

Chapter 23: Cumulative Effects and Interactions

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23. Cumulative Effects and Interactions

23.1 Introduction

23.1.1 This Preliminary Environmental Information (PEI) Report chapter addresses the potential for effect interactions and cumulative effects. These effects result from incremental changes caused by other present and reasonably foreseeable plans and projects together (i.e. cumulatively) with the Proposed Development.

23.1.2 The PEI Report considers the assessment of two types of cumulative effects: effect interactions (also known as ‘in-combination’ effects) and cumulative effects with other developments:

- a. Effect Interactions – the combined effect of individual impacts from the Proposed Development, which have been identified as part of the assessments reported within **Chapters 7-22** in PEI Report **Volume 2**, that are considered likely to result in a new or different likely significant effect, or an effect of greater significance than any one of the impacts on their own. For example, this can happen during construction if a receptor is subjected to noise, dust, and visual impacts associated with site works; and
- b. Cumulative Effects – where there is the potential for two or more developments that are reasonably foreseeable and/or consented, but not yet forming part of the baseline environment, within close enough proximity to the Proposed Development to lead to significant cumulative environmental effects on the same receptor.

23.1.3 Supporting information, including a figure and appendices, is listed in **Table 23-1**.

Table 23-1: Supporting documentation

Reference	Title
<i>Figures (provided in PEI Report Volume 3)</i>	
Figure 23-PD-1	Location of Preliminary Short-listed Other Developments
<i>Appendices (provided in PEI Report Volume 4)</i>	
Appendix 23-PD-1	Consultation
Appendix 23-PD-2	Preliminary Shortlist of Other Developments

23.2 Consultation

Phase One Public Consultation

23.2.1 Below is a summary of key topics raised from Phase One Public Consultation undertaken between 11 September and 25 October 2024 with regards to the cumulative effects and effects interaction:

- a. Cumulative and In-Combination Effects: ensure the Environmental Statement (ES) addresses cumulative impacts of all relevant schemes, foreseeable projects, and hydrologically linked sites, including Chiltern-specific zone of Influence (ZOI) and biodiversity considerations.
- b. Technical Assessments and Methodologies: apply site-specific modelling for canal discharges, robust traffic forecasting (beyond Trip End Model Presentation Program (TEMPRO)), Landscape Character Assessment (LCA), and updated materials / waste data. Incorporate climate resilience in flood risk and drainage design.
- c. Stakeholder Engagement and Infrastructure Protection: Maintain ongoing consultation with statutory bodies (e.g. Environment Agency, Natural England, Alliance for Water Stewardship, local authorities) to agree methodologies, safeguard existing utilities, and document outcomes in Statements of Common Ground and draft Development Consent Order (DCO) provisions.

23.2.2 These topics have been taken into consideration for the Proposed Development and EIA¹.

EIA Scoping

23.2.3 A formal request for an EIA Scoping Opinion was submitted to the Planning Inspectorate (PINS) on behalf of the Applicants on 28 March 2025 in accordance with Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') (Ref. 1). This request was accompanied by an EIA Scoping Report (provided in **Appendix 5-PD-1** of PEI Report **Volume 4**), in accordance with Regulation 10(3) of the EIA Regulations.

¹ A Phase One Public Consultation Report has been made available at Phase Two Public Consultation, which sets out activities undertaken to deliver the consultation and provides a summary of the key themes and issues raised, and how the project has considered these.

- 23.2.4 A summary of EIA Scoping Opinion comments received in relation to effect interactions and cumulative effects assessment are provided in **Appendix 23-PD-1** in PEI Report **Volume 4**.

Phase Two Public Consultation

- 23.2.5 The preliminary shortlist of other developments is provided in **Appendix 23-PD-2** in PEI Report **Volume 4**.
- 23.2.6 Following the Phase Two Public Consultation, the shortlist of other developments for the cumulative effects assessment at the ES stage will be developed in consultation with relevant local authorities.
- 23.2.7 Details of this consultation process will be provided in the ES.

23.3 Legislation, policy and guidance

- 23.3.1 This section identifies the legislation, potential policy and other guidance that has informed the effect interactions and cumulative effect assessments.

Legislation

The EIA Regulations

- 23.3.2 Regulation 5(2) of the EIA Regulations (Ref. 1) makes explicit reference to the requirement for an assessment of the effect interactions between types of effect, and 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 the following factors— ... (e) the interaction between the factors referred to in sub-paragraphs (a) to (d)”

- 23.3.3 No further guidance or requirement beyond the need for an assessment of the interrelationships between types of effect is provided.

- 23.3.4 In terms of cumulative effects, Schedule 4 paragraph 5 of the EIA Regulations requires an ES to include:

“A description of the likely significant effects of the development on the environment resulting from, inter alia— ... (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources ... The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.”

National Policy

National Policy Statement for Water Resources Infrastructure

- 23.3.5 The primary basis for deciding whether to grant a DCO for the Proposed Development is the National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 2). The NPSWRI sets out various policies relating to cumulative effects and effect interactions, including (but not limited to):
- a. Paragraph 3.2.6: *“When considering significant cumulative effects, any Environmental Statement should provide information on how the effects of an applicant’s proposal would combine and interact with the effects of other development (including projects for which consent has been granted).”*
 - b. Paragraph 3.2.7: *“The Examining Authority should consider how significant cumulative effects, and the interrelationship between effects, might as a whole affect the environment, even though they may be acceptable when considered on an individual basis or with mitigation measures in place.”*
 - c. Paragraphs 4.2.3, 4.8.7, 4.9.2, 4.13.7, 4.14.22 and 4.15.6: *“Where the development is subject to Environmental Impact Assessment... an assessment of any likely significant ... cumulative impacts”* of the following: air quality; historic environment; landscape and visual impacts; traffic and transport; and water quality and resources.

Local policy

- 23.3.6 Local policy considered includes relevant Local Plans (both adopted and emerging) and other adopted policy documents produced by the ten local authority administrative areas within which the Proposed Development is situated (refer to Table 1-4 in **Chapter 1: Introduction** in PEI Report **Volume 2**).

Guidance

- 23.3.7 In addition, the assessment has been undertaken with reference to the following relevant guidance.

PINS’ Advice on Cumulative Effects Assessment

- 23.3.8 PINS’ ‘Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment’ (Ref. 3) provides advice regarding a staged approach for documenting the cumulative effects assessment within an ES, relevant to Nationally Significant Infrastructure Projects (NSIP), and highlights the need to consider the potential for cumulative effects to arise due to the interactions between different components of the development, as well as with ‘other existing development and/or approved development’.

- 23.3.9 The assessment will be undertaken in consideration of PINS' Advice. Inherent effects interactions will be assessed within the topics chapter of the ES as appropriate.

23.4 Assessment methodology

Effect Interactions

- 23.4.1 The assessment of effect interactions is based on the methodology described in **Chapter 6: Environmental Impact Assessment Methodology** in PEI Report **Volume 2** and considers the potential for several direct or indirect effects arising from the Proposed Development to give rise to an effect on a single receptor. There are no specific, relevant guidelines on how the assessment of effect interactions should be undertaken, and so the assessment will be undertaken on a qualitative basis using the results of the individual assessments, relying on professional judgement.

Cumulative Effects

- 23.4.2 The cumulative effects assessment is based on the methodology described in **Chapter 6: Environmental Impact Assessment Methodology** in PEI Report **Volume 2**. This has been developed in consideration of with PINS' Advice on Cumulative Effects Assessment (Ref. 3).
- 23.4.3 A four-stage approach has been adopted for this assessment, as follows:
- a. Stage 1: Establish the zone of influence and identify a long list of 'other developments' (the 'development schedule');
 - b. Stage 2: Identify a shortlist of 'other developments' for the cumulative impact assessment;
 - c. Stage 3: Information gathering; and
 - d. Stage 4: Assessment.

23.5 Assessment

Effect Interactions

- 23.5.1 There is potential for both adverse and beneficial effect interactions associated with the Proposed Development (e.g. combined noise and visual impacts on receptors in close proximity during the construction phase). The combined effects of different environmental impacts from the Proposed Development on a single receptor are determined when the environmental assessments for the separate environmental topics have been completed. The assessments are at a preliminary stage and therefore the likelihood of effect interactions resulting in significant environmental effects will be

reported in the ES, following completion of the individual environmental topic assessments.

- 23.5.2 An exercise which outlines the effects on receptors or receptor groups will be undertaken to determine the potential for effect interactions and therefore any combined effects. Only adverse or beneficial residual effects classified as minor, moderate, or major in the individual environmental topic assessments will be considered in relation to potential effect interactions. Residual effects classified as negligible are excluded from the assessment of the effect interactions as, by virtue of their definition, they are considered to be imperceptible effects on an environmental / socio-economic resource or receptor.

Cumulative Effects

- 23.5.3 The assessment of cumulative effects arising from the Proposed Development in combination with other proposed developments at the ES stage will be based upon a review of current submitted planning and DCO applications as well as a study of policy documents.
- 23.5.4 As part of Stage 1, a preliminary long list was established in mid-2025 using the ZOIs and search criteria set out in Table 6-6 and Table 6-7, respectively, in **Chapter 6: Environmental Impact Assessment Methodology** in PEI Report **Volume 2**.
- 23.5.5 The cumulative study for the Proposed Development is currently at Stage 2 and is focused on the identification of relevant developments and land allocations within the Zoi which have the potential to generate significant cumulative effects. As part of this process, the long list is then shortlisted down to focus on those other developments that have the potential to result in likely significant cumulative effects with the Proposed Development and thus should be progressed to Stage 3 and 4.
- 23.5.6 The preliminary shortlist of other developments is provided in **Appendix 23-PD-2** in PEI Report **Volume 4**.
- 23.5.7 Stages 3 and 4 will be undertaken for the ES stage following agreement of the shortlist through ongoing engagement with the relevant local and consenting authorities.

23.6 Next Steps

Effect Interactions

- 23.6.1 The technical topic preliminary assessments (as presented in **Chapters 7-22** in PEI Report **Volume 2**) will be updated for the ES, taking account of comments received from the Phase Two Public Consultation, ongoing

stakeholder engagement, the final Proposed Development design, and associated further assessment as identified within the PEI Report.

- 23.6.2 This will allow the effect interaction assessment to be undertaken in its entirety, using the identified residual effects of the Proposed Development.

Cumulative Effects

- 23.6.3 The initial long list and shortlist (Stages 1 and 2, respectively) will be further refined prior to the preparation of the ES, aided by ongoing consultation with the relevant local and consenting authorities. This will ensure that all other developments with the potential to result in potentially significant cumulative effects (when considered together with the Proposed Development) are considered by each of the technical topic assessments.
- 23.6.4 Stage 3 will involve the collation of information relating to the short-listed schemes, including the design and location, programme for construction, operation and demolition, and any environmental assessments carried out.
- 23.6.5 Stage 4 will involve the assessment and identification of potentially significant cumulative effects in combination with the Proposed Development. The absence of information gathered at Stage 3 for some developments listed in the shortlist such as development allocations may mean they cannot progress to assessment as part of Stage 4.
- 23.6.6 The ES will report the results of the assessment with particular consideration given to any significant cumulative effects that are identified, and the need for mitigation. These effects will be reported within individual technical topic chapters as relevant with full details of Stages 1-4, including the final other development list, reported within an ES appendix and summarised within a cumulative effects and interactions chapter.

23.7 References

- Ref. 1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 02/02/2026].
- Ref. 2 Department for Environment, Food & Rural Affairs (Defra) (2025) National Policy Statement for Water Resources Infrastructure. Available at: <https://www.gov.uk/government/publications/national-policy-statement-water-resources-infrastructure> [Accessed 02/02/2026].
- Ref. 3 Planning Inspectorate (PINS) (2024) Planning Inspectorate's Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment> [Accessed 02/02/2026].