Hampshire Water Transfer and Water Recycling Project

Environmental Statement – Non-Technical Summary

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1 Introduction

1.1 Who is Southern Water?

1.1.1 Southern Water Services Limited (who are the Applicant for the Proposed Development) supplies water and wastewater services (wastewater is a combination of water from kitchens, bathrooms, sinks and taps and rainwater from roads and roofs, that is transported to, and cleaned at, a wastewater treatment works) to more than four million customers in the South East of England. Operations cover Hampshire, the Isle of Wight, Sussex and Kent, which includes more than 700 miles of coastline, two National Parks and several National Landscapes (areas recognised by the Government for their high-quality distinctive scenery and wildlife, unique history and their contribution to reducing the impacts of climate change).

1.2 What is the Proposed Development?

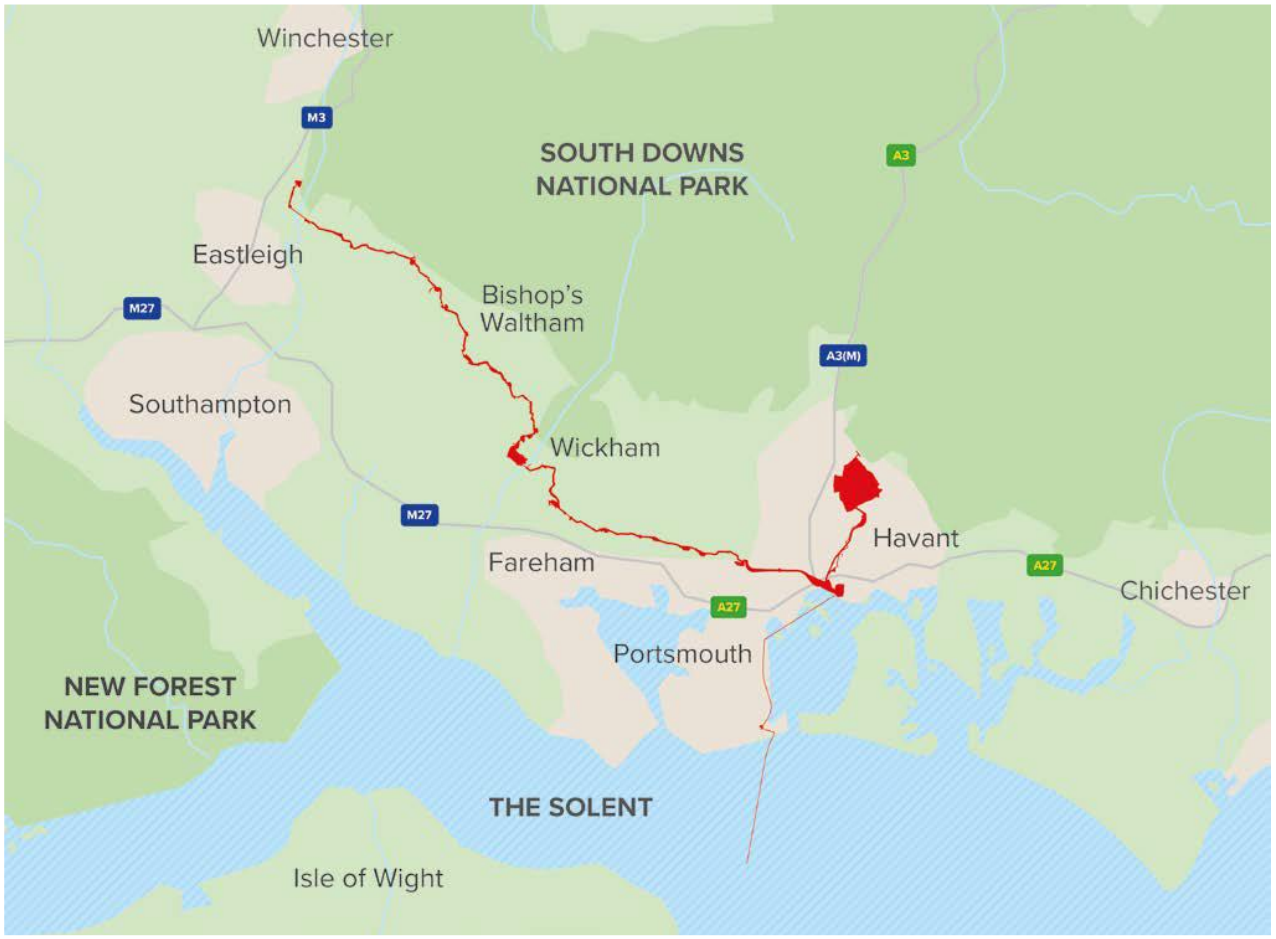
1.2.1 The Hampshire Water Transfer and Water Recycling Project (the Proposed Development) is a scheme which includes both water transfer and water recycling technology that will play a big role in making up the shortfall in water supply across the Hampshire supply area, especially in drought. The Proposed Development would turn wastewater into water that is ready to become safe drinking water at a new Water Recycling Plant in Havant.

1.2.2 This purified recycled water would be pumped via an underground pipeline to the Havant Thicket Reservoir for storage. Here, it would mix with spring water already stored in the Reservoir. The mixed water from the reservoir would then be pumped along another pipeline to Otterbourne Water Supply Works (WSW) where it would be treated to meet strict drinking water standards before being sent into supply.

1.3 Where is the Proposed Development located?

1.3.1 The Proposed Development is located in the south of Hampshire, in an area from Havant to Otterbourne, as shown in Graphic 1-1.

Graphic 1-1 Location of Proposed Development



1.4 Why is the Proposed Development needed?

1.4.1 The South East of England is classified by the Environment Agency as an area of serious water stress. This means that demand for water can exceed supply, especially during a drought. In Hampshire, in particular, a growing population, changing climate and sensitive environment means there is not enough water for people and nature when the weather is dry. Much of the county's water currently comes from the River Test and River Itchen, both chalk stream rivers that are ecologically important and rare.

1.4.2 Securing new water supplies for Hampshire in the next ten years is one of Southern Water's biggest challenges and priorities. Southern Water produced a Water Resources Management Plan (WRMP) in 2019. This stated Southern Water's commitment to protect the unique chalk stream rivers in Hampshire, the River Test and River Itchen, by reducing the amount of water taken from them. The 2019 Water Resources Management Plan identified potential long-term solutions to protect these unique chalk stream rivers and safeguard future drinking water supplies. Following detailed consideration of the different solutions, a water recycling and water transfer option was selected as the preferred option for addressing the water supply challenge in Hampshire. This water recycling and water transfer option became the Proposed Development.

1.4.3 Southern Water is in the process of producing a new WRMP, which will be called the Water Resources Management Plan 2024. This emerging WRMP builds on the

2019 WRMP and determines the water resources need for Southern Water up to 2075 and the best value options for how Southern Water will meet that supply need, including selecting new supply-side options that will be needed.

1.5 Project of national significance

1.5.1 The Proposed Development is a 'project of national significance' as a result of a Direction given by the Secretary of State under Section 35(1) of the Planning Act 2008. These are projects that are large in scale and have their own planning process to get permission to be built because of their size and importance to wider communities. An application therefore needs to be made to the relevant Secretary of State for a Development Consent Order (DCO) which would contain many of the consents and powers that would be needed to build, operate, and maintain the Proposed Development. Southern Water will therefore be the Applicant for the DCO. The DCO application is accompanied by an Environmental Statement which is one of a number of documents supporting the DCO application. The role of an Environmental Statement is outlined below.

1.5.2 Once the DCO application is submitted, the Secretary of State will appoint an Examining Authority. This is a panel of independent inspectors who will examine the application in public and make a recommendation as to whether the Proposed Development should be granted permission to be built. It is then for the Secretary of State to make the final decision on whether to grant or refuse the DCO.

1.6 What is the Environmental Statement?

1.6.1 The Environmental Statement provides information on the Proposed Development's likely significant environmental effects (both beneficial and adverse). The Environmental Statement has been prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017.

1.6.2 The Environmental Statement is made up of three Volumes:

1. Volume I contains the glossary and reports the environmental assessment:
   a. Chapters 1 to 5 describe the Proposed Development, the alternatives considered and the approach to assessment that has been taken.
   b. Chapters 6 to 19 present the assessment of the likely significant effects of the Proposed Development in relation to identified environmental topics.
   c. Chapter 20 Cumulative and in-combination effects considers the potential for environmental effects due to relationships between the different environmental topics considered in Chapters 6 to 19 (in-combination effects), and between the Proposed Development and other known larger scale developments in the surrounding area (cumulative effects).
   d. Chapter 21 summarises the likely significant effects reported in Chapters 6 to 20.
2. Volume II contains technical information which supports the environmental assessment.

3. Volume III contains figures that accompany both the technical assessments and supporting information contained in Volume I and Volume II.

1.6.3 This document forms the Non-Technical Summary of the Environmental Statement and outlines the likely significant environmental effects of the Proposed Development.

1.7 What is the purpose of this document?

1.7.1 This Non-Technical Summary provides an overview of the Environmental Statement which has been included with the DCO application. It has been prepared to help provide a concise understanding of the likely significant environmental effects of the Proposed Development, the fuller details of which are reported in the Environmental Statement.

1.7.2 For an accessible version of this document please contact one of the following:

1. Email: HampshireWTWRP@southernwater.co.uk
2. Post: FREEPOST HAMPSHIRE HWTWRP CONSULTATION
3. Phone: 0800 254 5138

1.8 How do I find more information?

1.8.1 This Non-Technical Summary collates information from a variety of key documents. These documents contain further detail on the matters in this report and the key documents are listed in Table 1-1.

Table 1-1 Key documents

Document	Volume and Document reference
Final Draft Water Resources Management Plan 2024 (May 2025)	Please visit www.southernwater.co.uk and navigate to: > about us > our plans > water resources management plan
Location plans	Document Reference 2.1 (DCO Volume 2)
Works plans	Document Reference 2.3 (DCO Volume 2)
Design Principles Document	Document Reference 5.11 (DCO Volume 5)
Design Approach Document which includes the Indicative Environmental Masterplan	Document Reference 5.12 (DCO Volume 5)
Environmental Statement which includes: • Glossary and abbreviations • Volume I Main Text • Volume II Appendices	Document Reference 6.1 (DCO Volume 6)

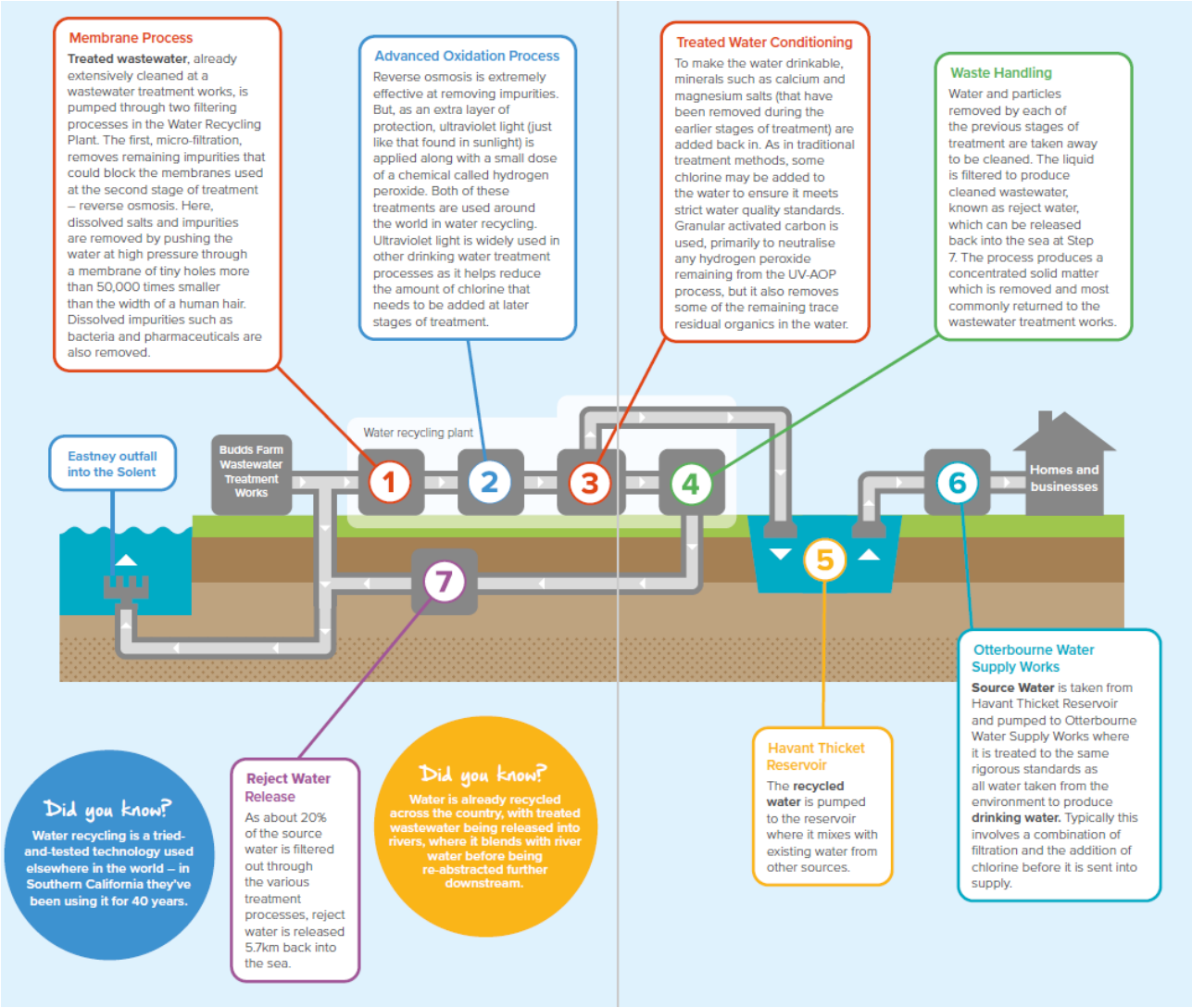
Document	Volume and Document reference
• Volume III Figures	
Outline Construction Environmental Management Plan which includes: • Reduced Working Width and Trenchless Crossing and Tunnelling Schedules and Plans • Outline Soil Resource Management Plan	Document Reference 7.1 (DCO Volume 7)
Framework Construction Traffic Management Plan which includes: • Framework Construction Worker Travel Plan • Framework Rights of Way Management Plan	Document Reference 7.2 (DCO Volume 7)
Traffic Management Strategy	Document Reference 7.3 (DCO Volume 7)
Outline Landscape and Ecology Management Plan which includes the reinstatement strategy	Document Reference 7.5 (DCO Volume 7)
Outline Written Scheme of Investigation	Document Reference 7.6 (DCO Volume 7)
Operational Environmental Management Plan	Document Reference 7.7 (DCO Volume 7)
Outline Carbon Management Plan	Document Reference 7.8 (DCO Volume 7)
Outline Skills and Employment Plan	Document Reference 7.9 (DCO Volume 7)
Invasive Non-Native Species Biosecurity Plan	Document Reference 7.10 (DCO Volume 7)

2 The Proposed Development

2.1 Overview of processes

2.1.1 Graphic 2-1 shows how the Proposed Development fits with other existing infrastructure and summarises the water recycling process proposed to be used by the Water Recycling Plant (WRP).

Graphic 2-1 Water Recycling Plant water recycling process



2.2 Key parts of the Proposed Development

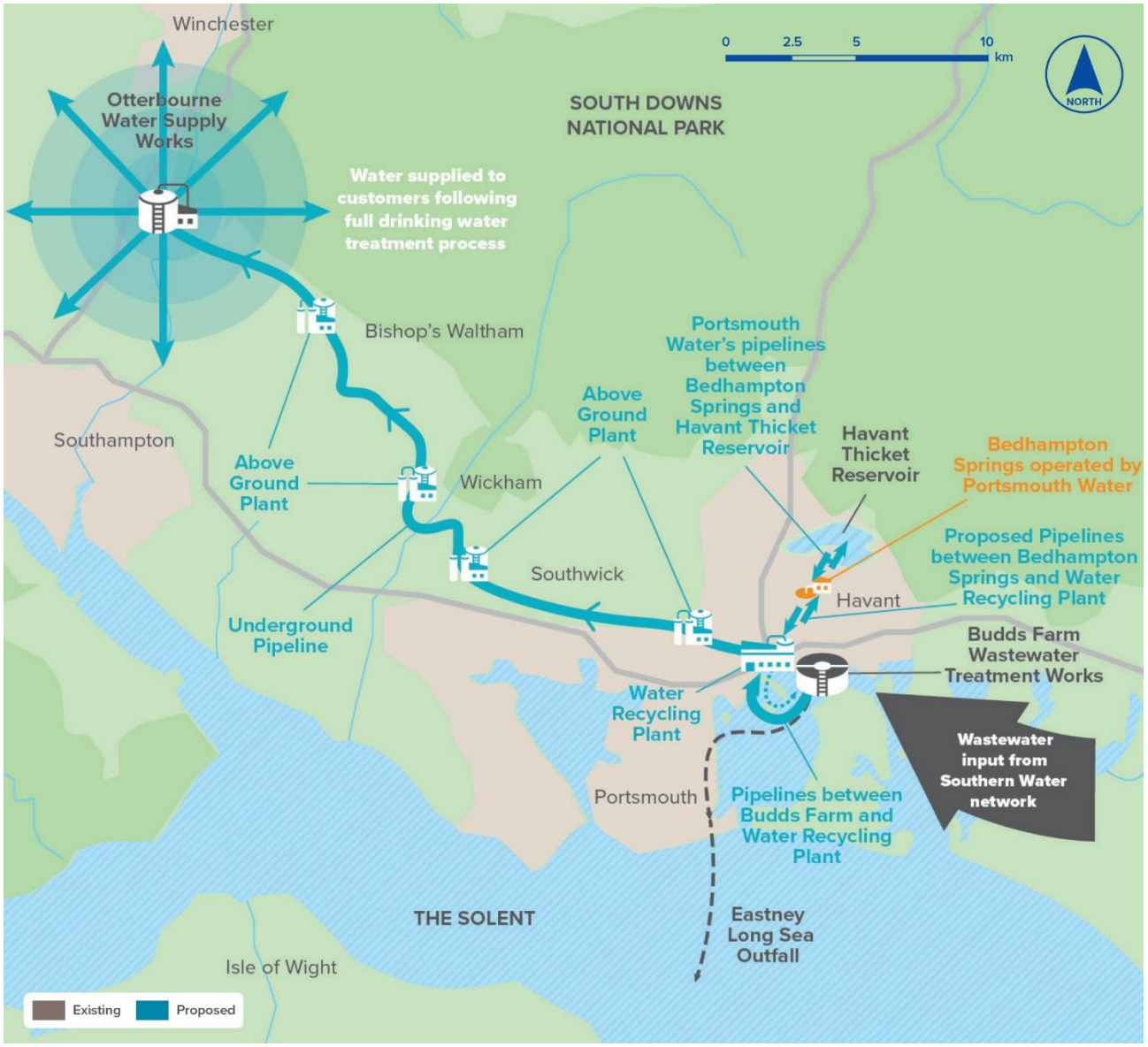
2.2.1 The key parts of the Proposed Development comprise the following and are shown on Graphic 2-2:

1. WRP site
2. Pipelines between Budds Farm Wastewater Treatment Works (WTW) and the WRP site
3. Pipelines between the WRP site and Bedhampton Springs

4. Pipeline between the WRP site and Otterbourne Water Supply Works
5. Above Ground Plant (AGP)
6. Use of the Havant Thicket Reservoir for the storage of recycled water
7. Use of the pipelines between Bedhampton Springs and Havant Thicket Reservoir
8. Use of the Eastney Transfer Tunnel and Eastney Long Sea Outfall, which are an existing tunnel and pipe that discharges water into the River Solent, for the release of reject water from the WRP site
9. Works at Otterbourne WSW to ensure that water transferred from Havant Thicket Reservoir does not introduce pathways for the spread of Invasive Non-Native Species
10. Other works including temporary works to support construction, changes to existing roads and the Public Rights of Way network and new vegetation planting

2.2.2 The following sections summarise the key parts of the Proposed Development. More detail can be found in Environmental Statement Chapter 3 Description of the Proposed Development, Volume I. The design presented within the DCO application requires further detail and development before it can be constructed and become operational. The final design, prepared by the Contractor (the Contractor is either Southern Water or a person appointed by Southern Water or by anyone else having the benefit of part or all of the DCO to carry out any construction element of the Proposed Development or to operate the Proposed Development), would comply with the Design Principles Document which has been provided with the DCO application. The Design Principles Document contains a series of general and site-specific 'design principles' which will ensure that the Contractor embeds a good design approach into the final detailed design of the Proposed Development after the DCO is made.

Graphic 2-2 The Proposed Development



Water Recycling Plant site

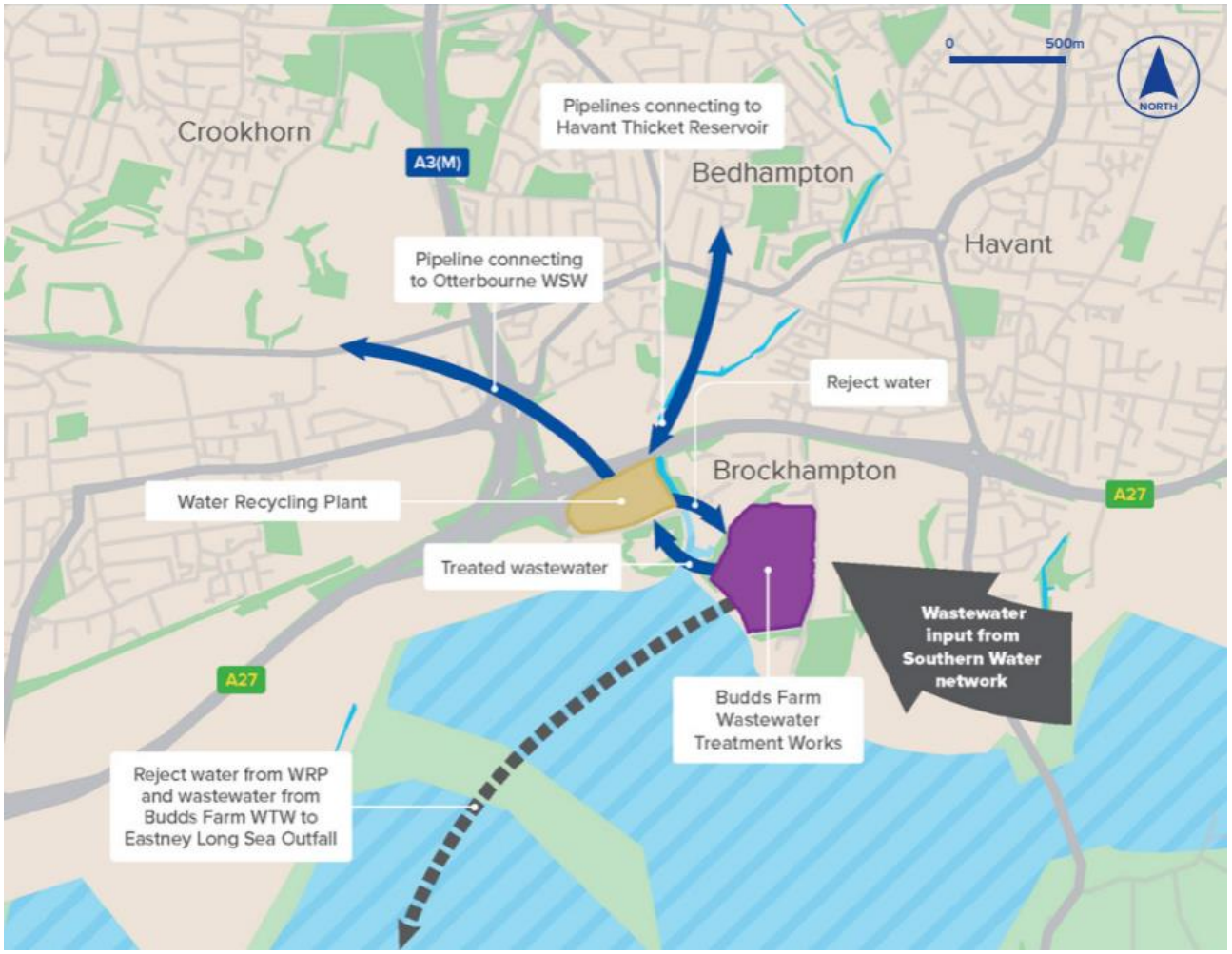
2.2.3 The WRP site would be located approximately 300m north-west of Budds Farm WTW, to the north of Harts Farm Way, south of the A27 and west of the Hermitage Stream, as shown in Graphic 2-3. This site was previously used as a landfill site and has since been covered. It would consist of a main building where the water recycling process would be undertaken, along with kiosks (to support control equipment), office buildings and parking facilities.

Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site

2.2.4 Two Pipelines, approximately 700m in length, would be constructed between Budds Farm WTW and the WRP site: one to transfer treated wastewater from Budds Farm WTW to the WRP site (ready to enter the water recycling process) and the other to transfer reject water containing impurities removed from the treated wastewater from the WRP site to Budds Farm WTW. The Pipelines would

also connect to existing infrastructure at Budds Farm WTW for release of treated wastewater. A pumping station would be located at Budds Farm WTW to move water to the WRP site.

Graphic 2-3 Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site



Pipelines between the Water Recycling Plant site and Bedhampton Springs

2.2.5 Pipelines, approximately 750m long, between the WRP site and Bedhampton Springs which then connect to Portsmouth Water's pipeline connecting to Havant Thicket Reservoir. Together these enable transfer of water between the WRP site and the Havant Thicket Reservoir.

Graphic 2-4 Pipelines between the Water Recycling Plant site and Bedhampton Springs

Pipeline between the Water Recycling Plant site and Otterbourne Water Supply Works

2.2.6 An underground pipeline would transfer water from the Havant Thicket Reservoir via the WRP site to Otterbourne WSW. The Pipeline would be approximately 35km long and transfer approximately 90 megalitres per day (Ml/d) of source water to make up any shortfall in water supply.

Graphic 2-5 Pipeline between the Water Recycling Plant site and Otterbourne Water Supply Works

Above Ground Plant

2.2.7 Due to the length of the Pipeline from Havant Thicket Reservoir to Otterbourne WSW, further Above Ground Plant (AGP) would be required to support the transfer of water to overcome the hills and valleys along the route. Along this section of the Pipeline, AGP would include Intermediate Pumping Stations (IPS) which are needed to help pump water uphill, and Break Pressure Tanks (BPT) which control the flow of water downhill, as shown in Graphic 2-3 to Graphic 2-5.

Invasive Non-Native Species Treatment at Otterbourne Water Supply Works

2.2.8 To ensure that the water transferred from Havant Thicket Reservoir would not introduce new pathways for the spread of Invasive Non-Native Species (these are plants or animals introduced into an area where they were not previously found where their spread could be considered harmful) into the environment, the waste flow from Otterbourne WSW would be treated prior to release. These treatment works would involve repurposing an existing tank and development of a new treatment plant.

Use of Havant Thicket Reservoir for the storage of recycled water

2.2.9 Following transfer from the WRP site, the purified recycled water would be combined with water contained within the Havant Thicket Reservoir. The Proposed

Development would use the Havant Thicket Reservoir for the storage of purified recycled water before it is transferred to Otterbourne WSW, as shown in Graphic 2-4.

Release from the Eastney Long Sea Outfall

2.2.10 Reject water (that is water containing impurities removed from the treated wastewater) produced by the WRP site would be returned to Budds Farm WTW using the Pipelines between the WRP site and Budds Farm WTW. The reject water would then be combined with existing treated wastewater flows from the existing Budds Farm WTW before being transferred and released far out within the Solent. This would use the existing infrastructure operated by Southern Water, consisting of Eastney Transfer Tunnel, Eastney Pumping Station and Eastney Long Sea Outfall, as shown in Graphic 2-3.

2.2.11 In the unlikely event of an emergency shutdown of the WRP, water within the WRP would be returned to Budds Farm WTW by opening the 'run to waste' valve. This water would then be released using the existing Eastney Transfer Tunnel, Eastney Pumping Station and Eastney Long Sea Outfall. The run to waste valve would be used to release water that does not meet the quality requirements at the WRP.

Other works

2.2.12 The construction and operation of the key parts of the Proposed Development would be supported by other development, which would include:

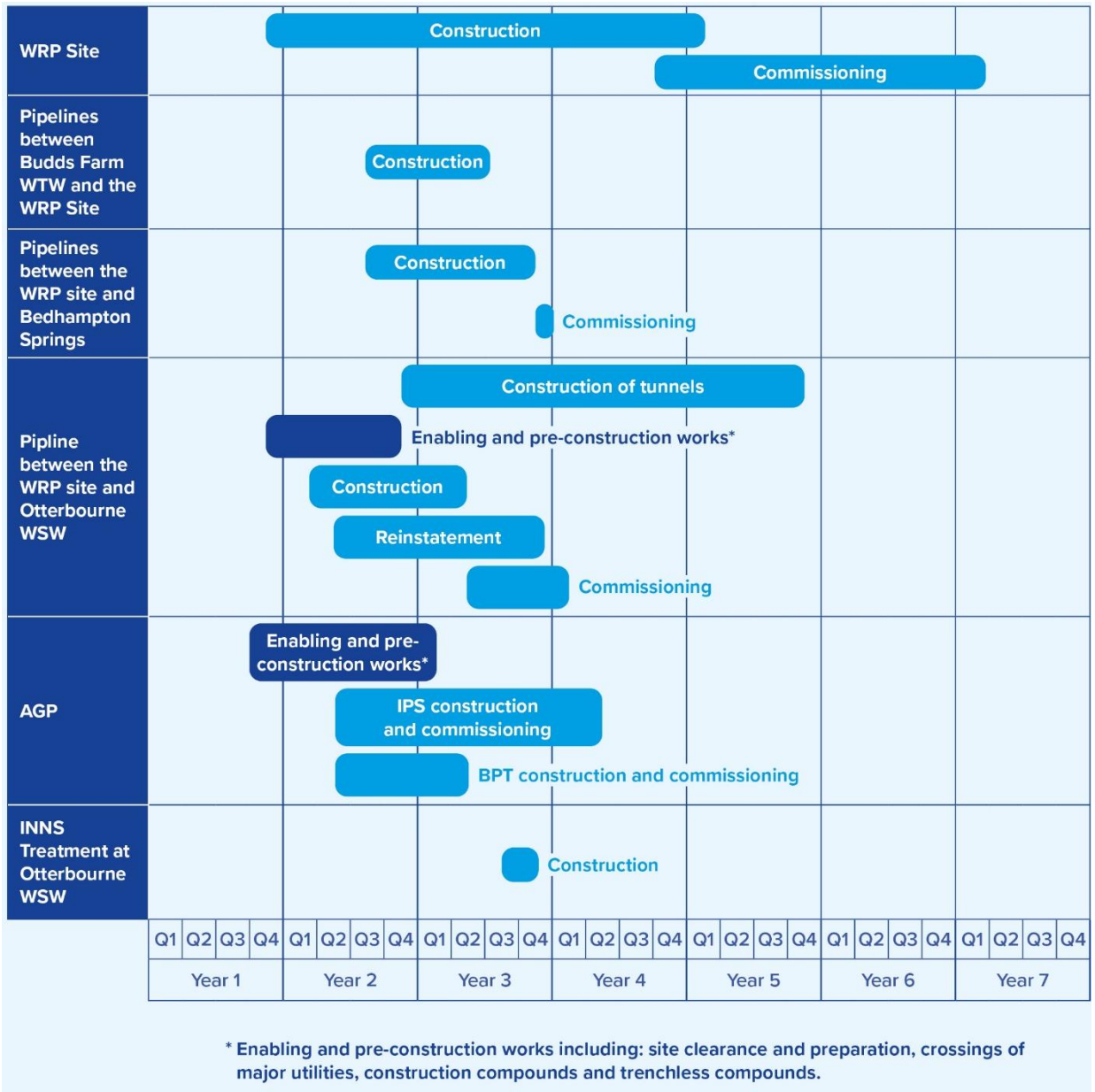
1. Temporary works to support construction including temporary construction compounds, water storage lagoons and temporary access to construction areas
2. Permanent works to support operation and maintenance including access to the AGP
3. Isolation, washout and air valves along the length of the pipelines to release pressure, facilitate commissioning of the pipeline and to enable repair and maintenance
4. Highway works and Public Rights of Way (these are paths over which members of the public have a legal right of passage) diversions and enhancements where required
5. Landscaping and environmental mitigation, enhancement, and compensation measures

2.2.13 Environmental Mitigation and Enhancement Areas are proposed throughout the Order Limits. Environmental mitigation is included in the Proposed Development where required to mitigate adverse impacts. The Proposed Development also seeks to provide additional environmental enhancement which includes habitat improvements adjacent to construction working areas. Enhancements will only be delivered subject to securing agreements with the relevant landowners.

2.3 Approach to construction

2.3.1 The Proposed Development is expected to take approximately five years to construct. Graphic 2-6 shows the indicative timing for construction of each of the key parts of the Proposed Development.

Graphic 2-6 Indicative construction programme



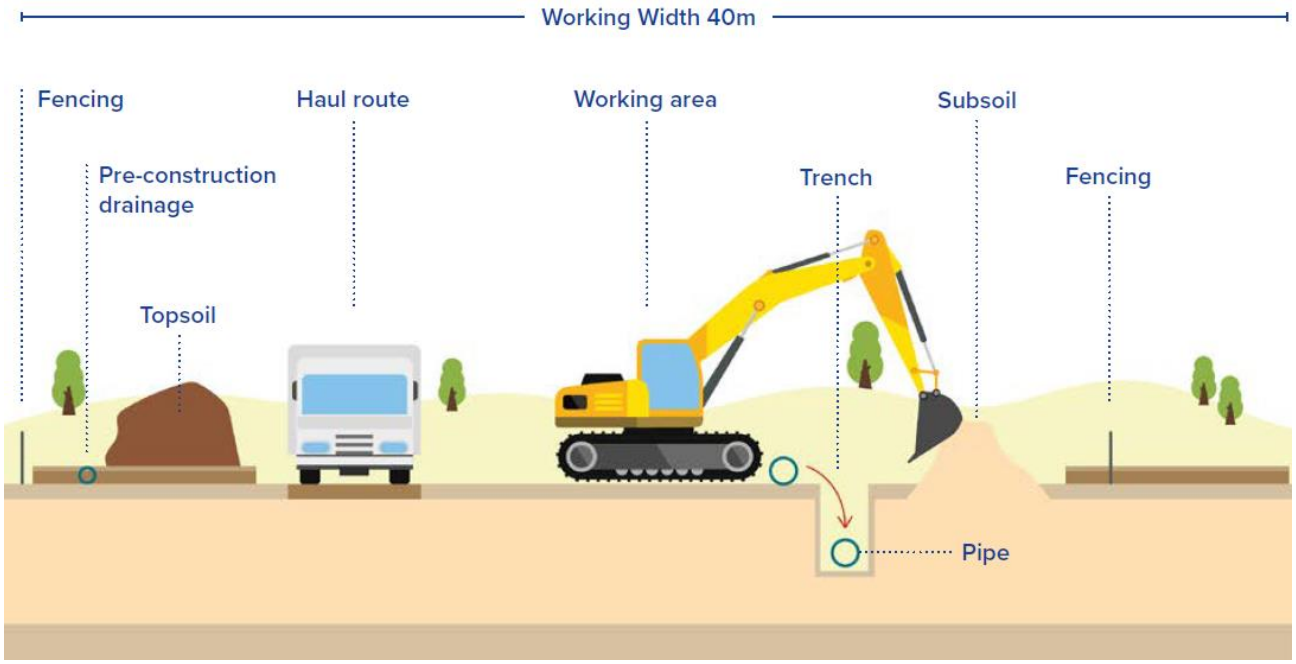
2.3.2 Several techniques are expected to be used to construct the key parts of the Proposed Development. Generally, an open-cut trench construction method would be used to install the underground sections of the pipelines. Other techniques including tunnelling would also be used where appropriate, for example, where pipelines need to pass through populated residential areas and the length is too long for trenchless construction. The main methods of pipeline construction are described below.

2.3.3 The construction methods presented within the DCO application require further detail and development before the Proposed Development can be constructed and become operational. The final construction methods, to be determined by the Contractor, would comply with controls and commitments secured through the DCO.

Trenched open-cut method

2.3.4 It is anticipated that most of the underground pipeline associated with the Proposed Development would be constructed using trenched open-cut excavation in open and unconstrained areas such as fields. The typical working width for trenched open-cut excavation would be 40m as shown in Graphic 2-7. This provides space for construction vehicle movement along haul roads, construction working areas, pipe storage areas, pipeline trench and soil storage areas.

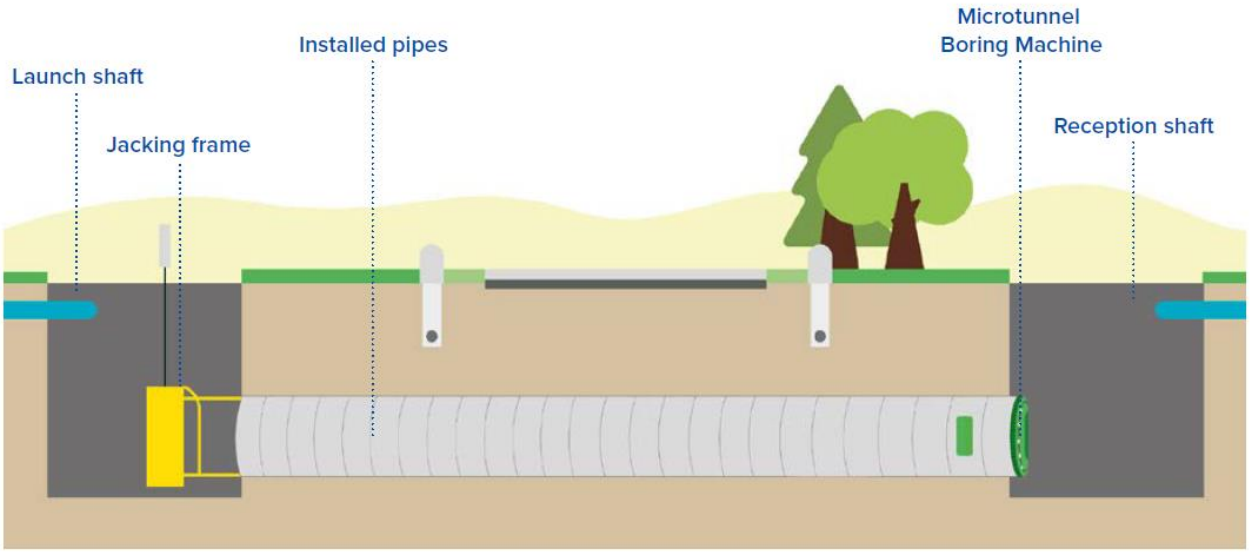
Graphic 2-7 Indicative typical working width for trenched open-cut construction



Trenchless method

2.3.5 For some sections of the pipeline (both above-ground sections and underground sections) there would be crossings that may not be suited to trenched open-cut excavation. Examples of these are roads, railways, waterways, sensitive environmental areas, and other areas where construction could be restricted. In these cases, an underground trenchless method would be used to pass underneath a sensitive feature as shown in Graphic 2-8.

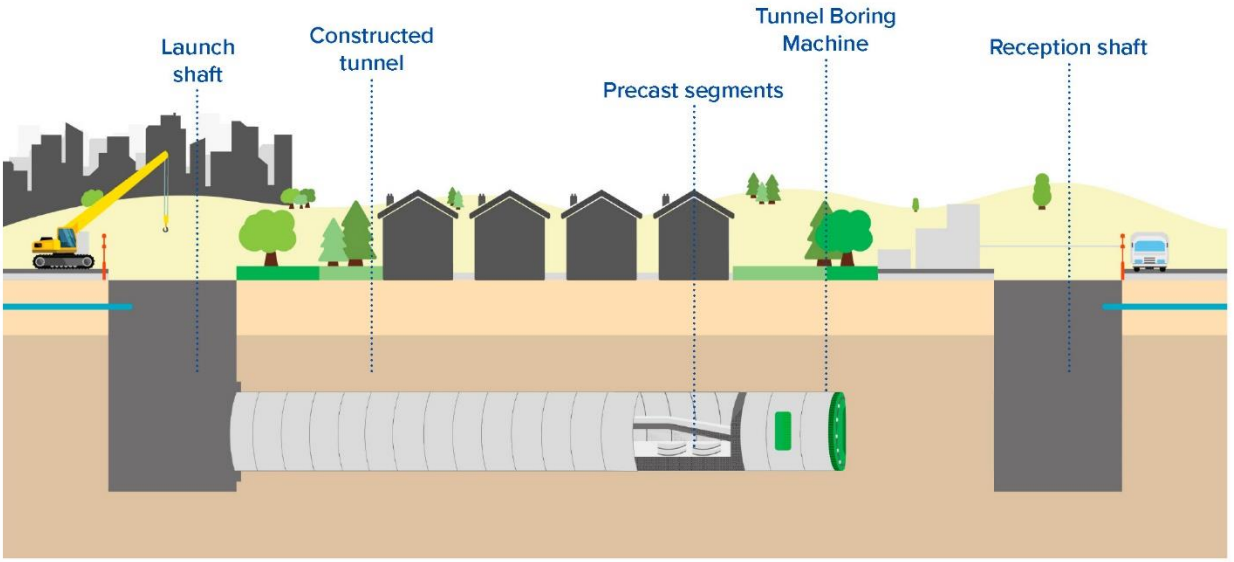
Graphic 2-8 Indicative cross-section of trenchless method



Tunnelling method

2.3.6 Tunnelling is to be used in areas where the underground pipeline needs to pass through residential areas and cross sensitive environmental features, where the length is too long for trenchless construction. Graphic 2-9 shows a cross section of a typical tunnel construction.

Graphic 2-9 Indicative cross section of tunnel construction



2.3.7 Tunnel shafts would be sunk at each end of the tunnel section from where a Tunnel Boring Machine would start and would then emerge and finish. Graphic 2-10 shows an example of tunnel shaft construction.

Graphic 2-10 Example of tunnel shaft construction

Construction compounds

2.3.8 Construction compounds would be temporarily required to support construction of the key parts of the Proposed Development, located at intervals along the pipeline. They are used for storage, offices and welfare facilities for construction workers.

2.3.9 Different types of temporary construction compounds would be used depending on construction methodologies being used, and for uses such as office buildings, welfare facilities and parking.

2.3.10 Construction would also be supported by the use of water storage lagoons. These are required to test the Pipeline to check for leaks and other operational issues prior to commissioning of the pipeline.

Construction environmental management

2.3.11 Construction impacts on the environment and local communities would be managed, as far reasonably practicable, through the implementation of a Construction Environmental Management Plan (CEMP). The CEMP will set out good practice construction management techniques and measures to avoid or

reduce environmental effects. An Outline CEMP has been provided with the DCO application.

2.3.12 Public Rights of Way may be temporarily closed or diverted to facilitate the construction of the Proposed Development. This would be done in accordance with the Framework Rights of Way Management Plan which is appended to the Framework Construction Traffic Management Plan provided with the DCO application.

2.3.13 The Framework Construction Traffic Management Plan sets out various construction traffic management measures that would be implemented to manage impacts during construction, including those in an appended Framework Construction Worker Travel Plan.

2.3.14 Vegetation that is removed to facilitate construction would be reinstated as close to the location, type and character of the existing vegetation as practicable. The reinstatement strategy forms part of the Outline Landscape and Ecology Management Plan (LEMP) that has been provided with the DCO application.

2.3.15 All outline management plans will be developed into detailed plans once consent for the DCO has been granted.

2.4 Operation and maintenance

2.4.1 The Proposed Development would operate at its full capacity to address the water supply deficit in an extreme drought (a drought event which has a 0.2% chance of occurring). At maximum operation, the pipelines between the WRP site and Havant Thicket Reservoir would transfer approximately 60Ml/d of recycled water from the WRP site to Havant Thicket Reservoir and approximately 90Ml/d of source water (water that is used as the source for drinking water) from Havant Thicket Reservoir to the WRP site. In normal weather conditions (i.e. outside of drought) the Proposed Development would meet the forecasted daily water supplies given the extent of supply deficits facing the Applicant's Hampshire supply area.

Water Recycling Plant

2.4.2 The WRP site would take in highly treated wastewater from Budds Farm WTW and use advanced treatment techniques to convert the treated wastewater into purified recycled water. The site would consist of a building where the water recycling process would be undertaken alongside kiosks for control equipment, office buildings and parking facilities.

2.4.3 The WRP site would undergo regular routine monitoring and maintenance including recording information, testing and replacement of equipment. As such there would be three to five operatives at the WRP site at any given time.

Pipeline

2.4.4 It is anticipated that some land along the pipeline (both above-ground and underground sections) would be required to allow access for maintenance. The specific maintenance activities that would be allowed within this land would be discussed with individual landowners.

Above Ground Plant

2.4.5 During operation, the AGP would undergo regular routine monitoring and maintenance including recording information, testing and replacement of equipment. These activities would require an operative to attend each IPS site and BPT site approximately once per week.

Release from the Eastney Long Sea Outfall

2.4.6 The Proposed Development would use the existing Eastney Long Sea Outfall for the release of reject water (through Budds Farm WTW) produced by the WRP site.

2.5 Decommissioning

2.5.1 Consent is not being sought in the DCO for the decommissioning of the Proposed Development, but the effects of decommissioning have been assessed for completeness. Decommissioning is the safe shutting down, dismantling and removal at the end of a development's operational life.

2.5.2 For assessment purposes, it is anticipated that the programme for decommissioning the parts of the Proposed Development would be similar to the construction programme.

2.5.3 During the decommissioning phase, it is anticipated that above-ground assets would be removed, including process, mechanical and electrical equipment, buildings, and associated below-ground structures. It is anticipated that buried pipeline infrastructure would be left in place and once drained would be capped, depending on industry good practice at the time.

2.5.4 Decommissioning would be subject to the appropriate permits, consents and regulatory environment at the relevant time. Control measures during decommissioning works are expected to be similar in nature to those in the Outline CEMP.

3 Evolution of the Proposed Development

3.1 Overview

3.1.1 The three water regulators, Ofwat, the Environment Agency and the Drinking Water Inspectorate oversee a process that water companies follow to identify and develop large scale water supply solutions. Southern Water considered a range of different options in line with this process to find the preferred option. This option was then refined and is presented as the Proposed Development in this document.

3.1.2 The Proposed Development has progressed through an options identification and appraisal process which considered alternative water resources solutions as well as different arrangements of these solutions. The process of option identification and selection has been informed by consultation and engagement, which is summarised in section 3.2. The process of option identification and selection leading to the Proposed Development is summarised in section 3.3 and shown in Graphic 3-1. Further details of how the Proposed Development has evolved can be found in Environmental Statement Chapter 4 Consideration of alternatives, Volume I.

Graphic 3-1 Consideration of alternatives process

3.2 Consultation and engagement

3.2.1 Consultation and engagement to inform the Proposed Development and EIA process has been undertaken with stakeholders, other interested organisations and groups, as set out in Table 3-1.

Table 3-1 Consultation and engagement

Consultation and engagement	Themes and topics
Summer 2022 Consultation July to August 2022	High-level environmental information about the Proposed Development was used to consult members of the public, statutory consultees and other stakeholders and seek views on the options and emerging plans for the Proposed Development.
Technical engagement 2022 to 2026	A programme of technical engagement has taken place with key stakeholders including the Environment Agency, Natural England, Marine Management Organisation and local planning authorities. These key stakeholders provided technical comments on scope, methods for the EIA, and on design and mitigation, all of which helped to inform the design of the Proposed Development.
EIA Scoping July to August 2023	An EIA Scoping Report was submitted by Southern Water to the Secretary of State in July 2023, which set out the proposed scope of the EIA for the Proposed Development. The EIA Scoping Report allowed the Secretary of State, Planning Inspectorate and stakeholders consulted to comment on the scope, methodology and approach Southern Water proposed to assess likely significant effects of the Proposed Development. An EIA Scoping Opinion was issued in August 2023 setting out where there was agreement or disagreement with the proposed scope of the EIA, the Environmental Statement has regard to this.
Summer 2024 Consultation May to July 2024	The Summer 2024 Consultation involved seeking feedback from members of the public, statutory consultees and other stakeholders on the options for the Proposed Development, including on the preliminary findings from the EIA. Feedback from the consultation informed and supported the assessment and design of the Proposed Development to seek to further reduce likely significant effects that were identified.
Spring 2025 Consultation March to April 2025	Following Summer 2024 Consultation feedback, specific areas of the design were refined and extensive water quality modelling was completed. The design changes and outcomes of the modelling were reported in the Spring 2025 Consultation, which took place from March to April 2025.
Autumn 2025 Targeted Consultation September to October 2025	Specific areas of the design were refined in response to Spring 2025 Consultation feedback and focussed on reducing potential impacts on affected landowners.
Spring 2026 Targeted Consultation	Consultation on two further design refinements, one at Otterbourne WSW, and one at the junction of Kiln Lane and Main Road in Otterbourne.
Development Consent Order application May 2026	The Environmental Statement reports the findings of the EIA undertaken for the Proposed Development and sets out the likely significant effects that would result throughout the lifetime of the Proposed Development. It also describes measures included to avoid, reduce and compensate for those likely significant effects. The Environmental Statement forms part of the DCO application.

3.3 Alternatives considered

Stage 1 – development and assessment of initial options

3.3.1 Southern Water considered a number of strategic water resources infrastructure solution options across three technologies and configurations, as shown in Graphic 3-2:

1. Three desalination options (treating sea water)
2. Five water recycling options (treating wastewater)
3. One water transfer option (using water from another water company)

3.3.2 Each of these options was assessed in terms of feasibility, with two water recycling options and all of the desalinisation options assessed to be unsuitable by Southern Water. These options were considered unsuitable due to scale, environmental and technological factors as well as value for money.

Graphic 3-2 Stage 1 options

Stage 2 – options appraisal process

3.3.3 An options appraisal process was undertaken to evaluate the remaining options against technical, environmental, planning and other criteria. This resulted in the selection of two options, described below and presented in Graphic 3-3:

1. A preferred option (shown in yellow) – water recycling involving Budds Farm WTW, a new WRP, Havant Thicket Reservoir, and Otterbourne WSW
2. A back-up option (shown in orange) – water recycling involving Budds Farm WTW, Peel Common WTW, a new WRP, a new reservoir and Otterbourne WSW

Graphic 3-3 Stage 2 options

3.3.4 Of the options considered, the preferred option (which is the Proposed Development) was selected as it is able to meet the future need of planning for a 1-in-500-year drought and is better value for money compared to the back-up option.

3.3.5 The following subsections provide an overview of the initial site selection process for the WRP site and the pipelines corridors for the Proposed Development.

3.3.6 The WRP site would consist of a main building where the water recycling process would be undertaken, along with kiosks (to support control equipment), office buildings and parking facilities.

Water Recycling Plant site selection

3.3.7 To select the site for the WRP, the following criteria were considered:

1. Land use: to avoid densely populated areas and areas of public use including hospitals and schools, key transport infrastructure, and key utilities
2. Land conditions: to avoid areas of marsh, mudflat, cliff face, and open water
3. Site size: the WRP site required a minimum of 45,000m^2 (4.5ha)

3.3.8 Sites meeting the above criteria were compared using key environmental, planning and engineering considerations, including flood risk, ground conditions and contamination, landscape and visual amenity, historic environment and transport accessibility.

3.3.9 Following this further assessment, a site located south of the A27 and north of Harts Farm Way was chosen as the preferred site for the WRP for the Proposed Development, as shown on Graphic 3-4.

Graphic 3-4 Water Recycling Plant

Pipelines site and route selection

3.3.10 A number of initial pipeline routes were considered, shown in Graphic 3-5. The initial pipeline routes were evaluated against environmental, planning and engineering criteria and two initial pipeline routes between Havant Thicket Reservoir and Otterbourne WSW, and two initial pipeline routes between the WRP site and Havant Thicket Reservoir were taken forward to give development flexibility.

Graphic 3-5 Stage 2 initial pipeline routes

Stage 3 Summer 2022 Consultation – preferred scheme development

3.3.11 The initial pipeline routes identified at Stage 2 were then expanded into pipeline corridors to take account of local constraints, as shown in Graphic 3-6. These pipeline corridors were then divided into sections (represented by colours in Graphic 3-6) so that each section could be evaluated and compared against other pipeline corridor sections, to find the best route.

Graphic 3-6 Stage 3 pipeline corridor options

3.3.12 Zones for the AGP needed for the Proposed Development were also considered at this stage. AGP are IPS and BPT, which are required along the length of the pipeline route.

3.3.13 To select sites for the AGP, zones were identified within the pipeline corridor sections as potential areas where the AGP could feasibly be located from an engineering perspective.

3.3.14 The pipeline corridor sections and AGP zones were evaluated against criteria developed by subject matter experts in consultation with stakeholders. The evaluation assessed the following subjects:

1. Constructability
2. Biodiversity and nature conservation
3. Flood risk
4. Geology and soils
5. Historic environment
6. Hydraulics and engineering
7. Landscape and visual amenity
8. Socio-economics
9. Land
10. Water quality and resources

3.3.15 Following the evaluation, the preferred pipeline corridor and AGP zones were identified and then presented at the Summer 2022 Consultation (see Graphic 3-7).

Graphic 3-7 Stage 3 preferred pipeline corridor

Stage 4 Summer 2022 Consultation to Summer 2024 Consultation – refinement of the Proposed Development

3.3.16 Following the Summer 2022 Consultation, refinement of the Proposed Development was undertaken as follows:

1. Development of an indicative pipeline route within the preferred pipeline corridor
2. Development of preferred AGP sites
3. Review of the site selection process for the WRP site
4. Siting of the indicative pipelines and temporary construction compounds

3.3.17 The refined Proposed Development design was shared at the Summer 2024 Consultation for comment and feedback.

Development of an indicative pipeline route within the preferred corridor

3.3.18 The preferred pipeline corridor was refined and developed further having regard to Summer 2022 Consultation feedback, and outcomes of environmental and engineering assessments.

3.3.19 Where options were available in the preferred pipeline corridor as presented at the Summer 2022 Consultation, the options were evaluated against one another to

identify the preferred option. In addition, where constraints were identified on the initial pipeline routes following the Summer 2022 Consultation, alternative pipeline routes were identified and evaluated. The evaluations comprised of assessments undertaken against the following criteria by subject matter experts:

1. Air quality
2. Biodiversity and nature conservation
3. Carbon and climate change
4. Geology and soils
5. Historic environment
6. Interface with other developments
7. Landscape and visual amenity
8. Noise and vibration
9. Resource and waste management
10. Socio-economics
11. Common land, open space or allotments
12. Traffic and transport
13. Water quality, resources and flood risk

3.3.20 Once the evaluation of options was undertaken within the preferred pipeline corridor an indicative pipeline route was identified (as shown in Graphic 3-8).

Development of preferred Above Ground Plant sites

3.3.21 Following the Summer 2022 Consultation, hydraulic modelling, which creates a digital simulation to understand how water will behave, was undertaken to determine whether the refined pipeline route required new or different AGP sites to support the transfer of water. The hydraulic modelling indicated zones along the refined pipeline corridor where the AGP was needed, and suitable sites were identified within the zones. The sites were then evaluated using the same criteria as used for the pipeline route evaluation.

Review of the Water Recycling Plant site selection

3.3.22 The review of the site selection for the WRP site was against the same criteria used for the pipeline route evaluation, and it confirmed that the site shown on Graphic 3-4 remained the preferred site. This was due to the limited environmental and planning constraints, and the site not containing any existing employment uses that would be displaced by the development of the WRP site.

Siting of the indicative pipeline route and temporary construction compounds

3.3.23 Further detailed siting of the indicative pipeline route was undertaken to respond to local constraints, this involved a review of the following linear features crossed by the indicative pipeline route:

1. Vegetation including hedgerows, trees and woodland
2. Watercourses including Main Rivers and Ordinary Watercourses
3. Roads, access roads and Public Rights of Way

3.3.24 The outcome of the review of linear features was the refinement and identification of a preferred pipeline route. Locations for temporary construction compounds, required to support the construction of the Proposed Development, were also identified at intervals along the preferred pipeline route. Graphic 3-8 illustrates how the pipeline could be located.

Definition of the Proposed Development area

3.3.25 Land is required to construct and operate the Proposed Development and to mitigate likely significant environmental effects to the extent that this is possible. The extent of this land is known as the 'Order Limits', as demonstrated in Graphic 3-8. Within the Order Limits, 'Limits of Deviation' are identified which define the extent of the area within which the Proposed Development would be located.

Stage 5 Summer 2024 Consultation to Spring 2025 Consultation

3.3.26 Following the Summer 2024 Consultation, the design was refined in response to the following sources:

1. Stakeholder feedback comprising feedback from the Summer 2024 Consultation as well as continued engagement with landowners, local planning authorities, statutory consultees and other stakeholders
2. Ongoing technical and environmental surveys
3. Updated regulatory requirements
4. Further understanding of the interface between the Proposed Development and other projects, such as those by Portsmouth Water

3.3.27 Design refinements included changes such as adjusting the Limits of Deviation for the pipeline to avoid the removal of veteran trees, inclusion of additional temporary construction access routes as well as inclusion of a pumping station at Budds Farm WTW. When a potential design refinement was identified, effects on those living nearby, the local community and the environment were considered and compared to the Stage 4 design to identify whether any new information would affect decision making from previous stages. As in the previous stages, design refinements sought to address stakeholder feedback, new survey information or requirements while still avoiding and minimising environmental adverse effects. Design refinements were adopted unless impacts of the change would have been worse overall, too difficult to mitigate or not feasible in construction or engineering terms.

3.3.28 After thorough evaluation, 25 design refinements were adopted relating to both construction and permanent design. Many of the design refinements were localised and the Proposed Development was not fundamentally different. These are described in Environmental Statement Chapter 4 Consideration of alternatives, section 4.6, Volume I.

3.3.29 In addition to the design refinements, the EIA identified the need for additional areas of land to provide environmental mitigation and enhancements. Areas for environmental mitigation would be used to mitigate some of the potential impacts of the Proposed Development on habitats such as trees and woodland, these being proposed as close as possible to where potential impacts would likely occur.

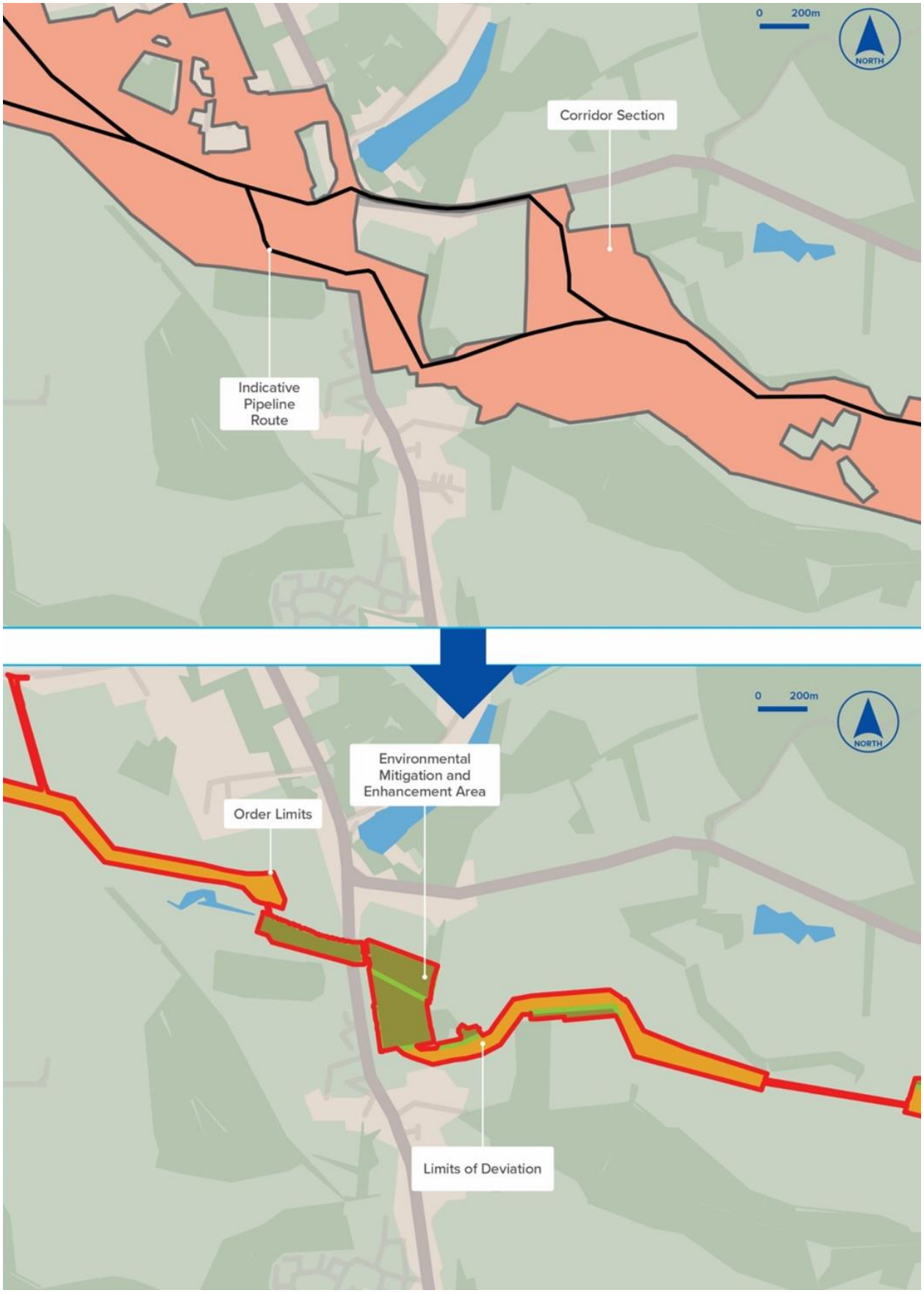
3.3.30 On top of mitigation, new areas of land were proposed for environmental enhancements to help the Proposed Development provide wider benefits to nature and communities. The locations of these enhancements are as follows:

1. WRP site
2. AGP located on the ridge of Portsdown Hill, north of Portsdown Hill Road and east of New Down Lane
3. AGP located to the east of Albany Farm
4. River Hamble and Ford Farm
5. AGP located north of Wintershill Hall
6. Pipeline section between Lower Upham and Brambridge
7. Otterbourne WSW

3.3.31 Adding these enhancements to the Proposed Development is in accordance with national planning policy, which includes Biodiversity Net Gain (an approach to make sure that habitats for wildlife are left in a better state than they were before development). In some locations, environmental enhancements are layered with environmental mitigation, for example, removal of invasive plants before creating new habitat and planting extra trees beyond the number needed to replace those lost. Enhancements will only be delivered subject to securing agreements with the relevant landowners.

3.3.32 The 25 design refinements and areas of land to provide environmental mitigation and enhancements resulted in changes to the Order Limits, which included both increases and decreases in the footprint of the Proposed Development.

Graphic 3-8 Relationship between corridor, route and Order Limits



Stage 6 Spring 2025 Consultation to Development Consent Order application

3.3.33 Following the Spring 2025 Consultation, the design developed in response to the following sources:

1. Stakeholder feedback from the Spring 2025 Consultation and from ongoing engagement with landowners and stakeholders including local planning authorities and statutory environmental bodies
2. Information from the continuing environmental assessments and surveys
3. Engineering design development, including the interface between the Proposed Development and existing Southern Water and Portsmouth Water infrastructure
4. Identified approved or planned development

3.3.34 In May 2025, Havant Borough Council approved Portsmouth Water's planning application for two new pipelines between Bedhampton Springs and Havant Thicket Reservoir. These pipelines are needed by Portsmouth Water to store spring water from Bedhampton Springs at the new Havant Thicket Reservoir. These pipelines would also be used by the Proposed Development meaning a separate pipeline is no longer needed and therefore was removed from consideration.

3.3.35 The approach followed at Stage 6 to identify and evaluate alternative designs (where required) was consistent with the approach at Stage 5. The evaluations compared the alternative designs against the Stage 5 design.

3.3.36 Design refinements were adopted at nine locations in Stage 6. These are described in Environmental Statement Chapter 4 Consideration of alternatives, section 4.6, Volume I. This resulted in changes to the Order Limits which included both small increases into new land (for example, junction improvements) and decreases in the footprint of the Proposed Development (for example, removal of an access route).

4 What are the environmental effects and mitigation?

4.1.1 An Environmental Statement has been prepared to meet the requirements of relevant planning policy and legislation, and to present the Environmental Impact Assessment (EIA) of likely significant effects of the Proposed Development on the environment.

4.1.2 The EIA considers the likely significant effects during the construction, operation, maintenance and decommissioning of the Proposed Development as follows:

1. Construction: The assessments consider the temporary activities involved in building the Proposed Development, the permanent presence of the Proposed Development once built, and any construction effects that would last permanently e.g. physical disturbance of archaeology.
2. Operation and maintenance: The assessments consider the activities involved in both operating and looking after the Proposed Development when it is in use.
3. Decommissioning: The assessment considers the activities involved in the closure of the Proposed Development at the end of its useful life.
4. Environmental topic assessments have been undertaken on the basis of maximum sizes and heights of the Proposed Development (for example, the maximum building dimensions) to allow for the design to be changed where there may be areas of uncertainty. This ensures the assessment is based on the biggest size the Proposed Development could be and therefore a worst case situation.

4.1.3 The EIA also considers combined likely significant effects from the Proposed Development on a single receptor or group of receptors (these are either physical, biological or human parts of the environment that may be impacted upon by the Proposed Development - for example, a school, bats, fish or a river) from a number of individual environmental impacts (for example noise, air quality, traffic and visual) (this is called an in-combination assessment). In addition, the EIA assesses the likely significant effects associated with other developments that would be constructed at the same time as the Proposed Development (this is called a cumulative assessment).

4.1.4 The EIA and design process has been undertaken to assess, avoid and/or reduce adverse environmental effects and promote beneficial effects as a result of the Proposed Development. The assessment within Volume I of the Environmental Statement has considered the following topics of the environment:

1. Chapter 6 Air quality and odour
2. Chapter 7 Archaeology and cultural heritage
3. Chapter 8 Terrestrial and freshwater biodiversity
4. Chapter 9 Marine biodiversity
5. Chapter 10 Carbon and climate change
6. Chapter 11 Land quality and ground conditions
7. Chapter 12 Land use and agriculture

8. Chapter 13 Landscape and visual
9. Chapter 14 Major accidents and disasters
10. Chapter 15 Noise and vibration
11. Chapter 16 Resources and waste management
12. Chapter 17 Socio-economics, tourism and health
13. Chapter 18 Traffic and transport
14. Chapter 19 Water environment (including flood risk)
15. Chapter 20 Cumulative and in-combination effects

4.1.5 The likely significant effects have been assessed against the current environmental baseline (a baseline is the current conditions and environmental features) and the future environmental baseline of the land within and surrounding the Order Limits. The future baseline is defined by considering changes to the current environmental baseline that may result from factors such as other developments that may occur over time in the absence of the Proposed Development and climate change.

Mitigation

4.1.6 Measures to avoid, prevent or reduce adverse (negative) environmental impacts are known as mitigation. These have been identified for each environmental topic and are categorised as follows:

1. Primary mitigation: changes to the location or design of the Proposed Development which are part of the Proposed Development design for the purpose of avoiding, preventing or minimising likely significant environmental effects. For example, changing the route of the Proposed Development to avoid passing through an ancient woodland.
2. Secondary mitigation: measures or actions to prevent or reduce any remaining likely significant adverse environmental effects of the Proposed Development identified through the EIA process. For example, more noise mitigation measures in addition to those already provided as part of the Proposed Development design.
3. Tertiary mitigation: standard good practice measures or actions to reduce impacts, regardless of the design process and EIA assessment. These include actions that will be undertaken to meet existing legislative requirements, and/or actions that are considered to be standard good practice used to manage commonly occurring environmental effects. For example, considerate practices for the Contractor in managing activities which have potential nuisance and environmental effects such as the spillage of fuels, oils or other chemicals.

4.2 Air quality and odour

Approach to the assessment

4.2.1 The air quality and odour assessment considers the potential impacts of the following on both human and ecological receptors:

1. Construction-related dust and tiny solids that suspend in the air (called particulate matter)
2. Construction-related emissions from Non-Road Mobile Machinery (these are machines that while mobile are not designed for the transport of passengers or goods on the public road – examples include bulldozers and cranes)
3. Road traffic
4. Additionally, the assessment takes into account the impacts of the release of odour emissions during the excavation of the landfill site at the WRP site

4.2.2 The assessment considers a study area of up to 250m from the Order Limits. In addition, the assessment considers a study area of up to 200m from roads affected by changes in traffic flows that exceed the relevant air quality screening criteria.

Baseline

4.2.3 In the UK, the primary concerns regarding health effects revolve around nitrogen dioxide and particulate matter. Within the study area the air quality is generally good, with road vehicle emissions being the main influence. There are two designated Air Quality Management Areas (AQMA) as follows:

1. Eastleigh AQMA No.1 (A335) – includes an area extending 30m either side of the A335 from the junction of Leigh Road and Bournemouth Road to Wide Lane (north of the roundabout with connects to Junction 25 of the M27)
2. Portsmouth AQMA No. 9 – includes a section of road between Milton Road and Eastern Road, Milton

4.2.4 AQMAs are identified by local planning authorities for special management to both meet air quality objectives (these include for example setting maximum limits for different types of pollutants) and look after human health. The average yearly mean nitrogen dioxide levels at Eastleigh AQMA No.2 (M3) have met the authority's air quality objective for more than five years and the AQMA was therefore removed in August 2025. Eastleigh AQMA No.1 (A335) is also expected to be considered for removal in future reviews.

4.2.5 Parts of the Proposed Development fall within the location of Portsmouth AQMA No.9. These are not likely to result in emissions in or near this AQMA as this area of the Order Limits is a section of existing underground pipeline.

4.2.6 Monitoring conducted by local planning authorities in the study area indicates that the annual mean nitrogen dioxide levels were above the air quality objective at three locations within Portsmouth City Council's area in 2019 and one location in 2021.

4.2.7 Future improvements in air quality are anticipated due to factors such as the adoption of newer road vehicles which emit less harmful emissions the increasing

use of electric vehicles. Estimates for current and future amounts of nitrogen dioxide and particulate matter, show they will meet relevant air quality objectives.

4.2.8 The WRP site contains underground contaminated materials which could be a potential source of odour during activities such as excavation.

4.2.9 Budds Farm WTW is another potential source of odours in the study area. However, the Budds Farm's WTW incorporates systems to manage odour to ensure any odour from the WTW has no detrimental impact on the quality of the local environment. This is supported by confirmation from the local planning authority of no odour-related complaints in 2024 and one complaint in 2025 which was investigated by the Council but there was no issue found - this underscores the infrequency of odour issues.

Mitigation

Primary mitigation

4.2.10 Primary mitigation measures have been included in the Proposed Development design to avoid or reduce likely significant effects on air quality. This has mainly been undertaken by:

1. Selecting the shortest pipeline routes
2. Avoiding populated areas and designated nature conservation sites whenever practicable
3. Using installation methods that do not require the digging of trenches when crossing sensitive ecological areas to avoid direct disturbance to habitats and features within these sites

Secondary mitigation

4.2.11 No secondary mitigation is proposed as none is required.

Tertiary mitigation

4.2.12 Tertiary mitigation measures for air quality and odour are secured in the Outline CEMP. These include good practice measures to control odour impacts (for example during works on former landfill) and reduce construction dust effects, such as the use of a Dust Management Plan, conducting regular site inspections, and employing techniques to stop the release of dust into the air. Appropriate measures will be in place to reduce dust and dirt from the construction sites being carried onto the public road network.

4.2.13 Specific mitigation measures for Non-Road Mobile Machinery in the Outline Carbon Management Plan focus on emissions control through maintenance and the use of ultralow sulphur diesel fuel where possible. Filters will be fitted to all Non-Road Mobile Machinery to help trap soot and diesel exhaust fumes, with ongoing checks for compliance. Measures to reduce the amount of fuel used during construction and careful siting within working areas would help manage the effects on air quality.

Monitoring

4.2.14 The Outline CEMP secures site specific monitoring measures relating to dust released during construction. This includes daily on-site and off-site inspections of dust soiling on nearby receptors, carrying out regular site inspections to monitor compliance with the Dust Management Plan and agreeing monitoring measures with the relevant local planning authority. In addition, the Contractor will undertake monitoring of works to control odour impacts.

Likely significant effects

Construction

4.2.15 During construction, activities such as earthworks, demolition and vehicle movements can result in the release of construction dust and particulate matter, which may affect air quality. Potential impacts, including nuisance (this is the interference with a person's use or enjoyment of their property, or an activity harmful to health) and the collection of dust on receptors from both construction and demolition activity, construction traffic and on-site plant are identified. With the primary and tertiary mitigation measures in place, no likely significant effects have been identified.

4.2.16 The impact of Non-Road Mobile Machinery emissions from construction activities are assessed with factors such as machinery types, working hours, and existing air quality conditions being considered. With tertiary mitigation measures in place, including siting machinery away from sensitive areas, no likely significant effects are concluded.

4.2.17 Assessment of construction road vehicle movements showed an exceedance of the relevant human health thresholds on Harts Farm Way. Following further review, it was found that there are no relevant human receptors within 200m of the road and as such, no further consideration was deemed necessary. Therefore, effects of construction road vehicle exhaust emissions on human receptors are considered to be not significant.

4.2.18 An assessment of construction road vehicle exhaust emissions on ecological features indicated they would be above the relevant thresholds at the following International, European and national designations:

1. River Itchen Special Area of Conservation
2. River Itchen Site of Special Scientific Interest
3. St Catherine's Hill Site of Special Scientific Interest
4. Portsdown Site of Special Scientific Interest
5. Chichester and Langstone Harbours Ramsar and Special Protection Area / Solent Maritime Special Area of Conservation / Langstone Harbour Site of Special Scientific Interest
6. Stoke Park Wood Site of Importance for Nature Conservation
7. Mount Fair Oak Horton Heath Site of Importance for Nature Conservation

4.2.19 This was therefore considered as part of the terrestrial and freshwater biodiversity assessment which is described in section 4.4.

4.2.20 Potential odour impacts on human receptors, such as receptors associated with Basepoint Business Park and residential dwellings along Mill Lane, arising from earthworks associated with the construction of the WRP site have also been assessed to be not significant.

Operation and maintenance

4.2.21 There are no likely significant effects identified during operation and maintenance of the Proposed Development for all receptors.

Decommissioning

4.2.22 Effects from decommissioning of the Proposed Development are expected to be no greater than those identified during the construction phase. The assessment of significance of decommissioning effects is therefore reported as not significant for all receptors.

4.2.23 Where decommissioning activities differ from those assessed during construction (for example, demolition of small structures), these activities would be assessed using good industry practice and will comply with all relevant statutory requirements applicable at the time.

4.3 Archaeology and cultural heritage

Approach to the assessment

4.3.1 The assessment of archaeology (the study of past human life through the recovery and analysis of physical things people have left behind – this can include objects, such as pottery or tools as well as traces of how humans have changed the landscape, such as digging ditches or constructing buildings) and cultural heritage (a combination of physical heritage such as artefacts or archaeological sites, intangible heritage such as oral history or traditions, and natural heritage such as culturally significant landscapes) considers the potential for likely significant effects on designated assets, such as listed buildings, scheduled monuments, Registered Parks and Gardens and Conservation Areas, and 'non-designated heritage assets' such as historic buildings, archaeological remains, gardens and landscapes.

4.3.2 Two study areas have been defined for the assessment. The first is a 500m buffer from the Order Limits, which sets a search area for non-designated heritage assets. These are features which are not recognised by any formal designation, but which hold significance for archaeological, historic or architectural interest. These features were identified by searches of the Hampshire, Winchester and Portsmouth Historic Environment Records, desk-based research and onsite surveys of the relevant areas.

4.3.3 The second study area, an extended study area of 1km from the Order Limits and 3km from AGPs and the WRP site, was defined to search for designated heritage assets. These are historic features which have sufficient significance to be designated on a local or national basis. These were identified by searches of the National Heritage List for England and the relevant local plans. Other categories of designated heritage assets, such as Registered Battlefields are not located within the extended study area.

4.3.4 Further studies have been undertaken to provide a more detailed understanding of the archaeological and cultural heritage baseline. These comprise:

1. Geoarchaeological Desk-Based Assessment (a report which studies buried soils and geology, such as gravels, to gain an understanding of how the previous landscape likely looked and how that may have shaped where human activity took place)
2. Geoarchaeological and Archaeological Monitoring of Ground Investigation works (an onsite survey which monitors and records any relevant geoarchaeological or archaeological findings during engineering led ground investigations)
3. Geophysical Survey (an onsite study using equipment which maps the differences in buried soils, without having to do any digging/disturbing of the ground, to identify where archaeological sites may be located)
4. Trial trenching (an onsite study where trenches are dug with a machine to establish whether archaeological sites may be present and what date they may be from)
5. Heritage asset settings scoping appraisal (a desk-based study which identifies which heritage assets, such as historic structures or sites, may be affected by the Proposed Development)

6. Heritage asset settings assessment (a desk-based and onsite study which analyses how the Proposed Development may affect the surroundings of the heritage assets, identified by the scoping appraisal)

Baseline

4.3.5 Designated and non-designated heritage assets dating from the Prehistoric period (dating back to around 1 million years ago) to the Modern period have been identified within the study areas:

1. 2,528 Historic Environment Records within the study area
2. 45 scheduled monuments within the extended study area
3. 288 listed buildings within the extended study area
4. 20 conservation areas within the extended study area
5. One Registered Park and Garden within the extended study area

4.3.6 As the Historic Environment Records are a record of past observations, further surveys have been undertaken to better understand the potential for further archaeological heritage assets to be present and to establish the location, nature and value of the heritage assets. Fieldwork by geophysical survey provided coverage of the majority of the Order Limits and trial trenching has been used to investigate key points within the Order Limits where access was available.

Mitigation

Primary mitigation

4.3.7 Primary mitigation measures have been embedded into the Proposed Development design to avoid or reduce damage or disturbance to archaeology and cultural heritage. This has principally been undertaken by:

1. Avoiding designated heritage assets where reasonably practicable
2. Avoiding non-designated heritage assets and areas of higher archaeological potential where reasonably practicable
3. Minimising disturbance within historic parkland, particularly of mature planting, earthwork remains and water features
4. Using existing features of the land and planting to provide screening
5. Restoring land and using appropriate planting to restore areas disturbed during pipeline construction or temporary works to pre-existing condition where possible
6. Using screening bunding (the piling up of excavated soils to create a visual barrier), planting, noise and light controls and other landscape treatments at AGP and WRP site
7. Using appropriate building and fencing finishes at AGP and WRP sites
8. Keeping the Order Limits wide at Frith Farm to provide flexibility to avoid the partial wreckage remains at the Second World War aircraft crash site
9. Providing a buffer between the Order Limits and the Second World War aircraft crash site at Pigeon House Farm to avoid the crash site and possible human remains

Secondary mitigation

4.3.8 Secondary mitigation comprises the application of an agreed scheme of archaeological investigation aimed at providing mitigation of the loss of archaeological information. This is set out in the Outline Written Scheme of Investigation (a document which sets out the scope of future archaeological, or heritage works) which has been provided with the DCO application, followed by site specific measures to be determined post-consent.

Tertiary mitigation

4.3.9 Tertiary measures relevant to archaeology and cultural heritage are secured in the Outline CEMP. These comprise good practice construction methodologies including measures to limit construction noise and emissions, which will be used to reduce the effects of the Proposed Development during construction which include:

1. Measures to control underground water within the Order Limits
2. Measures to limit construction disturbance to receptors such as Little Park Mansions, Otterbourne Manor and Park Place
3. Additional equipment to prevent disturbance in areas of archaeological interest where practicable

Monitoring

4.3.10 Monitoring requirements for mitigation of likely significant effects on archaeology and built heritage are described in the Outline Written Scheme of Investigation. Any landscape restoration and screening will require monitoring during the aftercare period to ensure that this planting is successfully established. Proposals for this monitoring are secured in the relevant sections of the Outline LEMP (sets out the planting, management and monitoring guidelines for the Contractor to follow), which has been prepared as part of the DCO application.

Likely significant effects

Construction

4.3.11 Non-designated archaeological remains and deposits of potential geoarchaeological interest have the potential to be permanently adversely affected by the Proposed Development through complete or partial removal during construction. With the application of an agreed scheme of archaeological work these remains will be appropriately investigated and their archaeological value largely retained and so no likely significant adverse effects are anticipated.

4.3.12 Change to the character of valued historic landscape elements is expected to be mainly temporary and short-term, ceasing either on completion of construction or shortly after restoration, and no likely significant adverse effects are anticipated.

4.3.13 Changes to settings of designated and non-designated heritage assets have the potential to give rise to likely significant adverse effects during the construction of the Proposed Development. Some of these effects would be significant and adverse during construction, but all would be temporary and either reduce to not

significant or to no effect once construction has ended and shortly after restoration. These comprise:

1. Fort Purbrook (Scheduled Monument and Grade II* listed National Heritage List for England 1001842) would be subject to a temporary likely significant effect.
2. Fort Widley (Scheduled Monument and Grade II* listed National Heritage List for England 1001862) would be subject to a temporary likely significant effect.
3. Fort Southwick (Scheduled Monument and Grade I listed National Heritage List for England 1001808) would be subject to a temporary likely significant effect.
4. Fort Nelson (Scheduled Monument and Grade I listed National Heritage List for England 1001860) would be subject to a temporary likely significant effect.
5. Church of St Nicholas, Boarhunt (Grade I listed National Heritage List for England 1350613) would be subject to a temporary likely significant effect.
6. Park Pale at Marwell Park (Scheduled Monument National Heritage List for England 1012308) would be subject to a temporary likely significant effect.
7. Otterbourne Manor (Scheduled Monument National Heritage List for England 1013055) would be subject to a temporary likely significant effect.

4.3.14 Old Bedhampton Conservation Area would be subject to a temporary likely significant effect as a result of a direct physical change combined with a temporary change in setting during construction. The lasting effect would reduce to not significant once construction has ended.

Operation and maintenance

4.3.15 There are no likely significant effects identified as arising during operation and maintenance of the Proposed Development.

Decommissioning

4.3.16 Effects from decommissioning of the Proposed Development are considered to be no greater than those arising in the construction phase and in most cases would be significantly lower than the construction phase. Works will take place in areas where archaeological and geoarchaeological remains would have already been disturbed during the construction phase. There may be only a very short increase in activity during decommissioning, and therefore, the assessment of significance of decommissioning effects is reported as not significant.

4.4 Terrestrial and freshwater biodiversity

Approach to the assessment

4.4.1 The assessment of terrestrial (life on land) and freshwater biodiversity considers all ecological (the study of living things within the context of their environment) features within the Zone of Influence which is the area where ecological features maybe impacted by a development.

4.4.2 Different desk study and field survey areas, based on good practice, have been applied for each ecological feature to enable robust assessment of likely significant effects.

Baseline

4.4.3 47 statutory designated sites (comprising 12 designated internationally and 35 nationally and locally) are either located within 2km of the Order Limits, hydrologically connected to the Order Limits (this is where water can transfer living things or materials between different parts of the water system – for example, between rivers and lakes) or are within 500m of the affected road network (the routes generated by construction traffic). These sites are designated for protection due to the presence of habitats or species that are of importance either internationally or nationally.

4.4.4 There are two non-statutory designated sites located wholly or partially within the Order Limits where trenched open-cut construction or temporary construction compounds are proposed. These sites are designated for protection due to the presence of habitats or species that are of local value.

4.4.5 The Order Limits encompass a wide range of habitats primarily comprising cropland (land used for growing of crops) and modified grassland (land which includes different types of grass which is managed by people – for example sport pitches or for animals to graze on). Other habitats present in smaller quantities include woodland and areas of rarer habitats. Protected species evidence recorded within the study area includes badger, bats, hazel dormouse, birds, water vole, otter, reptiles and freshwater species (found in areas like rivers, streams, lakes, ponds and canals).

4.4.6 These ecological features may be subject to effects during the construction, operation and decommissioning stages of the Proposed Development.

4.4.7 A number of surveys have been undertaken to inform the terrestrial and freshwater biodiversity assessment. This includes surveys for habitats, badger, bats, birds, hazel dormouse, river mammals and freshwater ecology (habitats and species).

Mitigation

Primary mitigation

4.4.8 Primary mitigation measures have been included in the Proposed Development design to avoid or reduce likely significant environmental effects. This includes avoiding all statutory designated sites and ancient woodland. Where practicable, the Proposed Development also avoids non-statutory designated sites, priority habitats (these are rare or threatened habitats), areas vulnerable to flooding and

known ecological receptors including main badger setts and otter holts (areas used by these animals for resting, sleeping and raising their young). The Proposed Development would implement a reduced working width where it crosses sensitive ecological features and also utilise existing gaps in vegetation where practicable.

4.4.9 To mitigate for habitat loss, specific mitigation measures are to be delivered in the Environmental Mitigation and Enhancement Areas which sit within the Order Limits.

4.4.10 The Proposed Development would be designed to avoid the shining of light onto hedgerows and other ecologically sensitive habitats. The pipeline infrastructure would be buried sufficiently deep to avoid watercourse sediments (these are materials which have been transported by water from elsewhere and dropped in a new location), thereby reducing the chances of exposure and interference with the natural form of watercourses.

Secondary mitigation

4.4.11 Secondary mitigation is required to reduce potential likely significant effects of the Proposed Development and is secured in the Outline CEMP. Secondary mitigation includes protected species licences which detail mitigation requirements for badger, bats and hazel dormouse. Mitigation under the protected species licences may include:

1. Timing of works to avoid key hibernation (a state of long deep sleep used by animals to conserve energy), nesting or breeding seasons
2. Sensitive working methodologies such as hand searching vegetation prior to clearance
3. Surveys before construction such as checks of potential features for roosting bats

4.4.12 Other secondary mitigation includes measures to address invasive non-native species (animals and plants, where their spread into an area where they were not previously found, could be harmful), temporary fencing at key connective locations for bats and hazel dormouse, introduction of bat boxes (small structures designed to provide a safe, warm and dry site for bats), noise barriers, a reptile translocation strategy (the re-location of reptiles to a new habitat), sensitive working methodologies, timing of works, habitat manipulation, exclusion zones, and surveys before construction.

Tertiary mitigation

4.4.13 Tertiary mitigation measures relevant to terrestrial and freshwater biodiversity are secured in the Outline CEMP. These measures include, but are not limited to, mitigating construction-related effects on protected and notable habitats and species by following good practice measures and the use of Ecological Clerks of Works (someone who will monitor construction works to ensure compliance with the relevant laws and guidelines) to supervise site activities and the Outline Soils Resource Management Plan (which is provided with the DCO application).

4.4.14 An Invasive Non-Native Species Biosecurity Plan has been provided with the DCO application and sets out both the invasive non-native species risks and measures to mitigate these risks during construction and operation.

4.4.15 An Outline LEMP has been provided with the DCO application. This includes a reinstatement strategy that provides information on seeding and planting specifications, including planting mixes.

4.4.16 An Operational Environmental Management Plan (OEMP) has been provided with the DCO application. This secures the general principles that will be followed during operation of the Proposed Development such as measures specific to the management of washouts and requiring the external lightning to comply with relevant guidance.

4.4.17 An Outline Water Monitoring Plan has been provided with the DCO application. It describes monitoring of water behaviour both above and below ground to identify when additional mitigation requirements may need to be implemented beyond those delivered as part of the Proposed Development.

Enhancements

4.4.18 Opportunities to incorporate environmental enhancements, including Biodiversity Net Gain, have been explored to ensure that the Proposed Development provides benefits to nature and the local community. Potential enhancement measures will be implemented within the Environmental Mitigation and Enhancement Areas and include river restoration, habitat creation and enhancement, planting of native species of value (those that would occur naturally within the Order Limits) for protected species and the creation of hibernation features for amphibians and reptiles. Enhancements would be delivered subject to securing agreements with the relevant landowners.

Monitoring

4.4.19 An extensive monitoring programme following construction, for both habitats and species, will be implemented. The Outline LEMP, which has been prepared as part of the DCO application, sets out the monitoring requirements to ensure the establishment of habitats created by the Proposed Development. The programme will also include surveys following construction for badger, bats, birds, hazel dormouse and reptiles.

Likely significant effects

Construction

4.4.20 Ecological features in the study area would experience adverse impacts such as habitat loss, degradation or fragmentation (where habitats are broken up into smaller, more isolated areas) or disturbance due to the removal of vegetation or noise, airborne pollution, vibration or other physical impacts associated with construction activities. These impacts will be mitigated through implementation of secondary and tertiary mitigation. With application of this mitigation, there are no likely significant effects on terrestrial and freshwater biodiversity during construction.

Operation and maintenance

4.4.21 The operation of the Proposed Development would result in less water being taken from the River Itchen Special Area of Conservation and Site of Special Scientific

Interest during drought conditions. This would have a beneficial effect on aquatic habitats and the species these watercourses support as well as a beneficial effect on the features that make the designated sites important, which is likely significant.

Decommissioning

4.4.22 Effects from decommissioning of the Proposed Development are expected to be no greater than those identified during the construction phase. The assessment of significance of decommissioning effects is therefore reported as not significant for all terrestrial and freshwater biodiversity features.

4.5 Marine biodiversity

Approach to the assessment

4.5.1 The assessment of marine biodiversity considers marine ecology (habitats and species in the sea) and fisheries (species involved in recreational and commercial fishing).

4.5.2 The study area has been determined by considering the likely significant effects on marine biodiversity features that occur within the Zone of Influence for the Proposed Development (the area where marine biodiversity features may experience impacts from the Proposed Development). The study areas for the purpose of this assessment comprise the entirety of Langstone Harbour, including the tidal extent (the furthest point up a river or stream where water is still influenced by the tide of the ocean) of Hermitage Stream, and a 10km area around the Eastney Long Sea Outfall.

4.5.3 A marine biodiversity desk study was carried out to collect baseline data. In addition, surveys were undertaken across the study areas, both for the intertidal areas (areas that are covered by seawater at high tide and uncovered at low tide) and in areas permanently below water. The surveys used multiple methods to gather data such as detailed observation, measurements using remote acoustic technology (the use of sound waves to map the seafloor), retrieval of samples and lab analysis.

Baseline

4.5.4 There are 24 statutory designated nature conservation sites within the study areas. These sites are important for saltmarsh (habitats regularly flooded by seawater and created by fine mud and silt being left behind), coastal lagoons (water bodies cut off from the open sea by a barrier, with only small channels allowing seawater in and out), seahorse, jellyfish, intertidal mudflats (lands submerged and exposed daily by the tides and where muds and clays are left behind), seagrass beds (areas located in shallow coastal waters populated by marine plants), sandflats (areas made up on sand which are submerged and exposed daily by the tides) and sandbanks (areas made up of mainly sandy deposits submerged under shallow seawater) as well as breeding birds, passage birds (birds that migrate and stop temporarily during spring and autumn to rest before continuing their journey) and overwintering birds (birds that either stay in or arrive to an area during water).

4.5.5 Surveys of Langstone Harbour have been undertaken which have shown that there is a wide range of habitats including seagrass beds, intertidal mudflats, mixed materials on the seafloor (boulders, cobbles, gravel and mud), coastal saltmarshes and saline reedbeds (coastal or tidal wetlands dominated by the reed plant), supporting a diverse variety of species.

4.5.6 European eel and European smelt were the only migratory fish species identified in Langstone Harbour during the migratory fish survey, with the European eel also present in Hermitage Stream. There are barriers to migration in Hermitage Stream which are considered to be passable by European eel but not European smelt. The survey determined that the stream overall presented little suitable habitat for migration and spawning of these species.

4.5.7 Other fish species identified in Langstone Harbour were flounder, Dover sole, sea bass and herring.

4.5.8 Regarding marine mammals, harbour porpoise and bottlenose dolphin are common around the study area in the Solent and there are known harbour seal and grey seal haul-out sites (areas which seals use to rest, raise pups and molt) in Chichester and Langstone Harbours.

4.5.9 Langstone Harbour is also a designated bass nursery (areas that protect young sea bass) and supports fisheries activities.

4.5.10 Surveys around the Eastney Long Sea Outfall have recorded mixed sediment and muddy sand habitats. The study area around the Eastney Long Sea Outfall falls within the Solent and a wide variety of fish species has been recorded there including mackerel, sea bream, rays and whiting.

Mitigation

Primary mitigation

4.5.11 Primary mitigation measures that have been included in the Proposed Development design include avoiding both designated sites and sites supporting protected species, and minimising interaction with marine priority habitats. Trenchless construction works would be used for Main River crossings to reduce adverse effects on those features which are connected by water to the marine environment. In addition, the design of the sustainable drainage systems outfall for the WRP site would not extend into the Hermitage Stream any more than the existing outfalls.

Secondary mitigation

4.5.12 No secondary mitigation measures have been identified as required for marine biodiversity.

Tertiary mitigation

4.5.13 Tertiary mitigation measures include good construction practices that are secured in the Outline CEMP to manage the effects of construction on marine biodiversity. These typically comprise pollution control measures, control of lighting, technology to reduce noise, control of invasive species in line with the Invasive Non-Native Species Biosecurity Plan, and other good practice measures for construction site management.

4.5.14 Management measures for the operation and maintenance of the Proposed Development are secured in the OEMP. These include general operational practices which reduce the potential to have an environmental impact and management and control measures that will be in place to avoid potential pollution events during operation. The OEMP also requires the Contractor to develop an Emergency Response Plan which will include a suite of Incident Management procedures to be defined in accordance with good industrial practice.

Monitoring

4.5.15 There are no likely significant adverse effects on marine biodiversity and therefore, no additional monitoring requirements are identified with respect to marine biodiversity, beyond those measures secured in the management plans provided with the DCO application.

Likely significant effects

Construction

4.5.16 With application of construction good practice secured in the Outline CEMP of the Proposed Development, the magnitude of potential construction impacts on marine biodiversity including pollution events, underwater noise and vibration, temporary habitat loss, introduction of invasive non-native species and light disturbance are considered to be not significant.

Operation and maintenance

4.5.17 With the water quality control and monitoring measures, maintenance processes and the collection of water by a tanker there are no likely significant effects anticipated from the operation of the Proposed Development on marine biodiversity.

Decommissioning

4.5.18 Decommissioning will be undertaken using good industry practice (including pollution control measures) and will take place in the context of the regulatory framework in place at the time, including relevant permits and consents. Therefore, there would not be any likely significant effects on marine biodiversity.

4.6 Carbon and climate change

Approach to the assessment

4.6.1 The carbon and climate change assessment covers three elements:

1. A carbon assessment, which calculates emissions of gases that trap heat and cause the greenhouse effect, from activities during construction, operation and decommissioning of the Proposed Development
2. A climate change resilience assessment, which considers how climate change in the future may affect the Proposed Development
3. An In-combination Climate Change Impact assessment, which considers the potential impacts of climate change to likely significant effects predicted in other Environmental Statement topic assessments

4.6.2 The study area for the carbon assessment is not defined by a distinct area but instead includes activities that occur as a result of the Proposed Development. The study area therefore includes the Proposed Development, as well as off-site activities where appropriate, such as the movement of vehicles.

4.6.3 The study area for the climate change resilience assessment is defined by the Order Limits for the Proposed Development.

4.6.4 The study area of the In-combination Climate Change Impact assessment is based on the study areas defined in other Environmental Statement topic assessments.

4.6.5 The assessments have been informed by desk studies, including carbon calculations and climate change projection data from the UK Climate Projection database.

Baseline

4.6.6 The baseline for the carbon assessment considers UK Carbon Budgets (these are restrictions on the total amount of greenhouses gases the UK can emit over a five year period) and is informed by existing emissions generated by Southern Water, the water sector and the UK as a whole. As the Proposed Development is being built to address future water supply deficits, it is not feasible to undertake a 'without development' appraisal of carbon emissions, i.e. to account for emissions totals for the likely future emissions associated with Southern Water's activities or within the Order Limits in the event that no development was brought forward.

4.6.7 The baseline for the climate change resilience and the In-combination Climate Change Impact assessments considers existing climate data from meteorological stations near to the Order Limits (these are equipped with instruments to measure things like temperature, air pressure, humidity, wind and rainfall). The future baseline was informed by the UK Climate Projection database, with climate projection data obtained up to 2100.

Mitigation

Primary mitigation

4.6.8 Primary mitigation has been driven by design measures that have been included in the Proposed Development where feasible and practicable, such as reducing

the amount of infrastructure and materials required to construct the Proposed Development and implementing sustainable drainage systems at the WRP site and AGP sites.

4.6.9 Resilience to future climate change has been considered in the design of the Proposed Development. Mitigation includes flood resilience measures and adopting design standards to protect against damage from heat and high winds.

Secondary mitigation

4.6.10 The Outline Carbon Management Plan which has been provided with the DCO application, establishes a framework for greenhouse gas emissions during construction and operation of the Proposed Development to be as low as reasonably practicable.

4.6.11 No additional secondary mitigation has been identified as required in relation to the climate change resilience assessment as the assessment has concluded there would be no likely significant effects, in contemplation of primary and tertiary mitigation.

Tertiary mitigation

4.6.12 Tertiary mitigation measures relevant for carbon emissions and climate change resilience include good construction practices that are secured in the Outline CEMP, and the Framework Construction Traffic Management Plan. These documents are provided as part of the DCO application.

Monitoring

4.6.13 Emissions data will be recorded during the construction phase, which will be used to inform ongoing decisions to further reduce carbon throughout the rest of the Proposed Development, where practicable and as set out in further detail in the Outline Carbon Management Plan.

4.6.14 Periodic monitoring of the Proposed Development will be undertaken during the operational phase of the Proposed Development to ensure resilience to climate hazards is maintained.

Likely significant effects

Construction

4.6.15 Carbon emissions as a result of construction of the Proposed Development have been assessed to be not significant, as they form a small part of the UK Carbon Budgets and would be a one-off emission source over a short period of time.

4.6.16 The Proposed Development has been designed to include flood resilient measures and measures to prevent damage from heat and high winds and therefore climate change resilience effects have been assessed to be not significant.

4.6.17 The In-combination Climate Change Impact assessment identified no likely significant effects during the construction phase.

Operation and maintenance

4.6.18 A process has been followed by Southern Water to review different options to select the required drought resilience scheme to meet future water demands in the region, of which carbon emissions were one of the factors considered. The proposed design of the Proposed Development therefore represents lower carbon emissions than the feasible and comparative alternatives that could have been taken forward, including desalination options (the removal of salt and minerals from seawater to turn it into water suitable for human consumption). The Proposed Development is not considered to affect the UK's ability to meet its future emission reduction and Net Zero targets. No likely significant effects are identified. Although not required or relied upon to reach a conclusion of no likely significant effects, additional mitigation is considered through the Outline Carbon Management Plan.

4.6.19 Taking into account the primary and tertiary mitigation adopted as part of the design, the Proposed Development was calculated to have a high resilience to climate change during the operational phase. Therefore, no adverse likely significant effects are anticipated.

4.6.20 The In-combination Climate Change Impact assessment identified no likely significant effects during the operation phase.

Decommissioning

4.6.21 Decommissioning of the Proposed Development is likely to take place in over 100 years' time, and the carbon footprint of the UK for that period is unknown. Therefore, the estimation of carbon emissions during this phase is less certain. A high-level assessment of carbon emissions as a result of decommissioning has been undertaken which predicts emissions of 110 tonnes CO_2e which would be a short term and single occurrence. This low volume and short timescale means the effect is considered to be not significant.

4.6.22 On the basis the Proposed Development is considered to have a high resilience to the projected effects of climate change during decommissioning, the effects of climate change to the Proposed Development are considered as not likely to be significant.

4.6.23 The In-combination Climate Change Impact assessment identified no likely significant effects during the decommissioning phase.

4.7 Land quality and ground conditions

Approach to the assessment

4.7.1 The assessment of land quality and ground conditions considers potential sources of contamination and how designated environmental sites, underlying geology and groundwater, surface water, buildings, infrastructure and agricultural land may interact with or be impacted by potential sources of ground contamination.

4.7.2 The land quality and ground conditions study area includes both the land within the Order Limits plus three separate buffer zones at 50m, 250m and 500m. These buffer zones have been applied based on the potential risks that potential sources of contamination like landfills may pose and the sensitivity of receptors that may be affected.

Baseline

4.7.3 The baseline environment for the land quality and ground conditions assessment was established using a range of publicly available data, information gathered through historical ground investigations and further ground investigations undertaken for the Proposed Development. The ground investigations were undertaken within the Order Limits and involved observations of current ground conditions and collection of soil and groundwater samples for laboratory analysis.

Geology

4.7.4 Located within the Order Limits are areas of Made Ground (land that is either artificial or comprising disturbed natural materials). Made Ground has either been proven to be present through ground investigations or is anticipated to be present due to historical activities.

4.7.5 Naturally occurring deposits, for example Alluvium (clay, silt, sand and gravel formed by the actions of natural features like glaciers or rivers), have also been identified as being present within the Order Limits. The naturally occurring deposits are present in isolated pockets and are not continuous across the whole Order Limits footprint.

4.7.6 Bedrock is variable across the footprint of the Order Limits.

Groundwater

4.7.7 The naturally occurring soils present within the Order Limits are classified as either Secondary A Aquifers (layers of rock capable of supporting water supplies at a local scale and potentially forming an important flow of water to a river that can occur outside of periods of rain, called river base flow) or Secondary Undifferentiated Aquifers (layers of rock that have variable characteristics which cannot be classified as either a Secondary A or B Aquifer). Private drinking water supplies have been recorded as taking water from the Secondary Aquifers.

4.7.8 The vast majority of the bedrock types present within the Order Limits are classified as Principal Aquifers. This type of aquifer may support water supplies and/or river baseflow on a strategic scale. It is from the Principal Aquifers that public drinking

water is taken (in the areas surrounding Bedhampton Springs and Otterbourne for example).

4.7.9 Some bedrock types have been recorded as unable to yield usable groundwater or resources and are therefore not significant for water supplies or river baseflow.

4.7.10 Source Protection Zones are present within the footprint of the Order Limits. These zones are to protect areas where groundwater is taken from and illustrate the sensitivity of groundwater resources and level of risk from contamination.

Surface water and environmentally sensitive areas

4.7.11 There are several rivers (for example, the River Itchen and Hermitage Stream) and other surface water features (for example, drainage ditches) present throughout the land quality and ground conditions study area.

4.7.12 Environmentally sensitive areas, such as the River Itchen Site of Special Scientific Interest and Special Area of Conservation, have also been identified as being present within the land quality and ground conditions study area.

Built environment

4.7.13 Features that form part of the built environment, such as, transport infrastructure, commercial and residential buildings have been identified as being present within the land quality and ground conditions study area. These features are not present throughout the whole study area and are often separated by areas of public open space or agricultural land.

Agricultural land

4.7.14 The study area is predominately located within areas of agricultural land which are deemed to be of moderate to excellent quality. Urban areas and areas of non-agricultural land are also present within the study area.

Potential sources of contamination

4.7.15 Historical and current land uses within the land quality and ground conditions study area have been identified as potential sources of contamination. Examples of potential historic and current sources of contamination within the study area include landfills, sewage works, infilled land (land which may have previously been a pond, quarry or mine which has now been filled in) and railway land.

Mitigation

Primary mitigation

4.7.16 Primary mitigation measures have been included in the Proposed Development design that aim to reduce the potential impacts associated with contamination on human health, groundwater (underground water), surface water, environmentally sensitive areas, the built environment and agricultural land. Primary mitigation for land quality and ground conditions includes incorporating gas protection measures at the WRP site and trenchless construction beneath Main Rivers to reduce the potential for contaminated material to enter rivers through surface runoff.

Secondary mitigation

4.7.17 No secondary mitigation measures have been identified for land quality and ground conditions as none are required.

Tertiary mitigation

4.7.18 Tertiary mitigation measures relevant for land quality and ground conditions include good construction practices that are secured in the Outline CEMP. This includes the casting of piles in situ for the WRP site (where a drilled hole is filled with concrete on site) to reduce the risk of contamination from the surrounding landfill waste into both the Principal Aquifers or the adjacent surface water. Also included is the need to undertake both a detailed risk assessment for foundations for the construction of the WRP site and the appropriate ground investigations in high risk areas, to reduce the surface area of exposed landfill waste as far as practicable, provide temporary cover of exposed landfill areas and permanently cover exposed landfill areas as soon as practicable, and that management plans and cleaning and treating strategies are put in place to deal with contamination.

4.7.19 During operation of the Proposed Development, task specific risk assessment and method statements will be developed, along with an Emergency Response Plan. These measures are secured in the OEMP, which has been provided with the DCO application.

Monitoring

4.7.20 The requirement for groundwater and surface water monitoring during construction is secured in the Outline CEMP. There may also be the requirement for ground gas monitoring to continue during the construction phase at specific locations for the protection of construction workers. This will be determined after the DCO is granted, when the design of the Proposed Development has further progressed.

Likely significant effects

Construction

4.7.21 The assessment identified that with the implementation of primary and tertiary mitigation measures, no likely significant effects are anticipated for any receptors within the land quality and ground conditions study area during the construction of the Proposed Development.

Operation and maintenance

4.7.22 No likely significant effects have been identified in relation to land quality and ground conditions during operation and maintenance of the Proposed Development.

Decommissioning

4.7.23 No likely significant effects have been identified in relation to land quality and ground conditions during decommissioning of the Proposed Development.

4.8 Land use and agriculture

Approach to the assessment

4.8.1 The land use and agriculture assessment considers the likely significant effects on residential property, community land and facilities, commercial property and land, development land, agricultural land including best and most versatile land, and soil resources.

4.8.2 For direct impacts the study area for the assessment is the Order Limits. For indirect impacts on residential property, community land and facilities, commercial property and land, development land and agricultural land, the assessment considers a study area of 500m from the Order Limits.

Baseline

4.8.3 The land use baseline draws on Ordnance Survey data (this is Great Britain's national mapping service), Google Maps, Points of Interest (these are locations where their location would typically be useful for people to know, for example businesses, schools and leisure services) and local planning authority websites to identify key settlements, community facilities, commercial properties and land, as well as land allocated for development in local plans (these are documents, produced by local councils, which set out a vision and policies for future development in an area) within the study area. Community facilities and land include schools and education facilities, healthcare facilities, religious buildings and grounds, open space and recreation facilities, community centres, libraries and family service centres.

4.8.4 Within the land use study area, there are several rural settlements including Wickham, Shedfield, Bishop's Waltham, Colden Common and Otterbourne, as well as 58 community land and facilities, 17 clusters of businesses and 46 individual businesses.

4.8.5 While the Proposed Development has been designed to avoid major housing allocation sites for future development, land currently allocated for employment uses is included within Order Limits. A small area of land within the Welborne Garden Village allocation (a major committed development north of Fareham) is included in the Order Limits to be used temporarily as a construction compound and potentially permanently for an access road expected to use the site's internal road network.

4.8.6 Detailed soil and Agricultural Land Classification surveys (these assess the quality of land for farming) of the AGP sites on agricultural land and high-level surveys of the soils and Agricultural Land Classification along the route of the Pipeline between the WRP site and Otterbourne WSW have been undertaken on agricultural land. Within the Order Limits, there is approximately 240ha of agricultural land, of which 114ha is best and most versatile land and 126ha is moderate or poor quality agricultural land.

4.8.7 There are eight main soil types within the Order Limits, mostly comprising imperfectly or poorly drained clays (these retain water as they have a high-water holding capacity), with well drained silty soils (these allow water to pass through them quickly) over chalk found between Crockerhill and Portsdown.

Mitigation

Primary mitigation

4.8.8 Primary mitigation measures have been included in the Proposed Development design that involve the avoidance of settlements, commercial property and land, major housing allocations and best and most versatile agricultural land where reasonably practicable, to reduce the risk of disruption to land use and agriculture.

Secondary mitigation

4.8.9 Engagement with affected businesses and community facilities has been undertaken, to understand the impacts of the Proposed Development. Engagement would continue with owners and operators of Wickham Park Golf Club and Winters Hill Hall (where likely significant effects are reported in ES Chapter 12 Land use and agriculture, Volume I) specifically around the extent of the proposed temporary possession of land, the approach to access and expected impacts from the relevant construction works. The Contractor will have regard to any feedback received when finalising its proposals. This is considered important for acceptance within the local communities and to build trust between the communities and Southern Water. The requirement for engagement post-consent, where a likely significant adverse effect has been identified, has been included as a measure within the Outline CEMP. Ongoing engagement will help to identify secondary mitigation which can be put in place to reduce the likely significant effects where practicable.

Tertiary mitigation

4.8.10 Good construction practices relevant to land use and agriculture are set out in the Outline CEMP, the Outline Soil Resource Management Plan (which is appended to the Outline CEMP), the Framework Construction Traffic Management Plan (and the appended Framework Rights of Way Management Plan), and the Traffic Management Strategy. These include measures to maintain access and reduce disruption, manage soil and waste, reduce dust released during construction, manage surface water and flood risk (including sediment), and engage with businesses and communities. The OEMP makes reference to a detailed Soil Resource Management Plan that will include appropriate soil protection measures to be implemented for operational works where there is the potential for adverse effects on soil resources.

Monitoring

4.8.11 There are no likely significant adverse effects identified that will require monitoring beyond the in-combination effects on amenity, for which monitoring measures will be specific to the contributing topics and effects and therefore included in the relevant chapters.

Likely significant effects

Construction

4.8.12 Likely significant adverse temporary effects have been identified for Wickham Park Golf Club due to the open-cut trenching through parts of the Golf Course and through the car park and the presence of a temporary construction compound to support the trenchless construction works at the River Meon.

4.8.13 Open-cut trenching through parkland at Winters Hill Hall, land take for BPT K and an associated temporary construction compound would cause temporary and permanent significant adverse effects on the wedding and events business.

4.8.14 The temporary removal of 114ha of best and most versatile land from agricultural use during construction would result in a likely significant adverse effect. The permanent loss of 1.6ha of best and most versatile agricultural land for the AGP sites would result in a likely significant adverse effect.

4.8.15 The construction of the Pipeline between the WRP site and Otterbourne WSW would result in a likely significant adverse in-combination amenity effect on two sensitive commercial receptors, Wickham Park Golf Club and Winters Hill Hall.

Operation

4.8.16 There are no likely significant effects identified during operation, as the temporary works will be reinstated on completion of construction and agricultural uses will resume, other than in the small areas required for the AGP. It is considered that any impacts arising from maintenance activity would be short-term and temporary and would therefore be unlikely to result in likely significant effects.

Decommissioning

4.8.17 Effects from decommissioning of the Proposed Development are considered to be no greater than those identified during the construction phase, with the exception of the buried pipeline infrastructure.

4.8.18 It is anticipated that when the Proposed Development is no longer in use, the buried pipeline infrastructure would be drained, sealed and left in the ground. This reduces the potential for likely significant effects associated with any temporary loss of land or disruption to agricultural land and soils. These effects are therefore likely to be less than those outlined in the construction assessment.

4.8.19 A likely significant adverse effect during decommissioning has been reported for Winters Hill Hall due to the temporary land take that would be required to decommission BPT K.

4.9 Landscape and visual

Approach to the assessment

4.9.1 The landscape and visual impact assessment considers the likely significant effects of the Proposed Development on the landscape as a resource in its own right, and on people's views of the landscape. For the visual effects the impacts on several visual receptor groups are assessed including:

1. People travelling through the area on local roads and/or Public Rights of Way which are promoted routes (these are routes which are actively advertised, shown on maps, leaflets and websites or may have some form of associated branding)
2. People travelling along Public Rights of Way which are not promoted routes (have the same rights of access as a promoted route but may not be advertised or may have only basic waymarking)
3. Residents
4. Tourists
5. People using open spaces
6. People travelling through the area on either main roads or on local roads
7. Views from Langstone Harbour

4.9.2 The study area for the landscape and visual assessment includes all land within the Order Limits and the area over which construction, operation and decommissioning of the Proposed Development may give rise to likely significant landscape and visual effects. The study area has been defined through analysis of Zones of Theoretical Visibility, which are computer generated maps which show where the Proposed Development might be visible from. A series of winter and summer surveys were then undertaken to refine and confirm the study area.

4.9.3 The assessment of operational effects considers two situations: year 1 when planting is new and year 15 when planting has matured.

Baseline

4.9.4 The landscape within the southern part of the study area comprises the coastal plain which extends along the coastline between Chichester Harbour in the east, Portsmouth at the centre and Fareham in the west. This area is dominated by settlement and industry but also includes areas of open water and habitat that are rich in wildlife and important for tourism and recreation. There are open views across the harbours from the shoreline, but views tend to be limited by buildings within the areas of dense settlement.

4.9.5 North of Portsmouth, the land rises steeply to form Portsdown Hill, which is a narrow ridge with panoramic views to the south across the coast and north across the Forest of Bere to the distant hills of the South Downs.

4.9.6 The Forest of Bere is lower lying and includes extensive areas of woodland. Views within this part of the study area therefore tend to be shorter. This area is crossed by several important chalk rivers that flow south from the South Downs National Park, which is close to the Order Limits around Wickham and Lower Upham.

4.9.7 The western end of the study area covers the broad floodplain of the River Itchen and higher ground where the settlement of Otterbourne is located. The dense vegetation along the river and the steep hills either side limit longer views.

4.9.8 The landscape character of the study area has been reviewed and assessed at three levels. These receptors comprise National Character Areas defined by Natural England, Landscape Character Areas defined by Hampshire County Council and Local Landscape Character Areas defined by Southern Water as part of the EIA process. This helps to draw distinctions between the different scales of effect and impact.

Mitigation

Primary mitigation

4.9.9 The landscape and visual assessment has informed the design of the Proposed Development from the outset. Primary mitigation measures have been included in the Proposed Development design such as carefully siting the Proposed Development in the landscape to avoid or reduce the loss of existing vegetation and siting permanent proposed structures so they best blend into both the existing structure of the land and pattern of the vegetation. The mitigation conserves and responds positively to landscape, ecology and historic features of value and opportunities for new planting and improvements to Green Infrastructure (these are networks of both green and blue spaces, such as water or planting, that can deliver a wide range of benefits) have been identified.

Secondary mitigation

4.9.10 For landscape and visual matters, all mitigation is considered to be primary (included in the design) mitigation and so no secondary measures are proposed.

Tertiary mitigation

4.9.11 Good construction practices are set out in the Outline CEMP to manage the effects of construction on landscape and visual receptors. These include, for example, locating works in the least prominent locations and making use of existing natural features such as vegetation to make the construction works less visible.

4.9.12 The Outline LEMP, which has been provided with the DCO application, sets out the detailed planting requirements such as plant species and layout.

Monitoring

4.9.13 Monitoring during the construction of the Proposed Development will be undertaken in accordance with the measures set out in the Outline LEMP, which will be developed further after the DCO is granted.

4.9.14 Monitoring of the growth and maintenance of planting and how successful the planting is in achieving the screening and integration objectives will be undertaken by the Contractor. The monitoring will take place over a span of 10 years including once a year between years 1 and 3, once during year 5 and then once every two years between years 6 and 10 following planting to ensure its successful establishment.

Likely significant effects

Construction

4.9.15 Construction activity would extend across the rural landscape through the centre of the south Hampshire lowlands, from the western edge of the settlement of Widley in the east to Otterbourne in the west. This would include construction of the Pipeline across the north facing slope of Portsdown Hill, with impacts on peacefulness and scenic quality extending into the lower lying Forest of Bere. Across the majority of the rest of the area, impacts would be more localised where it would cross lower lying areas which have more existing mature vegetation and settlement. For particularly sensitive locations, such as the crossings of chalk rivers, trenchless construction techniques would be used. There would be likely significant effects across four of the Landscape Character Areas defined at the county level, including likely significant effects within the Portsdown Hill open downs area. At the local level, 12 of the Local Landscape Character Areas identified would experience likely significant adverse effects. Adverse effects have also been identified with respect to the South Downs National Park designation and its setting during construction. The extent of these effects would be limited by intervening vegetation and landform but would temporarily compromise the purposes of the National Park.

4.9.16 There would be visual impacts during construction which would have a temporary likely significant effect and these are set out below:

1. A total of five visual receptors where people are travelling along Public Rights of Way which are promoted with significance ranging from moderate to major adverse
2. A total of 20 visual receptors where people are travelling along Public Rights of Way which are not promoted with significance ranging from moderate to major adverse
3. A total of seven visual receptors where people are residents with significance ranging from moderate to major adverse
4. One visual receptor where people are tourists with a moderate adverse significance
5. Three visual receptors where people are using public open spaces with a moderate adverse significance
6. Three visual receptors where people are travelling through the area on main roads with a moderate adverse significance
7. A total of 13 visual receptors where people are travelling through the area on local roads with a moderate adverse significance

4.9.17 There would be extensive views of construction activity from the higher ground of Portsdown Hill, particularly to the north where temporary construction compounds, vehicles and people moving across the landscape would be visible in the rural landscape. Where there is more vegetation and the landscape is lower-lying, for example to the west of Wickham, views would be shorter and largely screened by existing vegetation. Likely significant visual effects have been identified across the study area as outlined above, mostly relating to residents living in close proximity

to the Order Limits or people on Public Rights of Way. These impacts would be temporary and would cease on completion of construction.

Operation and maintenance

4.9.18 Following construction of the Pipeline, the ground above and within working areas such as temporary construction compounds, would be restored to its previous condition, where reasonably practicable. Whilst planting establishes in the early years of operation, gaps in existing vegetation where vegetation was removed to facilitate construction would remain and there would be a visible scar across the landscape. This would mostly be evident across Portsdown Hill and to the north with the southern part of the Forest of Bere East. However, across the majority of the area it would only result in localised impacts and the character of the area would not be affected.

4.9.19 The permanent AGP of the Proposed Development would be located within National Character Area 128: South Hampshire Lowlands. The AGP would be similar in scale to existing agricultural buildings in the area and have been positioned to take advantage of existing vegetation or to associate them with existing development.

4.9.20 During year 1 of operation, there would be likely significant effects at the county scale relating to Portsdown Hill, and within six of the Local Landscape Character Areas. By year 15 of operation, the planting would have grown larger and these effects would have reduced such that they would not be significant.

4.9.21 The visual effects of year 1 of operation would reduce substantially compared to the construction phase as the majority of the Proposed Development would be below-ground. By year 15 of operation, mitigation planting would have established such that the only remaining significant visual effects would relate to people travelling along Pilgrims' Way and along footpath 218/28/1.

Decommissioning

4.9.22 Visual effects relating to the decommissioning of the Proposed Development are considered to be no greater than those identified during the construction phase. The significance of effects resulting from decommissioning is therefore the same as reported for the construction effects.

4.10 Major accidents and disasters

Approach to the assessment

4.10.1 The major accidents and disasters assessment looks at the expected significant adverse effects of the Proposed Development on the environment from the vulnerability of the Proposed Development to the risks of major accidents and/or disasters which are relevant to the Proposed Development.

4.10.2 The study area has been determined by the worst case impact area, in the event of a major accident or disaster, informed by the maximum realistic extent of other topic assessment study areas, and includes the extent of the Order Limits. External sources of risk, such as fire, which could cause a major accident or disaster to the Proposed Development are also identified and included.

4.10.3 A desk study was undertaken to obtain information from external data sources and baseline data presented within other topic chapters with respect to major accidents and disasters. This included a review of a detailed unexploded ordnance (these are explosives that were fired or dropped but failed to detonate, remaining potentially active and therefore hazardous) survey that was undertaken to examine the risk of any unexploded ordnance being encountered during construction of the Proposed Development.

Baseline

4.10.4 National and Community risk registers (registers outlining serious risks that could result in an emergency) have been used to identify most of the potential risks for the Proposed Development which form the baseline for this assessment. Further risks have been identified based on the specific potential risks to and resulting from the Proposed Development. The baseline information, including relevant receptors, is therefore as follows:

1. The Proposed Development passes through Flood Zones 1, 2 and 3 (land with varying probabilities of being flooded by rivers and/or the sea). Some areas are also at risk of failure flooding by a dam or reservoir.
2. There is a low risk of unexploded ordnance across the Order Limits of the Proposed Development, with one area of moderate risk.
3. There are multiple sources of potential contamination across the Proposed Development, including from historic and modern landfills, sewage works, contamination associated with the railway and a corn mill, an infilled pond and watercourse, a garage/depot/warehouse, old chalk pits, disused sand pits, an old quarry, a colliers pit, reservoirs, farms, a hospital, an oil fuel reservoir and a former brick works.
4. In Hampshire, 3,269 fires were attended by the Hampshire and Isle of Wight Fire Service in 2024/2025.
5. There are 21 statutory designated sites within 2km of the Order Limits, including Special Protection Areas, Special Areas of Conservation, Ramsar sites, Sites of Special Scientific Interest and Local Nature Reserves.
6. Utilities plans for the study area show multiple gas pipes, including the Esso Southampton to London pipeline, other high pressure pipes, water mains,

wastewater pipes and electricity cables, underground and overground, crossing the Order Limits.

Mitigation

Primary mitigation

4.10.5 Primary mitigation measures have been included in the Proposed Development design and include:

1. Utility searches undertaken to understand where utilities are located within the Order Limits to avoid accidental damage during construction.
2. Temporary construction compounds have been sited to avoid identified flood risk zones 2 and 3 where possible.
3. A strip of land either side of the entire length of the Pipeline will be required to allow access for maintenance and restrict certain activities that could adversely affect the infrastructure.
4. Pipeline washout valves would be provided to drain down sections of the transfer pipeline. Water is used to commission the valves when they are first installed and then periodically during operation to test the valves, this water is captured and taken by tanker for treatment and disposal at a suitably permitted site.
5. Isolation valves would be installed on the pipeline to prevent flooding in the event of a pipe leak.
6. Works at Otterbourne WSW to ensure that the use of water from Havant Thicket Reservoir does not cause the introduction of plants or animals into an area where they were not previously found, where their spread could be considered harmful (known as invasive non-native species).
7. The Geoenvironmental Interpretative Report (this is provided within Environmental Statement Appendix 11.2 Geotechnical and geo-environmental reports, Volume II) details gas protection measures.

Secondary mitigation

4.10.6 Following the implementation of primary and tertiary mitigation measures, no adverse significant effects were identified, therefore no secondary mitigation is required.

Tertiary mitigation

4.10.7 The Outline CEMP secures mitigation measures for construction on the following potential risks:

1. Flooding
2. Damage to utilities
3. Fire
4. Unexploded ordnance
5. Bird strike
6. Pollution

4.10.8 The OEMP secures mitigation for measuring during operation on potential risks including:

1. Wildfire
2. Pipe rupture
3. Transport emergency
4. Malicious attack

4.10.9 The Invasive Non-Native Species Biosecurity Plan provides an outline of the Emergency INNS Management Plan (EIMP), which will be provided by the Contractor post consent. The EIMP will set out what needs to be done to release and manage water in an emergency, including the need to assess and identify the risk of INNS.

4.10.10 Legal agreements, which are called Protective Provisions, are to be included within the DCO for the benefit of water, gas, electricity and communication companies such as Southern Gas Networks. These will manage how the Proposed Development would interact with equipment belonging to these companies to minimise the risk of any damage to their equipment.

Monitoring

4.10.11 There are no expected significant adverse effects related to this assessment identified either during construction or operational stages of the Proposed Development that will require monitoring, beyond those measures set out in the management plans provided with the DCO application.

Expected significant adverse effects

4.10.12 The assessment looks at both effects that could occur to receptors and risks to the Proposed Development detailed in the baseline section.

Construction

4.10.13 No expected significant adverse effects have been identified following the implementation of mitigation in relation to major accidents and disasters.

Operation and maintenance

4.10.14 No expected significant adverse effects have been identified following the implementation of mitigation in relation to major accidents and disasters.

Decommissioning

4.10.15 No expected significant adverse effects have been identified following the implementation of mitigation in relation to major accidents and disasters.

4.11 Noise and vibration

Approach to the assessment

4.11.1 The assessment identifies noise and vibration that could be generated by the Proposed Development and the potential for this to effect noise and vibration sensitive receptors in the locality. Receptor types are broadly classified as either residential dwellings or non-residential noise and vibration sensitive receptors, such as schools, hospitals or outdoor amenity areas. Sensitive receptors have been identified within a 300m buffer of the Order Limits using Ordnance Survey data.

Baseline

4.11.2 The baseline noise environment was measured by surveys at receptors with the greatest potential to be affected by noise from the Proposed Development.

4.11.3 Publicly available noise mapping information for major roads and railways was used to identify likely baseline noise levels at the receptors where baseline noise surveys were not undertaken. Baseline vibration levels were not required for the assessment.

Mitigation

Primary mitigation

4.11.4 Primary mitigation measures that have been included in the Proposed Development design include siting permanent noise/vibration emitting sources away from sensitive receptors. Further primary mitigation will be developed in accordance with the Design Principles Document (provided with the DCO application) after the DCO is granted and will follow this mitigation hierarchy:

1. Firstly, avoid generation of noise and vibration, by adopting quiet and low vibration equipment and activities in the design
2. Then, control noise and vibration at source, using measures such as enclosing noisy equipment, considering site layouts to direct noise away from receptors and upgrading buildings with high indoor noise levels
3. Then, implement good practice environmental noise management measures
4. Finally, if required, add additional screening between the receptor and noise source

4.11.5 The Design Principles Document includes a commitment that operational noise levels at sensitive receptors will not exceed the identified thresholds for the onset of adverse effects.

Secondary mitigation

4.11.6 Secondary mitigation is required to reduce potential likely significant effects of the Proposed Development during construction. The Contractor will prepare a Noise and Vibration Management Plan (in accordance with the Outline CEMP) before construction begins. This plan will identify the secondary mitigation measures to

be implemented (over and above the tertiary mitigation). This is likely to include measures such as:

1. Use of quieter construction machinery and methods, where feasible
2. Use of temporary screening, silencers or enclosures for noisy construction machinery
3. Careful management of the time, number and location of noisy construction works/machinery relative to sensitive periods of a day or week

4.11.7 Secondary mitigation is also required to reduce potential likely significant effects of operational noise from the Proposed Development and will be developed after the DCO is granted in accordance with the Design Principles Document. Example mitigation measures include selection of quiet plant, enclosing items of noisy outdoor plant, upgraded acoustic enclosures and/or building fabric, adjustment of site layout and noise barriers.

Tertiary measures

4.11.8 Tertiary mitigation measures relevant to construction noise and vibration are set out in the Outline CEMP. These include the selection of quiet and low vibration equipment, optimal location of equipment on-site to reduce noise disturbance, scheduling works to reduce effects, and provision of plant movement alarms that vary their loudness according to background noise levels.

4.11.9 Additionally, the pipeline and pumping systems will be designed and maintained in accordance with recognised industry good practice and relevant water industry standards. This would ensure that the pipeline operates as intended and that noise from water flow within the underground pipeline is not expected to be audible. It will also ensure that vibration from the pumping systems would not be noticeable in areas such as homes, hospitals, and schools.

Monitoring

4.11.10 The Contractor will undertake and assess noise and vibration monitoring periodically during construction. Monitoring will aim to demonstrate that noise levels are being sufficiently controlled to protect residents from significant adverse construction noise and vibration effects.

4.11.11 Details of the monitoring will be confirmed in the detailed Noise and Vibration Management Plan, to be agreed with the relevant local planning authorities before construction begins. The detailed Noise and Vibration Management Plan will also identify mitigation measures to be implemented if monitored noise levels exceed the relevant criteria.

4.11.12 The OEMP requires the Contractor to operate an Environment Management System, which will include procedures for dealing with complaints on operational noise.

Likely significant effects

Construction

4.11.13 During construction, the noise and vibration impacts of the Proposed Development depend primarily on the duration and equipment required to undertake the works and their proximity to receptors. With the application of secondary mitigation, all construction noise and vibration effects would be not significant.

4.11.14 The potential for temporary construction traffic impacts on sensitive receptors along existing roads used by construction vehicles is dependent on the volume and route of construction traffic and the amount of other traffic using the route. It is assessed that the construction traffic noise effects would not be significant.

Operation and maintenance

4.11.15 Once operational, the WRP site, the Invasive Non-Native Species treatment plant (at Otterbourne WSW) and IPS would emit noise with the potential to disturb nearby receptors. However, with the application of secondary mitigation, operational noise effects would not be significant.

Decommissioning

4.11.16 Effects from decommissioning of the Proposed Development are considered to be no greater than those identified during the construction phase, with the exception of the buried pipeline infrastructure which would be left in situ (so construction impacts associated with the tunnelling, trenchless construction works and open cut construction would not occur during the decommissioning phase).

4.11.17 Potential impacts of decommissioning would therefore be limited to works to remove above-ground assets. Such works are not anticipated to result in high noise emissions and taking account of good practice industry measures that would be adopted, it is considered that effects would not be significant.

4.12 Resources and waste management

Approach to the assessment

Mineral safeguarding

4.12.1 The assessment evaluates the potential risk of making mineral receptors inaccessible for future extraction due to the construction of the Proposed Development; this is called sterilisation. The risks to mineral resources are based on the presence of known viable resources (Mineral Safeguarded Areas) within the area of the Order Limits.

4.12.2 The study area is defined as both land within the Order Limits and a distance of 400m on either side of the Order Limits. The assessment considers any other existing potential constraints to mineral exploration, for example the presence of residential properties, designated environmentally sensitive sites, roads, and railways.

Waste

4.12.3 The resources and waste management assessment considers the likely significant effects of the Proposed Development on the available capacity of waste management infrastructure (the facilities, equipment and systems for the collecting, transporting, processing and disposing of waste).

4.12.4 Two study areas are used for waste:

1. Development study area – this corresponds to the Order Limits
2. Expansive study area – this extends to the regions that are likely to manage the majority of the waste generated by the Proposed Development

4.12.5 The expansive study area has been defined specifically for inert (waste which would not undergo any significant physical, chemical or biological transformations), non-hazardous (waste not defined as hazardous) and hazardous (waste which may pose a threat to public health or the environment) landfill using available data published by the Environment Agency. The data indicates that waste generated in Hampshire is both managed within the region and exported to the following regions and sub-regions:

1. Inert: South East England and Wiltshire
2. Non-hazardous: South East England
3. Hazardous: South East England and Wiltshire

4.12.6 The waste assessment has also considered the potential impacts on Hampshire's landfill capacity, in the event that all of the waste generated by the Proposed Development were to remain within Hampshire for disposal.

Baseline

Mineral safeguarding

4.12.7 The Proposed Development does not pass within the boundary of any named safeguarded mineral extraction sites under the Hampshire Minerals and Waste

Plan 2013 for mineral extraction, however it does pass through Mineral Safeguarded Areas for Brick Clay, Superficial Sand and Gravel, and Soft Sand.

4.12.8 There are a large number of existing features which are considered to be constraints to mineral extraction. In areas where these constraints are present the Proposed Development would not be the reason for sterilisation of any underlying mineral resources.

Waste

4.12.9 Based on the data, the landfill capacity for the baseline year (2024) for the expansive study areas are as follows:

1. Inert waste (South East and Wiltshire) – 25,146,449 tonnes
2. Non-hazardous waste (South East) – 27,518,130 tonnes
3. Hazardous waste (South East and Wiltshire) – 631,716 tonnes
4. Hazardous waste (England) – 13,790,841 tonnes

4.12.10 The current landfill capacity for Hampshire is as follows:

1. Inert waste – 1,725,845 tonnes
2. Non-hazardous waste – 246,516 tonnes
3. Hazardous waste – 0 tonnes

Mitigation

Primary mitigation

4.12.11 Primary mitigation measures for resources and waste management have been included in the Proposed Development design. Through an extensive site and route selection process, preference for the shortest pipeline route was considered alongside other route selection criteria for the Proposed Development. The shortest (where practicable) pipeline route would reduce the overall quantity of waste generation. In addition, known risk areas in relation to ground contamination are avoided (as far as practicable). The route has also avoided named safeguarded mineral extraction sites under the Hampshire Minerals and Waste Plan 2013.

Secondary mitigation

4.12.12 There are no further secondary mitigation measures required for inert and non-hazardous waste. There are opportunities to further improve the design through mitigation measures for managing hazardous construction waste, which are secured in the Outline CEMP. These measures, such as minimising hazardous waste through design opportunities prior to excavation, construction and demolition, ensuring that waste is correctly classified and that hazardous and non-hazardous waste is not mixed, will be integrated into the Proposed Development and confirmed in the Site Waste Management Plan (SWMP). The SWMP which will be prepared by the Contractor after the DCO is granted. Options to treat hazardous waste are under consideration that will reduce the need to send hazardous waste to landfill. This includes the treatment of hazardous soils off-site and the treatment of hazardous waste to reduce contamination to the extent where

the waste can now be managed as non-hazardous. As these mitigation measures are not currently confirmed they are not defined or secured as secondary mitigation in the DCO application. No secondary mitigation is proposed for minerals safeguarding as none is required.

Tertiary mitigation

4.12.13 Good construction practices are secured in the Outline CEMP to manage the effects of construction on waste management facilities, including the development of a SWMP which will ensure that waste is managed in line with best practice and the waste hierarchy. This would reduce the amount of waste sent to landfill.

4.12.14 To ensure effective management of minerals encountered during construction, a Minerals Management Strategy will be developed by the Contractor before any excavation activities commence. This Minerals Management Strategy will address the management of mineral resources and will align with UK guidance on the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. The Minerals Management Strategy will include the following:

1. Extraction and handling procedures to encourage reuse of minerals in the Proposed Development
2. Documentation and records processes

Where minerals are encountered through the excavation and are not required for the construction of the Proposed Development, the potential for offsite reuse will be considered, having regard to the reasonable practicability and commercial viability of doing so in a way that would not give rise to environmental effects that have not been assessed within this Environmental Statement.

Monitoring

4.12.15 Further details on how the measures for monitoring waste will be secured are provided in the Outline CEMP. The SWMP developed after the DCO is granted will be updated at regular intervals through the design and construction stages. The Contractor will be responsible for recording waste quantities and treatment techniques, and comparing against forecasts, including for reuse, recycling, recovery, and landfill. The Mineral Management Strategy developed after the DCO is granted will outline the method for documenting the quantities of minerals which have been excavated, stored/stockpiled and used in construction.

Likely significant effects

Construction

Mineral safeguarding

4.12.16 Some parts of the Proposed Development pass through areas of potential mineral resources which have not already been sterilised (this happens when land use changes permanently prevent the removal of mineral resources from the ground). Therefore, the temporary and permanent construction effects of the Proposed Development would limit or eliminate access to these mineral resources.

4.12.17 Though impacts on mineral receptors were identified, tertiary mitigation would reduce the impacts on the mineral receptors; this will involve of the consideration of the potential for the reuse off-site for any minerals (such as sands and gravels) encountered during excavation that are not required for the construction of the Proposed Development. Regard will be had to the reasonable practicability and commercial viability of doing so in a manner that would not give rise to environmental effects not assessed within this Environmental Statement.

4.12.18 Based on the extent of the areas of potential resource and relative area of the Proposed Development, and low receptor sensitivity, the effects of the Proposed Development during construction are not considered to be significant.

Waste

4.12.19 No likely significant effects have been identified in relation to inert waste and non-hazardous waste. The effect on hazardous landfill is however considered to be significant due to the quantity of hazardous waste requiring off-site disposal compared to the available hazardous landfill capacity and because hazardous landfill has a very high sensitivity. Nevertheless, this would comprise only a 0.31% reduction in the capacity of hazardous landfill projected to be available in England at the end of construction.

Operation and maintenance

Mineral safeguarding

4.12.20 The impacts from operation and maintenance on mineral receptors have been scoped out.

Waste

4.12.21 The impacts from waste generated during operation have been scoped out.

Decommissioning

Mineral safeguarding

4.12.22 The effects from decommissioning of the Proposed Development are considered to be not significant.

Waste

4.12.23 It is not possible to robustly forecast landfill capacity so far in the future, however based on the requirements for local planning authorities to provide sufficient waste management capacity and improved waste management practices, it is estimated (for inert, non-hazardous and hazardous waste) that the Proposed Development would not result in a likely significant effect on landfill capacity during decommissioning.

4.13 Socio-economics, tourism and health

Approach to the assessment

4.13.1 The socio-economics, tourism and health assessment considers the likely significant effects on employment, strategic tourism receptors and health of the local population from the construction, operation and decommissioning of the Proposed Development.

4.13.2 For socio-economics, the study area for the assessment of employment, skills and supply chain effects considers Hampshire and the South East of England. The assessment includes employment effects, supply chain effects (which includes all the people, businesses, activities involved along the way and what they collectively spend both directly and locally), training and apprenticeships and effects on employment from impacts on allocated employment land.

4.13.3 For tourism, the study area for the assessment of impacts on strategic tourism receptors is the Order Limits plus a 500m buffer, however the assessment also considers the potential for impacts on access and amenity over a wider area, i.e. beyond the 500m buffer and up to 5km where appropriate. Impacts on access to strategic tourism receptors, amenity effects for strategic tourism receptors, effects on tourist accommodation and effects on tourism across the South Downs National Park as a whole are included.

4.13.4 Impacts on health are considered in terms of how the Proposed Development may cause changes to health determinants; these are factors which influence health such as access to social services, access to work and training, neighbourhood amenity (for example, changes to the landscape, visual amenity and noise and vibration), access to green space and recreation, community safety (for example, traffic levels) and the level of social connectedness within communities. Health impacts are considered at a population level, and ward populations have been selected as the appropriate level to assess these effects. Wards usually have about 5,500 people living within their boundaries. There are no wards entirely within the Order Limits, but those wards that intersect with the Order Limits form the study area for the health assessment. Consideration is given to vulnerable groups within populations who may be more vulnerable to health impacts including children, older people and people with particular health conditions.

Baseline

4.13.5 Baseline data has been collected at ward and local planning authority level for the wards and local planning authorities within the study area boundaries. The data sources used to inform the assessment included the Index of Multiple Deprivation, Ordnance Survey, Points of interest, Office for National Statistics and Office for Health Improvement and Disparities.

4.13.6 The socio-economic baseline shows that much of the study area is in areas of relatively low deprivation (this measures the ability to access the basic things people need to live well including their income, health, education, housing and their local environment), with generally high rates of employment, although there is considerable differences at ward and local planning authority levels. Hampshire has a relatively large construction sector, which accounts for a higher than average proportion of employment in the area. Workforce skills are in line with the national

average, and research by the Solent Local Enterprise Partnership has identified skills shortages in sectors including construction. Gross Value Added per person (this measures the value of goods and services provided in a region divided by its total population) is lower across Hampshire than national average and Havant has a notably low proportion of residents with degree-level qualifications.

4.13.7 In 2016, there were 43.5 million day visitors to Hampshire and 4.8 million overnight visitors. In the same year, tourism was valued at approximately £3 billion, supporting close to 90,000 jobs. Hampshire has approximately 90,000 tourist bedspaces, of which approximately 50,000 are in serviced/hotel and B&B style accommodation and approximately 40,000 are in non-serviced/self-catering style accommodation. Strategic tourism receptors identified in the baseline are Marwell Zoo and the Royal Armouries at Fort Nelson. These receptors are outside the 500m study area but are within 1.5km of the construction works and are significant for the region. These have been included in the assessment due to the potential for impacts on access and amenity.

4.13.8 The health profile for the county of Hampshire is largely better than the national average. The study area incudes Portsmouth which has significantly worse health outcomes than the other local planning authorities. In the study areas, Portsmouth City Council has the lowest male and female life expectancy and the highest prevalence of common mental health disorders. Havant and Fareham have the highest proportion of people aged 65 and above (24.6%) and Eastleigh has the highest proportion of people under the age of 15 (18%). Local planning authority health profiles indicate that the health of the population in Havant and Portsmouth is worse than the national averages. Havant and Portsmouth have the highest rates of chronic obstructive pulmonary disorder (a lung disease), high prevalence of common mental health disorders and the highest percentages of people disabled under the Equality Act in the study area. Other local planning authorities in the study area have generally better health than the national average, in line with Hampshire as a whole.

Mitigation

Primary mitigation

4.13.9 Primary mitigation measures have been included in the Proposed Development design and include avoiding settlements, commercial land, allocated employment land, tourism receptors, Public Rights of Way, property and major housing allocations where practicable, to reduce the risk of disruption to property, land and access.

Secondary mitigation

4.13.10 No secondary mitigation measures are identified in relation to socio-economics, tourism and health.

Tertiary mitigation

4.13.11 Good construction practices are secured in the Outline CEMP. The measures of particular relevance to socio-economics, tourism and health include measures to retain local employment opportunities, measures to improve safety, measures to

reduce disruption, and liaison with community groups, landowners or renters, and relevant associations.

4.13.12 The Outline Skills and Employment Plan includes measures which requires the Contractor to maximise opportunities for local people to access skills, training and employment.

4.13.13 A Framework Construction Traffic Management Plan (which includes an appended a Framework Rights of Way Management Plan) and Traffic Management Strategy have been developed and provided with the DCO application, setting out the measures to reduce construction impacts.

Monitoring

4.13.14 Proposed monitoring of impacts and mitigation relevant to the socio-economic, tourism and health assessment is set out in the following chapters of the Environmental Statement, Volume I: Chapter 6 Air quality and odour, Chapter 19 Water environment, Chapter 13 Landscape and visual, Chapter 15 Noise and vibration, and Chapter 18 Traffic and transport. No additional monitoring requirements are identified in relation to socio-economic, tourism and health effects.

Likely significant effects

Construction

4.13.15 The majority of effects associated with construction are considered to be insignificant for socio-economic, tourism and health. The following temporary effects have been identified that are likely to be significant:

1. Neighbourhood amenity: an effect on wellbeing and quality of life during construction for residents in Widley (Purbrook ward) due to visual effects on multiple locations in Widley, including views across the ridge from Portsdown Hill Road.
2. Community safety (perceptions of safety): an effect on pedestrians, cyclists and equestrians across the Proposed Development-wide study area, due to increased Heavy Goods Vehicle movements along local roads, including in residential areas and neighbourhood centres. This may cause increased stress levels, particularly for more vulnerable groups including older people, children, and people with sight or mobility difficulties.

Operation

4.13.16 The assessment identified a permanent, beneficial likely significant effect for the wider population, due to the increased security of future drinking water supplies. For vulnerable groups (including older people, families with young children, people on low incomes and people with existing health conditions), who would be more likely to experience adverse health consequences in the event of water shortages, this is considered to be a permanent, significant beneficial health effect.

Decommissioning

4.13.17 Effects from decommissioning of the Proposed Development are expected to be either less than or the same as those identified during the construction phase.

4.14 Traffic and transport

Approach to the assessment

4.14.1 The traffic and transport assessment considers the likely significant effects of the construction, operation and decommissioning of the Proposed Development on the transport network. The traffic and transport topics considered include delay, severance (the perceived ability (or inability) of members of communities to move around their community and access services/facilities), amenity, fear and intimidation, accidents and safety and hazardous loads.

4.14.2 The study area broadly comprises the Order Limits for the Proposed Development and the wider transport network, bound by Winchester and Petersfield in the north, B2149 and Havant in the east, M27 and Langstone in the south and the M3 in the west.

Baseline

4.14.3 The local road network includes a mix of rural lanes and streets used by receptors travelling on journeys important at a local level, as well as roads that are used for journeys important at a district level. The strategic road network located near the Order Limits includes the A3, A27, M27 and M3.

4.14.4 Many of the streets and roads in the urban areas have footways either on one-side or both sides of the road. There is a network of Public Rights of Way that intersect the Order Limits alongside some segregated cycleways (these are paths for cyclists that are separated, typically by a physical kerb, from pedestrians).

4.14.5 There are also numerous bus services that travel on roads within the study area. Mostly operating at a 30-minute or hourly frequency, and are generally important for journeys at a local or district level. Provision at bus stops varies from no waiting facilities to shelters with a raised kerb (these allow for level, step-free access to buses) and timetable information.

4.14.6 Surveys were undertaken which collected information on both the amount and speed of traffic for a seven day period.

Mitigation

Primary mitigation

4.14.7 Primary mitigation measures have been included in the Proposed Development design and include:

1. Avoiding temporary road closures on roads used for journeys at a regional or national level
2. Avoiding temporary closures on national trails, the National Cycle Network (a UK-wide network of signed paths and routes for walking and cycling) or other Rights of Way where there are not deemed to be suitable alternatives
3. Temporary and permanent transport infrastructure, such as new accesses, will be designed in accordance with the relevant standards
4. Transport infrastructure impacted by the Proposed Development will be reinstated to its previous condition after the works are completed

Secondary mitigation

4.14.8 No secondary mitigation measures are proposed.

Tertiary mitigation

4.14.9 Tertiary measures relevant to traffic and transport are secured in the Outline CEMP, Framework Construction Traffic Management Plan (and appended Framework Construction Worker Travel Plan and Framework Rights of Way Management Plan). This includes the preparation of the following detailed management plans after the DCO is granted:

1. Construction Traffic Management Plan(s), setting out how construction traffic will be managed, including hours of traffic movements of construction traffic, traffic routing, safe vehicular access and other measures to reduce the impacts. The Construction Traffic Management Plan(s) will also set out any physical works to the public highway or traffic management measures required to enable access for construction vehicles. Regular monitoring will include road condition surveys and construction worker parking.
2. Construction Worker Travel Plan(s) setting out measures to encourage construction workers to travel by sustainable modes of transport. Construction worker travel behaviour will be monitored as part of this Plan.
3. Rights of Way Management Plan, summarising potential Public Rights of Way mitigation measures, such as temporary closures and temporary/permanent diversions, that are required as part of the Proposed Development.
4. Traffic Management Strategy (TMS), setting out detail on any road closures and associated traffic management that may be required during the construction of the Proposed Development. Where closures are proposed close to each other, the TMS includes measures so that nearby roads will not be closed at the same time. Also included is where works in the public highway will be undertaken overnight to reduce impacts on journey times.

Monitoring

4.14.10 No likely significant effects requiring ongoing monitoring have been identified, beyond those measures (such as construction traffic management and Rights of Way management) that are set out in the detailed transport management plans described above.

Likely significant effects

Construction

4.14.11 With the implementation of the detailed management plans outlined above, no likely significant environmental effects are expected during construction. This includes effects relating to delay, severance, amenity, fear and intimidation, accidents and safety and hazardous loads.

Operation and maintenance

4.14.12 No likely significant environmental effects are expected during operation and maintenance.

Decommissioning

4.14.13 Effects from decommissioning of the Proposed Development are considered to be no greater than those identified during the construction phase. The assessment of significance of decommissioning effects is therefore reported as not significant.

4.15 Water environment

Approach to the assessment

4.15.1 The assessment looks at all topics of the water environment, fresh and marine surface water and groundwater, focussing on:

1. The hydrology (the study of the movement, distribution and management of water), geomorphology (the study of the shape of the land) and the quality of surface waters (including freshwater, coastal and transitional waters)
2. The quantity and quality of groundwater
3. Surface and groundwater resources
4. Surface and groundwater-dependent designated sites
5. Flood risk to and from the Proposed Development

4.15.2 The study area for the water environment assessment includes the following:

1. The catchments of surface watercourses that underlie the Order Limits, and any catchments that are hydrologically connected (i.e. downstream) to these catchments
2. The transitional and coastal water bodies and their associated onshore drainage catchments within which the Order Limits are located, and hydrologically connected water bodies that could be affected by changes to marine discharges (identified using the outputs of water modelling)
3. Groundwater bodies that underlie the Order Limits or are located within 1km of these Order Limits

Baseline

4.15.3 Information on current conditions of the water environment has been gathered through research of publicly available information and surveys including:

1. A geomorphological walkover survey to characterise the Main Rivers that intersect the Proposed Development
2. Site walkover to obtain information on key groundwater receptors such as points where water is removed for human use or springs
3. Ground investigations comprising drilling of boreholes and installing groundwater monitoring wells to obtain readings of groundwater levels and samples for laboratory testing. The investigations also included geophysical surveys of areas where there is a potential for karst features (a landscape formed by the dissolving of certain rock types) within the chalk bedrock underlying the Proposed Development.

Surface water

4.15.4 The Proposed Development crosses a variety of river catchments, including lowland, low gradient systems such as the Hermitage Stream, River Wallington and River Hamble, which drain into Langstone Harbour, Portsmouth Harbour and Southampton Water, respectively. The Proposed Development also crosses the catchments of the River Itchen and the River Meon, both of which are sensitive chalk river systems which drain into Southampton Water.

Groundwater

4.15.5 Underneath the Proposed Development is sensitive groundwater resources that provide water to private and public water supplies including the regionally important Bedhampton and Havant Springs Public Water Supply and Otterbourne Public Water Supply. Groundwater beneath the Proposed Development also connects with other sensitive receptors which rely on it such as springs, land-based plants and animals or above-mentioned chalk river systems.

Flood risk

4.15.6 The pipeline infrastructure and AGP would mostly be at low probability of flooding from surface waters, rivers, the sea or groundwater. However, the pipeline would need to interact with limited areas of medium and high probability of flooding from surface water and rivers, mostly where it needs to cross watercourses.

Mitigation

Primary mitigation

4.15.7 Primary mitigation measures have been included in the Proposed Development design and include:

1. Selecting the location of AGP and the route of pipelines, tunnels and other trenchless construction techniques to avoid or reduce impacts to high value surface and groundwater receptors where practicable
2. Crossing all Main Rivers using trenchless construction works
3. Installing the pipeline at least 2.5m below the bed of the Main Rivers and at least 1.5m below the bed of ordinary watercourses (dependent on local geology and geomorphological risks)
4. Using methodologies for all tunnels and trenchless construction works at watercourses and other barriers that excludes groundwater
5. Avoiding siting shafts associated with the pipeline within the chalk aquifer where reasonably practicable
6. Use of leak detection on the pipeline transfer, either via flow and pressure monitoring or active acoustic monitoring. This has been designed to automatically shut down the pipeline system in event of a leak to prevent long-term leakages
7. Inclusion of phosphorus mitigation measures (where phosphate enters water bodies in excess, it can cause environmental problems) in the design of the WRP site
8. Collection of all water generated through testing of washouts during operation and maintenance directly in a tanker, with no source water discharged to the environment. Water will be taken by tanker for treatment and disposal at a suitably permitted site

Secondary mitigation

4.15.8 The assessment has identified a likely significant effect caused by trenchless construction within the chalk south of the Otterbourne Public Water Supply which is within the highest source protection zone.

4.15.9 An Outline Water Monitoring Plan has been prepared which forms the basis of the Water Monitoring Plan. The detailed Water Monitoring Plan will be prepared by the Contractor after the DCO is granted. Monitoring and control measures will be implemented to mitigate the potential temporary impacts on the Otterbourne Public Water Supply from trenchless excavation in the vicinity.

4.15.10 No requirements for secondary mitigation have been identified for the remainder of impacts and receptors considered, on the basis that the primary and tertiary mitigation measures are implemented.

Tertiary mitigation

4.15.11 Good construction practices are secured in the Outline CEMP to manage the effects of construction on surface and groundwater receptors. These include measures to manage site drainage and runoff, manage the risk of sediment erosion and prevent the supply of contaminants into water receptors.

4.15.12 In addition, a range of management plans and strategies have been provided to manage potential impacts that could occur during the operation of the Proposed Development. These include the OEMP which sets out proposed details of washout maintenance measures for washout valves and operational drainage strategies to control runoff, off-site flood risk and the supply of contaminants from permanent above-ground infrastructure.

Monitoring

4.15.13 A detailed Water Monitoring Plan will be produced by the Contractor before construction commences which will provide a detailed description of the monitoring required to ensure that the quantity (flows and levels) and quality of the water environment is protected.

Likely significant effects

Construction

4.15.14 The release of sediment and contaminants to surface and groundwaters during construction (for example, as a result of ground disturbance and the use of construction materials and equipment) would result in effects on the majority of water receptors that are considered to be not significant.

4.15.15 Changes to surface water and groundwater flows and flood risk during construction (for example, as a result of changes to flow paths and infiltration rates) would result in effects on the majority of water receptors that are considered to be not significant.

4.15.16 Trenchless construction works between the WRP site and Otterbourne WSW would cross the chalk aquifer in the area of the Otterbourne Public Water Supply. A detailed Water Monitoring Plan is to be developed by the Contractor which will

establish a pre-construction baseline and measure impacts to the local surface water and groundwater regime from temporary and permanent construction effects during and post construction. The Plan will include trigger levels and action plans which will enable mitigation to be implemented based on the monitored conditions. With the application of mitigation, the effect would not be significant.

Operation and maintenance

4.15.17 No likely significant environmental effects on the water environment are expected during operation and maintenance.

Decommissioning

4.15.18 Effects from decommissioning of the Proposed Development are considered to be no greater than those identified during the construction phase. The assessment of significance of decommissioning effects is therefore reported as not significant.

4.16 Cumulative and in-combination effects

Approach to the assessment

4.16.1 This assessment considers the cumulative effects of the Proposed Development with other developments, plans and projects. It also considers receptor groups that may experience multiple effects at a single point in time that may potentially result in in-combination effects:

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

Likely significant effects

Cumulative effects

4.16.2 The cumulative effects assessment considers the combined effects of the Proposed Development with other developments within defined 'Zones of Influence' on a range of receptors. A list of other developments within these Zones of Influence was collated from a review of planning applications, local planning authority development plans and other available and relevant sources. The initial list was then refined to produce a shortlist of other developments for which information was collected to enable an assessment of cumulative effects.

4.16.3 The assessment concluded that there is limited potential for cumulative effects with other developments, due to the distance between the Proposed Development and the other developments, the relatively localised Zone of Influence of the impacts from the Proposed Development, and the mitigation identified for the Proposed Development.

In-combination effects

4.16.4 The in-combination effects assessment 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.

4.16.5 Many in-combination effects are inherently assessed within environmental topic assessments (reported in Chapters 6-19 of the Environmental Statement). An example is the assessment of amenity effects in the land use and agriculture assessment (in Chapter 12 of the Environmental Statement), which considers the interaction of air quality, noise, landscape and visual, and traffic and transport on relevant receptors. The in-combination effects assessment in Chapter 20 of the Environmental Statement considers cases where specific receptors or receptor groups may experience multiple topic impacts beyond those inherently assessed within topic chapters (during construction and operation of the Proposed Development).

4.16.6 The in-combination effects assessment concluded that road users of the B2177, Harts Farm Way, Titchfield Lane and Winters Hill could experience likely significant in-combination effects due to impacts on perceived safety, journey delays and

adverse visual impacts throughout the construction period. However, these impacts would be temporary and short-term in nature.

4.16.7 Furthermore, there are several statutory designations where the in-combination effects relate to the risk of contamination during construction. These could impact upon habitats and resources used by associated bird species. The impacts are however of negligible magnitude and not expected to be a significant effect.

4.16.8 For the built environment, during construction there is a risk there could be an accumulation of gas which may cause minor adverse significant effects. Also, vibrations may cause permanent damage to light framed structures located within 3.2m of ground compaction construction activities which is considered a minor adverse effect.

4.16.9 The assessment has concluded that construction activities are not expected to result in-combination likely significant effects and no additional mitigation is required above the measures already outlined within each of the relevant topic chapters.

4.16.10 During construction there is the potential for the contamination of agricultural land and the temporary loss of agricultural land. The significance of the in-combination effect has been assessed to be minor adverse which is not significant as the impacts are short term, temporary and any soils will be removed before construction.

4.16.11 Finally, the assessment concluded the temporary and localised effects on the South Downs National Park Special Qualities, mitigated and reversed post-construction, would not result in an in-combination effect with the perceived impact on users accessing Marwell Zoo, located within the South Downs National Park.

4.16.12 In-combination effects from decommissioning of the Proposed Development are considered to be no greater than those identified during the construction phase. The assessment of significance of decommissioning effects is therefore reported as not significant.

Mitigation

4.16.13 Primary and tertiary mitigation measures have been included in the Proposed Development design. Measures that are relevant to the cumulative and in-combination effects assessment are detailed in sections 4.7 (land quality and conditions), 4.8 (land use and agriculture) 4.9 (landscape and visual) and 4.11 (noise and vibration).

4.16.14 No additional secondary mitigation measures have been identified for cumulative effects or for in-combination effects.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