.33**) is equivalent to the Historic England guidance with only changes to terminology noted. The former sets out five steps:
- Step 1: asset identification. The NPPF (**Ref. 8.1**) and NPS EN1 (**Ref. 8.8**) requires an approach that is proportional to the significance of the asset, and for this reason only the settings of the most sensitive (i.e. designated) heritage assets are considered in this assessment. A scoping exercise filters out those assets which would be unaffected, typically where there are no views to/from the site.
 - Step 2: assess the contribution of setting. This stage assesses how setting contributes to the overall significance of a designated asset.
 - Step 3: assess change. This considers the effect of the proposals on asset significance. It is noted however that it can be difficult to quantify such change to the overall significance of a designated heritage asset (for example, significance would rarely be downgraded from 'high' to 'moderate' due to changes in setting).
 - Step 4: mitigation. This explores the way to maximise enhancement and avoid or minimise harm. This is typically considered at the design stage (i.e. embedded design mitigation).
 - Step 5: reporting. Making and documenting decisions and outcomes. This reports the assessment of effects.
- 3.7.4. The assessment has considered the physical surroundings of the asset, including topography and intervening development and vegetation. It also considers how the asset is currently experienced and understood through its setting, in particular views to and from the asset and the site, along with key views, and the extent to which setting may have already been compromised.

4. HISTORIC ENVIRONMENT BASELINE

4.1. LOCATION OF THE DCO PROPOSED DEVELOPMENT

4.1.1. The DCO Proposed Development comprises a 35 km linear scheme which extends north-east to south-west from Elton, Cheshire, in England (NGR reference: 346900, 376156) to rural land to the south of Oakenholt, Flintshire, in Wales (NGR 325108, 370798). The Newbuild Infrastructure Boundary includes the proposed locations of four Above Ground Installations (AGI) and three Block Valve Stations (BVS): Ince AGI, Stanlow AGI, Rock Bank BVS, Mollington BVS, Aston Hill BVS, Northop Hall AGI, and Flint AGI. The locations of three Block Valve Stations sited along the route of the existing Flint Connection to Point of Ayr Terminal Pipeline in Flintshire, Wales are also proposed. The three proposed BVSs are comprised of: the Cornist Lane BVS located at the junction of Cornist Lane and Lleprog Lane (NGR 321717, 372492; **Figure 8.1.1**), 3.7 km to the west of Flint); the Pentre Halkyn BVS located on B5121 (NGR 316714, 372639; **Figure 8.1.1**); and the Babell BVS located on Racecourse Lane (NGR 313552, 373575; **Figure 8.1.1**). The Newbuild Infrastructure Boundary lies within the jurisdiction of two national boundaries, Wales and England and two local authorities: Flintshire County Council and Cheshire West and Chester Council (**Figure 8.1.1**).

4.1.2. For the HEDBA, the various scheme elements have been grouped into three broad sections (see **Figure 8.1.1**). This is for the purposes of providing a broad archaeological and historical background narrative across such a large area. The grouping is as follows:

CHESHIRE NEWBUILD INFRASTRUCTURE BOUNDARY

4.1.3. This section comprises the section of the Newbuild Infrastructure Boundary which extends for 16 km from the proposed Ince AGI to England / Wales border (which lies parallel with the edge of the River Dee Floodplain close to Sealand). The Newbuild Infrastructure Boundary passes through a mixture of open pasture, reclaimed marshland and arable fields. In the north-east, the environment is characterised by heavy industry close to the River Mersey.

FLINTSHIRE NEWBUILD INFRASTRUCTURE BOUNDARY

4.1.4. This section comprises the south-western section of the Newbuild Infrastructure Boundary which extends for 18.9 km from England / Wales border, across the canalised channel of the River Dee to Sandycroft before turning west to along the River Dee to the Flint AGI. At this point, the Newbuild Carbon Dioxide Pipeline connects to the existing Flint Connection to PoA Terminal Pipeline. The Newbuild Infrastructure Boundary passes through a mixture of open pasture, reclaimed marshland, arable fields, and modern townscapes.

4.2. TOPOGRAPHY

- 4.2.1. Topography can provide an indication of suitability for settlement, and ground levels can indicate whether the ground has been built up or truncated, which can have implications for archaeological survival. Topographical heights have been obtained from the topographic survey undertaken by the applicant as part of this proposal.

CHESHIRE NEWBUILD INFRASTRUCTURE BOUNDARY

- 4.2.2. The area within the Newbuild Infrastructure Boundary is comprised of rolling hills which are intercut by successive streams and rivers, including the River Gowy in north-east of the section. The land gradually shifts between 3.8 m above Ordnance Datum (OD) in the former Ince Marshes in the north-eastern end of the Newbuild Infrastructure Boundary, rising gradually to 32.9 m OD within the south-west of the section. The natural topography is lower in the marshes, river valleys and streams which are located across the north and north-east of the Section, with general heights between 3.8 m OD and 9.0 m OD. The highest point is in Mollington, in the south-west part of the section at 32.9 m OD. The undulating ground level ends at the former north bank of the River Dee which is at 15.4 m OD. From here, the former Dee river valley lies on flat ground at c approximately 4.8 m OD.

FLINTSHIRE NEWBUILD INFRASTRUCTURE BOUNDARY

- 4.2.3. The ground level in the Flintshire section of the Newbuild Infrastructure Boundary rises gradually from the former Dee river valley (4.8m OD) in Mancot and Sandycroft to 83.6 m OD near Aston Hill Farm in Ewloe. The ground level gradually rises to 90.2 m OD within the fields to the north of Magazine Lane. The ground level stays flat between 83.3 m AOD and 90.2 m AOD until the north bank of the Alltami Brook. The ground level undulates to the west of Alltami Brook from 76.5 m OD to 94.5 m OD to 90.4 m AOD at the junction of Brookside and the A55. The ground level between the A55 to the south and the B5125 to the north rises toward the B5125 from 90.8 m OD to 119.2 m OD. The ground level then falls to 102 m OD between the B5125 and Connah's Quay Road and continues falling to the north to 88.7 m OD at Starkey Lane. The land begins to fall to the north to 41.6 m OD in the north end of the western end of the Newbuild Infrastructure Boundary.

BLOCK VALVE STATIONS ALONG THE FLINT CONNECTION TO POINT OF AYR TERMINAL PIPELINE

- 4.2.4. The three BVS sites on the existing Flint Connection to Point of Ayr Terminal Pipeline are located (from west to east) on a land rising up from Flint and sloping down towards the Dee towards the north-west.

- 4.2.5. The proposed Cornist Lane BVS is located on the southern side of the Dee river valley, with the land sloping to the north and west from 147.5 m OD in the south-east corner to 140.4 m AOD in the south-west corner and 132.4 m AOD in the north-west near the intersection of Nant Road and Cornist Lane.
- 4.2.6. The proposed Pentre Halkyn BVS is situated on land that gradually rises to the east from 206.0–206.9 m OD along the eastern edge adjacent to the B5121 to 218.3 m OD in the south-east corner.
- 4.2.7. The proposed Babell BVS is set on the edge of a valley with the land sloping to the south-west from 175.2 m OD in the north-west and 174.2 m OD in the north-east to 171.5 m OD in the south-west.

4.3. GEOLOGY

- 4.3.1. Geology can provide an indication of suitability for early settlement, and potential depth of remains.

CHESHIRE NEWBUILD INFRASTRUCTURE BOUNDARY

- 4.3.2. According to British Geological Survey (BGS) mapping (**Ref. 8.22**), the majority of this section is underlain by bedrock comprising undifferentiated Sandstone And Conglomerate, predominantly formed of the Chester formation. In the north-east of the Newbuild Infrastructure Boundary, where the Newbuild Infrastructure Boundary is located within reclaimed marshland of the River Gowy floodplain the bedrock is overlain by superficial deposits of Tidal Flat alluvium and peat deposits along with Blown sand. The remaining land between the reclaimed Ince Marshes and the River Dee floodplain is predominately comprised of Till, a superficial sedimentary deposit.

FLINTSHIRE NEWBUILD INFRASTRUCTURE BOUNDARY

- 4.3.3. The land within the former River Dee floodplain (in which the Shropshire Union Canal is located) is comprised of superficial Tidal Flat alluvial deposits with pockets of Alluvial Fan deposits along the north bank overlying the Etruria Formation, a sedimentary bedrock comprised of Mudstone, sandstone and conglomerate laid down during the Carboniferous Period.

4.3.4. Moving south-west, between Sandycroft and Lower Aston Hill BVS Lane, the geology is predominately comprised of a mixture of Tills and mudstones or overlying a mixture of Pennine Middle Coal Measures Formation and pockets of Etruria Formation. Between Lower Aston Hill BVS Lane and Holywell Road, the geology is predominately comprised of Glaciofluvial Deposits or Head deposits overlying Pennine Middle Coal Measures Formation, Gwespyr Sandstone, Bowland Shale Formation and pockets of Hollin Rock, a sandstone. Till deposits overlie Pennine Lower Coal Measures Formation deposits between Holywell Road and Alltami Brook. Till deposits overlie Pennine Lower Coal Measures Formation, Pennine Middle Coal Measures Formation, Gwespyr Sandstone, and Hollin Rock between Alltami Brook. The western end of the section is broken up by alluvial deposits at Northop Brook and Alltami Brook (**Ref. 8.22**).

BVS ON FLINT CONNECTION TO POINT OF AYR TERMINAL PIPELINE

4.3.5. The north-eastern corner of the proposed Cornist Lane BVS is overlain by superficial deposits of Devensian Till; otherwise, there are no other superficial deposits recorded. The Bedrock geology comprises Gwespyr Sandstone formation in the west and Bowland Shale formation in the east and centre of the Newbuild Infrastructure Boundary (**Ref. 8.22**).

4.3.6. The geology of the location of the proposed Pentre Halkyn BVS is comprised of Loggerheads Limestone formation overlaid primarily by till and an outcrop of Glaciofluvial Ice Contact deposits in the centre and north, comprising sand and gravel formed during the Quaternary period as a result of glacial melting (**Ref. 8.22**).

4.3.7. The bedrock geology of the location of the proposed Babell BVS is comprised of Cefn Mawr Limestone formation overlaid by superficial till in the north-west of the Newbuild Infrastructure Boundary, Glaciofluvial Ice Contact deposits in the centre and south-west of the Newbuild Infrastructure Boundary and head deposits in the east, comprised of poorly sorted angular rock debris and/or clayey hillwash and soil creep deposited through the process of solifluction (**Ref. 8.22**).

4.4. GEOARCHAEOLOGICAL DEPOSIT MODEL SUMMARY

INTRODUCTION

4.4.1. The Applicant commissioned Oxford Archaeology to assess the subsurface palaeoenvironmental and archaeological potential of three sections of the Newbuild Infrastructure Boundary. The results of this survey are included in **Appendix 8-5 – Geoarchaeological Deposit Model (Volume III)**, have been incorporated into the ES (**Chapter 8 – Cultural Heritage, Volume II**).

- 4.4.2. The aims (or purpose) of the Geophysical Survey **Appendix 8-5 – Geoarchaeological Deposit Model (Volume III)** were:
- To utilise available borehole data to characterise the sub-surface deposits at three main areas across the scheme;
 - To interpret the sub-surface stratigraphy in order to understand landscape development;
 - To evaluate the data regarding the presence or absence of areas of potential archaeology, including identification of deposits likely to contain palaeoenvironmental evidence that could inform landscape development, potential landuse, and human impact on the landscape;
 - To utilise the geoarchaeological data derived from the deposit model to inform locations for future interventions in order to build an improved deposit model; and
 - To recommend particular locations suitable for collection of samples for palaeoenvironmental assessment to aid landscape reconstruction.
- 4.4.3. Three areas within the Newbuild Infrastructure Boundary with the potential to contain palaeoenvironmental deposits were identified from the British Geological Survey (BGS) mapping. Area 1 was located in marshland at the north-eastern end of the DCO Proposed Development; Area 2 was within the River Gowy floodplain, also near the north-eastern end of the DCO Proposed Development; and Area 3 was within the River Dee floodplain, near the centre of the scheme (see **Figure 1 in Appendix 8-5 – Geoarchaeological Deposit Model (Volume III)**).
- 4.4.4. The results of recent geotechnical ground investigation and historical boreholes sourced from the BGS were used to prepare a geoarchaeological model.

SUMMARY OF RESULTS

- 4.4.5. For the full analysis and detailed results see **Appendix 8-5 – Geoarchaeological Deposit Model (Volume III)**. The result of the modelling is broadly consistent with the BGS mapping of the areas, with superficial sedimentary sequences dominated by minerogenic sands, clays, and silts, likely laid down in intertidal/alluvial environments. The thickness of Holocene deposits overlying Pleistocene glacial deposits was recorded to a maximum depth of c .15 m in Area 1 marginal to the River Mersey; c. 7m in Area 2 on the Gowy floodplain; and c. 18.5 m in Area 3 on the Dee. Analysis of LiDAR DTM data has clearly identified the presence of tidal creek systems and palaeochannels, particularly across the floodplain of the River Dee (Area 3). Within the tidal deposits, the borehole data record multiple interbedded peat horizons which were particularly substantial in the north-eastern marshland in Area 1, and on the River Gowy floodplain in Area 2, the top of which occurred at, or within 1m of, current ground surface. Thin peats are recorded from parts of the Dee

floodplain (Area 3), although the distribution here was found to be somewhat poor, with much of the data deriving from shallow test-pit interventions.

4.4.6. The overall data distribution was generally sparse. This was notable close to the floodplain edge in Areas 1 and 2, which are located at the interface between dryland and wetland. These areas may have provided a focus for past activity where evidence of occupation and relict land surfaces may lie buried at relatively shallow depths in waterlogged conditions. As a result, the character and depth of the interface of the Holocene and Glacial deposits is difficult to predict at these locations.

4.4.7. The waterlogged burial conditions suggest good potential for preservation of organic remains which may include wooden structures and artefacts associated with seasonal wetland edge occupation, particularly adjacent to former watercourses. In addition, the presence of substantial peat and intertidal deposits suggests high potential for preservation of a range of palaeoenvironmental remains (e.g., pollen, insects, and plant remains) and investigation of coastal evolution, sea-level change and palaeohydrology (e.g., diatoms, ostracods, and foraminifera).

4.5. OVERVIEW OF DESIGNATED HERITAGE ASSETS

4.5.1. A total of 156 designated heritage assets are present within 1km of the Newbuild Infrastructure Boundary, comprising:

- 18 scheduled monuments,
- 127 listed buildings,
- 2 Registered Historic Parks and Gardens,
- 1 Registered Historic Landscape, and
- 10 Conservation Areas.

4.5.2. Of these, only three designated heritage assets lie within the Newbuild Infrastructure boundary, comprising Chester Canal Conservation Area, Thornton-le-Moors Conservation Area, and the Holywell Common and Halkyn Mountain Registered Historic Landscape (HLW (C) 2).

4.5.3. There are 29 non-designated heritage assets identified within the Newbuild Infrastructure Boundary.

4.6. OVERVIEW OF PAST INVESTIGATIONS

4.6.1. 48 previous archaeological investigations have been undertaken within the 500 m Study Area. Of these, only 14 have been undertaken at least partially within the Newbuild Infrastructure Boundary and eight of these took the form of desk-based assessments with no intrusive investigation. The majority of the investigations (34) are located within the Cheshire section of the Newbuild Infrastructure Boundary which leaves archaeological understanding the Flintshire section extremely limited. Considering this and the full length of the Proposed DCO Development, current understanding of the nature and distribution of past activity, in particular for the prehistoric, Roman and early Saxon period, for which there is no documentary record, is very limited.

4.6.2. The investigations recorded within the Newbuild Infrastructure Boundary comprise:

- **North Dee 2D Seismic Survey Area, Cheshire: Appraisal Study of Heritage Assets of Archaeological Interest (ECH6160).** Undertaken by Peter Cardwell in 2015. The purpose of the study was to identify the presence of recorded heritage assets of archaeological interest and to advise on mitigation measures necessary to ensure that no damage was caused as a result of the survey, in particular damage from vehicles, drilling of boreholes for shot points, the effect of vibroseis tractors on structures (especially the low frequency start of a vibration sweep), the detonation of shot points and the effect of low frequency or blast shock waves.
- **Palaeoenvironmental Assessment of a proposed motorway service station at Hapsford (ECH3547).** Undertaken by Chester Archaeology in 1993. Peat was found along the eastern edge of the site where the ground slopes down towards Ince Marsh and presumably formed as a result of periodic flooding. It only survives beneath the low bank feature on the eastern boundary which has protected it from plough damage. It probably formed in the early Flandrian period and is generally well humified, but its depth could not be determined due to the presence of groundwater. No archaeologically significant ecofacts were recovered.
- **Land at Collinge Farm, Backford, Chester: Archaeological Impact Assessment (ECH4197).** Undertaken by AAA Archaeological Advisors in 2005. Neither the desktop survey nor a rapid field survey turned up any evidence for significant archaeological remains within the study area of the Land at Collinge Farm project.
- **Collinge Farm, Backford, Chester: Archaeological Watching Brief (ECH4435).** Archaeological Watching Brief undertaken by AAA Archaeological Advisors in 2005 during topsoil stripping and levelling of two fields. No archaeological features were recorded. Neither the desktop survey

(ECH4197) nor a rapid field survey turned up any evidence for significant archaeological remains within the Collinge Farm's study area.

- **Land at Ince Marshes: Desk-Based Assessment (ECH3777).** Undertaken by Gifford and Partners in 1998.
- **Ince Resource Recovery Park: Metal Detector Survey (ECH4701).** Undertaken by RSK Ltd. in 2010. Metal detector survey across land to be developed for Ince Resource Recovery Park. Items recovered included jettons, spindle whorls, Roman brooch and large numbers of later finds, including Second World War shrapnel.
- **AJ - EB line, Ledsham to Chester: Cultural Heritage Assessment (ECH6274).**
- **Proposed Motorway Services M56 Near Hapsford, Chester: Archaeological Evaluation Report (ECH6534).** Undertaken by Gifford and Partners in 1993. The results of the evaluation demonstrated that there were no archaeological remains or deposits within the Proposed Motorway Services M56 Near Hapsford, Chester development area.
- **Protos Park and Q Line, Cheshire: Heritage Impact Assessment (ECH6805).** Undertaken by Clwyd Powys Archaeological Trust in 2019. The assessment identified a single undesignated heritage asset within 250m of the Protos Park and Q Line, Cheshire scheme.
- **Report on Northwest Telent Techmac Design and Consultancy Services Framework Provision of Variable Message Signs on the M56 Between Junctions J9 -16 (ECH4557).** An appraisal or assessment of cultural heritage along the M56 between junctions J9 and J16 undertaken by Golder Associates in 2009. Identified listed buildings and sites from which the proposed signs would be visible. These include a moated site, fishpond and connecting channel at Elton, a heavy anti-aircraft gun site 400m west of Sutton Fields Farm and two sections of Roman Road between Appleton and Stretton.
- **Pre-sanction Engineering Capenhurst to Frodsham (4ZE) 11060: Desk-based Assessment (ECH4611).** Undertaken by AMEC in 2005.
- **Proposed Stanlow Combined Heat and Power (CHP) Plant and High-Pressure Pipeline Archaeological Desk Based Assessment (ECH4683).** Undertaken by Network Archaeology in 1999.
- **AE Line, Stanlow, Cheshire: Cultural Heritage Assessment (ECH6327).** Undertaken by Clwyd Powys Archaeological Trust in 2016.
- **Mickle Trafford to Ellesmere Port Pipeline, Cheshire: Archaeological Evaluation and Palaeoecological Analysis (ECH6456).** Oxford Archaeology North (OA North) undertook a programme of archaeological assessment, requested by the Chester City Archaeologist, on behalf of United Utilities Ltd, in advance of the proposed route for a new waste water

pipeline. The pollen assemblages of the samples submitted from Mickle Trafford provide evidence for the environment around the coring site over approximately the last 5000 years. Three specific clearance phases were represented; the first phase occurred during the Neolithic period when there was some clearance of the deciduous lime/oak woodland, possibly including the use of fire indicated by the charcoal content in the samples, and the growth of cereals. The second phase, perhaps during the Bronze Age, featured cereal growth and pasturing. The third phase comprised the major clearance of woodland, probably in the late Iron Age/early Roman periods, with extensive arable and pastoral farming.

4.7. GEOPHYSICAL (MAGNETOMETER) SURVEY SUMMARY

INTRODUCTION

- 4.7.1. The Applicant commissioned Magnitude Surveys Ltd. to assess the subsurface archaeological potential of a 60 m corridor (referred to as Geophysical Survey (GS) corridor) buffered around the indicative route of the Newbuild Carbon Dioxide Pipeline and proposed locations of the above ground infrastructure associated with the DCO Proposed Development. The results of this survey are included in **Appendix 8-4 - Geophysical Survey Report (Volume III)**, have been incorporated into the ES (**Chapter 8 – Cultural Heritage, Volume II**) and included in the baseline of the HEDBA.
- 4.7.2. The aims (or purpose) of the Geophysical Survey **Appendix 8-4 - Geophysical Survey Report (Volume III)**, in compliance with the ClfA Standards and guidance for archaeological geophysical survey (**Ref. 8.34**), were:
- To determine, as far as is reasonably possible, the nature of the detectable archaeological resource within a specified area using appropriate methods and practices; and
 - To inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.
- 4.7.3. A scoping exercise was carried out across the Newbuild Infrastructure Boundary to determine appropriate sites for the proposed magnetometer survey. The scoping of areas suitable for geophysical survey assessment was based on a number of factors. Areas that were considered unsuitable for the assessment comprised alluvium, woodland, field boundaries, those parts of the Newbuild Infrastructure Boundary containing modern development/hardstanding and any sections too narrow or small to provide meaningful results. Of the 173.5 ha of area considered suitable for assessment, 147.4 ha were completed with other 26.1 ha excluded due to access constraints. The areas of the proposed Babell BVS, Pentre Halkyn BVS, and Cornist Lane BVS were also excluded

based on modern disturbance from the construction of the existing Flint Connection to PoA Terminal Pipeline which would have masked any surviving archaeological remains.

- 4.7.4. Those parts of the Newbuild Infrastructure Boundary which were omitted comprise areas of existing hardstanding or roads as these areas do not offer suitable conditions for geophysical techniques. Magnetometer survey over tarmac is rarely successful, it may be possible over other types of paving but only in relatively unusual circumstances when no elements of the paved surface are strongly magnetic. Where made ground is present geophysical survey is not appropriate given the likelihood for metallic contamination which would obscure any archaeological remains present. Sites on alluvium or peat were also scoped out, as the Geophysical Survey method was not considered to be appropriate to produce useful results. Archaeological features in these types of deposits would likely be deeply buried, beyond depths of 1.0 m, and outside the effective detecting range of the instrument.
- 4.7.5. Magnitude Surveys Ltd. describes the survey as comprising “hand-pulled cart-mounted and hand-carried GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK due to its ability to detect a range of different features” (Ref. 8.25; see **Appendix 8-4 – Geophysical Survey Report (Volume III)**). The survey was conducted in line with the current best practice guidelines produced by Historic England (Ref. 8.35), the Chartered Institute for Archaeologists (Ref. 8.34) and the European Archaeological Council (Ref. 8.36). For a full and detailed description of the methodology used, see **Appendix 8-4 – Geophysical Survey Report (Volume III)**.

LIMITATIONS

- 4.7.6. Modern interference, as magnetic disturbance around field edges where they are bounded by roads or metal fencing and buried services, will have obscured any weaker anomalies, if present, within their vicinity.
- 4.7.7. The narrowness of the survey corridor has made it difficult or impossible to provide a more definitive interpretation of these anomalies because of the limited context.

RESULTS

- 4.7.8. The results of the Geophysical Survey have been summarised below and notable possible archaeological features have been given a distinct ‘Magnitude Surveys (MS)’ number. For a full breakdown and analysis, see **Appendix 8-4 – Geophysical Survey Report (Volume III)**.
- 4.7.9. Evidence of likely archaeological activity has been identified in the form of possible pit alignment (NGR 344592, 373366; Figure 211 in **Appendix 8-4 – Geophysical Survey Report, Volume III**), which could date from prehistory to

the medieval period. While the anomaly has a magnetic signal typical of infilled pits, it could be caused by modern agricultural activity such as a drain.

- 4.7.10. Agricultural activity in the form of mapped and unmapped former field boundaries and recent ploughing was identified across the survey corridor, along with evidence of historical agricultural practice in the form of multiple ridge and furrow regimes, both late medieval and post-medieval. The late medieval ridge and furrow remains were identified in fields to the south-west of Chester Road in Mancot, Flintshire (seen on figures 121 and 124 in **Appendix 8-4 – Geophysical Survey Report, Volume III**) and potential areas of strong agricultural lines were recorded in Northop Hall AGI (seen on Figure 13 in **Appendix 8-4 – Geophysical Survey Report, Volume III**) and identified on the CPAT HER as Brookside Ridge and Furrow (97837). The post-medieval ridge and furrow regimes were accompanied by drainage features and other evidence of agricultural activity (seen on Figures 61, 64, 67, 88, 91, 94, 97, 112, 118, 121, 127, 136, 142, 145, 148, 151, 157, 160, 163, 169, 172, 175, 184, 187, 193, 196, 199, 202, 223, 226, 238, & 241 in **Appendix 8-4 – Geophysical Survey Report, Volume III**). Historic former field boundaries were noted across the scheme (seen on Figures 5, 7, 9, 11, 13, 17, 23, 25, 29, 31, 33, 49, 51, & 53 in **Appendix 8-4 – Geophysical Survey Report, Volume III**).
- 4.7.11. The industrial use of the landscape was also recorded through multiple possible extractions areas, both mapped and unmapped. In addition, large spreads of magnetic debris were identified within Areas 68, 69, 135, 138, 139, 91 & 140. In the area of the Ashfield Farm Brickworks (103787) seen on the OS 2nd edition 6": mile map of 1898 (not reproduced; **Ref. 8.37**) of the Sandycroft and Mancot sections of the Newbuild Infrastructure Boundary, the extraction area and the disturbance caused by the Aston Hill BVS Colliery Railway (23603) has been identified during the survey (seen on Figures 21 & 23 in **Appendix 8-4 – Geophysical Survey Report, Volume III**). The evidence of a colliery was identified within Mancot, identified on the OS 1st edition 6":mile map of 1869 (not reproduced; **Ref. 8.38**) of the Ewloe Green section of the Newbuild Infrastructure Boundary as 'Old Colliery' and possibly associated with Willow Park Colliery (103786) was identified during the geophysical survey (seen on Figure 17 in **Appendix 8-4 – Geophysical Survey Report, Volume III**). The remains of the Ewloe Green Colliery (103806) was identified during the walkover survey and the geophysical survey (seen on Figure 17 in **Appendix 8-4 – Geophysical Survey Report, Volume III**).
- 4.7.12. Anomalies of undetermined origin have been detected throughout the GS corridor. These anomalies generally lack any pattern, distinct morphology, or shape which would allow for a more definitive categorisation of their cause but are distinct from ferrous anomalies. Most of these anomalies are thought to be geological or agricultural in origin. However, it is not possible to completely rule out an archaeological origin for any of these anomalies. Many smaller or weaker

discrete anomalies, which if taken individually, would not be considered to be obviously of anthropogenic origin, have been highlighted and categorised as Undetermined where they form distinct patterns that could be suggestive of past human activity. The undetermined anomalies are shown on Figures 64, 67, 76, 79, 82, 85, 88, 94, 97, 100, 103, 109, 112, 118, 121, 124, 127, 130, 139, 142, 145, 148, 151, 154, 157, 160, 163, 169, 172, 175, 181, 184, 187, 193, 196, 199, 202, 205, 208, 211, 226, 229, & 241 in **Appendix 8-4 – Geophysical Survey Report, Volume III**. As noted in the LiDAR results discussion in **paragraph 5.2.21**, the feature shown on Figure 172 in **Appendix 8-4 – Geophysical Survey Report, Volume III** is thought to be a remnant of a Second World War encampment seen on contemporaneous aerial imagery.

- 4.7.13. Natural variations relating to superficial geology are present in some areas of the survey corridor and are most visible in the total field data. Some of these variations take the form of discrete positive anomalies, which are likely to be caused by unsorted and unstratified deposits of till, sands, gravels and tidal deposits. It should be noted that it is possible that some of these anomalies have an anthropogenic origin, as they can be difficult to distinguish in the magnetic results from those produced by natural processes. Broad bands of both strong and weak, positive and negative anomalies cross the survey area in several places. Many of these are in places where the GS corridor crosses areas of tidal deposits that cause variations in the superficial geology.

4.8. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

PREHISTORIC PERIOD

Palaeolithic Period (800,000 BC – 10,000 BC)

- 4.8.1. The Lower (800,000–250,000 BC) and Middle (250,000–40,000 BC) Palaeolithic saw intermittent, perhaps seasonal Hominin occupation of Britain as the climate alternated between long cold (glacial) and short warm (interglacial) stages. The Upper Palaeolithic is the last of the Palaeolithic periods (40,000–10,000 BC), spanning the last glacial cycle of the Pleistocene (the British Devensian). After the last glacial maximum (c 20,000 BC), the Devensian ended with the improved climatic conditions of the Holocene (c 10,000 BC), and the environment changed from steppe-tundra to birch and pine woodland which resulted in continual human occupation.
- 4.8.2. Following the retreat of the glaciers in the late Devensian after 12,000 BC, humans began to inhabit and utilise Cheshire and Flintshire though there is scant evidence of extensive use. No evidence of occupation or use during the Palaeolithic period has been identified within the Newbuild Infrastructure Boundary or the Study Area. The closest evidence of Palaeolithic activity within the wider geographical area consists of lithic material, identified during archaeological investigations at Frodsham 5.9 km north-east of the Elton end of

the Newbuild Infrastructure Boundary in Cheshire, and Carden Park 15.9 km south-east of the Newbuild Infrastructure Boundary where it crosses the River Dee and within caves near Cefn in Denbighshire, 15.1 km south-west of the proposed Babell BVS Newbuild Infrastructure Boundary (**Ref. 8.39**).

Mesolithic Period (10,000 BC – 4000 BC)

- 4.8.3. The Mesolithic hunter-gatherer communities of the post-glacial period inhabited a still largely wooded environment, predominately pine, birch, and alder forest growth. The river valleys and coast would have been favoured in providing a predictable source of food (from hunting and fishing) and water, as well as a means of transport and communication. Evidence of activity is characterised by flint tools rather than structural remains.
- 4.8.4. No evidence of activity or settlement during the Mesolithic period has been identified within the Newbuild Infrastructure Boundary. The only remains dating to this period within the Study Area are two layers of peat (15199; MCH25132) dated to the Mesolithic and Bronze Age periods, found within borehole cores taken during an archaeological watching brief (ECH6863) prior to development of the Ince Resource Recovery Park, 235 – 740 m to the north-west of the eastern end of the Newbuild Infrastructure Boundary. This suggests that the low-lying coastal areas may have been formed of partially inundated marshy ground during this period. Evidence of Mesolithic activity in the wider area surrounding the Study Area suggests that the coastal area north-east of the Study Area was occupied and utilised around the Mesolithic settlement identified at Tatton Mere, 30 km north-east of the north-east end of the Newbuild Infrastructure Boundary (**Ref. 8.40**).
- 4.8.5. Evidence of activity and settlement within Flintshire shows exploitation of marine and estuarine resources 13km to the north-west of the Babell BVS Newbuild Infrastructure Boundary, between Prestatyn and Rhyl and up the estuary of the Clwyd inland to Rhuddlan. This evidence consists of the remains of middens of cockle and mussel shells dated to the period excavated by archaeologists at Prestatyn (**Ref. 8.41**).

Neolithic Period (4000 BC–2000 BC)

- 4.8.6. The Neolithic is usually seen as the time when hunter-gathering gave way to farming and settled communities, and forest clearance occurred for the cultivation of crops and the construction of communal monuments. Pollen records indicate forest clearance over large areas of the British Isles during this period.

- 4.8.7. Evidence of Neolithic activity in the Cheshire section of the Study Area has been identified during an archaeological evaluation and palaeoecological analysis (ECH6456) of a paleochannel running parallel to the River Gowy at Picton Lane 500 m north of the Newbuild Infrastructure Boundary. Pollen assemblages from three cores taken within the paleochannel provided evidence of three specific ancient clearance phases with the first phase dated to the Neolithic when the deciduous lime/oak woodland was partially cleared to provide land for agricultural activity. The charcoal content in the samples suggested the use of fire to clear and reintroduce nutrients into the ground, followed by the growth of cereals (**Ref. 8.42**). Activity is documented in the pollen assemblages through the Bronze Age through to the late Iron Age and early Roman period. It is possible similar agricultural activity was occurring within the Newbuild Infrastructure Boundary at this time.
- 4.8.8. Other Neolithic evidence within the Cheshire section is limited to the remains of a possible Neolithic long barrow, noted as part of a late medieval chapel-of-ease at Wervin (NHLE 1330243), 500 m north-east of the Shropshire Union Canal crossing of the Newbuild Infrastructure Boundary. An archaeological survey (ECH4274) revealed a levelled earthwork underlying the ruins of a medieval chapel-of-ease at Wervin, 600 m to the north-west of the Newbuild Infrastructure Boundary (NHL 1330243). There is the possibility that the mound originated as a Neolithic earthen long barrow but this has not been confirmed by intrusive investigation and it is considered most likely that the mound could be a natural feature. Long barrows were used for communal burial during the Early Neolithic (c. 4000–3300 BC) period. Evidence suggests that there is potential for the area around the eastern end of the Newbuild Infrastructure Boundary to have been utilised during the Neolithic period and additional evidence may be present within the Newbuild Infrastructure Boundary notably within any palaeoenvironmental deposits in the Gowy river valley.
- 4.8.9. There is no evidence of Neolithic activity or settlement within the Flintshire section of the Newbuild Infrastructure Boundary or Study Area. The closest evidence of Neolithic activity to the Study Area in Flintshire is comprised of the continued use of marine and estuarine resources at Prestatyn 13 km west of the Babell BVS Newbuild Infrastructure Boundary and evidence of agricultural activity including ploughing and the rearing of domestic herds of animals by more settled farming communities dated to 3500 BC.

Bronze Age (2000 BC–600 BC)

- 4.8.10. The Bronze Age (2000–600 BC) is characterised by technological change, when copper and then bronze eventually replaced flint and stone as the main material for everyday tools. It is seen as a period of increasing social complexity and organised landscapes, probably due to increasing pressure on available resources. The Early and Middle Bronze Age periods are better represented than earlier periods in both Cheshire and Flintshire, perhaps due to the improvement in climatic conditions. After 2500 BC, warmer drier weather extended arable cultivation into higher altitudes.
- 4.8.11. During this period much of the copper for making bronze was sourced from the copper mine on the Great Orme headland near Llandudno, 37 km north-west of the western end of the Newbuild Infrastructure Boundary, where prehistoric mining was undertaken on a large-scale, between 1700 BC and 1400 BC (**Ref. 8.41**). A partial cast copper alloy object (PRN 120359) was found by chance near Ewloe in Flintshire 130 m north-east of the Newbuild Infrastructure Boundary and a socketed blade (PRN 19357) dating to the Bronze Age was also found by chance near Bagillt 130 m north-east of the proposed Cornist Lane BVS. The only Bronze Age find in the Cheshire region of the Study Area is the chance find of a looped spearhead (HER No. 1014) in the Ince Marshes 820 m to the north of the eastern end of the Newbuild Infrastructure Boundary. Bronze Age remains are commonly recovered from wetland areas including streams, rivers and inter-tidal zones, having been ritually deposited as offerings and it is possible that the spearhead was deposited in the marshes as an offering. Palaeoenvironmental deposits (15199) identified during a watching brief (ECH6863) prior to development of Plot 9 of the Ince Resource Recovery Park, 235–740 m to the north-west of the east end of the Newbuild Infrastructure Boundary, suggests that the low-lying coastal area may have continued to be comprised of partially inundated marshy ground during this period.
- 4.8.12. The Flintshire section of the Study Area is located within a prehistoric landscape dominated by funerary monuments dating to the Bronze Age, seemingly beginning around the Northop Hall AGI area 410 m to the north-east, and continuing west across the uplands for approximately 24.5 km. Burial practice changed from communal tombs to round barrows found with grave goods and an associated mound. The HER records the location of three round barrows that have been destroyed as a result of modern development within close proximity to the Newbuild Infrastructure Boundary in the vicinity of Northop Hall AGI: the Northop Hall AGI Tumulus (PRN 100049) located to the rear of houses facing on to B5125, 390m north of the Newbuild Infrastructure Boundary, the Wared Wood Mound (PNR 100051) located 30 m to the south of the Newbuild Infrastructure Boundary, and the Gables Barrow (PRN 101848), 220 m to the west. It has been suggested that the Northop Hall AGI Tumulus (PRN 100049)

was a later feature, instead the result of post-medieval mining activities (**Ref. 8.43**).

- 4.8.13. Eight intact round barrows monuments, designated as scheduled monuments by Cadw, have been identified within the Study Area of the proposed Cornist Lane, Pentre Halkyn and Babell BVSs along the existing Flint Connection to Point of Ayr Terminal Pipeline. The round barrow 225 m south-east of Plas Newydd (FL076), Llyn Du round barrow (FL189) and a round barrow incorporated into the early medieval Whitford Dyke earthwork located to the north and south of Holywell Racecourse (FL006) is located within 1 km of the Babell BVS. Within 800 m of the Pentre Halkyn BVS are Bryn y Cosyn Round Barrows (FL096) and Two Round Barrows 90m north-east of Eosfan (FL046).
- 4.8.14. Additional evidence of Bronze Age activity within the Flintshire section of the Study Area includes a possible round barrow mound damaged by subsidence identified 210 m north of the Pentre Halkyn BVS (100284). The reported location of a Bronze Age standing stone with a find spot of two spindle whorls, a perforated stone disc, an unspecified number of flints, four stone beads and a Roman coin, is located 410 m north-west of the Pentre Halkyn BVS (100285 and 100276). Further evidence recorded on the HER includes a chance find of a human skull within glacial deposits in Coetia'r Orsedd field (102534), 130m south-west of the Babell BVS, along with the 'Gelli Fowler Barrow', a possible cairn or mound recorded 140 m north of the Pentre Halkyn BVS (100280).
- 4.8.15. Around 1250 BC, climate deterioration began and continued until 1000 BC, with the Cheshire and Flintshire region experiencing higher levels of rainfall and significantly lower summer temperatures. This resulted in an increased peat formation within lowland river valleys and in turn led to changes in human settlement patterns resulting in the abandonment of several upland settlements.
- 4.8.16. The late Bronze Age to Iron Age hillfort Bwrdd y Rhyfel Camp (FL072), 1.0km to the north-west of the Babell BVS, is the closest evidence of prehistoric occupation to the Newbuild Infrastructure Boundary, and it is noted that this area has a high proportion of ritual sites when compared with the area's occupation sites suggesting a more landscape characterised by ritual activity rather than occupation (**Ref. 8.44**). Evidence found at the hillfort suggests that this type of domestic and defensive structure became common in the mid to late Bronze Age and continued in use through to the Iron Age. In Cheshire, the closest known hillfort is the Helsby Hill promontory fort (NHLE 1013292), which is located 2.2 km east of the eastern end of the Newbuild Infrastructure Boundary overlooking the Ince Marshes. The age of the monument has not been accurately determined but it is thought to date to the early Iron Age or earlier. These hillforts are located on the Mid-Cheshire ridge and indicate a societal focus for the area which continued through the early Iron Age (**Ref. 8.45**).

4.8.17. During this period, the Newbuild Infrastructure Boundary would have lain within a landscape suitable for agricultural and settlement activity. The parts of the Newbuild Infrastructure Boundary around Northop Hall AGI and the proposed Cornist Lane, Pentre Halkyn and Babel BVS sites lie within the vicinity of a known Bronze Age funerary landscape.

Iron Age (600 BC–43 AD)

4.8.18. The Iron Age period is characterised in Cheshire and Flintshire by an expanding population which necessitated the intensification of agricultural practices and the utilisation of marginal land.

4.8.19. A number of large hillforts are known along the eastern border of the modern boundary of Wales and England and on the Mid-Cheshire Ridge and were used for defence as well as, social or commercial gatherings. The closest hillfort to the Site is the Wepre Promontory Fort (PRN 100053), which is located on a small spur 520 m north-west of the Ewloe Green Farm section of the Newbuild Infrastructure Boundary (outside the Study Area) and comprised an area roughly 40 m by 12 m enclosed by a double ditch and bank. A defended enclosure (PRN 19300) is noted on the HER record as having been identified as a cropmark in aerial photographs 1.8km west of the Flint end of the Newbuild Infrastructure Boundary (outside the Study Area).

4.8.20. The only other evidence dated to the Iron Age recorded in the Study Area is a find spot in Northop Hall AGI of a brooch in corroded but recognisable condition (120311) along with a coin from the Roman period (120374), 425 m north of the Northop Hall AGI section of the Newbuild Infrastructure Boundary in Flintshire.

4.8.21. Additional evidence of prehistoric activity around the Newbuild Infrastructure Boundary consists of an undated and weathered chert scraper identified during a watching brief (38254) on a water pipeline 495 m north-east of the Cornist Lane BVS (26916) and the chance find of an undated flint scraper found in a garden at Bryn Gywn Lane in Northop Hall AGI (103030) 460 m north of the Newbuild Infrastructure Boundary. An undated ditched enclosure located in Helsby Marsh in Cheshire (1011, MCH7626) was identified on aerial photographs taken in the 1940s and mapped on early Ordnance Survey maps 780m east of the Elton end of the Newbuild Infrastructure Boundary (outside of the Study Area). Later surveys in the 1960s and 1970s were not able to find enough evidence to date the feature and noted that the enclosure had been heavily degraded by ploughing activities by the late 1970s (CHER 2021, monument record 1011).

ROMAN PERIOD (AD 43–410)

4.8.22. The Roman emperor Claudius invaded south-east Britain between 43 AD to 47 AD and then began the conquest of Wales. The Romans arrived in Cheshire in the early 70s AD and by AD 74 had subdued the local tribes, including the

Cornovii of Cheshire and Shropshire. A principal site of Roman activity within the Study Area was the *Castra Deva*, a 1st century permanent fortress located 4.3 km to the south-east in Chester. The fort was completed by 79 AD and amongst the pre-eminent Roman bases in Britain as a result of its control of the River Dee.

- 4.8.23. *Castra Deva* was a prominent point in the network of forts at strategic points across Wales and north-west England which were linked by a system of straight roads (**Ref. 8.46**). The lines of several Roman roads are thought to pass through the Newbuild Infrastructure Boundary: the Roman road from Deva (Chester) to Varae (RR67a; 104572), thought to lie beneath the A458 today; the Chester to St Asaph Roman road (128773) at Flint; the Balderton – Holywell Roman Road (47800) crossing the site at Ewloe; King's Wood Lane/Saltersway/Military Way (PRN 2030/1, MCH1278) which crosses the Newbuild Infrastructure Boundary at Kingswood Lodge; and the Roman road from Chester to Wirral (Margary 670; PRN 2010/1/0, MCH6164) which crosses the Newbuild Infrastructure Boundary immediately south-west of Mollington. The road intersects the Newbuild Infrastructure Boundary just west of Mollington and can be traced along the modern A250. Roman roads are often flanked by ditches and agricultural and pastoral fields.
- 4.8.24. The Roman conquest of Wales was generally considered completed by the 2nd century when the majority of the military forces were deployed to the north along the frontier (**Ref. 8.47**). The conquest of Wales was facilitated by utilising the rivers as jumping off points to conquer the interior regions. The coastal regions, which include the majority of the Newbuild Infrastructure Boundary, were subdued first allowing the legions to advance from secured strategic forts and camps. There are few written records for this military endeavour as only the conquest of Anglesey is documented in detail (**Ref. 8.47**).
- 4.8.25. The Dee Estuary was well-established as the primary route of access for *Castra Deva*. The tidal river allowed easy waterborne movement of troops and supplies, as well as the rapid response to problems further afield. Lead mining and silver extraction as well as other mineral extraction activities were a major activity within north-east Wales at this time (**Ref. 8.48**).
- 4.8.26. Well-preserved examples of Roman camps have been identified and designated as scheduled monuments to the north of Upton, the closest example of which is on Fox Covert Lane (NHLE 1015130) 980 m south of the Newbuild Infrastructure Boundary where it passes the M53. The camp extends across two fields on either side of Fox Covert Lane. The temporary nature of these camps means that remains are often ephemeral and fragmentary, making well-preserved examples rare.
- 4.8.27. While the earliest evidence of industrial activity in the immediate area dates from approximately the mid-6th century AD in the form of known industrial sites

including the processing and smelting of lead ores on Halkyn Mountain within the Holywell Common and Halkyn Mountain Historic Landscape (HLW (C) 2; **Ref. 8.48**), which partially lies within the Newbuild Infrastructure Boundary of Pentre Halkyn BVS, that landscape contains what was possibly the earliest and most extensive of the Roman mining operations in Wales. At first the industry appears to have been a private commercial enterprise, possibly by a civilian mining operator moving swiftly in the wake of the Roman army, but later on it seems to have been more firmly under the control of the Roman military authorities (**Ref. 8.41**). There is also evidence of the sites on the banks of the Dee between the modern towns of Flint and Oakenholt where the lead ore brought down by horse and cart from Halkyn Mountain was processed before shipment of the refined minerals throughout the Roman territories.

4.8.28. The closest evidence of Roman settlement and industrial activity was found in and around the Pentre Bridge Roman Scheduled Monument (FL131) located on the southern bank of the River Dee, 870 m north of the Flint end of the Newbuild Infrastructure Boundary. Investigations undertaken within and between Flint and Oakenholt, 1.7–4.7 km north-east of the proposed Cornist Lane BVS, have identified additional evidence of activities supporting the lead industry and the extraction of silver from lead ore as well as settlement to facilitate the industrial activity (**Ref. 8.48**). The *Croes Atti* Roman Site Scheduled Monument (FL213) lies 800 m to the north-east of the Flint end of the Newbuild Infrastructure Boundary and consists of the buried remains of a Roman road, a roadside settlement and an associated cremation cemetery. In all likelihood, the settlement formed an industrial centre of lead processing and silver extraction, the products of which were then transported throughout the Roman territories.

4.8.29. Roman presence throughout the Study Area is evidenced through several chance finds of Roman coins and jewellery which include:

- An early 3rd-century coin found on the site of the old Methodist Church at Whitby, Backford (MCH229) less than 150 m away from the Mollington section of the Newbuild Infrastructure Boundary;
- A Bronze coin of Titus under Vespasian found in Saughall Parish (MCH1668 2356);
- Three coins, a silver denarius of Hadrian (AD 117–138) minted in Rome 132 AD (120389), a broken silver denarius of Antoninus Pius minted in Rome AD 161 by Marcus Aurelius (120390) and a silver denarius of Domitian (AD 81–96) minted in Rome AD 90 (120391) were found by chance somewhere between Bagillt and Halkyn, between the proposed Cornist Lane BVS and the proposed Pentre Halkyn BVS;
- A Roman coin was found by chance 410 m north-west of the Pentre Halkyn BVS (100276); and

- A very worn Roman coin of Hadrian was found in Northop Hall AGI 420 m north of the Newbuild Infrastructure Boundary.

4.8.30. Further evidence of Roman activity and presence is possible throughout the Newbuild Infrastructure Boundary but is likely to be concentrated along the River Dee and its associated floodplain as well as within proximity to the former Roman fort at Chester. It is likely that this evidence will be limited to road remains and associated features. Undocumented sites of military camps are possible within the Study Area and may have been obscured by later agricultural activity.

MEDIEVAL PERIOD

Early Medieval Period (AD 410–1066)

4.8.31. Following the withdrawal of the Roman army from Wales in the early 4th century AD the whole country fell into an extended period of socio-economic decline. Although the nature and dispersal of settlement during the early medieval periods is not well understood, it is likely that Chester continued to form a focus for settlement during this period, potentially forming part of the territory of the kingdom of Powys with Chester acting as the seat of a branch of Cadelling, a native British royal family (**Ref. 8.49**).

4.8.32. Anglo-Saxon activity within the area is documented by the 7th century through place-names but archaeological evidence of activity is sparse and fragmentary. The continued migration and settlement of the Angles and Saxon tribes into Britain, as well as their growing population, pushed the Celtic tribes of Britain into the west into the areas of Cornwall, Wales and Scotland (**Ref. 8.50**). The Welsh kingdoms became increasingly unified throughout the period into three major blocks of power: Gwynedd in the north-west, Powys in the centre and east, and Deheubarth in the south. The Newbuild Infrastructure Boundary is located within a contested area called Perfeddwlad whose boundaries were fluid as the territory was fought over by Powys, Gwynedd and Mercia (**Ref. 8.50**).

4.8.33. Evidence for Anglo-Saxon settlement in the Study Area is elusive, but occupation is attested by place-names (**Ref. 8.51**), church dedications and occasional discoveries of metalwork. In the 9th and 10th centuries, the Saxon Minster system began to be replaced by local parochial organisation, with formal areas of land centred on nucleated settlements served by a parish church. In 689 AD, the Minster Church of West Mercia (now St John's Church) was founded 5.5 km west of the Sealand/Sandycroft section of the site which later became the first cathedral in Chester. The Northop Church (100308), which was once occupied by the early Celtic Church of St Eurgain and St Peter dated to the late 6th century AD, is located 1km to the west of the Northop section of the Newbuild Infrastructure Boundary. An Anglo-Saxon cross shaft

dated between 410 and 1065 AD (1997/1/2, MCH1162) was found during an excavation in the foundations of the Grade I listed St Mary's Church (NHLE 1330242) in Thornton-le-Moors in 1982, 270 m west of the Newbuild Infrastructure Boundary. The shaft may indicate that an earlier church was present within the vicinity of the existing 14th century church but this has not yet been confirmed through investigation. The later medieval Grade II* listed Church of St Lawrence (NHLE 1139029), located 710 m north-west of the Newbuild Infrastructure Boundary in Stoak, is reportedly constructed on the site of an Anglo-Saxon chapel though again this has not been confirmed through investigation.

- 4.8.34. The Anglo-Saxon kingdom of Mercia is thought to have constructed two defensive earthworks, Wat's Dyke and Offa's Dyke, in the 8th century to maintain control over the borders between the Welsh kingdoms and Mercia. It is thought that the dykes may have been constructed to limit raiding and regulate trade and population movement (**Ref. 8.50**). Wat's Dyke is an early medieval defensive earthwork that stretched from Basingwerk Abbey on the Dee Estuary to the Severn Estuary. It generally runs parallel to the later Offa's Dyke and now appears in traces in the form of raised hedgerow or a cropmark, but originally was a construction considered more sophisticated than Offa's Dyke. It consists of the usual bank and ditch of an ancient dyke that faces Wales indicating it was constructed for the protection of the Anglo-Saxon lands to the east. Archaeological investigations in 1990 on remains of Wat's Dyke found earlier sherds of Romano-British pottery dated to between 411 and 561 AD which makes the early 8th century construction date for the entirety of the earthwork questionable (**Ref. 8.43**). The assumed line of Wat's Dyke (27061– 27075) runs through the north-west corner of the proposed Cornist Lane BVS at its closest point and continues along the north-east bank of the Afon Nant-y-Fflint. The presence of the dyke in this location has not been confirmed through archaeological investigation.
- 4.8.35. The western border of the Kingdom of Mercia defined the eastern border of Wales at the time. The construction of the earthwork known as Offa's Dyke in the late 8th century is thought to have formed the physical boundary of the established border retained until 1066.
- 4.8.36. Offa's Dyke is named after Offa, the Anglo-Saxon king of Mercia from AD 757 until 796. The northern line of Offa's Dyke is unclear as previously sections of what is now known to be a separate dyke, Whitford Dyke, was classified as part of it (**Ref. 8.52**). Sections of Whitford Dyke located near the Babell BVS Newbuild Infrastructure Boundary have been scheduled as part of Offa's Dyke and the assumed line (FL006, 28102– 28105, 106723, 106724) runs roughly north north-west to south south-east 350 m north-east to 690 m north of the proposed Babell BVS.

- 4.8.37. The Vikings had established a base at Dublin in around 841 AD and on the Wirral Peninsula in Cheshire, and it seems likely that North Wales, from Anglesey to the River Dee, would have been important for raiding and trading activities. A recorded Viking raid of the city of Chester in 893 AD suggests that the area around the River Dee was vulnerable to this type of activity during the late 9th century (**Ref. 8.49**). As the Norse community became more established in the Wirral Peninsula, trade became increasingly important and the establishment of new fortified quays and harbours as well as the use of previously established ones in and around the River Dee for mercantile endeavours became a more prominent activity (**Ref. 8.49**).
- 4.8.38. The Welsh kingdoms were united under Rhodri ap Merfyn Frych, also known as Rhodri Mawr, in the mid to late 9th century but this unification was short lived as internal conflict and rivalry following Rhodri's death divided the kingdoms until rise of Gruffudd ap Llywelyn in the mid-11th century. The DCO Proposed Development is located within what was the Tegeingl cantref (a territorial division imposed by Gruffudd ap Llywelyn in the late 11th century) within the Perfeddwlad territory, a highly contested independent territory comprised of four cantrefs: Rhos, Rhufoniog, Dyffryn Clwyd, and Tegeingl. Tegeingl comprised the land between the River Clwyd and the River Dee and was strategically important as it allowed for easy access and control of the important sea route into Chester (**Ref. 8.50**). The territorial divisions imposed remained after the death of Gruffudd ap Llywelyn in 1063 but the Welsh kingdoms were politically divided once more.

Late Medieval Period (AD 1066–1540)

- 4.8.39. Following the Norman conquest of 1066, King William I took over most of the Saxon lands, which included Cheshire, after protracted rebellions which resulted in the destruction of many communities in and around Chester. Domesday Book (**Ref. 8.53**), compiled in 1086, suggests that the settlement patterns established prior to 1086 were predominately of small, dispersed communities.
- 4.8.40. The Newbuild Infrastructure Boundary crosses through a total of 12 historic medieval parishes, which in some cases are likely to have developed from earlier Saxon landholdings. Within Cheshire these comprise (from west to east): Ince, Thornton Le Moors, St Oswald Chester, Plemstall, Backford, Holy Trinity Chester and Shotwick, Within Flintshire, the Newbuild Infrastructure Boundary lies within Hawarden, Northop and Flint historic parishes. The proposed Cornist Lane BVS lies within the former jurisdiction of Holwell parish and the proposed Babell BVS and Pentre Halkyn BVS lie within the extent of Ysceifiog.

- 4.8.41. The Newbuild Infrastructure Boundary crosses or is adjacent to the communities of Wervin, Croughton, Lea in Backford, Saughall, Picton and Mollington, all of which are included within the entries in the Domesday Book as part of the Willaston Hundred of Cheshire and Thornton-le-Moors which is included in the Duddeston Hundred. Parts of Flintshire were also included within the Domesday Book as part of the holdings of Norman lords (**Ref. 8.53**).
- 4.8.42. The Newbuild Infrastructure Boundary crosses or is adjacent to the Flintshire communities of Leadbrook, Bagillt, Wepre, Hawarden and Aston within the Ati's Cross Hundred. The inclusion of these communities within the entries suggests that these areas were settled prior to the Norman Conquest. Two entries, Thornton-le-Moors and Hawarden, note the existence of a church within the settlement's land suggesting that they were big enough to require one. This also suggests that the existing 14th century Church of St Marys (NHLE 1330242) replaced an early medieval church either within the same location or nearby. The Thornton-le-Moors entry also notes that the settlement was found 'in waste' suggesting that the turmoil during the transitional period between Anglo-Saxon and Norman rule had heavily impacted that community (**Ref. 8.53**, 729).
- 4.8.43. William created three earldoms along the Welsh border at Chester, Shrewsbury and Hereford. The second Earl, Hugh d'Avranches, also known as Hugh Lupus (Hugh the Wolf), was given the earldom of Chester. The land within the Study Area in Cheshire is thought to have been part of the Forests of Delamere and the Forest of Wirral with the River Gowy dividing the two (**Ref. 8.54**). Small intermittent settlements are noted within the forests, but the majority of the land was not utilised for settlement or agricultural activity. Cheshire continued to be ruled by Hugh's descendants until 1237 when King Henry III took the title and earldom for his eldest son, Prince Edward.
- 4.8.44. Much of the land within the Flintshire area of the Study Area was first conquered by Robert, the cousin of Hugh d'Avranches the Earl of Chester, between 1066 and 1073. Following his death, Tegeingl was left, via agreement, under the control of the earldom of Chester. However, a Welsh revolt in 1094 against Norman rule resulted in the reclamation of territory in Tegeingl, including Hawarden, which was maintained in 1136 following a victory and continued under Welsh control until 1170. Annexation and conquest of the Tegeingl cantref was common through the 13th century, and it was often used as collateral for reparations following Welsh expansion activities. The area remained largely in the control of the English lord at Chester, or later the king, but parts were contested and changed hands (**Ref. 8.50**).
- 4.8.45. The Normans imposed a new weapon on the landscape, the castle, soon copied by the Welsh Princes as they fought the invaders and each other. In its earliest form this was a mound of earth (the motte) topped with a timber tower and often supported by an enclosure surrounded by a bank and ditch (the

bailey). Examples within the Study Area include the Hen Blas Castle Site (FL062) 870 m north of the proposed Cornist Lane BVS and Ewloe Castle (FL064) 360 m north-west of the Newbuild Infrastructure Boundary. Ewloe Castle was constructed around 1257 by Llywelyn ap Gruffudd as part of his campaign to retain control over parts of Tegeingl cantref. Welsh resistance to English conquest continued until 1283 when Wales became England's first colony.

- 4.8.46. Defensive residential settlements called moated sites became more prevalent during this period and examples within the Study Area include the moated site at Elton (NHLE 1012122) 35 m north-east of the Newbuild Infrastructure Boundary and Hafod Wood Moated Site (FL179) 560 m south-east of the Cornist Lane BVS Newbuild Infrastructure Boundary. The moated manor of Lea Old Hall (2020/1/2, MCH957; 2020/1/1, MCH219), 355 m north of the Newbuild Infrastructure Boundary, is thought to date originally to the late early medieval period and continued in use through to the late medieval. A potential moated site (130012) within the previous Saltney Marshes along the south bank of the River Dee was noted on later historic Ordnance Survey maps 460 m south-east of the Newbuild Infrastructure Boundary.
- 4.8.47. A late medieval moat (1997/0/1, MCH962) is noted near the post-medieval Grade II listed barn to the north of Thornton Hall (NHLE 1130654) 130 m west of the Newbuild Infrastructure Boundary at Thornton-le-Moors. The settlement at Thornton-le-Moors was large enough to contain a church constructed in the 14th century, the Grade I listed Church of St Mary (NHLE 1330242) located 270 m to the west of the Newbuild Infrastructure Boundary.
- 4.8.48. The relatively large size of the parishes, the low density of population, and the dispersed nature of the settlements ensured that in the late medieval period much of the Study Area were served by a scattering of churches. Additional examples of late medieval churches in the Study Area include: the Grade II* listed Church of St Oswald (NHLE 1115612) located in Backford 445 m north-east of the Newbuild Infrastructure Boundary; the Grade II* listed Church of St Lawrence (NHLE 1139029), located 710 m north-west of the Newbuild Infrastructure Boundary in Stoak; the Grade II* listed Parish Church of St Deinol (12) located in Hawarden 940 m south-east of the Newbuild Infrastructure Boundary; and the Grade I listed Church of St Eurgain and St Peter (321) in Northop 930 m west of the Newbuild Infrastructure Boundary. The churchyard of the Grade II* listed Church of St Lawrence (NHLE 1139029) contains the remains of a later medieval standing cross (NHLE 1016856) incorporated into a later post-medieval sundial (NHLE 1138372).

- 4.8.49. Late medieval settlement patterns within the Flintshire area of the Study Area are difficult to determine based on the evidence that has been previously identified. It is likely that the town of Northop, located approximately 980 m west of the Newbuild Infrastructure Boundary, developed from a nucleated village (clustered settlement) established during the Medieval period (**Ref. 8.5151**). Additional evidence of settlement within the Study Area includes a system of fields, enclosures and hollow-ways thought to date primarily to the later medieval period (FL163) though possibly established in the prehistoric period, located 360 m south-west of the proposed Babell BVS and the Hen Caerwys Deserted Village Site (FL162) located 680 m south-west of the proposed Babell BVS.
- 4.8.50. Evidence of later medieval agricultural activity is recorded within the Newbuild Infrastructure Boundary, in the form of ridge and furrow earthwork remains (agricultural feature), adjacent to Picton Lane (15191, MCH25127) and also near Brookside in Northop Hall AGI (97837). Historic later medieval road alignments are documented at Church and Gordon Lanes (4549/0/9, MCH20349) near Lea by Backford 360 m north of the Newbuild Infrastructure Boundary. The HER also notes the presence of the Ffrith Farm Quillet (89506), 235 m north of the proposed Cornist Lane BVS. The quillet is a form of field system usually represented by strip fields. Potential strip field boundaries (99060, 23604) were also noted within the Newbuild Infrastructure Boundary in Mancot and 400 m north of the Newbuild Infrastructure Boundary near Shotton.
- 4.8.51. Later medieval isolated find spots are more common within the Flintshire section of the Study Area and include:
- A cast copper alloy seal matrix (7059, MCH15785) found by chance in Lea by Backford 280 m north of the Newbuild Infrastructure Boundary;
 - Three located between Bagillt and Halkyn 405 m north of the proposed Cornist Lane BVS comprising a silver pin from an annular brooch probably dating from c 1200–1400 (120334), small fragment of a cast copper alloy buckle (120335) and a silver long cross penny of Henry III (1216–1272) minted in Canterbury between 1251–1272 (120386);
 - A silver short cross penny of Richard I or John minted in Rhuddlan between 1190 and 1205 (120378) found near Coed Onn Road 135 m north-west of the Flint end of the Newbuild Infrastructure Boundary;
 - A silver gilt ring (119022) found off Allt-Goch Lane 170 m west of the Newbuild Infrastructure Boundary; a silver half-groat of Edward IV (120406) found near Northop 480 m west of the Newbuild Infrastructure Boundary;
 - Three silver short cross pennies (44426) found near Northop 30 m west of the Newbuild Infrastructure Boundary;
 - A copper alloy signet ring inscribed with an 'I', a palm and a crown (120329) found near Ewloe within the Newbuild Infrastructure Boundary.

- Several finds were also identified within a known dumping area near Sealand which was within the regularly inundated River Dee valley during the late medieval period (prior to the canalisation of the Dee in the post-medieval period). The dumping area is near Sealand Road, 290 m east of the Newbuild Infrastructure Boundary, and the finds include a signet ring with an abstract design (120245), a damaged long cross penny (120372), and a flat lozenge shaped copper alloy object (120246).

POST-MEDIEVAL PERIOD (AD 1540 – 1901)

Rural settlement (Early 16th – 18th century)

- 4.8.52. The settlement pattern within the Study Area in Cheshire during the early 16th century consisted of isolated settlements, set in areas of open agricultural fields and pasturage with pockets of wood and marshland (**Ref. 8.55**). The wetlands of the region located around the River Mersey, River Gowy and River Dee floodplains continued to be marshy and uninhabited. Chester remained the only city within the region and was the centre of activity and governance for the towns surrounding it during this period.
- 4.8.53. Christopher Saxton's 1577 Map of Cheshire (not reproduced; **Ref. 8.56**) is the earliest map consulted which shows the eastern half of the Newbuild Infrastructure Boundary and reflects the rural nature of the landscape during the early post-medieval period. The towns of Elton, Thornton, 'Werwyr' (modern Wervin), 'Pyckton' (modern Picton), 'Bakeford' (modern Backford), 'The lea' (modern Lea by Backford), 'Charleton' (modern Chorleton), and 'Mullynton' (modern Mollington) are identified as small settlements. The River Dee and River Mersey are shown connected by an eastern branch of the River Gowy which forks just north-west of the recorded location of Thornton on the map. John Speed's 1610 Map of Cheshire (not reproduced; **Ref. 8.57**) does not show any measurable change within the Study Area suggesting that the population size and general settlement pattern in this part of western Cheshire was static during the early post-medieval.
- 4.8.54. Dairy farming became the primary agricultural practice in by the middle of the 16th century in this part of Cheshire (**Ref. 8.40**, 62). Late 16th century probate inventories from Wirral suggests that 60 percent of the value of larger farming estates was invested in livestock, a proportion which remained relatively constant through the 17th century (**Ref. 8.40**). Enclosure of the open fields and reclamation of former marshland to make pasture was undertaken through the early post-medieval in response to the growing economic dependence on livestock. In the Dee valley, grants of land dated to 1546 referred to fields being farmed on the medieval strip system but by 1658 the same lands had been enclosed and converted to hedged fields (**Ref. 8.40**).

- 4.8.55. Throughout this period, the Flintshire section of the Newbuild Infrastructure Boundary remained predominantly agricultural with the landscape characterised by dispersed clusters of traditional farm buildings. Several mills dated to the post-medieval period have also been noted including the Pentre Halkyn windmill (17017) within the Newbuild Infrastructure Boundary of the Cornist Lane BVS, the Northop Hall AGI Windmill (97828) located 345 m north of the Newbuild Infrastructure Boundary, Windmill Field (103800) located 435 m south of the Newbuild Infrastructure Boundary at Lower Aston Hill BVS Lane, and the Bryn Awel Mill (104015), located 40 m to the north-east of the proposed Cornist Lane BVS. A mill leat (or mill stream) known as Nant y Felyn, which translates as Stream of the Mill (89483), is recorded 390 m west of the Newbuild Infrastructure Boundary at the proposed Flint AGI end of the route.
- 4.8.56. The early post-medieval period in Cheshire saw the construction of new houses as well as the reconstruction, renovation and extension of late medieval residential structures to accommodate the changing needs and fashions. The declining power and wealth of the Church as a result of the Dissolution of the Monasteries allowed for new estates to be available for development. One example is the Grade II listed The Willows (NHLE 1229983), constructed in 1684 as the dower house for Mollington Hall and located 180 m south-west of the Newbuild Infrastructure Boundary at Mollington.
- 4.8.57. Wales was formally annexed following the passage of the Wales Acts 1535 and 1542. Like in Cheshire, settlement patterns in Flintshire were predominately rural villages surrounded by open land. Christopher Saxton's 1577 Map of Flintshire and Denbighshire (not reproduced; **Ref. 8.58**) shows the locations of 'Harden cast' (modern Hawarden castle), 'Yowley cast' (modern Ewloe castle), 'Yowley hall', Northop, Flynt (modern Flint), 'Cornysh' (modern Cornist which does not remain a town), and 'Haulkin' (modern Pentre Halkyn). The map shows the mountains as hills on the map, beginning between 'Yowley cast' and Northop. Two navigable streams emptying into the Dee estuary are shown within the Study Area, one forking just north of 'Yowley castle' (modern Ewloe) and crossed by the Newbuild Infrastructure Boundary, probably Wepre Brook, and the other immediately west of 'Flynt' (modern Flint).
- 4.8.58. John Speed's 1610 Map of Flintshire (not reproduced; **Ref. 8.59**) shows no significant change within the Study Area, though three more communities located near the River Dee are recorded under the names 'Wepra' (modern Wepre), 'Golflin', and 'Kelstrin'. Of the three only 'Wepra' (1.7 km north) has continued as a modern settlement. This suggests that the population was increasing, albeit slowly, during the early post-medieval period with the majority of the activity likely focussed on utilising the river estuary for resources and ease of travel and waterborne shipping. The HER shows the location of an early post-medieval house, possibly established in the late medieval period (23601), 50 m north-west of the Newbuild Infrastructure Boundary section to the north of

Aston Hill BVS. The house was documented on the Hawarden Estate Map of Shotton in 1651 (not reproduced; – see HER record for 23601) and recorded as demolished in the early 1960s. Other 17th century structures within the Study Area include the Grade II* listed Aston Hill BVS thought to originally date from 1615 (23, 100166) located 140 m west of the proposed Aston Hill BVS and the Llwyn y Cosyn Mawr Farm (31257, 177954, 180979– 180981) located 465 m south-east of the Pentre Halkyn BVS.

Canals and railways (early 18th – late 19th century)

- 4.8.59. By the time of the early 18th century, continuous silting of the Dee Estuary (in the eastern part of the site) meant that plans were drawn up for canalisation of the natural watercourse between Connah’s Quay and Chester (**Ref. 8.63**). As part of these works a detailed set of plans of the estuary were drawn up and survive as one of the oldest detailed maps of the area (Collins undated, *A New and Exact Survey of the River Dee or Chester-water* (**Ref. 8.64**); not reproduced) which shows the Newbuild Infrastructure Boundary crossing the Dee River valley bounded to the north by a sharp bank (identified during the walkover survey as WSP18, see **Figure 8.1.3 in Annex A**) and Saltney Marshes to the south. The river valley comprises an area of low sandy land, identified as ‘Flint Sands’ on the plan (**Ref. 8.64**). The New Cut canalisation was excavated in 1737 and led to a revival in coastal traffic along the Dee. The work was planned and undertaken by engineers from the Netherlands and paid for by local merchants and the Chester Corporation (**Ref. 8.65**).
- 4.8.60. The County Map of Cheshire of 1794 (not reproduced; **Ref. 8.66**) shows the Saltney Marshes of River Dee and indicates there were two ferrying services which made use of the channel, which were known as the Higher Ferry at Saltney and the Lower Ferry at the old Queensferry Bridge and is marked on (not reproduced) as “New Channel”. The channel was not particularly successful in revitalising the Port of Chester; however, it did allow for the reclamation of the estuary above Shotton and the tracts of flat polder land (low-lying tracts of land protected by dykes), which were created between 1753 and 1857. Burdett’s 1777 Map of Cheshire (not reproduced; **Ref. 8.67**) shows the majority of the river valley land within the Proposed Development was reclaimed by this time. The communities of Sealand and Sandycroft developed within the reclaimed land with the industrial activity concentrated on the south bank of the River Dee within the communities of Sandycroft, Mancot and Shotton.
- 4.8.61. The expansion of the canal network continued in the later 18th century beginning with the construction of the Trent and Mersey Canal (T&M) which linked the River Trent at Derwent Mouth in Derbyshire to the River Mersey, 3 km to the north in order to provide an inland route between the major ports of Hull and Liverpool. Fearing the construction of this canal would divert trade away from Chester to Liverpool, the Chester Canal Act was passed in 1772,

allowing construction of the route linking Nantwich with the River Dee at Chester (**Ref. 8.68**). This was followed by the construction of the Ellesmere Canal in 1794, connecting Ellesmere port and Chester (**Ref. 8.69**) and by 1813 the two companies merged so that the two canal systems could be integrated. The canal is now part of the Shropshire Union Canal (10101/0/0, MCH18836) and survived the decline of the canals in the early 20th century due to its use as a water supply for local industries and the water board, as well as a feeder canal for the Shropshire Union main line (**Ref. 8.69**).

4.8.62. Expansion of the railways during the mid-19th century led to a transformation of the surrounding landscape within Cheshire and Flintshire, allowing for greater connectivity and increased ease in the transport of goods and people. Cheshire's first railway line opened in 1837 and by 1875 a railway link was provided at Ellesmere Port in 1863 via the Birkenhead Railway. The Wrexham Mold & Connah's Quay Railway route can be seen running through Northop Hall AGI on Ordnance Survey (OS) 6": mile scale mapping dated between 1888 and 1913 (**Ref. 8.70** and **Ref. 8.71**). In 1884 an Act was passed that allowed the construction of a railway crossing over the River Dee between Queensferry and Connah's Quay, the Hawarden bridge.

4.8.63. The population growth and establishment of new communities, in addition to the growth of different Protestant groups such as the Quakers, Presbyterian and Methodist denominations, necessitated the construction of new churches to service these communities by the 19th and early 20th centuries. The early meeting houses for alternative denominations were often in adapted buildings, or simple, purpose-built vernacular-style buildings, which had a domestic appearance reflecting the changing view of religious expression (**Ref. 8.55**). Examples of the new style of religious buildings are found primarily within the late post-medieval town of Sandycroft established following the canalisation of the River Dee and the reclamation of the Saltney Marshes and include the Sandycroft Presbyterian Chapel (English Presbyterian and Calvinistic Methodist) constructed in 1898 (1000083) located 280 m north-east of the Newbuild Infrastructure Boundary, Sandycroft Chapel (Primitive Methodist) constructed 1900 (1000082) located 210 m north-east of the Newbuild Infrastructure Boundary, and Sandycroft School (St Ambrose) Church in which Sunday school started in the 1870s (1000081) located adjacent to the Newbuild Infrastructure Boundary.

Industry and trade

4.8.64. Although agriculture was the predominant industry within the Study Area during the early post-medieval period, documentary evidence suggests that pottery was a common secondary industry undertaken by farmers within the Merseyside region which would include the easternmost sections of the Newbuild Infrastructure Boundary; however, evidence of pottery making during

this time, and pottery sherds dating to the 16th and 17th centuries, has not been identified in prolific amounts throughout the wider region (**Ref. 8.55**). The industry was fuelled by the import of suitable clays and fuels from the coalfields of south Lancashire and north Wales. Cottage potters built domestic kilns to serve the local markets around Chester during the early post-medieval period.

4.8.65. The earliest industrial activity within the Flintshire area of the Study Area is small scale pottery production centred at Buckley Mountain in response to the availability of clay, opencast coal and lead (**Ref. 8.60**), 2 km to the south of the Newbuild Infrastructure Boundary, with manufacturing activity extending into the Study Area at Ewloe Green at Buckley Potteries (58480), 250 m to the south-west of the Newbuild Infrastructure Boundary. Until the construction of the canal system in Cheshire, trade within the region was either highly localised or facilitated by coastal shipment (rather than trading over a large distance) (**Ref. 8.60**).

4.8.66. The upland geology of Flintshire contains significant deposits of coal, lead, and other minerals which have been the subject of mining activities since the prehistoric period. Improvements in transport allowed the industries in west Cheshire and North Wales to take advantage of the natural mineral resources in the region during the mid- to late post-medieval period. By the early 1600s, small collieries were operating in Flintshire and the mining activities in the county developed rapidly in the 17th century to meet the increasing demand for coal in industrial processes in nearby Cheshire. With the opening of canal systems and the railways, the Welsh coal mining industry saw a sharp rise in demand. The coal measures within Flintshire are extensive and productive. The collieries that have been recorded within the Study Area include:

- Ewloe Green Farm Colliery (103806) located within the Newbuild Infrastructure Boundary at Green Lane;
- Plas Ifan Coal Mine (103089) 65 m north of the Newbuild Infrastructure Boundary at Northop Hall AGI;
- Highfield Hall Coal Mine (106131) 125 m north-east of the Newbuild Infrastructure Boundary at Northop Hall AGI;
- Dublin Main Coal Mine (103090) 110 m north of the Newbuild Infrastructure Boundary;
- Blackbrook Avenue Colliery (103788) 95 m south-east of the Newbuild Infrastructure Boundary at Aston;
- Willow Park Colliery(103786) 45 m north of the Newbuild Infrastructure Boundary at Colliery Lane;
- Mancot Farm Colliery (103789) 140 m south-east of the Newbuild Infrastructure Boundary at Colliery Lane;

- Queensferry Colliery (37788) and Aston Hill BVS Colliery (103785) 350 m north-west of the Newbuild Infrastructure Boundary at Big Mancot; and
- Stockholm Colliery (103783) 60 m south of the Newbuild Infrastructure Boundary close to Ewloe.

4.8.67. Lead deposits found between the Point of Ayr and Halkyn were originally exploited during the Roman period. It is unclear if the surface veins continued to be exploited throughout the medieval period but as the demand for lead increased so did the efforts made to extract the ore and the veins were followed deeper underground as technology improved (**Ref. 8.61**). A survey recorded more than 250 mine sites in this area. Within the Study Area there are several examples of lead mine shafts, especially in the Holywell area within the Holywell Common and Halkyn Mountain Historic Landscape (HLW (C) 2) which covers the proposed Pentre Halkyn BVS. The shafts noted within the Study Area include the Holywell Common mine shafts (76786–76791, 76793–76801, 77640–77642, 77074–77081) located between 310 m north-east and 350 m south-east of the proposed Pentre Halkyn BVS, the closest being 10m east of the BVS Newbuild Infrastructure Boundary, and Holywell Racecourse mine workings (103607) located 465 m north-west of the proposed Babel BVS. Further mine shafts have been identified near Ewloe Green consisting of the Bellsfield shafts (99010) located 60 m north-west of the Newbuild Infrastructure Boundary at Holywell Road, Ewloe Castle shaft (99011) located 255 m north-west of the Newbuild Infrastructure Boundary at Holywell Road, Ewloe Green Farm shaft 1 and 2 (99008 and 99009) located 85 m and 215 m to the north-west of the Newbuild Infrastructure Boundary at Green Lane respectively.

4.8.68. The smelting firms that purchased this lead ore had their works on the banks of the River Dee. In Flintshire, small industries such as lead smelting were introduced into the valley by the 1500s and the first known lead smelting works on the Dee was established at Gadlys, near Bagillt. The London Lead Company was formed for smelting down lead with pit coal and sea coal. Often called 'The Quaker Company' they owned the Gadlys Lead Smelting Works and were smelting at Gadlys from 1704 to 1799. The Quaker Company was instrumental in pioneering lead mining in the Flintshire County from the late 17th to late 18th centuries (**Ref. 8.62**). A chemical manufacturing business exploiting the by-products from smelting operations came up. In 1850s Joseph Turner built chemical works at Queensferry.

4.8.69. In the mid-17th century, an important iron-working industry developed in Cheshire. John Wilkinson (1728-1808) became a famous 18th century ironmaster inventor and entrepreneur. In 1889, the opening of the Hawarden Railway Bridge over the River Dee improved access to the reclaimed Dee Marshes. Wharves serving the Shotton Iron Works owned by John Summers was established in the Deeside in 1890s.

4.8.70. Before the railways, industries on the south bank of Dee were served by tramroads. There are a few notable remains of tramways serving multiple types of industrial activities. Buckley Potteries was served by the Homestead tramway (19548) recorded 295 m south-east of the Newbuild Infrastructure Boundary at Ewloe Green. The remains of the Holly House tramway (99039) has been recorded within the Newbuild Infrastructure Boundary at Church Lane. Additional examples include Aston Tramline (99059) 365 m west of the Newbuild Infrastructure Boundary and the Sandycroft Railroad (99071) which is recorded 70 m north-east of the Newbuild Infrastructure Boundary at Mancot Royal but may extend into the Proposed Development as its route lies along the line of Chester Road (B5129).

TITHE MAPS AND HISTORIC ORDNANCE SURVEY MAP REGRESSION (1ST AND 2ND EDITION OS)

4.8.71. Mid-19th century tithe mapping dated between 1839–44 and late 19th century historic Ordnance Survey (OS) maps show generally that the land within the Newbuild Infrastructure Boundary remained predominately agricultural into the 20th century. Analysis of the tithe maps of 10 township parishes in Cheshire and four parishes in Flintshire show predominately irregular fields containing small ponds bordered by drainage infrastructure and hedged farm lanes within the Newbuild Infrastructure Boundary. Given the length of the DCO Proposed Development only the maps with significant changes will be detailed in the following paragraphs.

Cheshire Newbuild Infrastructure Boundary

4.8.72. The Elton Township within the Parish of Thornton-le-Moors in Cheshire Tithe map (**Ref. 8.72**; not reproduced) shows the eastern end of the Newbuild Infrastructure Boundary crossed by several roads which provide access to the fields as well as connect the communities of Thornton-le-Moors, Elton and Ince with additional communities to the south and east. The Thornton Township within the Parish of Thornton-le-Moors in Cheshire Tithe map (**Ref. 8.73**; not reproduced) shows that area north-eastern part of the Newbuild Infrastructure Boundary is crossed by two roads, one still extant, with the now defunct road running across the north-west corner of the Newbuild Infrastructure Boundary, connecting the communities of Elton and Thornton-le-Moors. The Picton Township within the Parish of Plemondstall in Cheshire Tithe map (**Ref. 8.74**; not reproduced) shows that the Newbuild Infrastructure Boundary is crossed by two roads (one of which is extant). The continuation of this road is seen on the Wervin Township within the Parish of St Oswalds on the Cheshire Tithe map (**Ref. 8.75**; not reproduced). The Chorlton Township within the Parish of Backford in Cheshire Tithe map (**Ref. 8.76**; not reproduced) shows that the east centre of Cheshire Newbuild Infrastructure Boundary contained a quarry site, approximately 200 m north of the Shropshire Union Canal.

- 4.8.73. The OS 2nd edition 6": mile map of 1897 (not reproduced; **Ref. 8.77**) of the Elton section of the Newbuild Infrastructure Boundary shows scattered farms and reclaimed marshland, which is crossed by drainage canals and the Hooton and Helsby line of the railway.
- 4.8.74. The OS 1st edition 6": mile map of 1869 (not reproduced; **Ref. 8.78**) of the Wervin/Picton section of the Newbuild Infrastructure Boundary shows scattered residential properties and farms crossed by the Shropshire Union Canal (10101/0/0, MCH18836). An old quarry site is noted to the north of the crossing of Caughall Road over the canal.
- 4.8.75. The OS 1st edition 6": mile map of 1869 (not reproduced; **Ref. 8.79**) of the Little Saughall section of the Newbuild Infrastructure Boundary shows scattered residential properties and farms. The Newbuild Infrastructure Boundary is crossed by Kingswood Lane noted on the HER as a possible Roman or medieval period road (2030/1, MCH1278).
- 4.8.76. The OS 2nd edition 6": mile map of 1898 (not reproduced; **Ref. 8.80**) of the Wervin/Picton section of the Proposed Development shows the addition of Caughall bridge Cottage near the crossing of Caughall Road over the canal. The old quarry is shown as a pond.
- 4.8.77. The OS 2nd edition 6": mile map of 1898 (not reproduced; **Ref. 8.81**) of the Mollington section of the Newbuild Infrastructure Boundary shows scattered residential properties and farms. The Newbuild Infrastructure Boundary is crossed by the Birkenhead Railway line (2468/1/0, MCH1705 and 2527/1/0, MCH19851) and sidings (2527/1/14, MCH1552) near Mollington Station (2527/1/10, MCH1553). The structures at Collinge Farm and Collinge Wood are noted on the map.

Flintshire Newbuild Infrastructure Boundary

- 4.8.78. The Hawarden (**Ref. 8.82**), Mold (**Ref. 8.83**), Northop (**Ref. 8.84**), and Flint (**Ref. 8.85**) parish tithe maps dating to 1839 show irregularly shaped agricultural fields and roads. Farms or small clusters of residential buildings are shown within the rural landscape between the built-up settlements at Mancot, Hawarden, Northop, and Flint. Drainage features are present predominately in the Sealand township section of the Hawarden parish tithe map on the north side of the canalised section of the River Dee.
- 4.8.79. The OS 1st edition 6": mile map of 1869 (not reproduced; **Ref. 8.86**) of the Sandycroft and Sealand sections of the Newbuild Infrastructure Boundary shows scattered residential properties and farms. The structures at Deeside Farm (180577–180580), Old Farm (55848–55851), Wood Farm (180559–180568, 55852–55858), The Beeches (180502–180505), Scotland (126805) and Rake Farm (178252, 103798, 179582, 179583) have been established by this time. A small semi-circular embanked and ditched area is shown within the

Newbuild Infrastructure Boundary immediately south of the embankment for the canalised River Dee. The Chester and Holyhead Railway crosses the Newbuild Infrastructure Boundary to the south of the River Dee.

- 4.8.80. The OS 2nd edition 6": mile map of 1898 (not reproduced; **Ref. 8.87**) of the Sandycroft and Sealand sections of the Newbuild Infrastructure Boundary shows changes to banks of the canalised River Dee. The channel has been narrowed and the banks have been revetted.
- 4.8.81. The OS 1st edition 6": mile map of 1869 (not reproduced; **Ref. 8.88**) of the Sandycroft and Mancot sections of the Newbuild Infrastructure Boundary shows scattered residential properties, farms, and collieries. Methodist Chapel (Primitive) is noted to the north-east of the Newbuild Infrastructure Boundary near the HER location for the Sandycroft Chapel, it is possible that this is an early location for this religious institution. The Queensferry Wireworks (disused) is noted just north of the Newbuild Infrastructure Boundary. The Mancot Quarry (99033) is visible and connected railroad (99064) is shown on the OS 1st edition 6": mile scale map of 1871 (not reproduced; **Ref. 8.89**) joining Mancot Colliery to the River Dee.
- 4.8.82. The OS 2nd edition 6": mile map of 1898 (not reproduced; **Ref. 8.90**) of the Sandycroft and Mancot sections of the Newbuild Infrastructure Boundary shows minor development within the area around the Newbuild Infrastructure Boundary in the construction of a school, probably Sandycroft School (St Ambrose) as noted by the CPAT HER just north of the Newbuild Infrastructure Boundary and the replacement of the wireworks with the Queensferry Corn Mill. Ashfield Farm Brickworks (103787) located near the crossing of the Aston Hill BVS Colliery Railway (23603) had quarried out some of the land within the Newbuild Infrastructure Boundary.
- 4.8.83. The OS 1st edition 6": mile map of 1869 (not reproduced; **Ref. 8.91**) of the Ewloe Green section of the Newbuild Infrastructure Boundary shows scattered residential properties and farms. The farms of Aston Hill (178144 and 179532–179537), New Inn Bridge (179540, 178147) and the Grade II listed farm buildings at Castle Hill Brewery (15105–15110) had been established by this time. Old Colliery is noted at the terminus of Shotton Lane and Holywell Road immediately south-east of the Newbuild Infrastructure Boundary. A quarried-out area is shown within the Newbuild Infrastructure Boundary to the east of Old Aston Hill, which is noted in the HER as Holly House Farm sand pits (99061) and were recorded during the walkover survey (WSP009, as shown on **Figure 8.1.3 in Annex A**).
- 4.8.84. The OS 2nd edition 6": mile map of 1898 (not reproduced; **Ref. 8.92**) of the Ewloe Green section of the Newbuild Infrastructure Boundary shows two railways crossing the Newbuild Infrastructure Boundary. One running north-west to south-east immediately west of the Grade II* Aston Hill BVS (23), presumably

Hawarden Railway (99034). The other recorded as Aston Hill BVS Colliery Railway (23603) with two small lines converging near Aston Hill BVS and generally running north-east to south-west likely connecting the small collieries within the area including workings at Coal Pit Field (99046) 85 m south of the Newbuild Infrastructure Boundary, Coal Pit Hey (99047) within the Newbuild Infrastructure Boundary, and Blackbrook Avenue Colliery (103788) 100 m south-east of the Newbuild Infrastructure Boundary. The quarried-out area near Old Aston Hill has grown and it is noted as sand pits.

- 4.8.85. The OS 1st edition 6": mile map of 1869–1871 (not reproduced; **Ref. 8.93**) of the Northop Hall AGI section of the Newbuild Infrastructure Boundary shows scattered residential properties and farms along the main road between Ewloe and Flint/Northop. The small community of Dublin lies north-west of Newbuild Infrastructure Boundary at Alltami Brook. A railway crosses the Newbuild Infrastructure Boundary to the west of Alltami Brook, possibly serving to connect Castle Brickworks (103711) with riverside infrastructure. A colliery is noted between Boar's Head Farm and Galchog, immediately east of Highfield Hall (322) on the north side of the main road. The map notes the presence of a weighing machine in the field south-east of Highfield Hall within the Newbuild Infrastructure Boundary near the location of the proposed Northop Hall AGI.
- 4.8.86. The OS 2nd edition 6": mile map of 1898 (not reproduced; **Ref. 8.94**) of the Northop Hall AGI section of the Newbuild Infrastructure Boundary shows increased residential development within Northop Hall AGI along the main road between Ewloe and Flint/Northop. The Plas Ifan Coal Mine (103089) is noted immediately north of the Newbuild Infrastructure Boundary to the west of the terminus of Smithy Lane with the main road. The earthworks associated with the colliery appear to extend into the Newbuild Infrastructure Boundary. The colliery near Highfield Hall is noted as disused and the weighing machine is no longer noted.

BVSs along the Flint Connection to Point of Ayr Terminal Pipeline

- 4.8.87. The OS 1st edition 6": mile map of 1870 (not reproduced; **Ref. 8.95**) shows Cornist Lane to the west of the Newbuild Infrastructure Boundary which is shown as lined with trees. There are also two field boundaries within the Cornist Lane BVS Newbuild Infrastructure Boundary. The trees are no longer marked the OS 2nd edition 25": mile map of 1899 (not reproduced; **Ref. 8.96**).
- 4.8.88. The proposed Pentre Halkyn BVS does not show much development within the Newbuild Infrastructure Boundary between OS 1st edition 6": mile map of 1870–72(not reproduced; **Ref. 8.97**) and the later OS maps 1989–94 (**Ref. 8.98**). The B5121, is marked to the west of the boundary, and there is an east–west running field boundary in the top north-west corner of the area. A lead mine shaft is also shown just outside the Newbuild Infrastructure Boundary to the east.

4.8.89. The proposed Babell BVS shows very little in the way of development from the 1870 OS 1:2,500 map (not reproduced, **Ref. 8.99**) through to the 1989 OS 1:2,500 map (not reproduced; **Ref. 8.100**). The 1870 OS 1:2,500 map (not reproduced; **Ref. 8.99**) has an 'old quarry' marked within the Newbuild Infrastructure Boundary, which by the 1871 map (not reproduced; **Ref. 8.101**) is no longer shown. There is more detail shown on this map, with two field boundaries marked and a small area of woodland.

MODERN PERIOD (AD 1901 - PRESENT)

4.8.90. The landscape and focus of industrial activity within the Study Area began to change in response to external pressures with the mining industry facing decline by the end of the 19th century in the face of cheaper imported lead. As such only small-scale, intermittent activity continued following the First World War until the remaining mines were closed in the 1960s. The prolonged agricultural depression in Britain along with the introduction of heavy taxes on inherited wealth in the 20th century, put an end to agricultural land being the primary source of wealth, with the result being that the several large estates were sold or broken up in the surrounding region.

Cheshire Newbuild Infrastructure Boundary

4.8.91. The mid-20th century saw a greater intensification of heavy industrial activity, as seen at the former Stanlow and Ince Marshes along the Mersey Estuary (in the north-east of the Newbuild Infrastructure Boundary). The primary industries were oil refineries and chemical works (as salt was readily available), located on marshland that had been reclaimed. The Grade II listed 'Building 50 at Thornton Aero Engine Research Laboratory' (NHL 1392326), 435 m to the north of the Newbuild Infrastructure Boundary at Stanlow AGI, was constructed by Sir Alan Cobham and Burnet, Tait and Lorne in 1940 at Ince as the first of four laboratories constructed to form Shell's Thornton Research Centre. Additional buildings within the Shell oil refinery complex at Stanlow, building 27 and 38 (LL41 and LL42), are locally listed. The proposed Stanlow AGI is sited within the land developed as part of the oil refinery.

4.8.92. The OS 6" mile map of 1938 (not reproduced; **Ref. 8.102**) of the Elton and Thornton-le Moors sections of the Newbuild Infrastructure Boundary shows the first major change in the eastern end of the Study Area in the form of the road that later became the A5117 which crosses the Newbuild Infrastructure Boundary at the east end and immediately south of the proposed Stanlow AGI. No further change is noted until the OS 1:10 560 scale map of 1967–68 (not reproduced; **Ref. 8.103**) when the Stanlow Oil Refinery (now the Stanlow Manufacturing Complex) is first depicted to the north of Thornton-le-Moors and within the Newbuild Infrastructure Boundary at the proposed Stanlow AGI. The HER notes the area of Royal Ordnance Factory (ROF) Dunham on the Hill (4217, MCH9985), a Second World War ammunition site, extending within the

Newbuild Infrastructure Boundary in this area (though this site is omitted from the OS mapping as military sites were often excluded). The OS 1:10000 scale map of 1983 (not reproduced; **Ref. 8.104**) shows the line of the M56 to the south of the Newbuild Infrastructure Boundary for the first time and with it the road system takes its current form. Today, the Ince Bio Power plant along with the Central Farmers (CF) Fertilisers plant has been developed on the fields of the reclaimed Ince Marshes though the area within the Newbuild Infrastructure Boundary has remained largely unchanged. Residential development within the area, particularly in Elton has been undertaken as a result of the construction of the M56 motorway.

4.8.93. No change to the Wervin / Picton section of the Newbuild Infrastructure Boundary is noted until the OS 1:10 560 scale map of 1967 (not reproduced; **Ref. 8.105**) which shows that the Caughall Bridge Cottage near the crossing of Caughall Road over the canal has been removed. The CHER notes that a Road Block was set up during the Second World War at Caughall Bridge (4079/1/11, MCH10008), adjacent to the Newbuild Infrastructure Boundary, this is not noted on the mid-20th century OS maps. No further changes are shown on the OS maps to the present day.

4.8.94. No change to the Mollington section of the Newbuild Infrastructure Boundary is noted until the OS 1:10 560 scale map of 1954 (not reproduced; **Ref. 8.106**) which shows further residential development around the Willows extending to the boundary of the Newbuild Infrastructure Boundary.

Flintshire Newbuild Infrastructure Boundary

4.8.95. The areas around Northop Hall AGI, Ewloe, Mancot, Aston, and Sandycroft became increasingly developed through the mid- to late 20th century.

4.8.96. No change to the Sandycroft and Sealand sections of the Newbuild Infrastructure Boundary is noted until the OS 1:10 560 scale map of 1963–68 (not reproduced; **Ref. 8.107**) which shows the removal of the residence called ‘Scotland’ and the development of Royal Air Force (RAF) Hawarden (85258), specifically the Beeches Dispersal site runways (85253) which extend into the Newbuild Infrastructure Boundary. The airfield is noted as the Hawarden Airport by the OS 1:10 560 scale map of 1969 (not reproduced) and the runway bays within the Newbuild Infrastructure Boundary have been removed by the OS 1:10 000 scale map of 1975–78 (not reproduced **Ref. 8.108**).

4.8.97. RAF Hawarden was developed in the late 1930s as a shadow factory for military planes with a connected airfield (**Ref. 8.109**). During the Second World War it also served as an RAF base for flight training. The sites of four military aircraft wrecks are noted within the Study Area around RAF Hawarden:

- The Airspeed Oxford II N4731 which crashed on 26/4/1940 (130274) 55 m west of the Newbuild Infrastructure Boundary;

- The Supermarine Spitfire I R7117 which crashed at Mancot on 30/3/1942 (130408) 340 m south-east of the Newbuild Infrastructure Boundary;
- The Armstrong Whitworth Siskin IIIDC J9207 which crashed on 14/7/1939 (130305) 450 m north-west of the Newbuild Infrastructure Boundary; and
- The Supermarine Spitfire I R6829 which crashed on 20/2/1942 (130407) 450 m north-west of the Newbuild Infrastructure Boundary.

- 4.8.98. The HER records note that the pilot survived the crash of the Supermarine Spitfire I R7117 but the pilot of the Supermarine Spitfire I R6829 was killed during the crash.
- 4.8.99. The aircraft factory was taken over by de Havilland in 1948 and the other elements of the RAF base were divested gradually until the airfield was wholly left in de Havilland control in 1959 (**Ref. 8.109**). The airfield and factory are now operated by Airbus UK as the Chester Hawarden Airport.
- 4.8.100. No change to the Sandycroft and Mancot sections of the Newbuild Infrastructure Boundary is noted until the OS 1:10 560 scale map of 1948 (not reproduced; **Ref. 8.110**) which shows the removal of the Aston Hill BVS Colliery Railway. The brickworks have been extended near Gladstone Way until the OS 1:10 000 scale map of 1969 (not reproduced; **Ref. 8.111**) and further residential development along Chester Road continued until the late 1970s. The site is roughly as existing by the OS 1:10 000 scale map of 1978 (not reproduced; **Ref. 8.112**).
- 4.8.101. The OS 1:10 560 scale map of 1970 (not reproduced; **Ref. 8.112**) of the Northop Hall AGI section of the Newbuild Infrastructure Boundary shows the first major changes within the area other than increased residential development within Northop Hall AGI along the main road between Ewloe and Flint/Northop. The railway west of Alltami Brook had been removed, although the embankment is still partially noted on OS maps until the modern day. The A55 was constructed between the late 1970s and late 1980s just to the south of the Newbuild Infrastructure Boundary and is shown as completed by the OS 1:10 000 scale map of 1987 (not reproduced; **Ref. 8.113**).

BVSs along the Flint Connection to Point of Ayr Terminal Pipeline

- 4.8.102. No further changes are noted within the proposed Cornist Lane BVS Newbuild Infrastructure Boundary until the OS 1:10,560 scale map of 1994 (not reproduced; **Ref. 8.114**), when a track is marked running through the area in a north-east to south-west direction.
- 4.8.103. The only change noted within the later OS maps of the proposed Pentre Halkyn BVS is the gradual removal of the lead mine which is noted as disused on the 1965 OS Map (not reproduced; **Ref. 8.115**).

4.8.104. No further changes are noted within the proposed Babel BVS until the 1964 OS map (not reproduced) where one of the field boundaries is moved further to the south. A slight change is noted in the 1989 OS map (not reproduced; **Ref. 8.116**), where a track can be seen running in an east–west direction, through the centre of the Newbuild Infrastructure Boundary, through the wooded area.

5. AERIAL PHOTOGRAPH AND LIDAR ASSESSMENT SUMMARY

5.1. INTRODUCTION

- 5.1.1. A full report on the aerial photograph and LiDAR can be seen in **Appendix 8-3 – Aerial Photographs and LiDAR Assessment (Volume III)**. This section provides a summary of the results.

AERIAL PHOTOGRAPHS

- 5.1.2. Reviewing historic aerial photography helps understand the historic environment resource by revealing sites that are often difficult, or even impossible, to see from the ground. Historic aerial photos especially provide information on features, sites or landscapes that may have since been removed, altered or hidden due to modern development, urbanisation or a change in land use. Interpretation and mapping of sites visible as cropmarks, soilmarks, and earthworks allows a better understanding of past landscapes to inform the baseline, and therefore risk and management strategies.
- 5.1.3. Aerial photographs (captured either through vertical and oblique angles) can help identify and interpret earthwork sites, and cropmarks, and can help visualise the features or sites differently – especially when captured from different directions. Furthermore, looking at a wide range of photographs from different years can provide a perspective on the changing landscape, condition and preservation of the sites over time.
- 5.1.4. Relevant aerial photos were identified by their ‘capture location’ being within a 1km ‘search area’ of the remote sensing ‘Study Area’ (the Newbuild Infrastructure Boundary).
- 5.1.5. One hundred and one aerial photographs were requested for this assessment from the Historic England Archive (**Ref. 8.28**), but 79 were utilised for assessment as 22 were not held as prints for consultation.
- 5.1.6. Sixty-six aerial photographs were identified within a 1 km buffer of the Newbuild Infrastructure Boundary in The Royal Commission of Ancient and Historic Monuments of Wales (RCAHMW)’s archive (**Ref. 8.26**). However, only one was considered to be of potential use, due to the foreground and content of the photograph being within the Study Area.

LIDAR

- 5.1.7. LiDAR uses the nature and consistent speed of light pulses to build up a point cloud, and, by triangulating those points together, builds a detailed Digital Terrain Model (DTM) of the reflected surface. Furthermore, as light can penetrate vegetation it can build a picture below canopy and dense vegetation, allowing visibility of the ground (surface) where other techniques cannot. This allows not only individual feature detection but a broad insight into large areas of the ground and how it has been shaped and manipulated in the past.
- 5.1.8. The LiDAR data was downloaded from publicly available sources (**Ref. 8.24** and **Ref. 8.23**). It does not provide full coverage of the Newbuild Infrastructure Boundary; there is substantial coverage from 1m resolution LiDAR data - approximately 61% of the Newbuild Infrastructure Boundary, and approximately 18% coverage from 2 m resolution. Altogether, coverage of the available LiDAR dataset was 78.5% of the Newbuild Infrastructure Boundary. In total, LiDAR data was found to be available for 360 hectares.
- 5.1.9. Features of potential archaeological interest were identified by visual examination of the LiDAR imagery, in conjunction with other relevant datasets, within Newbuild Infrastructure Boundary. For a description of the methodology used in the assessment see **Appendix 8-3 – Aerial Photographs and LiDAR Assessment (Volume III)**.
- 5.1.10. Identified features were assigned a unique numerical identifier and are briefly described. The potential origin of each feature was interpreted based on a consideration of its form, landscape context and other relevant datasets. Where possible, a broad date range was assigned to each feature by reference to conventionally defined archaeological periods.

5.2. RESULTS

- 5.2.1. The features identified are predominately evidence of agricultural activity. Feature types include late medieval and post-medieval ridge and furrow evidence, drainage features, access tracks and field boundaries.

Prehistoric to Early Medieval

- 5.2.2. No sites have been identified within the Newbuild Infrastructure Boundary which may be firmly dated to the prehistoric, Roman, or early medieval periods. This does not indicate the total absence of possible features of these dates within the Newbuild Infrastructure Boundary, but is perhaps due to the limitations of this analysis.

Late Medieval

- 5.2.3. The moated site, fishpond and connecting channel at Elton (NHLE reference: 1012122) is a scheduled monument that lies 35 m north-east of the Newbuild Infrastructure Boundary. The scheduled monument and a square drainage system network extending to the east and south past the scheduled monument boundary is visible on the LiDAR data. The moated site is also visible on a number of aerial photographs. It is likely that further buried remains of associated late medieval activities may be located within the Newbuild Infrastructure Boundary given its close proximity. Nearby fields contained evidence of plough scarring suggesting intensive cultivation which may have obscured older more ephemeral evidence.
- 5.2.4. The Newbuild Infrastructure Boundary appears to have been extensively farmed in the late medieval period due to the remnants of (sometimes eroded) ridge and furrow features, plough scars and former field boundaries, visible through both the aerial photos, and the LiDAR data.
- 5.2.5. This pattern of parallel ridges and troughs were created by ploughing the land. Ridge and furrow can also be an indicator of medieval rural settlement patterns, graphically displaying the extent and location of settlement and land management limits. Generally, in the vicinity of relict ridge and furrow there may be remains of occupation because of the increased likelihood of associated infrastructure, buildings and/or agricultural related activity.
- 5.2.6. Within the Newbuild Infrastructure Boundary, there is a small amount of 'S' shaped ridge and furrow indicative of earlier dates; the 'S' shape is caused by larger, heavier ploughing tools of the medieval period, and the reverse 'S' shape of the later medieval period. This differs from the more advanced, narrower and tighter turns produced by post-medieval ploughing methods.
- 5.2.7. The ridge and furrow earthworks identified south of Saughall display a slight (reverse) 'S' shape, suggesting that they may be of late medieval date.
- 5.2.8. Where earlier ridge and furrow earthworks survive, it indicates that these fields were later used for pasture, rather than as arable land, after the late medieval, as later and modern ploughing would have largely eradicated any earlier ridge and furrow.

Post-Medieval

- 5.2.9. One of the most common feature types identified during this assessment were characteristic post-medieval ridge and furrow features, particular evident in the LiDAR data. Most examples of the ridge and furrow display straight and narrow sets of ridges which were most likely created in the post-medieval period. Clear examples of ridge and furrow surviving as earthworks are identified east and west of Mollington, and south-east and south-west of Deeside, intermittently covering a large area.

- 5.2.10. Across the Newbuild Infrastructure Boundary, these landforms have varying levels of preservation due to the location and intensity of subsequent land use. It appears that many of these fields were turned over to grazing in the modern period and have not been intensively ploughed allowing for the survival of these features.
- 5.2.11. Aerial photographs also document the post-medieval landscape well. Identified remains within the Newbuild Infrastructure Boundary mostly relate to the many aspects of agricultural activities (e.g., plough scars) which span the whole period. Narrow ridge and furrow earthworks, and former field boundaries corroborate the notion of an extensively farmed landscape since late medieval/post-medieval times.
- 5.2.12. At present day, most of the land within the Newbuild Infrastructure Boundary comprises fields under a mixture of arable cultivation and pasture. These relict field systems vary in size but they are mostly rectangular in shape. It is possible that the pattern of these field systems is a product of the Inclosure Acts of the 18th and 19th centuries or that the spatial patterning of these field systems may correspond with earlier land divisions. This includes some components of medieval open field systems, where individual farmers looked after their own strips of land. By the 20th century, most of the enclosed fields were combined which resulted in the loss of numerous field boundaries.
- 5.2.13. Two parallel, linear features may represent the remains of a former roads or trackways associated with the Ashfield Farm Brickworks (CPAT HER reference: 103787). The remains are now cut by a modern road (A550) located near the former Aston Hill BVS Colliery Railway.

Modern

- 5.2.14. One potential enclosure ditch, north-west of Moston, Cheshire, is visible on LiDAR 20 m north-east of the Newbuild Infrastructure Boundary. The enclosure, appears sub-rectangular in form, covering 0.5 hectares and on top of a hill and is cut by a modern field boundary. The encampment was also noted during the geophysical survey (Figure 172 in **Appendix 8-4 – Geophysical Survey Report, Volume III**). After discussions with the Cheshire West and Cheshire Planning Development Archaeologist and analysis of further historic aerial photographs provided by the Planning Development Archaeologist, the feature has been interpreted as likely a part of a Second World War encampment. Additional detail can be found in **Appendix 8-3 – Aerial Photographs and LiDAR Assessment (Volume III)**.

Undated

- 5.2.15. Within the footprint of the Newbuild Infrastructure Boundary, aerial photos have indicated several marks in crops and grass suggesting the presence of potential buried boundaries, ditches, and pit features. These surviving features can neither be assigned to archaeological periods nor can be confidently classed as archaeology.
- 5.2.16. Twenty-six of the identified anomalies were discrete features, mostly sub-circular or sub-oval in plan. Their size varied greatly, ranging from 2.5 to 58 m in diameter. These depressions were intermittently distributed within the Newbuild Infrastructure Boundary, and they were mostly identified within or at the edges of agricultural fields. Some of these features may be of natural origin, for example the remains of tree throws or natural ponds, but it is possible that some are a result of human activity. The original purpose and date of these discrete anomalies cannot be distinguished with certainty based on the remote sensing data, but it is likely that many of these features represent post-medieval extraction pits and industrial activities. Most of the discrete features are not cut by other anomalies within the Newbuild Infrastructure Boundary which potentially means that they were open and used in the post-medieval period.
- 5.2.17. There are also a number of linear depressions and banks visible on the LiDAR imagery within the Newbuild Infrastructure Boundary. In many instances, these probably represent drainage systems. Where the linear banks and depressions that did not appear to respect existing or former field systems, it is plausible, however, that some of these features represent older features.
- 5.2.18. The Newbuild Infrastructure Boundary crosses two reclaimed marshlands, the Ince Marshes and the Saltney Marshes. Palaeochannels were noted within both areas and occasionally across the Newbuild Infrastructure Boundary. Palaeochannels — a remnant of an inactive river or stream channel that has been filled or buried by younger sediment — are undatable without intrusive survey, but their presence could help indicate locations of human activity due to the water source they could provide. The palaeochannels in the former Saltney Marshes are noted on historic maps from the 18th century and are also documented on the plans for the Dee canalisation activities. A former embankment extending into the Saltney Marshes is noted near the palaeochannels but is unclear whether these are associated.

6. FACTORS AFFECTING ARCHAEOLOGICAL SURVIVAL

6.1. INTRODUCTION

- 6.1.1. Past ground disturbance from modern development may have compromised archaeological survival (e.g., building foundations or quarrying), and can be identified from historic maps, site walkover survey, and information on the likely depth of deposits. Given the scale of the DCO Proposed Development and the varying landscape which it crosses, archaeological survival across the Newbuild Infrastructure Boundary is anticipated to be highly variable.
- 6.1.2. Where the Newbuild Carbon Dioxide Pipeline crosses existing roads, archaeological survival is anticipated to be low, due to truncation from road and pavement construction and from the excavation of services and drainage trenches, which typically follow roads.
- 6.1.3. The main past impact on archaeological survival within the Newbuild Infrastructure Boundary are modern building developments, mechanised ploughing, historic quarrying, road construction and associated services, electricity pylons, vegetation root disturbance.

6.2. PAST IMPACTS AND IMPLICATIONS FOR ARCHAEOLOGICAL SURVIVAL

MODERN BUILDING FOUNDATIONS AND SERVICES

- 6.2.1. The main past impact to archaeological survival across the Newbuild Infrastructure Boundary is likely to be modern (20th century) building development. The primary impact from modern buildings derives from foundations, areas of hardstanding, and site preparation / historic demolition which would have partially truncated or removed potential shallow remains to the footprint of the works.
- 6.2.2. There are a number of existing buildings present across the Newbuild Infrastructure Boundary. Notably, the construction of the Stanlow Manufacturing Complex in the north-east part of the Newbuild Infrastructure Boundary will have truncated or removed any earlier archaeological deposits within the footprint of each building. The foundations used for the buildings present are not known, however, if piled foundations have been used, any archaeological remains within the footprint of each pile will have been removed. Other kinds of foundations (e.g., standard pad or strip) would likely have extended to a depth of 1.0–1.5 mbgl and have truncated or completely removed any archaeological remains within their footprint.

- 6.2.3. Modern services are known to be present across the Newbuild Infrastructure Boundary. Trenches for drains and services associated with the roads and pavements are likely to extend to depths of 1.0–1.5 mbgl and have truncated or completely removed any archaeological remains within their footprint.

MODERN PLOUGHING

- 6.2.4. A number of the fields within the Newbuild Infrastructure Boundary have been ploughed during the 20th century. The impact of mechanised ploughing will depend on its nature, where deep ploughing has been used, this can cause considerable disturbance to any archaeological remains do a depth of around 0.3–0.4 mbgl. However, the bases of deep cut features can survive the reworking of the topsoil by ploughing.

QUARRYING AND MINING

- 6.2.5. Whilst any surviving elements of historic quarrying or mining would be considered heritage assets, their construction is likely to have affected the survival of (or removed entirely) any earlier archaeological remains.
- 6.2.6. Brickearth / sand extraction pits are shown on historic mapping throughout the Newbuild Infrastructure Boundary. Where historic extraction activities have occurred, this would have had the effect of truncating any earlier archaeological deposits entirely, to the depth of the extraction pits.
- 6.2.7. The construction of the 19th century colliery buildings in the Mancot, Ewloe, and Northop Hall AGI parts of the Newbuild Infrastructure Boundary will have truncated or removed any archaeological remains within the footprint to the depths of their formation, and the excavation of the mine shafts would have completely removed any archaeological remains within their footprint.
- 6.2.8. Historic 18–19th century mine shafts are noted near the Pentre Halkyn BVS Newbuild Infrastructure Boundary and potentially extend within the boundary. Where these are present, they are likely to have removed entirely any archaeological remains present to the footprint of the mine.

OTHER

- 6.2.9. Fences, gates, stiles and hedgerows demarcating property and field boundaries are found on the land within the Newbuild Infrastructure Boundary. Whilst archaeological features can survive within woodland and hedgerows, there may have been localised truncation from root action. The digging of trenches and holes for fence and gate posts will also have had a similar impact. Ground intrusion could potentially have severely truncated or completely removed any remains within their footprint to a depth of 1.0–1.5 mbgl at these locations.

6.3. ANTICIPATED ARCHAEOLOGICAL SURVIVAL

- 6.3.1. Archaeological survival is likely to be high within the agricultural fields in the Cheshire section of the Newbuild Infrastructure Boundary and to the north-west of Northop Hall AGI. Post-medieval mining and brick making activities within the Newbuild Infrastructure Boundary in Mancot, fields to the north of Magazine Lane between Ewloe Green and around the Pentre Halkyn BVS Newbuild Infrastructure Boundary would have heavily impacted the survival of remains within these areas, likely removing entirely any remains of earlier periods.
- 6.3.2. The reclamation activities within the River Dee valley following the canalisation of the River Dee in the 19th century would have buried the valley landscape and deposits likely preserving them beneath deep made ground deposits.

7. STATEMENT OF VALUE: BURIED HERITAGE ASSETS

7.1. INTRODUCTION

- 7.1.1. This section summarises the known buried heritage assets and potential for each chronological period, based on the archaeological and historical background of the area, its geology, topography and hydrology, the likelihood for evidence of past activity, and taking into account past disturbance which may have affected survival. For example, the site may have high potential for the presence of activity of a particular period, but with low survival.
- 7.1.2. This section includes professional opinion on the likely heritage value of such remains, where there is low to moderate or higher potential for such to be present. For each chronological period where the potential is assessed as low the likely heritage value is not included, as this implies that remains are not predicted within the Newbuild Infrastructure Boundary.

7.2. KNOWN BURIED HERITAGE ASSETS WITHIN THE NEWBUILD INFRASTRUCTURE BOUNDARY

- 7.2.1. The buried heritage assets identified within the Newbuild Infrastructure Boundary are summarised below.

Table 7.5 - Predicted Known Buried Heritage Assets

Value	Buried Heritage Asset
Very High	N/A
High	Wat's Dyke (27066)
Moderate	King's Wood Lane/Saltersway/ Military Way (2030/1, MCH1278) Roman Road - Chester to Wirral (Margary 670) (2010/1/0, MCH6164)
Low	Chester to Crewe Line (L & NWR) (2468/1/0, MCH1705) Birkenhead and Chester Line (L & NWR/GWR) (2527/1/0, MCH19851) ROF Dunham on the Hill (4217, MCH9985) Ridge and Furrow Earthworks in Large Standleys and Standleys Small (15191, MCH25127) Sidings S of Mollington Station, Chester to Birkenhead Railway (2527/1/14, MCH1552) Royal Observer Corps Monitoring Post at Saughall (4135/0/2, MCH9818)

Value	Buried Heritage Asset
	Sealand Embankment III (34237) Pentre Halkyn windmill (17017) Ashfield Farm Brickworks (103787) Brookside Ridge and Furrow (97837) Chester - St Asaph Roman road (46802) Coal Pit Hey (99047) Ewloe Green Farm Colliery (103806) Ewloe railway (99043) Ewloe, Old Aston Hill, RAF Hawarden wireless station, aerial mast IV (129644) Ewloe, Old Aston Hill, RAF Hawarden wireless station, building II (129640) Hen-dyddyn Farm sand pit (85032) Holly House Farm Sand pits (99061) Little Leadbrook Farm marl pit (85035) Little Leadbrook Farm marl pit (85036) Mancot Royal strip field system (99060) Sandycroft boundary stone (103807)
Negligible	Find spot: Hawarden, finger ring (120329)

7.2.2. The assessment of heritage value, in line with NPPF (Ref. 8.1) and the interests set out in section 3.5.4 above, are included in Section 11 of this report.

7.3. UNKNOWN BURIED HERITAGE ASSETS WITHIN THE NEWBUILD INFRASTRUCTURE BOUNDARY

PALAEOENVIRONMENTAL

7.3.1. The Newbuild Infrastructure Boundary has high potential for palaeoenvironmental remains within the former Ince Marshes of the River Mersey estuary at the eastern end of the Newbuild Infrastructure Boundary and within the River Gowy and the River Dee floodplains. The alluvium may contain well-preserved (due to waterlogging) organic remains. Minerogenic deposits such as alluvial silts and clays have high potential for diatom preservation, the assessment of which can provide information of the past landscape. Peat deposits preserve pollen and floral and faunal macrofossils such as seeds, plant fragments, molluscs and occasionally ostracods. Organic material can also be dated by radiocarbon techniques, important for establishing the chronology for the depositional sequence. In combination with geoarchaeological assessment

of the sediments, examination of pollen and diatoms can provide valuable information of contemporary local environmental conditions. Such remains have historic and archaeological interest for the past environment in which prehistoric and later people lived and would be of **low** or **moderate** heritage value, derived from historic and archaeological interest.

PREHISTORIC

- 7.3.2. The Newbuild Infrastructure Boundary has a moderate to high potential for prehistoric remains. The potential for prehistoric remains is considered lower east of Northop Hall AGI and higher west of Northop Hall AGI. The sections of Newbuild Infrastructure Boundary located to the west of Northop Hall AGI are located within a known prehistoric funerary landscape. Designated Bronze Age round barrow sites are located within the vicinity of proposed Babell BVS and Pentre Halkyn BVS. The CPAT HER notes that remains of further round barrows have been identified near the proposed Babell BVS, Pentre Halkyn BVS and Northop Hall AGI. Further funerary remains dated to the prehistoric period are possible in areas not impacted by mining activities or later development. Isolated finds are possible throughout the Newbuild Infrastructure Boundary, of likely low heritage value.
- 7.3.3. If present, remains of round barrows would be of **moderate** or **high** heritage value based on their archaeological and historical interest. Isolated remains would be of **low** value based on their archaeological and historic interest.

ROMAN

- 7.3.4. The Newbuild Infrastructure Boundary has a moderate potential to contain remains dating to the Roman period. The lines of the Chester to Wirral Roman Road (Margary 670) (MCH6164) runs through the footprint of the DCO Proposed Development and it is possible that remains of this Roman road survive below ground, although the extent is unclear. The fortress at Chester controlled the River Dee so it is also likely that Roman remains may be present along the course of the river. Previously unrecorded remains associated with these features could be located within the Newbuild Infrastructure Boundary.
- 7.3.5. If present, remains of structures or roadside features would of **moderate** or possibly **high** value based on their archaeological and historic interest. Isolated remains would be of **low** value based on their archaeological and historic interest.

EARLY MEDIEVAL

- 7.3.6. The Newbuild Infrastructure Boundary has variable potential for early medieval remains to be present, dependant on location. There is a high potential for early medieval remains within the Cornist Lane BVS and the Babell BVS Newbuild Infrastructure Boundaries given their proximity to Wat's, Offa's and Whitford

Dykes and further evidence relating to the dykes and any activity undertaken within their vicinity is likely within the Newbuild Infrastructure Boundary. There is indication that the towns of Thornton-le-Moors and Stoak in Cheshire and Northop in Flintshire were established by or during the early medieval but no archaeological evidence of settlement dated to this period has been found within the Study Area to date. It is likely that the land surrounding these settlements was utilised for agriculture or pasturage at this time; therefore, it is considered that there is moderate potential for remains of agricultural activity and low potential for settlement remains within the rest of the Newbuild Infrastructure Boundary.

- 7.3.7. If present, remains relating to activity on or near the dykes would be of **low** to **medium** value depending on the type and extent of remains. Remains of early medieval agricultural activity would be of **low** value based on their archaeological and historic interest. Isolated remains would be of **low** value based on their archaeological and historic interest.

LATE MEDIEVAL

- 7.3.8. There is high potential for late medieval remains to be located within the Newbuild Infrastructure Boundary. Early historic maps and the placement of historic churches show that the population was dispersed in small villages surrounded by isolated farmsteads and farmland. HER records and results from the geophysical and remote sensing assessments show that evidence of late medieval agricultural activity and transportation infrastructure is present throughout the Newbuild Infrastructure Boundary; however further remains of a similar type are possible throughout the boundary and may have been masked by later industrial or agricultural activity.
- 7.3.9. Agricultural remains (i.e. ridge and furrow or agriculture ditches) would likely be of **low** value. Isolated remains and find spots would be of likely **negligible** or **low** value based on their archaeological and historic interest.

POST-MEDIEVAL

- 7.3.10. Overall, there is a moderate to high potential for post-medieval remains to survive within the Newbuild Infrastructure Boundary. For the majority of the Newbuild Infrastructure Boundary, the post-medieval landscape would have comprised agricultural farmland. As such, the main potential is for surviving features relating to this history, such as field boundaries and drainage ditches. These are most likely in the rural areas of Newbuild Infrastructure Boundary, as suggested by the identification of field systems, visible as cropmarks on aerial photographs and LIDAR along with evidence of ridge and furrow cultivation recorded by the Geophysical Survey (**Appendix 8-4 - Geophysical Survey Report (Volume III)**). Post-medieval agricultural remains such as field boundary

ditches of cultivation layers would be of **negligible** or possibly **low** heritage value, based on the archaeological and historical interest of the finds.

- 7.3.11. Within the Deeside and Ewloe parts of the Newbuild Infrastructure Boundary, there is an uncertain potential for post-medieval industrial remains, in the form of colliery remains and brickwork extraction pits. If present (and depending on their nature and extent) such remains would be of **low** value.

MODERN

- 7.3.12. There is a moderate potential for modern remains to be located within the footprint of the Newbuild Infrastructure Boundary due to the proximity of RAF Hawarden. Any remains associated with these assets are likely to take the form of buried building remains and earthworks although the survival and extent is unclear. The remains of a Second World War airplane crash site were recorded close to the Newbuild Infrastructure Boundary in Mancot, connected with the training ground at RAF Hawarden. These types of sites are generally well recorded and it is unexpected that unknown sites of this magnitude would be identified within the footprint of the Newbuild Infrastructure Boundary; however, there is a possibility that military paraphernalia may be recovered closer to the RAF training ground.
- 7.3.13. In general, below ground remains of the modern period would be of **low** or **negligible** value based on their archaeological and historic interest; however, remains associated with the Second World War are potentially of **medium** value based on their archaeological and historical interest.

8. STATEMENT OF VALUE: ABOVE GROUND HERITAGE ASSETS

8.1. INTRODUCTION

- 8.1.1. Following Step 1 of the setting guidance, a scoping exercise took place for the Study Area. All of the above ground heritage assets located in the 1km Study Area were initially assessed to determine whether they were at risk of harm through a change in setting as a result of the DCO Proposed Development.
- 8.1.2. 130 above ground heritage assets have been scoped out of this assessment as they are located at a distance greater than 100 m from the Newbuild Infrastructure Boundary and as such are not within direct line of sight of any above ground works. Therefore, the DCO Proposed Development would not have an impact through changes in the setting of these assets.
- 8.1.3. The definition of setting used here is taken from the NPPF (**Ref. 8.1**) and is “*the surroundings in which an asset is experienced. Its extent is not fixed and may change as the asset and its surrounding evolve. Elements of a setting may make a positive or negative contribution to the value of an asset, may affect the ability to appreciate that significance or may be neutral*” (Annex 2).
- 8.1.4. Historic England in its Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning 3 (**Ref. 8.31**) considers that the importance of setting lies in what it contributes to the value of the heritage asset. This depends on a wide range of physical elements within, as well as perceptual and associational attributes pertaining to, the heritage asset’s surroundings.
- 8.1.5. Historic England discusses several other general considerations including cumulative change; change over time; appreciating setting; buried assets and setting; designated settings; setting and urban design; and setting and economic and social viability.

8.2. ABOVE GROUND HERITAGE ASSETS SCOPED INTO ASSESSMENT

ABOVE GROUND HERITAGE ASSETS WITHIN THE NEWBUILD INFRASTRUCTURE BOUNDARY

Thornton-le-Moors Conservation Area (110)

- 8.2.1. The Thornton-le-Moors Conservation Area (CA) extends into the Newbuild Infrastructure Boundary at the junction of Poole Lane and the A5117. The CA does not have a Conservation Area Appraisal on the Cheshire West and Chester Council website.

- 8.2.2. The Thornton-le-Moors CA encompasses the area of the historic town of Thornton-le-Moors in Cheshire and its immediate environs. It is characterised by the presence of nine designated buildings/structures, most notably the 14th century Grade I listed Church of St Marys (NHLE 1330242) and associated burial ground containing the Grade II listed Table Tomb to John Davies of Dunham (NHLE 1145887) and is bounded by the Grade II listed retaining wall on the west, south and half on the east side including gate piers at the south-west corner (NHLE 1130655). The other designated assets include the 17th century Grade II listed Thornton Hall (NHLE 1130653), the late 17th or early 18th century Grade II listed Barn to north-east of Thornton Hall (NHLE 1130654), the Grade II listed Glebe Farmhouse (NHLE 1130652), the 18th century Grade II listed Church Farmhouse including Cottage Wing to west (NHLE 1330241), the late 18th to early 19th century Grade II listed Church House Farmhouse including a shippon (cattle shed) abutting on north (NHLE 1330240), and the early 18th century Grade II listed Yew Tree House (NHLE 1130651). The historic character of the listed buildings have been retained through alterations in the later centuries preserving some original features and the conservation area has retained its compact layout and road system. The conservation area is judged as having high value as a result of the presence of the Grade I listed 14th century church and surrounding post-medieval buildings. The CA is an asset of **high** value.
- 8.2.3. The conservation area is set within a rural landscape and preserves the characteristics of a small rural village; however, the setting was heavily impacted by the development of the Stanlow Manufacturing Complex immediately to the north (**Insert 8.1**). The refinery infrastructure towers over the historic buildings changing the setting from rural agricultural to partially industrial and breaking the rural tranquillity of the original setting (**Insert 8.2**). This has impacted on the understanding of the rural character of the CA and had a detrimental impact on the understanding of the designated assets within the CA. The combination of the A5117 to the north of the conservation area (**Insert 8.3**) and the Stanlow Manufacturing Complex has added to the general noise level of the area removing it further from its rural aspects. It is considered that the setting therefore makes a **negligible** contribution to the value of the conservation area.



Insert 8.1 - View looking north at Grade I listed St Mary's Church (NHLE 1330242) in Thornton-le-Moors CA, Stanlow Manufacturing Complex in background



Insert 8.2 - Looking north at Grade II listed Church Farmhouse (NHLE 1330241) within the Thornton-le-Moors CA



Insert 8.3 - North-east view from Poole Lane within Thornton-le-Moors Conservation Area to the proposed Stanlow AGI site

Chester Canal Conservation Area

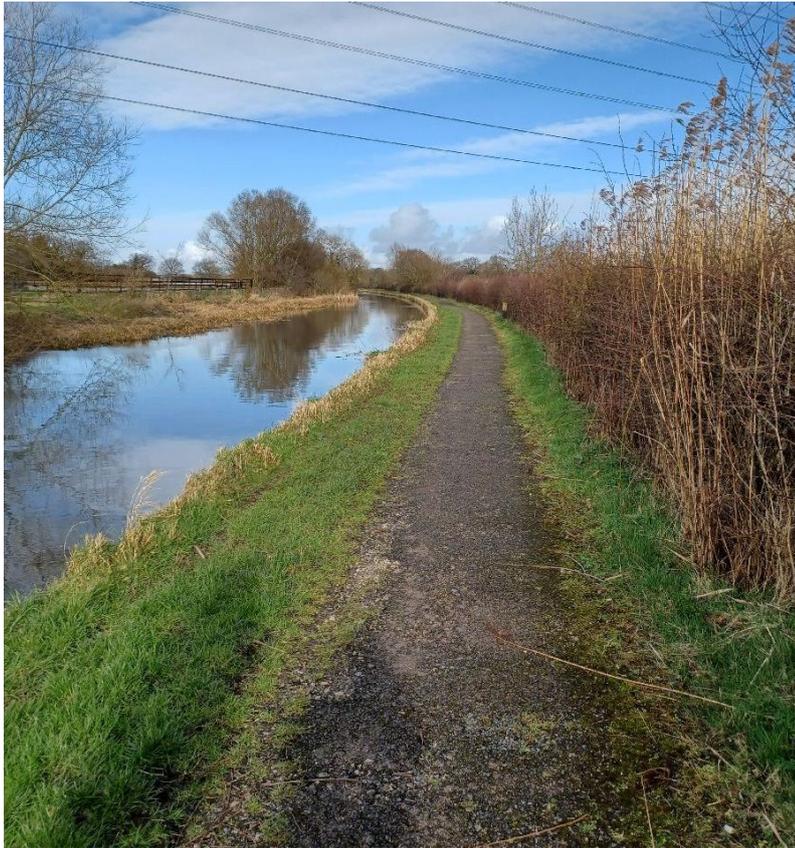
- 8.2.4. The Chester Canal (CA) encompasses the length of the Shropshire Union Canal, originally the Wirral Line of the Ellesmere Canal and associated historic railway and canal infrastructure some of which is designated for its historic and architectural interest. The CA crosses the Newbuild Infrastructure Boundary at Caughall Road, between Wervin and Backford in Cheshire. One of the notable examples of infrastructure is located 240 m south of the Newbuild Infrastructure Boundary is the Grade II listed railway viaduct over the Shropshire Union Canal (NHLE 1278977) dated to 1839, built of red sandstone, and also called the Chester & Birkenhead railway viaduct (**Insert 8.4**). The viaduct is impressive in scale, height and is an important focal point along the stretch of canal nearest to the DCO Proposed Development. The south-eastern Shropshire section was the first part of the canal system to be constructed and was completed in 1795 joining the Chester Canal at a large basin close to the bottom of the Northgate Locks near Chester.
- 8.2.5. The section of the CA that the DCO Proposed Development runs through is rural in nature passing through open agricultural and pastoral fields with intermittent residential, agricultural and railway structures (**Insert 8.5** and **Insert 8.6**). The area is characterised by gentle rolling countryside and possesses aesthetic value enhanced by the associated historic infrastructure. Apart from

the associated canal buildings, furniture and features, the railway and road bridges are evidence of the development of the industrial transport infrastructure in this area and a clear reminder of how important this infrastructure was historically. Currently, the canal and CA are primarily utilised used for tourism and pleasure (i.e. as a walking and biking trail, for fishing, and for canal boating). The CA is an asset of **medium** value.

- 8.2.6. The open views over the Gowy floodplain towards Helsby Hill are of agricultural land, historic canals and railway infrastructure. Towards the northern boundary of Chester, there are a few historic wharves and a number of original 18th-19th century bridges. At Croughton a further Grade II listed bridge – Croughton bridge is dated around 1795 is a single span semi-elliptical arch with battered abutments. It is therefore considered that the setting makes a **major** contribution to the value of the CA.



Insert 8.4 - Looking west at the Grade II listed railway viaduct over the Shropshire Union Canal (NHLE 1278977)



Insert 8.5 - Looking north along the Chester Canal Conservation Area



Insert 8.6 - Looking north-west across the Chester Canal Conservation Area to the DCO Proposed Development

Wat's Dyke (PRN 27061–27075)

- 8.2.7. Wat's Dyke (dated to the early 7th century AD) is an early medieval linear earthwork running through the northern Welsh Marches to the River Dee estuary. It appears in traces in the form of raised hedgerow or a cropmark (running to the south-west of the proposed Cornist Lane BVS) but originally was a construction considered more sophisticated than Offa's Dyke. It consists of the usual bank and ditch of an ancient dyke, that faces Wales, indicating the purpose of the dyke being the protection of the English lands to the east. The asset runs parallel with nearby Offa's Dyke, and they are thought to date to a similar period, which could enhance its group value. The asset is located within overgrown brush along the north bank of the Afon Nant-y-Fflint at the edge of an open pastoral fields (**Insert 8.7**), and is crossed by the north-west corner of the Newbuild Infrastructure Boundary at the Cornist Lane BVS site.
- 8.2.8. The area in which the asset is situated is a rural agricultural landscape, of scattered farmsteads and open fields with hedgerow field boundaries. As a non-designated asset of national importance, it is considered of **high** value derived from its historic and archaeological interest for the potential for information about the Anglo-Saxon activity along this historically contested border. The original purpose of the Dyke and its function within the landscape has been obscured through time. The setting of the asset makes a **moderate** contribution to its heritage value.



Insert 8.7 - Looking north-west at the Afon Nant-y-Fflint from the centre of Cornist Lane BVS Newbuild Infrastructure Boundary

ABOVE GROUND HERITAGE ASSETS OUTSIDE THE NEWBUILD INFRASTRUCTURE BOUNDARY

Moated site, fishpond and connecting channel, Elton (NHLE 1012122)

- 8.2.9. The Historic England List (Ref. 8.21) entry (NHLE 1012122) states that:
- “The monument at Elton comprises a moated site possessing a causeway and outer banks with an adjoining fishpond and connecting channel. The moated site at Elton consists of a slightly raised island c.30 m square from which some stone foundations have in the past been removed. The island is surrounded on all sides by a moat c.12 m wide x 1.7 m max. depth. A causeway gives access to the island across the N arm of the moat and wide outer banks exist on the N and S sides of the moat. A short distance to the N is a waterlogged/silted fishpond linked to the NW corner of the moat by a channel now utilised by a modern field drain. The hedged field boundary at the W of the monument is excluded from the scheduling, however, the ground beneath it is included. The site contains a diversity of component parts and survives in a relatively undamaged condition and retains considerable archaeological potential for the recovery of evidence of the building that originally occupied the island.”*
- 8.2.10. The asset is located to the south of Elton Green, 60 m south of the A5117 within a pasturage bordered by short hedges, and 35 m north-east of the Newbuild Infrastructure Boundary. The noise from the A5117 to the north and the M56 to the south is muffled but permanent. Moated sites were prominent between about c. 1250 and 1350 with the largest concentration in the central and eastern parts of England. However, moated sites were built throughout the period and are widely scattered throughout England (NHLE 1012122).
- 8.2.11. Moated sites are thought to represent high status of the occupier, perhaps the ‘lord of the manor’. Although in general the moats were likely constructed for protection, the moat in this case is more likely to have been implemented to provide a solid drained surface as the monument is located within low lying ground that was not fully drained until the late post-medieval period. They form a significant class of medieval monument and are important for the understanding of the distribution of wealth and status in the countryside (NHLE 1012122).

8.2.12. The asset is of **high** value, derived from its historical and archaeological interest. It is an important example of a later medieval earthwork. The asset is set in open arable land, with minimal development in the near vicinity. The flat land on which the monument is located would have provided far reaching views of the countryside in most directions. However, these are now broken up by hedgerows. The views from the moated site would have been an important aspect of its original use as a defensive structure. The remaining earthwork no longer functions in its original capacity, but its rural aspect still contributes to its setting. It is therefore considered that the setting makes a **moderate** contribution to the value of the asset.

Picton Conservation Area (175)

8.2.13. The Picton Conservation Area (CA) did not have an appraisal at the time of writing. The CA comprises the area of the historic rural village of Picton and its immediate environs which is located between the River Gowy floodplain and the Shropshire Union Canal along Picton Lane, a rural single track country lane. It is characterised by the presence of the Grade II listed Picton Hall and Picton Hall Farmhouse (NHLE 1229985) located at the southern end of the conservation area. Picton village comprises residential and agricultural buildings surrounded by open pastoral and agricultural land. The conservation area is an asset of **medium** value. The Newbuild Infrastructure Boundary is located 10 m north of the CA at its nearest point.

8.2.14. The rural character of the setting of the conservation area has not changed and the town can be understood in its original context (**Insert 8.8**). It is considered that the setting makes a **major** contribution to the value of the CA.



Insert 8.8 - Looking north-west from the Newbuild Infrastructure Boundary adjacent to the Picton Conservation Area

Grade II listed The Willows (NHLE 1229983), Grade II listed Barn 25 Metres South East of Willow Farmhouse (NHLE 1229984), and Grade II listed Sundial within the garden of The Willows (NHLE 1278832)

- 8.2.15. The Grade II listed building The Willows (NHLE 1229983) was formerly the dower house for Mollington Hall and dates to 1684 with later 18th and mid-19th century additions. The Grade II listed barn (NHLE 1229984) was formerly a threshing barn, now a shippon (cattle barn) with a hayloft above. It dates to the early 18th century, with late 18th century and 19th century alterations. They are both located in Mollington on Well Lane within a quiet residential community.
- 8.2.16. They are assets of **high** value, which they gain from their historical and architectural values. The Willows is important as an example of a former dower house, which was later used as a farmhouse. It shows the changing importance of the area from a manor to an agricultural landscape, providing a good understanding of the use and a picture of the landscape during this time. The associated barn (NHLE1229984) also shows the changing character of the farm with the emphasis of the farm changing from grain to animal husbandry.

- 8.2.17. The immediate setting of the farmhouse comprises residential buildings with detached housing to the north, east, and south. The north-west of the asset consists of flat open fields delineated by short hedgerows providing a view of the wider landscape. The town of Mollington, in which The Willows is located, developed in the later post-medieval and early modern periods and has changed from a rural agrarian setting to a rural townscape. The setting of the asset makes a **moderate** contribution to its heritage value.
- 8.2.18. The farmhouse is located 840 m to the north-east of the proposed Mollington BVS located north of Parkgate Road and about 175 m south-west of the Newbuild Infrastructure Boundary at its nearest point. A row of trees further to the east helps in creating a degree of visual separation between the farmhouse and the proposed pipeline route (**Insert 8.9**).



Insert 8.9 - Looking south-west toward the DCO Proposed Development from The Willows

Footpath Guidepost 40 Metres North West of No 123 (NHLE 1130583)

8.2.19. The National Heritage List for England (**Ref. 8.21**) entry (NHLE 1130583) describes the asset as:

“Footpath guidepost: late C19 by W H Smith and Co., Whitchurch. Tapering octagonal cast-iron shaft, carries maker's name. Moulded cap with ball finial has single finger plate with nicked corners reading PUBLIC FOOTPATH TO MOLLINGTON PLEASE KEEP TO PATH”

8.2.20. The asset is of **medium** value deriving from its historical value. The guidepost could not be located during the walkover survey or setting assessment or on Google maps due to the overgrowth in the recorded location and it is unclear if it still remains *in situ* (**Insert 8.10**). If still in place, the asset lies just north of Hermitage Road, 30 m north of the Newbuild Infrastructure Boundary, overlooking nearby late post-medieval and early modern residential and agricultural buildings set within a rural agrarian landscape to the east of Mollington. The setting of the asset makes a **low** contribution to its heritage value.



Insert 8.10 - Looking north at the recorded location of the Grade II listed guidepost

Plas Moor (Cadw Ref. 15113) and L-Plan range of Farm Buildings (Cadw Ref. 15114)

- 8.2.21. The Grade II listed late 18th century farmhouse Plas Moor (Cadw Ref. 15113) is located on the north of the Moor Lane set in its own lawned gardens with the Grade II listed L-Plan range of Farm Buildings (Cadw Ref. 15114). They are located 250 m south-west of the Newbuild Infrastructure Boundary with a direct line of sight.
- 8.2.22. The assets are of **high** value gaining value from their architectural and historical value as good examples of 18th century farm buildings. They are currently in good condition. They are bound by fields on all sides, and the relatively flat landscape allows for far reaching views from all sides. The assets still stand within their original farmland and are recognisable in their original capacity as farm buildings as they have undergone little exterior alteration. The setting of these assets makes a **major** contribution to their heritage value.

Aston Hill BVS (Cadw ref. 23) and Aedocular Gateway at Aston Hill BVS (Cadw ref. 15103)

- 8.2.23. The Grade II* listed Aston Hill BVS (Cadw ref. 23) was originally constructed in 1215 while a later part of the building dates to 1616. It was home to the Whitley family since the 14th century who were also associated with the Whitley chapel in Hawarden Church. The Aedocular Gateway to Aston Hill BVS (Cadw ref. 15103) is a Grade II listed structure dated to the early 17th century.
- 8.2.24. Aston Hill BVS is of **high** value derived from its architectural and historical value, as a house of regional value, with elements from as early as the 14th century, as well as important internal fittings. The Grade II listed Aedocular Gateway is also of **high** value through its architectural value as an interesting and early example of its kind and due to its association with Aston Hill BVS.
- 8.2.25. Both assets are currently in good condition and in use as an elderly residential facility. They are situated immediately north of Lower Aston Hill BVS Road, a quiet single lane, within walled grounds bounded by arable fields on north and east and a quiet residential community to the west and open agricultural fields and Lower Aston Hill BVS Road to the south (**Insert 8.11**). The field to the north is separated from the assets by a line of trees. The assets are located 225 m west of the proposed Aston Hill BVS and 90 m north of the Newbuild Infrastructure Boundary at its nearest point. The building can still be understood within its original rural landscape and the setting of the asset makes a **major** contribution to its heritage value.



Insert 8.11 - Looking west from the Newbuild Infrastructure Boundary at the Grade II* listed Aston Hill BVS

Church of the Holy Spirit (20115)

- 8.2.26. The Grade II listed Church of the Holy Spirit (20115) is located on the north side of Church Lane within Ewloe Green. The Neo-Byzantine style church (**Insert 8.12**) was constructed in 1937–8 to serve the growing communities of Ewloe and Aston. It is listed as a fine example of a 20th century church by H S Goodhart-Rendel, nephew to Lady Gladstone, in memory of Henry Neville, Baron Gladstone of Hawarden.



Insert 8.12 - Looking north at the Church of the Holy Spirit and grounds

- 8.2.27. The asset, of **medium** value, is currently in good condition in well-maintained grounds. It is set back within the small residential community centred on Church Lane and relatively secluded within grounds enclosed by vegetation. The grounds are quiet with ambient noise muffled by the surrounding vegetation. The asset is located 80 m north of the Newbuild Infrastructure Boundary at Church Lane. It is considered therefore that the setting makes a **moderate contribution** to the value of the asset.

Castle Hill Farm Complex (Cadw Ref. 15105 – 15110)

- 8.2.28. The Grade II listed early 19th century rural industrial building Castle Hill Farm complex consists of the Main House (Cadw Ref. 15105), low attached extensions (Cadw Ref. 15106), granary (Cadw Ref. 15107), former brewery (Cadw Ref. 15108), adjacent malting tower (Cadw Ref. 15109) and the former stable block (Cadw Ref. 15110). They are arranged loosely around a courtyard. They are set back from the Holywell Road and are accessible only by a private farm trackway running north-south off Holywell Road (B5125) to the east of the Ewloe Castle scheduled monument (FL002), which is also Grade I listed (13). The Castle Hill Farm complex continued as a working brewery until 1950.

8.2.29. The assets are of high value as they are large and impressive examples of early industrial buildings, retaining their external character and holding group value with the associated listed structures within the former Fox's Brewery complex. As such, they are of historic and architectural interest. The assets are located about 150 m north of the Newbuild Infrastructure Boundary.

8.2.30. The complex is currently in good condition in well-maintained grounds with woodland on the west and arable fields on the north, east, and south. Holywell Road is a popular thoroughfare within the Ewloe area and is reasonably busy. The listed structures and associated fields were not accessible during the assessment, but it is reasonable to assume that some noise from Holywell Road is audible within the listed assets. The buildings can still be understood within their original rural landscape. The setting of the assets makes a **major** contribution to their heritage value.

Former Maltings at Swndwr Farm (Cadw ref. 575) and associated farm buildings.

8.2.31. The Cadw description (**Ref. 8.43**) states:

“The Grade II listed former Maltings at Swndwr Farm (Cadw Ref. 575) is a rural industrial building of substantial size and early date, probably later 18th Century. Enlarged and raised by one storey in 1824 (date on tail of kneeler towards farmhouse). It was known to have supplied Foxes Brewery at Ewloe. Owned by the Soughton estate in the late 19th century and leased out. It was out of use by 1987 and subsequently converted to apartments.”

8.2.32. The asset is reached by a farm road running north-east through the Swndwr Farmyard off the B5126 to the east of Northop village. It is surrounded by associated non-designated farm buildings (180373, 180370, 178111, 180372, 180371, 180374). The asset is of **medium** value and is a large and impressive example of early industrial buildings, retaining its external character, notwithstanding its conversion to accommodation. It is an important asset associated with the Northop CA and is located about 275 m west of the Newbuild Infrastructure Boundary.

8.2.33. The building is currently in good condition in well-maintained grounds along the A55 with arable fields to the west. Its setting is within a group of associated farm buildings and open rural agricultural landscape and the asset can still be understood as a rural industrial building despite its conversion. It is considered therefore that the setting makes a **major** contribution to the value of the asset.

Highfield Hall (322)

8.2.34. The Grade II listed early 19th century building Highfield Hall (Cadw ref. 322) was constructed in Regency style. It is located about 160 m to the north of the proposed Northop Hall AGI and 195 m east of the Newbuild Infrastructure Boundary as it crosses the B5125. The building replaced an earlier house to the

north-east which was incorporated into the service ranges. The Hall is visible on early historic maps of the area including the Northop tithe map of 1839 (not reproduced; **Ref. 8.84**) and was sold by the Soughton estate in 1917. At the time of writing, it functions as a hotel.

- 8.2.35. The asset, of **medium** value, is a fine example of Regency country houses, retaining good original character with well-detailed exterior and interior. The building is currently in good condition set in well-maintained grounds along the B5125 and bound by arable fields on all sides. There is a line of trees surrounding the site with heavy plantation on the west and south-west of the asset. Due to its location, within arable fields, the building can still be understood within its original rural landscape. It is considered therefore that the setting makes a **major** contribution to the value of the asset.

Hafod Wood Moated Site (FL179)

- 8.2.36. The Cadw description (**Ref. 8.43**) states:

“The monument comprises the remains of a well-preserved medieval moated homestead. It comprises a rectangular moated site, c 23 m square within a moat c 8m wide and counterscarp bank c 2m wide. The site is in excellent condition; the moat platform is fairly level with no signs of disturbance. The moat is waterlogged in places and therefore has good potential for organic remains. There is no clear entrance. A circular feature in the south-west corner may be an earlier pond or quarry. “

- 8.2.37. Hafod Wood Moated Site, a scheduled monument, was not accessible at the time of the walkover survey and thus the immediate setting of the asset is not fully known. Modern mapping and a review of online satellite imagery suggests that the asset is located within a small patch of woodland to the south of Nant-y-Fflint but the visibility from the asset is unclear. The asset is set in a rural landscape with dominated by agricultural and pastoral fields to the north-west and south-east of the asset and woodland to the north-east. As a result, views were considered from the direction of the proposed Cornist Lane BVS 500 m to the south-west (**Insert 8.13**). Views from the moated site would have been an important aspect of its original use as a defensive structure.

- 8.2.38. As a scheduled monuments, the asset is considered of **high** value derived from its historical and archaeological interest. The monument is considered to be of national importance for its potential to add to the knowledge of later medieval settlement within a contested and volatile border region. There is a patch of woodland to the north-east of the asset. Due to its location, within arable fields and woodland, the scheduled monument can still be understood within its original rural landscape. It is considered therefore that the setting makes a **major** contribution to the value of the asset.



Insert 8.13 - Looking towards Hafod Wood Moated Site (FL179) from Cornist Lane BVS, facing west

Bryn y Cosyn Round Barrows (FL096)

8.2.39. The Cadw description (**Ref. 8.43**) states:

“The monument comprises the remains of three earthen built round barrows, which probably date to the Bronze Age (c. 2300–800 BC). The barrows are circular in shape on plan and have a rounded profile. The southernmost barrow measures 60ft in diameter and 4ft high. The two to the north measure 18.2m in diameter and 0.6m high and have been reduced by ploughing.”

8.2.40. As a scheduled monument the asset is considered of **high** value derived from its archaeological and historical interest. The barrows are of national importance for the potential to enhance our knowledge of burial practices within a significant ritual landscape. There is no record that the barrows have been previously excavated so it is possible that the contents, potentially both ritual and burial deposits, are intact. These barrows are part of a wider landscape that holds numerous identified barrows and add to the value of the ritual landscape as a result.

8.2.41. The barrows have been reduced in height and are now only notable as minor variations within ground level which makes them difficult to appreciate. They are located c. 500 m to the south-east of the proposed Pentre Halkyn BVS on the side of a hill immediately west of Berthen Road within pasturage. The views are open to the north and west (**Insert 8.14**). The setting of barrows has changed from their original landscape; however, they are still located within a predominately rural landscape. The setting of the asset makes a **moderate** contribution to its heritage value.



Insert 8.14 - Looking towards Pentre Halkyn Block Valve Station from Bryn y Cosyn Round Barrows (FL096), facing north-east

Round Barrow 225m south-east of Plas Newydd (FL076)

8.2.42. The Cadw description (**Ref. 8.43**) states:

“The monument comprises the remains of an earthen built round barrow, which probably date to the Bronze Age (c. 2300–800 BC). The barrow has a diameter of 36.6m and stands to a height of 1.8m. The Round Barrow is in a rural elevated landscape within a known prehistoric landscape dominated by funerary monuments dating to the Bronze Age.”

8.2.43. The asset is located 300 m to the south-east of the proposed Babel BVS. As a scheduled monument the asset is considered of **high** value derived from its archaeological interest. The barrows are of national importance for the potential to enhance our knowledge of burial practices within a significant ritual landscape. There is no record that the barrows have been previously excavated so it is possible that the contents, potentially both ritual and burial deposits, are intact. These barrows are part of a wider landscape that holds numerous identified barrows and add to the value of the ritual landscape as a result.

8.2.44. The barrow is located at the summit of a hill overlooking the proposed Babel BVS within privately owned fields and was not accessible during the site walkover. The CPAT and Archwilio descriptions of the barrow suggest that it has been damaged by ploughing and is likely reduced in height as a result. The setting of barrow has changed from its original open landscape; however, it is still located within a predominately rural landscape. The setting of the asset makes a **moderate** contribution to its heritage value.

Offa's Dyke: Section N & S of the Circle on Holywell Racecourse, and Circle and Round Barrow (FL006)

8.2.45. The Cadw description (**Ref. 8.43**) states:

“The monument comprises the remains of a multi-period complex of earthworks, situated within pasture fields to the south and west of Lower Stables. The complex consists of two lengths of dyke (formerly identified as Offa's Dyke, but more recently identified as the Whitford Dyke), abutting an earlier earthwork consisting of a round barrow c.24m in diameter and 1.1m high, set eccentrically within an oval, hengiform enclosure, c.108m north-east to south-west, by 95m. The oval enclosure is defined by a bank with an external ditch. The barrow, dating to the Bronze Age (c.2300 BC - 800 BC), was excavated in 1925. The area today in which the asset is situated is a rural agricultural landscape, of scattered farm stead, open fields with hedgerow field boundaries. The Round Barrow is within a known prehistoric landscape dominated by funerary monuments dating to the Bronze Age.”

8.2.46. The asset is located 700 m to the north-east of the proposed Babel BVS. As a scheduled monument the asset is considered of **high** value derived from archaeological and historic interest. This is an example of a multi-period site in

which an early medieval earthwork abuts a Bronze Age round barrow. The early medieval earthwork has been identified as part of the Whitford Dyke whose date of construction is unknown. Evidence relating to its construction and structure are likely to survive. The barrow is of national importance for the potential to enhance knowledge of burial practices within a significant ritual landscape. There is no record that the barrow has been previously excavated so it is possible that the contents, potentially both ritual and burial deposits, are intact. The barrow is part of a wider landscape that holds numerous identified barrows and add to the value of the ritual landscape as a result.

- 8.2.47. The earthworks are located adjacent to a farm and could not be visited during the walkover. Modern aerial views on Google Earth Pro (2022) suggest that the monument has been heavily impacted by the construction of auxiliary farm buildings and agricultural activity. The setting of the barrow has changed substantially from its original open landscape; however, it is still located within a predominately rural landscape which overall has been only partially affected by the introduction of roads, agricultural infrastructure and modern buildings. The setting of the asset makes a **negligible** contribution to its heritage value.

Llyn Du Round Barrow (FL189)

- 8.2.48. The Cadw description (**Ref. 8.43**) states:

“The monument comprises the remains of an earthen built round barrow, which probably dates to the Bronze Age (c. 2300 - 800 BC) and is located within the corner of a field, covered with grass. The barrow is circular with a rounded profile and measures 26m in diameter and stands to a height of 3m. There is no apparent ditch.”

- 8.2.49. The barrow is located within 15 m west of Babell Road, 500 m to the north-east of the proposed Babell BVS. The barrow has been heavily impacted by agricultural activity and has been reduced by minor variations within the ground surface which makes it difficult to appreciate (**Insert 8.15**). The views from the barrow are largely unobstructed which would have made it quite prominent before it was reduced through ploughing.

- 8.2.50. As a scheduled monument the asset is considered of **high** value derived from its archaeological and historic interest. The barrow is of national importance for the potential to enhance our knowledge of burial practices within a significant ritual landscape. There is no record that the barrow has been previously excavated so it is possible that the contents, potentially both ritual and burial deposits, are intact. The barrow is part of a wider landscape that holds numerous identified barrows and add to the value of the ritual landscape as a result. The setting of the asset makes a **moderate** contribution to its heritage value.



Insert 8.15 - Looking south-west toward Babell BVS over Llyn Du Round Barrow (FL189)

Enclosure, Field System & Hollow-ways North of Pant (FL163)

- 8.2.51. The Cadw description (**Ref. 8.43**) states:
- “The monument consists of the remains of a field system, dating to the prehistoric or medieval period. The setting of the monument is an open elevated agricultural landscape. With scattered farmsteads and fields with hedgerow boundaries. Although the Scheduled Monument is not associated with the modern farming landscape in now stands, it still resides in a landscape of a similar purpose to which this asset once belonged.”*
- 8.2.52. The Scheduled Monument comprises a large open pasture on the eastern side of a steep hill 250 m to the west of the Babell BVS (**Insert 8.16**). The hill provides extensive views in all directions and is relatively exposed.
- 8.2.53. As a scheduled monument the asset is considered of **high** value derived from its archaeological and historic interest. The dating of this monument has not been determined; however, it is considered that the monument could add to our knowledge of agriculture or settlement activity during the prehistoric and/or

medieval periods. The medieval period was quite volatile within the region and the details of settlement pattern are not well understood. Modern intrusions within the landscape including the electrical tower at the top of the hill adjacent to the scheduled monument and the power station immediately south-west intrude on the general pastoral nature of the setting and reduce its contribution to the value. The setting of the asset makes a **moderate** contribution to the value.



Insert 8.16 - View of the Enclosure, Field System & Hollow-ways North of Pant (FL163), facing north-west

Plas-newydd Grade II listed (PRN 24687)

- 8.2.54. The asset is a farm complex containing traditional 17th century farm buildings (**Ref. 8.117**), located c. 200 m to the east of the proposed Babel BVS.

8.2.55. The Cadw description (**Ref. 8.43**) states:

“Dated 1641 on the hall fireplace lintel, it was originally a two-unit house of hall and parlour, and with a massive gable-end hall stack. In the late 19th century the house was remodelled to suit contemporary taste by inserting larger sash windows, while the hall was narrowed to create an entrance hall. A cart house was also added in the second half of the 19th century, which has subsequently been partly adapted as an additional ground-floor room in the house.”

8.2.56. Plas-newydd was not able to be assessed as it is privately owned and access was not available. The rear of the property is not visible from the proposed Babell BVS as the view is shielded by a line of vegetation (**Insert 8.17**).

8.2.57. As a Grade II listed designated asset, it is considered of **medium** value derived from its architectural and historic interest. The building reportedly retains some of its original interior detail despite having undergone remodelling in the 19th century. The rural agricultural landscape within which it stands has changed little since the farm was built. The setting of the asset makes a **moderate** contribution to the heritage value.



Insert 8.17 - Looking east across the Babell BVS toward Plas-newydd (PRN 24687)

Whitford Dyke (PRN 106723 and 106724)

- 8.2.58. The asset comprises sections of a linear earthwork which has been traced for approximately 9 km. It runs from a presumed northern end to the east of Trelawnyd (SJ 0916 7973) to its southern terminal (SJ 1531 7466), 400 m north-east of the proposed Babell BVS where the HER records both these assets. Most of the upstanding sections were scheduled in the belief that they were part of Offa's Dyke; however, this has now been revised and the monument is instead seen as a completely separate boundary earthwork or short dyke named 'Whitford Dyke'. The date of construction is not currently known but is assumed to belong to the early medieval period (**Ref. 8.52**).
- 8.2.59. The area in which the asset is situated is a rural agricultural landscape of scattered farmsteads and open fields with hedgerow field boundaries. Although it is a non-designated asset, it is considered of **high** value as a result of its direct association with the scheduled section (FL006) and its archaeological and historic interest. The original purpose of the Dyke and its function within the landscape has been obscured through time. The setting of the asset makes a **moderate** contribution to its heritage value.

Offa's Dyke (28102–28105)

- 8.2.60. The asset forms sections of a linear earthwork originally identified as part of Offa's Dyke, a late 7th century earthwork which formed the acknowledged, if not enforced, border between the Anglo-Saxon kingdom of Mercia and the Welsh kingdoms during the early medieval period; however, nearby sections have been identified as part of Whitford Dyke calling into question the identification of these sections as part of Offa's Dyke. Whitford Dyke was once identified as a northern extension of Offa's Dyke but is instead seen as a completely separate boundary earthwork or short dyke (**Ref. 8.52**). These assets are recorded c. 350 m to the north-east of the proposed Babell BVS.
- 8.2.61. The area in which the asset is situated is now a rural agricultural landscape of scattered farmstead and open fields with hedgerow field boundaries. Although it is a non-designated asset, it is considered of **high** value as a result of its direct association with the scheduled section (FL006) and its archaeological and historic interest. The original purpose of the Dyke and its function within the landscape has been obscured through time. The setting of the asset makes a **moderate** contribution to its heritage value.

9. STATEMENT OF VALUE: HISTORIC LANDSCAPES AND HEDGEROWS

9.1. INTRODUCTION

9.1.1. This section discusses the heritage value of the Historic Landscape Character (HLC) and Historic Hedgerows within the Newbuild Infrastructure Boundary. The HLC would be permanently impacted by the construction works through the partial loss of the HLC area. The impact on these assets would be permanent.

9.2. HISTORIC LANDSCAPES

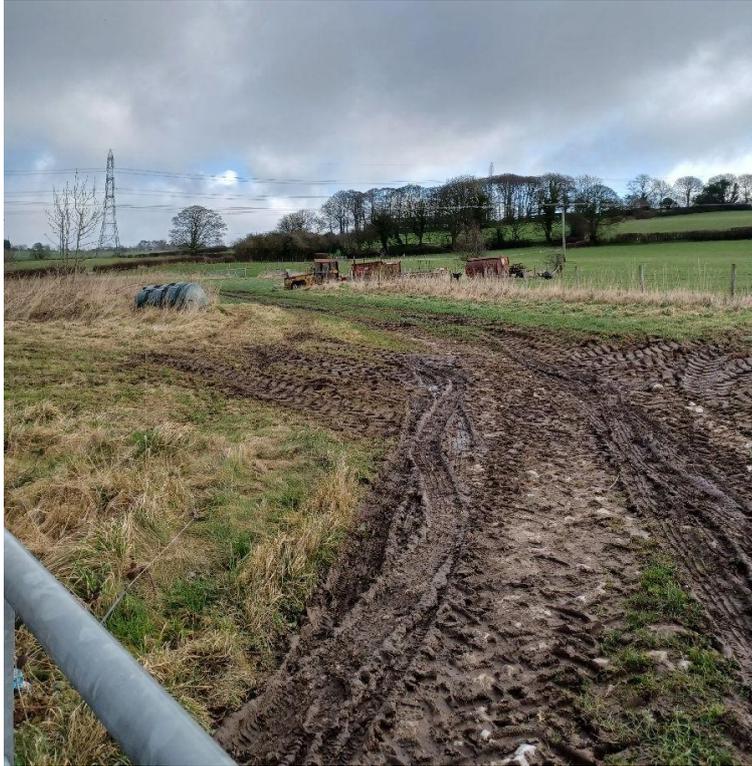
9.2.1. Information about Historic Landscapes in Cheshire is derived from the Cheshire Historic Landscape Character (HLC) as provided by the CHER. There are 64 character areas which fall into 18 separate character types which have been identified within the Newbuild Infrastructure Boundary. All character types are of considered to be of negligible heritage value. The character types are as follows:

- 20th century industry. (HCH4357, HCH3386, HCH4223, HCH1913, HCH4223);
- 20th century plantation/woodland. (HCH4171);
- Post-medieval plantation/woodland (HCH3368, HCH4198);
- 19th century field systems (Planned Enclosure). (HCH3355);
- 19th century field systems (Planned Enclosure of a marsh). (HCH1157, HCH3913, HCH4151, HCH3825, HCH2517, HCH3912);
- 20th century communications. (HCH3470, HCH3387, HCH1176);
- Post-medieval communications. (HCH1175, HCH1176, HCH2466, HCH2470);
- Post-medieval field systems. (HCH3468);
- 20th century field systems. (HCH1909, HCH4152, HCH4168, HCH4169, HCH3914);
- 20th century recreation. (HCH3915);
- Ancient field systems (Semi-regular). (HCH4153, HCH4147, HCH3467, HCH3392, HCH3356, HCH3357);
- Ancient field systems (Irregular). (HCH3460, HCH3457, HCH3422, HCH3422, HCH3421, HCH3417, HCH3367, HCH3936, HCH3467);
- Ancient field systems (regular). (HCH3339);
- Post-medieval settlement. (HCH3372);
- 20th century settlement (HCH3391);

- Late post-medieval agricultural improvement. (HCH4145, HCH3462, HCH3451, HCH3455, HCH4169, HCH1909);
- Natural water bodies. (HCH1935);
- Medieval townfields. (HCH3914, HCH4146, HCH3930, HCH3356, HCH3335, HCH3336, HCH3338);
- 20th century Enclosed Parkland. (HCH3377); and
- 20th century military (Active). (HCH3444)

9.2.2. A single Registered Historic Landscape (RHL) is noted in the Welsh section of the Newbuild Infrastructure Boundary, which partially coincides with the location of the Newbuild Infrastructure Boundary around the proposed Pentre Halkyn BVS: the Holywell Common and Halkyn Mountain Historic Landscape designated by Cadw. The Holywell Common and Halkyn Mountain Historic Landscape is comprised of land that had been used for lead mining within the Roman period and medieval periods before being extensively mined for lead and zinc during the post-medieval period. The richest veins were extensively exploited during the 18th and 19th centuries with mining declining during the early 20th century and ending in the 1960s. The characterisation (**Ref. 8.118**) states that the resulting ore fields are quite distinct in appearance as they are generally not productive agriculturally as a result of the historic mining and are used as rough pasturage. The mining activity has left a mark in the landscape as craters and tips have been left intact, rather than having been graded level, which is apparent both from the air and at ground level. The settlement pattern within the landscape was predicated on the mining industry and although the earlier patterns of scattered farms and small collections of houses encroaching on open common land can still be encountered, the majority of the nucleated settlements were founded during the height of the mining activity (**Ref. 8.118**).

9.2.3. The BVS would be located within an open pastoral field along the western edge of the RHL (**Insert 9.1**), although only a very small area of the RHL is impacted. The CPAT HER records the remains of several historic mineshafts just outside the Newbuild Infrastructure Boundary which would have had an impact on the land within it. These remains are an important feature within the RHL and are characteristic of the landscape. The rough open pasturage of the land within the boundary is also common within the landscape. The RHL is of **moderate** heritage value. The open pasturage and scattered farmsteads of the surrounding countryside remain relatively unchanged, and although the quiet rural nature of the surrounding landscape is likely to be the same as when the landscape was under heavy industrial use, the bustling industry that would have been present within the RHL is not apparent. The setting of the asset makes a **moderate** contribution to its heritage value, but only in relation to the presence of ores below ground.



Insert 9.1 - Looking north-east across the proposed Pentre Halkyn BVS site and the Holywell Common and Halkyn Mountain Historic Landscape

9.3. HISTORIC HEDGEROWS

- 9.3.1. Digital copies of the early 19th century tithe maps from Cheshire Archives (**Ref. 8.72 – Ref. 8.76** and **Ref. 8.119 – Ref. 8.124**) and the National Library of Wales (**Ref. 8.82 – Ref. 8.85**) were obtained and georeferenced in ArcGIS 10.8.1 and the boundaries where hedgerows are utilised were identified. The information was provided to the Ecology team to aid in their identification of potential historic hedgerows within the Newbuild Infrastructure Boundary.
- 9.3.2. Approximately 21 historic hedgerows were identified, throughout the Newbuild Infrastructure Boundary, that fit the criteria for historic hedgerows. A further 296 established hedgerows were identified on the tithe maps but are not thought to fit one of the four criteria in the statutes.

10. DCO PROPOSED DEVELOPMENT RELEVANT TO THE ASSESSMENT

10.1. OVERVIEW

10.1.1. Below is a summary of the elements of the construction of the DCO Proposed Development relevant to this HEDBA. A full description can be found in **Chapter 3 – Description of the DCO Proposed Development (Volume II)**.

10.2. NEWBUILD CARBON DIOXIDE PIPELINE

10.2.1. An open-cut trenching method will be used for a majority of the Newbuild Carbon Dioxide Pipeline route. Trenchless techniques of pipeline installation will be required at certain locations to avoid disruption to utilities, major highways, railways, watercourses, particular environmental sensitivities, such as ancient woodland.

10.3. OPEN CUT TRENCH

10.3.1. The minimum depth of the excavated trench is expected to be 2.5–6.0 metres below ground level (mbgl) in open cut sections.

10.3.2. In areas of very soft, wet ground, the open-cut trench construction method may be shored with sheet piling to protect the trench from collapse or waterlogging. The sheet piling would be removed prior to backfilling of the pipeline trench. Dewatering activities will be required in areas where the groundwater is high.

10.3.3. Any minor watercourses that are interrupted during the installation of the pipeline will be either temporarily diverted or serviced with pumps to bypass the section affected. The watercourse would be dammed at each end of the flume to form a dry area in between. A trench would be excavated under the other half of the flume and the pipe installed at least 1.0 m below the true cleaned bottom of the watercourse or drainage ditch. Concrete protection slabs would be installed and once the watercourse bed and banks are reinstated and all works complete, the flume would be removed allowing the watercourse to flow naturally.

GUIDED AUGER BORE (GAB)

10.3.4. Shallow launch and reception shafts would be dug on either side of an obstacle (for example, a railway line) which may require the installation of concrete rings or sheet piles. An auger would bore horizontally to install a sleeve pipe beneath the obstacle and connect each pit. The pits would be removed as far as practicable on completion of the works with the surface being returned to the original condition. The depth of the pit and hole would vary depending upon the location requirements.

UNGUIDED AUGER BORE (UAB)

- 10.3.5. UAB technique involves creating a base in a pit to an accurate line and level and setting up the rig inside that base. The pits would be removed as far as practicable on completion of the works with the surface being returned to the original condition. The depth of the pit and bore would vary depending upon the individual location's requirements.

HORIZONTAL DIRECTIONAL DRILLING (HDD)

- 10.3.6. Horizontal Directional Drilling technique utilises a track mounted HDD boring machine to pass a series of drills and reamers extending into the ground from the entrance pit until it reaches the exit pit. The pits would be removed as far as practicable on completion of the works with the surface being returned to the original condition. The depth and size of the pits and hole would vary depending upon the individual location's requirements. The depths have yet to be detailed but it is assumed that depth of the HDD would extend through any archaeological horizons so the impact would be limited to the excavation of the launch and reception pits and the shallow sections of the hole.

MICROTUNNELLING

- 10.3.7. An unmanned Micro-tunnel Boring Machine (MTBM) to install a reinforced concrete carrier pipe between two shafts or pits, before threading through pipeline sections. The pits would be removed as far as practicable on completion of the works with the surface being returned to the original condition. The depth and size of the pits would vary depending upon the individual location's requirements. If the pit is shallow the tunnel may truncate and remove any archaeological remains within its circumference.

CONSTRUCTION COMPOUNDS

Centralised Compounds

- 10.3.8. Where applicable, the topsoil would be stripped from the Centralised Compounds and stockpiled around the compound perimeter within the site fence. A stone road and apron would be laid on a geotextile membrane.
- 10.3.9. In general, the centralised compounds would not be connected to existing utilities, using self-contained mobile welfare facilities, generators, and mobile communications. Lighting would be of the lowest luminosity necessary for safe delivery of each task.

Localised Compounds

- 10.3.10. It is anticipated that Localised Compounds would be required to facilitate the construction works at AGI and BVS locations at difficult open-cut trench crossing locations that may, e.g., Alltami Brook and Northop Hall AGI road. Localised Compound sizes would vary but would be approximately 35 m x 35 m

in size. The compound perimeter would include HERAS style or equivalent fencing. The localised compound would also provide hardstanding areas, with apron and access areas comprising stone laid on a geotextile membrane.

- 10.3.11. During the construction of the AGI and BVS facilities the construction equipment will be laid down on shallow pad foundations.
- 10.3.12. Each compound will include storage areas, as well as construction facilities including offices, storage containers, and parking facilities in addition to the permanent works. In order to reduce the temporary footprint of all compounds, it is expected that any welfare facilities will be shared across different sites.
- 10.3.13. In general, the localised compounds would not be connected to existing utilities, using self-contained mobile welfare facilities, generators, and mobile communications. Lighting would be of the lowest luminosity necessary for safe delivery of each task.

10.4. AGIS AND BVS SITES

- 10.4.1. Construction of the AGI and BVS sites is anticipated to entail the following sequence of typical activities:
 - Pre-construction activities (for example, topsoil stripping, the formation of compound and material stockpile);
 - Construction of an access road if required, or upgrade of an existing track if possible;
 - Erection of secure fencing for construction works;
 - Connections to utility services;
 - Earthworks to establish foundation levels;
 - Formation of plant foundation bases and above ground structures;
 - Construction of pipework and equipment and associated infrastructure; and
 - Perimeter reinstatement landscape works and removal of temporary infrastructure.
- 10.4.2. The size of the permanent AGI compounds will vary depending upon location and individual constraints.
- 10.4.3. The support foundation for the upstanding sections of the AGI will require a thicker pad foundation. The foundation for the Ince AGI will require piled foundations.
- 10.4.4. The AGI kiosk would be 4.5m in height with an additional enclosure for fans proposed on the roof taking the height to 5.0m.
- 10.4.5. The block valves will be installed below ground level, with only limited above ground visible elements including a secure above ground chamber, access covers, and a containerised electrical and instrumentation kiosk. The depth of

the valve pit would depend on the location of the BVS, however the anticipated minimum depth of cover above the pipework ranges between 0.9 m to 1.8 mbgl. The kiosk would be 4.5 m in height with an additional enclosure for fans proposed on the roof taking the height to 5.0 m.

- 10.4.6. It is anticipated that each BVS will be located within a compound approximately 40 m by 45 m, with secure fencing up to 3 m in height, incorporating a double access gate for vehicles. The compound would include security lighting but would not be permanently lit. The security lighting would be 5.5 m in height.
- 10.4.7. Where required, the area of BVS and the temporary construction compounds will be graded or terraced to create a level surface.
- 10.4.8. The proposed drainage strategy includes the construction of a retention pond with a maximum excavation depth of 2.0 mbgl, a vortex separator installed at 1.5–2.0 mbgl, and an open cut drainage channel with an expected excavation depth not to exceed 2.0 mbgl. However, the final drainage design is subject to further review.

11. BURIED HERITAGE ASSETS: IMPACT ASSESSMENT

11.1. INTRODUCTION

- 11.1.1. This section provides an assessment of the potential impacts of the DCO Proposed Development during the Construction stage. During construction, anything that would cause ground disturbance, such as preliminary ground works, site strip/topsoil removal, demolition, remediation, landscaping, planting, excavation for services, drainage and lighting, could potentially have an impact on buried heritage assets. Above ground heritage assets may also be directly impacted through demolition and alteration of historic fabric, and indirectly temporarily impacted from vibration (e.g., piling), dust and noise.
- 11.1.2. The specific likely impacts for each part of the DCO Proposed Development are outlined below.
- 11.1.3. The impact assessment has been undertaken based on worst-case scenario. The impacts may be refined following detailed design, but it has been assumed that heritage assets within the DCO Proposed Development boundary will be impacted.

11.2. PREDICTED ENVIRONMENTAL EFFECTS

PRELIMINARY WORKS / ENABLING WORKS / TOPSOIL STRIP

- 11.2.1. Ground preparation works across the extent of the Newbuild Infrastructure Boundary are likely to form the main impact to potential buried heritage assets. It is assumed for the purposes of this assessment that topsoil would be removed in the following areas:
- Within the footprint of temporary haul roads, temporary Construction Compounds and stockpile areas;
 - For the pipeline easement corridor; and
 - Within the footprint of the proposed AGI and BVS sites.
- 11.2.2. The removal of topsoil would expose any archaeological remains that may be present immediately beneath the topsoil. These may then be affected by movement of vehicles and plant involved in demolition and construction activities, for example through rutting and compaction. In addition, it is possible that topsoil removal without archaeological supervision may result in overstripping, which would have an effect upon archaeological remains located beneath the topsoil, or understripping, where archaeological features are concealed beneath a thin layer of topsoil but are then exposed and unprotected from subsequent demolition and construction activities.

- 11.2.3. In some areas, the construction of the temporary construction compounds may require deeper earthworks or terracing to create a flat surface. These works will truncate or remove any archaeological remains within their footprint to the depth of their formation.

NEWBUILD CARBON DIOXIDE PIPELINE

Trench excavation

- 11.2.4. The method of pipeline trench excavation will be dependent on the presence of onsite constraints. The majority of the pipeline would be installed using an open cut trench formation, the depth is to be determined during detailed design. For the purpose of this assessment, the depth of disturbance is anticipated to be between 2.5–6.0 mbgl. The minimum depth from the top of the pipe to the ground surface would be in accordance with relevant standards but is typically 1.2m in open cut sections.

Proposed trenchless pipeline installation

- 11.2.5. The Newbuild Carbon Dioxide Pipeline would be constructed using trenchless crossing techniques required at certain locations to avoid disruption to utilities, major highways, railways, watercourses, particular environmental sensitivities, such as ancient woodland. Any remains within the footprint of the pits would be completely removed or truncated. It is possible the boring tunnel itself would lie beneath archaeological horizons and would not lead to an impact.

Dewatering

- 11.2.6. Dewatering activities will need to be undertaken specifically in the area around the Ince AGI set within agricultural land formerly comprised of the Ince Marshes, the fields between Elton and Thornton-le-Moors, and the River Gowy floodplain all located in the east of the DCO Proposed Development. The range of impact for the dewatering (**Figure 18.3 in Chapter 18 (Water Resources and Flood Risk) (Volume II)**) has been calculated by the Hydrology team and the results are detailed in **Chapter 18 (Water Resources and Flood Risk) (Volume II)**. Ground water level changes as a result of dewatering activities can desiccate fragile previously waterlogged remains, such as palaeoenvironmental remains or organic archaeological remains within peats, causing further decay and damage. All buried environments are dynamic and it is generally accepted that preservation will be more likely if archaeological deposits and features are maintained in conditions as close as possible to the environment that has enabled them to survive to date.

Other

- 11.2.7. Mitigation woodland planting is expected at three locations along the Newbuild Infrastructure Boundary on the north-west side of the M56 near Thornton-le-Moors in Cheshire, immediately north of the Shropshire Union Canal and west of Liverpool Road near Lea by Backford in Cheshire, and on the east bank of Alltami Brook on the east side of Northop Hall AGI in Flintshire. Tree/shrub planting will disturb or truncate any archaeological remains within their footprint.

AGIS (INCE, STANLOW, NORTHOP HALL AGI, AND FLINT) AND BVS SITES (ROCK BANK, MOLLINGTON, ASTON HILL, BABELL, PENTRE HALKYN, AND CORNIST LANE)

Foundations and pits

- 11.2.8. The impacts presented below consider a reasonable worst-case scenario for the excavations needed for the pits for the pig launchers/receivers (a funnel shaped 'Y' section of pipeline utilised for maintenance), block valve pits, vortex separator pits (part of the drainage infrastructure), foundation pads, lighting foundation pads, fencing foundations, and compounds.
- 11.2.9. The excavation works for the foundations and pits will truncate or remove any archaeological remains within their footprint to the depth of their formation.
- 11.2.10. Piled foundations are proposed for the Ince AGI infrastructure. Any archaeological remains within the footprint of each pile would be removed as the pile is driven downwards. The pile type is proposed to be vibro-compacted. Vibro-compacted piles may cause additional impact through vibration and deformation of fragile surrounding remains, in particular at the level of the water table.
- 11.2.11. The insertion of pile caps and connecting ground beams, along with the excavation of a pile guide trench, typically extend no more than 1.0–1.5 mbgl and would remove any archaeological remains within the footprint of these works to this depth.

Services and drainage

- 11.2.12. New service trenches are anticipated at all locations with an assumed depth of 1.5 mbgl. The drainage strategy (**Outline Surface Water Drainage Strategy Report (Document reference: D.6.5.13)**) at all the BVS and AGI locations will comprise the excavation of retention ponds, a vortex separator, and an open cut drainage channel. These works will truncate or remove any archaeological remains within their footprint to the depth of their formation.

Other

- 11.2.13. Soft and hard landscaping is expected at each AGI and BVS location and will be tailored to fit the individual location. Tree / shrub planting will disturb or truncate any archaeological remains within their footprint.
- 11.2.14. The impact of the removal of trees, shrubs, or hedgerows would depend on the type of removal technique used. Manual removal would disturb any archaeological remains adjacent to the roots. Chemical removal would be less disruptive to the adjacent remains but would take a significant amount of time.

11.3. KNOWN BURIED HERITAGE ASSETS WITHIN THE NEWBUILD INFRASTRUCTURE BOUNDARY

- 11.3.1. Wat's Dyke (27066) is located partially along the north-east bank of the Afon Nant-y-Fflint within the north-west corner of the Cornist Lane BVS Newbuild Infrastructure Boundary. No sign of this earthwork was identified during the walkover survey; however, it was heavily overgrown at the point of survey, so it is possible the asset was obscured. Any ground disturbance associated with the DCO Proposed Development would likely result in a moderate magnitude of impact on the asset, resulting in a ***moderate adverse (significant)*** effect on an asset of high value.
- 11.3.2. The line of King's Wood Lane/Saltersway/ Military Way (2030/1, MCH1278) crosses the Newbuild Infrastructure Boundary north-east of Hermitage Road between Saughall and Mollington in Cheshire. Remains of the road were not observed during the walkover survey. The asset is of medium value derived from its archaeological and historical interest. Any ground disturbance associated with the DCO Proposed Development would likely result in a minor magnitude of impact on the asset, resulting in a ***slight adverse (not significant)*** effect.
- 11.3.3. The line of the Roman road –r– Chester to Wirral (Margary 670) (2010/1/0, MCH6164) crosses the Newbuild Infrastructure Boundary south-west of Townfield Lane just south of Mollington in Cheshire. Remains of the road were not observed during the walkover survey. The asset is of medium value derived from its limited archaeological and historic interest at a regional level. Any ground disturbance associated with the DCO Proposed Development would likely result in a minor magnitude of impact on the asset, resulting in a ***slight adverse (not significant)*** effect.

- 11.3.4. ROF Dunham on the Hill (4217, MCH9985) extends into the Newbuild Infrastructure Boundary south of Elton Green in Cheshire. Remains of the asset were not observed during the walkover survey. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.5. Ridge and furrow earthworks in Large Standleys and Standleys Small (15191, MCH25127) extends into the Newbuild Infrastructure Boundary south of Elton Green in Cheshire. Remains of the asset were not observed during the walkover survey. The asset is of low value deriving from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.6. The site of the Royal Observer Corps Monitoring Post at Saughall (4135/0/2, MCH9818) is located south-east of Hermitage Road. This historic asset is no longer extant. However, below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.7. The site of the Sealand Embankment III (34237) is located between Sealand Road and Deeside Lane in Sealand, Flintshire. This historic asset is no longer extant; however, below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.8. The site of the Pentre Halkyn windmill (17017) is located in the north-east of the Cornist Lane BVS Newbuild Infrastructure Boundary. This historic asset is no longer extant; however, below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.

- 11.3.9. The site of the Ashfield Farm Brickworks (103787) is located west of Gladstone Way in Big Mancot, Flintshire, see **Figure 8.1.3 in Annex A**. This historic asset is no longer extant; however, below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.10. The site of the Brookside ridge and furrow (97837) is located west of Brookside in Northop Hall AGI, Flintshire. This historic asset was observed within the LiDAR data and during the geophysical survey and walkover survey (WSP3). The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.11. The line of the Chester to St Asaph Roman road (46802) crosses the Newbuild Infrastructure Boundary along the existing B1529 in Mancot Royal. Remains of the road are likely obscured by the later road system. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a minor magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.12. The site of the Coal Pit Hey (99047) is located north-east of Lower Aston Hill BVS Lane in Aston, Flintshire, see **Figure 8.1.3 in Annex A**. This historic asset is no longer extant, although below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.13. The site of the Ewloe Green Farm Colliery (103806) is located north-east of Green Lane in Ewloe Green, Flintshire. This historic asset was observed within the LiDAR data and during the geophysical survey (MS6) and walkover survey (WSP6). The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.

- 11.3.14. The site of the Ewloe railway (99043) is located south-east of Church Lane in Ewloe, Flintshire, see **Figure 8.1.3 in Annex A**. This historic asset is no longer extant; however, below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a minor magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.15. The site of the Ewloe, Old Aston Hill, RAF Hawarden wireless station, aerial mast IV (129644) is located south-east of Aston Hill Farm in Ewloe, Flintshire. This historic asset is no longer extant, although below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.16. The site of the Ewloe, Old Aston Hill, RAF Hawarden wireless station, building II (129640) is located south-east of Aston Hill Farm in Ewloe, Flintshire. This historic asset is no longer extant, although below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.17. The site of the Hen-dyddyn Farm sand pit (85032) is located north of Starkey Lane, north-west of Northop Hall AGI, Flintshire. This historic asset is no longer extant; however, below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.18. The site of the Holly House Farm Sand pits (99061) is located east of Church Lane in Ewloe, Flintshire, see **Figure 8.1.3 in Annex A**. This historic asset was observed during walkover survey (WSP7). The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.

- 11.3.19. The site of the Little Leadbrook Farm marl pit (85035) is located east of Allt-Goch Lane, north-west of Northop Hall AGI, Flintshire. This historic asset is no longer extant; however, below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.20. The site of the Little Leadbrook Farm marl pit (85036) is located east of Allt-Goch Lane, north-west of Northop Hall AGI, Flintshire. This historic asset is no longer extant, although below ground remains may still survive. The asset is of negligible or very low value deriving from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.21. The site of the Mancot Royal strip field system (99060) is located south-east of Chester Road in Mancot Royal, Flintshire. This historic asset was observed within the LiDAR data (113) and during the geophysical survey (MS2). The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.22. The site of the Sandycroft boundary stone (103807) is located south-east of Chester Road, Sandycroft, Flintshire. This historic asset is no longer extant; however, below ground remains may still survive. The asset is of low value derived from its limited archaeological and historic interest at a local level. Any ground disturbance associated with the DCO Proposed Development would likely result in a major magnitude of impact on the asset, resulting in a *slight adverse (not significant)* effect.
- 11.3.23. There are no known buried heritage assets within the extent of the Babell BVS or Pentre Halkyn BVS Newbuild Infrastructure Boundary.
- 11.3.24. The following assets are located within the Newbuild Infrastructure Boundary though are known to not remain at these locations. As such these are not considered further in this assessment:
- Hawarden, finger ring (120329);
 - Chester to Crewe Line (L & NWR) (2468/1/0, MCH1705);
 - Birkenhead and Chester Line (L & NWR/GWR) (2527/1/0, MCH19851); and
 - Sidings S of Mollington Station, Chester to Birkenhead Railway (2527/1/14, MCH1552).

11.4. UNKNOWN BURIED HERITAGE ASSETS WITHIN THE NEWBUILD INFRASTRUCTURE BOUNDARY

- 11.4.1. Due to the quantity of potential unknown below ground heritage assets across the route (and the varying associated impacts), a summary of the predicted 'significant' effects (by chronological period) is provided below. The nature and extent of potential archaeological remains will be clarified by proposed on site surveys (e.g., trial trench investigation).
- 11.4.2. In EIA terms, a moderate or greater effect is considered 'significant'.
- 11.4.3. It should be noted that these are not definitive effects, but rather an assessment of potential effects should archaeological remains of each period survive.

PALAEOENVIRONMENT

- 11.4.4. The magnitude of impact on any palaeoenvironmental deposits within the boundary of DCO Proposed Development would depend on the extent of disturbance but is not considered to be more than minor, resulting in a *slight adverse (not significant)* effect on the value of the asset depending upon the type and extent of the remains.

PREHISTORIC

- 11.4.5. If present, remains of round barrows would be of medium or high heritage value based on their archaeological and historical interest. Isolated remains would be of low value based on their archaeological and historic interest. The magnitude of impact on any prehistoric assets within the boundary of Proposed DCO Development is major and depending on the value of the asset (based on type and extent), this would result in either a *slight, moderate or large adverse (not significant to significant)* effect.

ROMAN

- 11.4.6. If present, remains of structures or roadside features would likely be of medium value based on their archaeological and historic interest. Isolated remains would be of low value based on their archaeological and historic interest. The magnitude of impact on any Roman assets within the boundary of Proposed DCO Development is major and depending on the value of the asset (based on type and extent), this would result in either a *slight or moderate (not significant to significant)* effect.

EARLY MEDIEVAL

- 11.4.7. If present, early medieval period below ground remains relating to activity on or near the dykes would be of low to medium value based on their archaeological and historic interest. Remains of early medieval agricultural activity and isolated remains would be of low value based on their archaeological and historic interest. The magnitude of impact on any early medieval assets within the

boundary of Proposed DCO Development is major and depending on the value of the asset (based on type and extent), this would result in either a *slight or moderate adverse (not significant to significant)* effect.

LATE MEDIEVAL

- 11.4.8. Further agriculture remains (i.e. ridge and furrow or agriculture ditches) would likely be of low value. Isolated remains and find spots would be of likely negligible or low value based on their archaeological and historic interest. Isolated remains and further agricultural remains would be of low value based on their archaeological and historic interest. The magnitude of impact on any later medieval assets within the boundary of Proposed DCO Development is major and depending on the value of the asset (based on type and extent), this would result in a *slight adverse (not significant)* effect.

POST-MEDIEVAL

- 11.4.9. Below ground remains of the post-medieval period would be of low value based on their archaeological and historic interest. The magnitude of impact on any post-medieval assets within the boundary of Proposed DCO Development is major and depending on the value of the asset (based on type and extent), this would result in a *slight adverse (not significant)* effect.

MODERN

- 11.4.10. In general, below ground remains of the modern period would be of low or negligible value based on their archaeological and historic interest; however, remains associated with the Second World War air crash sites could be of medium value based on their archaeological and historical interest, although the possibility of further discovery is very low. The magnitude of impact on any modern assets within the boundary of Proposed DCO Development is major and depending on the value of the asset (based on type and extent), this would result in a *slight adverse (not significant)* effect.

12. ABOVE GROUND HERITAGE ASSETS: ASSESSMENT OF IMPACTS

12.1. INTRODUCTION

- 12.1.1. The following section examines the potential impacts arising from a change in the setting during the construction and operation of the DCO Proposed Development.
- 12.1.2. The impact assessment has been undertaken based on worst-case scenario. The impacts may be refined following Detailed Design.

12.2. ABOVE GROUND HERITAGE ASSETS WITHIN THE NEWBUILD INFRASTRUCTURE BOUNDARY

CHESTER CANAL CONSERVATION AREA

- 12.2.1. The Newbuild Carbon Dioxide Pipeline will be constructed under the foundation of the Chester Canal via a trenchless crossing technique (see Section 7 of this report), requiring deep pits on either side of the canal immediately outside of the boundary of the CA. The proposed below ground pipeline will extend along the north-west side of the CA for approximately 2.4 km. The proposed Rock Bank BVS would be constructed within agricultural fields 270 m north-west of the CA and would be 5.0 m in height. The current proposed outline drainage strategy for the BVS may extend into the CA just above Pretty Bridge, in the form of an open cut channel connecting a retention pond and vortex separator with the feeder creek to the canal. The view from the CA to the proposed BVS is screened by thick mature vegetation.
- 12.2.2. Temporary construction works would result in an increase in noise, vibration, lighting, dust and pollution during construction. This is assessed as a temporary minor adverse magnitude of impact on the heritage asset, and, based on its value being medium, the resulting effect would be temporary *slight adverse (not significant)*.
- 12.2.3. During the operation stage, the area of the proposed pipeline would revert to its original agricultural use and would not have any further impact. The proposed drainage cut would be left open and seeded with appropriate vegetation. Based on the proposed height of the BVS, the potential for visual intrusion from the proposed development to the wider rural landscape to the north-east of the conservation area is low. The extent of existing screening by vegetation suggests that only the associated lighting is likely to be visible; therefore, the impact of the proposed development is assessed as permanent minor adverse on the heritage asset, resulting in a *slight adverse (not significant)* effect.

THORNTON-LE-MOORS CONSERVATION AREA (110)

- 12.2.4. During the construction stage, the north-east corner of the CA may be directly physically impacted by the construction of the proposed pipeline and temporary construction compound. The Stanlow AGI is proposed to be constructed to the north of the A5117, 225 m north-east of the north-east corner of the CA and the proposed height would be approximately 5.0 m. The view from the CA to the proposed AGI is screened by thick mature vegetation and the AGI is set within the industrial landscape of the Stanlow Manufacturing Complex and would likely blend into the refinery infrastructure. Construction works would be undertaken to the north-east, east, and south-east of the asset, resulting in likely increase in noise, vibration, lighting, dust and pollution. This is assessed as a temporary minor adverse magnitude of impact on the heritage asset, and based on its value being high, the resulting effect would be temporary *slight adverse (not significant)*.
- 12.2.5. During the operation stage, the area of the proposed pipeline would revert to its original agricultural use and there would be no further impact. Based on intervening screening along with the presence of the modern highway, the changes to setting are not considered to affect the value of the CA as the view is not considered to contribute to its value. The magnitude of impact is therefore assessed as negligible, resulting in a permanent *slight adverse (not significant)* effect.

WAT'S DYKE (27061–27075)

- 12.2.6. Wat's Dyke runs along the eastern bank of the Afon Nant-y-Fflint and it is considered likely that it may form the part of the bank of the watercourse. The line of Wat's Dyke crosses the north-west corner of Cornist Lane BVS Newbuild Infrastructure Boundary, which was extended to facilitate the outline drainage strategy for the BVS. A drainage channel is currently proposed to cut through the eastern bank of the Afon Nant-y-Fflint to discharge into the watercourse.
- 12.2.7. In addition to the excavation of a proposed open cut drainage trench across the asset (at 27066), Wat's Dyke will be subject to impacts to its setting from a rise in noise levels, increased construction related traffic and visual intrusion from plant and machinery. This is assessed as a temporary minor adverse magnitude of impact through changes in the setting of the asset, which would result in a temporary *slight adverse (not significant)* effect on the value of the asset.
- 12.2.8. The construction of the Cornist Lane BVS and the proposed drainage infrastructure would be visible from the assets permanently altering the setting of Wat's Dyke by adding industrial elements to the rural agrarian landscape. This would result in a permanent minor adverse impact through changes in the setting resulting in a *slight adverse (not significant)* effect on the value of the asset.

12.3. ABOVE GROUND HERITAGE ASSETS WITHIN THE VICINITY OF THE NEWBUILD INFRASTRUCTURE BOUNDARY

Moated Site, Fishpond and Connecting Channel, Elton (NHLE 1012122)

- 12.3.1. The Newbuild Carbon Dioxide Pipeline and the associated Construction Compound would lie 35 m to the south-west of the scheduled monument at its closest point. Temporary changes to setting would lead to due an increase in noise, vibration, lighting, dust and pollution. The visual intrusion will be partially mitigated by the existing short hedgerows between the scheduled monument and DCO Proposed Development (**Insert 12.1**). This would have a temporary minor adverse impact on the heritage asset, and due its value being high, the effect would be temporary *slight adverse (not significant)*.



Insert 12.1 - Looking south-west at the proposed construction compound area from the raised island of the scheduled monument

PICTON CONSERVATION AREA (175)

- 12.3.2. During the Construction stage, construction works would be undertaken immediately north-west of the CA to construct an access road to the proposed pipeline route located to the north-west and west of the asset and would result in an increase in noise, vibration, lighting, dust and pollution from the increase in heavy traffic. This is assessed as a temporary minor adverse magnitude of impact on the heritage asset, and based on its value being high, the resulting effect would be temporary *slight adverse (not significant)*.

12.3.3. There would be no impact during the operation stage as the area of the Newbuild Carbon Dioxide Pipeline would revert to its original agricultural use and as such there are no permanent visual changes.

GRADE II LISTED THE WILLOWS (NHLE 1229983), GRADE II LISTED BARN 25 METRES SOUTH EAST OF WILLOW FARMHOUSE (NHLE 1229984), AND GRADE II LISTED SUNDIAL WITHIN THE GARDEN OF THE WILLOWS (NHLE 1278832)

12.3.4. This asset is made up of a group of three Grade II listed buildings of high heritage value. The Willows farmhouse is 840 m to the north-east of the proposed Mollington BVS, located north of Parkgate Road and about 175 m to the south-west of the Newbuild Infrastructure Boundary at its nearest point. A row of trees further to the west creates a degree of visual separation between the farmhouse and the DCO Proposed Development. The assets will be separated from the proposed Mollington BVS by residential development to their south and south-west.

12.3.5. During the Construction stage, most activities will be shielded and the only elements of the DCO Proposed Development that are likely to be visible from the assets are tall machinery (such as cranes). This is anticipated to be no more than a temporary minor adverse magnitude of impact during the Construction stage, resulting in a temporary slight adverse (not significant) effect.

12.3.6. During the operational stage, there would be no further impact as the pipeline would be below ground and the proposed Mollington BVS would continue to be shielded by intervening development.

FOOTPATH GUIDEPOST 40 METRES NORTH WEST OF NO 123 (NHLE 1130583)

12.3.7. During the Construction stage, construction works would be undertaken around the guidepost resulting in an increase in noise, vibration, lighting, dust and pollution. This is anticipated to be no more than a temporary minor adverse magnitude of impact during the Construction stage, resulting in a temporary *slight adverse (not significant)* effect.

12.3.8. There would be no change during the operation stage, as such the resulting effect would be *neutral (not significant)*.

PLAS MOOR (CADW REF. 15113) AND L-PLAN RANGE OF FARM BUILDINGS (CADW REF. 15114)

12.3.9. During the Construction stage, construction works would be undertaken within the near vicinity of the assets, resulting in a substantial increase in noise, vibration, light pollution, dust and pollution. This is assessed as a temporary minor adverse magnitude of impact, resulting in a temporary *slight adverse (not significant)* effect.

12.3.10. There would be no change during the operation stage, as such the resulting effect would be *neutral (not significant)*.

ASTON HILL BVS (CADW REF. 23) AND AEDOCULAR GATEWAY AT ASTON HILL BVS (CADW REF. 15103)

12.3.11. The closest section of the Newbuild Infrastructure Boundary lies 85 m to the south-west of these assets in the form of an access road for the construction plant and materials. The Newbuild Infrastructure Boundary runs to the south of the assets before turning north-east to run within fields 140 m to the east of the assets. The proposed Aston Hill BVS would be located within open fields 240 m east-south-east of the assets, separated by a low hedgerow. The hedge along the field boundary runs north-east to south-west and will provide some shielding but the approximately 4.5 m high BVS is likely to be partially visible from the upper storeys of the buildings. The fields in which the proposed BVS and pipeline would be located comprise the two dominant views from Aston Hill BVS; therefore, the proposed construction will permanently change the view of the current rural open fields, altering the skyline from the asset and affecting the current character of the setting.

12.3.12. During the Construction stage, construction works would be undertaken around the listed buildings, resulting in an increase in noise, vibration, and lighting. This is anticipated to be no more than a temporary moderate adverse magnitude of impact during the Construction stage, resulting in a temporary ***moderate adverse (significant)*** effect.

12.3.13. The changes to the setting brought about by the proposed Aston Hill BVS structure during Operation would result in a minor adverse magnitude of impact, caused by a change in its setting. Although it has been assessed that the current setting of the listed building provides a major contribution to the value of the asset, and while the proposed Aston Hill BVS would change this, it will still be possible to understand the asset and its wider agricultural setting. The resulting effect would therefore be permanent ***slight adverse (not significant)***.

CHURCH OF THE HOLY SPIRIT (20115)

12.3.14. The proposed pipeline would be constructed along Church Lane 90 m to the south of the asset, but the construction technique is expected to be one of the trenchless options. During the Construction stage, there is the potential for increased noise, dust, vibration and lighting within close vicinity to the asset. Views may be temporarily changed if any tall machinery, such as cranes, are used. However, these temporary changes would not impact on the understanding of the church in its current landscape and is anticipated to be no more than a temporary negligible adverse impact during the Construction stage, resulting in a *slight adverse (not significant) effect*.

12.3.15. During the Operation stage, the land would revert to its original use and as such there would be no impact during the Operation stage (*neutral (not significant) impact*).

CASTLE HILL FARM COMPLEX (CADW REF. 15105 – 15110)

12.3.16. During the Construction stage, due to the proximity of the assets to the Newbuild Infrastructure Boundary there will be a temporary minor magnitude of impact, due to the temporary loss of associated farmland, which contributes to the value of the asset. However, this would not change the understanding of the buildings in their current setting or indeed links to the surrounding historic landscape. As such, construction works are assessed as a temporary minor adverse impact with a resulting temporary *slight adverse (not significant)* effect.

12.3.17. During the Operation stage, the landscape would revert to its original use and no above ground aspects are within line of sight of these assets; therefore, there would be no change resulting in a *neutral (not significant)* impact.

FORMER MALTINGS AT SWNDWR FARM (CADW REF. 575) AND ASSOCIATED FARM BUILDINGS

12.3.18. During the Construction stage, the asset's setting would be temporarily impacted by the temporary loss of the farmland it is associated with. However, this would not impact on the heritage value of the building in its current landscape and is anticipated to be no more than a temporary minor adverse magnitude of impact during the Construction stage, resulting in a temporary *slight adverse (not significant)* effect.

12.3.19. There would be no change during the Operation stage, as such the resulting effect would be *neutral (not significant)*.

HIGHFIELD HALL (322)

12.3.20. Highfield Hall, an asset of medium value is located 170 m north-west of the Newbuild Infrastructure Boundary. The south-east view from the grounds of the asset shows that the proposed Northop Hall AGI and construction works would be separated by the road (B5125) and existing vegetation (**Insert 12.2**), though based on the proximity to there is the potential for impact resulting from increased noise and lighting. The Northop Hall AGI is proposed to be constructed to the south of the B5125 200 m south-east of the asset. The view from the grounds at the south of Highfield Hall show that the AGI and construction works would be partially screened by the existing vegetation and a road (**Insert 12.2**) but the view from the upper storeys would likely be unimpeded. This may also impact on the understanding of the building in its current agrarian landscape. Construction works would have a temporary minor adverse magnitude of impact on the heritage asset, and due its value being moderate, the effect would be temporary *slight adverse (not significant)*.

12.3.21.

The changes to the setting brought about by the proposed Northop Hall AGI would slightly diminish the feeling of isolation the hall has in its current rural surroundings, and it would experience a partial loss of its surrounding agrarian setting. Based on the assessment that the current setting of the listed building provides a major contribution to the value of the asset, the proposed Northop Hall AGI would be permanent minor adverse impact to the asset, and due its medium value the effect would be permanent *slight adverse (not significant)*.



Insert 12.2 - Looking south towards the Newbuild Infrastructure Boundary from the car park immediately in front of the Grade II listed Highfield Hall

HAFOD WOOD MOATED SITE (FL179)

12.3.22.

As a scheduled monument, the asset is considered of high value derived from its historical and archaeological interests. The monument is considered to be of national importance for its potential to add to the knowledge of later medieval settlement within a contested and volatile border region. There will be no physical impact to the Hafod Wood Moated site. The asset was constructed on an elevated position which lies 445 m to the south-west of the proposed Cornist Lane BVS. The reason for its construction on higher ground could have for been strategic defence. The position of the proposed Cornist Lane BVS on the opposite side of the valley is likely to be visible in views from the asset. However, in all likelihood, the value of the monument is likely to be unaffected,

as the surrounding rural views will be unchanged. The magnitude of impact is therefore assessed a negligible, resulting in a *slight adverse (not significant)* effect.

BRYN Y COSYN ROUND BARROWS (FL096)

- 12.3.23. There will be no physical impact to the Bryn y Cosyn Round Barrows. The assets were constructed on elevated land. The proposed Pentre Halkyn BVS would be constructed 500 m to the south-east of the asset. The barrows overlook the proposed Pentre Halkyn BVS site which would alter their setting. This would result in a permanent minor adverse impact through changes in the setting of the asset, which would result in a permanent *slight adverse (not significant)* effect on the value of the asset.

ROUND BARROW 225M SOUTH-EAST OF PLAS NEWYDD (FL076)

- 12.3.24. There will be no physical impact to the round barrow. It is set within a prehistoric funerary landscape and, due to its elevated position, is likely to have intervisibility with associated assets in the broadly rural landscape. The proposed Babell BVS will be located approximately 500 m from the asset and will add an incongruous industrial feature to the setting. This would result in a permanent minor adverse impact through changes to the setting of the asset, which would result in a permanent *slight adverse (not significant)* effect on the value of the asset.
- 12.3.25. In addition, due to the asset's position close to the Newbuild Infrastructure Boundary, it may be subject to potential impacts from a rise in noise levels, increased construction related traffic, visual intrusion from plant and machinery. This is judged to be a temporary *minor adverse (not significant)* impact which would result in a temporary *slight adverse (not significant)* effect on the value of the asset through changes in the setting of the asset.

OFFA'S DYKE: SECTION N & S OF THE CIRCLE ON HOLYWELL RACECOURSE, AND CIRCLE AND ROUND BARROW (FL006)

- 12.3.26. There will be no physical impact to the asset which is the remains of a multi-period complex of earthworks. There would be no impact through changes in the setting of the asset due to the screening effect of a line of trees.

LLYN DU ROUND BARROW (FL189)

- 12.3.27. There will be no physical impact to the round barrow. It is set within a prehistoric funerary landscape and, due to its elevated position, is likely to have intervisibility with associated assets in the broadly rural landscape. The proposed Babell BVS will be located approximately 500 m from the asset and will add an incongruous industrial feature to the setting. This would result in a permanent minor magnitude of impact, which would result in a permanent *slight adverse (not significant)* effect on the value of the asset.

ENCLOSURE, FIELD SYSTEM & HOLLOW-WAYS NORTH OF PANT (FL163)

- 12.3.28. There will be no physical impact to these assets. Due to the asset's position close to the Newbuild Infrastructure Boundary, it may be subject to temporary impacts during construction from a rise in noise levels, increased construction related traffic and a visual intrusion from plant and machinery. This is judged to be no more than a temporary minor adverse impact through changes in the settings of the assets, which would result in a temporary *slight adverse (not significant)* effect on the value of the asset.
- 12.3.29. There would be no change during the operation stage, as such the resulting effect would be *neutral (not significant)*.

PLAS-NEWYDD GRADE II LISTED (PRN 24687)

- 12.3.30. There will be no physical impact to this asset; however, the farm is built on an elevated position overlooking the proposed Babell BVS, which is positioned in land once associated with the farm. The construction of Babell BVS would alter the rural landscape and bring previously unknown industrial developments in. This would result in a permanent minor adverse magnitude of change, which would result in a permanent *slight adverse (not significant)* effect on the value of the asset.
- 12.3.31. Due to the asset's position close to the Newbuild Infrastructure Boundary, it may be subject to potential impacts from a rise in noise levels, increased construction related traffic and a visual intrusion from plant and machinery. This is assessed as a temporary minor adverse magnitude of impact resulting in a temporary *slight adverse (not significant)* impact.

WHITFORD DYKE (PRN 106723 AND 106724)

- 12.3.32. There will be no physical impact to the asset. However, due to the asset's position close to the Newbuild Infrastructure Boundary, it may be subject to potential impacts through changes in setting from a rise in noise levels, increased construction related traffic and a visual intrusion from plant and machinery. This is assessed as a temporary minor adverse magnitude of, which would result in a temporary *slight adverse (not significant)* effect.
- 12.3.33. There would be no change during the operation stage, as such the resulting effect would be *neutral (not significant)*.

OFFA'S DYKE (28102–28105)

- 12.3.34. There will be no physical impact to the asset. However, due to the asset's position close to the Newbuild Infrastructure Boundary, it may be subject to potential impacts, through changes in setting, from a rise in noise levels, increased construction related traffic and a visual intrusion from plant and machinery. This is judged to be no more than a temporary minor adverse impact through changes in the setting of the asset, which would result in a temporary *slight adverse (not significant)* effect on the value of the asset.
- 12.3.35. There would be no change during the operation Stage, as such the resulting effect would be *neutral (not significant)*.

13. HISTORIC LANDSCAPES AND HEDGEROWS: IMPACT ASSESSMENT

13.1. HISTORIC LANDSCAPE CHARACTER AREAS

- 13.1.1. There are 64 Historic Landscape Character areas that are located within the Newbuild Infrastructure Boundary; however, they will not be subject to any changes as a result of the development or are of negligible value.
- 13.1.2. The Holywell Common and Halkyn Mountain Historic Landscape (HLW (C) 2) will be directly physically impacted by the construction of the proposed Pentre Halkyn BVS. The impact would be on much less than 1% of the asset and would result in a permanent minor adverse impact resulting in a permanent *slight adverse (not significant) effect* on the value of the asset. Potential temporary impacts from increased noise levels, increased construction related traffic, visual intrusion from plant and machinery and vibration are judged to be no more than a temporary minor adverse impact on the setting of the asset resulting in a temporary *slight adverse (not significant) effect*.

13.2. HISTORIC HEDGEROWS

- 13.2.1. The excavation of the open cut trench would necessitate the removal of the hedgerows within the trench footprint. Important historic hedgerows are of low value while the historic hedgerows that cannot be shown to fit the criteria would likely be of negligible value. The removal of the section of hedgerow within the footprint would result in a permanent moderate adverse impact, although other sections of the hedgerow would survive, resulting in a permanent *slight adverse (not significant) effect* on the value of the asset.

14. CONCLUSIONS AND RECOMMENDATIONS

14.1. ARCHAEOLOGY (BELOW GROUND HERITAGE ASSETS)

- 14.1.1. Given the scale of the site and the varying landscape which it crosses, archaeological survival is anticipated to be variable. Survival is anticipated to be highest within the greenfield parts of the Newbuild Infrastructure Boundary, particularly within section in England and land north-west of Northop Hall AGI. Historic land reclamation within the River Dee valley, following the canalisation of the River Dee in the 19th century, will have likely buried the former landscape and as such any palaeoenvironmental or prehistoric deposits present will have been preserved beneath thick layers of made ground.
- 14.1.2. Based on current evidence, there is moderate to high potential for buried archaeological remains to be present from the prehistoric to modern period. This will be clarified by site-based evaluation survey. This assessment has also identified a number of known non-designated heritage assets which may be affected physically by the DCO Proposed Development.
- 14.1.3. Investigation of historic aerial photographs and available LiDAR data has resulted in 196 features (either new or new parts of known features) of potential historical interest across the Newbuild Infrastructure Boundary (207 in total including the scheduled monument and other features in very close proximity to the Newbuild Infrastructure Boundary). The results of the assessment were consistent with the expectations, given the rural character of the Newbuild Infrastructure Boundary.
- 14.1.4. The geophysical survey (**Appendix 8-4 – Geophysical Survey Report, Volume III**) identified a potential pit alignment within the Newbuild Infrastructure Boundary to the west of Thornton Green Lane as well as approximately 100 features, many of which are related to agricultural or industrial activity within the boundary. Undetermined anomalies that could not be directly attributed to natural processes or anthropomorphic activity were found throughout the boundary and would need to be investigated further to determine their origin and value.
- 14.1.5. During construction of the Newbuild Carbon Dioxide Pipeline, any activities that require ground disturbance, such as preliminary ground works, topsoil removal for easement corridor, pipeline trench excavation, diversion of existing utilities, drainage, and establishment of laydown areas and temporary works compounds, could impact on known or possible below ground heritage assets. The construction of the compounds would be preceded by site-wide topsoil stripping and in some areas may require deeper earthworks (i.e. terracing or grading). These works will truncate or remove any archaeological remains within their footprint to the depth of their formation.

- 14.1.6. **Table 14.6** - Predicted Impacts on Known or Possible Heritage Assets Prior to Mitigation
- 14.1.7. contains a summary of the predicated impacts on the heritage assets expected to be impacted by the Newbuild Infrastructure Boundary.
- 14.2. BUILT HERITAGE (ABOVE GROUND HERITAGE ASSETS)**
- 14.2.1. The Newbuild Infrastructure Boundary extends into Chester Canal Conservation Area, Thornton-le-Moors Conservation Area and the Holywell Common and Halkyn Mountain Registered Historic Landscape (HLW (C) 2).
- 14.2.2. A large number of heritage assets were scoped out of the assessment, due to their distance from the DCO Proposed Development. There remains the potential for slight adverse effects through temporary and permanent changes to the setting of above ground heritage assets within and outside of the DCO Proposed Development.
- 14.2.3. There will be a direct physical impact to the Registered Historic Landscape of Hollywell Common and Halkyn Mountain (HLW c 2); however, the impact to the asset's value will be minor.
- 14.3. SUMMARY**
- 14.3.1. **Table 14.6** - Predicted Impacts on Known or Possible Heritage Assets Prior to Mitigation
- 14.3.2. below summarises the predicted impact of the DCO Proposed Development on known and unknown heritage assets and includes their value and the impact of the proposals prior to the implementation of mitigation measures.
- 14.3.3. No direct permanent significant effects are expected on any designated heritage assets.

Table 14.6 - Predicted Impacts on Known or Possible Heritage Assets Prior to Mitigation

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Previously unrecorded palaeoenvironmental remains within the former Ince Marshes, River Gowy floodplain, and the former River Dee floodplain (including the former Saltney Marshes)	Low or medium depending upon type and extent of remains	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The proposed dewatering activities would desiccate and potentially degrade any peats or palaeoenvironmental remains within the area of impact. The magnitude of impact on palaeoenvironmental remains within the DCO Proposed Development boundary during the Construction stage would be minor adverse resulting in <i>slight adverse (not significant)</i> effects.
Potential Bronze Age funerary remains from Northop Hall AGI west to Babell BVS	Medium to high depending on extent and survival	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The magnitude of impact on unknown remains within the DCO Proposed Development boundary during the Construction stage would be major adverse resulting in <i>moderate to large adverse (significant)</i> effects.
Potential Roman road remains	Medium	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The magnitude of impact on unknown remains within the DCO Proposed Development boundary during the Construction stage would be moderate adverse resulting in <i>moderate adverse (significant)</i> effects.
Potential Roman roadside remains	Medium	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The magnitude of impact on unknown remains within the DCO Proposed Development boundary during the Construction stage would be major adverse resulting in <i>moderate adverse (significant)</i> effects.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Potential later medieval agricultural remains	Low to medium depending on type and survival	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The magnitude of impact on unknown remains within the DCO Proposed Development boundary during the Construction stage would be major adverse resulting in permanent <i>slight adverse (not significant) to moderate adverse (significant)</i> effect.
Potential post medieval agricultural remains	Low	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The magnitude of impact on unknown remains within the DCO Proposed Development boundary during the Construction stage would be major adverse resulting in permanent <i>slight adverse (not significant)</i> effect.
Potential modern earthworks/building remains relating to RAF Hawarden	Medium	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The magnitude of impact on unknown remains within the DCO Proposed Development boundary during the Construction stage would be major adverse resulting in permanent <i>moderate adverse (significant)</i> effect.
Potential remains associated with the Second World War Airspeed Oxford II N4731 crash site (130274)	Medium	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The magnitude of impact on unknown remains within the DCO Proposed Development boundary during the Construction stage would be major adverse resulting in permanent <i>moderate adverse (significant)</i> effect.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Potential isolated remains (Prehistoric through post-medieval)	Low	The DCO Proposed Development would remove or truncate any unknown heritage assets within their footprint. The magnitude of impact on unknown remains within the DCO Proposed Development boundary during the Construction stage would be <i>major adverse</i> resulting in permanent <i>slight (not significant)</i> effect depending upon type and context of remain.
Chester Canal Conservation Area	Medium	<p>The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage. The excavation of the proposed drainage channel would result in a permanent direct minor adverse impact on the conservation area, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.</p> <p>The construction of Rock Bank BVS to the north-west of the asset would result in a permanent <i>minor adverse</i> impact through changes in the setting of the asset during the Operation stage, which would result in a permanent <i>slight adverse (not significant)</i> effect.</p>
Thornton-le-Moors Conservation Area	High	<p>The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.</p> <p>The presence of the proposed Stanlow AGI to the north-east of the asset would result in a permanent <i>negligible adverse</i> impact through changes in the setting of the asset during the Operation stage, which would result in a permanent <i>slight adverse (not significant)</i> effect.</p>
Wat's Dyke (PRN 27061–27084)	Moderate	One of the assets (27066) would be physically impacted by the excavation of a drainage channel through the asset. This would result in a <i>moderate adverse</i> magnitude of impact on the asset, resulting in a <i>moderate adverse (significant)</i> effect.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
		<p>Potential impacts from increased noise levels, increased construction related traffic, visual intrusion from plant and machinery and vibration are judged to be no more than a temporary <i>minor adverse</i> impact through changes in the setting of the asset resulting in a temporary <i>slight adverse (not significant)</i> effect.</p> <p>The DCO Proposed Development would result in a permanent <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a permanent <i>slight adverse (not significant)</i> effect.</p>
Registered Historic Landscape: Hollywell Common and Halkyn Mountain (HLW c 2)	Moderate	<p>There will be a direct physical impact on this asset. The impact would be on less than 1% of the asset and would result in a permanent <i>minor adverse</i> impact resulting in a permanent <i>slight adverse (not significant)</i> effect on the value of the asset.</p> <p>Potential impacts from increased noise levels, increased construction related traffic, visual intrusion from plant and machinery and vibration are judged to be no more than a temporary <i>minor adverse</i> impact through changes in the setting of the asset resulting in a temporary <i>slight adverse (not significant)</i> effect.</p>
Moated site, fishpond and connecting channel, Elton (NHLE 1012122)	High	<p>During the construction of the compound, any impact to archaeological remains associated with the Scheduled monument, would have a <i>moderate adverse</i> impact on the heritage asset, moreover due its value being high the effect would be <i>moderate adverse (significant)</i>.</p> <p>The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.</p>
Picton Conservation Area	Moderate	<p>The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.</p>

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
The Willows (NHLE 1229983) and Barn 25 Metres South East of Willow Farmhouse (NHLE 1229984)	High	The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.
Footpath Guidepost 40 Metres North West of No 123 (NHLE 1130583)	Moderate	The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.
Plas Moor (Cadw Ref. 15113) and L-Plan range of Farm Buildings (Cadw Ref. 15114)	High	The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.
Aston Hill BVS (Cadw ref. 23) and Aedocular Gateway at Aston Hill BVS (Cadw ref. 15103)	High	<p>The construction of Aston Hill BVS and newbuild pipeline to the east and south of the asset would result in a temporary <i>moderate adverse</i> impact through changes in the setting of the asset during the Construction stage, which would result in a temporary <i>moderate adverse (significant)</i> effect.</p> <p>The proposed Aston Hill BVS to the east of the assets would result in a permanent <i>minor adverse</i> impact through changes in the setting of the asset during the Operation stage, which would result in a permanent <i>slight adverse (not significant)</i> effect.</p>
Church of the Holy Spirit (20115)	Moderate	The DCO Proposed Development would result in a temporary <i>negligible adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Castle Hill Farm Complex (Cadw Ref. 15105 – 15110)	High	The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.
Former Maltings at Swndwr Farm (Cadw ref. 575) and associated farm buildings.	High	The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.
Highfield Hall	Moderate	<p>The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect during the Construction stage.</p> <p>The construction of Northop Hall AGI to the south-east of the asset would result in a permanent <i>minor adverse</i> impact through changes in the setting of the asset during the Operation stage, which would result in a permanent <i>slight adverse (not significant)</i> effect.</p>
Hafod Wood Moated Site (FL179)	High	There will be no physical impact to the asset. The proposed Cornist Lane BVS position on the opposite side of the valley would result in a <i>negligible</i> impact through changes in the setting resulting in a <i>slight adverse (not significant)</i> effect.
Bryn y Cosyn Round Barrows (FL096)	High	There will be no physical impact to the asset. The DCO Proposed Development would result in a permanent <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a permanent <i>slight adverse (not significant)</i> effect.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Round Barrow 225m south-east of Plas Newydd (FL076)	High	There will be no physical impact to the asset. The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect. The DCO Proposed Development would result in a permanent <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a permanent <i>slight adverse (not significant)</i> effect.
Offa's Dyke: Section N & S of the Circle on Holywell Racecourse, and Circle and Round Barrow (FL006)	High	There will be no impact (<i>not significant</i>) to the asset.
Llyn Du Round Barrow (FL189)	High	There will be no physical impact to the asset. The DCO Proposed Development would result in a permanent <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a permanent <i>slight adverse (not significant)</i> effect.
Enclosure, Field System & Hollow-ways North of Pant (FL163)	High	There will be no physical impact to the asset. The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect.
Plas-newydd (PRN 24687)	Moderate	There will be no physical impact to the asset. The DCO Proposed Development would result in temporary and permanent <i>minor adverse</i> impacts to the setting of the asset, which would result in a <i>slight adverse (not significant)</i> effect.
Whitford Dyke (PRN 106723 and 106724)	High	There will be no physical impact to the asset. The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Offa's Dyke (28102–28105)	High	There will be no physical impact to the asset. The DCO Proposed Development would result in a temporary <i>minor adverse</i> impact through changes in the setting of the asset, which would result in a temporary <i>slight adverse (not significant)</i> effect.
King's Wood Lane/Saltersway/Military Way (2030/1, MCH1278)	Moderate	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Roman Road - Chester to Wirral (Margary 670) (2010/1/0, MCH6164)	Moderate	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
ROF Dunham on the Hill (4217, MCH9985)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>major</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Ridge and Furrow Earthworks in Large Standleys and Standleys Small (15191, MCH25127)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>major</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Royal Observer Corps Monitoring Post at Saughall (4135/0/2, MCH9818)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>major</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Sealand Embankment III (34237)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>major</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Pentre Halkyn windmill (17017)	Low	Any ground disturbance associated with the DCO Proposed Development would likely to result in <i>major</i> adverse impact on the remains of the asset; however, as the preservation of this asset is likely to be poor the magnitude of effect is anticipated to be no more than <i>minor adverse (not significant)</i> .
Ashfield Farm Brickworks (103787)	Low	Any ground disturbance associated with the DCO Proposed Development would likely to result in <i>major adverse</i> impact on the remains of the asset; however, as the preservation of this asset is likely to be poor the magnitude of effect is anticipated to be no more than <i>minor adverse (not significant)</i> .
Brookside Ridge and Furrow (97837)	Low	Any ground disturbance associated with the DCO Proposed Development would likely to result in <i>major adverse</i> impact on the remains of the asset; however, as the preservation of this asset is likely to be poor the magnitude of effect is anticipated to be no more than <i>minor adverse (not significant)</i> .
Chester - St Asaph Roman road (46802)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Coal Pit Hey (99047)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Ewloe Green Farm Colliery (103806)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Ewloe railway (99043)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Ewloe, Old Aston Hill, RAF Hawarden wireless station, aerial mast IV (129644)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Ewloe, Old Aston Hill, RAF Hawarden wireless station, building II (129640)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Hen-dyddyn Farm sand pit (85032)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Holly House Farm Sand pits (99061)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Little Leadbrook Farm marl pit (85035)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.

Heritage Asset	Asset Value	Impact of Proposals on Asset Value Prior to Mitigation
Little Leadbrook Farm marl pit (85036)	Negligible or very low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>neutral or slight adverse (not significant)</i> effect.
Mancot Royal strip field system (99060)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.
Sandycroft boundary stone (103807)	Low	Any ground disturbance associated with the DCO Proposed Development would likely result in a <i>minor</i> magnitude of impact on the asset, resulting in a <i>slight adverse (not significant)</i> effect.

14.4. RECOMMENDATIONS

- 14.4.1. It is recommended that a programme of targeted intrusive investigation is undertaken following completion of detailed design on DCO consent has been received. This will form trial trench investigation targeted on those features identified through a combination of walkover, geophysical survey and remote sensing.
- 14.4.2. It is considered that effects from direct physical impacts on sub-surface heritage assets during the Construction stage are anticipated in areas of interest identified during the assessment of the LiDAR and aerial photography and on the features identified during the geophysical survey. These areas include the scheduled monuments (NHLE 1012122) and its associated features by Elton (L 190), and areas of the ridge and furrow earthworks south of Saughall (L 72, 73, 75—78), and the Cornist Lane BVS (L 179—182). Such features such be avoided during detailed design, but they will otherwise need to be mitigated through excavation and recording. Strip, map and sample is proposed across the Newbuild Infrastructure Boundary where there will be sub-surface impact. This will be undertaken during the Construction phase.
- 14.4.3. An Outline WSI is appended to the **Outline Construction and Environmental Management Plan (OCEMP) (Document reference: D.6.5.4)** to detail the methodologies for any further investigation and mitigation required following the consent of the DCO Proposed Development. The impacts to the setting of the Grade II* listed Aston Hill BVS (Cadw ref. 23) and Grade II listed Aedocular Gateway at Aston Hill BVS (Cadw ref. 15103) will be mitigated through targeted landscape planting determined as part of the assessment by the WSP Landscape and Visual Impact team. The mitigation proposed is described in detail in **Chapter 12: Landscape and Visual Impact Assessment (Vol. II)** and their associated appendices. The layout of the proposed vegetative screening is shown in the plan: **EN070007-D.2.14-LAY-Sheet 3**.
- 14.4.4. No specific mitigation is recommended for the temporary impacts that will occur in the Construction stage due to changes in the setting of heritage assets. However, it is considered that good construction practices, such as wheel-washes, noise barriers, and minimal use of lighting where practicable, will act to reduce any such impacts. Any such practices will be outlined in the **Register of Environmental Actions and Commitments (REAC) (Document reference: D.6.5.1)**.

- 14.4.5. Hedgerows are expected to be retained as far as reasonably practical and replaced where possible given the limitations on planting over pipeline infrastructure as part of the embedded mitigation strategy (**See OCEMP – Document Reference: D.6.5.4**).

15. REFERENCES

Ref. 8.1: MHCLG [Ministry of Housing, Communities and Local Government], July 2021, National Planning Policy Framework

Ref. 8.2: Welsh Government, 2021, *Planning Policy Wales*. Cardiff: Welsh Government.

Ref. 8.3: *Ancient Monuments and Archaeological Areas Act 1979* Available at <https://www.legislation.gov.uk/ukpga/1979/46> [Accessed 9/05/2022]

Ref. 8.4: Welsh Government, 2016, *Historic Environment (Wales) Act 2016*. Cardiff: Welsh Government.

Ref. 8.5: The Planning (Listed Buildings and Conservation Areas) Act of 1990

Ref. 8.6: *Protection of Military Remains Act 1986 c.35* Available at [Protection of Military Remains Act 1986 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/1986/35) [Accessed 9/05/2022]

Ref. 8.7: *The Hedgerow Regulations Act 1997* Available at <https://www.legislation.gov.uk/ukxi/1997/1160/contents/made>

Ref. 8.8: *National Policy Statement for Energy EN1* Available at <https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>

Ref. 8.9: *Draft Overarching National Policy Statement for Energy EN1* Available at <https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-review-of-energy-national-policy-statements>

Ref. 8.10: MHCLG, 2021, [Ministry of Housing, Communities and Local Government], July 2019 Conserving and Enhancing the Historic Environment: Planning Practice Guide. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>.

Ref. 8.11: Cheshire West and Chester Council. *Local Plan (Part One) Strategic Policies (2015)* and *(Part two) Land Allocations and Detailed Policies (2019)*. Available on: https://inside.cheshirewestandchester.gov.uk/policies_plans_and_strategies/planning_policy/local_plan

Ref. 8.12: Cheshire West and Chester Council, 2019, *Cheshire West and Chester Local Plan (Part 2)*. Available at https://inside.cheshirewestandchester.gov.uk/policies_plans_and_strategies/planning_policy/local_plan.

Ref. 8.13: Flintshire County Council, 2011, *Unitary Development Plan 2000–2015*. Retrieved from: [REDACTED]

Ref. 8.14: Welsh Government, 2017, *Technical Advice Note 24: The Heritage Environment*. Cardiff: Welsh Government.

Ref. 8.15: ClfA, 2020, Standards and Guidance for Desk-based Assessment.

Ref. 8.16: ClfA, 2020, *Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment*.

Ref. 8.17: Historic England, 2019, Statements of Heritage Significance: Historic England Advice Note 12

Ref. 8.18: Cadw, 2011, *Conservation Principles for the Sustainable Management of the Heritage Environment in Wales*. Cardiff: Welsh Government.

Ref. 8.19: Cadw, 2017, *Heritage Impact Assessment in Wales*. Cardiff: Welsh Government.

Ref. 8.20: Cadw, 2022, Cadw Record Search, Available on [Search Cadw records | Cadw \(gov.wales\)](#).

Ref. 8.21: Historic England, 2022, Search the National Heritage List, Available on [REDACTED]

Ref. 8.22: British Geological Survey. (2022). [REDACTED]

Ref. 8.23: Natural Resources Wales and the Welsh Government, 2022, [Online] Lle Geo-portal for Wales. Available at: <http://lle.gov.wales/home>

Ref. 8.24: Department of Environment, Food and Rural Affairs, 2022, [Online] DEFRA Survey Data Download. Available at: <https://environment.data.gov.uk/DefraDataDownload/?Mode=survey>

Ref. 8.25: Carrozzo P, 2022, *Geophysical Survey Report: HyNet CO₂ Pipeline*. Unpublished client report.

Ref. 8.26: Royal Commission of Ancient and Historical Monuments of Wales Archive, Aberystwyth

Ref. 8.27: Coflein, 2021, [Online] Royal Commission of the Ancient and Historic Monuments of Wales historic asset online database. Available at: <https://coflein.gov.uk/en/>

Ref. 8.28: Historic England Archive, Swindon (aerial photographs)

Ref. 8.29: Historic England, 2008, Conservation principles, policies and guidance. Swindon

- Ref. 8.30:** Historic England, 2017, Conservation principles, policies and guidance. Consultation Draft. Swindon
- Ref. 8.31:** Historic England, 2017, *The Setting of Heritage Assets. Historic England Good Practice in Planning: 3 (2nd edition)*.
- Ref. 8.32:** Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment*. Abingdon, Oxon.
- Ref. 8.33:** Cadw, 2017, *Setting of Historic Assets in Wales*. Cardiff: Welsh Government.
- Ref. 8.34:** ClfA [Chartered Institute for Archaeologists] Dec 2020, Standard and guidance for archaeological geophysical survey, Reading
- Ref. 8.35:** David, A., Linford, N., Linford, P. and Martin, L., 2008. Geophysical survey in archaeological field evaluation: research and professional services guidelines (2nd edition). Historic England.
- Ref. 8.36:** Schmidt, A., Linford, P., Linford, N., David, A., Gaffney, C., Sarris, A. and Fassbinder, J., 2015, *Guidelines for the use of geophysics in archaeology: questions to ask and points to consider. EAC Guidelines 2*. European Archaeological Council: Belgium.
- Ref. 8.37:** OS 2nd edition 6": mile map of 1898. Obtained from Groundsure Ltd.
- Ref. 8.38:** Ordnance Survey 1st edition 6":mile map of 1869. Obtained from Groundsure Ltd.
- Ref. 8.39:** Fitzpatrick-Matthews, K., 2006, [Online] The Palaeolithic of West Chester Available at:

- Ref. 8.40:** Crosby A, 1996, A History of Cheshire, Philmore and Co Ltd, Chichester
- Ref. 8.41:** CPAT, undated, [Online] Flintshire history and archaeology overview. Available at: 
- Ref. 8.42:** Oxford Archaeology North, 2006, Mickle Trafford to Ellesmere Port Pipeline, Cheshire: Archaeological Evaluation and Palaeoecological Analysis
- Ref. 8.43:** Archwilio, 2022, [Online] Welsh designated and non-designated historic assets online database. Available at: 
- Ref. 8.44:** Stanford SC, 1980, *The Archaeology of the Welsh Marches*. William Collins Sons & Co. Ltd; London

Ref. 8.45: Fairburn N et al, 2002, Brook House Farm, Bruen Stapleford, Excavations of a first Millennium BC Settlement, in Carrington P (ed), *Journal of the Chester Archaeological Society*, Vol 77, Chester

Ref. 8.46: Silvester RJ and Toller H, 2010, 'Roman Roads in Wales and the Marches' in Burnham BC and Davies JL (ed.) *Roman Frontiers in Wales and the Marches*. Aberystwyth: Royal Commission on the Ancient and Historic Monuments of Wales; pp. 91–97.

Ref. 8.47: Burnham BC and Davies JL (ed.) *Roman Frontiers in Wales and the Marches*. Aberystwyth: Royal Commission on the Ancient and Historic Monuments of Wales

Ref. 8.48: CPAT, 2000, Historic Landscape Characterisation, *Holywell Common and Halkyn Mountain*

Ref. 8.49: Victoria County History, Edited by C P Lewis and A T Thacker, 2003, *A History of the County of Chester: Volume 5 Part 1, the City of Chester: General History and Topography*. London: Victoria County History. British History Online, accessed March 2022, [REDACTED]

[REDACTED]

Ref. 8.50: Hume P 2021, *The Welsh Marcher Lordships, I: Central & North*. Logaston Press: Eardisley

Ref. 8.51: CPAT, 2012, *Historic Settlements in Flintshire*. Report No. 1142.

Ref. 8.52: CPAT, 2014, *Whitford Dyke, Pentre-ffyddion, Flintshire, Excavation Report*, unpublished

Ref. 8.53: Domesday Book, 1086, Translated by A. Williams and G. H. Martin, 2003. London: Penguin Books Ltd.

Ref. 8.54: Hewitt HJ, 1929, *Medieval Cheshire: An Economic and Social History of Cheshire in the Reigns of the Three Edwards*. Chetham Society

Ref. 8.55: North West England Regional Research Framework, 2022. Available at [REDACTED]

Ref. 8.56: Christopher Saxton's 1577 Map of Cheshire. Cheshire Local History Association. Available at:

[REDACTED]

Ref. 8.57: John Speed's 1610 Map of Cheshire. Cheshire Local History Association. Available at:

[REDACTED]

Ref. 8.58: Saxton, C. 1579 Map of Flintshire and Denbighshire, Denbigh ac Flint duorum olim Cambriae modo Walliae, comitatum descriptio A. Dmi 1577. Ref. MAP 5190. Available at: [REDACTED]

Ref. 8.59: Speed, J. 1610 Map of Flintshire, Flint-shire Performed by John Speede. Ref. MAP 5216. Available at: [REDACTED]

Ref. 8.60: Longworth C, 2004, [Online] *Buckley Sgraffito: a study of a 17th century pottery industry in North Wales, its production techniques and design influences*. Available at [REDACTED]

Ref. 8.61: Halkyn Mountain Ranger, 2022, [Online] Local History overview. Available at: [REDACTED]

Ref. 8.62: CPAT, 2012, *Medieval and Early Post-Medieval Industry in East and North-East Wales*. Report No. 1144.

Ref. 8.63: Lloyd, G, 1967–68, *The Canalisation of the River Dee in 1737* in Flintshire Historical Society Vol. 23. Held by Llyfrgell Genedlaethol Cymru – The National Library of Wales.

Ref. 8.64: Collins, undated, *A New and Exact Survey of the River Dee or Chester-water*. North East Wales Archive PM/7/1.

Ref. 8.65: Sealand Community Council, 2022, [Online] Local History overview. Available at [REDACTED]

Ref. 8.66: Burdett PP, 1794, *The County Palatine of Chester; reduced from the large survey, in four sheets*. W. Faden, London. Digitised by National Library of Scotland. Available on [REDACTED]

Ref. 8.67: Burdett, P. 1777 Map of Cheshire, 1":mile scale. Available at: [REDACTED]

Ref. 8.68: Prestley, J, 1831, *Historical Account of the Navigable Rivers, Canals and Railways of Great Britain*.

Ref. 8.69: Shropshire Union Canal Society, 2022, *History of the Shropshire Union Canals* [Online]. History. Available at: [REDACTED]

Ref. 8.70: Ordnance Survey 1st edition 6":mile map of 1888. Obtained from Groundsure Ltd.

Ref. 8.71: Ordnance Survey 1st edition 6":mile map of 1913. Obtained from Groundsure Ltd.

Ref. 8.72: Chester Archives, 2022. Elton Parish Tithe Map. Available at: [REDACTED]

Ref. 8.73: Chester Archives, 2022. Thornton-le-Moors Parish Tithe Map. Available at: [REDACTED]

Ref. 8.74: Chester Archives, 2022. Picton Township within the Parish of Plemondstall Tithe Map. Available at: [REDACTED]

Ref. 8.75: Chester Archives, 2022. Wervin Township within the Parish of St Oswalds Tithe Map. Available at: [REDACTED]

Ref. 8.76: Chester Archives, 2022. Chorlton Township within the Parish of Backford Tithe Map. Available at: [REDACTED]

Ref. 8.77: OS 2nd edition 6": mile map of 1897 (Elton). Obtained from Groundsure Ltd.

Ref. 8.78: OS 1st edition 6": mile map of 1869 (Wervin/Picton). Obtained from Groundsure Ltd.

Ref. 8.79: OS 1st edition 6": mile map of 1869 (Little Saughall). Obtained from Groundsure Ltd.

Ref. 8.80: OS 2nd edition 6": mile map of 1898 (Wervin/Picton). Obtained from Groundsure Ltd.

Ref. 8.81: OS 2nd edition 6": mile map of 1898 (Mollington). Obtained from Groundsure Ltd.

Ref. 8.82: Hawarden Parish Tithe Map c1839. National Library of Wales. Available on [REDACTED]

Ref. 8.83: Mold Parish Tithe Map c1839. National Library of Wales. Available on [REDACTED]

Ref. 8.84: Northop Parish Tithe Map c1839. National Library of Wales. Available on [REDACTED]

Ref. 8.85: Flint Parish Tithe Map c1839. National Library of Wales. Available on [REDACTED]

Ref. 8.86: OS 1st edition 6": mile map of 1869 (Sandycroft and Sealand). Obtained from Groundsure Ltd.

Ref. 8.87: OS 1st edition 6": mile map of 1898 (Sandycroft and Sealand). Obtained from Groundsure Ltd.

Ref. 8.88: OS 1st edition 6": mile map of 1869 (Sandycroft and Mancot). Obtained from Groundsure Ltd.

Ref. 8.89: OS 1st edition 6": mile map of 1871 (Sandycroft and Mancot). Obtained from Groundsure Ltd.

Ref. 8.90: OS 1st edition 6": mile map of 1898 (Sandycroft and Mancot). Obtained from Groundsure Ltd.

Ref. 8.91: OS 1st edition 6": mile map of 1869 (Ewloe Green). Obtained from Groundsure Ltd.

Ref. 8.92: OS 1st edition 6": mile map of 1898 (Ewloe Green). Obtained from Groundsure Ltd.

Ref. 8.93: OS 1st edition 6": mile map of 1869–1871 (Northop Hall AGI). Obtained from Groundsure Ltd.

Ref. 8.94: OS 1st edition 6": mile map of 1898 (Northop Hall AGI). Obtained from Groundsure Ltd.

Ref. 8.95: OS 1st edition 6": mile map of 1870 (Cornist Lane). Obtained from Groundsure Ltd.

Ref. 8.96: OS 1st edition 6": mile map of 1899 (Cornist Lane). Obtained from Groundsure Ltd.

Ref. 8.97: OS 1st edition 6": mile map of 1870–72 (Pentre Halkyn). Obtained from Groundsure Ltd.

Ref. 8.98: OS 1st edition 1: 10 000 scale map of 1989–94 (Pentre Halkyn). Obtained from Groundsure Ltd.

Ref. 8.99: OS 1st edition 1:2500 scale map of 1870 (Babell). Obtained from Groundsure Ltd.

Ref. 8.100: OS 1:2500 scale map of 1989 (Babell). Obtained from Groundsure Ltd.

Ref. 8.101: OS 1st edition 1:2500 scale map of 1871 (Babell). Obtained from Groundsure Ltd.

Ref. 8.102: OS 6": mile map of 1938 (Elton). Obtained from Groundsure Ltd.

Ref. 8.103: OS 1:10 560 scale map of 1967–68 (Elton). Obtained from Groundsure Ltd.

- Ref. 8.104:** OS 1:10 000 scale map of 1983 (Thornton-le-Moors). Obtained from Groundsure Ltd.
- Ref. 8.105:** OS 1:10 560 scale map of 1967 (Wervin / Picton). Obtained from Groundsure Ltd.
- Ref. 8.106:** OS 1:10 560 scale map of 1954 (Mollington). Obtained from Groundsure Ltd.
- Ref. 8.107:** OS 1:10 560 scale map of 1963–68 (Sandycroft and Sealand). Obtained from Groundsure Ltd.
- Ref. 8.108:** OS 1:10 000 scale map of 1975–78 (Sandycroft and Sealand). Obtained from Groundsure Ltd.
- Ref. 8.109:** Delve K, 2007, *The Military Airfields of Britain: Wales and West Midlands*, The Crowood Press, Marlborough
- Ref. 8.110:** OS 1:10 560 scale map of 1948 (Sandycroft and Mancot). Obtained from Groundsure Ltd.
- Ref. 8.110:** OS 1:10 000 scale map of 1969 (Sandycroft and Mancot). Obtained from Groundsure Ltd.
- Ref. 8.111:** OS 1:10 000 scale map of 1978 (Sandycroft and Mancot). Obtained from Groundsure Ltd.
- Ref. 8.112:** OS 1:10 560 scale map of 1970 (Northop Hall AGI). Obtained from Groundsure Ltd.
- Ref. 8.113:** OS 1:10 000 scale map of 1987 (Northop Hall AGI). Obtained from Groundsure Ltd.
- Ref. 8.114:** OS 1:10,560 scale map of 1994 (Cornist Lane). Obtained from Groundsure Ltd.
- Ref. 8.115:** OS 1:10,560 scale map of 1965 (Pentre Halkyn). Obtained from Groundsure Ltd.
- Ref. 8.116:** OS 1:10,560 scale map of 1989 (Babell). Obtained from Groundsure Ltd.
- Ref. 8.117:** CPAT, 2019, *Farms and Farmsteads – Flintshire*.
- Ref. 8.118:** CPAT, 2000, *Holywell Common and Halkyn Mountain Registered Landscape Characterisation*. Report No. 357.
- Ref. 8.119:** Chester Archives, 2022. Wimbolds Trafford Township within the Parish of Thornton-le-Moors Tithe Map. Available at:

Ref. 8.120: Chester Archives, 2022. Backford Township within the Parish of Backford and Stoke Tithe Map. Available at:

Ref. 8.121: Chester Archives, 2022. Backford Township within the Parish of Backford and Stoke Tithe Map. Available at:

Ref. 8.122: Chester Archives, 2022. Lea Township within the Parish of Backford and Stoke Tithe Map. Available at:

Ref. 8.123: Chester Archives, 2022. Little Saughall Township within the Parish of Shotwick Tithe Map. Available at:

Ref. 8.124: Chester Archives, 2022. Great Saughall Township within the Parish of Shotwick Tithe Map. Available at:

16. BIBLIOGRAPHY

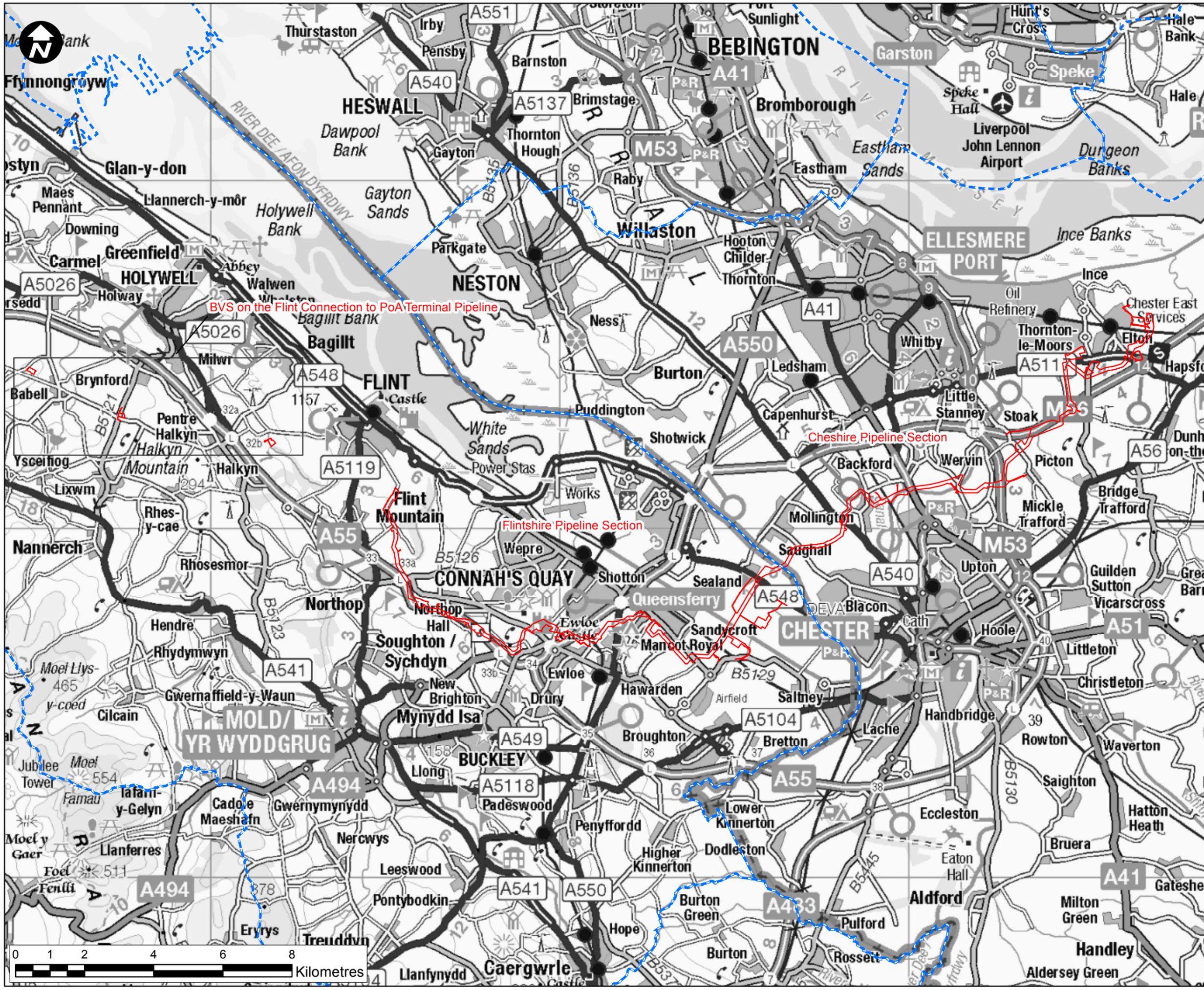
- Arnold, C.J. and Davies, J.L., 2000, *Roman & Early Medieval Wales*. Sutton.
- Beresford, M.W., Joseph, J.K.S.S. and Joseph, J.K.S., 1979, *Medieval England: an aerial survey (Vol. 2)*. Cambridge University Press.
- ClfA [Chartered Institute for Archaeologists] Dec 2020a, *Standards and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment*, Reading.
- ClfA [Chartered Institute for Archaeologists] Dec 2020b, *Standards and guidance for historic environment desk-based assessment*, Reading
- Chester Archaeological Service, 1993, *Palaeoenvironmental Assessment of a Proposed Motorway Service Station at Hapsford*. Unpublished grey literature obtained from the Archaeological Data Service.
- Clwyd Powys Archaeological Trust (CPAT), 1995, *Mount Pleasant – Fferm Water Main, Clwyd: Watching Brief*. CPAT Report 128.
- Clwyd Powys Archaeological Trust (CPAT), 1998, *Dee Estuary Historic Landscape: An Initial Study*. CPAT Report 226.
- Clwyd Powys Archaeological Trust (CPAT), 2000, *Prehistoric Funerary and Ritual Sites: Flintshire and Wrexham*. CPAT Report 351.
- Clwyd Powys Archaeological Trust (CPAT), 2002, *Early Prehistoric Settlement in Mid and North-East Wales: the Lithic Evidence*. CPAT Report 467.
- Clwyd Powys Archaeological Trust (CPAT), 2011, *Early Medieval Cemeteries in Mid and North-East Wales*. CPAT Report 1071.
- Clwyd Powys Archaeological Trust (CPAT), 2014, *Military Aircraft Crash Sites*. CPAT Report 1249.
- Clwyd Powys Archaeological Trust (CPAT), 2016, *AE Line, Stanlow, Cheshire: Cultural Heritage Assessment*. CPAT Report 1446.
- Clwyd Powys Archaeological Trust (CPAT), 2017, *Roman Deeside, Flintshire: Archaeological Assessment*. CPAT Report 1470.
- Clwyd Powys Archaeological Trust (CPAT), 2019, *Pentre Ffwrndan Roman Settlement, Flintshire: Community Excavation and Outreach Report*. CPAT Report 1633-1.
- Eni Progetti, 2022, LBA CCS Transport and Storage Project: New Onshore Pipelines. *Unpublished Constructability Report*

Annexures



Annex A

FIGURES



Key:
 - - - - - District Boundary
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HyNet North West

PROJECT TITLE
HyNet Carbon Dioxide Pipeline

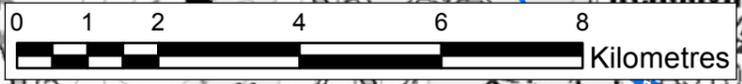
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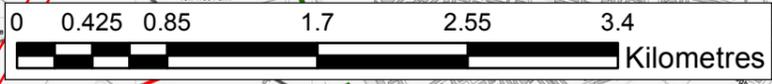
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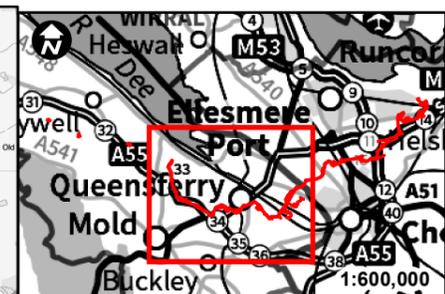
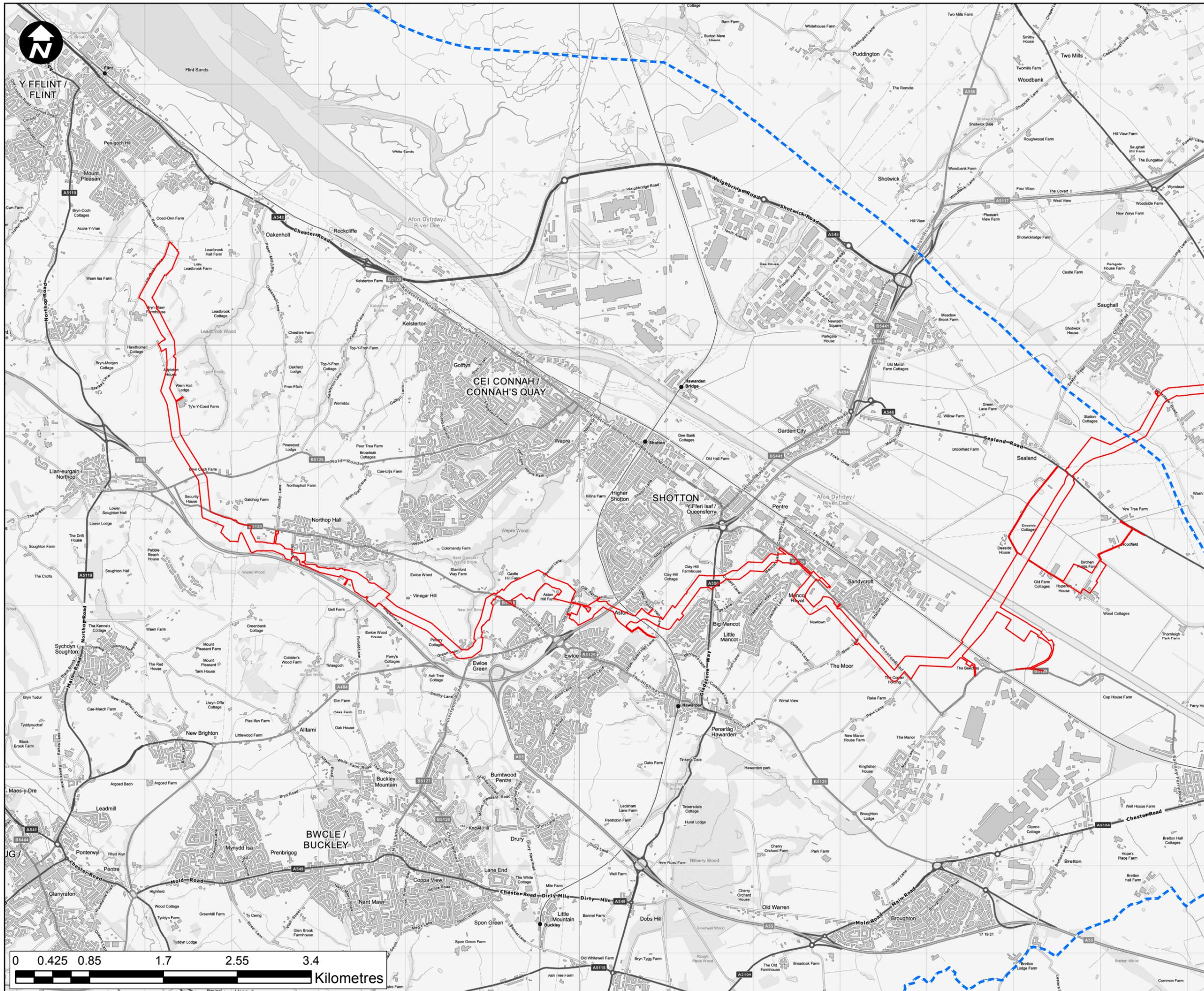
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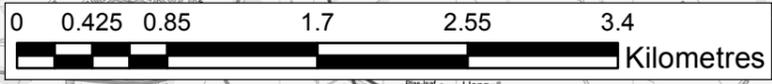
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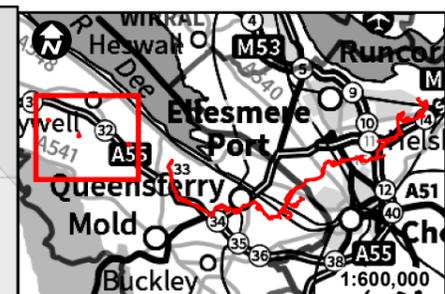
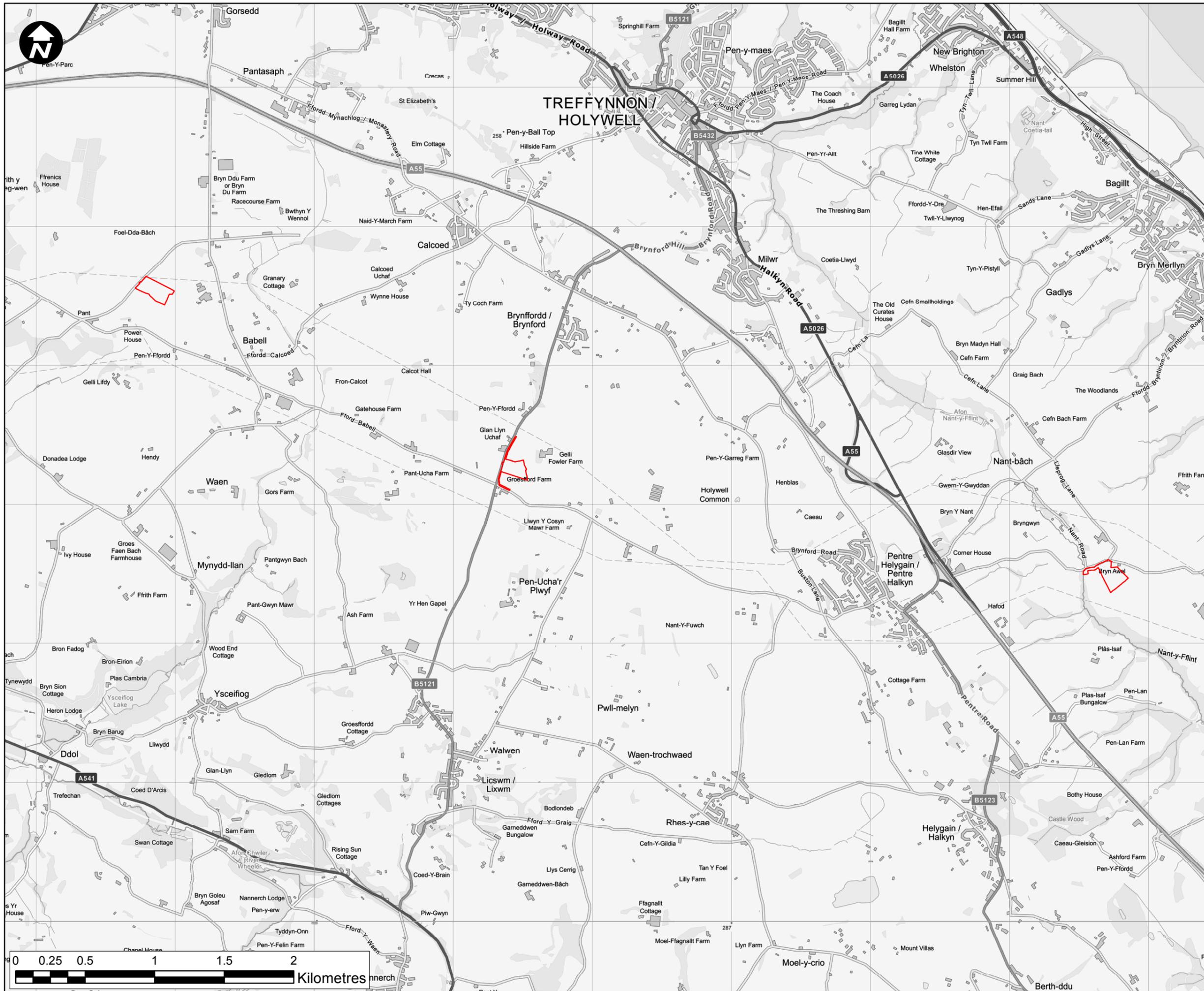
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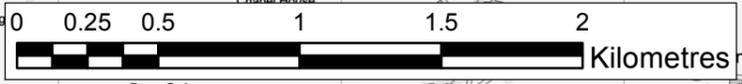
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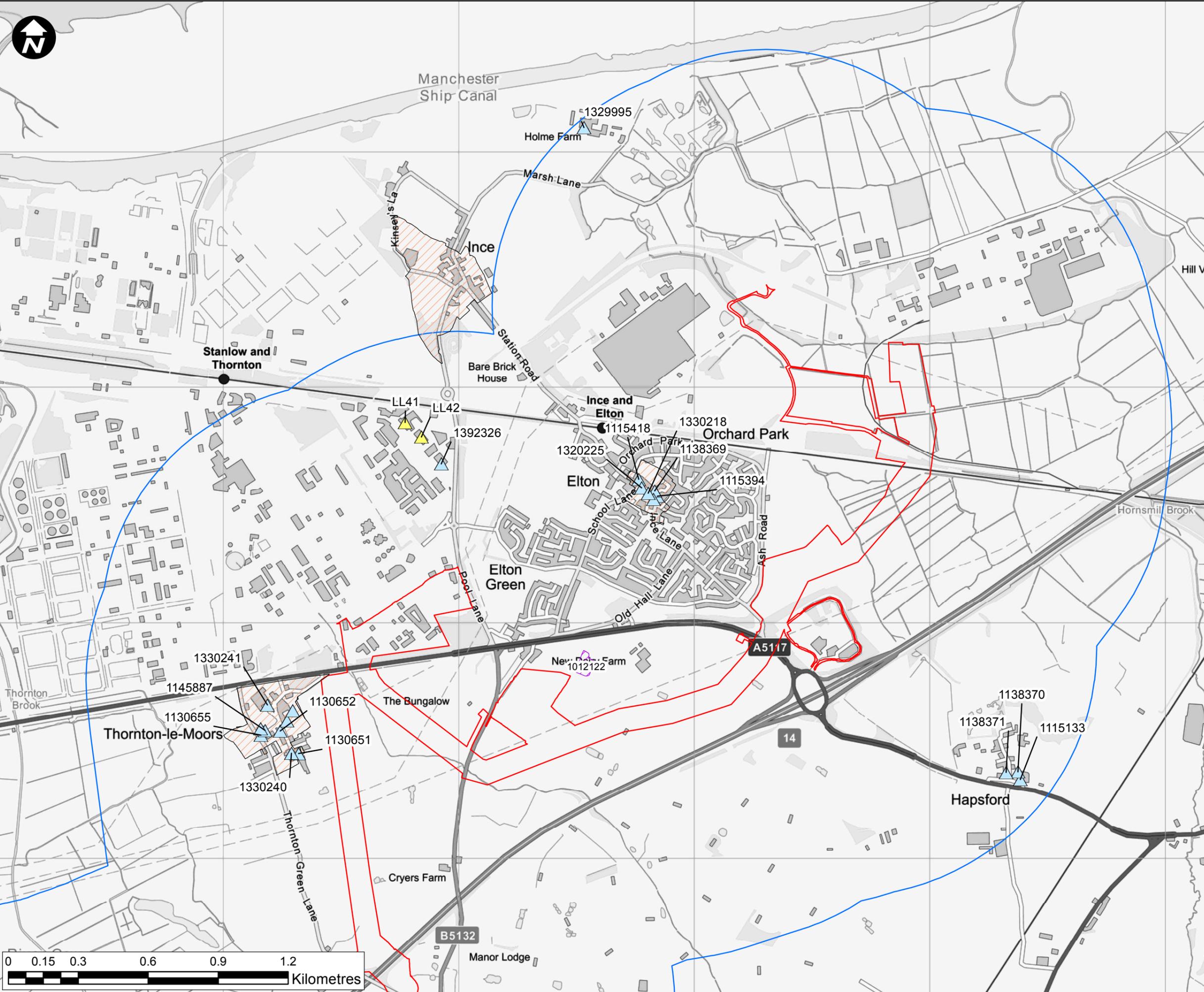
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- Key:**
- ▲ Listed Building
 - ▲ Locally Listed Building
 - Scheduled Monument
 - Conservation Area
 - 1 km study area
 - Newbuild Infrastructure Boundary

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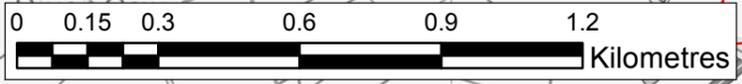
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 Sheet 1

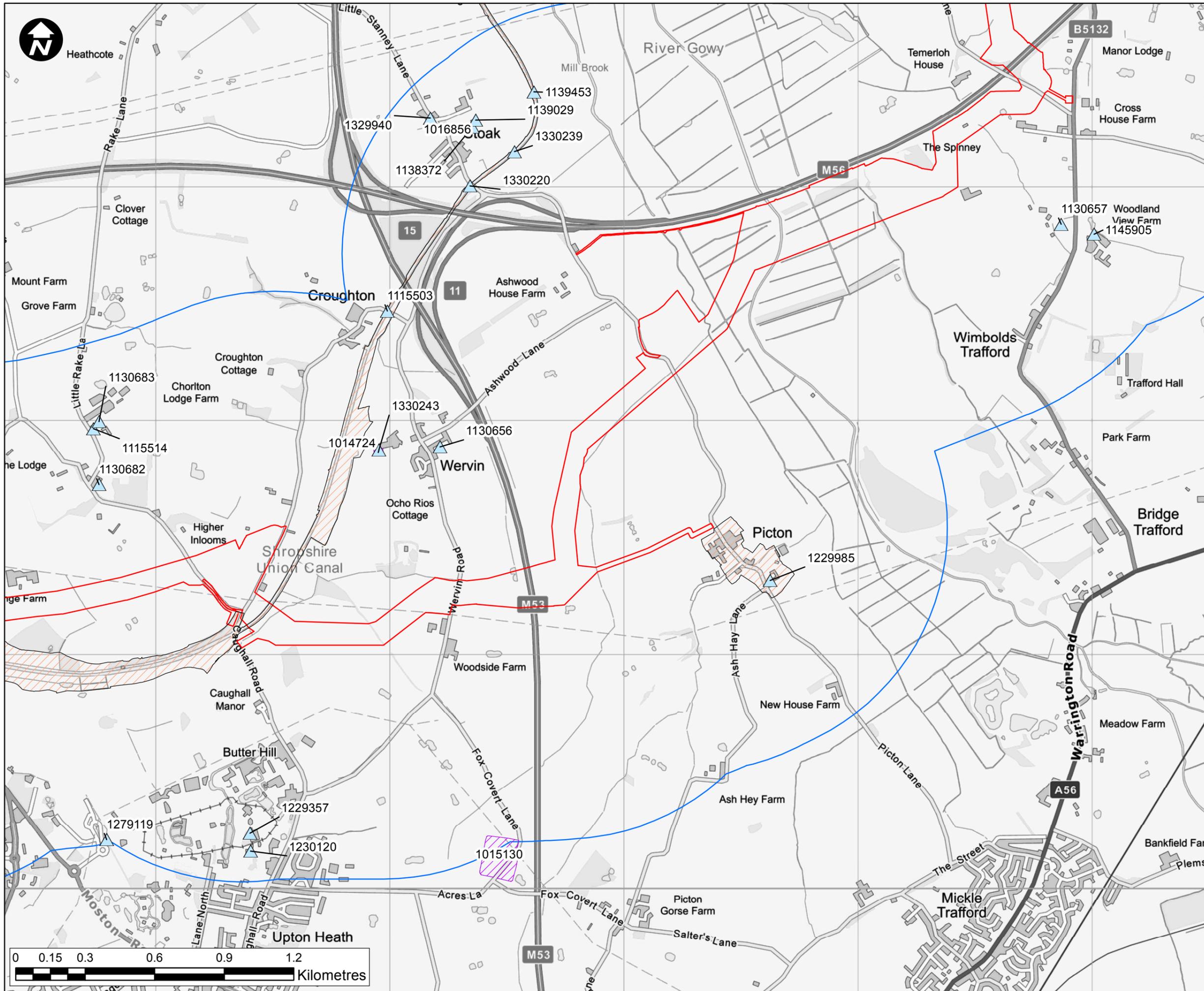
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- Key:**
- Listed Building
 - Scheduled Monument
 - Conservation Area
 - 1 km study area
 - Newbuild Infrastructure Boundary

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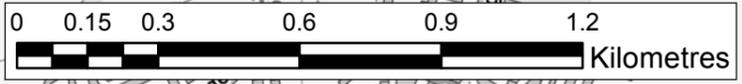
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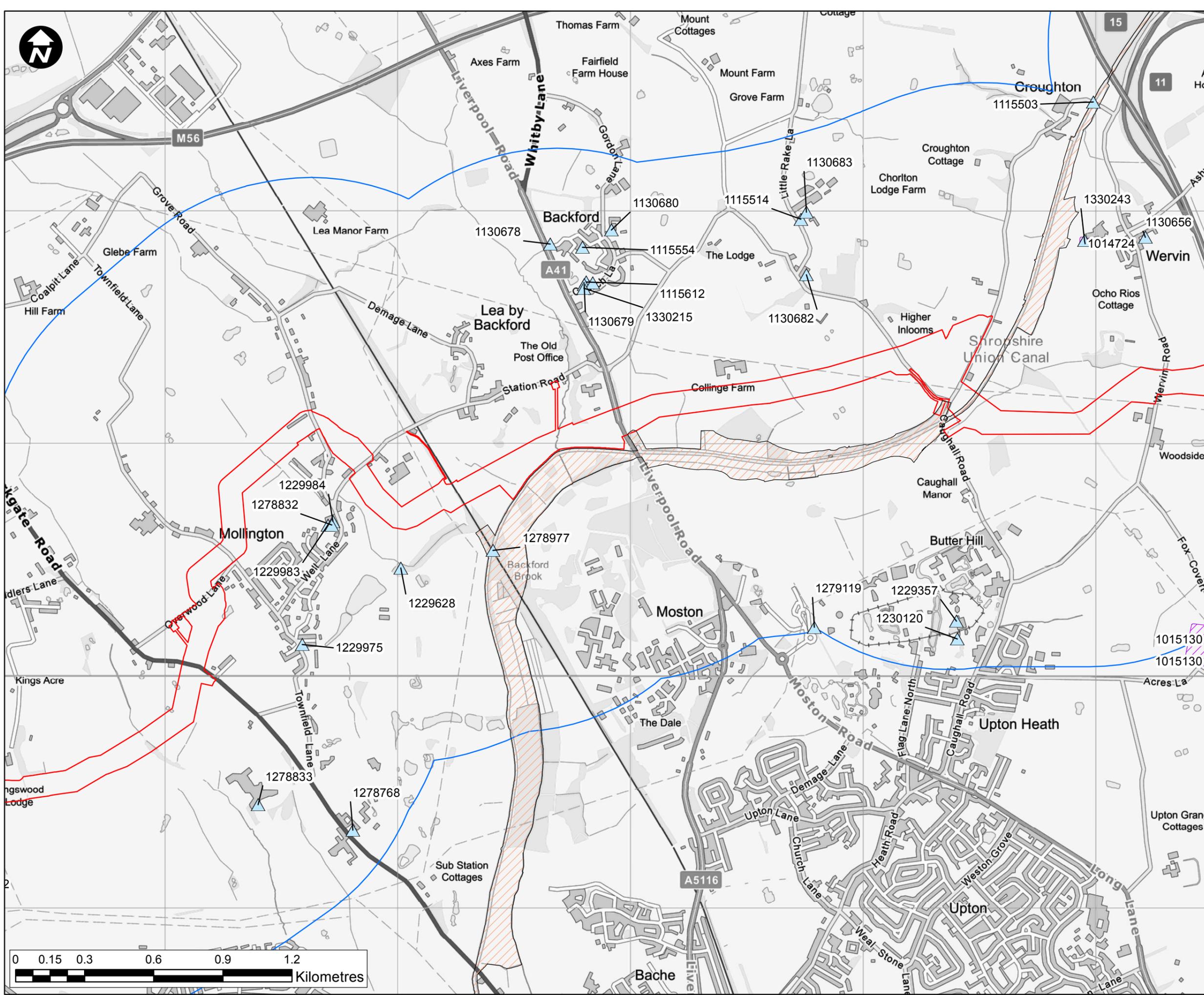
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- Key:**
- Listed Building
 - Scheduled Monument
 - Conservation Area
 - 1 km study area
 - Newbuild Infrastructure Boundary

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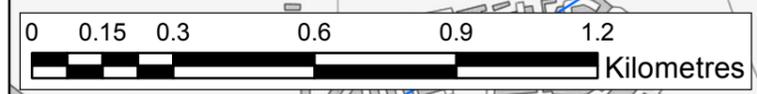
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 Sheet 3

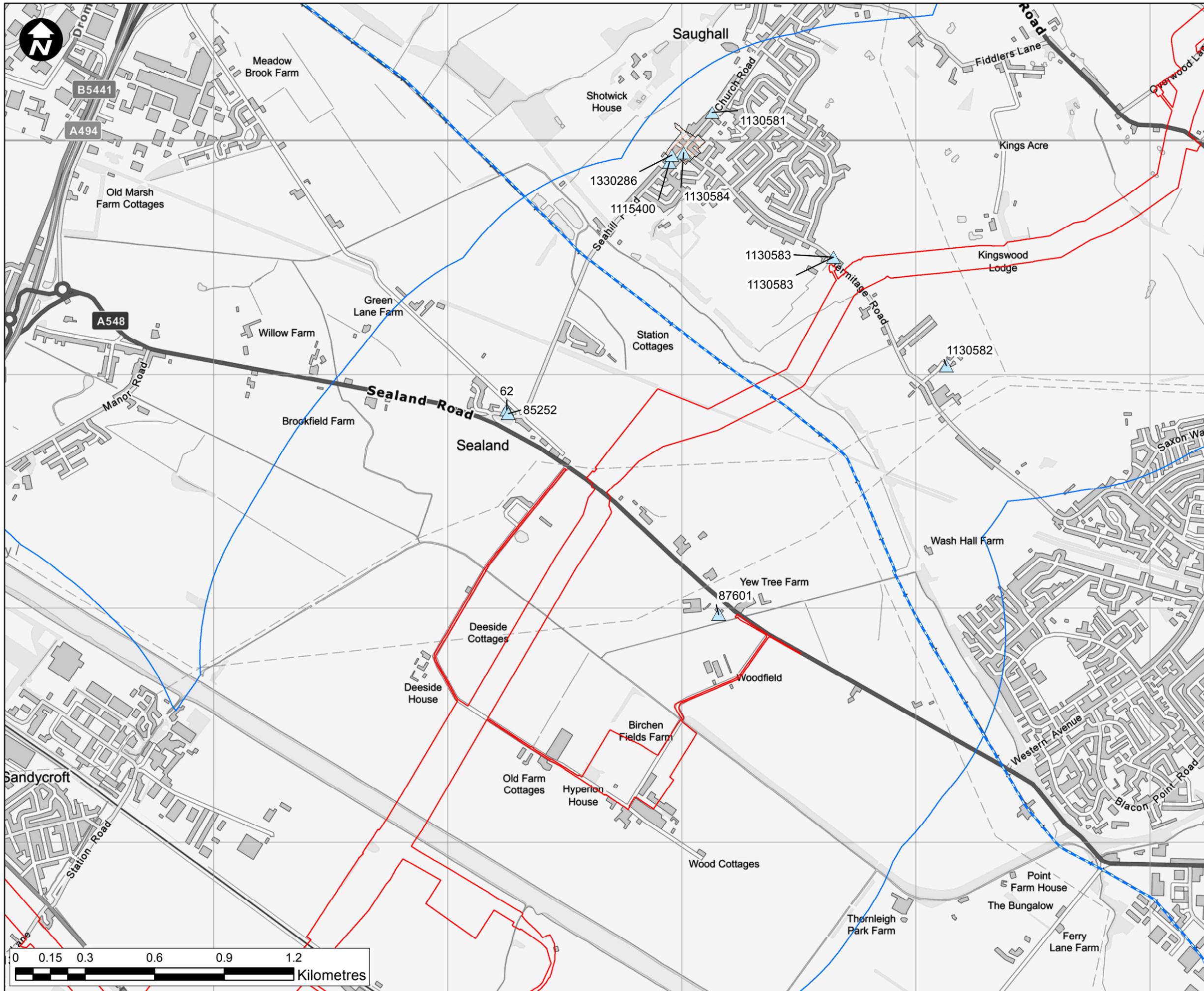
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- Key:
- Listed Building
 - Conservation Area
 - District Boundary
 - 1 km Study Area
 - Newbuild Infrastructure Boundary

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HyNet Carbon Dioxide Pipeline

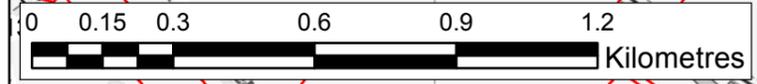
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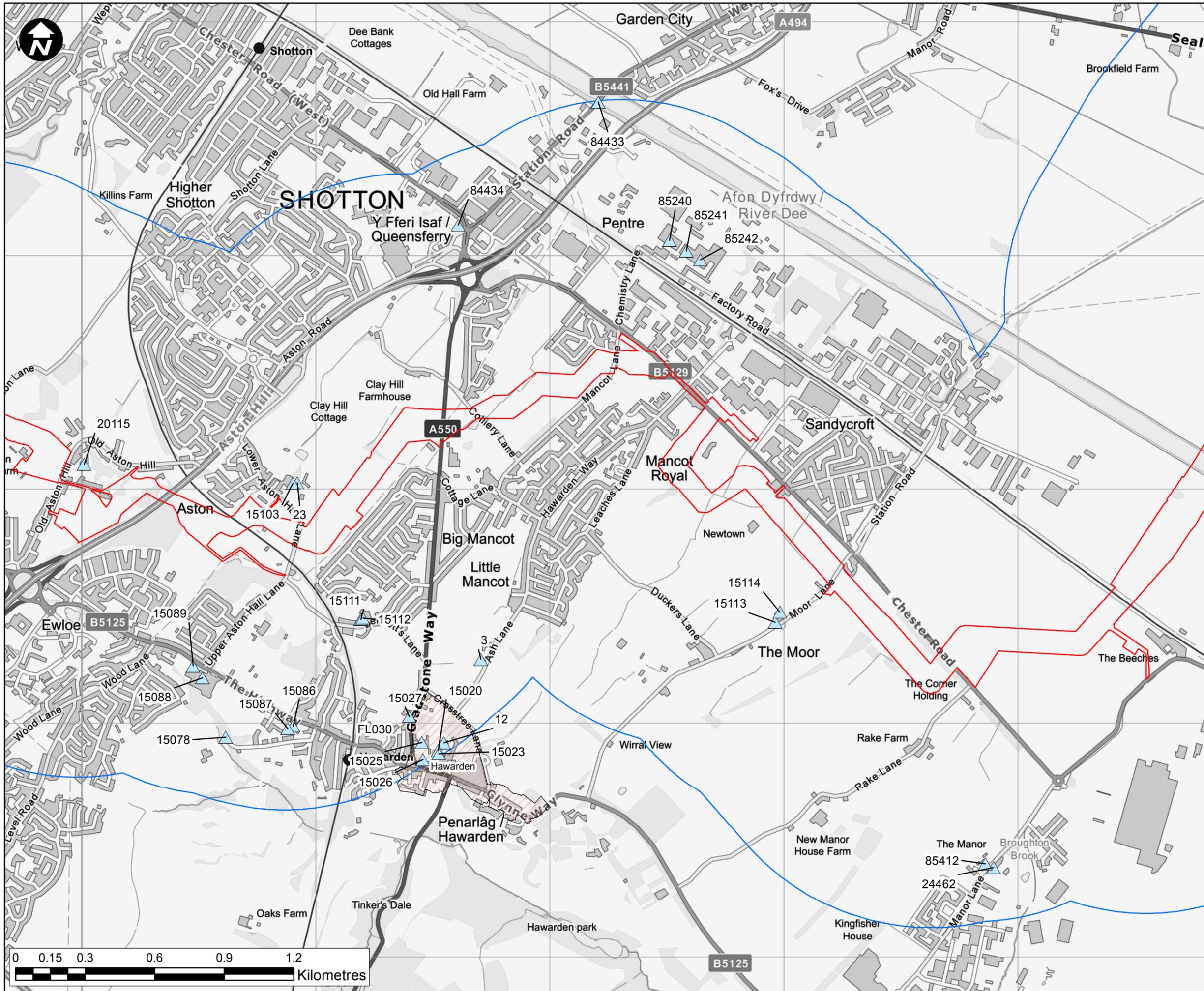
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- Key:**
- Scheduled Monument
 - Listed Building
 - Conservation Area
 - 1 km study area
 - Newbuild Infrastructure Boundary

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 Figure 8.1.2 DCO
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 Designated Heritage Assets
 Sheet 5

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