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15 CUMULATIVE EFFECTS

15.1 Introduction

15.1.1 Cumulative effects occur as a result of several actions on an environmental receptor which may overlap or act in combination. The following types of cumulative effects have been considered in accordance with the EIA Regulations and best practice guidance:

- Inter-project cumulative effects – the combined residual (post-mitigation) effects of the Proposed Development and another project or projects on a single receptor/resource; and
- Intra-project combined effects – the interaction and combination of different environmental residual (post-mitigation) effects from within the Proposed Development affecting a receptor.

15.2 Relevant legislation and planning policy

15.1.1 Although the Proposed Development does not constitute a nationally significant infrastructure project (NSIP), a method is adopted based on that set out in [Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment](#)¹. In the absence of equivalent DNS-specific guidance, this is considered to represent best practice in respect of Cumulative Effects Assessment (CEA) and also captures the requirements in other main sources of guidance, as detailed below.

15.1.2 [Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment](#)¹ sets out a staged approach to CEA for Nationally Significant Infrastructure Projects and provides a recognised method for documenting the CEA within an applicant's Environmental Statement.

15.2.1 Schedule 4 paragraph (5)(e) of the [Environmental Impact Assessment \(EIA\) Regulations 2017](#)² states that an Environmental Statement should include “a description of the likely significant effects of the development on the environment resulting from... the cumulation of effects with other existing and/or approved projects”. Regulation 4(2) states that the “EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on biodiversity, air quality, climate, cultural heritage, landscape and visual, noise and vibration, traffic and transport, land and soils, major accidents and

¹ <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure>

² <https://www.legislation.gov.uk/uksi/2017/571/contents/made>

disasters and material assets". Regulation 4(2)(e) refers to the need to assess "the interaction between those factors".

15.2.2 In addition to CEA being a required element of the EIA, it is also recognised in [Planning Policy Wales Edition 12](#)³, [Future Wales: the National Plan 2040](#)⁴ and the adopted [Flintshire Local Development Plan](#)⁵, as being a relevant consideration in the determination of development proposals.

15.2.3 In addition to Advice Note Seventeen, other relevant guidance has been considered, including from the [Institute of Environmental Management and Assessment \(IEMA\)](#)⁶.

15.3 Scope of the assessment

15.3.1 The scope of the cumulative assessment is as set out in the EIA Scoping Report (November 2022) and informed by the Scoping Opinion provided by Planning and Environment Decisions Wales. **Table 15.1** below summarises the key responses relating to the cumulative effects assessment and how these have been or will be addressed.

Table 15.1 Summary of key responses from the Scoping Direction in relation to the assessment of cumulative effects

Consultee	Key matters raised	Actions in response to consultee comments
Planning and Environment Decisions Wales	Scoping Direction, Section 6.4: Effects deemed individually not significant from the assessment, could cumulatively be significant, so inclusion criteria based on the most likely significant effects from this type of development may prove helpful when identifying what other developments should be accounted for.	Noted and reflected in Section 15.5 of this assessment.
Planning and Environment Decisions Wales	Scoping Direction, Section 6.4: Include proportionate information relating to projects that are not yet consented, dependent on the level of certainty of them coming forward.	Noted, a high-level assessment of projects of this nature has been undertaken where appropriate in Section 15.6 .

³ https://www.gov.wales/sites/default/files/publications/2024-02/planning-policy-wales-edition-12_1.pdf

⁴ [gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf](https://www.gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf)

⁵ flintshire.gov.uk/en/PDFFiles/Planning/Examination-Library-Documents/FINAL-LDP-Written-Statement-English.pdf

⁶ <https://www.iema.net/download-document/236676>

Consultee	Key matters raised	Actions in response to consultee comments
	Scoping Direction, Section 6.4: All of the other developments considered should be documented and the reasons for inclusion or exclusion should be clearly stated.	Noted and reflected in Section 15.5 and Volume 4, Technical Appendix 15.1 of this assessment.
	Scoping Direction, Section 6.4: Professional judgement should be used to avoid excluding other development that is close to threshold limits but has characteristics likely to give rise to a significant effect; or could give rise to a cumulative effect by virtue of its proximity to the Proposed Development.	Noted and reflected in Section 15.5 of this assessment.
	Scoping Direction, Section 6.4: Professional judgement should be applied to other development that exceeds thresholds but may not give rise to discernible effects.	Noted and reflected in Section 15.5 of this assessment.
	Scoping Direction, Section 6.4: The process of refinement should be undertaken in consultation with Flintshire County Council and other consultees, where appropriate.	Noted.
	Scoping Direction, Section 6.4: The scope of the cumulative assessment should be fully explained and justified in the Environmental Statement.	Noted and reflected in the assessment. See Sections 15.4 to 15.6 which outline the methodology and scope of the assessment.
Planning and Environment Decisions Wales	Scoping Direction, Section 6.4: The Planning Inspectorate's guidance for Nationally Significant Infrastructure Projects – Advice Note Seventeen: Cumulative Effects Assessment sets out a staged process for assessing cumulative impacts that may be of relevance to the Applicant.	Planning Inspectorate Advice Note Seventeen ⁷ has been used as guidance to inform the cumulative assessment methodology set out in Section 15.4 and Section 15.5 .

⁷ <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure>

Consultee	Key matters raised	Actions in response to consultee comments
	Scoping Direction, Table 1, ID.10: The assessment of the cumulative impacts should also consider the construction of the connection to HyNet North West Above Ground Installation (AGI) at Northop Hall.	Noted, Section 15.6 considers the cumulative effect of the connection to HyNet North West Above Ground Installation (AGI) at Northop Hall, hereafter referred to as the 'Padeswood CO ₂ Spur Pipeline'.

15.4 Intra-project combined effects

15.4.1 The approach to the assessment of interactions of environmental effects (intra-project effects) has considered the changes in baseline conditions at common sensitive receptors (i.e. those receptors that have been identified as experiencing likely effects by more than one environmental factor) due to the Proposed Development. The assessment has been based upon residual (post-mitigation) effects of 'slight/minor' or greater significance only ('negligible' residual effects will not be considered). The assessment includes consideration of where multiple non-significant effects could combine to become significant. The Study Area for the assessment of intra-project effects has been informed by the Study Areas for the individual factor assessments.

15.4.2 The assessment of intra-project combined effects has been undertaken using a two-stage approach:

Stage 1 – Screening

15.4.3 Screening has been undertaken to determine whether a sensitive receptor is exposed to more than one type of residual (post-additional mitigation) effect during the construction, operation and decommissioning phases of the Proposed Development. Those common sensitive receptors exposed to two or more types of residual (post-additional mitigation) effects with significance of 'slight/minor' or greater, have been taken forward to Stage 2 of the assessment.

15.4.4 If there is only one type of effect on a sensitive receptor (i.e. only one Environmental Statement chapter has identified effects on that sensitive receptor), then it is considered that there are no potential intra-project combined effects and the sensitive receptor has not been taken forward to Stage 2 of the assessment.

Stage 2 – Assessment of intra-project combined effects

15.4.5 An assessment of the overall significance of the cumulative effects on common sensitive receptors identified at Stage 1 has been undertaken based on technical information provided in the draft Environmental Statement chapters and supporting technical appendices as well as professional judgement. Given that the types of effects may be very different in some cases, a quantitative

assessment has not been possible, and it has been necessary to apply professional judgement in determining the significance of each individual effect.

- 15.4.6 The evaluation at the receptor level considered: the magnitude of change at the common receptor; previously identified sensitivity; duration and reversibility of interaction. The focus was on determining a change in the level of effect likely to be experienced and whether this is significant or not.

15.5 Inter-project cumulative effects

- 15.5.1 The approach to the assessment of inter-project effects considers the deviation from the baseline conditions at common sensitive receptors as a result of changes brought about as a result of the Proposed Development in combination with one or more other identified cumulative developments.
- 15.5.2 Developments already operating at the time of assessment, including the existing cement works, form part of the environmental baseline, as defined in the draft Environmental Statement chapters.
- 15.5.3 The assessment of the inter-project effects is based upon the residual (post-additional mitigation) effects that have been identified in the various environmental factor assessments for the Proposed Development, as well as available environmental information for the other existing development and/or approved developments.
- 15.5.4 The identification of other existing development and/or approved developments comprises two clear stages as follows:
- **Stage 1:** establish a long list of other existing development and/or approved developments based on appropriate spatial and temporal limits.
 - **Stage 2:** apply a clear rationale to establish a short list of other existing development and/or approved developments which, in combination with the Proposed Development, have the potential to result in a significant cumulative effect.

Stage 1: Long list methodology

- 15.5.5 The first task in establishing the long list of relevant 'other existing development and/or approved development(s)' is to determine the 'search area'. The 'search area' has been determined by affording consideration to the Zone of Influence (Zol) for potential cumulative effects of each environmental factor assessed within this draft Environmental Statement.
- 15.5.6 The Zol is defined as the spatial area over which either a project or cumulative effect is likely to be experienced. **Table 15.2** presents the assigned Zols as based on the environmental factor-specific Study Areas presented in **Volume 2, Chapters 5-14**.
- 15.5.7 The Study Areas for each EIA factor are determined by reference to relevant subject matter specific guidance and methods. These same Study Areas are

used as the basis for determining the Zol for cumulative assessment unless stated otherwise. At distances beyond the identified Study Area and Zol respectively, there is no potential for significant cumulative effects due to distance from the Proposed Development.

Table 15.2 Zone of Influence for each Environmental Factor

Environmental Factor	Zone of Influence (km)	Justification
Biodiversity	5km	A 5km Zol is used to determine the potential for cumulative impacts. This is expanded from the Study Area used in Volume 2, Chapter 5: Biodiversity , to account for that many of the animal species considered in the assessment are mobile and individuals and populations are likely to range beyond the Site boundary. 5km is considered a sufficient range to capture any potential significant cumulative effects.
Air quality	5km	<p>The Zol is the same as the Study Area used in Volume 2, Chapter 6: Air Quality, as this is identified as the area over which significant effects may occur as a result of the Proposed Development.</p> <p>A reduced Zol of 350m is applied for construction related effects as Volume 2, Chapter 6: Air Quality considers that this is the geographic limit of extent over which construction related effects may occur.</p>
Cultural heritage	5km	<p>A 5km Zol is used for consistency with the Study Area identified in Volume 2, Chapter 8: Cultural Heritage, as this is the identified area of which significant effects may occur in relation to the Proposed Development.</p> <p>Data from Cadw and Clwyd Powys Archaeological Trust HER for a 1km radius of the Site boundary for non-designated assets and 5km for designated assets has been used in the course of cumulative assessment. This has been supplemented by relevant published documentary and cartographic material including the ClifA Wales/Cymru's Research Framework for the Archaeology of Wales (2017)⁸ and LIDAR data where available.</p>

⁸ <https://www.archaeoleg.org.uk/pdf/review2017/overview2017.pdf>

Environmental Factor	Zone of Influence (km)	Justification
Climate	Not applicable (global)	Cumulative impact assessments are not applicable for greenhouse gas emissions (all schemes globally contribute to the same global emissions).
Landscape and visual	5km	The Zol is the same as the defined Study Area for the landscape and visual impact assessment. It has been established and detailed in Chapter 9: Landscape and Visual Impact that significant effects would not occur beyond this distance from the Site boundary.
Land and soils	1km	A 1km Zol is used for consistency with the Study Area used in Volume 2, Chapter 12: Land and Soils , as this is the area identified over which significant effects from the Proposed Development may occur.
Noise and vibration	2km	A 2km Zol is used to reflect the Study Area used in Volume 2, Chapter 10: Noise and Vibration , as this is sufficient to give coverage of the most exposed receptors in each direction, and to encompass all locations where significant effects may occur.
Traffic and transport	A5118, A550 (east route), A541 (west route), A494 (west route), A55.	Links considered within the assessment in the immediate vicinity and as part of the construction traffic routes have been considered within the cumulative assessments. The extent of the Zol is as the Study Area considered in Volume 2, Chapter 11: Traffic and Transport , and during scoping with the Local Highways Authority. This is the extent of which significant effects as a result of the Proposed Development may occur.
Major accidents and disasters	3km	A 3km Zol is used to reflect the Study Area used in Volume 2, Chapter 13: Major Accidents and Disasters . This is considered sufficient to encompass all the areas where risk of major accident may occur.

- 15.5.8 With reference to **Table 15.2**, the overall combined ‘search area’ for the long list of relevant ‘other existing and/or approved development(s)’ has been based on the largest Zol in terms of distance, which in this case is 5km.
- 15.5.9 Following the adoption of this 5km search area, a planning application search was undertaken to identify other existing development and/or approved developments within 5km, using the planning portals of Flintshire County Council, Wrexham County Borough Council, Cheshire West and Chester Council, the Planning Inspectorate and Development of National Significance planning application portals.
- 15.5.10 The 5km Zol extends from the ‘bounding circle’ surrounding the Site boundary of the Proposed Development, as presented on **Figure 15.1**. Where precise geographic data for the boundaries of identified other existing or approved developments is not available, the central National Grid Reference point has been used to map their location.
- 15.5.11 Note that for purposes of providing a robust assessment, some developments were considered for the shortlist outside of the identified 5km Zol, where these were specifically identified as needing express consideration due to their scale, location or likelihood of having similar environmental effects to the Proposed Development.
- 15.5.12 To focus the search criteria for the long-list, primary focus was on those developments considered to be of sufficiently large scale to have potential to interact with the Proposed Development at the scale of the Zol considered. This included the following and was informed by development proposals likely to constitute ‘major’ development proposals in planning terms and/or to require EIA screening:
- Employment developments;
 - Residential developments of 10+ dwellings;
 - Minerals and waste applications;
 - Industrial developments;
 - Development of National Significance applications;
 - Nationally Significant Infrastructure Project developments;
 - Transport infrastructure developments (trunk roads or motorways only); and
 - Energy infrastructure developments.
- 15.5.13 The developments are assigned in tiers which descend from Tier 1 (most certain) to Tier 3 (least certain) and reflect a diminishing degree of certainty which can be assigned to each development. Of the development types listed above, only those that meet one or more of the following criteria will be included on the long list (in line with the ‘Tier 1’ and ‘Tier 2’ descriptions in Table 2 of the [Planning Inspectorate's Advice Note Seventeen](https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure)⁹):
- Projects that are under construction but that will not be completed prior to the Proposed Development commencing;

⁹ <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure>

- Projects with planning permission granted within the last five years (whether under the Planning Act 2008 or other regimes), but not yet implemented (Tier 1);
- Submitted but not yet determined applications (whether under the Planning Act 2008 or other regimes) (Tier 1);
- Projects on the Planning Inspectorate's Programme of Projects where an EIA Scoping Report has been submitted, but for which an application has not yet been submitted (Tier 2); and
- Known projects relating to the Padeswood CO₂ Spur Pipeline and the wider HyNet North West scheme (Tier 2), where they do not otherwise meet the above criteria.

15.5.14 The fourth bullet point above as expressed in [Advice Note Seventeen](#)¹⁰ solely relates to NSIPs. However, for the purposes of a robust assessment this criteria was widened to include all projects screened as EIA development under the Development of National Significance (DNS) regime, where an EIA Scoping Report has been submitted but for which an application has not yet been submitted.

15.5.15 It should be noted that with reference to 'Tier 3' descriptions in Table 2 of [Advice Note Seventeen](#)¹⁰, the following other existing and/or approved development(s) have not been considered for inclusion in the long list, as none of the below have sufficient environmental assessment information freely and publicly available to inform the inter-project cumulative effects assessment, nor are any of the below considered to be 'existing and/or approved development':

- Projects on the Planning Inspectorate's Programme of Projects where an EIA Scoping Report has not been submitted;
- Projects that have been identified in the relevant Development Plan(s) (and emerging Development Plans); and
- Projects identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

15.5.16 The long list of other existing and/or approved development(s) is provided in **Volume 4, Technical Appendix 15.1**. This long list will be kept under review and any changes agreed with Flintshire County Council prior to the final Environmental Statement to allow for a robust assessment of cumulative effects.

Stage 2: Short list methodology

15.5.17 Following the formation of the long list, the eligible other existing and/or approved developments identified have been through further assessment (Stage 2) to establish a short list which, in combination with the Proposed Development, have the potential to result in significant cumulative effects.

15.5.18 The criteria used to determine whether to include or exclude an existing development and/or approved development on the short list reflects the

¹⁰ <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure>

process established by [Planning Inspectorate Advice Note Seventeen](#)¹¹ and has regard to relevant policy and guidance documents. [Planning Inspectorate Advice Note Seventeen](#)¹¹ states at 3.2.4 that the criteria should address the following:

- **Temporal scope:** The applicant may wish to consider the relative construction, operation and decommissioning programmes of the 'other existing and/or approved development' identified in the Zol together with the programme, to establish whether there is overlap and any potential for interaction;
- **Scale and nature of development:** The applicant may wish to consider whether the scale and nature of the 'other existing and/or approved development' identified in the Zol are likely to interact with the proposed development. Statutory definitions of major development and EIA screening thresholds may be of assistance when considering issues of scale;
- **Other factors:** The applicant should consider whether there are any other factors, such as the nature and/or capacity of the receiving environment that would make a significant cumulative effect with 'other existing and/or approved development' more or less likely and may consider utilising a source-pathway-receptor approach to inform the assessment; and
- **Documentation:** The CEA short listing process may be documented using Matrix 1 (**Volume 4, Technical Appendix 15.1**)¹². The reasons for excluding any development from further consideration should be clearly recorded. This will provide decision makers, consultation bodies and members of the public with a clear record of 'other existing development and/or approved development' considered and the applicant's decision making process with respect to the need for further assessment.

15.3.1 [The Planning Inspectorate's Advice Note Seventeen](#)¹³ suggests that professional judgement may also be used to supplement the threshold criteria and in order to avoid excluding 'other existing and/or approved development'. This professional judgement may consider if the following matters justify a development being scoped in for assessment even if it does not meet the above threshold criteria (quoted directly from the Advice Note, noting that reference to NSIP should be taken to be DNS for this application):

- Below the threshold criteria limits but has characteristics likely to give rise to a significant effect; or
- Below the threshold criteria limits but could give rise to a cumulative effect by virtue of its proximity to the proposed NSIP.

15.5.19 [The Planning Inspectorate's Advice Note Seventeen](#) also notes at 3.2.6 "*Similarly, professional judgement could be applied to support excluding 'other existing development and/or approved development' that exceeds the thresholds but may not give rise to discernible effects. All of the 'other existing development and/or approved development' considered should be*

¹¹ <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure>

¹² N.B. **Volume 4, Technical Appendix 15.1** adopts the structure and format of Matrix 1

¹³ <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure>

documented and the reasons for inclusion or exclusion should be clearly stated.”

15.5.20 Taking the above into consideration, the other existing development and/or approved developments on the long list has been reviewed against the following criteria to form the short list:

- **Criteria 1:** The other existing and/or approved development has a construction, operational and/or decommissioning phase that overlaps with any phase of the Proposed Development; and
- **Criteria 2:** The other existing and/or approved development and the Proposed Development share common sensitive receptors/resources which are assessed and described in the supporting environmental documentation, and have the potential to be significantly affected by the combination of the other existing and/or approved development and the Proposed Development; and
- **Criteria 3:** The other existing and/or approved development has sufficient environmental assessment information freely and publicly available to inform the inter-project cumulative effects assessment. The assessment of each existing and/or approved development on the short list will be proportionate to the environmental assessment information available.

15.5.21 Where an existing development and/or approved development meets all of the above criteria, it has been included on the ‘short list’ and will be taken forward for further consideration in the assessment. The identified ‘short list’ is detailed below in **Table 15.3**. This short list will be kept under review and any changes agreed with Flintshire County Council prior to the completion of the Environmental Statement to allow for a robust assessment of cumulative effects.

15.5.22 Where developments are discounted from the short list, they will continue to be monitored to ensure that any changes to those projects are identified and their omission from the short list is reassessed prior to undertaking the cumulative assessment for the final Environmental Statement.

Table 15.3 Short list of other existing development and/or approved development

Application Reference	Planning Regime	Details	Distance from the Site boundary (km)	Status
58968	Town and Country Planning Act 1990 Town and Country Planning (Development Management Procedure) (Wales) Order, 2012	Applicant: F G Whitley & Sons Ltd Location: Ffordd Byrnwr Gwair, Mold, Flintshire For the residential development of 20 no. apartments across two buildings	4.7km north west	Approved after completing Legal Agreement 16/02/2021
60955	Town and Country Planning Act 1990 Town and Country Planning (Development Management Procedure) (Wales) Order, 2012	Applicant: ClwydAlyn Housing Ltd Location: Princess Avenue, Buckley, Flintshire Erection of 10 affordable walk-up apartments and 2 affordable houses. To include designated parking, bin stores and associated gardens for the houses	1.4km north west	Approved after payment of Commuted Sum 14/05/2020
62289	Town and Country Planning Act 1990 Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017	Applicant: Asbri Planning Ltd Location: Liverpool Road, Buckley, Flintshire Screening Opinion for construction of residential development (Max. 200 dwellings) and associated works	2.1km north west	Screening Opinion received 13/02/2021

Application Reference	Planning Regime	Details	Distance from the Site boundary (km)	Status
61572	Town and Country Planning Act 1990 Town and Country Planning (Development Management Procedure) (Wales) Order, 2012	Applicant: Clwyd Alyn Housing Association Location: 66A Mold Road, Mynydd Isa, Mold, CH7 6TD Development of 56 no. dwellings, including new roadway, parking areas, landscaping and drainage connections including formation of swale	2.8km north west	Approved after completing Legal Agreement 15/07/2021
58975	Town and Country Planning Act 1990 Town and Country Planning (Development Management Procedure) (Wales) Order, 2012	Applicant: Ty Coch Energy Location: Ty Coch Farm, Greenfield Road, Greenfield, Holywell, CH8 7QU Construction and operation of a Gas Fuelled Capacity Mechanism Embedded Generation Plant and associated infrastructure	18.3km north west	Approved 16/01/2019
DNS/3251545	Planning (Wales) Act 2015	Applicant: Ynni Newydd Cyf Location: Bretton Hall, Chester Road, Flintshire, CH4 0DF A proposed solar farm and grid connection and associated supporting energy infrastructure	7.0km north east	Approved with Conditions 19/12/2023

Application Reference	Planning Regime	Details	Distance from the Site boundary (km)	Status
EN070007	Planning Act 2008	<p>Applicant: Liverpool Bay CCS Limited</p> <p>Location: From the Ince AGI in Cheshire, via Stanlow Refinery, to Talacre Beach in North Wales</p> <p>HyNet North West Carbon Dioxide Pipeline</p>	3.6km north west	Examining Authority issued Recommendation Report to the Secretary of State 20/12/2023
63104	<p>Town and Country Planning Act 1990</p> <p>Town and Country Planning (Development Management Procedure) (Wales) Order, 2012</p>	<p>Applicant: Caulmert Ltd</p> <p>Location: Weighbridge Road, Sealand, Flintshire</p> <p>Erection of an advanced gasification plant and associated development</p>	8.4km north east	Approved 17/11/2021
DNS/3253253	Planning (Wales) Act 2015	<p>Applicant: Lightsource BP</p> <p>Location: Plas Power Estate, Ruthin Road, Wrexham LL11 3BS</p> <p>Installation of proposed ground mounted photo voltaic solar farm, including battery energy storage system, together with associated equipment, infrastructure and ancillary works.</p>	10.9km south east	Updated EIA Scoping Direction issued 17/10/2023

Application Reference	Planning Regime	Details	Distance from the Site boundary (km)	Status
63507	<p>Town and Country Planning Act 1990</p> <p>Town and Country Planning (Development Management Procedure) (Wales) Order, 2012</p>	<p>Applicant: Stewart Milne Homes (North West England) Limited</p> <p>Location: Land to the south of New Brighton Road, New Brighton, Mold, CH7 6RB</p> <p>Residential development comprising 84 dwellings including the provision of affordable units, areas of public open space, landscaping and associated works.</p>	4.5km north west	Re-consultation open
62458	<p>Town and Country Planning Act 1990</p> <p>Town and Country Planning (Development Management Procedure) (Wales) Order, 2012</p>	<p>Applicant: Alyn Housing Ltd</p> <p>Location: Well Street, Buckley, Flintshire</p> <p>Residential development of up to 140 dwellings, means of access, open space, sustainable drainage infrastructure and all other associated works</p>	2.2km north west	Under Consideration

Padeswood CO₂ Spur Pipeline

- 15.5.23 In addition to the identified shortlist, and to accord with comments made by Planning and Environment Decisions Wales in its Scoping Direction, the cumulative effect of the Padeswood CO₂ Spur Pipeline has been considered. This does not meet the criteria for Tier 1 and Tier 2 as described above due to not being sufficiently advanced in the planning process (as of July 2024). However, as a known facilitating component of the Proposed Development, it is considered relevant to include it in the inter-project assessment.
- 15.5.24 Liverpool Bay CCS Limited is responsible for the consenting, construction and operation of the Padeswood CO₂ Spur Pipeline, the purpose of which is to connect the Proposed Development to the main HyNet North West Carbon Dioxide Pipeline at Northop Hall. A planning application submission for the Padeswood CO₂ Spur Pipeline is anticipated in early 2025. Information on the CO₂ pipeline route corridor is available on the [HyNet hub website](#)¹⁴. At the time of preparing this draft Environmental Statement (July 2024) it is understood that detailed routing is still to be finalised, beyond the preferred route corridor as the information supplied on the above website.
- 15.5.25 The construction programme is subject to the granting of planning permission and therefore yet to be confirmed. Operation is anticipated by 2029 to coincide with that of the Proposed Development.
- 15.5.26 At the time of preparing this draft Environmental Statement, limited environmental information is available to assess this development. An assessment of the cumulative effects of the development has nevertheless been undertaken below based on the information available on the [HyNet hub website](#).

Stage 3: Information gathering

- 15.3.2 The other existing and/or approved developments that form part of the short list were subject to a review of environmental information, where available, including details of:
- Location;
 - Programme, including construction, operation and decommissioning;
 - Baseline data;
 - Effects arising from such other developments; and
 - Proposed design.

Stage 4: Assessment

- 15.5.27 A review of short-listed projects has been undertaken to inform cumulative effects for the purposes of this assessment (refer to **Section 15.6**). Should significant cumulative effects be identified, consideration is given to additional

¹⁴ <https://hynethub.co.uk/index.php?contentid=82>

mitigation to avoid, prevent, reduce or, if possible, offset any identified significant adverse cumulative effects.

15.5.28 There is no formal guidance on the criteria for determining significance of cumulative effects. For the full assessment to be presented in the Environment Statement, the following principles have been considered when assessing the significance of inter-project effects, with consideration given to [Planning Inspectorate Advice Note Seventeen](#)¹⁵ and any mitigation measures required to avoid, prevent, reduce or, if possible, offset any identified significant adverse cumulative effects:

- Extent of inter-project impact on any receptors/resources;
- The duration and frequency of the effects;
- The sensitivity of the receptors/resources affected;
- How the impacts identified combine to affect the condition of the receptor/resource;
- The probabilities of the impacts occurring in relation to each other in such a way so as to produce a cumulative effect, considering the extent and duration of the impact change;
- The ability of the receptor/resource to absorb further impacts; and
- The level of effect compared to that considered at the project level.

15.6 Inter-project cumulative assessment

15.6.1 This section presents an overview of inter-project cumulative effects based on effects arising from the short-listed projects presented in **Table 15.3**. The assessment is structured by EIA factor as addressed in **Volume 2, Chapters 5-14**.

Biodiversity

15.6.2 The ecological information available for the short-listed developments is summarised as described below.

15.6.3 The approved residential development of 20 apartments across 2 buildings at Ffordd Byrnwr Gwair, Mold (application reference 58968) is located 4.7km to the north west of the Site boundary. The Preliminary Ecological Appraisal (PEA) undertaken as part of the residential development concluded there would be negligible effects on biodiversity. As such, and given the distance from the Proposed Development it is considered unlikely that significant in combination effects on biodiversity will occur.

15.6.4 The approved development of 10 affordable walk-up houses and 2 affordable houses at Princess Avenue, Buckley (application reference 60955) is located 1.4km north west of the Site. The PEA undertaken as part of the development noted that there were two trees of low potential value for roosting bats which would be retained, and the Site was unlikely to be of any particular value for

¹⁵ <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure>

foraging/ commuting bats. There were some habitat features within the site which were of potential value for nesting birds, which would be lost due to the proposed development. It is expected that this will be subject to the mitigation proposals within the PEA and that residual adverse effects on ecological receptors would be mitigated with no significant effect. As such, and given the distance from the Proposed Development it is considered unlikely that significant in combination effects on biodiversity will occur.

- 15.6.5 The proposed development of 200 residential dwellings (application reference 62289) at Liverpool Road, Buckley is located 2.1km north west of the Site. The Site is adjacent to the Deeside and Buckley Newt Sites Special Area of Conservation (SAC), designated for its large populations of great crested newts (*Triturus cristatus*), and a great crested newt licence and associated mitigation strategy were recommended in the planning application supporting information. This population is considered separate from the population located within the Proposed Development, and as such no significant cumulative effects on great crested newts are anticipated with the Liverpool Road development. The PEA concluded there could be adverse effects on roosting bats, birds and hedgehogs (*Erinaceus europaeus*) in terms of habitat loss, and recommends various avoidance and compensation methods to nullify potential adverse impacts on the taxa. As such no significant cumulative effects on biodiversity are anticipated with the Proposed Development.
- 15.6.6 The approved development of 56 dwellings (application reference 61572) on land to the rear of A66 Mold Road, Mynydd Isa is located 2.8km north west of the Site. The Ecological Impact Assessment (EclA) undertaken as part of the development concluded that the habitat loss experience by any bat, badger, breeding/nesting bird, barn owl, hedgehog and reptile populations identified to be and/or potentially associated with the zone of the development's influence would be appropriately and proportionately addressed by the implementation of the mitigation measures and recommendations detailed in the taxa specific reports produced to inform the EclA. As well as this, based on the successful implementation of the great crested newt mitigation and habitat enhancement and compensation measures detailed in the EclA it was concluded that the proposed development would not be likely to negatively impact on the favourable conservation status of any great crested newt populations associated with the zone of the development's influence. As such no significant cumulative effects on biodiversity are anticipated with the Proposed Development.
- 15.6.7 The proposed HyNet North West Carbon Dioxide Pipeline (application reference EN070007) at Ewloe, Flintshire is located 3.6km north west of the Site. A number of ecological constraints were identified and detailed in the biodiversity chapter of the Environmental Statement, including great crested newt, roosting, commuting and foraging bats, badger (*Meles meles*), barn owl (*Tyto alba*), riparian mammals, breeding birds and wintering birds. With the implementation of the recommended mitigation and enhancement measures it was considered that residual effects on all ecological constraints were

negligible or minor adverse significance. As such no significant cumulative effects on biodiversity are anticipated with the Proposed Development.

- 15.6.8 A proposed residential development comprising 84 dwellings (application reference 63507) including the provision of affordable units, areas of public open space, landscaping and associated works is located 4.5km north west of the Site. There is potential for habitat loss impacts on bats and badgers. However, with the implementation of the recommended mitigation and enhancement measures, in conjunction with the long distance from the Site boundary, it was considered that residual effects on all ecological constraints were negligible or of minor adverse significance. As such no significant cumulative effects on biodiversity are anticipated with the Proposed Development.
- 15.6.9 Another residential development of up to 140 dwellings, means of access, open space, sustainable drainage infrastructure and all other associated works are proposed 2.2km north west of the Site boundary (application reference 62458). There is potential for habitat loss for great crested newts, foraging/commuting bats, nesting birds and reptiles. A great crested newt development licence was recommended for the development, as well as a habitat management plan. With the implementation of the recommended mitigation and enhancement measures, it was considered that residual effects on all ecological constraints were negligible or minor adverse significance. As such no significant cumulative effects on biodiversity are anticipated with the Proposed Development.
- 15.6.10 In terms of the proposed Padeswood CO₂ Spur Pipeline, impacts on ecological receptors will be focused on the construction stage of the development. Due to the underground nature of the pipeline, significant operation effects would not be expected.
- 15.6.11 Ecological receptors considered during construction will include statutory designated sites (Deeside and Buckley Newt Sites special area of conservation (SAC)), great crested newts, badgers, hedgerows, nesting and wintering birds and bats. Mitigation measures may be required including production of a Habitats Regulations Assessment and application for European Protected Species licences or badger sett closure licences. With the required mitigation in place, no significant residual effects would be anticipated.
- 15.6.12 Giving regard to the developments detailed above, their individual significance and the impacts of the Proposed Development itself, it is not considered that there would be a significant combined effect from all of the above developments on biodiversity in the local region.

Air quality

- 15.6.13 The Zol for Air Quality is identified as extending 350m from the Site boundary for the construction phase cumulative assessment. None of the developments captured by the cumulative assessment are located closer than 350m to the Site boundary for the construction phase except the Padeswood CO₂ Spur Pipeline, which is adjacent to the Proposed Development on the western

boundary. Hence, only this development is considered for the in-combination construction assessment for this EIA factor.

- 15.6.14 The construction phases of the Proposed Development and the Padeswood CO₂ Spur Pipeline may occur concurrently although the expected programme for the latter is yet to be confirmed. However, it is assumed that the Padeswood CO₂ Spur Pipeline would include mitigation such as a Dust Management Plan (DMP), similar to that in place for HyNet North West Carbon Dioxide Pipeline (EN070007), in line with best practice guidance on the assessment of dust from earthworks and construction. This provides that all committed developments should contain appropriate dust mitigation measures. With adoption of this mitigation for both the Proposed Development and the Padeswood CO₂ Spur Pipeline, cumulative construction phase air quality effects are considered to be not significant.
- 15.6.15 The operational Zol for Air Quality is identified as extending 5km from the Site boundary. The short-listed planning application do not include developments with significant combustion sources within this Zol, which could lead to NO_x, PM, SO₂ and CO emissions.
- 15.6.16 Therefore, cumulative operational phase air quality effects are considered to be not significant.

Climate

- 15.6.17 Greenhouse gas (GHG) emissions are inherently cumulative, as all emissions contribute to the same impact on the same ultimate receptor (i.e. the global climate). On this basis, and in line with best practice, the cumulative effects of GHG emissions from projects neighbouring the development have been scoped out of the cumulative effects assessment, given 'local' emissions are of the same importance as emissions from projects globally.
- 15.6.18 However, cumulative GHG emissions have been considered in respect of the Padeswood CO₂ Spur Pipeline, given how the two projects are inherently linked (ie, if this Proposed Development does not proceed, the Padeswood CO₂ Spur Pipeline will not be constructed, and vice versa). There would be unavoidable GHG emissions associated with the construction of the underground pipeline, related to the embodied carbon of the materials and fuel use as part of the construction phase. It is not anticipated that there would be any material GHG emissions associated with the operation of the pipeline.
- 15.6.19 While the GHG emissions have not yet been assessed given the early stage of the Padeswood CO₂ Spur Pipeline planning applications any lifecycle emissions would be expected to be minor when considered alongside the lifecycle GHG emissions and savings associated with the progression of the

Proposed Development, which the Padeswood CO₂ Spur Pipeline ultimately enables.

Cultural heritage

- 15.6.20 From the short list detailed above, six applications (references 58968, 60955, 62289, 61572, 63507, and 62458) relate to residential development. Due to location and nature of these developments they are not considered to give rise to significant cumulative effects on heritage assets with the Proposed Development given the heritage information available about these projects.
- 15.6.21 The other short-listed applications, references 58975, DNS/3251545, 63104 and DNS/325253 relate to energy infrastructure developments. No significant cumulative effects on heritage assets are anticipated to arise from these developments based on the heritage assessments available. These developments are also outside of the identified Zol for cultural heritage.
- 15.6.22 EN070007 relates to the HyNet North West Carbon Dioxide Pipeline at Ewloe, Flintshire and is located 3.6km north west of the Site boundary. It is anticipated that there could be in combination impacts with the Proposed Development. Specifically:
- There are designated assets within 5km of the anticipated join point of the Padeswood CO₂ Spur Pipeline (see below) and the HyNet North West Carbon Dioxide Pipeline at Northop Hall. These comprise 19 Scheduled Monuments, four grade I listed buildings, 14 grade II* listed buildings, 163 grade II listed buildings, three grade II* registered parks and gardens, one grade II registered park and garden, and four Conservation Areas, as detailed in **Volume 4, Technical Appendix 15.2**.
 - There are eight non-designated assets within 5km of the anticipated join point of the Padeswood CO₂ Spur Pipeline (see below) and the HyNet North West Carbon Dioxide Pipeline at Northop Hall, as detailed in **Volume 4, Technical Appendix 15.2, Table 1**.
- 15.6.23 As the HyNet North West Carbon Dioxide Pipeline is below ground, it is expected that any in combination setting related effects on identified heritage assets will be limited to temporary and reversible effects during the construction period. Once operational, the only visible elements will be the Above Ground Installations at Padeswood and Northop Hall but these will be much smaller in scale and footprint than the Proposed Development and hence any in combination effect related to intervisibility will not exceed that already assessed for the Proposed Development.
- 15.6.24 Archaeological related effects will be limited in extent to the respective construction areas of the identified developments and the Proposed Development and these are not expected to interact other than at the connection interface between the Padeswood CO₂ Spur Pipeline and the Proposed Development, assessment of which is already provided in the draft Environmental Statement.

- 15.6.25 No significant cumulative effects on heritage assets are therefore anticipated from the combination of the Proposed Development and the HyNet North West Carbon Dioxide Pipeline.
- 15.6.26 While the final route of the Padeswood CO₂ Spur Pipeline has not yet been determined, the construction may present potential effects on buried archaeology and the setting of designated heritage assets during construction. Once operational there are not expected to be any additional heritage effects.
- There are 530 designated assets located within 5km of the Padeswood CO₂ Spur Pipeline, comprising 40 scheduled monuments, 16 grade I listed buildings, 31 grade II* listed buildings, 417 grade II listed buildings, two grade I registered parks and gardens, three grade II* registered parks and gardens, ten grade II registered parks and gardens, and 11 Conservation Areas, as detailed in **Volume 4, Technical Appendix 15.2**.
 - There are 171 non-designated assets identified on the publicly available National monuments Record of Wales¹⁶ – Heritage Assets spatial data located within 1km of the Padeswood CO₂ Spur Pipeline, detailed in **Volume 4, Technical Appendix 15.2**.
- 15.6.27 Although it is not possible to fully assess the potential impact of the Padeswood CO₂ Spur Pipeline on heritage assets at this point due to the limited information publicly available, the presence of both designated and non-designated assets within the locality Padeswood CO₂ Spur Pipeline corridor highlights the archaeological potential in the area, and therefore any previously unknown archaeological remains in the vicinity of the pipeline could be subject to truncation or total loss as a result of the construction of the pipeline. The significance of any such effects at this stage is unknown as will depend on the pipeline route adopted, the outcomes of the archaeological assessments completed for that project, and the extent of mitigation adopted.
- 15.6.28 There is also the potential for combined setting related impacts from the proposed installation of the Padeswood CO₂ Spur Pipeline which will require further assessment and could be used to inform design and any required archaeological mitigation. These could occur at three sections of Wat's Dyke (Scheduled Monuments, FL088, FL089 & FL090) St John the Baptists Church (grade II* listed, 18470), Hartsheath (grade II registered park and garden, PGW(C)21(FLT)), Plas Teg (grade II registered park and garden, PGW(C)24(FLT)), the modern cement works at Penyffordd (non-designated, 305769), and Laburnum Cottage (non-designated, 35967).
- 15.6.29 However, due to the largely below ground nature of the pipeline any combined settings effects which could occur are likely to be limited to the construction period and will be temporary and reversible. With adoption of adequate

¹⁶ Royal Commission on the Ancient and Historical Monuments of Wales (2024) *National Monuments Record of Wales* © Crown Database Right: RCAHMW, licensed under the [Open Government Licence 3.0](#).

mitigation (specific measures to be identified) during the pipeline construction any in combination effects are not expected to be significant.

Landscape and visual

- 15.6.30 Cumulative landscape and visual impact assessment (CLVIA) is based on best practice and information in Guidelines for Landscape and Visual Impact Assessment 3 (GLVIA3)¹⁷, which is the established industry-standard guidance for landscape and visual impact assessment. Paragraph 7.5 of GLVIA3 states that with respect to cumulative assessment, *“It is always important to remember that the emphasis on EIA is on **likely significant** effects rather than on comprehensive cataloguing of every conceivable effect that might occur”*.
- 15.6.31 Paragraph 7.10 states, *“In most cases the focus of the cumulative assessment will be on the additional effect of the project in conjunction with other developments of the same type. In some cases, development of another type or types will be relevant and may help to give a more complete picture of the likely significant cumulative effects.”*
- 15.6.32 From the short list detailed above six of the planning applications within the 5km Zol (references 58968, 60955, 62289, 63507, 62458 and 61572) relate to residential development within the context of a heavily settled landscape away from the immediate vicinity of the Site boundary. None of these developments are similar to, or relate in any way, to the Proposed Development; and they would not be viewed or considered within the same context as the proposed industrial structures being developed on a site within the boundary of an existing cement works and enclosed by woodland belts. Therefore a detailed CLVIA is not required for these developments and no significant cumulative landscape or visual effects are anticipated.
- 15.6.33 With regard to the HyNet North West Carbon Dioxide Pipeline (ref EN070007), the project is linked to the Proposed Development in that it is proposed the northern end of Padeswood CO₂ Spur Pipeline would link in with the HyNet North West Carbon Dioxide Pipeline. The HyNet North West Carbon Dioxide Pipeline would be approximately 60km in length connecting Ince (east of Ellesmere Port and approximately 21km north east of the Site boundary) to a terminal pipeline near Flint (approximately 10km north-north west of the Site boundary). The route of the HyNet North West Carbon Dioxide Pipeline is almost entirely outside the identified Zol for the LVIA, with the exception of a short section which runs through the northern-most section of the Zol between 4km and 5km from the Site boundary.
- 15.6.34 This stretch of the HyNet North West Carbon Dioxide Pipeline runs to the north of Buckley and the north of the A55 North Wales Expressway and is physically and visually separated from the Proposed Development by a major communications route, the urban area and landform. The Zone of Theoretical Visibility (ZTV) prepared for the above ground elements of the HyNet North West Carbon Dioxide Pipeline has been reviewed and only small and very occasional areas of landscape within the HyNet North West Carbon Dioxide

¹⁷ Landscape Institute in collaboration with IEMA (2013). *Guidelines for Landscape and Visual Impact Assessment (GLVIA3)*. Not available online.

Pipeline ZTV overlap with the ZTV prepared for the Proposed Development. It is unlikely that the two operational developments would be visible simultaneously and any long-term cumulative visual effects would only be Negligible or None.

- 15.6.35 For the construction of the Padeswood CO₂ Spur Pipeline, a full assessment of cumulative landscape and visual effects with the Proposed Development is limited by the current lack of knowledge of the spur pipeline route. We can anticipate, however, that construction impacts would be small, temporary and short-term and once operational the pipeline would be underground and therefore it is highly unlikely that any significant residual visual impacts would be created.
- 15.6.36 Should the HyNet North West Carbon Dioxide Pipeline or the Padeswood CO₂ Spur Pipeline require the removal of landscape elements such as hedgerows or mature trees it is anticipated that these would be reinstated where possible and trees replaced elsewhere if need be. This may lead to short-term effects if those trees also provide a benefit of screening potential views of the Proposed Development but it is not anticipated that tree removal would be required on the scale which may make such an effect significant.
- 15.6.37 At this stage it is not possible to provide quantitative assessment of the cumulative landscape and visual impacts arising from the Padeswood CO₂ Spur Pipeline connection in addition to the Proposed Development, other than to reiterate that an underground pipeline of this scale will not create long-term operational cumulative impacts on landscape character and visual amenity, other than minor changes in the location or nature of landscape elements due to, for example, localised tree or hedge removal during pipeline construction.
- 15.6.38 Construction details of the Padeswood CO₂ Spur Pipeline are not available, however it is assumed that any landscape elements disturbed by the construction would be reinstated i.e. replacement hedgerows would be planted; lost or disturbed mature trees would be replaced and so on. It is noted that replacement in situ may not always be possible due to the operational restrictions of the pipeline, however, tree removal is not anticipated at the scale that would change the character of the landscape or significantly alter the degree of screening offered to the Proposed Development by existing tree cover. There would be the potential for low level and minor cumulative construction effects only on landscape character and visual amenity.

Noise and vibration

- 15.6.39 Of those developments contained within **Table 15.3** Application reference 60955 (erection of 10 affordable walk-up apartments and 2 affordable houses) is the nearest. From the planning information available, there is no mention of fixed plant infrastructure associated with the shortlisted development and therefore is likely to have a negligible impact on the sensitive receptors considered. As the operational phase impacts from the Proposed Development are not significant and operational impacts associated with the shortlisted

development are likely to be negligible, cumulative impacts are considered not significant.

- 15.6.40 Construction phase information available through application 60955 and the nature of works to be carried out is insufficient to determine cumulative impacts at this stage. However, it is assumed that construction works would be subject to their own assessment and mitigation plans to be agreed with the regulatory agencies. In light of the above, it is considered that cumulative impacts are not significant.
- 15.6.41 All other shortlisted developments, including HyNet North West Carbon Dioxide Pipeline (EN070007), were not within the Zol considered for noise and therefore, cumulative effects are not significant.
- 15.6.42 Construction of the southern section of the Padeswood CO₂ Spur Pipeline, and the connecting interface at the Site will occur within the identified 2km Zol. At this stage the timing and extent of construction works for the Padeswood CO₂ Spur Pipeline is unknown, but they will be temporary and reversible, and likely to be of a scale not exceeding the construction works for the Proposed Development already assessed in **Volume 2, Chapter 10; Noise and vibration**.
- 15.6.43 Should the construction of both projects proceed in parallel there may be some additive effect of construction noise affecting the same receptors, particularly to the north of the Site. However, it is expected that construction noise can be readily mitigated through standard measures such that any residual effect is not significant.
- 15.6.44 No significant cumulative effect is anticipated during operation as the Padeswood CO₂ Spur Pipeline will be buried underground and is not expected to generate noise.

Traffic and transport

- 15.6.45 Assessment of cumulative development effects arising from the shortlisted projects has been considered for the construction phase of the Proposed Development only, (as operational traffic effects have been scoped out of assessment for the Proposed Development). Review of the shortlisted proposals in terms of information available, construction phase estimated timescales and proposed routing of traffic has been completed.
- 15.6.46 The review identified that the only highway link which may result in cumulative development and proposed development traffic is the A494: North of A541.
- 15.6.47 The exact routes of all of the shortlisted projects are not known, though the cumulative construction phase impacts are considered to be not significant where the following developments were included (the location of the other shortlisted developments is such that they are not expected to overlap with the links used by the Proposed Development).
- 62289 - Screening Opinion for construction of residential development (Max. 200 dwellings) and associated works (2.1km from the Site boundary);

- 61572 - Development of 56 no. dwellings, including new roadway, parking areas, landscaping and drainage connections including formation of swale (2.8km from the Site boundary);
- DN/3251545 - A proposed solar farm and grid connection and associated supporting energy infrastructure (7.0km from the Site boundary);
- 062458 – Development of up to 140 residential properties (2.2km from the Site boundary); and
- 063507 – Development of up to 83 residential properties, including affordable housing (4.5km from the Site boundary).

15.6.48 The exception to this is the A494 Mold Expressway link, which is anticipated to have some overlap in traffic between the shortlisted developments and the Proposed Development. Based on the information available at the time of writing, the identified shortlisted developments generate an estimated 426 LGVs and 94 HGVs which have been considered on the A494 Mold Expressway link based on their proposed locations. No other link interactions are expected to align with the Proposed Development's study area. The resulting cumulative impact during Proposed Development construction was anticipated as not significant with a percentage change maximum of 0.3% All vehicles and 4.9% HGVs in the HGV peak (Scenario 1); in Scenario 2, this equates to 0.1% All vehicle change and 1.6% HGV.

15.6.49 In respect of the Padeswood CO₂ Spur Pipeline, it is considered that the known routing alignment is not likely to significantly impact receptors associated with traffic and transport. However, confirmation of proposed construction access locations and vehicle numbers (which are currently not available in respect of the project) is required to definitively assess potential impacts associated with the Proposed Development, particularly given construction of the two projects is likely to occur at the same time.

15.6.50 It is anticipated that any currently unknown effects arising from coinciding construction periods can be adequately addressed through measures such as Construction Traffic Management Plans and routing agreements that would be secured for each development.

15.6.51 While the risk of cumulative construction traffic impacts remains, these would be temporary in nature, and are likely to be subject to controls and mitigation to reduce impacts as has been proposed for the Proposed Development. No operational impacts on traffic from the operational pipeline are anticipated, given it will not require staff other than infrequent maintenance or repair trips to operate.

Land and soils

15.6.52 The Zol for land and soils is identified as extending 1km from the Site boundary. None of the developments being covered by the cumulative assessment are located closer than 1km from the Site boundary, except for the Padeswood CO₂ Spur Pipeline which is assessed below. The nearest is the residential development at Princess Avenue, Buckley (reference 60955, located 1.4km from the Site boundary). The comparatively much smaller scale of the Princess Avenue development would only be expected to influence land and soils within

its immediate proximity; there is unlikely to be an in-combination effect with the Proposed Development extending into the 1km identified Zol.

- 15.6.53 The Padeswood CO₂ Spur Pipeline will overlap with and is adjacent to the Site from the western boundary. The route proceeds in a westerly direction, and only the closest section of the route (within the 1km Zol) has been considered by this cumulative assessment.
- 15.6.54 Mineral resources are not considered to be at risk from the Padeswood CO₂ Spur Pipeline, as these are not significantly affected by the Proposed Development and are expected to have been a routing criteria in selection of the Padeswood CO₂ Spur Pipeline corridor.
- 15.6.55 With respect to soil and geological units, the Proposed Development is assessed as having limited impact on soils within the Site boundary, and geological units (both superficial and bedrock deposits) are considered to be of low sensitivity.
- 15.6.56 The construction and operation of the Padeswood CO₂ Spur Pipeline is expected to have effects of a similar nature and magnitude to those already assessed for the Proposed Development but as these are not significant for either element and there is no interactive effect between the two, the in-combination effect is expected to be not significant.
- 15.6.57 With respect to groundwater, the hydrogeological units are considered to be of moderate sensitivity both beneath the Site, and the adjacent land to the west (secondary A aquifer in bedrock and secondary undifferentiated aquifer in superficial geological units, both of which are assigned low vulnerability classifications) but given the additional mitigation that will be undertaken as part of the Proposed Development, and which will be of corresponding benefit to the Padeswood CO₂ Spur Pipeline construction, a significant cumulative effect would not be anticipated.
- 15.6.58 Consideration of the potential for residual significant cumulative effects as a result of the Padeswood CO₂ Spur Pipeline being constructed alongside the Proposed Development has therefore concluded that there would be no significant effects for this environmental factor.

Major accidents and disasters

- 15.6.59 The majority of the shortlisted developments are of a type, location and character that they do not directly influence the risk of major accident and disaster occurring as a result of the Proposed Development. The development of additional housing within the wider vicinity of the Site would present additional receptors in the unlikely event of a major accident or disaster but none of the shortlisted planning applications result in residential use being developed closer than any existing receptors. Of those potential residential developments considered in this cumulative assessment, the total number of new dwellings proposed (*circa* 372) is not likely to lead to a major increase in the number of residential receptors within the study area. The measures required to protect occupants of new properties would therefore not exceed

those measures already proposed. None of the identified cumulative developments would pose a new or increased risk of a major accident or disaster occurring.

- 15.6.60 The proposed HyNet North West Carbon Dioxide Pipeline (EN070007) presents similar accident and disaster risks to those identified for the Proposed Development, particularly around the identified potential for accidental release of carbon dioxide. Whilst this is a matter that both projects are required to address through consenting and implementation, the respective locations being a minimum of 3.6km from each other is such that there is unlikely to be overlap in the receptors considered by each assessment and therefore a significant in combination effect is not anticipated beyond that already assessed for each project individually.
- 15.6.61 At this stage there is limited information available relating to the connection to the Padeswood CO₂ Spur Pipeline and the safety processes that the project will use during the construction and operation phases. However, it is assumed that all construction activities, materials and methods will be in line with existing best practice safety measures and processes. Through the implementation of such measures, it is unlikely the pipeline construction will lead to any incidents that have the potential for major accidents or disasters to occur. As such, the construction of the Padeswood CO₂ Spur Pipeline is not likely to lead to any in combination effects relating to major accidents or disasters.
- 15.6.62 Once operational, the pipeline will carry CO₂ captured at the existing site in a large quantity. It is expected that the pipeline will have been designed to prevent leaks or defects and this will minimise the potential for hazards relating to a large release of CO₂ occurring. The operation of the pipeline is also expected to be compliant with a series of management plans and safety processes that would be designed to prevent or minimise to as low as reasonably possible the potential for a major accident or disaster to occur. This would be expected to include safety 'shut off' measures that would automatically be enabled in the unlikely event that there was a leak in the pipeline. Such safety measures would prevent any 'chain reaction' scenario should there be an issue with either the Proposed Development or the pipeline extending away from the Site. Thus, once operational, the pipeline is not expected to give rise to any incidents that would be deemed a major accident or disaster, and does not present any additional in combination effects with the Proposed Development.

15.7 Assessment of Effects: Intra-project combined effects

Stage 1 Screening

- 15.7.1 The approach to the assessment of intra-project combined effects considers the change in baseline conditions at common sensitive receptors (i.e. those

receptors that have been assessed by more than one technical topic) due to the Proposed Development.

- 15.7.2 The assessment is based upon residual effects considered to be of minor or greater significance (i.e. excluding negligible effects).
- 15.7.3 An overall assessment of the intra-project combined effects on identified common sensitive receptors has been made using professional judgement and the technical information provided in **Volume 2, Chapters 5-14**.
- 15.7.4 Only adverse residual effects with the potential for effect interactions are considered. The following environmental factors are therefore excluded from the assessment:
- Biodiversity;
 - Air quality;
 - Climate;
 - Major accidents and disasters; and
 - Material assets and waste.
- 15.7.5 The following environmental factors are included within the assessment:
- Landscape and visual (construction and operation);
 - Noise (construction and operation);
 - Traffic and transport (construction only);
 - Cultural heritage (construction and operational); and
 - Land and soil (construction only).
- 15.7.6 Potential intra-project combined effects during the construction and operational phases of the Proposed Development have been identified for the following common receptor groups:
- Residential receptors including houses, settlements and their occupants;
 - Community receptors including local road and footpath users; and
 - Other receptors including the heritage assets and minerals resources.

Stage 2 – Assessment of Intra-Project Combined Effects

- 15.7.7 **Table 15.4** presents the residual effects of the individual factors on common sensitive receptors. The potential for effect interactions are discussed in **Table 15.4** below.

Table 15.4 Residual effects of the individual factors on common sensitive receptors

Factor	Significance of Residual Effects		
	Residential Receptors	Community Receptors	Other Receptors
Landscape and visual (construction phase)	Not applicable	Major/Moderate Adverse and significant residual effects from the PRow Buckley 301/55 and Buckley 301/56	Not applicable
Landscape and visual (operational phase)	Major/Moderate Adverse and significant residual effects on Padeswood Drive West, Bannel Lane and Spon Green	Major/Moderate Adverse and significant residual effects from Pen-yr-allt, PRow Buckley 301/55 and Buckley 301/56, PRow Leeswood 408/73 and 408/75 (incorporating Wat's Dyke Way)	Not applicable
Traffic and transport (construction phase)	Not applicable	Minor adverse residual not significant effects on the A5118, A550, A55 and A494	Not applicable
Noise (construction phase)	Minor adverse, not significant, at several locations during construction	-	Not applicable
Noise (operational phase)	Minor adverse, not significant, effects on properties to north of Padeswood Lake Road (Dyke Farm and Well House Farm)	-	Not applicable
Cultural heritage	Not applicable	Not applicable	Low adverse not significant effects

Factor	Significance of Residual Effects		
	Residential Receptors	Community Receptors	Other Receptors
(construction phase)			<p>on the Medieval ridge and furrow, Bannel Farm shafts and work shafts, modern cement works, railway siding, Hartsheath registered parks and gardens, Plas Teg registered parks and gardens and Laburnum Cottage.</p> <p>Medium adverse not significant effects on Wat's Dyke, Padeswood Hall, gardens and farm buildings, modern football ground, St John the Baptist Church</p>
Cultural heritage (operational phase)	Not applicable	Not applicable	<p>Low adverse not significant effects on the Medieval ridge and furrow, Hartsheath registered parks and gardens, Plas Teg registered parks and gardens and Laburnum Cottage</p> <p>Medium adverse not significant effects on Wat's Dyke, St John the Baptists Church</p>

Factor	Significance of Residual Effects		
	Residential Receptors	Community Receptors	Other Receptors
Land and soil (construction phase)	Not applicable	Not applicable	Minor adverse, not significant effects on mineral resources

Residential receptors

- 15.7.8 The residential receptors group includes houses, settlements and their occupants within the local area.
- 15.7.9 The landscape and visual effects of the Proposed Development on Padeswood Drive West, Bannel Lane and Spon Green are reported in detail within **Volume 2, Chapter 9: Landscape and Visual**. This includes identification of Major/Moderate adverse and significant residual effects as a result of the new structures that form the operational phase of the Proposed Development. No secondary or tertiary mitigation is proposed as all identified measures that can be accommodated within the Site boundary have already been accepted by the Applicant and form embedded mitigation.
- 15.7.10 The noise effects of the Proposed Development are reported in detail within **Volume 2, Chapter 10: Noise and vibration**. This identifies that with the embedded mitigation identified during the project iteration and design, operational noise effects will not be significant. The potential noise effects on residential receptors during construction will be mitigated via the measures set out in the Outline Construction Environment Management Plan (OCEMP) (**Volume 4, Technical Appendix 2.1**) and within **Volume 2, Chapter 10: Noise and vibration**.
- 15.7.11 The traffic and transport effects of the Proposed Development on the local road network are reported in detail within Volume 2, Chapter 11: Traffic and Transport, with minor adverse and not significant residual effects as a result of the construction and operational phases of the Proposed Development. The assessment takes into account a number of aspects including severance, road safety, fear and intimidation which can affect residential receptors along the local road network.
- 15.7.12 Due to the assessment methods adopted, and the corresponding differences in identification of receptors, no individual receptor is specifically assessed in each of the landscape and visual, noise and vibration and traffic and transport chapters. However, interpretation of the results presented indicates that:
- Construction related effects may be experienced simultaneously for all three assessment topics at properties to the north of the Site boundary in the vicinity of Padeswood Drive;
 - Construction related noise and visual effects (but not traffic) may be experienced simultaneously at properties to the south of the Site boundary in

the vicinity of Padeswood Lake Road, including Dyke Farm and Well House Farm;

- Operational effects may be experienced simultaneously for traffic and visual (but not noise) at properties to the north of the Site boundary in the vicinity of Padeswood Drive; and
- Operational effects may be experienced simultaneously for noise and visual (but not traffic) in the vicinity of Padeswood Lake Road, including Dyke Farm and Well House Farm.

15.7.13 No more than a maximum of one environmental factor is assessed as significant at any one location, and all locations identified are already characterised as being in the setting of the existing cement works in terms of its visual prominence, noise and generation of traffic. Further reference to the assessments provided in the respective draft Environmental Statement chapters indicates that where effects do occur at specific locations these are consistent with the established use of the cement works. The potential for intra-project effects to arise at any greater significance than that already assessed in the draft Environmental Statement chapters is therefore limited, and not anticipated to give rise to any additional operational significant effects.

Community receptors

15.7.14 The community receptors group includes road users and footpath users on transport links and PRoW in the local area.

15.7.15 The landscape and visual effects of the Proposed Development on Pen-yr-allt, PRoW Buckley 301/55, Buckley 301/56, Leeswood 408/73 and Leeswood 408/75 (incorporating Wat's Dyke Way) are reported in detail within **Volume 2, Chapter 9: Landscape and visual**, including identification of Major/Moderate adverse and significant residual effects as a result of the construction and operation of the Proposed Development.

15.7.16 The traffic and transport effects of the Proposed Development on the A5118, A550, A55 and A494 are reported in detail within **Volume 2, Chapter 11: Traffic and transport**, and are considered to have a minor adverse and not significant residual effect as a result of construction of the Proposed Development. These impacts are mitigated through the implementation of a Construction Traffic Management Plan (CTMP) and a Travel Plan (**Volume 4, Technical Appendix 11.2**).

15.7.17 For the construction phase, it is not considered that there is a significant combined effect arising from visual and traffic impacts as these impacts are temporary, of limited duration and reversible. Additionally, whilst these impacts are upon the community receptor group, they will affect different individual receptors. The local road network serves predominantly car users, whilst visual effects are experienced from local footpaths, therefore this further reduces the opportunity for a significant combined effect.

15.7.18 For the operational phase, traffic related effects are considered negligible. Whilst this does not exclude a combined intra-project effect being significant if experienced across multiple environmental factors, the fact that operational

traffic movements are forecast to be small in the context of the existing cement works operation and that only two other environmental factors (noise and landscape / visual) are identified in the assessment criteria mean that this position remains valid.

- 15.7.19 Reference to the respective draft Environmental Statement chapters indicates considered that noise and visual related effects may interact at public locations to the south of the Site boundary, particularly for example at Padeswood Lake Road and the identified PRoWs as **Table 15.4**. However, for noise the assessment focuses primarily on residential locations as exposure at community locations will be transient and temporary and unlikely to be significant.
- 15.7.20 Taking into account the nature and significance of the effects predicted, and the small number of inter-acting environmental factors (i.e. two), it is considered that operational intra-project effects are unlikely to exceed the significance already assessed in the respective draft Environmental Statement chapters.

Other Receptors

- 15.7.21 The 'other receptors' group include cultural heritage assets and minerals resources, as assessed in **Volume 2, Chapter 8: Cultural heritage** and **Volume 2, Chapter 12: Land and soils** respectively.
- 15.7.22 Setting related assessment for cultural heritage assets already takes into account other intra-project effects, in particular landscape and visual effects but also issues such as noise and traffic. Intra-project effects are therefore already implicit in the assessment provided for cultural heritage and no further assessment is needed.
- 15.7.23 The mineral resource assessment relates primarily to coal measures known to be present beneath and in proximity to the Site boundary. It is not envisaged that there is any interaction between potential effects on these reserves and the identified noise, landscape, traffic and cultural heritage effects noted above. Therefore, no further assessment is required.

15.8 Difficulties and uncertainties

- 15.3.3 The assessment of inter-project cumulative effects is limited to publicly available information obtained from the relevant planning applications on the Flintshire County Council, DNS and PINS planning portal websites.
- 15.3.4 The information obtained from the relevant planning portals for the developments in the long list and short list is up to date as of the date of search (11/04/2024).

15.9 Summary

- 15.9.1 Cumulative effects occur as a result of several actions on an environmental receptor which may overlap or act in combination. The following types of

cumulative effects have been considered in accordance with the EIA Regulations and best practice guidance:

- Inter-project cumulative effects – the combined residual (post-mitigation) effects of the Proposed Development and another project or projects on a single receptor/resource; and
- Intra-project combined effects – the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor.

15.9.2 The cumulative assessment identifies that inter-project and intra-project effects are not predicted to result in any greater significance of effects than that already assessed through **Volume 2, Chapters 5 -14**.

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15.10 References

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