Hampshire Water Transfer and Water Recycling Project

Environmental Statement – Chapter 20 Cumulative and in-combination effects

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20.1 Introduction

20.1.1 This chapter provides an assessment of the cumulative effects and in-combination effects that may be experienced by common receptors during the construction, operation and decommissioning of the Hampshire Water Transfer and Water Recycling Project (hereafter referred to as the 'Proposed Development'), which is being progressed by Southern Water Services Limited ('the Applicant').

1. **Cumulative effects** are effects from the interrelationship between the Proposed Development with other developments (inter-project).
2. **In-combination effects** are effects from the interaction between individual effects of the Proposed Development, i.e. the interrelationship between different environmental topics (intra-project).

20.1.2 Cumulative effects occur when a resource, receptor or group of receptors are affected by more than one development at the same time. For example, two visually intrusive developments proposed within a sensitive landscape or conservation area may result in more significant landscape and visual effects than just one development considered in isolation.

20.1.3 In-combination effects occur when a resource, receptor or group of receptors are potentially affected by more than one source of environmental impact resulting from the same development. For example, a community may be affected by noise and dust effects resulting from the construction phase activities of a single development.

20.1.4 Whilst this Environmental Statement (ES) presents an assessment of the effects that may occur from decommissioning activities of the Proposed Development, the Applicant is not seeking consent for decommissioning.

20.1.5 This chapter details the legislation, policy and guidance that is relevant to a cumulative and in-combination effects assessment, summarises the engagement undertaken to date, and sets out the scope and methodology of assessment. Following this, the likely significant cumulative and in-combination effects are assessed taking account of embedded primary, tertiary and secondary mitigation, with the need for any additional secondary mitigation as a result of cumulative and in-combination effects considered. Resultant residual effects are then identified.

20.1.6 This chapter should be read in conjunction with Environmental Statement (ES) Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6), and the topic assessments presented in the following ES Chapters Volume I (Document reference 6.1, DCO Volume 6):

1. ES Chapter 6 Air quality and odour
2. ES Chapter 7 Archaeology and cultural heritage
3. ES Chapter 8 Terrestrial and freshwater biodiversity
4. ES Chapter 9 Marine biodiversity
5. ES Chapter 10 Carbon and climate change
6. ES Chapter 11 Land quality and ground conditions

7. ES Chapter 12 Land use and agriculture
8. ES Chapter 13 Landscape and visual
9. ES Chapter 14 Major accidents and disasters
10. ES Chapter 15 Noise and vibration
11. ES Chapter 16 Resources and waste management
12. ES Chapter 17 Socio-economics, tourism and health
13. ES Chapter 18 Traffic and transport
14. ES Chapter 19 Water environment

20.2 Legislation, policy and guidance

20.2.1 This section identifies the legislation, policy, guidance and other documentation that has informed the cumulative and in-combination effects assessment.

Table 20-1 List of relevant legislation

Legislation description	Relevance to assessment
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) [1]	Paragraph 2 of Regulation 5 states that an Environmental Impact Assessment must describe and assess… *(e) the interaction between factors…"* *(i.e. population and human health, biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC2[1], land, soil, water, air and climate, material assets, cultural heritage and the landscape.)*
	Paragraph 5 of Schedule 4 states that an ES should include: *"(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".*

National policy

20.2.2 The primary policy for deciding whether to grant a Development Consent Order (DCO) for the Proposed Development is the National Policy Statement for water resources infrastructure (NPSWRI) [2]. This sets out policies to guide how DCO applications for water resources infrastructure should be decided and how the effects of such infrastructure are considered. Table 20-2 lists the paragraphs from the NPSWRI that may be relevant to the cumulative and in-combination effects assessment. It also specifies where these policy requirements are addressed within the chapter.

Table 20-2 List of relevant national policy

Relevant paragraph reference	Policy requirement	Where addressed in chapter
National Policy Statement for water resources infrastructure 2025 [2]		
3.1.3	*"In considering any proposed development, and in particular, when*	Cumulative and in-combination effects are

[1] Directives still apply as they had effect immediately before exit day.

Relevant paragraph reference	Policy requirement	Where addressed in chapter
	weighing its adverse impacts against its benefits, the Examining Authority and the Secretary of State (SoS) should take into account its potential… adverse impacts, including any longer-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts."	considered in section 20.7. Any additional mitigation proposed as a result of cumulative effects is detailed in section 20.7.
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)."*	Cumulative effects are considered in section 20.7.
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."*	Cumulative and in-combination effects are considered in section 20.7.
3.12.4	*"[health] impacts may affect people in a cumulative manner…should consider the cumulative impact on health."*	The health assessment is inherently cumulative and is considered in ES Chapter 17 Socio-economics, tourism and health, Volume I (Document reference 6.1, DCO Volume 6).
4.2.5	*"The Environmental Statement should describe…any significant air quality effects, associated with the development (both alone and in-combination)"*	Cumulative and in-combination effects are considered in section 20.7.
4.3.15	*"Where a proposed development is likely to have a significant adverse effect on a SSSI* [Sites of Special Scientific Interest] *(either individually or in combination with other developments)…"*	Cumulative effects are considered in section 20.7.
4.4.12	Footnote 122 in relation to climate change "*…Including the level of emissions and the impact of those on national and international efforts to limit climate change, both alone and where relevant in combination with other developments at a regional or national level, or sector level."*	The assessment of emissions, including the Proposed Development alone and where relevant in-combination with other developments, is set out in detail in section 10.8 of ES Chapter 10 Carbon and

Relevant paragraph reference	Policy requirement	Where addressed in chapter
		climate change, Volume I (Document reference 6.1, DCO Volume 6).
National Planning Policy Framework 2025 [3]		
165 (a), 171, 198, 199, 223 (f), 224 (b)	Topics should take into account cumulative impacts.	Cumulative effects are considered in section 20.7.

Local policy

20.2.3 The local policies listed in Table 20-3 may be considered relevant to the cumulative and in-combination effects assessment of the Proposed Development. While the SoS is required to determine an application for development consent in accordance with the NPSWRI, it may be that the SoS considers aspects of local policy to be matters that are important and relevant to the determination. In the event that there is any conflict between these local policies and the NPSWRI, the NPSWRI would prevail for the purposes of decision making given the national significance of the infrastructure.

20.2.4 Adopted and emerging development plan policies have been considered, and those relevant are included in Table 20-3.

Table 20-3 List of relevant local policy

Local planning authority	Relevant local policy	Relevance to assessment
East Hampshire District Council (EHDC)	No relevant local policy	Not considered within this assessment
Eastleigh Borough Council (EBC)	Eastleigh Borough Local Plan 2016-2036 (Adopted April 2022) [4] • DM11: Nature conservation	DM11 includes provisions to restrict development if internationally, nationally or locally designated sites or protected species and/or habitats would be adversely affected as a result of development either individually or cumulatively with other existing or proposed developments.
Fareham Borough Council (FBC)	Fareham Local Plan 2037 (Adopted April 2023) [5] • Policy TIN2: Highway Safety and Road Network • Policy D2: Ensuring Good Environmental Conditions • Policy NE3: Recreational Disturbance on the Solent Special Protection Areas	TIN2 includes provisions to ensure the residual cumulative impact on the road networks is not severe and the impacts on the local and strategic highway network arising from the development itself or the cumulative effects of development on the network are mitigated. D2 includes provisions to ensure development proposals do not, individually, or cumulatively, have an unacceptable adverse environmental impact, either on neighbouring occupants, adjoining land, or the wider environment.

Local planning authority	Relevant local policy	Relevance to assessment
		NE3 includes provisions to ensure development will avoid or mitigate any 'in-combination' negative effects.
Havant Borough Council (HBC)	Havant Borough Core Strategy (Adopted March 2011) [6] • Policy CS12: Chichester Harbour Area of Outstanding Natural Beauty (AONB) Building a Better Future Draft Local Plan (Emerging Local Plan (Regulation 18) May 2025) • Policy 4: Infrastructure and Environmental Mitigation to Support Development • Policy 43: Amenity and Pollution • Policy 47: Accessibility, Transport and Parking	CS12 includes provisions to ensure development carefully assesses the impact of individual proposals, and their cumulative effect. Policy 4 includes provisions to ensure due consideration is given to the infrastructure needs arising from the development including cumulative effects of nearby sites. Policy 43 requires that development individually or cumulatively would not cause an unacceptable material deterioration in environmental quality. Policy 47 includes provision that any traffic generated by the development would not result in severe impacts, either individually or cumulatively.
Hampshire County Council (HCC)	Hampshire Minerals and Waste Plan (Adopted October 2013) [7] Policy 10: Protecting public health, safety and amenity Policy 12: Managing traffic	Policy 10 requires that developments avoid or mitigate environmental harm, which includes assessing cumulative effects 'in combination' with other mineral or waste activities. Policy 12 requires that traffic cumulative impacts of minerals and waste developments and other developments are considered.
Portsmouth City Council (PCC)	Portsmouth Plan (The Portsmouth Core Strategy) (Adopted October 2012) [8] • PCS8: District Centres Portsmouth Local Plan 'Regulation 18' consultation draft (Emerging Local Plan September 2021) • Policy C3: Transport • Policy G3: Water Quality (nutrient neutrality) • Policy D3: Pollution, Health and Amenity	PCS8 includes provisions to ensure there is no unacceptable adverse impact on the amenity of adjoining or nearby residents, taking into account the cumulative impact of other similar uses nearby. C3 includes provisions to ensure impacts on the local or strategic road networks are mitigated from developments and/or the cumulative effect of developments. G3 includes provisions to ensure developments must be able to demonstrate nutrient neutrality can be secured in perpetuity in order to meet the requirements of the Habitat Regulations given the potential for a cumulative impact upon the Solent's water environment.

Local planning authority	Relevant local policy	Relevance to assessment
		D3 includes provisions to ensure developments will not contribute to or be adversely affected by pollution (including cumulative levels) which cannot be addressed through mitigation. Developments will need to demonstrate where they have avoided, minimised or where necessary mitigated adverse (direct or cumulative) impacts on amenity.
Winchester City Council (WCC)	Winchester District Local Plan Part 2 Development Management and Site Allocations (Adopted April 2017) [9] • Policy DM14: Local Distinctiveness • Policy DM22: Rural Character 'Your Place Your Plan Winchester District Local Plan' 2020-2024 [10] • Policy NE13: Leisure and Recreation in the Countryside	DM14 includes provisions to ensure development considers cumulative effects on the character of an area. DM22 includes provisions to ensure the cumulative impact of developments will be considered, including any ancillary or minor development that may occur as a result of the main proposal. NE13 includes provisions to ensure a development does not create unacceptable visual or noise intrusion in the countryside, either by itself or when viewed cumulatively with other developments.
South Downs National Park Authority (SDNPA)	South Downs Local Plan 2014-2033 (Adopted 2 July 2019) [11] • Strategic Policy SD6: Safeguarding Views • Strategic Policy SD23: Sustainable Tourism • Development Management Policy SD54: Pollution and Air Quality South Downs Local Plan Review 'Regulation 18' (Emerging Local Plan January 2025) • Core Policy SD1: Sustainable Development • Strategic Policy SD6: Safeguarding Views • Strategic Policy SD23: Sustainable Tourism	SD6 includes provisions to restrict development unless it will conserve and enhance sequential views, and does not result in adverse cumulative impacts within views. SD23 ensures that development, on its own or cumulatively with other development uses, must not prejudice or disadvantage people's enjoyment of other existing and appropriate tourism and recreation activities. SD54 includes provisions to restrict development unless levels of air, noise, vibration, light, water, odour or other pollutants do not have a significant negative effect on people and the natural environment now or in the foreseeable future, taking into account cumulative impacts and any mitigation. SD1, SD6 and SD23 of the Local Plan review remain as adopted.

Guidance and advice

20.2.5 In addition, the assessment has been undertaken in accordance with relevant guidance and advice and has been compiled in accordance with professional standards. The guidance and advice which relate to this assessment are detailed in Table 20-4.

Table 20-4 List of relevant guidance and advice

Guidance and advice	Description	Relevance to assessment
Planning Inspectorate (2024) Nationally Significant Infrastructure Projects (NSIP): Advice on Cumulative Effects Assessment [12]	This note provides advice regarding a staged approach for documenting the cumulative effects assessment (CEA) within an ES, 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'. The advice notes that interrelationships (i.e. in-combination effects) are typically assessed within the topic chapters and where they are identified, these in-combination effects should be assessed in the ES. This note suggests the following guidance should be considered: • Guidelines for the Assessment of Indirect and Cumulative Impacts, Impact Interactions (1999) [13] • Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (2017) [14]	This advice and guidance has been taken into consideration in this assessment in relation to the cumulative and in-combination effects of the Proposed Development.
National Planning Practice Guidance (NPPG) [15]	This guidance states "*each application (or request for a screening opinion) should be considered on its own merits. There are occasions, however, when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development.*"	This guidance has been taken into consideration in this assessment in relation to the cumulative and in-combination effects of the Proposed Development.
Guidelines for the Assessment of Indirect and Cumulative Impacts, Impact Interactions (1999)	This guidance provides information on methods and tools to assess cumulative impacts.	This guidance has been taken into consideration in this assessment in relation to the cumulative effects of the Proposed Development.
Environmental Impact Assessment of	This guidance provides direction on how to identify, assess, and report cumulative and in-combination impacts.	This guidance has been taken into consideration in this

Guidance and advice	Description	Relevance to assessment
Projects Guidance on the preparation of the Environmental Impact Assessment Report (2017)		assessment in relation to the cumulative and in-combination effects of the Proposed Development.

20.3 Consultation, scoping and engagement

Consultation

20.3.1 Feedback received from stakeholders for each consultation relevant to cumulative and in-combination effects is summarised within the Consultation Report (Document reference 5.1, DCO Volume 5), including how the Proposed Development has had regard to the feedback. These cover the consultation responses received for the following consultations:

1. Summer 2022 Consultation
2. Summer 2024 Consultation
3. Spring 2025 Consultation
4. Autumn 2025 Consultation
5. Spring 2026 Consultation

Environmental Impact Assessment scoping

20.3.2 An Environmental Impact Assessment (EIA) Scoping Opinion was adopted by the Planning Inspectorate on behalf of the SoS on 31 August 2023. A full list of the EIA Scoping Opinion comments made by the Planning Inspectorate and their respective responses are provided in ES Appendix 5.3 Response to EIA Scoping Opinion, Volume II (Document reference 6.2, DCO Volume 6).

20.3.3 Comments received in relation to the CEA and in-combination assessment are set out in Table 20-5, describing how and where these are addressed in the ES.

Table 20-5 Environmental Impact Assessment Scoping Opinion – Planning Inspectorate Comments

EIA Scoping Opinion ID	Summary of EIA Scoping Opinion comment	How the ES addresses the EIA Scoping Opinion comment	Where addressed in the ES
3.14.2	The EIA Scoping Opinion states that in addition to the search parameters for cumulative projects that are listed in the EIA Scoping Report, the following projects should also be considered (as relevant) in the ES:	The additional parameters requested have been incorporated into the CEA methodology for	Section 20.5

EIA Scoping Opinion ID	Summary of EIA Scoping Opinion comment	How the ES addresses the EIA Scoping Opinion comment	Where addressed in the ES
	• Planning permissions and DCOs that are older than five years if there is evidence that these could have been subject to a longer implementation period or are multi-phase projects where later construction phases could coincide with the Proposed Development. • NSIPs and planning applications that are subject to adopted scoping opinions. • Refused planning applications that are subject to appeal procedures not yet determined.	identifying other projects.	
3.14.3	The EIA Scoping Opinion considers that any likely significant cumulative effects arising from the Proposed Development and shortlisted tier 1, 2 and 3 projects should be provided in the ES. Any gaps and/ or uncertainty in the assessment should be explained.	All shortlisted tier 1, 2 and 3 projects have been assessed.	ES Appendix 20.1, List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6) ES Appendix 20.2 Cumulative effects assessment, Volume II (Document reference 6.2, DCO Volume 6)
3.14.4	The EIA Scoping Report states that significant in-combination effects will be reported in the relevant topic chapters of the ES. The Inspectorate agrees with this approach subject to the ES clearly setting out the methodology used for the assessment, the impact pathways considered and the likely significant effects arising from in-combination effects (as distinguished from other effects) together with any additional mitigation required to address them.	Some topic assessments inherently assess in-combination effects, for example, the assessment of amenity effects presented in ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6). Where this is the case, these are reported in the relevant ES topic chapters, along with the methodology	In-combination effects that are inherently assessed within topic assessments are reported within ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6). These inherently assessed in-combination effects are set out in Table 20-11. Other in-combination effects are assessed in section 20.7 of this chapter, in

EIA Scoping Opinion ID	Summary of EIA Scoping Opinion comment	How the ES addresses the EIA Scoping Opinion comment	Where addressed in the ES
		used to assess these effects. Where there is the potential for additional in-combination effects not considered inherently as part of topic assessments, this is assessed in this chapter.	accordance with the methodology presented in section 20.5.
13.4.5	The EIA Scoping Opinion states the ES should state any cut-off date that has been used in respect of identifying cumulative projects for the assessment and explain why this date has been selected, and any steps proposed to update the assessment during any examination.	The list of cumulative projects included in the assessment have been consulted with the local planning authorities based on a cut-off date of February 2026.	Sections 20.5 and 20.6 refer to the cut-off date for identifying cumulative projects.
3.14.6	The EIA Scoping Opinion states the ES should include an assessment of any likely significant cumulative and in-combination effects that would arise from a phased approach, using the worst case phasing scenario that would be allowed under the DCO.	The Proposed Development will now be delivered in one phase with the worst case scenarios being assessed within the topic chapters.	The change to a single phase has been reflected as a core assumption in all chapters.
3.14.7	The EIA Scoping Opinion states the ES should include figure(s) showing the location of longlisted and shortlisted projects for the assessment of cumulative effects.	Due to the number of projects on the longlist, it was agreed with the local planning authorities that the ES would include a figure showing the location of only the shortlisted projects for the assessment of cumulative effects.	ES Figure 20.1 Projects considered as part of the cumulative effects assessment (shortlist), Volume III (Document reference 6.3, DCO Volume 6)
3.14.8	The EIA Scoping Opinion states the ES should assess any likely significant cumulative effects arising from the Proposed Development and other development which is related or consequential to it, but which is proposed to be consented	Other developments which are related or consequential to the Proposed Development but which are proposed to be consented or	The assessment methodology is set out in section 20.5, with more information on the inclusion of consequential

EIA Scoping Opinion ID	Summary of EIA Scoping Opinion comment	How the ES addresses the EIA Scoping Opinion comment	Where addressed in the ES
	or delivered separately. This includes development which may be subject to permitted development rights. The ES should clearly distinguish between Proposed Development for which development consent is sought and any other development.	delivered separately are identified in the assessment methodology and included in the assessment of cumulative effects.	developments in paragraphs 20.5.39 and 20.5.40. The assessment of cumulative effects is detailed in section 20.7 and Appendix 20.2 Cumulative effects assessment, Volume II (Document reference 6.2, DCO Volume 6).

Engagement

20.3.4 Relevant statutory consultation bodies, and particularly the host authorities as described in section 2.3 of the ES Chapter 2 Planning legislation and policy, Volume I (Document reference 6.1, DCO Volume 6) (Hampshire County Council (HCC), HBC, WCC, FBC, PCC, EBC, EHDC) as well as SDNPA, which is not a host authority, have been consulted on the longlist and also the shortlist of the 'other existing development and/or approved developments' to be included in the CEA, ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6). A summary of engagement undertaken is outlined below.

EIA Working Groups

20.3.5 Five EIA Working Groups have been established as forums for ongoing engagement with statutory bodies regarding the Proposed Development. These Working Groups when combined cover all of the assessment topics considered by the EIA. A full description of each of the EIA Working Groups, the key stakeholders, and an overview of the topics presented can be found in ES Chapter 5 EIA approach and methodology, Volume I (Document reference 6.1, DCO Volume 6). The CEA and in-combination assessment approach has been presented at these EIA Working Groups.

Joint Officer Group

20.3.6 The purpose of the Joint Officer Group (JOG) is to engage with the host authorities relevant to the Proposed Development on scheme development, programme, consultation, planning and in some cases EIA matters. The members of the JOG include HCC, HBC, WCC, FBC, PCC, EBC, EHDC and SDNPA. SDNPA attends relevant JOG meetings as needed.

20.3.7 The approach and methodology from this chapter was provided as a note to the JOG in November 2024. It was agreed that HCC would need to consider which

developments should be included from a highway's perspective. No other comments on the approach and methodology were received.

20.3.8 The longlist and shortlist of other developments was then issued to the JOG for agreement in March 2025. PCC confirmed in written comments dated 2 April 2025 that they had no further comments. HCC provided further comments on the long and shortlists via emails dated 4 April, 10 April and 12 May 2025.

20.3.9 Additional engagement with the JOG occurred in Autumn 2025. FBC confirmed in written comments dated 14 October 2025 that they had no further comments. EBC, HBC, HCC and SDNP provided further comments on the long and shortlists via emails between October 2025 and May 2026.

20.3.10 These comments have been reflected in the longlist and taken forward to the shortlist as appropriate (ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6)).

20.4 Mitigation

20.4.1 A range of measures have been embedded into the Proposed Development design to avoid or reduce environmental effects and where necessary secondary mitigation measures would be implemented. The assessment of cumulative and in-combination effects assumes implementation of these mitigation measures presented in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6).

20.5 Assessment methodology

Potential likely significant effects

20.5.1 Likely significant cumulative effects requiring assessment may be temporary or permanent and may occur during construction and operation. For in-combination, likely significant effects may be temporary or permanent and may occur during construction, operation and decommissioning. Due to the long design life of the Proposed Development, it is not possible to assess any cumulative effects associated with decommissioning. Cumulative and in-combination effects topics have been scoped in or out according to whether the effects have been scoped out during the EIA scoping process, e.g. odour effects have been scoped out for the operational phase and therefore have also been scoped out of the cumulative effect assessment for the operational phase. Where a topic assessment is inherently cumulative, it has been scoped out of the assessment detailed in this chapter so as to avoid duplication. Topics scoped in and out for the cumulative effects assessment are summarised in Table 20-6. All topics have been scoped in for the in-combination effects assessment, refer to paragraphs 20.5.41 to 20.5.50 for details on how this has been applied. The scope of these assessments has responded to feedback received as detailed in section 20.3.

20.5.2 In-combination effects during decommissioning are considered to be no greater than those identified during the construction phase and are therefore assessed to be of the same significance as those assessed for construction.

Table 20-6 Summary of the scope for cumulative effects assessment

Topic	Construction	Operation
Air quality and odour	Scoped in	Scoped out
Archaeology and cultural heritage	Scoped in	Scoped in
Terrestrial and freshwater biodiversity	Scoped in	Scoped in
Marine biodiversity	Scoped in	Scoped in
Carbon and climate change	Carbon – Scoped out Climate change resilience – Scoped in In-combination climate impact (ICCI) – considered in ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6)	Carbon – Scoped out Climate change resilience – Scoped in ICCI – considered in ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6)
Land quality and ground conditions	Scoped in	Scoped in
Land use and agriculture	Scoped in	Scoped in
Landscape and visual	Scoped in	Scoped in
Major accidents and disasters	Considered inherently in ES Chapter 14 Major accidents and disasters, Volume I (Document reference 6.1, DCO Volume 6)	Considered inherently in ES Chapter 14 Major accidents and disasters, Volume I (Document reference 6.1, DCO Volume 6)
Noise and vibration	Noise – Scoped in Vibration – Scoped in	Noise – Scoped in Vibration – Scoped out
Resources and waste management	Waste – Scoped in Minerals – Scoped out	Waste – Scoped out Minerals – Scoped out
Socio-economics, tourism and health	Scoped in	Scoped in
Traffic and transport	Scoped in	Scoped in
Water environment	Scoped in	Scoped in

20.5.3 As outlined in Table 20-6, cumulative effects of unrelated cumulative developments have been scoped out for the carbon assessment. This is in accordance with the EIA Scoping Opinion, which agreed with the proposed approach to scope out cumulative effects in the carbon assessment in alignment with the Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as the Institute of Environmental Management and Assessment) guidance, Assessing Greenhouse Gas Emissions and Evaluating their Significance [16], which states "*Effects of GHG emissions from cumulative projects therefore in general should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other*".

20.5.4 However, following the UK Supreme Court ruling in *R (Finch) v Surrey County Council* [2024] UKSC 20, carbon assessment within EIAs are required to consider indirect greenhouse gas (GHG) emissions associated with a project.

Consequently, the carbon assessment has evaluated any pathways between the Proposed Development and indirect GHG emissions during the construction and operation phase that would necessitate an assessment.

20.5.5 No indirect upstream emissions were identified for the Proposed Development. However, potential pathways to downstream emissions were identified, which include emissions resulting from additional infrastructure required directly as a consequence of the Proposed Development, or emissions associated with upgrades to existing infrastructure where such upgrades are specifically necessitated by the Proposed Development. The related and consequential projects relevant to the carbon assessment for which an assessment has been undertaken in ES Appendix 20.2 Cumulative effects assessment, Volume II (Document reference 6.2, DCO Volume 6) are listed in paragraphs 20.5.39 and 20.5.40.

20.5.6 Additionally, the Applicant considered potential indirect carbon emissions from the Proposed Development associated with water consumption. However, no causal link can be made between the provision of water resources and additional activities related to their use due to a variety of downstream uses for the water resource that would be provided by the Proposed Development, including residential, commercial and industrial purposes. Whether on a regional or national basis, it is unfeasible to establish a causal connection between an additional availability of water resources as a result of the Proposed Development and the establishment of a new consumer base, such as a new residential development or industrial facility. Therefore, these potential pathways are not capable of assessment.

Study area

20.5.7 This section describes the spatial scope for the CEA. The study area for the CEA is defined as the Zone of Influence (ZoI) and varies for each topic. The ZoI is primarily based on the study areas for each topic as set out within each ES topic chapter (ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6)). A summary is presented in Table 20-7.

Table 20-7 Zone of Influence summary table

Environmental topic	Zone of Influence
ES Chapter 6 Air quality and odour, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with relevant Natural England (NE) (2023) Guidelines for Impact Risk Zones for SSSIs [17]. • The Order Limits plus a 500m buffer for construction dust and Non-Road Mobile Machinery (NRMM) emissions. • The Order Limits plus a 3km buffer for ecological receptors with respect to construction traffic emission impacts.
ES Chapter 7 Archaeology and cultural heritage, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined through the scoping process in consultation with relevant historic environment stakeholders. • Designated heritage assets within 1km of the Order Limits and within 3km of visible elements of the Proposed Development i.e. the Above Ground Plant (AGP) sites and the Water Recycling Plant (WRP) site. • Non-designated heritage assets within 500m of the Order Limits.

Environmental topic	Zone of Influence
ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with the relevant Chartered Institute of Ecology and Environmental Management (CIEEM) (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland [18]; and NE and Department for Environment Food and Rural Affairs (2022) Standard Advice for Protected Species [19]. • The Order Limits plus a 2km buffer for both construction and operational effects on terrestrial and freshwater biodiversity receptors. • No internationally designated sites with bats as a qualifying feature are located within 10km of the Order Limits. Therefore, this ZoI is not considered in the cumulative assessment. • Statutory designated sites that are hydrologically linked to the Proposed Development within the ZoI are based on downstream sites, and groundwater dependant sites.
ES Chapter 9 Marine biodiversity, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with the relevant CIEEM (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland [18]. • The Order Limits plus a 2km buffer for all designated marine sites. • Hydrologically connected areas within 10km of the Order Limits, including the discharge point of the Eastney Long Sea Outfall (LSO) located within the Solent (anticipated extent of hydrological connection based upon tidal excursion and search range for transitory species). • The entirety of Langstone Harbour, including the tidal extent of Hermitage Stream.
ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6)	• The ZoI for the cumulative effects for the carbon assessment is described in paragraphs 20.5.3 to 20.5.6. • Cumulative effects with respect to climate resilience may arise from other developments, which have the potential to exacerbate the vulnerability of the Proposed Development to the effects of climate change, for example other projects giving rise to increased flood risk or coastal erosion. ZoI is geographically bounded by the area within the Order Limits.
ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with the relevant ISEP guidance [20]. • The ZoI consists of the Order Limits plus a 250m buffer from the Order Limits for identifying potential sources of contamination and receptors. • The Order Limits plus a 500m buffer for groundwater abstractions.
ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with the NPSWRI [2]. *Land use* • The Order Limits plus 500m for residential property, commercial property and land, development land, community facilities and land, and agricultural land.

Environmental topic	Zone of Influence
	Agriculture • The Order Limits for Best and Most Versatile (BMV) Land and soils.
ES Chapter 13 Landscape and visual, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with the relevant Landscape Institute guidance [21]. • The Order Limits plus a 3km buffer for landscape and up to 3km for views.
ES Chapter 15 Noise and vibration, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with guidance in the Design Manual for Roads and Bridges (DMRB) LA111 Noise and Vibration Rev 2 (2020) [22]. • The noise and vibration study areas for the EIA have been defined through stakeholder engagement and by identifying the noise and vibration sensitive receptors (NVSRs) with the potential to be impacted by the Proposed Development. • The ZoI during construction is no further than 300m from the Order Limits for noise, and 100m from the Order Limits for vibration. • The ZoI during operation encompasses the NVSRs at which the predicted operational noise levels from the WRP site and AGP sites have been predicted as equal to or above the Lowest Observed Adverse Effect Level. • The ZoI for indirect effects incorporates the identified road links and the closest NVSRs which are no more than 50m away from roads which the Proposed Development traffic is anticipated to result in noise level changes of at least 1dB(A).
ES Chapter 16 Resources and waste management, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with the relevant ISEP (2020) Materials and Waste in EIA guidance [23]. • The ZoI for waste considers the area where landfill capacity has been identified as being likely to be affected by the Proposed Development. This includes the whole of London, South East and South West regions.
ES Chapter 17 Socio-economics, tourism and health, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with the relevant Homes and Community Agency (2014) Additionality Guide (Fourth Edition) [24]. *Socio-economics* • Employment and skills arising from the construction and operation of the Proposed Development consider a ZoI at a local planning authority level, and also at a sub-regional and regional level. *Tourism* • The Order Limits plus a 500m buffer. *Health* • ZoI defined on a ward level which intersect the Order Limits. The relevant local planning authority and ward boundaries are shown in ES Figure 17.1 Study area: Administrative

Environmental topic	Zone of Influence
	boundaries, Volume III (Document reference 6.3, DCO Volume 6).
ES Chapter 18 Traffic and transport, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with traffic modelling and relevant ISEP (2023) Guidelines for the Environmental Assessment of Road Traffic [25]. • The traffic and transport ZoI for the EIA has been established through stakeholder engagement as part of the Transport Assessment Scoping Report. The ES ZoI has been defined by identifying the most probable routes for construction traffic, for both the movement of materials and employees, and operational traffic. The indicative study area for the purposes of the ES is shown in ES Figure 18.1 Local highway network, Volume III (Document reference 6.3, DCO Volume 6).
ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6)	• ZoI defined in accordance with Environment Agency guidance as outlined within Table 19-5 Summary of the study area for the water environment, ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6). *Surface water (including flood risk)* • ZoI is defined based on the hydrological catchments that intersect with the Order Limits. • ZoI associated with changes to the discharge from the Eastney LSO is defined on the results of numerical modelling. *Groundwater* • The ZoI for groundwater aligns with the ZoI identified in ES Appendix 19.3 Hydrological impact assessment, Volume II (Document reference 6.2, DCO Volume 6), and/or hydrologically connected groundwater bodies.

20.5.8 Effects that may be experienced in-combination are considered over the same study areas as considered in topic assessments in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6).

Assessment scenarios

20.5.9 This section describes the temporal scope for the cumulative and in-combination effects assessment.

20.5.10 Cumulative and in-combination effects are assessed in line with the assessment years stated in section 5 of ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6), to cover construction and operation periods. The assessment of construction effects is based on the Proposed Development's single delivery construction programme, with each topic assessing effects for the worst case construction scenario, either across the whole construction programme or a particular phase representing the 'peak' of activity within the construction programme for that topic.

20.5.11 Following regard to host authority responses, the longlist of 'other developments' that underpins the CEA is based on a cut-off date of February 2026 (ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document

reference 6.2, DCO Volume 6)). The longlist and shortlist will be kept under review with regard to any new information arising that may be relevant to the Proposed Development and assessment. Any new information will be considered to identify any new likely significant cumulative effects arising, and if identified, these will be reported as an update during examination.

Assessment methodology

20.5.12 Consistent with the distinction between cumulative effects and in-combination effects, the assessment for this topic is split into two sections:

1. Cumulative effect assessment: comprising an assessment of cumulative effects of the Proposed Development with other developments within the defined ZoIs on a range of resources/receptors, refer to Table 20-7.
2. In-combination effects assessment: comprising an assessment of effects on common single resource/receptor or receptor groups arising from more than one topic which may, together, result in in-combination effects from the Proposed Development.

20.5.13 The proposed methodology for each of these assessments is described separately below.

Cumulative effects assessment

20.5.14 Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [12] provides a staged and sequential approach to CEA which can be split into four distinct phases, explained in Table 20-8. The Advice Note states the recommended process focusses on cumulative effects with 'other existing development and/or approved development'.

Table 20-8 Stages of cumulative effects assessment

CEA stage	Activity
Stage 1: Establish the ZoI and identify the longlist of 'other existing development and/or approved development'	Identify the ZoI (study area) for each environmental topic considered within the ES. Identify a longlist of 'other existing development and/or approved development' in the vicinity of the Proposed Development which may have cumulative effects (during either construction or operation). This includes related and/or consequential development consented separately, including by way of permitted development rights. Undertake desktop review of available environmental information for identified cumulative developments.
Stage 2: Establish the shortlist of 'other existing development and/or approved development'	Establish which of the identified 'other existing development and/or approved development' from Stage 1 has the potential to give rise to significant cumulative effects, known as the shortlist. Criteria used to establish the shortlist include the following where they would make a significant cumulative effect with 'other existing development and/or approved development' more or less likely: • overlaps in temporal scope, • the scale and nature of the 'other existing development and/or approved development/receiving environment; or

CEA stage	Activity
	• any other relevant factors such as the nature and/or capacity of the receiving environment that would make a significant cumulative effect with 'other existing development and/or approved development' more or less likely'.
Stage 3: Information gathering	Information relating to each of the 'other existing development and/or approved development' shortlisted at Stage 2 is gathered and reviewed.
Stage 4: Assessment	An assessment of the cumulative effects of the Proposed Development with the 'other existing development and/or approved development' identified in Stages 1-3 of the process outlined above is undertaken. This assessment assumes the implementation of all mitigation identified within the topic chapters. Where required, further mitigation measures are identified to avoid, prevent, reduce or, if possible, offset any identified likely significant cumulative effects.

Cumulative Effects Assessment Stage 1: Establishing the Proposed Development's Zone of Influence and longlist of 'other existing development and/or approved development'

Establishing the Zone of Influence (study area)

20.5.15 The ZoI refers to the spatial area over which an effect from a project is likely to be experienced. The proposed ZoI for the Proposed Development varies for each environmental topic and the ZoIs for the assessment are summarised in Table 20-7.

Establishing the longlist of 'other existing development and/or approved development'

20.5.16 To identify the longlist of 'other existing development and/or approved development', a desk study exercise has been undertaken in the form of a review of planning applications, relevant development plans and any other available and relevant sources, in accordance with Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [12].

20.5.17 The advice recommends that a wide range of future projects are included within the CEA, which can be tiered (from Tier 1-3) according to how far advanced the development is within the planning system and to the level of detail that is likely to be available for each tier. Table 20-9 sets out the three tiers of other existing and, or approved development as set out in table 2 of the Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [12].

20.5.18 The third column of Table 20-9 identifies the types of development that have been included within each of these three tiers for the purposes of establishing the longlist.

20.5.19 The EIA Scoping Report identified the proposed search parameters for cumulative projects (refer to ES Appendix 5.1 EIA Scoping Report, Volume II (Document reference 6.2, DCO Volume 6)). The EIA Scoping Opinion requested that in addition to the parameters listed in the EIA Scoping Report, some additional projects should also be considered (as relevant) in the ES (set out in Table 20-5).

20.5.20 Further parameters for the longlist search have been applied to include only planning permissions for developments that are above the threshold for EIA, as set out in Schedule 1 or 2 of the EIA Regulations [1].

20.5.21 Related or consequential development which is proposed to be delivered separately to the Proposed Development, including under permitted development rights, are also included in ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6).

Table 20-9 Assigning certainty to 'other existing development and/or approved development'

Tier	Advice note criteria	Type of development / thresholds for longlist inclusion	
1	Other existing and, or approved development • under construction • permitted applications under the Planning Act (2008) or other regimes but not yet implemented • submitted applications under the Planning Act or other regimes but not yet determined all refusals subject to appeal procedures not yet determined	• All submitted applications for and determined DCOs • Transport Works Act Orders (TWAOs) • Town & Country Planning Act (TCPA) planning applications for schemes that are above the thresholds for EIA, under either schedule 1 or 2 of the EIA Regulations, and applications that are subject to adopted scoping opinions (including applications that are older than five years where later construction phases could coincide with the Proposed Development) • Relevant applications below the EIA threshold identified by the local planning authorities	Decreasing level of detail likely to be available ↓
2	Other existing and, or approved development • projects on the Planning Inspectorate's programme of projects	• NSIPs and projects where a scoping report has been submitted to the Planning Inspectorate	
3	Other existing and, or approved development • projects on the Planning Inspectorate's programme of projects where a scoping report has not been submitted • identified in the relevant Development Plan and emerging Development Plans, with appropriate weight given as they near adoption, recognising that there will be limited information available on the relevant proposals • identified in other plans and programmes, as appropriate, which set the framework for future development consents or approvals, where such development is reasonably likely to come forward	• Site allocations identified in an adopted or emerging Local Plan • NSIPs where a scoping report has not been submitted	

20.5.22 The Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [12] advises that *"where other projects are expected to be completed before construction of the Proposed Development and the effects of those projects are fully determined, and where the effects of these projects are sufficiently understood, they are considered as part of the future baseline for the Proposed Development"*. This advice has been incorporated within this chapter and as such projects considered to be future baseline are not assessed within the CEA.

20.5.23 The less information that is available for the future projects (for example, regarding environmental effects predicted and project definition), the less likely that the CEA is able to make a robust assessment in relation to these projects. Reasonable steps have been taken to review publicly available information, and a precautionary approach has been taken when conducting the CEA.

20.5.24 The longlist search area was based on the largest ZoI of 3km for most topics, extended to 10km for marine biodiversity and then regionally for resources and waste management as presented in Table 20-7.

20.5.25 Searches have been conducted online, using LandInsight [26] and the websites of the relevant local planning authorities and the Planning Inspectorate's website over the previous five-year period or older if the permission has been subject to a longer implementation process or are multi-phase projects. These are presented in ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6) in the following categories:

1. Development Plan Allocations
2. Emerging Development Plan Allocations
3. Town and Country Planning Act (TCPA) applications
4. Development Consent Orders
5. Additional related or consequential development
6. Transport and Works Act Orders
7. Marine applications

Cumulative Effects Assessment Stage 2: Establishing a shortlist of 'other existing development and/or approved development'

20.5.26 The 'longlist' of 'other existing development and/or approved developments' identified under CEA Stage 1 has been subject to threshold and criteria refinement to identify a more proportionate list of developments to be assessed within the CEA known as the 'shortlist'.

20.5.27 The threshold and criteria considered in shortlisting developments at CEA Stage 2 is outlined in Table 20-10. Criteria have been adapted from Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [12] and the EIA Regulations [1]. The resultant shortlist of developments is identified in ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6) and shown in ES Figure 20.1 Projects considered as part of the cumulative effects assessment (short list), Volume III (Document reference 6.3, DCO Volume 6).

Table 20-10 Criteria for shortlisting 'other existing development and/or approved development'

Threshold	Description
The temporal scope of 'other existing development and/or approved development'	Consideration of relative construction and operation programmes of the 'other existing development and/or approved development' identified in the ZoI during the Proposed Development programme. This is to establish whether there is overlap in temporal scope for construction and operation phases, and any potential for interaction.
The scale and nature of 'other existing development and/or approved development'	Consideration of whether the scale and nature of the 'other existing development and/or approved development' identified in the ZoI are likely to interact with the Proposed Development and to result in a cumulative effect during construction and/or operation.
Any other relevant factors	Consideration of whether the nature and/or capacity of the receiving environment makes a significant cumulative effect with 'other existing development and/or approved development' more or less likely. The sensitivity of the receiving environment includes whether the sites are within: • Wetlands, riparian areas, river mouths • Coastal zones and the marine environment • Forest areas • Nature reserves and parks • European sites[2] and other areas classified or protected under national legislation • Areas in which there has already been a failure to meet the environmental quality standards, laid down in retained European Union legislation and relevant to the project, or in which it is considered that there is such a failure • Densely populated areas • Landscapes and sites of historical, cultural or archaeological significance The potential for creation of source-pathway-receptor impacts is considered, as is the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area.

20.5.28 Professional judgement has been applied to 'other existing development and/or approved development' that exceed the thresholds but do not give rise to discernible environmental effects. Where relevant, the reasons for excluding any 'other existing development and/or approved development' from further consideration is outlined in ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6).

[2] In Schedule 3 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 "European site" means a site within the meaning of the Conservation of Habitats and Species Regulations 2010.

Cumulative Effects Assessment Stage 3: Information gathering

20.5.29 In line with Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [12], the following information on the shortlisted 'other existing development and/or approved development' has been compiled from publicly available sources described under CEA Stage 1 above:

1. "*proposed design and location information*;
2. *proposed programme of construction, operation and decommissioning; and*
3. *environmental assessments that set out baseline data and effects arising from the 'other existing development and/or approved development*".

20.5.30 Through the Stage 3 process, 45 'other existing development and/or approved development' have been identified as baseline or future baseline. These are presented in ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6). Baseline projects are those projects where construction is already complete, and the developments are operational. Future baseline projects are at various stages of construction but are expected to be completed by the time the Proposed Development starts construction.

20.5.31 The Havant Thicket Reservoir Project (ref. DCO 004 in ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2, DCO Volume 6)) is treated as both future baseline and part of the CEA. Construction of the reservoir has commenced and is due to be completed by 2031 thus the development warrants forming part of the future baseline for the EIA, i.e. the woodland/parkland required for the reservoir is assessed as already lost as this would happen early in the Havant Thicket Reservoir Project programme. With construction of the Proposed Development assumed to commence in 2028, there would however potentially be an overlap in later construction activities associated with the reservoir and the start of construction associated with the Proposed Development, which is considered in the CEA. The pipeline element of the Havant Thicket Reservoir Project is also considered in the CEA, as is consideration of whether cumulative effects would be any different if the Havant Thicket Reservoir Project construction period extended (with a corresponding greater overlap in construction activities between the Proposed Development and Havant Thicket Reservoir Project).

Cumulative Effects Assessment Stage 4: Assessment

20.5.32 This chapter provides an assessment of the cumulative effects of the Proposed Development with the 'other existing development and/or approved development' identified through CEA Stages 1-3, outlined above.

20.5.33 In accordance with The Planning Inspectorate's advice, Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [12] an assessment has been provided for all shortlisted Tier 1, Tier 2 and Tier 3 'other existing development and/or approved development', where possible.

20.5.34 The assessment of significance of any cumulative effects has been determined in accordance with the assessment methodologies outlined within ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6). The assessment of

cumulative effects varies, depending on each environmental topic's individual assessment criteria and thresholds for likely significant effects.

20.5.35 Cumulative effects have been identified by considering whether:

1. There would be any change in magnitude of the likely significant effects from the Proposed Development, as identified within the topic chapter of the ES, taking into consideration any effects from the 'other existing development and/or approved developments'. For example, a moderate adverse likely significant effect becoming a major adverse likely significant effect.
2. The effects of the Proposed Development on key receptors potentially affected by 'other existing development and/or approved development', together with any effects of the 'other existing development and/or approved development' would trigger a likely significant effect where the effects of the Proposed Development in isolation would not. That is to say that a likely non-significant effect from the Proposed Development becomes a likely significant effect when considered with effects from the 'other existing development and/or approved development'.

20.5.36 Based on this, each topic for each shortlisted development, provides a brief narrative of potential cumulative effects and whether cumulative effects are considered to be 'significant' or 'not significant'.

20.5.37 Where significant cumulative effects beyond those identified as residual likely significant effects from the Proposed Development in isolation are identified, an assessment of the need for additional mitigation (further to that already identified within each topic chapter) has been undertaken and if required is provided in section 20.8.

Marine discharges

20.5.38 In addition to the assessment of 'other existing development and/or approved development', there is a requirement to assess for the potential for cumulative effects associated with planned and/or permitted discharges to the Solent, due to potential changes to the existing wastewater discharge at the Eastney LSO and Sandown LSO during the Proposed Development's operational phase. This is detailed in section 20.7.

Other related and consequential projects

20.5.39 In addition to the CEA with 'other existing development and/or approved development', there is a need to consider the potential for likely significant cumulative effects from cumulative effects of the Proposed Development with other related and consequential projects (that arise due to the Proposed Development). The Applicant and Portsmouth Water will be delivering upgrades to existing sites that the Proposed Development interfaces with to ensure they continue to meet their statutory supply obligations. Projects proposed include:

1. Utility connections required for the Proposed Development
2. Increased fencing and security measures required because of the Proposed Development at developments not related to the Proposed Development

20.5.40 These projects and utility connections are included in ES Appendix 20.1 List of 'other developments' – longlist and shortlist, Volume II (Document reference 6.2,

DCO Volume 6) and ES Appendix 20.2 Cumulative effects assessment, Volume II (Document reference 6.2, DCO Volume 6) where relevant.

In-combination effects assessment

20.5.41 The Planning Inspectorate's advice, Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [12], notes that the interrelationships between topics for a proposed project are typically assessed as part of the topic chapters of an ES.

20.5.42 In accordance with the advice, in-combination effects are, where appropriate, considered inherently within the environmental topic chapters of the ES. An example is the assessment of amenity effects in ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6), which considers the interaction of air quality, noise, landscape and visual, and traffic and transport on relevant receptors. These inherent in-combination effects are not repeated in this chapter. A summary of the in-combination effects inherently assessed within topic chapters is presented in Table 20-11.

20.5.43 However, there are some cases where specific receptors or receptor groups may experience multiple topic impacts beyond those inherently assessed within the topic chapters. This chapter provides an assessment of these additional in-combination effects using a receptor-led staged process. There is currently no industry standard methodology for the assessment of in-combination effects therefore the methodology presented is based on professional judgement and experience.

20.5.44 Receptors related to carbon assessment within ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6) have not been considered in relation to in-combination effects in this chapter as effects on the global atmosphere are not location or receptor specific, as supported by ISEP guidance, Assessing Greenhouse Gas Emissions and Evaluating their Significance [16] (Ref). An ICCI assessment is presented in ES Appendix 10.3 In-combination climate assessment, Volume II (Document reference 6.2, DCO Volume 6).

Stage 1: Identify relevant receptors and impacts

20.5.45 The in-combination assessment considers the topic residual effects presented in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6) which take primary, tertiary and any secondary mitigation measures into account.

20.5.46 The potential interactions between individual effects at receptors have been identified by collating and reviewing the topic residual effects presented in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6).

20.5.47 Negligible or neutral effects would not result in any discernible adverse or beneficial effects on a receptor. Receptors assessed as having negligible or neutral residual effects have therefore been scoped out and not taken forward to Stage 2 as it is considered that these are very unlikely to result in a notable in-combination effect, even if multiple effects of a similar level of significance are considered.

20.5.48 Effects reported as 'slight'/'minor' or greater within the ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6) have however been considered further to determine if there were any receptors that had the potential to be affected by more than one of these 'slight'/'minor' (or greater) topic effects. Receptors affected by only a single effect were excluded from the assessment.

20.5.49 For the effects and receptors identified, it was then checked which of these had already been inherently assessed within topic assessments. Table 20-11 sets out the in-combination effects assessed inherently as part of the topic assessments in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6). These inherently assessed in-combination effects did not require any further consideration having already been assessed and reported.

20.5.50 Stage 1 concluded with a list of receptors (common to more than one topic) and potential in-combination effects to be taken forward to Stage 2 of the in-combination assessment.

Stage 2: Identification of receptor groups

20.5.51 At Stage 2, those individual receptors brought forward for further consideration have been categorised by receptor type into 'receptor groups'. The term 'receptor group' is used because the in-combination assessment does not assess every individual receptor assessed in the ES but rather assesses potentially sensitive groups of receptors identified through the EIA process. This stage was undertaken in a workshop held with competent topic specialists, allowing the collaborative identification of receptor groups and locations where in-combination effects may be experienced. In addition, the Stage 2 workshop refined where no effects on receptors were possible and did not need to be taken forward to Stage 3.

Stage 3: Assessment of potential in-combination effects on receptor groups

20.5.52 At Stage 3, consideration has been given to the potential for in-combination effects to arise for each of the identified receptor groups across the construction and operation phases of the Proposed Development based on the effects scoped in at Stage 1.

20.5.53 Having identified the receptor groups that may be impacted by more than one topic effect (Stage 2), professional judgement was then used to qualitatively consider the potential combining of different effects on the receptor groups. This review was undertaken at a workshop held with competent topic specialists to consider the potential for effects on receptors and in-combination effects.

20.5.54 Consideration of the capacity of a receptor group to accommodate the combined changes that may be experienced from the Proposed Development is key to this assessment with the following taken into account:

1. Value/sensitivity of the receptor group.
2. Significance of individual effects.
3. Temporal/spatial scale of effects.
4. Mitigation already included within assessments in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6).

20.5.55 The in-combination assessment is unique as the interaction of impacts and effects is often difficult to quantify, and therefore it is challenging to attribute significance. The in-combination assessment describes the possible changes to the impacts and therefore potential effects, based on professional judgement. Where effects identified in assessments combine and are considered to be exacerbated, significance has been carefully considered, taking into account the factors described in paragraph 20.5.54. The narrative within Table 20-13 concludes whether the in-combination effect for each receptor group is considered significant or not significant.

20.5.56 If significant in-combination effects are identified, the need for secondary mitigation is considered as appropriate.

20.6 Assumptions and limitations

Cumulative effects assessment

20.6.1 The assessment of cumulative effects is based on the shortlist of 'other developments' and publicly available information. The list of cumulative projects included in the assessment were consulted on with the local planning authorities based on a cut-off date of February 2026. New applications which came forward after February 2026 are not included in the ES. The longlist and shortlist will be kept under review with regard to any new information arising that may be relevant to the Proposed Development and assessment. Any new information will be considered to identify any new likely significant effects arising, and if identified, will be reported as an update during examination.

20.6.2 The conclusions of the CEA are based on the quantity and quality of available information for the shortlist of 'other developments'. This varies depending on which stage of the planning process the other development is at, i.e. whether it is an allocated site or whether a planning application has been submitted. Additionally, any mitigation measures proposed within the submitted material of 'other developments' has been assumed to be or would be implemented if permission is granted.

In-combination effects assessment

20.6.3 The in-combination effects assessment does not have a standard approach or guidance to provide a consistent industry approach. The approach within this chapter reflects a bespoke methodology based on professional judgement and aligns with similar approaches on other DCO projects.

20.7 Assessment of likely significant effects

20.7.1 The cumulative and in-combination effects assessment resulting from the construction and operation of the Proposed Development is based on the information provided within the ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6). It is undertaken on the basis that any mitigation measures (primary, secondary and tertiary) identified within the topic chapters would be in place.

Cumulative effects assessment

20.7.2 ES Appendix 20.2 Cumulative effects assessment, Volume II (Document reference 6.2, DCO Volume 6), assesses the cumulative effects for each topic in relation to the shortlisted developments.

20.7.3 No topics report likely significant adverse cumulative effects.

20.7.4 Modelling was undertaken to assess releases from Eastney LSO. This assessment was undertaken in line with Environment Agency's guidance 'Surface water pollution risk assessment for your environmental permit [27]'. Modelling of screened in parameters indicates the distance to the Environmental Quality Standard (EQS) for parameters screened in was calculated as being 1-2m from the outfall thus indicating rapid dilution at the outfall location. Given the distance to EQS for the chemical parameters screened in, cumulative effects with other outfalls are not predicted.

In-combination effects assessment

Stage 1: Identify relevant receptors and impacts

20.7.5 A review of the receptors that feature in more than one topic assessment (that are assessed to experience 'slight'/'minor' effects or greater) was undertaken to identify 'common' receptors that may be subject to in-combination effects.

20.7.6 Each identified receptor was then considered in terms of whether the potential in-combination effects had already been inherently assessed as part of topic assessments within ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6). Table 20-11 provides a summary of the in-combination effects that have been inherently assessed within ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6).

Table 20-11 In-combination effects assessed inherently as part of the topic assessments in ES Chapters 6 to 19, Volume I

Topic	Scope of inherent in-combination effects assessment
ES Chapter 6 Air quality and odour, Volume I (Document reference 6.1, DCO Volume 6)	Considers the in-combination air quality effects on human receptors as a result of traffic movements.
ES Chapter 7 Archaeology and cultural heritage, Volume I (Document reference 6.1, DCO Volume 6)	Considers the in-combination indirect effects on heritage assets from different sources such as hydrological impacts and changes to setting (visually and in the form of noise, dust, vibration and traffic).
ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6)	Considers the in-combination ecological effects on receptors such as noise and visual disturbance, vehicular movements and emissions, changes to water flows, quality or quantities, degradation or loss of groundwater dependent features.
ES Chapter 9 Marine biodiversity, Volume I (Document reference 6.1, DCO Volume 6)	Considers the in-combination effects on ecological habitats from different sources such as underwater noise and vibration and changes to or degradation of water quality.

Topic	Scope of inherent in-combination effects assessment
ES Chapter 10 Carbon and climate change (Document reference 6.1, DCO Volume 6)	Climate change is considered within the topic assessments, the Climate Change Resilience assessment specifically considers the vulnerability of the receptors to the projected effects of climate change.
ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6)	Considers the in-combination effects on land quality and ground conditions (regarding leachate pollution), groundwaters and aquifers, surface water quality and ecological habitats and statutory designations.
ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6)	Considers the in-combination effects on amenity for residential properties, community facilities and land and commercial property and land, from different sources: air quality, landscape and visual impacts, noise and vibration, and traffic and transport.
ES Chapter 15 Noise and vibration, Volume I (Document reference 6.1, DCO Volume 6)	The assessment of noise and vibration effects on human noise and vibration sensitive receptors inherently considers effects from traffic movements.
ES Chapter 17 Socio-economics, tourism and health, Volume I (Document reference 6.1, DCO Volume 6)	The socio-economics, tourism and health assessment, specifically the neighbourhood amenity assessment considers the in-combination effects from air quality, land quality, land use, visual impacts, noise and vibration and traffic. The health assessment uses outcomes from these other topic assessments to determine whether the Proposed Development would result in changes to health determinants and whether these changes would result in effects on health outcomes within the population of the study area.

20.7.7 Topics with no identified common receptors, or where all receptors have been assessed inherently within topic assessments in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6) have not been taken forward to the in-combination assessment. These topics are:

Table 20-12 Topics not taken forward to in-combination assessment

Topic	Rationale for not taking forward to in-combination assessment
ES Chapter 6 Air quality and odour, Volume I (Document reference 6.1, DCO Volume 6)	Air quality related in-combination effects on receptors are fully inherently assessed within: • Amenity assessment in section 12.8 of ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6) which considers effects on the amenity of community land and facilities; and commercial property and land. • Health assessment in section 17.8 of ES Chapter 17 Socio-economics, tourism and health, Volume I (Document reference 6.1, DCO Volume 6), specifically the assessment of effects on neighbourhood amenity which considers how dust and emissions from construction activities affect how a person experiences their neighbourhood.

Topic	Rationale for not taking forward to in-combination assessment
	• Assessment of nitrogen on sites designated for nature conservation and the species that they support in section 8.8 of ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6).
ES Chapter 7 Archaeology and cultural heritage, Volume I (Document reference 6.1, DCO Volume 6)	Topic workshop confirmed there are no common receptors with other ES topics therefore no in-combination effects and not progressed to Stage 2.
ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6)	For the carbon assessment, as the receptor is the global atmosphere, there are no common receptors with other ES topics. Additionally, for the climate change resilience assessment, the Proposed Development and associated infrastructure are the receptors; therefore, there are no common receptors with other ES topics. This is as agreed with the Planning Inspectorate in the EIA Scoping Opinion. Therefore, no in-combination effects and not progressed to Stage 2.
ES Chapter 14 Major accidents and disasters, Volume I (Document reference 6.1, DCO Volume 6)	Topic workshop confirmed there are no common receptors with other ES topics therefore no in-combination effects and not progressed to Stage 2.
ES Chapter 15 Noise and vibration, Volume I (Document reference 6.1, DCO Volume 6)	Noise related in-combination effects on human receptors are fully inherently assessed within: • Amenity assessment in section 12.8 of ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6) which considers effects on the amenity of community land and facilities; and commercial property and land. • Health assessment in section 17.8 of ES Chapter 17 Socio-economics, tourism and health, Volume I (Document reference 6.1, DCO Volume 6), specifically the assessment of effects on neighbourhood amenity which considers how noise and vibration from construction activities affect how a person experiences their neighbourhood.
ES Chapter 16 Resources and waste management, Volume I (Document reference 6.1, DCO Volume 6)	Resources and waste related in-combination effects are fully inherently assessed within: • ES Chapter 6 Air quality and odour and ES Chapter 18 Traffic and transport, Volume I (Document reference 6.1, DCO Volume 6) which contain an assessment of effects on air quality and traffic movements from the transportation of waste that cannot be reused on site. • ES Chapter 7 Archaeology and cultural heritage, ES Chapter 8 Terrestrial and freshwater biodiversity, ES Chapter 11 Land quality and ground conditions and ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6) identify existing constraints to mineral extraction,

Topic	Rationale for not taking forward to in-combination assessment
	the underlying mineral resources are not considered further in the assessment. • ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6) contains an assessment of carbon impacts associated with the management of waste.
ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6)	Water related in-combination effects on receptors are fully inherently considered within: • ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6) which considers how changes in hydrology, hydrogeology, geomorphology and water quality impact terrestrial and freshwater protected sites, habitats and species. • ES Chapter 9 Marine biodiversity, Volume I (Document reference 6.1, DCO Volume 6) which considers how predictions of changes in the water environment and water quality impact protected marine habitats and species. • ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6) which considers the potential for pre-existing and new sources of contamination to be introduced to the water environment.

Stage 2 - Identification of receptor groups

20.7.8 The in-combination assessment does not assess every individual receptor assessed in the ES but rather assesses potentially sensitive groups of receptors identified through the EIA process.

20.7.9 A workshop with the topic specialists was held to agree the groups of common receptors that may experience potential in-combination effects during construction from the Proposed Development within ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6). These common receptor groups and the associated topics are presented in Table 20-13 and are as follows:

1. Ecological-related statutory designations:
   a. Marine biodiversity
   b. Terrestrial and freshwater biodiversity
2. The built environment:
   a. Land quality and ground conditions
   b. Vibration
3. Users of road network:
   a. Landscape and visual
   b. Socio-economics, tourism and health
   c. Traffic and transport
4. Agricultural land (specifically BMV):

a. Land quality and ground conditions
b. Land use and agriculture

5. Special Qualities of the South Downs National Park (SDNP)
   a. Landscape and visual
   b. Socio-economics, tourism and health

20.7.10 The receptor groupings were considered spatially in terms of their location along the Proposed Development as follows:

a. Water Recycling Plant site
b. Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site
c. Pipelines between the Water Recycling Plant site and Bedhampton Springs
d. Pipeline between the Water Recycling Plant site and Otterbourne Water Supply Works

20.7.11 No common receptors were identified during the operation phase, therefore there are no in-combination effects identified during operation.

20.7.12 Receptors are not considered within the in-combination assessment where they are inherently assessed in topic assessments, as described in Table 20-12, and in particular through the amenity assessment in ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6) and the health assessment in ES Chapter 17 Socio-economics, tourism and health, Volume I (Document reference 6.1, DCO Volume 6).

Stage 3 - Assessment of potential in-combination effects on receptor groups

20.7.13 Table 20-13 presents a summary of impacts for the common receptor groups that may experience potential in-combination effects from the construction of the Proposed Development, further to those inherently assessed within ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6).

20.7.14 In-combination effects during decommissioning are considered to be no greater than those identified during the construction phase and are therefore assessed to be of the same significance as those assessed for construction.

Table 20-13 In-combination assessment during construction

Receptor	Terrestrial and freshwater biodiversity	Marine biodiversity	Land quality and ground conditions	Land use and agriculture	Landscape and visual	Socio-economics, tourism and health	Noise and vibration	Traffic and transport
Statutory designations, specifically: Portsmouth Harbour SPA, Ramsar and SSSI, Chichester & Langstone Harbour SPA, Ramsar Langstone Harbour SSSI	During construction there is the risk of standard construction accidental pollution event(s) which could impact foraging resources used by qualifying bird species of the designated sites. This is assessed as a minor adverse effect and not significant.	During construction there is the risk of accidental pollution event(s) which could affect estuarine habitats. This is assessed as a minor adverse effect and not significant.	Effects on this receptor group are considered inherently in ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6)	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group
	Significance of in-combination effects							
	The receptor grouping comprises the Portsmouth Harbour SPA, Ramsar and SSSI, Chichester & Langstone Harbour SPA, Ramsar and Langstone Harbour SSSI. The in-combination effects relate to the risk of contamination during construction, which could impact foraging resources used by qualifying bird species. Both Terrestrial and freshwater biodiversity and Marine biodiversity consider these as having high - very high value with a negligible magnitude and assess these as a minor adverse effect and not significant. Mitigation identified within ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6) and within ES Chapter 9 Marine biodiversity, Volume I (Document reference 6.1, DCO Volume 6) is good practice prevention (tertiary) measures which are secured through the Outline Construction Environmental Management Plan (CEMP) (Document reference 7.1, DCO Volume 7). The potential impacts, specifically the risk of accidental pollution event(s) which could affect estuarine habitats and foraging resources used by associated bird species, both of which are qualifying features of the SPA, Ramsar site(s) and SSSIs, are considered individually and in-combination to be of negligible magnitude and are therefore not expected to result in an in-combination likely significant effect on the integrity or conservation objectives of the Ramsar, SPA and SSSI sites. No additional mitigation arising from the in-combination assessment has been identified above the measures outlined within ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6) and within ES Chapter 9 Marine biodiversity, Volume I (Document reference 6.1, DCO Volume 6).						
The built environment, specifically: The fabric of residential and non-residential properties within 3.2m of ground compaction activities (non-human receptor)	This topic does not consider this receptor group	This topic does not consider this receptor group	During construction, there is a risk that new preferential pathways for contamination/gas migration could be created, which could cause damage or gas accumulation. This may mean that commercial and residential properties and recreational routes/facilities could experience minor adverse effects.	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group	During construction un-reinforced or light framed structures within 3.2m of ground compaction construction activities may experience a minor adverse effect due to direct ground-borne vibration effects, which may cause permanent damage.	This topic does not consider this receptor group
	Significance of in-combination effects							
	The receptor group comprises commercial and residential properties, and recreational facilities. The in-combination effects relate to the risk of contamination and vibration during construction, both of which may lead to permanent effects on the built environment. ***Water Recycling Plant site*** *Land quality and ground conditions*: There are currently no commercial or residential properties located at the WRP site and the WRP site is bound to the north, south and west by highways. The sensitivity of the built environment within the WRP site is considered to be low and the magnitude of impact is considered to be negligible. The significance of effect to the built environment during the construction of the WRP site is considered negligible adverse which is not significant. *Vibration*: Compaction activities at the WRP site would be further than 6m from the closest identified vibration sensitive receptor; hence, building damage impacts would be negligible. Receptor sensitivity is medium; hence, the effect would be temporary, short-term and neutral, which is not significant. *In-combination effect*: Given there are no buildings at the WRP site and no buildings within 3.2m of ground compacting activities, construction activities are not expected to result in in-combination likely significant effects.							

Receptor	Terrestrial and freshwater biodiversity	Marine biodiversity	Land quality and ground conditions	Land use and agriculture	Landscape and visual	Socio-economics, tourism and health	Noise and vibration	Traffic and transport
	Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site *Land quality and ground conditions:* Due to the presence of a highway and commercial buildings on or within 250m of the Pipelines, the sensitivity of the built environment is considered to be medium. Potential impacts to these identified receptors are considered to be localised to work areas and areas of potential contamination, the magnitude of impact is considered to be low. The significance of effect to the built environment during the construction of the Pipelines is considered minor adverse which is not significant. *Vibration:* No vibration sensitive buildings have been identified within the direct effects vibration study areas related to the Pipelines between Budds Farm Wastewater Treatment Works and the WRP site, other than those already captured in the assessment around the WRP site. *In-combination effect:* There is no spatial overlap with the potential for new contamination pathways and the potential for minor building impacts from vibration, therefore construction activities are not expected to result in in-combination likely significant effects. ***Pipelines between the Water Recycling Plant site and Bedhampton Springs*** *Land quality and ground conditions:* Due to the presence of transport infrastructure, commercial and residential properties on or within 250m of the Pipelines, the sensitivity of the built environment is considered to be medium. Potential impacts to these identified receptors are considered to be localised to work areas and areas of potential contamination, the magnitude of impact is considered to be low. The significance of effect to the built environment during the construction of the Pipelines is considered minor adverse which is not significant. *Vibration:* The works would be further away than the identified distance threshold for the onset of minor building damage impacts; hence, these effects would be permanent and neutral which is not significant. *In-combination effect*: There is no spatial overlap with the potential for new contamination pathways and the potential for minor building impacts from vibration, therefore construction activities are not expected to result in in-combination likely significant effects. ***Pipeline between the Water Recycling Plant site and Otterbourne Water Supply Works*** *Land quality and ground conditions*: Due to the presence of commercial and residential properties along this Pipeline, the sensitivity of the built environment for land quality and ground conditions is considered to be medium. Due to the depth of tunnelling in Section D, distance from the built environment and construction methods, the magnitude of impact is considered to be low to negligible and therefore the significance of effect is considered minor adverse and not significant. Measures to mitigate contamination are detailed in section 11.4 ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6). *Vibration*: The receptor sensitivity is high with a negligible magnitude of impact, with mitigation the effects are no worse than minor and not significant. Primary and tertiary mitigation to avoid or reduce vibration effects is detailed in section 15.4 of ES Chapter 15 Noise and vibration, Volume I (Document reference 6.1, DCO Volume 6), with this implemented, the only works with the potential to cause likely significant effects on the built environment (building damage effects to un-reinforced or light framed structures) are any vibratory ground compaction works within 3.2m of an un-reinforced or light framed structure. Secondary mitigation is detailed in section 15.9 of ES Chapter 15 Noise and vibration, Volume I (Document reference 6.1, DCO Volume 6) and the Outline CEMP (Document reference 7.1, DCO Volume 7) secures a range of ground-borne vibration mitigation measures. With secondary mitigation implemented, residual effects are considered minor adverse which is not significant. *In-combination effect:* Whilst some of the receptors within this receptor group have a medium/high sensitivity, both topics have assessed minor adverse effects which are not significant. The impacts are considered individually and in-combination to be of low to negligible magnitude and are therefore not expected to result in an in-combination likely significant effect. No additional mitigation arising from the in-combination assessment is required above the measures as outlined in the relevant topic chapters.							
Users of road network, specifically: B2177, Harts Farm Way (1 and 3), Titchfield Lane, Winters Hill	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group	During construction of the Proposed Development people travelling along the roads listed in the 'Receptor' column would experience a moderate adverse likely significant effect due to the loss of screening vegetation, proximity to works and consequent intrusion on views.	During construction of the Proposed Development, drivers, pedestrians, equestrians and cyclists across the study area would experience a minor adverse likely significant effect with regards to perceived safety from construction traffic movements.	Effects on this receptor group are considered inherently within the neighbourhood amenity assessment in Chapter 17 Socio-economics, tourism and health, Volume I (Document reference 6.1, DCO Volume 6)	During construction of the Proposed Development driver and bus passengers on the roads listed in the 'Receptor' column would experience a minor adverse but not significant effect due to delay caused by traffic management.
	Significance of in-combination effects							
	The receptor group comprises the users of the road network. The in-combination effects relate to the impacts from perceived safety, changes in views and traffic delays caused by temporary traffic management. Road closures (severance) are not considered as part of the in-combination assessment as once closed, users would not be present.							

Receptor	Terrestrial and freshwater biodiversity	Marine biodiversity	Land quality and ground conditions	Land use and agriculture	Landscape and visual	Socio-economics, tourism and health	Noise and vibration	Traffic and transport
	With regards to community safety (perceived safety), ES Chapter 17 Socio-economics, tourism and health, Volume I (Document reference 6.1, DCO Volume 6) identifies drivers, pedestrians, equestrians and cyclists across the study area to be of medium sensitivity, with perceived safety considered to be of minor magnitude, the likely significant effect is assessed as minor adverse. For the LVIA, the magnitude of impact to users of the road network has been assessed as medium to high, with the sensitivity being medium to high. For delay, the magnitude of impact has been assessed as minor to high, with the sensitivity being low to medium. Mitigation is embedded and outlined in the Traffic Management Strategy (TMS) (Document reference 7.3, DCO Volume 7) and Framework Construction Traffic Management Plan (CTMP) (Document reference 7.2, DCO Volume 7). These management plans include measures that seek to reduce delay associated with works in the public highway, such as lane and road closures, where practicable. At those locations where potential in-combination effects are identified, traffic management would be in place for a maximum of six weeks. The TMS (Document reference 7.3, DCO Volume 7) also includes restrictions, including overnight working where practicable, to reduce potential delay. A wide range of primary and tertiary mitigation has been embedded into the design to reduce the landscape and visual effects. These are outlined in section 13.4 of ES Chapter 13 Landscape and visual, Volume I (Document reference 6.1, DCO Volume 6). Whilst vegetation would be lost and construction would be experienced as intrusive visually, the lane and road closures would not change the proportion of view experienced by the users of the road network. In addition, the road and lane closures are all within the Order Limits and have been assessed on a worst case basis. A delay in journey time would not contribute to the landscape and visual effects experienced by the users of the road network. Community safety (perceived safety) would not increase the magnitude of impact of these combined effects and therefore not contribute to the significance of effect. The impacts in-combination are not expected to increase in magnitude and therefore it is not expected there will be an in-combination likely significant effect. No additional mitigation arising from the in-combination assessment has been identified above the measures as outlined in the relevant topic chapters.							
Agriculture, specifically BMV land (1,2 and 3a)	This topic does not consider this receptor group	This topic does not consider this receptor group	During construction, there is potential to mobilise pre-existing sources of contamination/create new preferential pathways on agricultural land. There is also the potential for new sources of contamination to be introduced. The significance of effect is considered to be minor adverse.	During construction there would be a temporary loss of BMV agricultural land within the Order Limits, which is assessed as major adverse and significant.	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group
	Significance of in-combination effects The receptor is BMV agricultural land that is temporarily lost as part of the construction phase. The in-combination effects relate to the temporary loss of the BMV land and also the potential for contamination during construction. The location of BMV land is detailed in ES Figure 12.6 Agricultural land classification, Volume III (Document reference 6.3, DCO Volume 6). ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6) considers the sensitivity of the receptor to be high, however, with the implementation of the tertiary mitigation measures described in section 11.4 of ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6) the magnitude of impact is considered to be negligible. Therefore, the significance of effect is considered minor adverse which is not significant. ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6) considers Grade 1 and 2 BMV land to be of very high sensitivity and Subgrade 3a BMV land to be of High sensitivity, all Grades determined as a minor magnitude of impact. There would be a temporary, short-term, moderate adverse effect on the very high sensitivity BMV agricultural land and a temporary, short-term, minor adverse effect on the High sensitivity BMV land. However, these areas would not be removed from agricultural production all at the same time and there would be a rolling programme of pipeline installation. Primary mitigation measures identified in ES Chapter 12 Land use and agriculture, Volume I (Document reference 6.1, DCO Volume 6) avoid BMV land where possible and tertiary mitigation measures are detailed in the Outline Soil Resource Management Plan (Document reference 7.1, DCO Volume 7). The Outline CEMP (Document reference 7.1, DCO Volume 7) also details mitigation measures to manage the effects of construction on this receptor. It is considered there are no in-combination effects as the soils would be removed before construction, therefore in the unlikely event contamination occurs, the receptor would not experience any effects. The land would be restored to its pre-existing agricultural use using the same soils in the same locations from which they would have been excavated. No additional mitigation arising from the in-combination assessment has been identified above the measures as outlined in the relevant topic chapters.							

Receptor	Terrestrial and freshwater biodiversity	Marine biodiversity	Land quality and ground conditions	Land use and agriculture	Landscape and visual	Socio-economics, tourism and health	Noise and vibration	Traffic and transport
Special Qualities of the SDNP	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group	This topic does not consider this receptor group	During construction there would be temporary effects to some of the Special Qualities of the SDNP. However during operation there is unlikely to be any effects.	During construction there is an increased perception that users of Marwell Zoo, located within SDNP, may experience delays during a short period of construction.	This topic does not consider this receptor group	This topic does not consider this receptor group

Significance of in-combination effects

The receptor grouping considers the Special Qualities of the SDNP that support its purpose as a National Park. Of the seven Special Qualities of SDNP, the six listed below were deemed to be of relevance to the ES Chapter 13 Landscape and visual assessment, Volume I (Document reference 6.1, DCO Volume 6) and ES Chapter 17 Socio-economics tourism and health, Volume I (Document reference 6.1, DCO Volume 6). The in-combination effects relate to the impacts of the Proposed Development on the Special Qualities.

1. *Special Quality Number 1: Diverse, inspirational landscapes and breathtaking views."* Relevant to ES Chapter 13, Volume I (Document reference 6.1, DCO Volume 6)
2. *Special Quality Number 2: A rich variety of wildlife and habitats including rare and internationally important species.* Relevant to ES Chapter 13, Volume I (Document reference 6.1, DCO Volume 6)
3. *Special Quality Number 3: Tranquil and unspoilt places.* Relevant to ES Chapter 13, Volume I (Document reference 6.1, DCO Volume 6)
4. *Special Quality Number 5: Great opportunities for recreational activities and learning experiences.* Relevant to ES Chapter 13 and ES Chapter 17, Volume I (Document reference 6.1, DCO Volume 6)
5. *Special Quality Number 6: Well-connected historical features and rich cultural heritage.* Relevant to ES Chapter 13, Volume I (Document reference 6.1, DCO Volume 6)
6. *Special Quality Number 7: Distinctive towns and villages, and communities with real pride in their area.* Relevant to ES Chapter 13, Volume I (Document reference 6.1, DCO Volume 6)

Special Quality number 4 *An environment shaped by centuries of farming and embracing new enterprise* was deemed to not be relevant as the Proposed Development is located outside the SDNP and would therefore not affect land use of commercial enterprise within the SDNP.

ES Chapter 13 Landscape and visual assessment, Volume I (Document reference 6.1, DCO Volume 6) considers the value attached to the landscape of the SDNP to be very high. During construction there would be some temporary impacts resulting in localised reductions in tranquillity, changes to the historic landscape fabric and setting of a small number of heritage assets and distinctive settlements. The temporary effects during construction would be reduced through the application of the measures set out in the Outline CEMP (Document reference 7.1, DCO Volume 7), and would be reversed once construction of the Proposed Development is completed. The construction impacts on the landscape and breathtaking views, and rich variety of wildlife would be very low and not significant.

ES Chapter 17 Socio-economics tourism and health, Volume I (Document reference 6.1, DCO Volume 6) considers the perceived impact of users accessing Marwell Zoo, located within the SDNP, on the opportunity to access recreation and learning. Whilst users of the Zoo may perceive delays for a short period during construction, access to the Zoo will be maintained at all times and it is not expected to be impacted. Therefore there is no predicted wider impact to the opportunity for Special Quality number 5 (opportunity for recreation and learning) of the SDNP.

The effects identified in ES Chapter 13 Landscape and visual assessment, Volume I (Document reference 6.1, DCO Volume 6) for Special Qualities 3, 6 and 7 are localised, reduced through mitigation and would be reversed post construction, and for Special Qualities 1 and 2 the impacts are very low and considered not significant. ES Chapter 17 Socio-economics tourism and health, Volume I (Document reference 6.1, DCO Volume 6) concludes there would be no wider impact to Special Quality 5, noting access to Marwell Zoo within the SDNP will be maintained at all times during construction. Therefore it is considered that there would be no significant in-combination effects from the Proposed Development on the Special Qualities of the SDNP during construction.

No additional mitigation arising from the in-combination assessment has been identified above the measures as outlined in the relevant topic chapters.

20.7.15 The in-combination effects assessment has identified a number of cross-topic effects, taking account of the Proposed Development and primary, tertiary and secondary mitigation identified in the relevant topic assessments.

20.7.16 The assessment has concluded that there are no additional in-combination effects (or increase in effects) experienced by the common receptors from the Proposed Development during construction.

20.8 Secondary mitigation

20.8.1 Mitigation measures are defined in ES Chapter 5 EIA approach and methodology, Volume I (Document reference 6.1, DCO Volume 6), with primary, secondary and tertiary mitigation presented for each topic in their respective chapter.

Cumulative effects

20.8.2 The CEA concludes that there would be no likely significant effects during the construction phase of the Proposed Development.

20.8.3 No additional mitigation has been identified above the measures as outlined in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6).

In-combination effects

20.8.4 The in-combination effects assessment concluded that there are no additional likely significant effects, or increase in effects as a result of in-combination impacts on receptors.

20.8.5 No additional mitigation has been identified above the measures as outlined in ES Chapters 6 to 19, Volume I (Document reference 6.1, DCO Volume 6).

20.9 Summary of residual likely significant effects

20.9.1 Section 20.7 and Table 20-13 present the assessment of likely significant effects with respect to cumulative and in-combination effects.

20.9.2 No residual likely significant effects have been identified for cumulative effects.

20.9.3 No residual likely significant effects have been identified for in-combination effects.

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