South East Strategic Reservoir Option

Preliminary Environmental Information Report

Chapter 5 - Water environment

Date: October 2025

Contents

List of tables

5 Water environment

5.1 Introduction

5.1.1 This chapter of the Preliminary Environmental Information (PEI) Report provides the preliminary assessment of likely significant effects on water environment from the construction and operation of the proposed SESRO Project (the Project, as detailed in Chapter 2: Project description).

5.1.2 Within this chapter, aspect-specific sections are included on:

- Legislation, policy and guidance (Section 5.2)
- Consultation, engagement and scoping (Section 5.3)
- Assessment methodology (Section 5.4)
- Study area (Section 5.5)
- Baseline conditions (Section 5.6)
- Project parameters, assumptions and limitations (Section 5.7)
- Embedded design mitigation and standard good practice (Section 5.9)
- Preliminary assessment of likely significant effects (Section 5.10)
- Next steps (Section 5.11)

5.1.3 This chapter considers the potential effects on the quality and quantity of surface and groundwaters, geomorphology and flood risk that may result from the construction and operation of the Project.

5.1.4 This chapter should be read in conjunction with Chapter 2: Project description and other chapters of key relevance, namely:

- Chapter 6: Aquatic ecology - potential effects on aquatic designated sites, habitats, protected and notable species, and invasive non-native species (INNS), which are affected by changes to hydrology and hydrogeology.
- Chapter 7: Terrestrial ecology - potential effects on terrestrial designated sites, habitats, protected and notable species, and INNS, which are affected by changes to hydrology and hydrogeology.
- Chapter 8: Historic environment – potential effects on buried archaeological remains from changes to groundwater.
- Chapter 12: Traffic and transport - potential effects on vessel users on the River Thames.
- Chapter 14: Geology and soils - potential effects on sources of contamination and underlying geological and hydrogeological conditions, which could affect water quality.
- Chapter 16: Human health – potential effects on health determinants from water.
- Chapter 18: Climate resilience - potential effects on greenhouse gas emissions and climate change resilience which could affect hydrology, hydrogeology, flood risks and water resources.
- Chapter 19: Major accidents and disasters - potential effects on flood risk and water supply associated with emergency drawdown of the reservoir.
- Chapter 20: Cumulative effects – consideration of other relevant developments for the future baseline and assessment of potential cumulative effects upon water environment receptors.

5.1.5 This chapter is supported by the following figures and appendices:

- Figure 5.1: Surface Water Features
- Figure 5.2: WFD Surface Waterbodies
- Figure 5.3: Surface Water Quality Monitoring Locations
- Figure 5.4: Surface Water Flow and Level Monitoring Locations
- Figure 5.5: Aquifer Designations
- Figure 5.6: WFD Groundwater Bodies
- Figure 5.7: Hydrogeological Study Area and Features
- Figure 5.8: Groundwater Monitoring Locations
- Figure 5.9: Catchment Abstraction Management Strategy Areas
- Figure 5.10: Existing Risk of Flooding from Rivers and Sea (Fluvial)
- Figure 5.11: Existing Risk of Flooding from Surface Water (Pluvial)
- Figure 5.12: Groundwater Flooding Susceptibility
- Figure 5.13: Water Environment Receptors – Abstractions, Discharges, WFD Groundwater Bodies and Local Wildlife Sites
- Figure 5.14: Water Environment Receptors – Superficial Geology
- Figure 5.15: Water Environment Receptors – Bedrock Geology
- Appendix 5.1: WFD screening and scoping report
- Appendix 5.2: Preliminary Hydrogeological Impact Assessment (HIA)
- Appendix 5.3: Surface water monitoring data
- Appendix 5.4: Preliminary assessment of effects for water environment
- Appendix 5.5: Water environment receptors considered in the preliminary assessment, with sensitivity commentary

5.1.6 This PEI Report does not constitute a draft ES. Assessments reported within this PEI Report chapter are considered a reasonable 'worst case', as a precautionary approach has been taken where design, construction or baseline information is being developed. Nevertheless, the preliminary assessment is considered sufficiently robust to enable consultees to understand the likely significant environmental effects of the Project, based on current design information and understanding of the baseline environment. Gaps in information identified within the PEI Report will be considered and addressed as part of the assessment during the production of the ES, as noted in Section 5.11: Next steps.

5.1.7 Where initial likely significant effects are identified at this stage, these may ultimately be determined as not significant in the ES once data gaps are addressed and the design and mitigation are further developed. The ES will be submitted with the DCO application and will provide the final assessment of likely significant effects; this will be informed by the ongoing EIA process and ongoing consultation and engagement.

5.2 Legislation, policy and guidance

5.2.1 Table 5.1 lists the legislation, policy and guidance relevant to the water environment for the Project and specifies where in the PEI Report information is provided in relation to these. A full policy compliance assessment will be presented within the Planning Statement as part of the DCO application.

5.2.2 National Policy Statements (NPS) form the principal policy for development progressing through the Planning Act 2008 process. The NPS for Water Resources Infrastructure

(NPSWRI) is the primary NPS for the Project. In addition, the Secretary of State must also have regard to any other matters which they think are both important and relevant to the decision and this could include regional and local planning policies.

5.2.3 The Project is located mainly within the Vale of White Horse District, with the exception of the far eastern extent on the eastern bank of the River Thames, which falls within the South Oxfordshire District. The Project is wholly within the county of Oxfordshire. The regional and local planning policies most relevant to the assessment within this chapter are included in Table 5.1.

Table 5.1 Relevant legislation, policy and guidance for water environment

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
Legislation		
Bathing Water Regulations 2013 Establishes standards for the quality of designated bathing waters, ensuring the monitoring and protection of water quality at recreational sites.	The Project must outline appropriate mitigation measures and demonstrate that the quality of the designated Bathing Water, at Wallingford Beach on the River Thames, is not adversely affected by the Project. It is therefore relevant to this assessment.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Conservation of Habitats and Species Regulations 2017 (the 'Habitat Regulations 2017') Provides for the designation and protection of important habitats and species as part of the National Site Network (NSN). The protection of water dependent NSN sites also forms part of the requirements established under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. This informs the way in which the regulations apply to pollution related pressures and incidents, and informs the assessment regarding sensitivity of water environment receptors.	The Project must not add to the nutrient load of any internationally important sites that are failing to achieve the required condition due to nutrient pollution.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Environment Act 1995 (as amended) Provides for the establishment of the Environment Agency and their requirements and functions in relation to drainage and flood risk.	The Act includes measures related to drainage and flood defence which have informed the design of	Embedded design mitigation and standard good practice relating to drainage and flood risk are set out in Section 5.9. A summary of the ongoing

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
Amendments to this Act were set out by 'Environment (Amendment etc.) (EU Exit) Regulations 2019' to ensure this Act continued to function after the withdrawal of the UK from the European Union, in accordance with the European Union (Withdrawal) Act 2018.	the Project and the stakeholder engagement.	technical engagement is set out in Table 5.3.
Environment Act 2021 Aims to improve air and water quality, protect wildlife, increase recycling and reduce plastic waste. Includes binding targets on water quality and biodiversity. It gives powers to the Secretary of State to specify what chemicals should be taken into account in assessing water quality and further controls over licenced abstractions. Part 5 sets out relevant legislation post Brexit for water and changes to the priority substances listed.	The Project could impact water quality. The Act requires an assessment to understand the potential effect on water quality and to mitigate any likely significant effects.	A preliminary assessment of likely significant effects on water quality is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Environmental Damage (Prevention and Remediation) (England) Regulations 2015 Based on the 'polluter pays' principle and imposes obligations on operators of economic activities requiring them to prevent, limit or remediate environmental damage. They apply to damage to protected species, natural habitats, Sites of Special Scientific Interest (SSSI), water and land and implement directive 2004/35/EC, on environmental liability.	Without the implementation of appropriate mitigation, the Project could cause environmental damage. As required by the Regulations, all practicable steps will be undertaken to prevent the deterioration of the status of a surface or groundwater body and affects the ecological potential of a surface water body.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10 and embedded design mitigation and standard good practice is set out in Section 5.9.
Environmental Permitting (England and Wales) Regulations 2016 (as amended) Extends the requirement for an environmental permit to flood risk activities, in addition to polluting activities included under the previous regulations. The permitting requirements for flood risk activities allow the Environment Agency (as	The Regulations have and will continue to inform ongoing discussions with the Environment Agency regarding permitting requirements to ensure that the Project is designed appropriately and sufficient	A summary of the ongoing technical engagement is set out in Table 5.3.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
regulator for England) to concentrate on higher risk activities.	information collated to allow discharge permits to be gained in the future.	
Environmental Protection Act 1990 (as amended) Makes provision to control pollution arising from industrial and other processes for waste management. Amendments to this Act were set out by 'Environment (Amendment etc.) (EU Exit) Regulations 2019' to ensure this Act continued to function after the withdrawal of the UK from the European Union, in accordance with the European Union (Withdrawal) Act 2018.	There is the potential that the Project would result in water pollution and an increase in flood risk without mitigation. The Act is therefore relevant to the mitigation development for the Project.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Environmental Targets (Water) (England) Regulations 2023 Sets binding targets in relation to the water environment. The first target in respect of water is that the load of each of the following— (a) total nitrogen, (b) total phosphorus, (c) sediment, entering the water environment through agricultural diffuse pollution is, by 31 December 2038, at least 40 percent (%) lower than the baseline. The second target in respect of water is that the load of total phosphorus discharged into freshwaters from relevant discharges is, by 31 December 2038, at least 80% lower than the baseline.	The Project must follow the principle of improving water quality in order to meet the binding targets, therefore it is relevant to this assessment.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10 and embedded design mitigation and standard good practice is set out in Section 5.9. Appendix 5.1: WFD screening and scoping report includes an initial assessment of the risks to receptors and identification of those waterbodies where a more detailed impact assessment is needed.
Flood and Water Management Act 2010 Relates to the management of risks related to flooding and coastal erosion. The aim is to reduce the risk of flooding due to extreme weather events, which are likely to increase as a result of climate change.	The principles and provisions outlined in the Act must inform the Project design and mitigation through consideration of changes to flood risk.	Embedded design mitigation and standard good practice is set out in Section 5.9. Also see Chapter 18: Climate resilience.
Flood Risk Regulations 2009 The regulations designate Local Lead Flood Authorities (LLFA) and impose duties on the Environment Agency and	The Project has implications for flood risk and therefore takes account of these plans.	Documents prepared by LLFAs, in fulfilment of their duties set out by the Regulations, have informed

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
LLFAs to prepare a number of documents including: preliminary flood risk assessments, flood risk and flood hazard maps, flood risk management plans.	The LLFA has been closely engaged.	Section 5.6: Baseline conditions. Also see Chapter 18: Climate resilience.
Groundwater (Water Framework Directive) (England) Direction 2016 Sets out instructions to the Environment Agency on obligations to protect groundwater, including requirements to monitor and set thresholds for pollutants, add new pollutants to the monitoring list and change the information reported to the European Commission.	The principles relating to the prevention of risks to groundwater have informed the preliminary assessment and design of the Project.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10 and Appendix 5.2: Preliminary HIA. Embedded design mitigation and standard good practice is set out in Section 5.9. Appendix 5.1 WFD screening and scoping report includes an initial assessment of the risks to receptors and identification of those waterbodies where a more detailed impact assessment is needed.
Groundwater Regulations 1998 Focuses on the protection of groundwater for domestic or agricultural use by controlling the discharge of hazardous substances, ensuring the prevention of groundwater contamination.	The Project must prevent and limit groundwater pollution.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9. Appendix 5.2: Preliminary HIA provides a preliminary hydrogeological assessment of impacts from the Project on groundwater resources and groundwater dependent receptors.
Highways Act 1980 Consolidates various laws related to the management and operation of the road network in England and Wales, including provisions for the construction and maintenance of highways, which can impact drainage systems and water quality.	The design of highway improvements associated with the Project must include provisions for drainage to prevent surface water from flowing onto highways and to mitigate flooding or erosion caused by water	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
	discharged from highways.	
Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') These regulations contain the requirements for the assessment of the effects of certain public and private projects on the environment to ensure that the environmental impacts are thoroughly assessed and considered before development consent is granted. Requires the evaluation of potential impacts on water quality and aquatic ecosystems, ensuring that any adverse effects are identified and mitigated.	The impact assessment must include information on the likely significant effects on the environment, including water.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Land Drainage Act 1991 Provides functions to drainage boards and local authorities to manage watercourses and provide consenting powers for proposed works to watercourses associated with development.	The Project must consider its impact on Ordinary Watercourses and obtain the necessary consents for any works affecting Ordinary Watercourses.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Thames Conservancy Act 1932 Deals with the development of accommodations and river management of the non-tidal River Thames and provides a system of licensing.	The Project must not contribute to the pollution of the River Thames, negatively impact the flow regime through abstraction and discharges, or affect navigation. Any releases into the river must be managed to prevent a deterioration to water quality, and/or an increased prominence of problematic water levels.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
The Nitrate Pollution Prevention Regulations 2015 Designates land as Nitrate Vulnerable Zones (NVZs) and imposes limits on the amount of nitrogen originating from agricultural and other sources that can	The Project must take account of NVZs that could be impacted and mitigate against any nitrate pollution.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
be applied in these zones. This helps to prevent nitrate pollution in water bodies, protecting water quality and aquatic ecosystems.		and standard good practice is set out in Section 5.9.
Urban Waste Water Treatment (England and Wales) Regulation 1994, transposed from the EU Directive; Urban Wastewater Treatment Directive 91/271/EEC (as amended) Transposes the Council Directive 91/271/EEC concerning urban wastewater collection, treatment and its discharge into English and Welsh law. The regulations also require Defra to publish a situation report on the disposal of urban wastewater and sludge and compliance with the regulations.	The Project must ensure it assesses the impacts upon drainage and wastewater transfer systems.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Water Abstraction and Impounding (Exemptions) Regulations 2017 Contains circumstances where water abstractions and impounding works are exempt from licensing requirements.	Dewatering activities may be required as part of the construction of the Project which must be undertake in line with the Water Abstraction and Impounding (Exemptions) Regulations 2017.	Consents and licences will be outlined as part of the DCO.
Water Act 2014 Amends the Water Resources Act 1991 and the Water Industry Act 1991 to make provision with respect to compensation under section 61 of the Water Resources Act 1991.	The provisions regarding water industry infrastructure have been taken into account in the drainage design of the Project. It has also informed the stakeholder engagement completed with relevant stakeholders.	Embedded design mitigation and standard good practice is set out in Section 5.9. A summary of the ongoing technical engagement is set out in Table 5.3.
Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD Regulations) Transposes into English and Welsh law the Water Framework Directive (WFD) 2000/60/EC and contains provisions to protect rivers, lakes, estuaries, coastal waters and groundwater. The regulations remain in force following the	The principles of the Regulations have been applied to develop the assessment methodology described in Appendix 5.1: WFD screening and scoping report. This includes an initial assessment of the	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9. Appendix 5.1: WFD screening

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
UK's withdrawal from the European Union. These regulations provide for protection of all types of water bodies and include environmental objectives, compliance parameters to be assessed and bring in the protection of areas with specific requirements. These requirements underpin the impact assessment for the water environment.	risks to receptors and identification of those waterbodies where a more detailed impact assessment is needed. The report identifies the need for a detailed assessment to ensure WFD status and/or future objectives are not compromised.	and scoping report includes an initial assessment of the risks to receptors and identification of those waterbodies where a more detailed impact assessment is needed.
Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 Presents the updated environmental standards to be used in the second cycle of the WFD (2000/60/EC) river basin management planning process in England and Wales.	See Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD) above.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Appendix 5.1: WFD screening and scoping report includes an initial assessment of the risks to receptors and identification of those waterbodies where a more detailed impact assessment is needed.
Water Industry Act 1991 Consolidates laws related to the supply of water and provision of sewerage services in England and Wales and sets standards for water quality and management, ensuring the efficient and sustainable use of water resources.	The Project is a strategic resource option that would provide a resilient water supply. It is therefore relevant to this assessment.	The Act is relevant to the entirety of Chapter 5: Water environment.
Water Resources (Abstraction and Impounding) Regulations 2006 Contains provisions relating to the licensing of abstraction and impounding of water in England and Wales in the light of amendments made by the Water Act 2003 to the Water Resources Act 1991. The 2006 regulations have been updated by the Water Abstraction and Impounding (Exemptions) Regulations 2017.	Any required abstraction and impoundment licenses would be granted by the Environment Agency and must be thoroughly assessed for their environmental impact.	A preliminary assessment of likely significant effects is set out in Section 5.10. Consents and licences will be outlined as part of the DCO.
Water Resources Act 1991 Sets out provisions for the control of pollution of water, abstraction, working in or near watercourses and consent	The Project is a water resources management scheme involving permanent watercourse	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
for the erection of temporary and permanent obstructions of watercourses. It also establishes the Environment Agency's powers and duties for the protection of water resources, flood defence, fisheries, recreation, conservation and navigation.	diversions. It also has the potential to result in the pollution of watercourses, thereby it is relevant to this assessment.	out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Water Supply (Water Quality) Regulations 2018 Provides the framework for drinking water quality in England in respect of public supplies provided by water companies and licensed water suppliers.	There is the potential that the Project would result in impacts upon Drinking Water Protection Areas. It is therefore relevant to this assessment.	A preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
National Policy Statement for Water Resources Infrastructure (NPSWRI)		
Paragraphs 4.7.1 to 4.7.21 Set out detailed requirements for flood risk, including the need to undertake a flood risk assessment, ensure that climate change is taken into account, and ensure that the development's design takes into account flood risk, and should put forward measures to mitigate the impact of flooding. It also sets out aspects that the Secretary of State will consider in relation to flood risk when determining an application.	The Project must be designed to mitigate the impact of flooding and the assessment of flood risk must be completed in line with the requirements outlined in the NPSWRI.	Section 5.6: Baseline conditions outlines all flood risk receptors. A preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
Paragraphs 4.15.1 to 4.15.16 Sets out a series of requirements for the assessment of environmental impacts on surface and groundwaters and water quality.	The Project has undertaken a preliminary assessment of the impacts of the Project on water quality and water resources.	Section 5.6: Baseline conditions outlines all surface and groundwater receptors. A preliminary assessment of likely significant effects is set out in Section 5.10. Appendix 5.1: WFD screening and scoping report includes an initial assessment of the risks to WFD receptors and identification of those waterbodies where a more detailed impact assessment is needed. Appendix 5.2: Preliminary HIA provides a preliminary hydrogeological assessment

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
		of impacts from the Project on groundwater resources and groundwater dependent receptors. Also see Chapter 20: Cumulative effects.
Other national policy		
A Green Future: Our 25 Year Plan to Improve the Environment (HM Government, 2023) Outlines the UK government's long-term strategy to improve the environment including goals for enhancing water quality, reducing pollution, reducing flooding and ensuring sustainable water management.	The goals, outlined within the policy paper, have informed the current Project design, as well as mitigation and enhancement measures.	Embedded design mitigation and standard good practice is set out in Section 5.9.
Plan for Water 'Our integrated plan for delivering clean and plentiful water' (Defra, 2023c) Sets out the first steps to reform the programme for the water system which builds on and outlines additional actions to be taken to meet water targets and transform the water system.	The Project is a strategic resource option that would provide a resilient water supply. It is therefore relevant to this assessment.	The Plan is relevant to the entirety of Chapter 5: Water environment.
Environmental Improvement Plan 2023 (Defra, 2023a) Builds on the 25 Year Environment Plan, setting out specific actions and targets to improve the natural environment in England. In particular, it addresses nutrient pollution of rivers from wastewater treatment and agriculture by increasing advice and incentives, tackles restoring rivers and woodlands through Landscape Recovery Projects, introduces water efficiency labelling and reducing leakages and as well as 'Goal 3: Clean and plentiful water'.	The Project will deliver improvements to local habitats and biodiversity. It is therefore aligned with the apex goal of the Plan.	Embedded design mitigation and standard good practice is set out in Section 5.9.
Flood and Coastal Erosion Risk Management: Policy Statement (Defra, 2020) Outlines the UK government's long-term strategy to enhance resilience against flood and coastal erosion risks,	This Project has the potential to result in impacts upon current flood risk. Mitigation should align with the UK Government's Flood and	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
including measures for upgrading flood defences, managing water flow, and implementing nature-based solutions to reduce flood risk and protect water quality.	Coastal Erosion Risk Management Strategy to ensure that there will be no resultant increase in flood risk.	Embedded design mitigation and standard good practice is set out in Section 5.9.
National Planning Policy Framework 2025 (MHCLG, 2025) Sets out government's planning policies for England and how these are expected to be applied. Section 14, paragraphs 170-182 set out detailed considerations for flood risk in terms of avoiding new development in areas of inappropriate flood risk and ensuring that new developments are sufficiently resilient to flooding. Section 15, paragraph 187(e) states that development should not pose an unacceptable risk of water pollution, and that it should help to improve local environmental conditions.	This Project is partially located within areas of medium and high flood risk, as well as having the potential to impact water quality. It is therefore relevant to this assessment.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.
National Planning Practice Guidance: Flood risk and coastal change (MHCLG, 2024) Advises how to take account of and address the risks associated with flooding and coastal change in the planning process. Paragraphs 1 – 79 details how to take account of and address the risks associated with flooding within the planning process. Water supply, wastewater and water quality paragraphs 16 – 20 also details water quality and water related infrastructure considerations for planning applications.	The Project has the potential to result in impacts to water supply and quality and will include mitigation measures to protect the water environment. It is therefore relevant to this assessment.	Section 5.6: Baseline conditions outlines all surface and groundwater receptors. Embedded design mitigation and standard good practice is set out in Section 5.9. A preliminary assessment of likely significant effects is set out in Section 5.10.
Regional and local policy		
South Oxfordshire Local Plan 2011-2035 (adopted December 2020) (South Oxfordshire District Council, 2020) Sets out the future for development in South Oxfordshire up to 2035. DES1 focuses on delivering High Quality Development which includes the requirement for all new	The Project has the potential to impact upon flood risk, water resources and water quality. The strategic objectives for South Oxfordshire are therefore relevant and have informed the	Embedded design mitigation and standard good practice is set out in Section 5.9. A preliminary assessment of likely significant effects is set out in Section 5.10.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
development to mitigate water run-off and flood risks. ENV4 aims to protect and enhance water resources, ensuring sustainable water management and preventing pollution. It requires that development adjacent to a watercourse protect and, where possible, enhance the function and setting of the watercourse. Policy ENV12 requires that development should not result in significant adverse impacts on human health or the natural environment. EP4 ensures that the risk and impact of flooding will be minimised through measures such as directing new development to areas with the lowest probability of flooding, ensuring that development does not increase the risk of flooding elsewhere and ensuring wider environmental benefits of development in relation to flood risk. The requirement for a site-specific Flood Risk Assessment (FRA) and Drainage Strategy, as well as the requirement for the assessment against the South Oxfordshire Strategic Flood Risk Assessment and the Oxfordshire Local Flood Risk Management Strategy is set out.	current Project Design and mitigation measures. As required by the strategic objectives, an FRA and Drainage Strategy will be produced and will be submitted as part of the ES.	
Vale of White Horse District Council Local Plan 2031 Part 1 (adopted December 2026) (Vale of White Horse District Council, 2016) Sets out the spatial strategy and strategic policies for the district to deliver sustainable development. CP42: Flood Risk: Defines how flood risk should be addressed to support new development proposals, including how to minimise the risk and impact of flooding. CP 43: Natural Resources sets out the Council's approach to minimising environmental impacts associated with development proposals, including to the water environment.	The Local Plan includes policies relating to the provision of land for the Project, as well as policies relating to flood risk management, reducing the impact on the water environment, works within or adjacent to watercourses and the Wilts and Berks Canal. It is therefore relevant to the assessment.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9. A preliminary assessment of likely significant effects is set out in Section 5.10.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
CP14: Strategic Water Storage Reservoirs safeguards land for the provision of a reservoir to assist with the management of water supply in the South East of England. It also outlines requirements for reservoir development at this location. CP 14a: Upper Thames Strategic Storage Reservoir: Land is safeguarded for a reservoir and ancillary works between the settlements of Drayton, East Hanney and Steventon in accordance with the proposals set out in the draft Water Resources Management Plan 2019 and Core Policy 14 (Local Plan 2031: Part 1). DP 30: Watercourses seeks to ensure that watercourses are accommodated appropriately within new development and outlines requirements for development of land that contains or is adjacent to a watercourse. DP 32: Wilts and Berks Canal: seeks to support the long-term vision for the restoration of the Wilts and Berks Canal and safeguards a continuous route corridor for restoration of the Wilts & Berks Canal using the historic line wherever possible.		
Thames River Basin District Flood Risk Management Plan (FRMP) 2021 to 2027 (Environment Agency, 2022c) The FRMP outlines the main flood risk issues and changes in the Thames River Basin District. The FRMP sets out how organisations, stakeholders and communities will work together to manage flood risk in the Thames River Basin District. It includes detailed actions such as upgrading flood defences, improving drainage systems, and implementing nature-based solutions to reduce flood risk. The FRMP also addresses the impacts of climate change on flood risk and aims to enhance community resilience.	The Project is within this RBD. The current Project design includes measures, such as replacement floodplain, watercourse diversions and new surface water channels, to manage flood risk, which is the core aim of the Thames RBD FRMP.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
Thames River Basin Management Plan (RBMP) 2022 - 2025 (Environment Agency, 2022e) Outlines the strategies and measures to protect and enhance the water environment within the Thames River Basin District. Informs decisions on land use planning and address key challenges such as water quality, flood risk management, and habitat conservation, ensuring sustainable water resource management.	The Thames RBMP has informed the existing and future baseline including the challenges for the water environment within the study areas, as well as proposed mitigation and enhancement measures.	Embedded design mitigation and standard good practice is set out in Section 5.9.
Thames Abstraction Licensing Strategy (Environment Agency, 2019b) Outlines the management of water resources within the Thames catchment area, including the availability of water for abstraction. Flow is required to be maintained to support the environment, navigation, recreation and existing licences, as such the Lower Thames is classed as 'water not available for licencing'. The document evaluates the impacts of new abstraction licences on aquatic ecosystems and hydrology, ensuring sustainable abstraction practices.	The Project, which would involve the abstraction of water from the River Thames to fill the reservoir and the discharge to the River Thames for downstream water supply abstraction, has the potential to result in impacts upon surface and groundwater quantity. It is therefore relevant to this assessment.	Existing baseline relating to abstractions is outlined in Section 5.6. A preliminary assessment of likely significant effects is set out in Section 5.10.
Kennet and Vale of White Horse Abstraction Licensing Strategy (2019a) Outlines the management of water resources within the Vale of White Horse area, including the availability of water for abstraction. The Thames bespoke licensing strategy, which classifies 'water not available for licencing', also applies to the Kennet and Vale of White Horse. The document evaluates the impacts of new abstraction licences on aquatic ecosystems and hydrology, ensuring sustainable abstraction practices.	The Project has the potential to result in impacts upon surface and groundwater quantity. It is therefore relevant to this assessment.	Existing baseline relating to abstractions is outlined in Section 5.6. A preliminary assessment of likely significant effects is set out in Section 5.10.
South Oxfordshire and Vale of White Horse District Councils, Emerging Joint Local Plan 2041 (Publication Version) (2024a) The Emerging Local Plan will guide the	The Project has the potential to impact upon flood risk, water resources and water quality, and is exploring	Embedded design mitigation and standard good practice is set out in Section 5.9. Appendix 5.1: WFD screening and scoping report includes

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
kinds of new housing and jobs needed and where they should go, informing planning application decisions for the two districts. It contains developing planning policies that help address the climate emergency, restore nature, and meet the needs of residents. Outlines several key policies including CE1 which requires that all new developments must reduce the risk of flooding and conserve and store water in accordance with Policy CE6 (Flood risk and drainage) and Policy CE7 (Water efficiency). The risk and impact of flooding must be minimised in the authority area by ensuring that development is directed to areas with the lowest flood risk, does not increase the risk elsewhere and remains safe throughout its lifetime. Further requirements for development are set out in CE6. Policy HP10 (Watercourses) aims to ensure that watercourses are positively integrated in the design of new development and that the ecological importance of the watercourse is not compromised. Policy IN7 sets out the safeguarding of land for SESRO, as well as the requirement for the applicant to consider providing a flood alleviation scheme for Abingdon, the replacement for a section of the Wilts and Berks Canal and measures to ensure water quality standards are met.	opportunities to support the delivery of the Abingdon Flood Alleviation Scheme and the Wilts and Berks canal. The strategic objectives for South Oxfordshire and Vale of White Horse District Councils are therefore relevant, and have informed the design, mitigation and enhancements measures.	an initial assessment of the risks to receptors and identification of those waterbodies where a more detailed impact assessment is needed.
Oxfordshire Local Flood Risk Management Strategy (Oxfordshire County Council, 2025) Provides an overview of flood risk management across Oxfordshire and the roles and responsibilities of Risk Management Authorities and other key stakeholders. A series of objectives and measures are set out including taking a collaborative approach to reduce flood risk (including working with Thames Water) (Objective 2), taking a	The guidance provided by the Lead Local Flood Authority (LLFA) has been applied to the sections in this chapter relating to flood risk and its management. It has informed the existing and future baseline flood risk for the development, as well as the identification of	Existing flood risk is outlined in Section 5.6: Baseline conditions and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
sustainable and holistic approach to flood risk management, seeking to deliver wider environmental and social benefits, climate change mitigation and improvements under WFD (Objective 3) and prevent an increase in flood risk from development where possible (Objective 4). The Strategy requires that new development consider climate change and the use of SuDS and is resilient to flooding.	mitigation measures to manage the impacts of the Project on flood risk during construction and operation.	
Oxfordshire Local Nature Recovery Strategy (draft) (Oxfordshire County Council, 2024) A coordinated strategy for nature's recovery, to help wildlife to flourish, improve the quality of air and water, and mitigate the impacts of climate change. Includes the draft Statement of Biodiversity Priorities which outlines a number of potential measures that may be implemented relating to habitats such as rivers, streams, standing water, wetland habitats and floodplains. Aims include enhancing the water environment by restoring river diversity and managing riparian habitats to achieve good ecological condition. It focuses on improving operational canals as wildlife corridors, sensitively managing ponds to boost biodiversity and water quality, and creating varied wetland habitats. Additionally, the strategy includes creating and managing ditches and new ponds across different habitat types to increase biodiversity and clean water habitats. It also emphasizes managing riverbanks to enhance biodiversity, improve water quality, and facilitate wildlife movement along watercourses. Local nature recovery opportunities identified within the draft Order limits include areas of wet woodland, wetland and pond creation, river restoration,	The Project has the potential to impact upon water quality and river geomorphology. The aims outlined in the LNRS are therefore relevant and have been used to inform the identification of mitigation measures.	Baseline conditions are set out in Section 5.6 and a preliminary assessment of likely significant effects is set out in Section 5.10. Embedded design mitigation and standard good practice is set out in Section 5.9.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
pond management and chalk stream improvement.		
Abingdon-on-Thames Neighbourhood Plan 2041 (Pre-Submission Draft) (Abingdon-on-Thames Town Council, 2024) Sets out a vision for the sustainable development of Abingdon. Objective 7 aims to minimise future flood risk by protecting and, where possible, extending the functional floodplain.	The Neighbourhood Plan includes aims and objectives relating to flood risk. It is therefore relevant to the assessment.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9.
Culham Neighbourhood Plan 2020-2041 (Culham Parish Council, 2022) Sets out a series of planning policies that will be used to determine planning applications in the area up to 2041. The associated Design Code policies DHC2.3.1, LE2.3.1 and OVS2.3.1 require that proposals consider flood resistance and resilience measures.	The Project has the potential to impact upon flood risk. The design codes for Culham are therefore relevant and have informed current Project Design and mitigation measures.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9.
East Hanney Neighbourhood Plan (2021-2031) (East Hanney Parish Council, 2023) Sets out a plan for a sustainable future for East Hanney, including objectives and policies that will be used in shaping future development. Policy EHNP 7 aims to protect and enhance Letcombe Brook and its corridor. It necessitates that proposals protect the waterway system through the village and include flood risk assessments and appropriate flood mitigation. Policy EHNP 16 requires that applications need to demonstrate that they do not increase the risk of flooding and must take account of the predicted impact of climate change.	The Neighbourhood Plan includes policies relating to the protection of watercourses and mitigation of flood risk. It is therefore relevant to the assessment.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9.
Steventon Parish Neighbourhood Development Plan 2022-2031 (Steventon Parish Council, 2024)	The Project has the potential to impact upon flood risk. The policies outlined in the Neighbourhood Development are	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9:

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
Sets out policies that will be used in making planning decisions about the future of the area up to 2031. Policy 4 (d) aims to increase resilience to flooding and climate change by the application of design measures which mitigate the effects of changing temperatures and rainfall.	therefore relevant and have been used to inform the identification of mitigation measures.	Embedded design mitigation and standard good practice.
Sutton Courtenay Neighbourhood Plan 2031 (Sutton Courtenay Parish Council, 2024) Sets out objectives and policies that will be used in making planning decisions about the future of the area up to 2031. Policy SC6 instructs that proposals should conserve existing natural blue corridors and SC10 states that proposals should avoid the loss of important watercourses and water bodies. Policy SC7 requires that proposals should demonstrate that surface water drainage will not add to the existing site run off or cause any adverse impact to properties or their setting. Policy SC12 requires proposals to protect and enhance the waterside character of the River Thames.	The Neighbourhood Plan includes policies relating to blue corridors, surface water drainage and the River Thames. It is therefore relevant to the assessment.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9.
Guidance		
Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (C532) (Masters-Williams, H. et al, 2001) Provides guidance on environmental best practices for controlling water pollution resulting from construction activities, emphasising potential pollution sources within construction sites and effective prevention methods. It also covers benefits and obligations, water pollution management, legislative frameworks, construction contracts, and water management techniques.	The Project will follow best practice in order to control water pollution.	Embedded design mitigation and standard good practice is set out in Section 5.9.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
Control of Water Pollution from Linear Construction Projects – Technical Guidance (C648) (Murnane, Heap and Swain, 2006) Provides advice on managing and controlling water pollution specifically for linear construction including detailed instructions of control measures to be considered at the design and construction phases as well as methods to ensure their effectiveness.	The assessment will follow the good practice guidance set out in CIRIA (2006), particularly as it relates to the mitigation of water pollution.	Embedded design mitigation and standard good practice is set out in Section 5.9.
Design Manual for Roads and Bridges (DMRB): LA 113 - Road drainage and the water environment (National Highways, 2020b) Provides comprehensive guidelines for assessing and managing the impacts of projects on the water environment. It offers a framework for evaluating potential impacts and implementing mitigation measures to minimise adverse effects on water quality, flood risk, and aquatic ecosystems. Specifically, it outlines procedures for assessing environmental sensitivity, the magnitude of impact, and the significance of potential effects on the water environment.	The manual provides a guide informing the methodology and criteria for assessing the impact of development on the water environment.	Section 5.4: Assessment methodology introduces the methodology for the water environment assessment. Embedded design mitigation and standard good practice is set out in Section 5.9. A preliminary assessment of likely significant effects is set out in Section 5.10.
Environmental good practice on site (C811) (Kwan, Dickinson and MacLeod, 2023) Provides practical guidance for managing construction sites to deliver sustainable construction and minimise environmental impacts. This guidance is designed to help site managers and environmental managers implement good environmental practices, ensure compliance with regulations and promoting sustainable construction.	The assessment will follow the good practice guidance set out in Kwan, Dickinson and MacLeod (2023), particularly as it relates to managing construction sites.	Embedded design mitigation and standard good practice is set out in Section 5.9. A preliminary assessment of likely significant effects is set out in Section 5.10.
Flood and coastal risk projects, schemes and strategies: climate change allowances (Environment Agency, 2022a) Outlines when and how risk management authorities should use	The guidance will inform design and the identification of mitigation measures to manage the impact of the Project on flood risk.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
climate change allowances for flood and coastal risk projects, schemes, and strategies. It promotes an adaptive approach to managing flood risk, enabling the development of projects that can adapt to a range of future climate change scenarios. By using climate change allowances to assess and plan for future flood risk, the guidance ensures that potential risks are identified and mitigated, and that projects are designed to be resilient to future climate change impacts.		A preliminary assessment of likely significant effects is set out in Section 5.10.
Flood Risk Assessments: Climate Change Allowances (Environment Agency, 2022b) Outlines when and how local authorities, developers, and their agents should use climate change allowances in flood risk assessments to ensure that developments are resilient to future climate change. It promotes an adaptive planning approach to managing flood risk, ensuring that all potential risks are identified and mitigated, thereby protecting communities and infrastructure.	The guidance will inform design and the identification of mitigation measures to manage the impact of climate change on flood risk.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9. A preliminary assessment of likely significant effects is set out in Section 5.10.
Groundwater Protection Collection (previously covered in GP3) (Environment Agency and Defra, 2024) Provides detailed guidance on protecting groundwater from pollution and managing activities that could impact groundwater quality. It outlines the necessary environmental permits and risk assessments for activities that may affect groundwater, and provides a framework for implementing controls, overall helping to identify and mitigate potential risks to groundwater quality.	Groundwater will be protected from pollution and any other activities that could impact groundwater quality in accordance with the guidance.	Embedded design mitigation and standard good practice is set out in Section 5.9. Appendix 5.2: Preliminary HIA provides a preliminary hydrogeological assessment of impacts from the Project on groundwater resources and groundwater dependent receptors.
Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems (UK TAG, 2004) Outlines methods for determining the presence of Groundwater Dependent Terrestrial Ecosystems (GWDTEs) and evaluating the risk of significant	The methods outlined in the guidance will inform the existing and future baseline assessment of GWDTEs.	The hydrogeological baseline is outlined in Section 5.6: Baseline conditions. Appendix 5.2: Preliminary HIA provides a preliminary hydrogeological assessment of impacts from the Project on

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
damage due to changes in groundwater flow or quality, ensuring that groundwater-dependent ecosystems are protected and managed sustainably.		groundwater resources and groundwater dependent receptors.
Hydrogeological impact appraisal for dewatering abstractions (Environment Agency, 2007) Provides practical advice on assessing the hydrogeological impact of groundwater abstractions for both dewatering and consumptive use, thereby protecting groundwater resources and associated ecosystems. It promotes a risk-based approach to ensure that the level of assessment is proportionate to the potential environmental impact and integrates this process into the Environment Agency's abstraction licensing framework.	The impacts of any dewatering undertaken during the construction of the Project will be assessed following Environment Agency guidance.	Appendix 5.2: Preliminary HIA provides a preliminary hydrogeological assessment of impacts from the Project on groundwater resources and groundwater dependent receptors.
Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities (McBain and Styles, 2019) Details key regulations, stakeholders and methodologies for assessing and mitigating impacts on the water environment. Specifically, it outlines the potential impacts from construction, operation and decommissioning of a development and a framework for evaluating sensitivity of a feature or receptor and identifying the magnitude and effects.	The paper provides a guide to the Project in informing the methodology and criteria for assessing the impact of development on the water environment.	Section 5.4: Assessment methodology introduces the methodology for the water environment assessment.
Oxfordshire County Council Preliminary Flood Risk Assessment (draft) (Oxfordshire County Council, 2011) Evaluates flood risk and examines historical flooding from local sources throughout the county. Predicts future flooding impacts, highlighting hotspots primarily in towns, Oxford city, and some small rural communities.	The LLFA guidance should inform the existing and future baseline flood risk for the Project.	Existing flood risk is outlined in Section 5.6: Baseline conditions.
South Oxfordshire and Vale of White Horse Level 1 Strategic Flood Risk	The recommendations relating to the	Existing flood risk is outlined in Section 5.6: Baseline

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
Assessment (SFRA) (2024b) Maps the spatial distribution of all flood risk sources across the authority areas to guide the application of the Sequential Test. The SFRA offers several recommendations, including conducting site-specific FRAs, thoroughly investigating the use of SuDS, and considering Natural Flood Management for mitigation.	assessment of flood risk and appropriate mitigation will be followed.	conditions. Embedded design mitigation and standard good practice is set out in Section 5.9.
South Oxfordshire and Vale of White Horse Level 2 Strategic Flood Risk Assessment (2024c) Focuses on potential development sites and communities at high and medium flood risk, providing detailed recommendations for flood risk management including site-specific assessments, SuDS implementation and consideration of climate change adaptation.	The recommendations relating to the assessment of flood risk and appropriate mitigation will be followed.	Existing flood risk is outlined in Section 5.6: Baseline conditions. Embedded design mitigation and standard good practice is set out in Section 5.9. A preliminary assessment of likely significant effects is set out in Section 5.10.
Water Resources Planning Guideline (Environment Agency, Natural Resources Wales and The Water Services Regulation Authority, 2023) Outlines the requirements for water companies in England and Wales to prepare and maintain a Water Resources Management Plan (WRMP). The plan, which emphasises adaptive planning to address uncertainties, aims to ensure a secure supply of water while protecting the environment.	Securing water supply while protecting the environment is central to the Project.	The guidance is relevant to the entirety of Chapter 5: Water environment.
Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Planning Inspectorate, 2025) Is a non-statutory advice note that summarises the requirements of the WFD Regulations in relation to nationally significant infrastructure project applications.	The advice note provides a guide to the Project in informing the WFD Compliance Assessment and is being used to inform the approach.	Appendix 5.1: WFD screening and scoping report outlines the proposed scope of the WFD compliance assessment that will be undertaken.
Practical Methodology for Determining the Significance of Impacts on the Water Environment (Mustow, Burgess and Walker, 2007)	The Project will follow guidance to inform the water environment impact assessment.	The preliminary assessment of likely significant effects is set out in Section 5.10.

Legislation, policy or guidance description	Relevance to assessment	Where in the PEI Report is information provided to address this
This paper reviews the current status of Environmental Impact Assessments for the water environment in the UK and proposes a more detailed approach to determine the significance of impacts.		

5.3 Consultation, engagement and scoping

5.3.1 Feedback from consultation and engagement is used to define the assessment approach and to ensure that appropriate baseline information is used. Feedback is also used to drive the design of the Project to avoid, prevent and reduce any likely significant environmental effects. In particular, feedback from key stakeholders has informed the Project's proposed mitigation measures. Specific mitigation measures relevant to the Water environment assessment are summarised in Section 5.9: Embedded design mitigation and standard good practice of this chapter. Engagement is ongoing and will continue to inform the EIA and design process.

Scoping Opinion

5.3.2 The EIA Scoping Report (Thames Water, 2024a) was issued to the Planning Inspectorate (PINS) on 28 August 2024. PINS provided its EIA Scoping Opinion (The Planning Inspectorate, 2024) on 8 October 2024, which included feedback from consultation bodies that it formally consulted.

5.3.3 Table 5.2 captures the key Scoping Opinion comments received from PINS and other key comments received from consultation bodies relevant to the Water environment assessment, along with the Applicant's response to these at this stage of the assessment. Key activities to inform the final assessment that will be undertaken between the PEI Report and ES are covered in Section 5.11: Next steps. The full consultee comments on the EIA Scoping Report and responses to these will be provided in the ES.

Table 5.2 Key Scoping feedback for water environment

Stakeholder	Scoping comment	Applicant response
Planning Inspectorate	PINS 3.1.4 - The Scoping Report states parts of the Proposed Development are located within flood risk zones 2 and 3 but does not identify whether it is located in areas of 3a or 3b flood risk. The ES should clearly identify if and where the Proposed Development is located in flood zone 3b (functional floodplain). This should be used to inform appropriate mitigation and/or compensation in relation to flood mitigation.	This will be reported on in the ES. This information is being used to help inform the ongoing design development.

Stakeholder	Scoping comment	Applicant response
Planning Inspectorate	PINS 3.1.5 - Scoping Report paragraph 6.6.34 and Table 6-14 identifies potential pollution impacts from sedimentation on surface water quality, but potential impacts from erosion and accretion of sediment on hydrology, geomorphology, flood mitigation assets and the reservoir itself are not included. The ES should assess significant effects from erosion and accretion where they are likely to occur and describe and secure any relevant and appropriate mitigation measures.	A preliminary assessment of the effects arising from erosion and accretion has been undertaken as part of the PEI Report (Appendix 5.4: Preliminary assessment of effects for Water environment). A more detailed assessment will be undertaken and presented within the ES.
Planning Inspectorate	PINS 3.1.6 - Scoping Report Table 6-14 identifies that potential impacts from watercourse crossings on fluvial geomorphology are scoped in. This impact should also be scoped in for hydrology.	A preliminary assessment of the effects arising from watercourse crossings has been undertaken as part of the PEI Report (Appendix 5.4: Preliminary assessment of effects for Water environment). A more detailed assessment will be undertaken and presented within the ES.
Planning Inspectorate	PINS 3.1.9 - The Scoping Report does not mention the potential for geological faulting which is a matter identified by the Environment Agency in their consultation response. The ES should include further consideration of how faulting may influence the hydrogeology beneath the new reservoir - particularly in relation to ground water quality.	The PEI Report (Appendix 5.2: Preliminary HIA) has considered geological faulting within the context of the water environment and how faulting may influence the local hydrogeology.
Planning Inspectorate & Environment Agency	PINS 3.1.8 - The Environment Agency consultation response identifies that the Design Manual for Roads and Bridges Guidance (LA113 2020) used to determine the criteria for magnitude of effect in relation to flood risk is not appropriate. The ES should justify the methodology for assessment of flood risk in agreement with relevant consultation bodies.	The DMRB (LA113) (National Highways, 2020b) is standard guidance used to undertake water environment EIA. The methodology for the Project is based upon DMRB and it is acknowledged that DMRB does not fully align with NPS requirements to not worsen flood risk. The methodology (Chapter 5: Water environment, Section 5.4: Assessment methodology) has been revised to reflect that

Stakeholder	Scoping comment	Applicant response
		worsening of flood risk beyond the limits of uncertainty to Third Party land would require additional mitigation. This revised methodology approach will be discussed and agreed with the Environment Agency.
Environment Agency	Culverting. As raised elsewhere within this response, culverted crossings should be avoided as they damage the bed of the river, restrict natural fluvial processes and can also harm biodiversity. Clear span bridges that do not interfere with the activity of the channel, or the channel banks, should be used in preference.	Culverts will be avoided and designed out where practicable. A full schedule of watercourse crossings will be provided as part of the ES alongside a justification as to why culverts are required at any given location, including best practice for design of culverts to mitigate their adverse environmental impacts.
Environment Agency	Foul Drainage. The introduction of new sewage flows and/or trade effluents on Abingdon Sewage Treatment Works (STW), with particular regard for the quality of the final effluent from the STW on the receiving environment. This applies to any new discharges to foul sewer during construction or operation. There is a risk that increased sewage or trade effluent flows could risk non-compliance with Abingdon STW's water discharge activity permit, increase the frequency that any storm overflows could operate, or introduce or increase the concentration of substances not controlled by emission limits within the permit.	The approach to foul drainage across the site is under development. It may involve treatment on site or connection to the existing STWs at Abingdon or Drayton. The drainage strategy will be provided with the DCO application.
Environment Agency	Mitigation. We welcome the proposal to produce a Water Quality Management Plan and a Construction Code of Practice. We would like to encourage the applicant to secure the production of an Environmental Monitoring Plan within these documents, to ensure that compliance is maintained throughout construction. We would look to review and advise on these documents as and when	The Contractor will implement, as part of the CEMP, measures to control the potential risks to the water environment, relating to water resources, water quantity, flood risk and water quality. Surface water and groundwater monitoring requirements will be prepared and

Stakeholder	Scoping comment	Applicant response
	they are produced (pre- or post-determination).	implemented as part of the Contractor's CEMP.
Environment Agency	We recommend that large projects consider a basic water resources assessment at the EIA stage which identifies water demands and the intended sources of supply for activities during construction so that any implications for the effect of potential license restrictions can be problem solved early on.	A basic Water Resource Assessment will be undertaken for the Project and will be provided as part of the DCO submission.
Environment Agency	Impoundments. Newly created outfalls to the Childrey Brook and River Ock pose uncertainties around how the upper catchment may discharge to the rivers. How the outfalls are managed may depend on the flow regime or levels needing to be achieved in the upstream waterbodies. Given that the new watercourses create entirely new conditions and flow regimes, this may not yet be known. If structures are required to regulate flows at the confluences, it should be considered that they will need to be passable to fish and eels and may require impoundment licenses.	The ES will include relevant details about the design of the diverted watercourses. The ES will also include relevant details about the design of any structures required to regulate flows, taking into consideration that these structures will need to be passable to fish and eels and may require impoundment licenses.
Environment Agency	Downstream Conveyance. Paragraph 2.4.6 discusses how SESRO is designed to convey raw water to and from the River Thames and to allow abstraction of water from the River Thames further downstream, however there doesn't appear to be any discussion of the practicality of conveyance downstream for onward abstraction. Consideration is needed of the operating ranges of the river sections, and the assumptions about gate movements to ensure that water is not 'held up' in river sections before reaching Datchet and Affinity's abstractions.	The higher flows in the river resulting from the discharges from the reservoir should not result in water being 'held up' as the levels will be managed operationally by the navigation infrastructure. Close consultation is being undertaken with the navigation authority. An operating procedure for the River Thames will be outlined as part of the DCO submission.
Environment Agency	It should be made clear what the impacts are in terms of water levels (primarily head levels) in the reaches between Abingdon and Windsor. There does not appear to be any consideration of impacts on Windsor Park gauging station. This is the 'receiving' gauging station for the augmentation water and the 'control' for the Jubilee	The impact on water levels and flows in the River Thames, including at Windsor Park and Kingston, has been assessed in the PEI Report (Appendix 5.4: Preliminary assessment of

Stakeholder	Scoping comment	Applicant response
	River and the monitoring location for Lower Thames abstractions, so is of key importance. There also does not appear to be any consideration of the impacts on Kingston flows in relation to the Teddington Target Flow which is key.	effects for Water environment).

Non-statutory public consultation

5.3.4 Non-statutory public consultation on the emerging proposals for the Project was undertaken with stakeholders and local communities in Summer 2024. Formal responses to this non-statutory consultation feedback have been provided within the 'Statement of Response' (Thames Water, 2025). Any feedback relevant to the Water environment assessment has been taken into account where appropriate.

Ongoing engagement

5.3.5 This section summarises the ongoing technical engagement for the water environment with key stakeholders since EIA scoping. This includes meetings, written correspondence and a Technical Liaison Group (TLG) attended by:

- Environment Agency (Member of: Flood Risk TLG, Surface Water and Aquatic Ecology TLG, Water Resources and Water Quality Modelling TLG and Geology and Hydrogeology TLG)
- Natural England (Member of: Surface Water and Aquatic Ecology TLG and Water Resources and Water Quality Modelling TLG)
- Oxfordshire County Council (Member of: Flood Risk TLG and Geology and Hydrogeology TLG)
- South Oxfordshire District Council (Member of: Geology and Hydrogeology TLG)
- Vale of White Horse District Council (Member of: Flood Risk TLG and Geology and Hydrogeology TLG)

5.3.6 Table 5.3 provides a summary of the ongoing technical engagement for the water environment, including the issues raised and outcomes for the assessment.

Table 5.3 Key ongoing engagement for water environment

Stakeholder	Topics	Outcome
Environment Agency/Oxfordshire County Council/Vale of White Horse District Council - Flood Risk TLG	Key topics discussed include: • Abingdon flood alleviation scheme • Reservoir safety including operation and emergency drawdown • Intake/outfall structure on the River Thames • Groundwater flooding	• Identification of future topics for TLG sessions • Working towards agreement on vulnerability classifications of key land uses (subject to clarifications) • Agreement in principle on the scope of the climate change assessment

Stakeholder	Topics	Outcome
	• Receptors and their value • Climate change allowances	
Environment Agency - Water Resources and Water Quality Modelling TLG	Key topics discussed include: • Scoping Opinion comments from the Planning Inspectorate, the Environment Agency, Vale of White Horse District Council, Wilts and Berks Canal Trust, Abingdon Town Council, Oxfordshire County Council • Water quality monitoring strategy • Modelling framework and development • Diversion and realignments of channels • Creation of new WFD waterbodies • Reservoir management • Conceptual water balance model • Drinking water quality risk assessment	• Identification of future topics for TLG sessions • Feedback provided on scope of water quality monitoring strategy • Confirmation of models to be reviewed by EA
Environment Agency/Oxfordshire County Council/Vale of White Horse District Council/ Natural England - Geology and Hydrogeology TLG	Key topics discussed include: • Scoping Opinion comments • Ground investigations and surveys • Groundwater modelling • HIA • Water management	• Identification of future topics for TLG sessions • Additional details requested on scope of the groundwater monitoring programme
Environment Agency and Natural England - Surface Water and Aquatic Ecology TLG	Key topics discussed include: • Scoping Opinion comments • Receptors • Watercourse biodiversity net gain approach • Proposed approach to surface water and aquatic ecological surveys and monitoring • Diversion and realignments of channels • Requirements for newly created WFD water bodies • Criteria for assessment of significance	• Identification of future topics for TLG sessions • Agreement on the scope of the geomorphology and Modular River (MoRPh) surveys. • Feeback provided on the scope of the hydrometric monitoring strategy

5.4 Assessment methodology

5.4.1 This section outlines the methodology followed to assess the likely significant effects of the Project in relation to the water environment including:

- Effects scoped into the assessment
- Study area
- Criteria for determining likely significant effects
- Assessment of cumulative effects

5.4.2 The project-wide approach to the assessment methodology is set out in Chapter 4: Approach to the environmental assessment. This has informed the approach used in this Water environment assessment. Any further data collection or site surveys, studies, modelling, or additional assessments that are still to be undertaken to inform the ES are set out in Section 5.11: Next steps.

5.4.3 The assessment methodology followed for the water environment considers the effect of the Project on hydrology, fluvial geomorphology, surface water quality, hydrogeology and flood risk. The assessment within the PEI Report and ES follows guidance, as set out in Section 5.2: Legislation, policy and guidance. Key guidance relating to the assessment methodology includes the Design Manual for Roads and Bridges (DMRB) LA 104 Environmental assessment and monitoring (DMRB LA 104) (National Highways , 2020a), DMRB LA 113 Road drainage and the water environment (DMRB LA 113) (National Highways , 2020b).

Scope of the assessment

5.4.4 The scope of the assessment has been informed by the EIA Scoping process, including the EIA Scoping Report (Thames Water, 2024a) and Scoping Opinion (The Planning Inspectorate, 2024), combined with subsequent changes to the current Project design and an enhanced understanding of the baseline environment.

5.4.5 The construction and operation of SESRO has the potential to result in changes to flood risk, hydrology, fluvial geomorphology, surface water quality and hydrogeology.

5.4.6 Matters that have been scoped out of the Water environment assessment are documented in Appendix 4.1: Matters scoped out of the EIA, along with justification of this scoping approach. In summary, matters scoped out are construction and operational effects of coastal and tidal flooding.

5.4.7 Effects that are scoped in for the Water environment assessment relevant to the construction phase are:

- Hydrology
  - Dewatering activities could result in temporary changes to flows within the associated watercourses
  - Watercourse diversions and local catchment impingement due to presence of the reservoir will result in different flow routing within the Ock catchment
  - Watercourse crossings could affect watercourse continuity and flow
  - Temporary changes in ground levels could result in changes to surface water levels and flow

  - Effects of construction activity on water quantity in groundwater bodies could result in changes to surface water levels and flow
  - Changes to land drainage (such as loss and/or modification of ditches)
  - Potential impacts from erosion and accretion of sediment
- Fluvial geomorphology
  - To accommodate the reservoir and associated infrastructure, rivers and ditches would be diverted and some ponds would be lost
  - Watercourses would need to be crossed, which could affect continuity and flow, as well as lead to scour
  - Effect of temporary working at the River Thames intake/outfall could result in a change of riparian, bank and marginal features
  - Potential impacts from erosion and accretion of sediment
- Surface water quality
  - Contaminants could be released into the watercourses (rivers, ditches, ponds) within the Ock catchment and the River Thames
  - Potential for the release of suspended solids from disturbed soils, clay and material stockpiles as well as temporary and/or permanent watercourse crossings
  - Temporary changes in physico-chemical processes could occur until the biological and geomorphological processes associated with the watercourse diversions are established. This could result in temporary changes in water quality in the associated watercourse (downstream)
- Hydrogeology
  - Contaminants (such as fuels, oils and drilling fluids) could be released into groundwater, either through losses to ground (e.g. spillages) or through tunnelling activities
  - Contamination is possible through disturbance of existing ground contamination, (e.g. agricultural contaminants and landfills which occupy areas at the eastern end of the intake/outfall pipeline route)
  - Effects of construction activity on water levels and quantity in designated aquifers (both superficial deposits and bedrock)
- Flood risk
  - Any construction activities undertaken within flood zones could, in the absence of mitigation, exacerbate flood risk
  - Changes to surface water flow paths or ground permeability that could change the rate or volume of surface water generated
  - Excavations or intrusive works that could change groundwater levels, leading to an increased risk of groundwater flooding
  - Potential impacts from erosion and accretion of sediment

5.4.8 Effects that are scoped in for the Water environment assessment relevant to the operation phase are:

- Hydrology

  - Changes in flow regime of the River Ock and its tributaries and the River Thames resulting from the proposed abstraction and discharge regime
  - Augmentation in the River Thames may change the abstraction regime of other licensed abstractions
  - Changes in flow related to abstraction or augmentation could affect the existing river level management protocol for the River Thames
  - Effects on the flow regimes of other relevant water bodies within the Ock catchment due to changes to flow routes
- Fluvial geomorphology
  - Effects on hydromorphology of the River Ock and its tributaries
  - Potential for a localised impact on the hydromorphology of the River Thames
- Surface water quality
  - Potential changes in the water quality of the River Ock and its tributaries and the River Thames
  - Potential impacts on the water quality of water bodies created as part of the Project
- Hydrogeology
  - Effects on watercourse baseflows and other hydraulically connected receptors (e.g. springs and potential non-designated GWDTEs)
  - Effects on water quality and quantity in designated aquifers (both superficial deposits and bedrock)
- Flood risk
  - Changes in configuration of floodplain
  - Changes to watercourse alignment
  - Changes to catchment water balance
  - Changes to surface water flow paths or ground permeability that could change the rate or volume of surface water generated
  - Changes to groundwater flood risk

5.4.9 Table 5.4 summarises the aspects and matters that are scoped in to the EIA.

Table 5.4 Scoping summary

Feature	Scoped in/out	
	Construction	Operation
Hydrology	IN	IN
Fluvial geomorphology	IN	IN
Surface water quality	IN	IN
Hydrogeology	IN	IN
Flood risk	IN	IN

5.4.10 Any effects on the water environment from contaminated land are considered within Chapter 10: Geology and soils. In addition, any effects to habitats within the water

environment, such as watercourses and ponds, are assessed within Chapter 6: Aquatic ecology. Vulnerability from future flooding is assessed in Chapter 18: Climate resilience and effects associated with emergency drawdown, water supply and embankment breach are discussed in Chapter 19: Major accidents and disasters.

Study area

5.4.11 The study areas for surface water, groundwater and flood risk are identified using the 'source-pathway-receptor' model and are selected based on the potential pathways and impact on the water environment associated with the Project. The pathway is the hydraulic connection between the water source that has the potential to be changed and receptors up or down gradient. The likely zones of influence associated with changes in the water environment have been identified based on professional judgement. Three separate study areas have been identified for surface water, groundwater and flood risk based on the likely zone of influence. The study areas are described in Section 5.5: Study area.

Surface water

5.4.12 The study area for surface water includes all surface water bodies within the indicative location for the Project, as well as those in hydraulic connection where flows may change due to the presence of the reservoir, abstraction or discharges.

Groundwater

5.4.13 The study area for groundwater includes all groundwater bodies within the indicative location for the Project as well as those in hydraulic connection where flows may change due to the presence of the reservoir, abstraction or discharges.

Flood risk

5.4.14 The study area for flood risk, for the construction phase and operation phase, is based on a conservative assessment of the location where flood risk has potential to be impacted. The hydraulic modelling being undertaken will confirm the study area for assessing flood risk impacts, i.e. areas where a significant change in flood risk is predicted. At this stage it is assumed that this geographical extent will cover any impacts related to surface water and groundwater flood risk. The groundwater extent of the flood risk study area has been informed by the preliminary HIA.

5.4.15 The study area will be reviewed and, as appropriate, refined between the PEI Report stage and the ES stage, as the assessment progresses. This process will take into account any activities which have the potential to affect flood risk from any source at greater distance (such as dewatering and discharges). The final study area will ensure that all receptors that are potentially in hydraulic connectivity with the Project that could be reasonably impacted are included (such as downstream receptors).

Methodology

Baseline

Data collection

5.4.16 Baseline data collection has been undertaken to obtain information over the study areas. This section provides the approach to collecting baseline data.

Hydrology

5.4.17 The following data sources have been accessed to inform the baseline with respect to hydrology:

- Hydrology Data Explorer, River Thames at Sutton Courtenay (Environment Agency, 2024b) (Accessed: August 2024)
- National River Flow Archive (NRFA) data:
  - 39046 - River Thames at Sutton Courtenay gauge daily flows (1974-present) (Accessed: August 2024) (NRFA, 2024a)
  - 39018 – Ock at Abingdon gauge daily flows (1962-1979) (Accessed: August 2024) (NRFA, 2024b)
  - 39081 – Ock at Abingdon gauge daily flows (1979-present) (Accessed: August 2024) (NRFA, 2024c)
  - 39061 – Letcombe Brook at Letcombe Bassett (1971-present) (Accessed: August 2024) (NRFA, 2024d)
  - 39112 – Letcombe Brook at Arabellas Lake (1992-present) (Accessed: August 2024) (NRFA, 2024e)
  - 39113 – Manor Farm Brook at Letcombe Regis (1992-2023) (Accessed: August 2024) (NRFA, 2024f)
- Historic spot flow data collected by the EA and its predecessors at secondary gauging sites within the Ock Catchment covering spot gauging at some locations as far back as 1950. Some locations only contain a single spot gauge.
- Thames Water Python Water Resource Model (PyWR) Reporting (Received: July 2025)
- Infoworks ICM (Integrated Catchment Modelling) flow velocity and level data for the main channel of the River Thames and the Ock catchment (Accessed: November 2024)
- Ordnance Survey historic maps available via the National Library of Scotland (OS, 2025) (Accessed: February 2025)
- Google Earth imagery (Google, 2025) (Accessed: February 2025)
- LiDAR data (Environment Agency, 2023b) (Accessed: February 2025)
- Environment Agency Catchment Data Explorer (Environment Agency, 2025b) (Accessed: February 2025)
- Environment Agency Request for Information on Licensed Abstractions and Consented Discharges within hydrogeological study area (Received: May 2025)

Fluvial geomorphology

5.4.18 The following data sources have been accessed to inform the baseline with respect to fluvial geomorphology:

- Ordnance Survey historic maps available via the National Library of Scotland (OS, 2025) (Accessed: February 2025)
- Google Earth imagery (Google, 2025) (Accessed: February 2025)
- LiDAR data (Environment Agency, 2023b) (Accessed: February 2025)
- Environment Agency Catchment Data Explorer (Environment Agency, 2025b) (Accessed: February 2025)

Surface water quality

5.4.19 The following data sources have been accessed to inform the baseline with respect to surface water quality:

- Environment Agency WFD Ecological status for the 2015, 2019 and 2022 cycles (Environment Agency, 2025b) (Accessed: February 2025)
- Observed water quality data from the Environment Agency Water Quality Archive (referred to as WIMS) for the period 2013 to 2020 (Defra, 2025b) (Accessed: February 2025)
- Observed water quality data from Thames Water (i.e., at their intakes) for the period 2015 to 2023 (Accessed: February 2025)
- Baseline model outputs from the main channel of the River Thames and also the Ock catchment simulated in a water quality model run using the model software Infoworks ICM (Integrated Catchment Modelling) (Accessed: November 2024)
- Reservoir water quality treatment requirements from Thames Water process engineering teams (Accessed: April 2025)
- SESROs Intermediate Reservoir Model and reporting for water quality in the reservoir during operational periods (Received: March 2025)
- Computational Fluid Dynamics (CFD) reservoir modelling reporting (run by Tuan Ta Limited) (Received: December 2024)
- Centre for Ecology & Hydrology (Unknown) Protech modelling reporting for algal levels in the reservoir (Received: November 2024)

Hydrogeology

5.4.20 The following data sources have been accessed to inform the baseline with respect to hydrogeology:

- Environment Agency (2025b) Catchment Data Explorer (Accessed: February 2025)
- Environment Agency (2025g) Hydrology Data Explorer (Accessed: February 2025)
- British Geological Survey (BGS) (2025a) GeoIndex Onshore: 1:50,000 geology (Accessed: February 2025)
- Groundwater model of the Corallian aquifer, created in 2003 and updated in 2008 by Environmental Simulations Incorporated (ESI) (ESI Ltd., 2008) (Received: March 2025)
- Multi-Agency Geographic Information for the Countryside (MAGIC Map) (Defra, 2025a) (Accessed: February 2025)
- Groundwater Dependent Terrestrial Ecosystems (Environment Agency, 2024a) (Accessed: February 2025)

- Environment Agency Request for Information on Licensed Abstractions and Consented Discharges within hydrogeological study area (Received: May 2025)

Flood risk

5.4.21 The following data sources have been accessed to inform the baseline with respect to flood risk:

- Hydraulic model of the River Ock, Mott MacDonald (2024). The River Ock model is a modified version of the Environment Agency's River Ock model (2020) (Received: October 2024)
- Hydraulic model of the River Thames, Mott MacDonald (2024). The River Thames model is a modified version of the Environment Agency's River Thames model (2022) (Received: September 2024)
- Flood Map for Planning (Environment Agency, 2025e) (Accessed: February 2025)
- Check long-term flood risk service. Outlines risk posed by surface water and reservoirs. (Environment Agency, 2025c) (Accessed: February 2025)
- South Oxfordshire and Vale of White Horse District Council SFRA (2024b and 2024c) (Accessed: February 2025)
- Oxfordshire County Council Preliminary Flood Risk Assessment (2011) (Accessed: February 2025)
- Oxfordshire County Council Local Flood Risk Management Strategy (2025) (Accessed: February 2025)
- BGS (2025b) Susceptibility to Groundwater Flooding dataset (Accessed: August 2025)
- Records of local flood history from EA/LLFA/LA (Accessed: February 2025)
- Surface Water Management Plans from LLFA/LA (Accessed: February 2025)
- National Flood Risk Assessment 2 (NaFRA2) as shown on the long-term flood risk service (Environment Agency, 2025c) (Accessed: February 2025)

5.4.22 The following desk studies have been undertaken to support this PEI Report chapter:

- WFD Scoping Report (See Appendix 5.1: WFD screening and scoping report)
- Preliminary Hydrogeological Assessment (See Appendix 5.2: Preliminary HIA)

5.4.23 In addition to these data sources, the Water environment assessment also draws on environmental baseline data collated for other aspects, specifically, baseline data presented in Chapter 6: Aquatic ecology, Chapter 10: Geology and soils and Chapter 18: Climate resilience.

Site surveys

Hydrology

5.4.24 The baseline surveys undertaken for hydrology include:

- Hydrology baseline flow and water level surveys within the Ock catchment commenced in May 2024 and are ongoing.
- Targeted flow and water level surveys to quantitatively assess the extent to which the Project may affect the flow regime in the River Thames at sensitive reaches, completed in 2022/2023.
- Ditch water level monitoring within the Ock catchment.

Fluvial geomorphology

5.4.25 The baseline surveys undertaken for fluvial geomorphology include:

- Fluvial geomorphology surveys, including walkover surveys undertaken in November 2021 and June 2023 and further surveys in June 2024, are ongoing to support the ES.

Surface water quality

5.4.26 The baseline surveys undertaken for surface water quality include:

- Water quality data collection along the River Thames reaches on a monthly basis by Thames Water commenced in December 2021 and is ongoing.
- Water quality monitoring within the Ock catchment commenced in June 2024 and is ongoing.

Hydrogeology

5.4.27 The baseline surveys undertaken for hydrogeology commenced in May 2024 and are ongoing. These include:

- Phase 1 preliminary Ground Investigation (GI) spot groundwater levels
- GI surveys within the Ock catchment
- Continuous groundwater/surface water interaction monitoring via in-situ piezometers
- GI programme, to support hydrogeological site characterisation and provide continuous groundwater level monitoring data, designed largely to support groundwater modelling activities
- Groundwater sampling for water quality analysis

Flood risk

5.4.28 The baseline surveys undertaken for flood risk include:

- A topographic survey of relevant hydrological features commenced prior to 2007 and is ongoing

Future baseline

5.4.29 The assessment has considered the likely evolution of the baseline without the implementation of the Project. The future baseline for the Water environment assessment includes the following:

- Any relevant other developments expected to be operational prior to or during the construction and operation of the Project
- Any changes in agricultural practices or land use changes
- Climate change projections for precipitation, flow in watercourses and aquifer recharge within the study areas
- Updates to relevant policy changes such as those within RBMP, WRMP, Flood Management Plan, abstraction licensing strategy and the Water Industry National Environment Programme (WINEP)
- Management of the River Thames

5.4.30 The following data sources have been accessed to inform the future baseline with respect to the water environment in addition to baseline data sources listed in paragraphs 5.6.81 to 5.6.90:

- Refer to Chapter 20: Cumulative effects for the methodology used to prepare the list of other developments relevant to the future baseline
- Refer to Chapter 10: Geology and soils, Chapter 5: Aquatic ecology and Chapter 18: Climate resilience
- UK Climate Projections 2018 (UKCP18)

Criteria for the assessment of significance

5.4.31 The methodology for assessing effects is based on the principle that the environmental effects of the Project, in relation to a receptor, should be determined by identifying the receptor's sensitivity, assessing the magnitude of impact the Project would have on the receptor and then combining these two elements to identify the significance of effect (using professional judgement where necessary).

5.4.32 Due to the assessment assumptions and limitations set out under paragraph 5.8.1, it has not been possible to confidently assign the magnitude of impacts and therefore categorise the significance of each effect for this preliminary assessment of effects on the water environment. Instead, the sensitivity of receptor and professional judgement have been used to determine whether effects are likely to be significant or not, and where appropriate adopting a precautionary determination that effects are likely to be significant, where design, construction or baseline information that informs the assessment is still being developed.

Assessment of sensitivity

5.4.33 The sensitivity of each identified receptor has been assigned for the preliminary assessment based on criteria set out in Table 5.5 for water quality, hydrology, fluvial geomorphology, flood risk and groundwater. These criteria have been developed based on the DMRB guidance referenced in paragraph 5.4.3.

5.4.34 Following a precautionary approach, where multiple criteria are assigned for a given sensitivity, the criteria that has the potential to produce the highest sensitivity outcome has been selected for the given receptor in the assessment for this chapter.

Table 5.5 Criteria for establishing the sensitivity of receptors

Sensitivity of receptor	Typical descriptors	Water Quality	Hydrology/ Fluvial geomorphology/ WFD	Flood Risk	Hydrogeology
Very high	Very high importance and rarity, international scale and very limited potential for substitution	• WFD water body with 'High' status for water quality related classification elements (e.g. Physico-chemical quality elements) • Water quality supports habitats protected / designated under EU habitat legislation (e.g. Special Area of Conservation (SAC), Special Protection Area (SPA)) • Watercourse is already used for public potable water supply	**Hydrology** • Hydrology supports habitats protected / designated under EU habitat legislation **Fluvial geomorphology** • Conforms most closely to a natural, unaltered state and will often exhibit signs of free meandering and possess well-developed bedforms (point bars and pool-riffle sequences) and abundant bank side vegetation: Morph Survey Conservation Status score of 8-10 (High) **WFD** • Hydromorphological designation 'not designated artificial or heavily modified' • Hydromorphological and/or Hydrological Supporting Elements of WFD status 'High'	• Areas of essential infrastructure or highly vulnerable development. These can include essential transport and utility infrastructure, emergency services and basement dwellings	• Principal aquifer providing a regionally important resource and/or supporting a site protected under European Commission (EC) and UK legislation for ecology and nature conservation • Public water supply - Groundwater Source Protection Zone (SPZ1) • Water feeding GWDTEs with a high or moderate groundwater dependence with a high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs
High	High importance and rarity, national scale and limited potential for substitution	• WFD water body with 'Good' status for water quality related classification elements (e.g. Physico-chemical quality elements) • Water quality supports habitats protected / designated under UK habitat legislation (e.g. SSSI, Local Nature Reserve (LNR) • Water body is already used for non-potable water supply	**Hydrology** • Hydrology supports habitats protected / designated under UK habitat legislation **Fluvial geomorphology** • Shows signs of previous alteration but still retains many natural features or may be recovering towards conditions indicative of the higher category: Morph Survey Conservation Status score of 5-7 (Moderate) **WFD** • Hydromorphological designation can either be 'not designated artificial or heavily modified' or 'heavily modified' • Hydromorphological and/or Hydrological Supporting Elements of WFD status 'Supports Good'	• Areas of more vulnerable development. These can include hospitals, residential units, educational facilities and waste management sites	• Secondary A aquifers and other secondary aquifers providing a locally important resource or supporting a river ecosystem • Public water supply - Groundwater Source Protection Zone (SPZ2) • Private abstractions for potable use • Water feeding GWDTEs of low groundwater dependence with a high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs; or water feeding highly or moderately GWDTE with a national non-statutory UK Biodiversity Action Plan (BAP) priority
Moderate	Medium or high importance and rarity, regional scale, limited potential for substitution	• WFD water body with 'Moderate' status for water quality related classification elements (e.g. Physicochemical quality elements)	**Hydrology** • Hydrology supports habitats with regional interest **Fluvial geomorphology** • Substantially modified by previous engineering works and likely to possess an artificial cross section (e.g. trapezoidal) and will probably be deficient in bedforms and bankside vegetation: Morph Survey Conservation Status score of 2-4 (Low) **WFD**	• Areas of less vulnerable **development.** These can include retail, commercial and general industrial units, agricultural / forestry sites and water / sewage treatment plants	• Aquifer providing water for agricultural or industrial use with limited connection to surface water • Public water supply - Groundwater Source Protection Zone (SPZ3) • Industrial agricultural abstractions • Water feeding GWDTEs of low groundwater dependence with a national non-statutory UK BAP priority; or water feeding highly or moderately GWDTE sites with no conservation designation

Sensitivity of receptor	Typical descriptors	Water Quality	Hydrology/ Fluvial geomorphology/ WFD	Flood Risk	Hydrogeology
			• WFD hydromorphological designation 'heavily modified' • Hydromorphological and/or Hydrological Supporting Elements of WFD status 'Supports Good'		
Low	Low or medium importance and rarity, local scale	• WFD water body with Poor status for water quality related classification elements (e.g. Physico-chemical quality elements)	**Hydrology** • Hydrology supports habitats with local interest **Fluvial geomorphology** • Channelised (reaches whose bed and banks are mostly covered by hard protection (e.g. concrete walls or sheet piling): Morph Survey Conservation Status score of 1 • Culverted (i.e. totally enclosed by hard protection): Conservation Status score of 1 **WFD** • WFD hydromorphological designation 'heavily modified' or 'artificial' • Hydromorphological and/or Hydrological Supporting Elements of WFD status 'Does Not Support Good'	• Water compatible development	• Unproductive strata • Water feeding GWDTEs of low groundwater dependence with no designation or groundwater that supports a wetland not classified as a GWDTE, although may receive some minor contribution from groundwater
Negligible	Very low importance and rarity, local scale	• Non-WFD water body or WFD water body with Bad status for water quality related classification elements (e.g. Physico-chemical quality elements)	**Hydrology** • Hydrological regime means that the stream is dry for most of the year. **Fluvial geomorphology** Reach entirely covered by hard protection; and/or completely culverted.	• No flood risk receptors	• No groundwater present

Source: Based on Table 3.70, DMRB LA 113 (National Highways, 2020b) and fluvial geomorphology from 'Guidebook of applied geomorphology' (Sear et al., 2009).

Magnitude of impact

5.4.35 As noted in paragraph 5.4.32, the preliminary assessment of effects for this aspect has not categorised the magnitude of impacts caused by the Project.

5.4.36 For the assessment that is reported in the ES, the criteria for assessing magnitude of impact in Table 5.6 will be applied. The criteria have been developed based on the DMRB guidance referenced in paragraph 5.4.3. NPPF notes that there should be no increase in flood risk to third parties because of new development. As such, the magnitude of any off-site increase in flood risk will be assessed on a case-by-case basis in the ES in consultation with relevant stakeholders.

5.4.37 Whilst not relied upon for the preliminary assessment, in forming a professional judgement of whether an effect will be significant or not, an indicative consideration of the criteria in Table 5.6 has been made at this stage, although the magnitude of impact is not reported.

Table 5.6 Criteria for assessing the magnitude of impact

Magnitude of impact	Description and nature of change	Examples
Major	Results in loss / improvement of attribute and/or quality and integrity of the attribute	**Adverse** • Loss of, or extensive change to, an aquifer / groundwater supported habitats • Potential high risk of pollution to groundwater • Negative change to the environmental status / classification of a water feature, including water quality classification • Permanent / irreversible damage to physical environment; and the extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource • Changes to site resulting in an increase in augmentation / runoff of >75% with flood/sewerage exceedance potential • Increase in peak flood level (1% annual exceedance probability (AEP) event) > 100mm • Loss of (existing) flood storage areas • Extensive change to the hydrological regimes of rivers and catchments • Extensive change to the geomorphological form and functioning of rivers and catchments **Beneficial** • Augmentation could reduce / dilute existing pollutants • Recharge of an aquifer • Permanent addition of, improvement to, or restoration of physical environment; and the extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource • Positive change to the environmental status / classification of a water feature, including water quality classification

Magnitude of impact	Description and nature of change	Examples
		• Changes to site resulting in a decrease in augmentation / runoff of >75% • Extensive improvements to the hydrological regimes of rivers and catchments • Reduction in peak flood level (1% AEP event) >100 mm
Moderate	Affects integrity of attribute, or loss / improvement of part of attribute	**Adverse** • Partial loss or change to an aquifer / groundwater supported habitats • Potential medium risk of pollution to groundwater • Permanent /irreversible damage to physical environment; and the extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource • Pollution of a receiving water body, but insufficient to change the environmental status / classification, including water quality classification • Changes to site resulting in an increase in augmentation / runoff of >50% with flood / sewerage exceedance potential • Increase in peak flood level (1% AEP event) >50 millimetre (mm) • Moderate changes to the hydrological regime and associated catchments • Moderate changes to the geomorphological form and functioning of rivers and associated catchments **Beneficial** • Reduced pollution of a receiving water body, but insufficient to change the environmental status / classification, including water quality classification • Permanent addition of, improvement to, or restoration of physical environment; and the extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource • Changes to site resulting in a decrease in augmentation / runoff >50% • Reduction in peak flood level (1% AEP event) >50 mm • Moderate improvements to the hydrological regime and associated catchments
Minor	Results in some measurable change in attributes, quality or vulnerability	**Adverse** • Minor change to an aquifer/groundwater supported habitats • Potential low risk of some pollution to a surface water or groundwater body, but insufficient to cause loss in quality, fishery productivity or biodiversity

Magnitude of impact	Description and nature of change	Examples
		• Permanent/irreversible damage to physical environment; and the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource • Changes to site resulting in an increase in augmentation/runoff of >25% with flood / sewerage exceedance potential • Increase in peak flood level (1% annual probability event) >10 mm • Minor changes to the hydrological regime and associated catchments • Minor changes to the geomorphological form and functioning of rivers and associated catchments **Beneficial** • Reduction in peak flood level (1% AEP event) < >10 mm • Permanent addition of, improvement to, or restoration of physical environment; and the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource • Potential reduction in existing pollution risk to groundwater • Minor changes to the hydrological regime and associated catchments
Negligible	Affects attribute, but of insufficient magnitude to affect the use or integrity	**Adverse** • No measurable affect on the integrity of the water environment • Temporary / reversible damage to physical environment; and the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource • No measurable impact upon an aquifer and very low risk of pollution to groundwater • Negligible change in peak flood level (1% annual probability event) that is unlikely to be measurable or that is within the limits of uncertainty • Negligible change to the hydrological regime and associated catchments • Negligible changes to the geomorphological form and functioning of rivers and associated catchments **Beneficial** • The Project may beneficially affect the integrity of the water environment, but this is not considered measurable • No measurable impact upon an aquifer • Temporary addition of, improvement to, or restoration of physical environment; and the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource

Magnitude of impact	Description and nature of change	Examples
No change	Results in no change to the receptor	• No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Source: Based on DMRB LA113 Table 3.71 (National Highways, 2020b).

Significance of effect

5.4.38 As noted in paragraph 5.4.32, the preliminary assessment for this aspect has not categorised the significance of each effect (i.e. whether it is major, moderate, minor, neutral or none). Instead, the sensitivity of the receptor and professional judgement and experience (with consideration given to the criteria set out in Table 5.6) has been used to determine if each likely effect is anticipated to be 'significant' or not 'significant'.

5.4.39 For the assessment that is reported in the ES, categories of significance will be applied to effects, based on the combination of magnitude of impact and sensitivity of receptor as shown in Table 5.7. Effects that are moderate or major are deemed to be significant. The resultant effects may be either adverse, beneficial or neutral, depending on the nature of the impact. Note that Table 5.7 is based on DMRB guidance and has been adapted to align with the overarching significance categories applied across the SESRO EIA noted in Chapter 4: Approach to the environmental assessment.

5.4.40 Whilst not relied upon for the preliminary assessment, in forming a professional judgement of whether an effect will be significant or not, an indicative consideration of the significance matrix in Table 5.7 has been made in determining if likely effects are anticipated to be 'significant' or not 'significant'.

Table 5.7 Significance matrix

Receptor sensitivity	Magnitude of impact				
	No change	Negligible	Minor	Moderate	Major
Negligible	None	Neutral	Neutral	Minor	Minor
Low	None	Neutral	Minor	Minor	Moderate (significant)
Moderate	None	Minor	Minor	Moderate (significant)	Moderate (significant)
High	None	Minor	Moderate (significant)	Moderate (significant)	Major (significant)
Very High	None	Minor	Moderate (significant)	Major (significant)	Major (significant)

Source: Adapted from DMRB, Table 3.8.1, LA104 (National Highways, 2020a).

5.4.41 For this preliminary assessment, the assessment of effects has assumed that 'embedded design mitigation' and 'standard good practice mitigation' relevant to the Water environment assessment are in place (these measures are presented in Section 5.9: Embedded design mitigation and standard good practice). Nevertheless, as noted in Section 5.10: Preliminary assessment of likely significant effects, the preliminary

assessment assumes that additional mitigation that may reduce any identified likely significant adverse effects is not applied, as the viability, nature, and extent of these are not confirmed at this stage in the EIA process. As a result, consideration of residual effects (those that remain after the implementation of all mitigation, including additional mitigation) has not been completed for this preliminary assessment; this will be undertaken in the ES. Additional mitigation that is being explored is presented in Section 5.11: Next steps.

Assessment of cumulative effects

5.4.42 The cumulative effects assessment approach for both inter- and intra-project cumulative effects is broadly set out in Chapter 20: Cumulative effects. However, for this aspect further detail on the assessment process for inter-project cumulative effects is set out below.

5.4.43 To consider the likely cumulative significant effects related to the water environment, an amended area was searched to take into account the different scales and types of interactions expected. The search has been tailored for the Water environment aspects to focus only on other developments that are likely to impact the water environment. The search criteria used includes:

- Infrastructure projects of national significance within the Water Environment ZOI
- Water Resources Management Plans within the Water Environment ZOI
- Canals and River Trust projects and plans within the Water Environment ZOI
- Developments identified through Flood Risk Management Plans (Environmental Agency, 2022c), RBMPs (Environment Agency, 2022d), Drought Plans (Thames Water, 2022) and Drainage and Wastewater Management Plan (Thames Water, 2023a)

5.4.44 The outcomes of the inter-project cumulative effects assessment are reported in Chapter 20: Cumulative effects. The intra-project cumulative effects assessment is summarised within Chapter 20: Cumulative effects, and within Chapter 20 signposts are provided to the location of the intra-project cumulative effects assessment (where it has been possible to provide at this stage)

5.5 Study area

5.5.1 The study areas are defined according to the sensitivity of the receiving environment and the potential effects of the Project. The methodology used to define the study areas for surface water, groundwater and flood risk receptors is outlined in Section 5.4: Assessment methodology.

5.5.2 The study areas have changed since the EIA scoping stage as a result of changes to the design and the associated draft Order limits. See Chapter 2: Project description for details of the Project parameters and assumptions for the PEI Report.

5.5.3 The study areas for the water environment are shown in PEI Report Figures 5.1, 5.5 and 5.10.

Surface water

5.5.4 For surface water, the study area includes the geographical extent of the draft Order limits and all surface water features, including Main Rivers and their tributaries, Ordinary Watercourses, ponds and other surface water features, surface water abstractions, discharges and flood zones, within 1 kilometre (km) of the draft Order limits, or where features have hydraulic connectivity to the Project. The study area has been extended beyond the 1km zone around the draft Order limits to capture potential impacts to the River Thames associated with abstraction and discharges related to the Project. The section of the River Thames to Teddington Weir, which forms the tidal limit, and at which point additional flows released from the Project will have been re-abstracted, has been included to capture potential impacts to surface water receptors downstream of the Project. The surface water study area is shown on Figure 5.1.

5.5.5 For the WFD scoping assessment, the study area is shown on Figure 5.2 and is described in Appendix 5.1: WFD screening and scoping report. This study area is aligned with the Aquatic ecology study area.

Groundwater

5.5.6 For hydrogeology, the study area includes the geographical extent of the draft Order limits and all known groundwater features within 1km of these limits, including underlying aquifers, SPZs, mapped springs, groundwater abstractions and GWDTEs. Additionally, the study area incorporates the previous EIA scoping study area, which is bounded by the River Ock and the edge of the Chalk escarpment to the south, and extends from the Letcombe Brook in the west to Abingdon in the east, with a further 1km zone included to ensure comprehensive coverage of potentially hydraulically connected receptors. The hydrogeological study area is shown on Figure 5.7.

Flood risk

5.5.7 For flood risk, the study area is the same as the 1km surface water study area (excluding the area of the River Thames beyond this downstream to Teddington Weir). The flood risk study area, which is consistent for all sources of flooding, is shown on Figure 5.10.

5.6 Baseline conditions

5.6.1 To assess the significance of effects arising from the Project in relation to the water environment, it is necessary to identify and understand the baseline environment within the study areas. This provides a reference state against which any potential impacts on the water environment can be assessed.

5.6.2 This section outlines the existing and expected future baseline conditions of the water environment in the study areas.

Existing baseline

5.6.3 This assessment has considered the known receptors within the study areas. Key existing baseline features for the water environment are shown in the following PEI Report figures:

- Figure 5.1: Surface Water Features

- Figure 5.2: WFD Surface Waterbodies
- Figure 5.5: Aquifer Designations
- Figure 5.6: WFD Ground Waterbodies
- Figure 5.7: Hydrogeological Study Area and Features
- Figure 5.9: Catchment Abstraction Management Strategy Areas
- Figure 5.10: Existing Risk of Flooding from Rivers and Sea (Fluvial)
- Figure 5.11: Existing Risk of Flooding from Surface Water (Pluvial)
- Figure 5.12: Groundwater Flooding Susceptibility

5.6.4 The main surface water bodies present are the River Thames and the River Ock, with numerous Main Rivers, Ordinary Watercourses, and several lakes and ponds also present. There are several designated and protected sites within the study areas, which are important for environmental or drinking water quality protection. The hydrological conditions are varied due to diverse geology. Extensive areas within the flood risk study area are at risk from pluvial flooding. There are also parts of the flood risk study area with the potential for groundwater flooding, as well as areas at medium and high risk of fluvial flooding.

Designated sites

5.6.5 There are five statutory designated sites that are entirely located within or partly located within the surface water study area, as outlined in Table 5.8 below and shown on Figure 5.1. These sites include those that are hydrologically and not hydrologically connected to the site that are listed as a Protected Area on Catchment Data Explorer. The list of relevant designated sites will be reviewed at the ES stage once further information on the hydrological connectivity and influence of the watercourses on designated sites is available.

Table 5.8 Internationally and nationally designatied sites within the surface water study area

Name	Designation	Distance from draft Order limits	Hydrologically connected and within area influence of the Project
Little Wittenham	SAC, SSSI	6.6km east	Yes. Reach 14 – River Thames is located alongside the designated site[1].
Barrow Farm Fen	SSSI	11.7km north	No – upstream of draft Order limits
Culham Brake	SSSI	0.8km north east	No – upstream of draft Order limits
Frilford Heath, Ponds and Fens	SSSI	0.2km north	No – upstream of draft Order limits
Temple Island Meadows	SSSI	28.7km south east	No – adjacent and immediately upstream of Thames

[1] As set out in Chapter 6: Aquatic ecology, Little Wittenham SAC does not support aquatic habitats and/or features which are located in the area with the greatest hydrological influence from the Project, and so only the SSSI is considered in this PEI-Report. Ongoing modelling will provide more information on the hydrological connectivity between the receptor and designated site and may result in refinements at ES.

Public water supply protections for surface water

5.6.6 The Lower Thames Drinking Water Safeguard Zone (DWSZ) for surface water extends across the majority of the surface water study area (Environment Agency, 2025b). Furthermore, two Drinking Water Protected Areas, where raw water is abstracted from rivers and reservoirs, are located within the surface water study area, corresponding with the Thames (Cookham to Egham) and Thames (Egham to Teddington) catchments (Defra, 2025).

Public water supply protections for groundwater

5.6.7 A small section in the southwestern part of the hydrogeological study area falls within SPZ1. This SPZ is linked to the Wantage supply in the Chalk aquifer, situated approximately 4km southwest of the draft Order limits, as illustrated on Figure 5.7. No additional SPZs are present within the hydrogeological study area. There is one DWSZ for groundwater within the hydrogeological study area which is based on the SPZ. Two further DWSZs are located adjacent to the River Thames in the Thames (Reading to Cookham) and Thames (Cookham to Egham) WFD surface water body catchments (Defra, 2025).

5.6.8 The entirety of the hydrogeological study area lies within a NVZ (Defra, 2025).

Groundwater dependant terrestrial ecosystems

5.6.9 The Environment Agency data shows three designated GWDTEs within the hydrogeological study area:

- Barrow Farm Fen (SSSI)
- Frilford Heath, Ponds & Fens (SSSI)
- Little Wittenham (SSSI) (Environment Agency, 2025f)

5.6.10 GWDTEs are shown on Figure 5.7.

Surface water

5.6.11 The main surface water bodies in the surface water study area are the River Thames and the River Ock. However in total, there are approximately 242km of Main Rivers and 248km of Ordinary Watercourses that feed into the named watercourses within the surface water study area, including the River Thames to Teddington Weir (Environment Agency, 2025h). Main Rivers are displayed on Figure 5.1.

5.6.12 There are also several lakes and ponds within the surface water study area (UK Centre for Ecology & Hydrology, 2025). Further details are provided in Chapter 6: Aquatic ecology.

Surface water WFD water bodies

5.6.13 Three WFD river management catchments are located within the surface water study area; the Gloucestershire and the Vale management catchment which covers the draft Order limits and the Thames and Chilterns South and the Maidenhead and Sunbury management catchments which are located in the downstream Thames reaches.

5.6.14 A total of 17 WFD river water body catchments are present within the surface water study area:

- Ten of the WFD river water bodies are located wholly or partially within the draft Order limits.
- One WFD river water body is located within the surface water study area, but outside of the draft Order limits.
- The catchments of two WFD river water bodies are located within the surface water study area, but the WFD river water bodies themselves are outside of the draft Order limits.
- Four WFD river water bodies (and their water body catchments) are located downstream of the 1km zone around the draft Order limits (Environment Agency, 2025b).

5.6.15 The WFD river waterbodies within the study area and their corresponding reach numbers are outlined in Table 5.9.

Table 5.9 WFD river water bodies within the surface water study area and reach number

WFD river water body	Location	Reach number
Ock (to Cherbury)	Outside of draft Order limits	Reach 1
Ock and tributaries (Land Brook confluence to Thames)	Within draft Order limits	Reach 2
Stutfield Brook (source to Ock)	Outside of draft Order limits	Reach 3
Childrey and Woodhill Brooks	Within draft Order limits	Reach 4
Childrey Brook and Norbrook at Common Barn	Within draft Order limits	Reach 5
Letcombe Brook	Within draft Order limits	Reach 6
Cow Common Brook and Portobello Ditch	Within draft Order limits	Reach 7
Frilford and Marcham Brook	Within draft Order limits	Reach 8
Sandford Brook (source to Ock)	Within draft Order limits	Reach 9
Ginge Brook and Mill Brook	Within draft Order limits	Reach 10
Moor Ditch and Ladygrove Ditch	Within draft Order limits	Reach 11
Mill Brook and Bradfords Brook system, Wallingford	Outside of draft Order limits	Reach 12
Thames (Evenlode to Thame)	Within draft Order limits	Reach 13 (upstream of the intake/outfall) Reach 14 (downstream of the intake/outfall)
Thames Wallingford to Caversham	Outside of draft Order limits	Reach 15
Thames (Reading to Cookham)	Outside of draft Order limits	Reach 16
Thames (Cookham to Egham)	Outside of draft Order limits	Reach 17 Reach 18 Reach 19

WFD river water body	Location	Reach number
		Reach 20
Thames (Egham to Teddington)	Outside of draft Order limits	Reach 21 Reach 22 Reach 23 Reach 24

River Ock catchment

5.6.16 Nine WFD river water bodies are located within the 'River Ock catchment'. These are Reaches 1 to 9. In total, five of the WFD river water bodies have a Moderate ecological status and five have a Poor ecological status. (Environment Agency, 2025b).

River Thames and Oday catchment

5.6.17 Eight WFD river water bodies are located within the 'River Thames and Oday catchment'. These are reaches 10 to 12, which are tributaries of the River Thames, and reaches 13 to 24, which are the River Thames. In total, five of the WFD river water bodies have a Moderate ecological status and three have a Poor ecological status (Environment Agency, 2025b).

5.6.18 The current WFD chemical and ecological status for all surface water bodies is summarised in Table 6 of Appendix 5.1: WFD screening and scoping report.

Fluvial geomorphology

River Ock catchment

5.6.19 While none of the WFD river water bodies within the River Ock catchment are designated as artificial or heavily modified (Environment Agency, 2025b), Many of the smaller watercourses have been artificially modified, historically straightened and over deepened. Some smaller watercourses support little to no flow during the summer months. Many of the watercourses are typical of a lowland system that is managed for agricultural purposes, however there are a few locations where a more natural and varied planform is observed.

5.6.20 Under the WFD 2022 Cycle 3 River Basin Management Plan (RBMP), all WFD river water bodies within the River Ock catchment achieved the 'Supports Good Status' for hydromorphological supporting elements classification (Environment Agency, 2025b).

River Thames and Oday catchment

5.6.21 Four of the WFD river water bodies in the River Thames and Oday catchment are classified as heavily modified (Environment Agency, 2025b). Reaches of the River Thames downstream of the River Thame confluence were not assessed for hydromorphological supporting elements classification due to their Heavily Modified Water Body classification.

Surface water quality

River Ock catchment

5.6.22 RBMP water quality data indicates that the majority of water bodies within the River Ock catchment achieve High status for ammonia, with the exception of Reach 4 and Reach 5 where Good status is achieved.

5.6.23 Eight of the Nine WFD water bodies achieve High or Good status for dissolved oxygen with only Reach 7 achieving a Bad status classification.

5.6.24 Six of the WFD water bodies have Poor status in relation to phosphate. Reach 1, Reach 6 and Reach 9 achieve Moderate, Good and High status, respectively.

5.6.25 All WFD water bodies in the Ock catchment achieve High status in relation to temperature and pH.

5.6.26 All WFD water bodies are identified as having a Fail status in relation to priority hazardous substances. All water bodies are failing for mercury and its compounds and polybrominated diphenyl ethers (PBDE). Additionally, one or more water bodies are failing for perfluorooctane sulphonate (PFOS), benzo(g-h-i)perylene or cypermethrin (Environment Agency, 2025b).

5.6.27 Surface water monitoring data undertaken in the River Ock catchment is provided in Appendix 5.3: Surface water monitoring data.

River Thames and Oday catchment

5.6.28 RBMP water quality data indicates that the majority of water bodies within the River Thames and Oday catchment achieve High status for ammonia and dissolved oxygen, with the exception of Reach 12 and Reaches 21-24 where Good status is achieved for dissolved oxygen.

5.6.29 Six of the eight WFD water bodies have Moderate status in relation to phosphate, with Reach 10 and Reach 11 achieving a lower status of Poor.

5.6.30 All WFD water bodies in the River Thames and Oday catchment achieve High status in relation to pH. Six of the water bodies achieve High status in relation to temperature, with Reach 16 and Reaches 21-24 achieving Moderate status.

5.6.31 All WFD waterbodies are identified as having a Fail status in relation to priority hazardous substances. All water bodies are failing for PBDE. Additionally, one or more water bodies are failing for benzo(b)fluoranthene, benzo(g-h-i)perylene, mercury and its compounds PFOS, tributyltin or cypermethrin (Environment Agency, 2025b).

5.6.32 Surface water monitoring data undertaken in the River Thames catchment is provided in Appendix 5.3: Surface water monitoring data.

Hydrology

River Ock catchment

5.6.33 The Ock flows in a predominantly easterly direction, with multiple tributaries discharging into the watercourse, namely the Stutfield Brook, Childrey Brook, Letcombe Brook, Cow Common Brook, Marcham Brook and Sandford Brook. The Ock discharges into the River

Thames at Abingdon, about 2km downstream of the (39081) - Ock at Abingdon NRFA flow gauging station.

5.6.34 There are no gauging stations in the upper catchment or tributaries of the River Ock within the surface water study area. However, the record of River Ock flows measured at Abingdon provides the most complete record of its baseline hydrological characteristics. Information from the 39081 NRFA gauging station shows the topography of the catchment to be highest to the southwest (~260 metres Above Ordnance Datum (mAOD)), gradually falling towards the confluence with the Thames (~50mAOD). The 39081 gauge shows a QMED[2] of 10.4 cubic metres per second (m^3/s) and a mean flow of 1.58 m^3/s across the period of record (1979 – 2023). The Q95 (low flow value) is 0.34m^3/s (NFRA, 2024d). The hydrology of the catchment is influenced by groundwater abstraction and effluent returns.

5.6.35 The River Ock accounts for approximately 5% to 8% of the flow in the River Thames as measured at the gauge at Sutton Courtenay.

River Thames and Oday catchment

5.6.36 The River Thames rises at Thames Head, Gloucestershire, and flows in a predominantly south-easterly direction, passing the (39046) Thames at Sutton Courtenay NRFA gauge, slightly downstream of Abingdon-on-Thames. Upstream of the 39046 NRFA gauge, several tributaries discharge into the Thames, including Ginge Brook, Moor Ditch, the River Ock, Mill Brook and the Oday ditch. The Thames continues east to discharge into the North Sea near Tilbury.

5.6.37 Information from the 39046 NRFA gauging station shows the topography of the catchment to be highest to the north and west (~320mAOD), gradually sloping southeast towards the gauge (~45mAOD). The 39046 gauge shows a mean flow of 27.98m^3/s across the period of record (1973 – 2023) and a low flow (Q95) value at this location of 2.61m^3/s. The hydrology of the catchment is influenced by groundwater abstraction, and effluent returns, and this gauge is located between the off-take and discharge for Didcot Power Station (NFRA, 2024b).

Abstractions

River Ock catchment

5.6.38 There are two licensed reach abstractions in the River Ock catchment: one for agricultural irrigation purposes and one for irrigation of a golf course. One of these abstractions is partially located within the draft Order limits.

5.6.39 There are 10 licensed point abstractions from surface water in the surface water study area: nine for agricultural irrigation purposes and one for hydroelectricity power generation. None of these abstractions are located within the draft Order limits.

5.6.40 There are no surface water area abstractions within the River Ock catchment (Environment Agency, 2025a).

[2] Median annual maximum flood

River Thames and Oday catchment

5.6.41 There are two licensed reach abstractions in the River Thames and Oday catchment, one for hydroelectric power generation and one for agricultural irrigation purposes. Neither of these are located within the draft Order limits.

5.6.42 There are eight licensed point abstractions from surface water, one of which is for public water supply. Two of the abstractions are used for agriculture irrigation and two for aquaculture. None of these abstractions are located within the draft Order limits.

5.6.43 There are no surface water area abstractions within the River Thames and Oday catchment (Environment Agency, 2025a).

5.6.44 It is noted that there may be potential for further unlicensed abstractions that are not recorded in this dataset. Data on surface water abstractions has only been obtained for part of the River Thames that is located within the surface water study area. Further information for the full extent of the River Thames located within the surface water study area will be obtained and used to inform the ES.

5.6.45 Locations of abstractions are presented on Figure 5.7.

Discharges

River Ock catchment

5.6.46 28 active consented discharges to freshwater rivers have been identified from Environment Agency data within the River Ock catchment, 13 of these discharges are located within the draft Order limits.

5.6.47 Consented discharges are associated with domestic effluent, wastewater treatment works (WwTW), and trade effluent (Environment Agency, 2025d).

River Thames and Oday catchment

5.6.48 20 active consented discharges to freshwater rivers have been identified from Environment Agency data within the River Thames and Oday catchment, three of these discharges are located within the draft Order limits.

5.6.49 Consented discharges are associated with domestic effluent, WwTW, and trade effluent (Environment Agency, 2025d).

5.6.50 Data on surface water discharges has only been obtained for part of the River Thames that is located within the surface water study area. Further information for the full extent of the River Thames located within the surface water study area will be obtained and used to inform the ES.

5.6.51 Locations of discharges are presented on Figure 5.7.

Hydrogeology

5.6.52 The hydrogeology across the hydrogeological study area is varied as a result of the geology in the area. Full details of geological stratigraphy in the hydrogeological study area are presented in Chapter 10: Geology and soils.

Superficial aquifers

5.6.53 Superficial aquifer deposits overlie the bedrock sequence across most of the hydrogeological study area (BGS, 2025a). Their distribution and type are shown on Figure 5.5. They consist mostly of River Terrace Deposits and Alluvium and are highly variable in thickness and lithology.

5.6.54 The permeable and water-bearing alluvium, sand and gravel superficial deposits are designated as Secondary A aquifers while the Head deposits are categorised as Secondary (undifferentiated) aquifers. These can generally be classified as minor aquifers with a shallow near-surface water table that interacts with the numerous streams and drains in the area and support small scale local water supply.

Bedrock aquifers

5.6.55 A table of the geological sequence underlying the hydrogeological study area and the aquifer classification for each identified formation is set out in Appendix 5.2: Preliminary HIA. The locations of these formations are shown on Figure 10.1: Aquifer designations are shown on Figure 5.5.

Groundwater WFD catchments

5.6.56 There are two WFD groundwater bodies within the hydrogeological study area, the Shrivenham Corallian water body and the Vale of White Horse Chalk water body, as shown on Figure 5.6. A further six WFD groundwater bodies are located along the River Thames in areas that could potentially experience changes as a result of the Project (Environment Agency, 2025b).

5.6.57 Further information on the WFD groundwater bodies is provided in Appendix 5.1: WFD screening and scoping report and Appendix 5.2: Preliminary HIA.

Groundwater levels

5.6.58 Groundwater level monitoring has been undertaken as part of the 2024 ground investigation. Groundwater level data is available from May 2024 and monitoring is ongoing with additional monitoring planned. EA long-term monitoring borehole data has also been used to help define groundwater levels (Environment Agency, 2024a).

5.6.59 Groundwater flow in the superficial deposits generally mirrors the topography, flowing from south to north-east, with local flow patterns influenced by numerous surface watercourses. Groundwater levels within the superficial deposits range from 53-66mAOD, and between 0-1.5 metres below ground level (mbgl) with levels generally between 0.2 and 1.1mbgl. These levels suggest that the River Ock and River Thames may be gaining water from groundwater locally, although clay layers in thicker alluvial deposits may limit groundwater – surface water interactions in some areas. Generally, the superficial groundwater levels show a seasonal response, with the lowest groundwater levels in summer (July and August) and groundwater levels rising through October, November, and December. The near-surface water table also indicated that groundwater flooding risk may be an issue in some areas (see section on Groundwater flooding below).

5.6.60 Groundwater level monitoring within the Gault Clay has shown limited groundwater level variation to date. This, combined with the consistent exceedance of the formation top by piezometric heads, indicates that the Gault Clay functions as a confined aquitard with low permeability.

5.6.61 Observed groundwater level variations and piezometric head data suggest that the Kimmeridge Clay generally behaves as a low-permeability, confined aquitard, with localised variability in hydraulic response.

5.6.62 Groundwater level monitoring within the Lower Greensand shows that groundwater levels generally decline through the summer months and begin to recover from October onwards, consistent with seasonal recharge patterns. Following recharge, groundwater may discharge to nearby surface water features as baseflow, contribute to lateral flow within the aquifer, or be retained within the aquifer.

5.6.63 Groundwater levels within the Corallian Group generally show relatively stable long-term groundwater levels with seasonal fluctuations of around 1-3m. The boreholes monitoring the Corallian Group at outcrop show more pronounced seasonal fluctuations, likely due to their responsiveness to seasonal rainfall.

5.6.64 Groundwater levels in the chalk range from approximately 95-145mAOD, and 0-120mbgl. The data from borehole monitoring indicates stable long-term groundwater level trends, with noticeable seasonal fluctuations ranging from approximately 5-15 m.

5.6.65 Results of the groundwater monitoring are provided in Appendix 5.2: Preliminary HIA.

Abstractions

5.6.66 There are 22 licensed abstractions from groundwater in the hydrogeological study area, ten for agricultural irrigation and general use, four for construction, one for golf course irrigation, one for amenity lake and pond throughflow and six for mineral processing and production. Two of these abstractions are located within the draft Order limits. Groundwater abstractions are predominantly from the Corallian Group and River Terrace Deposits aquifers.

5.6.67 There are three area abstractions within the hydrogeological study area, one of which is located partly within the draft Order limits, south of Caldecott. All three area abstractions within the hydrogeological study area are dewatering abstractions within the River Terrace Deposits for industrial use (Environment Agency, 2025a).

5.6.68 It is noted that there may be potential for further unlicensed abstractions that are not recorded in this dataset. Groundwater abstractions are presented on Figure 5.7 and provided in Appendix 5.2: Preliminary HIA.

5.6.69 The hydrogeological study area spans the Kennet and Vale of White Horse, as well as the Thames Corridor Catchment Abstraction Management Strategy (CAMS) areas, as designated by the Environment Agency (Environment Agency, 2019a and 2019b). These are displayed on Figure 5.9: Catchment Abstraction Management Strategy Areas.

Discharges

5.6.70 10 active consented discharges to groundwater have been identified from Environment Agency data within the hydrogeological study area. Further to the discharges outlined in the surface water discharges section, within the hydrogeological study area, there are an additional:

- Seven discharges into land / infiltration systems
- Two discharge to grass plots / irrigation areas
- One discharge into groundwater via a borehole

5.6.71 These are all discharges associated with domestic effluent (Environment Agency, 2025d). Groundwater discharges are presented on Figure 5.7.

Groundwater-surface water interactions

5.6.72 It is assumed that that watercourses in the hydrogeological study area, including the River Ock and River Thames, Ginge Brook, Letcombe Brook, and Cow Common Brook and Portobello Ditch, interact with shallow groundwater and, in particular, gain water from superficial deposits. Although clay layers in thicker alluvial deposits may limit groundwater–surface water interactions in some areas. There may also be some loss from the superficial deposits into the Lower Greensand, dependent on the relative levels.

Springs

5.6.73 A number of springs are located within the hydrogeological study area (Institute of Geological Sciences, 1978). These are shown on Figure 5.7.

Flood risk

5.6.74 The sources of flooding include fluvial, pluvial, groundwater and infrastructure failure (e.g. sewers and drainage). The flood risk study area is located inland with no risk from tidal or coastal sources of flooding.

Historic flooding

5.6.75 There is a history of flooding in the River Ock and River Thames catchments with East Hanney, Steventon and Abingdon all being affected by flooding over the last few years. The South Oxfordshire District Council and Vale of White Horse District Council joint Strategic Flood Risk Assessment indicates significant flood events affecting the region in 2007, 2014, 2023 and 2024. These caused both fluvial and pluvial flooding across the flood risk study area. Groundwater flooding issues have also been indicated across the region, with anecdotal reports of East Hanney being affected from this source in recent years (South Oxfordshire District Council and Vale of White Horse District Council, 2024b and 2024c). Note that this list is not exhaustive as not all flood events are recorded.

Fluvial flooding

5.6.76 The sections of the flood risk study area at risk from fluvial flooding are presented within Figure 5.10. The majority of the flood risk study area is not at risk of fluvial flooding during events up to and including the 0.1% annual chance and consequently are mapped as Flood Zone 1[3]. Sections of the flood risk study area are within Fluvial Flood Zone 2[4] and Flood Zone 3[5], which are primarily associated with the following watercourses:

- Childrey Brook, as it crosses the railway line, south-west of the draft Order limits, to its confluence with the River Ock, north of the site

[3]Land having a less than 0.1% annual probability of river or sea flooding [less than 1 in 1,000 chance]
[4]Land having between a 1% and 0.1% annual probability of river flooding [between 1 in 1,000 and 1 in 100 chance] or land having between a 0.5% and 0.1% annual probability of sea flooding [between 1 in 200 and 1 in 100 chance]
[5]Land having a 1% or greater annual probability of river flooding [1 in 100 chance] or Land having a 0.5% or greater annual probability of sea [1 in 200 chance]

- Letcombe Brook, as it crosses the railway line, south-west of the draft Order limits, to its confluence with the Childrey Brook
- Portobello Ditch to Cow Common Brook, to the south of the draft Order limits
- River Ock, south of Marcham
- Mere Dyke, in the east of the site, to the River Ock
- River Thames (Evenlode to Thame), in the east of the draft Order limits (Environment Agency, 2025e)

Pluvial flooding

5.6.77 The risk of pluvial (surface water) flooding is shown on Figure 5.11. This mapping shows the routes likely to be taken by surface water flowing overland after periods of intense or prolonged rainfall. These maps include the overland flow routes associated with water escaping the channel of small watercourses. Extensive areas across the flood risk study area are at risk from pluvial flooding, with notable pockets identified to the north of West Hanney and west of Drayton (Environment Agency, 2025e).

Groundwater flooding

5.6.78 The BGS Groundwater Flooding Susceptibility mapping indicates there is the potential for groundwater flooding within the flood risk study area. This is attributed to the superficial deposits and low lying topography of the area. The susceptibility of areas to groundwater flooding is shown on Figure 5.12. The potential is greatest in areas adjacent to the River Thames, particularly in Abingdon, Stanford-in-the-Vale, Sandford on Thames and Grove (BGS, 2025b).

5.6.79 Ongoing groundwater monitoring will be reviewed to ascertain the risk of groundwater flooding in the flood risk study area to inform the assessments.

Infrastructure failure

5.6.80 The existing infrastructure in the flood risk study area that has potential to cause flooding includes sewerage networks (public and private) and water supply pipelines. Sewer flooding could occur where rainfall exceeds the capacity of the sewer / drainage systems, where drains get blocked or when the system surcharges due to high water levels in receiving water bodies. This source of flooding is likely to be more common in urban areas, which represents a small proportion of the flood risk study area. Details of the existing infrastructure that exists within the flood risk study area with potential to cause flooding will be presented in the ES.

Future baseline

5.6.81 As set out in Chapter 4: Approach to the environmental assessment, the preliminary assessment of effects considers the likely evolution of the baseline without the implementation of the Project. Where climate change may alter future water environment baseline conditions and therefore likely significant effects, this is discussed as part of the In-combination Climate Change Impact (ICCI) assessment which brings together all climate related impacts on aspect assessments and is presented in Appendix 18.3: In-combination climate change impacts assessment.

5.6.82 The River Thames is managed for flood risk and navigation purposes within the surface water and flood risk study areas. It is expected that it would continue to be managed similarly into the future.

5.6.83 The WINEP for water companies associated with Asset Management Plans (AMP) (including AMP8, AMP9 and past AMPs) included the introduction of measures to reduce upstream river phosphate inputs (e.g. improvement in treatment processes and increased storm tank capacity). For example, future improvements are proposed at Drayton, Abingdon, Appleton, Didcot and Cassington wastewater treatment works (as well as more widely across the River Thames catchment) to reduce the need for untreated discharges in wet weather (Thames Water, 2023b). This has the potential to lead to improvements in water quality of receiving water bodies such as Ginge Brook, Marcham Brook, Moor Ditch, Oday ditches and River Thames. Some abstractions for public water supply have also been subject to sustainability reductions and these reductions will likely continue to ensure environmental protection and enhancement. These changes may benefit the aquatic communities through improvements to flows and water quality, potentially resulting in an increase in the distribution and abundance of pollution and flow sensitive species. However, overall water demand is expected to increase to 2075 and new water supplies will need to be pursued to meet the shortfall (Thames Water, 2024a).

5.6.84 There may be changes in land use within the River Ock catchment associated with changes in agricultural practices (e.g. changes in crop types and changes in the use of fertilisers and pesticides) which could change the water quality and watercourse habitat within both the River Ock and the River Thames catchment in the future. The Ock Catchment Partnership is also delivering projects within the River Ock catchment to help improve the freshwater environment including improving water quality, help manage flood risk, encourage sustainable resource management and restore and protect freshwater habitats. This includes through working with landowners to restore floodplains and freshwater habitats, and to reduce sources of diffuse and point source pollution (Freshwater Habitats Trust, 2025).

5.6.85 Population in the region is expected to increase, which would likely result in more demand for water in the region (Thames Water, 2024b).

5.6.86 Ground conditions and drainage pathways are not expected to change in the near future. However, there is the potential for changes if any mineral restoration or construction works are undertaken in the area.

5.6.87 The future baseline will also be influenced by developments that may alter the local hydrological regime, general drainage routes, potentially modifying surface and groundwater flow paths, water quality, water quantity and hydromorphology.

5.6.88 The following developments have provisionally been identified as part of the future baseline and are of relevance to the Water environment assessment:

- Abingdon Flood Alleviation Scheme
- Dalton Barracks Garden Village
- Land adjacent to Culham Campus
- Valley Park, Didcot
- Grove Airfield
- Monks Farm, North Grove
- North-west of Grove
- Crab Hill (north-east Wantage)

- East Hanney Solar Farm
- Willowsfield Energy Park
- Didcot Graden Town Housing Infrastructure Fund
- Filford and Marcham improvements (Marcham bypass)
- Land for improvements to Featherbed Lane and Steventon Junction and Relief to Rowstock and Harwell to Didcot Busway
- Land at Grove Railway Station
- Land for Abingdon south bypass
- Didcot Data Campus
- Didcot Technology Park
- South East of Marcham
- Manor Solar Farm, Land to the East of Denchworth
- Teddington Direct River Abstraction

5.6.89 These developments have been identified as being located within the flood risk study area for the Project and as having the potential to introduce new flood risk receptors. These developments are not anticipated to introduce any new surface water or groundwater receptors that are at risk of being affected by the Project.

5.6.90 The following developments in isolation have been identified as having the potential to result in changes to the future baseline of the Water environment study area. However, the construction and operation of these developments are in some way dependent on the Project and would not proceed without the Project. Consequently, they are not considered as part of the future baseline as this considers the state of the future environment in the absence of the Project:

- Severn to Thames Transfer (STT)
- Thames to South Water Transfer (T2ST)
- Farmoor Transfer (SWOX Raw water transfer)
- Wilts and Berks Canal
- East Hanney Flood Alleviation Scheme
- Steventon Flood Alleviation Scheme

Water environment receptors considered in the Preliminary Assessment

5.6.91 Table 5.10 shows the Water environment receptors in the study area that have been considered in the preliminary assessment for the PEI Report. Each Reach has been divided into the named WFD waterbody, the Main Rivers associated with that Reach that are not named WFD watercourses and the Ordinary Watercourses / ditches associated with that Reach. In some cases, individual receptors have been grouped where anticipated effects and mitigation are likely to be very similar. The sensitivity of each receptor is defined in the table. The table also identifies the area ID, effect ID(s) and the figure relevant to each receptor. The effect IDs are unique identifiers of each effect assessed (discussed further in Appendix 5.4: Preliminary assessment of effects for Water environment), whilst the area ID relates to the spatial extent of the receptor assessed.

5.6.92 Table 5.10 is also reproduced with an additional column that gives commentary justifying the sensitivity category assigned; this is provided in Appendix 5.5: Water environment receptors considered in the preliminary assessment, with sensitivity commentary.

5.6.93 Figures 5.2, 5.13, 5.14 and 5.15 show the locations of receptors that have been spatially defined for the preliminary assessment for the PEI Report, with relevant area IDs noted either as labels on the map or in the legend. Table 5.10 signposts to which figure shows which area ID. Note that certain receptors have not been spatially mapped where data is not sufficiently complete to allow this, or where spatial representation is not applicable – Table 5.10 notes where this is the case. Further data gathering to inform the ES will inform any revisions to the defined spatial extents of receptors.

Table 5.10 Receptors assessed in the preliminary assessment

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Flood Risk – Not spatially mapped				
Essential infrastructure: The Project - A415/SESRO Main Access, Pumping station and pumping station access road, Reservoir embankment, Drayton substation, Steventon to East Hanney Road diversion, Water treatment buildings, Intake/outfall structure	Very High	WEN-227, WEN-236, WEN-245, WEN-281, WEN-290, WEN-299	EIA-683	N/A
Essential infrastructure: Third party - A338, A34, A415 Marcham Road, Great Western Main Line railway - London to Bristol	Very High	WEN-228, WEN-237, WEN-246, WEN-282, WEN-291, WEN-300	EIA-683	N/A
Highly vulnerable: Third party - Residential properties with basements, caravans, mobile homes & park homes	Very High	WEN-229, WEN-238, WEN-247, WEN-283, WEN-292, WEN-301	EIA-683	N/A
More vulnerable: The Project - Temporary rail, visitor centre	High	WEN-230, WEN-240, WEN-249, WEN-284, WEN-293, WEN-302	EIA-683	N/A
More vulnerable: Third party - Residential homes, Residential institutions, health services	High	WEN-231, WEN-239, WEN-248, WEN-285, WEN-294, WEN-303	EIA-683	N/A
Less vulnerable: The Project - Borrow pit, Link road to the Rail Material Handing Storage area, Main SESRO Compound North East (PS Site), Rail material handling facility and GWMLR Railway Sidings (SW) construction compound, A338 East Hanney access (SW) construction compound, Steventon access (SE) construction compound, Integrated constructed wetland	Moderate	WEN-232, WEN-241, WEN-250, WEN-286, WEN-295, WEN-304	EIA-683	N/A
Less vulnerable: Third party - Abingdon Sewage Treatment Works, Drayton Sewage Treatment Works, Agricultural and commercial buildings, Allotments, Local roads, Undeveloped agricultural land	Moderate	WEN-233, WEN-242, WEN-251, WEN-287, WEN-296, WEN-305	EIA-683	N/A
Water-compatible development: The Project - Wilts and Berks Canal, Watercourse Diversions	Low	WEN-235, WEN-243, WEN-252, WEN-288, WEN-297, WEN-306	EIA-683	N/A

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Water-compatible development: Third party - Gravel pits on the western bank of the River Thames, Marina	Low	WEN-234, WEN-244, WEN-253, WEN-289, WEN-298, WEN-307	EIA-683	N/A
Surface water – Spatially mapped on Figure 5.2				
Existing lakes (Hydrology/Fluvial geomorphology/WFD)	Low	WEN-975, WEN-976, WEN-1043, WEN-1044	EIA-685	Figure 5.2
Existing lakes (Surface water quality)	Low	WEN-977, WEN-1045	EIA-685	Figure 5.2
Existing ponds (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-787, WEN-978, WEN-1046, WEN-1047	EIA-685	Figure 5.2
Existing ponds (Surface water quality)	Negligible	WEN-979, WEN-1048	EIA-685	Figure 5.2
Reach 1 Ock (to Cherbury Brook) - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-980, WEN-981, WEN-1136[6]	EIA-115	Figure 5.2
Reach 1 Ock (to Cherbury Brook) - WFD (Surface water quality)	Moderate	WEN-802, WEN-1136[6]	EIA-115	Figure 5.2
Reach 1 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-809, WEN-821, WEN-1052, WEN-1053	EIA-115	Figure 5.2
Reach 1 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-818, WEN-1054	EIA-115	Figure 5.2
Reach 2 Nor Brook - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1011, WEN-1012, WEN-1087, WEN-1088	EIA-116	Figure 5.2
Reach 2 Nor Brook - Main River Non-WFD (Surface water quality)	Negligible	WEN-1013, WEN-1089	EIA-116	Figure 5.2
Reach 2 Ock and tributaries (Land Brook confluence to Thames) - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-748, WEN-750, WEN-842, WEN-855	EIA-116	Figure 5.2

[6] All features of this waterbody have been combined into a single receptor for the operation phase effects and the highest sensitivity of the combined features has been assigned on a precautionary basis.

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Reach 2 Ock and tributaries (Land Brook confluence to Thames) - WFD (Surface water quality)	High	WEN-749, WEN-854	EIA-116	Figure 5.2
Reach 2 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1014, WEN-1015, WEN-1090, WEN-1091	EIA-116	Figure 5.2
Reach 2 Ordinary Watercourse / ditch network (Surface water quality)	High	WEN-1016, WEN-1092	EIA-116	Figure 5.2
Reach 2 - Other Main Rivers Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1017, WEN-1018, WEN-1093, WEN-1094	EIA-116	Figure 5.2
Reach 2 - Other Main Rivers Non-WFD (Surface water quality)	Negligible	WEN-1019, WEN-1095	EIA-116	Figure 5.2
Reach 3 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1020, WEN-1021, WEN-1096, WEN-1097	EIA-687	Figure 5.2
Reach 3 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-1022, WEN-1098	EIA-687	Figure 5.2
Reach 3 Stutfield Brook - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1023, WEN-1024, WEN-1101[6]	EIA-687	Figure 5.2
Reach 3 Stutfield Brook - Main River Non-WFD (Surface water quality)	Negligible	WEN-1025, WEN-1101[6]	EIA-687	Figure 5.2
Reach 3 Stutfield Brook (source to Ock) - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-803, WEN-807, WEN-1104[6]	EIA-687	Figure 5.2
Reach 3 Stutfield Brook (source to Ock) - WFD (Surface water quality)	Moderate	WEN-804, WEN-1104[6]	EIA-687	Figure 5.2
Reach 4 Childrey and Woodhill Brooks - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-808, WEN-812, WEN-889, WEN-1105	EIA-107	Figure 5.2
Reach 4 Childrey and Woodhill Brooks - WFD (Surface water quality)	Moderate	WEN-810, WEN-1106	EIA-107	Figure 5.2

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Reach 4 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-813, WEN-817, WEN-890, WEN-1107	EIA-107	Figure 5.2
Reach 4 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-814, WEN-1108	EIA-107	Figure 5.2
Reach 5 Childrey Brook and Norbrook at Common Barn - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-751, WEN-752, WEN-839, WEN-845	EIA-108	Figure 5.2
Reach 5 Childrey Brook and Norbrook at Common Barn - WFD (Surface water quality)	Moderate	WEN-753, WEN-849	EIA-108	Figure 5.2
Reach 5 East Hanney Ditch - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-823, WEN-824, WEN-867, WEN-879	EIA-108	Figure 5.2
Reach 5 East Hanney Ditch - Main River Non-WFD (Surface water quality)	Negligible	WEN-825, WEN-902	EIA-108	Figure 5.2
Reach 5 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-829, WEN-830, WEN-868, WEN-885	EIA-108	Figure 5.2
Reach 5 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-831, WEN-893	EIA-108	Figure 5.2
Reach 6 Letcombe Brook - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-756, WEN-1026, WEN-1109, WEN-1110	EIA-112	Figure 5.2
Reach 6 Letcombe Brook - WFD (Surface water quality)	High	WEN-757, WEN-1111	EIA-112	Figure 5.2
Reach 6 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1027, WEN-1028, WEN-1112, WEN-1113	EIA-112	Figure 5.2
Reach 6 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-1029, WEN-1114	EIA-112	Figure 5.2
Reach 7 Cow Common Brook - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1030, WEN-1031, WEN-1115, WEN-1116	EIA-109	Figure 5.2
Reach 7 Cow Common Brook - Main River Non-WFD (Surface water quality)	Negligible	WEN-1032, WEN-1117	EIA-109	Figure 5.2

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Reach 7 Cow Common Brook and Portobello Ditch - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-745, WEN-746, WEN-836, WEN-840	EIA-109	Figure 5.2
Reach 7 Cow Common Brook and Portobello Ditch - WFD (Surface water quality)	Moderate	WEN-747, WEN-846	EIA-109	Figure 5.2
Reach 7 Landmead Ditch - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-761, WEN-763, WEN-871, WEN-875	EIA-109	Figure 5.2
Reach 7 Landmead Ditch - Main River Non-WFD (Surface water quality)	Negligible	WEN-764, WEN-882	EIA-109	Figure 5.2
Reach 7 Mere Dyke - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-766, WEN-768, WEN-872, WEN-876	EIA-109	Figure 5.2
Reach 7 Mere Dyke - Main River Non-WFD (Surface water quality)	Negligible	WEN-769, WEN-883	EIA-109	Figure 5.2
Reach 7 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-772, WEN-774, WEN-873, WEN-877	EIA-109	Figure 5.2
Reach 7 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-775, WEN-884	EIA-109	Figure 5.2
Reach 8 Frilford and Marcham Brook - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-1033, WEN-1034, WEN-1119[6]	EIA-110	Figure 5.2
Reach 8 Frilford and Marcham Brook - WFD (Surface water quality)	High	WEN-1035, WEN-1119[6]	EIA-110	Figure 5.2
Reach 8 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1036, WEN-1037, WEN-1122[6]	EIA-110	Figure 5.2
Reach 8 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-1038, WEN-1122[6]	EIA-110	Figure 5.2
Reach 9 Sandford Brook - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1040, WEN-1041, WEN-1123, WEN-1124	EIA-117	Figure 5.2

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Reach 9 Sandford Brook - Main River Non-WFD (Surface water quality)	Negligible	WEN-1042, WEN-1125	EIA-117	Figure 5.2
Reach 9 Sandford Brook (source to Ock) - WFD (Hydrology/Fluvial geomorphology/WFD)	Very High	WEN-782, WEN-783, WEN-844, WEN-856	EIA-117	Figure 5.2
Reach 9 Sandford Brook (source to Ock) - WFD (Surface water quality)	Very High	WEN-781, WEN-857	EIA-117	Figure 5.2
Reach 9 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-778, WEN-779, WEN-869, WEN-900	EIA-117	Figure 5.2
Reach 9 Ordinary watercourse / ditch network (Surface water quality)	Negligible	WEN-901, WEN-1039	EIA-117	Figure 5.2
Reach 10 Ginge Brook - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-982, WEN-983, WEN-1055, WEN-1056	EIA-111	Figure 5.2
Reach 10 Ginge Brook - Main River Non-WFD (Surface water quality)	Negligible	WEN-984, WEN-1057	EIA-111	Figure 5.2
Reach 10 Ginge Brook and Mill Brook - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-759, WEN-827, WEN-1058, WEN-1059	EIA-111	Figure 5.2
Reach 10 Ginge Brook and Mill Brook - WFD (Surface water quality)	High	WEN-755, WEN-1060	EIA-111	Figure 5.2
Reach 10 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-985, WEN-986, WEN-1061, WEN-1062	EIA-111	Figure 5.2
Reach 10 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-987, WEN-1063	EIA-111	Figure 5.2
Reach 11 Moor Ditch - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-988, WEN-989, WEN-1064, WEN-1065	EIA-114	Figure 5.2
Reach 11 Moor Ditch - Main River Non-WFD (Surface water quality)	Negligible	WEN-990, WEN-1066	EIA-114	Figure 5.2

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Reach 11 Moor Ditch and Ladygrove Ditch - WFD (Hydrology/Fluvial geomorphology/WFD)	High	WEN-770, WEN-843, WEN-903, WEN-991	EIA-114	Figure 5.2
Reach 11 Moor Ditch and Ladygrove Ditch - WFD (Surface water quality)	High	WEN-776, WEN-904	EIA-114	Figure 5.2
Reach 11 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-992, WEN-993, WEN-1067, WEN-1068	EIA-114	Figure 5.2
Reach 11 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-994, WEN-1069	EIA-114	Figure 5.2
Reach 12 Mill Brook and Bradfords Brook system, Wallingford - WFD (Surface water quality and Hydrology/Fluvial geomorphology/WFD)	Very High	WEN-786, WEN-905	EIA-113	Figure 5.2
Reach 12 Ordinary Watercourse / ditch network (Surface water quality and Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-995, WEN-1070	EIA-113	Figure 5.2
Reach 13 Thames (Evenlode to Thame) - WFD (Hydrology/Fluvial geomorphology/WFD)	Very High	WEN-788, WEN-792, WEN-1074, WEN-1075	EIA-121	Figure 5.2
Reach 14 Thames (Evenlode to Thame) - WFD (Surface water quality)	Very High	WEN-796, WEN-864	EIA-121	Figure 5.2
Reach 13 Thames (Evenlode to Thame) - WFD (Surface water quality)	Very High	WEN-789, WEN-1079	EIA-121	Figure 5.2
Reach 13 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-996, WEN-997, WEN-1073[6]	EIA-121	Figure 5.2
Reach 13 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-998, WEN-1073[6]	EIA-121	Figure 5.2
Reach 14 Thames (Evenlode to Thame) - WFD (Hydrology/Fluvial geomorphology/WFD)	Very High	WEN-795, WEN-798, WEN-835, WEN-880	EIA-121	Figure 5.2
Reach 14 Thames (Evenlode to Thame) - Main River Non-WFD (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1005, WEN-1006, WEN-1083, WEN-1084	EIA-121	Figure 5.2

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Reach 14 Thames (Evenlode to Thame) - Main River Non-WFD (Surface water quality)	Negligible	WEN-1085	EIA-121	Figure 5.2
Reach 14 Thames (Evenlode to Thame) - Main River Non-WFD (Surface water quality)	Negligible	WEN-1007	EIA-121	Figure 5.2
Reach 14 Ordinary Watercourse / ditch network (Hydrology/Fluvial geomorphology/WFD)	Moderate	WEN-1002, WEN-1003, WEN-1080, WEN-1081	EIA-121	Figure 5.2
Reach 14 Ordinary Watercourse / ditch network (Surface water quality)	Negligible	WEN-1004, WEN-1082	EIA-121	Figure 5.2
Reach 15-24 Thames Wallingford to Caversham, Thames (Reading to Cookham), Thames (Cookham to Egham) and Thames (Egham to Teddington) - WFD (Surface water quality, hydrology and fluvial geomorphology)	Very High	WEN-833, WEN-1010	EIA-670	Figure 5.2
Project proposed recreational lakes (activities such as swimming, paddleboarding and sailing and fishing) (Hydrology/Fluvial geomorphology/WFD)	High	WEN-865, WEN-1126	EIA-3	Figure 5.2
Project proposed recreational lakes (activities such as swimming, paddleboarding and sailing and fishing) (Surface water quality)	High	WEN-1127	EIA-3	Figure 5.2
Project proposed reservoir (Hydrology/Fluvial geomorphology/WFD)	High	WEN-863, WEN-1128	EIA-3	Figure 5.2
Project proposed reservoir (Surface water quality)	Very High	WEN-1129	EIA-3	Figure 5.2
Project proposed Wilts and Berks canal (Hydrology/Fluvial geomorphology/WFD)	Low	WEN-866, WEN-1130	EIA-3	Figure 5.2
Project proposed Wilts and Berks canal (Surface water quality)	High	WEN-1131	EIA-3	Figure 5.2
Hydrogeology				
Alluvium	High	WEN-321, WEN-364, WEN-468, WEN-492	EIA-19	Figure 5.14

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
Head	High	WEN-323, WEN-366, WEN-470, WEN-494	EIA-18	Figure 5.14
River Terrace Deposits	High	WEN-322, WEN-365, WEN-469, WEN-493	EIA-20	Figure 5.14
Upper Greensand	Very High	WEN-318, WEN-361, WEN-465, WEN-489	EIA-21	Figure 5.15
Gault Formation	Low	WEN-314, WEN-357, WEN-461, WEN-485	EIA-73	Figure 5.15
Lower Greensand	High	WEN-317, WEN-360, WEN-464, WEN-488	EIA-75	Figure 5.15
Kimmeridge Clay Formation and Ampthill Clay Formation	Low	WEN-315, WEN-358, WEN-462, WEN-486	EIA-72	Figure 5.15
Corallian Group	High	WEN-316, WEN-359, WEN-463, WEN-487	EIA-651	Figure 5.15
Mapped Water Supply Spring	High	WEN-324, WEN-455, WEN-456, WEN-471	EIA-656	Figure 5.13
Potential Springs (unmapped)	High	WEN-367, WEN-383, WEN-496, WEN-513	EIA-686	Not spatially mapped
Marcham Salt Water Spring	Moderate	WEN-335, WEN-346, WEN-472, WEN-495	EIA-145	Figure 5.13
Abingdon Area abstraction (TH/039/0018/011)	Moderate	WEN-326, WEN-327, WEN-457, WEN-458	EIA-641	Figure 5.13
Corallian agricultural groundwater abstraction (TH/039/0017/001/R01)	Moderate	WEN-336, WEN-337, WEN-474, WEN-475	EIA-650	Figure 5.13
Groundwater point River Terrace abstractions outside draft Order Limits (28/39/18/0055; 28/39/18/0009; TH/039/0018/003)	Moderate	WEN-338, WEN-339, WEN-476, WEN-477	EIA-655	Figure 5.13

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
River Gravels Industrial groundwater abstraction (TH/039/0018/012)	Moderate	WEN-347, WEN-348, WEN-498, WEN-499	EIA-660	Figure 5.13
Area abstractions outside draft Order Limits	Moderate	WEN-328, WEN-329, WEN-459, WEN-460	EIA-642	Figure 5.13
River Ock reach abstraction (28/39/17/0027)	Moderate	WEN-349, WEN-350, WEN-500, WEN-501	EIA-661	Figure 5.13
River Thames reach abstraction outside draft Order limits (TH/039/0015/003)	Moderate	WEN-368, WEN-369, WEN-514, WEN-515	EIA-663	Figure 5.13
Surface water abstractions outside draft Order limits (28/39/17/0143; 28/39/17/0146; 28/39/18/0019; TH/039/0017/005; 28/39/17/0152; TH/039/0015/006)	Moderate	WEN-370, WEN-371, WEN-516, WEN-517	EIA-666	Figure 5.13
Surface water abstractions outside draft Order limits (28/39/18/0059)	High	WEN-1132, WEN-1133, WEN-1134, WEN-1135	EIA-666	Figure 5.13
CAWM.0345 (Thames Water sewage discharge to freshwater river)	Low	WEN-308, WEN-309	EIA-640	Figure 5.13
CAWM.0380 (Thames Water sewage discharge to freshwater river)	Low	WEN-310, WEN-311	EIA-643	Figure 5.13
CAWM.0381 (Thames Water sewage discharge to freshwater river)	Low	WEN-312, WEN-313	EIA-644	Figure 5.13
CAWM.0382 (Trade discharge to freshwater river)	Low	WEN-340, WEN-341	EIA-645	Figure 5.13
CAWM.0557 (Sewage discharge to freshwater river)	Low	WEN-342, WEN-343	EIA-646	Figure 5.13
CAWM.1151 (Trade discharge to freshwater river)	Low	WEN-344, WEN-345, WEN-478, WEN-479	EIA-647	Figure 5.13
CNTD.0030 (Thames Water sewage discharge to freshwater river)	Low	WEN-351, WEN-352, WEN-502, WEN-503	EIA-648	Figure 5.13
CNTD.0053 (Thames Water sewage discharge to freshwater river)	Low	WEN-353, WEN-354, WEN-504, WEN-505	EIA-649	Figure 5.13

Receptor Name	Sensitivity	Effect-ID(s)	Area-ID	Figure ID
CTCR.1804 (Thames Water sewage discharge into freshwater river)	Low	WEN-355, WEN-356, WEN-506, WEN-507	EIA-652	Figure 5.13
EPREB3990AK (Trade discharge to freshwater river)	Low	WEN-372, WEN-373, WEN-518, WEN-519	EIA-653	Figure 5.13
EPRTB3094RX (Sewage discharge to freshwater river)	Low	WEN-374, WEN-375, WEN-520, WEN-521	EIA-654	Figure 5.13
TEMP.2989 (Thames sewage discharge to freshwater river)	Low	WEN-376, WEN-377, WEN-522, WEN-523	EIA-88	Figure 5.13
Shrivenham Corallian	Very High	WEN-319, WEN-362, WEN-466, WEN-490	EIA-99	Figure 5.13
Vale of White Horse Chalk	Very High	WEN-320, WEN-363, WEN-467, WEN-491	EIA-100	Figure 5.13
Potential Non-Designated GWDTE	Very High	WEN-330, WEN-378, WEN-480, WEN-508	EIA-101	Figure 5.13
Potential Private Water Supplies (unmapped)	High	WEN-325, WEN-473, WEN-497	EIA-686	Not spatially mapped
South Oxfordshire Crematorium	High	WEN-331, WEN-379, WEN-481, WEN-509	EIA-265	Figure 5.13

5.7 Project parameters, assumptions and limitations

5.7.1 Chapter 2: Project description relies on the use of relevant parameters and assumptions to allow flexibility in the final design of the Project, in accordance with the Rochdale envelope approach (Planning Inspectorate, 2018). This preliminary assessment for the Water environment aspect uses the parameters and assumptions outlines in Chapter 2: Project description as well as additional parameter and assumption specific to this aspect to ensure that the reasonable worst-case scenario is considered within this assessment.

Project parameters and assumptions specific to this aspect

5.7.2 Table 5.11 identifies the Project parameters, components and activities relevant to this assessment where assumptions specific to the preliminary Water environment assessment have been generated.

Table 5.11 Project parameters and assumptions forming the basis of assessment

Project parameter / component / activity	Assumption (basis of assessment)
Wilts and Berks canal	It is assumed that the operation of the overflow weir from the proposed canal to the River Ock will be designed and managed in such a way that it will not exacerbate flooding in the Ock catchment. It is anticipated that 90,000m^3 of water will be required to initially fill the canal. Studies are currently ongoing to determine sources to be used to fill the canal during the construction phase and to also identify sweetening flows and sources of water to be used to top up water levels in the canal during the operational phase. The canal will be constructed with clay lining and as such it is assumed that there will be negligible infiltration/leakage impacts and therefore water will only be lost through evaporation.
Wilts and Berks canal	It is assumed that fish will colonise naturally, and any designs will consider wider ecological habitats so that fish can establish and form part of the newly created ecosystem. The canal will provide extensive new aquatic habitat and will include naturalised channel banks, margins and bed to support vegetation and provide habitat for species and communities.
Bridges and culverts (over/under watercourses and canal)	The structures at the crossings between the Wilts and Berks Canal and the Watercourses (two crossings) will be several back-to-back precast concrete box culverts to span the entire width of the watercourse. The design assumes that a minimum of 300mm of natural material will be provided beneath the lowest bed level of a watercourse and the structural concrete of a culvert.

Project parameter / component / activity	Assumption (basis of assessment)
Modifications to mainline railway to allow exit west (switch and crossing)	It is assumed that this component will not require change to watercourse crossing structures. Temporary compounds will be designed to ensure that a sufficient buffer around any watercourse or water body is implemented.
Floating islands	It is assumed that the floating islands will cover less than 2% of the reservoir surface area.
Operation	If water quality in the River Thames does not meet the desired limits, or flows drop below the hands off flow, abstraction will be controlled accordingly.
Operation	The abstraction from/discharge to the River Thames will be subject to the conditions of an environmental permit and will be at the values detailed in Chapter 2, Section 2.6.
Western watercourses diversion (Cow Common Brook, Portobello Ditch, East Hanney Ditch) and Eastern watercourses diversion (Mere Dyke, Drayton North Ditch, River Ock and Landmead Ditch)	Watercourse diversion will be completed as part of Early Works, within the first seven years of construction. It is assumed that the establishment of watercourse diversions will take two growing seasons. It is assumed that construction will be completed followed by a growing season to allow establishment straight away. Work on watercourses will be undertaken from downstream to upstream, in 'commissioned' sections and will adhere to EA pollution prevention guidance and other appropriate standards. Silt control will be provided at the interface between 'commissioned' sections and sections under construction to help protect water quality.
Western watercourses diversion (Cow Common Brook, Portobello Ditch, East Hanney Ditch) and Eastern watercourses diversion (Mere Dyke, Drayton North Ditch, River Ock and Landmead Ditch)	Both the eastern and western channels are three stage channels, consisting of low flow channel, mean annual flood channel and a wider floodplain. Pending completion of groundwater modelling assessments, it has been conservatively assumed that some sections of channel may require a clay lining to prevent infiltration into gravel deposits, seeking to provide continuity of floodplain beneath structures where possible. It is assumed that 50% of Western Watercourse Diversion is clay lined and 20% of Eastern Watercourse Diversion is clay lined. The liner is assumed to extend across the 5m cross-section width.
Western watercourses diversion (Cow Common Brook, Portobello Ditch, East Hanney Ditch) and Eastern watercourses diversion (Mere Dyke, Drayton North Ditch, River Ock and Landmead Ditch)	Design assumes minimum 300mm natural material beneath lowest bed level of a watercourse and the structural concrete of a culvert. This assumption does not apply to ditches which unavoidably need to be culverted.
Western watercourses diversion (Cow Common Brook,	It is assumed that the proposed design of the western watercourse diversions (three stage channels including all

Project parameter / component / activity	Assumption (basis of assessment)
Portobello Ditch, East Hanney Ditch) and Eastern watercourses diversion (Mere Dyke, Drayton North Ditch, River Ock and Landmead Ditch)	watercourse crossings) will have sufficient capacity to convey all the flow generated for the 1% AEP flood event, including increases to account for climate change.
Western watercourses diversion (Cow Common Brook, Portobello Ditch, East Hanney Ditch) and Eastern watercourses diversion (Mere Dyke, Drayton North Ditch, River Ock and Landmead Ditch)	It is assumed that dewatering of the new channels will be required during construction. This water would be over-pumped into existing watercourses downstream of the construction activity.
Western watercourses diversion (Cow Common Brook, Portobello Ditch, East Hanney Ditch) and Eastern watercourses diversion (Mere Dyke, Drayton North Ditch, River Ock and Landmead Ditch	It is assumed that the eastern watercourse diversion and western watercourse diversion designs support aquatic species and communities appropriate to these watercourse typologies.
Western watercourses diversion (Cow Common Brook, Portobello Ditch, East Hanney Ditch)	The western watercourse diversion involves the rerouting of Cow Common Brook, Portobello Ditch and East Hanney Ditch. The design prioritises the preservation of natural flow regimes, minimisation of erosion, appropriate control of channel erosion and deposition processes, and enhancement of aquatic habitats. The channel design includes careful consideration of cross-section geometry, longitudinal slope, and meander patterns to replicate natural fluvial processes, encourage ecological resilience, and minimise long-term maintenance requirements
Western watercourses diversion (Cow Common Brook, Portobello Ditch, East Hanney Ditch)	Periphery drainage (around the reservoir) and realigned watercourses would be constructed at the same time on each side of the reservoir (eastern and western). This excavation would move north to the south (downstream to upstream) and would connect to existing ditches as the construction moved into the location of existing ditches sequentially.
Ditch system	It is assumed that plants and animals including fish and eels will be able to colonise the ditch system and that the ditches will provide suitable habitat.
Reservoir (including embankment and directly associated infrastructure, such as pipes in the base)	It is assumed that the design will manage sediment deposition in the lowest part of the reservoir (the non-operational storage area), and the aeration system on the bed of the reservoir, in such a way as to not affect the quality of water.
Reservoir (including embankment and directly associated infrastructure, such as pipes in the base)	The first fill of the reservoir will be undertaken through abstraction from the River Thames. It is assumed that abstractions from the River Thames will be agreed with the EA

Project parameter / component / activity	Assumption (basis of assessment)
	relative to measured levels in the River Thames as per the Environmental Permit.
Reservoir (including embankment and directly associated infrastructure, such as pipes in the base)	The approach to future designations and classification of newly created waterbodies will need to be agreed with the regulator (the Environment Agency). For the purposes of the assessment, it has been assumed that no additional treatment of water abstracted from the River Thames will be undertaken prior to being released into the reservoir. Therefore, it has been assumed that the water quality within the reservoir will be similar to that in the River Thames.
Reservoir (including embankment and directly associated infrastructure, such as pipes in the base)	The wave protection design and maintenance of rip rap (rock armour) and/or open stone asphalt will limit establishment or prohibit natural marginal and littoral habitats within the reservoir.
Pumping station	It is assumed that the Project pumping station will be designed to be resilient to flooding.
Recreational lakes centre (including visitors centre)	Sources of water to provide a sweetening flow to the recreational lakes are currently being explored. It is anticipated that sources may include flows from the reservoir embankment toe drain and overflows from the canal.
Recreational lakes centre (including visitors centre)	It is assumed that the recreational lakes will be designed and managed to ensure that they are suitable for recreational use.
Recreational lakes centre (including visitors centre)	The recreational lakes, whilst designed for recreation, amenities and activities, will also provide biodiversity benefits through creation of aquatic habitats supporting aquatic species and communities. The lakes will generally be natural in terms of their morphology, hydrology and water quality.
Intake/outfall structure	Scour protection or other protective measures will be implemented as needed (i.e. not full extent of reach) to protect the bed and the banks of the River Thames in close proximity to the intake and outfall structures.
River Thames flood compensation (eastern bank)	It is assumed that the proposed berm design, located on the eastern bank of the River Thames, opposite the proposed intake and outfall structures will mitigate any changes in flood water level for all scenarios up to the 1% AEP flood event including an allowance for climate change.
River Thames flood compensation (eastern bank)	Berm on the eastern bank will require loss of in-channel, bank face and bank top habitats. The berm will minimise hard engineered surfaces and reinstate lost habitats as far as practicable.
River Thames erosion protection	Scour and erosion protection may degrade riverine habitats but this will be localised to river margins and the bank face.
Steventon to East Hanney road diversion, Intermediate shaft	It is assumed that highways drainage including dry swales and retention ponds are designed to ensure there is a negligible

Project parameter / component / activity	Assumption (basis of assessment)
road upgrade, A34 Marcham Interchange, Construction access from A34 layby and Upgrade to A34 layby south of SESRO	impact to water quality from pollutants associated with the highway on nearby or connected downflow waterbodies.
Active travel routes, additional footpaths and non-motorised vehicles (NMU) provision	The access network within the Site would need several crossings of watercourses and the canal and towpath. Bridges or culverts will be provided where active travel routes cross watercourses diversions, canal and ditches. Bridges will be provided on all Main Rivers and WFD watercourses, whereas culverts will be provided across ditches.
Most / all project components	It is assumed that the design of permanent project features that have the potential to affect rivers or that could be affected by flood risk from rivers will be assessed and designed with climate change taken into account. Specifically, it is assumed that the 1% annual exceedance probability flood flows will be increased by 26% and 41%. The percentage uplift applied, in terms of determining which scenario is used as the design standard, will be dependent on the flood risk vulnerability of a receptor, as outlined in National Planning Policy Framework (NPPF) Annex 3.
All project components	It is assumed that there will be a reduction in the flow that reaches the River Ock from the river diversions. This is due to a reduction in the active contributing catchment, as a result of the establishment of the reservoir.
Steventon to East Hanney road diversion	It is assumed that all design features which pose a risk of changing overland flow characteristics in terms of flow, volume or direction will be served by drainage which will ensure there is no change in the risks posed by existing surface water flow.
Bridges (over watercourses and canal)	Road bridges over watercourses will be flood resilient structures, meaning the soffit of the bridge will have enough freeboard (600mm assumed minimum) under the 100year Return period (RP) + Climate change allowance (CC) with appropriate mammal ledges where required. Canal bridges over watercourses will be designed to accommodate the canal operational depth and pond levels and may in some circumstances become surcharged by flood flows.
Rail siding and material handling facility	The proposed material handling facility is located partially within Flood Zones 2 and 3 associated with the existing East Hanney Brook. This is upstream of the proposed diversion. Therefore, replacement flood storage on a 'no detriment' basis will be required. For the purposes of the assessment, it is assumed that this has already been incorporated into the design of the rail handling facility.

Project parameter / component / activity	Assumption (basis of assessment)
Material excavation and handling	It is assumed that the main reservoir earthworks would be undertaken from March - October (inclusive). Works may be undertaken outside of this period if conditions are suitably dry.
General construction activities	Construction compounds will not be located in Flood Zone 3.
General construction activities	It is assumed that temporary bridges will be required over ditches and watercourses, including newly realigned ones. The following will apply to temporary construction access/haul road watercourse crossings: New crossings of watercourses will be avoided insofar as reasonably practicable, with a preference to use existing crossing points and structures wherever possible. Where required, temporary construction watercourse crossings will be sized to convey the design flood (normally the 1% annual probability flood) and be designed appropriately taking into account the receptor value/sensitivity of the watercourse, in order to reduce bank-top and in-channel impacts as far as practicable. In some instance the temporary crossings will be in place for a number of years. This may result in the need for a climate change allowance to be applied to the design of the crossing. The design of any temporary construction crossings of very high/high value watercourses (comprising Main Rivers and/or WFD/WER Main River water bodies) will seek to comprise a clear span solution, where feasible, in order to avoid in-channel impacts on surface water quality, hydromorphology, aquatic habitats, and river continuity (including fish passage). It is assumed at this stage that temporary construction crossings of low value watercourses and/or ditches will comprise temporary culvert structures. The design will seek to use box culverts with a buried invert level below the channel bed, where practicable, in order to reduce effects on flow and sediment continuity and reduce blockage risk. All temporary construction watercourse crossings are to be removed following the completion of the construction works and local channel morphology and habitats restored/reinstated, where necessary.
General construction activities	The construction sequencing and methodology will be developed to ensure that any temporary construction mitigation measures are adapted to ensure no increases in flood risk in the permanent case. These temporary mitigation measures may include appropriate siting of construction compounds, materials storage areas and temporary flood compensation requriements.
Thames to Southern Water Transfer (T2ST) Water	The T2ST component of SESRO will not include full connection and therefore effects associated with transfer of water and the creation of a new hydrological connection on the water

Project parameter / component / activity	Assumption (basis of assessment)
Treatment Works (WTW) and pipelines	environment receptors is not within the scope of this assessment. It is considered as part of the future baseline and in Chapter 20 Cumulative effects.

5.8 Assessment assumptions and limitations

General

5.8.1 This section identifies the aspect-specific assumptions and limitations made for the preliminary Water environment assessment including those related to the availability of data to inform the assessment and assumptions used in the methodology. All assessed effects in this chapter are preliminary and will be revisited in the ES in light of data available at that time and the design taken forward for submission. Assessments reported with this PEI Report chapter are considered a reasonable 'worst case' as a precautionary approach has been taken where design, construction or baseline information is incomplete. Nevertheless, the preliminary assessment is considered sufficiently robust to enable consultees to understand the likely significant environmental effects of the Project, based on current design information and understanding of the baseline environment. Gaps in information identified within the PEI Report will be considered and addressed as part of the assessment during the production of the ES, as noted in Section 5.11: Next steps. Assumptions and limitations identified in relation to the preliminary Water environment assessment include:

- For the assessment of construction impacts, where construction methods and sequencing are not available, current standard construction practices are assumed. For the assessment of operational impacts, the assessment is based on the design as it currently stands – aspects that are still evolving will be assessed in full within the ES.
- The findings presented in this chapter have been derived from both desk-based and field studies. It has not yet been possible to survey all areas identified within the draft Order limits. As a consequence, in some locations the assessment is based upon limited or incomplete data. Ongoing data collection, surveying and monitoring will enhance understanding of current and future conditions within the study areas, these will be incorporated into the ES. Every effort has been made to ensure that the existing data used for the PEI Report present an accurate interpretation of the water environmental baseline and the interaction between surface water and groundwater.
- The findings presented in this chapter are preliminary and have been derived from initial modelling outputs. Modelling is being further developed, refined and calibrated and will be incorporated into the ES.

5.8.2 Further aspect-specific limitations and assumptions associated with the Project are discussed in the following sections:

Surface Water and Flood Risk

5.8.3 A detailed assessment of water resources required to enable construction and operation of the Project has not yet been undertaken. An assessment of water demands and the intended sources of supply will be undertaken to inform the ES.

5.8.4 To supplement and refine this initial assessment, further data collection and modelling will be undertaken in relation to water quality and flood risk. These will be presented to support the ES at a later stage.

5.8.5 The baseline conditions for water quality have been derived from EA Water Framework Directive catchment explorer data and existing water quality monitoring that has been undertaken for the Project (Environment Agency, 2025b). Further water quality monitoring will be undertaken and will be used to inform the ES.

WFD

5.8.6 The findings presented in the WFD Scoping Report are preliminary and have not been derived from modelling outputs. Modelling is being developed, refined and calibrated and will be incorporated into the impact assessment at ES.

5.8.7 A programme of measures for the delivery of the WFD objectives is not available for all waterbodies for this assessment. Where available, this will be incorporated into the next iteration for ES.

Hydrogeology

5.8.8 The preliminary HIA has been collated based on a range of publicly available data, information provided by stakeholders and site investigation and survey data available at the time of writing. As the design develops, groundwater modelling is progressed and further baseline data is obtained, the HIA will be updated. However, the assessment to date is considered sufficient to inform the receptors susceptible to potential likely significant effects.

5.8.9 Many of the publicly available datasets are at a coarse regional scale, and as such there is a level of uncertainty associated with use of this data as they are unlikely to identify local hydrogeological and hydrological variations at a smaller scale. As an example, the geology within the hydrogeological study area has been assumed to be as per the geological maps available from the BGS which are at a minimum 1:10,000 scale (BGS, 2025a), unless ground-truthed by ground investigation works.

5.8.10 Ground investigation works have been undertaken to inform the ground and groundwater conditions throughout the area of the Project. Groundwater level monitoring began in May 2024 and is ongoing at the time of assessment. This preliminary HIA includes data analysed up to March 2025, with further analysis undertaken and presented in the ES.

5.8.11 It is acknowledged as a limitation that there will always be gaps in hydrogeological data where the information is not readily available, particularly with respect to more local receptors of lesser value. This may include the location of springs or unlicensed abstractions (less than 20m^3/day), which are not registered with local planning authorities or where land access has not been available at this stage. Due to unidentified receptors being of relatively low significance and with standard good practice mitigation measures in

place, these gaps are considered unlikely to result in the identification of additional likely significant effects.

5.8.12 It is assumed that the licenced abstractions within the draft Order limits will continue to operate as per the baseline and would not be physically removed by the construction of the reservoir and associated infrastructure.

5.8.13 It has been assumed that the section of Wilts and Berks Canal to be provided by the Project would be lined where the Lower Greensand is at outcrop and as such there would be no infiltration/leakage impacts.

5.8.14 Private water supply data and spring data have not been included in the preliminary HIA as they were not received with sufficient time to do this. This is a limitation in the current understanding of relevant receptors. This data will be used to inform the ES.

5.9 Embedded design mitigation and standard good practice

5.9.1 As described within Chapter 4: Approach to the environmental assessment, identified embedded design (primary) mitigation and standard good practice (tertiary) measures are assumed to be applied within this preliminary assessment, to reduce the potential for environmental effects.

5.9.2 Embedded design mitigation identified for the Project at this stage are noted in Chapter 2: Project description. These, and standard good practice measure to be applied are described in greater detail within the Draft commitments register in Appendix 2.2.

5.9.3 Table 5.12 and Table 5.13 list the embedded design mitigation and standard good practice measures applicable to the preliminary Water environment assessment during construction and operation respectively, including the unique commitment IDs that relate to the Draft commitments register (where further detail on each can be referred to). The tables also state the purpose of each mitigation and the applicable securing mechanisms.

Table 5.12 Construction: Relevant embedded design mitigation and standard good practice measures, their purpose and securing mechanisms

Embedded design mitigation or standard good practice measure (unique commitment ID)	Purpose of mitigation measure	Indicative securing mechanism
Provide floodplain conveyance and compensation before construction of the reservoir and the intake/outfall structure (ED-01)	To reduce flood risk, maintain water quality and establish new watercourse and riparian habitats created.	Under the terms of the DCO Design Principle
Manage water quality at the SESRO intake (ED-02)	To manage and maintain water quality standards within the reservoir.	Under the terms of the DCO
Construction sequencing to mitigate flood risk (ED-03)	To manage and reduce flows and flood risk to receptors downstream of the Project and help manage flood risk on site.	CoCP

Embedded design mitigation or standard good practice measure (unique commitment ID)	Purpose of mitigation measure	Indicative securing mechanism
Construction phase surface water management (ED-41)	To protect and maintain water quality and flows during construction.	CoCP
Permanent conveyance tunnels/pipelines good practice (ED-49)	To protect groundwater receptors from adverse impacts from tunnelling activities and presence of tunnels.	Under the terms of the DCO
Measures to reduce new watercourse crossings (ED-51)	To protect the form and functioning of watercourses.	Under the terms of the DCO
Standard good practice measures to reduce the impacts to surface and groundwater resources (SGP-02)	To protect and maintain water quality and flows during construction.	CoCP
Standard good practice measures for works within or adjacent to waterbodies (SGP-03)	To manage and reduce flows and flood risk to receptors and protect the form and functioning of waterbodies.	CoCP
Managing construction works within flood zones (SGP-05)	To manage and reduce flows and flood risk to receptors downstream of the Project and help reduce flood risk to on site receptors and infrastructure.	CoCP
Standard good practice measures for road cleanliness (SGP-22)	To protect water quality and flows during construction.	CoCP
Design of temporary crossings during construction to maintain function and integrity of watercourses (SGP-35)	To protect the form and functioning of watercourses.	Under the terms of the DCO
Ground investigation, risk assessment, and, if required, remediation, in accordance with standard good practice measures for land contamination (SGP-43)	To protect ground and surface water receptors from contamination due to the creation of new pathways.	Under the terms of the DCO
Protection of riparian zone during construction (SGP-46)	To protect the form and functioning of watercourses and associated riparian habitat.	CoCP

Table 5.13 Operation: Relevant embedded design mitigation and standard good practice measures, their purpose and securing mechanisms

Embedded design mitigation or standard good practice measure (unique commitment ID)	Purpose of mitigation measure	Indicative securing mechanism
Measures to address the risks of increased precipitation, intense periods of rainfall and frequency and intensity of flooding (ED-13)	To protect the Project and receiving receptors from anticipated increases in flood risk associated with future climate change.	Under the terms of the DCO
Measures for safe reservoir operation (ED-17)	To ensure the reservoir will operate safely and can manage varying water levels and extreme weather events.	Requirement of existing legislation
Reduce the impact of the Steventon to East Hanney road diversion on environmental receptors (ED-20)	To reduce the impact the East Hanney to Steventon road diversion has on surrounding environmental receptors.	Design Principles
Drainage Strategy to align with national and local planning policy and guidance (ED-22)	To ensure the Project is compliant with national and local planning policy and guidance.	Under the terms of the DCO
Maintain water quality in the reservoir (ED-28)	To maintain water quality standards within the reservoir.	Under the terms of the DCO
Scour protection on the River Thames (ED-30)	To protect the bed and banks of the River Thames from erosion as a result of discharge flows from the Project's outfall into the River Thames.	Under the terms of the DCO
Lining of key watercourses and surface water features and provision of substrate (ED-31)	To prevent excessive water loss from these receptors during dry conditions and provide suitable aquatic substrate to protect their form and functioning.	Under the terms of the DCO
Design of culverts to maintain function and integrity of watercourses (ED-36)	To protect the form and functioning of watercourses.	Under the terms of the DCO
Operation phase surface water management (ED-42)	To manage and maintain water quality and flows during operation.	Under the terms of the DCO
Emergency fire management system for Battery Energy Storage System (BESS) (ED-46)	To protect water environment receptors from firewater pollution.	Under the terms of the DCO
Measures embedded into the design to ensure permanent conveyance to tunnels/pipelines (ED-49)	To protect groundwater receptors from adverse impacts from tunnelling activities and presence of tunnels.	Under the terms of the DCO
Drainage designed to reduce the risk of flooding (ED-50)	To manage and reduce flood risk to receptors of the Project and help manage flood risk on site.	Under the terms of the DCO

Embedded design mitigation or standard good practice measure (unique commitment ID)	Purpose of mitigation measure	Indicative securing mechanism
Measures to reduce new watercourse crossings (ED-51)	To protect the form and functioning of watercourses.	Under the terms of the DCO
Measures to manage groundwater levels and flow routes (ED-52)	To manage groundwater levels and flow routes.	Under the terms of the DCO

5.10 Preliminary assessment of likely significant effects

Introduction

5.10.1 This section summarises the findings of the preliminary assessment of effects for the water environment, focusing on key effects that are initially anticipated to be 'significant', be they adverse, beneficial or neutral. The judgement of significance has been made assuming that embedded design mitigation and standard good practice mitigation relevant to the water environment is applied (these are noted in Table 5.12 and Table 5.13 and provided in detail in the Draft commitments register in Appendix 2.2). Nevertheless, the assessment assumes that additional mitigation is not yet applied, as the precise nature and extent of any additional mitigation measures is not confirmed at this stage in the EIA process. As a result, consideration of residual effects (those that remain after the implementation of *all* mitigation, including additional mitigation) has not been completed for the PEI report.

5.10.2 As noted in paragraphs 5.1.6 and 5.1.7, assessments reported within this PEI Report chapter are considered a reasonable 'worst case' in line with the precautionary approach that has been taken. Where initial likely significant effects are identified at this stage, these may ultimately be determined as not significant in the ES once data gaps are addressed, and the design and mitigation are further developed. The next steps for the water environment assessment, including further exploration of relevant additional mitigation, are set out in Section 5.11: Next steps.

5.10.3 Appendix 5.4: Preliminary assessment of effects for Water environment, sets out the preliminary assessment of effects, receptor by receptor, for construction and operation, respectively. The appendix is split into tables that list effects that are initially anticipated to be significant, and tables that list effects that are not anticipated to be significant. The tables identify the following for each effect:

- Receptor name, the Effect ID (a unique identifier for each effect), and sensitivity category
- Project components and activities giving rise to the effect
- Relevant embedded design mitigation and standard good practice mitigation (with unique Commitment ID, which relates to Appendix 2.2: Draft commitments register)
- Initial category of effect significance, including whether it is adverse, beneficial or neutral (taking account of embedded design mitigation and standard good practice mitigation)
- Description and duration of the effect
- Any additional mitigation and monitoring identified at this stage (with unique Additional Mitigation ID to enable cross reference to the measure noted in Section 5.11: Next steps

Summary of likely significant construction effects

5.10.4 This section summarises the construction effects that are initially anticipated to be 'significant' through the preliminary assessment of effects for Water environment. It pulls out the key potential causes and receptors affected.

Key potential causes of effects

5.10.5 Chapter 2: Project description explains the construction components and activities for the Project. Key effects on the water environment may result from the following:

- The Project requires the diversion of two watercourses within the draft Order limits, the creation of floodplain conveyance and compensation and provision of the Wilts and Berks Canal, the construction of them would potentially cause effects on the water environment.
- In addition, where construction works interact with the existing water environment, key activities may result in significant effects. Excavations, dewatering, tunnelling, below ground works and watercourse crossings all risk affecting the water balance and water quality of the catchments within the study area.
- The construction of the intake/outfall structure on the River Thames and associated infrastructure also risk causing effects on the water environment.
- Flood risk may be affected by changes in ground level and reconfiguration of watercourses both of which affect flood conveyance.

Key likely significant construction effects

5.10.6 The likely significant construction effects on the water environment receptors are summarised below and provided in full in Appendix 5.4: Preliminary assessment of effects for Water environment.

5.10.7 In some instances where application of Embedded Design and Standard Good Practice Mitigation has not been sufficient to mitigate the potential for likely significant effects due to the scale of works proposed, Additional Mitigation and design work is being undertaken to identify opportunities to mitigate these effects. Effects have been identified on a precautionary basis and will be reviewed and refined as further baseline, design, assessment and modelling information becomes available.

Construction effects on the water quality of surface water receptors

5.10.8 Initial assessment of surface water receptors indicates that there are likely to be significant adverse effects related to surface water quality of certain watercourses for a long-term period, due to the length of the construction period. These effects are due to general construction works that interact with the existing water environment, and will likely apply to works in and around:

- Reach 2 Ock and tributaries (Land Brook confluence to Thames) (including the Ordinary Watercourse / ditch network)
- Reach 5 Childrey Brook and Norbrook at Common Barn
- Reach 7 Cow Common Brook and Portobello Ditch
- Reach 9 Sandford Brook (source to Ock)
- Reach 11 Moor Ditch and Ladygrove Ditch
- Reaches 13 and 14 Thames (Evenlode to Thame)

5.10.9 This is due to the potential for accidental discharges or spills of pollutants, groundwater dewatering, surface water discharges, surface water drainage/runoff and in channel works during construction works. This may lead to the temporary mobilisation of fine sediments

and contaminants to surface waterbodies, leading to potential deterioration in water quality.

5.10.10 Additionally, any below ground works may lead to changes in groundwater/surface water interaction and the potential mobilisation of existing contaminants in the ground, leading to potential deterioration in water quality.

5.10.11 Most of these receptors are classified 'high' or 'very high' sensitivity, therefore even where small changes in water quality are anticipated, this may result in identification of significant effects.

5.10.12 Beyond Reach 14 Thames (Evenlode to Thame), no significant effects are anticipated due to the localised impact of construction works.

Construction effects on the hydrology of surface water receptors

5.10.13 Initial assessment of surface water receptors indicates that there are likely to be long-term significant adverse effects related to the surface water hydrology of the following watercourses due to the length of the construction period:

- Reach 2 Ock and tributaries (Land Brook confluence to Thames)
- Reach 5 Childrey Brook and Norbrook at Common Barn (including East Hanney Ditch and the Ordinary watercourse / ditch network)
- Reach 7 Cow Common Brook and Portobello Ditch (including Cow Common Brook Landmead Ditch, Mere Dyke, and Ordinary watercourse / ditch network)
- Reach 9 Sandford Brook (source to Ock)
- Reaches 13 and 14 Thames (Evenlode to Thame)

5.10.14 This is due to the construction of watercourse diversions, loss and/or modification of watercourses, presence of temporary or permanent watercourse crossings, surface water abstraction and/or discharges and surface water drainage/runoff all of which have potential to affect the hydrology of surface water features, as well as runoff rates, volumes and the distribution of flows.

5.10.15 Additionally, any below ground works may lead to changes in groundwater/surface water interaction and changes to baseflow in adjacent watercourses, through drawdown or the introduction of new discharges of water.

5.10.16 Most of these receptors are classified 'high' or 'very high' sensitivity, therefore even where small changes in hydrology are anticipated, this may result in identification of significant effects.

5.10.17 Beyond Reach 14 Thames (Evenlode to Thame), no significant effects are anticipated due to the localised impact of construction works.

Construction effects on the fluvial geomorphology of surface water receptors

5.10.18 The preliminary assessment of surface water receptors indicates that there are likely to be long-term significant adverse effects related to the fluvial geomorphology of the following watercourses due to the length of the construction period:

- Reach 2 Ock and tributaries (Land Brook confluence to Thames)
- Reach 5 Childrey Brook and Norbrook at Common Barn (including East Hanney Ditch and the Ordinary watercourse / ditch network)

- Reach 7 Cow Common Brook and Portobello Ditch (including Landmead Ditch, Mere Dyke, Cow Common Brook and the Ordinary watercourse / ditch network)
- Reach 9 Sandford Brook (source to Ock)
- Reaches 13 and 14 Thames (Evenlode to Thame)

5.10.19 This is due to the diversion of watercourses, loss and/or modification of watercourses, presence of temporary or permanent watercourse crossings, vegetation clearance and in channel works. These activities may lead to adverse impacts on the local channel morphology and habitats, which may result in potential impacts to hydromorphological conditions.

5.10.20 Watercourse diversions will be completed as part of the Enabling Works phase, which covers a period of approximately 7 years, from 2028 to 2034. There are currently uncertainties regarding longer term effects on the diverted watercourses associated with water availability and impacts on flows. This is due to current uncertainties related to the design of the groundwater drain. Further studies will be undertaken to determine the duration of adverse impacts on the condition of the watercourses and to inform the ongoing design development to mitigate adverse impacts and provide betterment, where possible. It is intended that watercourses will support better quality aquatic habitats, compared to baseline conditions, where possible.

5.10.21 Most of these receptors are classified as 'high' or 'very high' sensitivity, therefore even where small changes in fluvial geomorphology are anticipated, this may result in identification of significant effects.

5.10.22 Beyond Reach 14 Thames (Evenlode to Thame), no significant effects are anticipated due to the localised impact of construction works.

Construction effects to groundwater receptors

5.10.23 Initial assessment of groundwater receptors, as detailed in Appendix 5.2: Preliminary HIA and Appendix 5.4: Preliminary assessment of effects for Water environment, indicates that there are likely to be significant, adverse, long-term effects to the superficial aquifers: Alluvium, Head and River Terrace Deposits due to direct impact to groundwater levels or flows, during construction.

5.10.24 Undertaking construction works, such as dewatering, excavation, tunnelling, piling and trenching activities has the potential to alter and impact groundwater levels and flows in the area.

5.10.25 However, the significance of these effects will be mitigated through additional mitigation measures to reduce the effects to groundwater resources.

Summary of likely non-significant construction effects

5.10.26 This section summarises the justification for construction effects that are initially anticipated to be 'non-significant' through the preliminary assessment of effects for the water environment. In particular, it pulls out the key embedded design mitigation and standard good practice mitigation that will be applied and are anticipated to reduce certain adverse impacts, reducing the associated effects to non-significant.

Construction effects to surface water receptors

5.10.27 For surface water, there are non-significant adverse effects anticipated in relation to changes in water quality, hydrology and fluvial geomorphology as a result of construction activities on some WFD and non-WFD waterbodies, main rivers and Ordinary Watercourses/ditches associated with: Reaches 1 to 24 and existing lakes and ponds.

5.10.28 This is due to a combination of receptors typically being of lower sensitivity to project activities, being further away from main construction activities and the implementation of embedded design mitigation and standard good practice measures (e.g. construction stage surface water management and standard good practice measures for works within or adjacent to waterbodies). These measures will help protect and maintain water quality and flows as well as the form and functioning of watercourses during construction.

Construction effects to flood risk receptors

5.10.29 The preliminary assessment has concluded that there is potential for construction activities to affect flood risk. However, with embedded design and standard good practice measures, there will be no increases in flood risk and therefore all effects are considered to be neutral and non-significant.

5.10.30 Embedded design mitigation including; construction phase surface water management, construction sequencing to mitigate flood risk, providing replacement floodplain and diversion channels before the reservoir is constructed and standard good practice measures to reduce impacts to surface water and groundwater resources will all assist in ensuring there is no detriment to flood risk receptors during construction.

Construction effects to groundwater receptors

5.10.31 With regard to groundwater receptors, adverse effects have been identified relating to changes in water quality, flows and levels in groundwater receptors as a result of construction activities. However, the preliminary assessment and Preliminary HIA (Appendix 5.2) have determined that these activities are unlikely to result in significant effects for the majority of groundwater receptors.

5.10.32 This is due to a combination of receptors typically being of lower sensitivity to project components, being further away from main construction activities, and the implementation of embedded design mitigation and standard good practise measures (e.g. measures to ensure permanent conveyance to tunnels/pipelines and standard good practice measures to reduce the impact to surface and groundwater resources). These will contain and manage surface water runoff from the construction site, preventing adverse impacts on the water environment and other adverse impacts, such as changes to flow volume, water levels and water quality in the river catchment or groundwater body.

5.10.33 Furthermore, ground investigations, risk assessments, and, if required, remediation, in accordance with standard good practice measures for land contamination will also be undertaken to further minimise any effects to the water environment and other adverse impacts, such as changes to flows volume, water levels and water quality in the river catchment or groundwater body.

Summary of likely significant operational effects

5.10.34 This section summarises the operational effects that are initially anticipated to be 'significant' through the preliminary assessment of effects for Water environment. It pulls out the key potential causes and receptors affected.

Key potential causes of effects:

5.10.35 Chapter 2: Project description explains the operational components and activities for the Project. Key effects on the Water environment may result from the following:

- During the operation phase of the Project, the existence of the reservoir and its interaction with the River Thames risk causing effects on the water environment. Specifically, the abstraction and discharge regime, as well as the periodic emergency drawdown testing, would all risk causing changes to the flows, levels and water quality in the River Thames downstream.
- Within the Ock catchment, the existence of the reservoir, diverted watercourses, Project PABs, other project components also risk causing effects on the water environment as they all have the potential to result in a change to water flows, levels, routing and water quality in the catchment.
- The proposed new watercourse channels, ditches, and wetland scrape features will have a more naturalised morphology, riparian structure, and lateral connectivity with the floodplain. Together with changes in catchment land use from existing arable and pasture agricultural land use to new areas of neutral grassland, scrub, woodland, and wet woodland, the Project has the potential to result in beneficial effects on the water environment.
- Certain aspects of the design are under development therefore impacts from the groundwater drain are subject to a preliminarily assessed. Potential impacts include changes in surface water flows.

Key likely significant operational effects

5.10.36 The likely significant operational effects on the water environment receptors are summarised below and provided in full in Appendix 5.4: Preliminary assessment of effects for Water environment.

5.10.37 In some instances where application of Embedded Design and Standard Good Practice Mitigation has not been sufficient to mitigate the potential for likely significant effects due to the scale of works proposed, Additional Mitigation and design work is being undertaken to identify opportunities to mitigate these effects. Effects have been identified on a precautionary basis and will be reviewed and refined as further baseline, design, assessment and modelling information becomes available.

Operational effects on the water quality of surface water receptors

5.10.38 The preliminary assessment of surface water receptors indicates that there is the potential for likely short-term adverse significant effects related to the water quality of Reach 14 Thames (Evenlode to Thame) associated with the operation of the reservoir, including the abstraction and discharge regime, routine emergency drawdown testing of the reservoir and the presence of upstream project components. Surface water discharges and surface

water drainage/runoff may lead to the release of fine sediments and contaminants to surface waterbodies, leading to a deterioration in water quality.

Operational effects on the hydrology of surface water receptors

5.10.39 Preliminary assessment of surface water receptors indicates that there is the potential for likely permanent adverse significant adverse effects related to the surface water hydrology of the following watercourses:

- Reach 2 Ock and tributaries (Land Brook confluence to Thames)
- Reach 5 Childrey Brook and Norbrook at Common Barn (including East Hanney Ditch and Ordinary Watercourse / ditch network)
- Reach 7 Cow Common Brook and Portobello Ditch (including Cow Common Brook, Landmead Ditch, Mere Dyke and Ordinary Watercourse / ditch network)
- Reach 9 Sandford Brook (source to Ock)
- Reach 11 Moor Ditch and Ladygrove Ditch

5.10.40 This is due to the potential that permanent loss of catchment area, creation of new sections of watercourse, changes to surface water drainage/runoff and changes to groundwater drainage/discharges may lead to changes to downstream watercourse flows, volumes and levels, impacting the hydrology of the watercourse.

5.10.41 Permanent beneficial significant effects on the surface water hydrology of Reach 4 Childrey and Woodhill Brooks, Reach 6 Letcombe Brook and Reach 10 Ginge Brook and Mill Brook are expected as a result of the Project. This is due to land-use changes in the form of Project PABs. Enhancement of existing watercourse(s) that may lead to beneficial changes to downstream levels/flows and may mitigate the existing effects on hydrology. Due to the high sensitivity of these receptors, even where small beneficial changes in hydrology are anticipated, this may result in identification of significant effects.

5.10.42 Most of these receptors are classified ‘high’ or ‘very high’ sensitivity, therefore even where small changes in hydrology are anticipated, this may result in identification of significant effects.

5.10.43 There is also the potential for likely short-term adverse effects on the hydrology of Reach 14 Thames (Evenlode to Thame) associated with the operation of the reservoir, including the abstraction regime and routine emergency drawdown testing of the reservoir, as well as the presence of Project components within or upstream of watercourse(s), which may lead to adverse changes to flow volumes and the quantity of water of the receptor.

Operational effects on the fluvial geomorphology of surface water receptors

5.10.44 Preliminary assessment of surface water receptors indicates that there is the potential for likely permanent significant adverse effects related to the fluvial geomorphology of the following watercourses:

- Reach 2 Ock and tributaries (Land Brook confluence to Thames)
- Reach 5 Childrey Brook and Norbrook at Common Barn (including East Hanney Ditch and the Ordinary Watercourse / ditch network)
- Reach 7 Cow Common Brook and Portobello Ditch (including Cow Common Brook, Landmead Ditch, Mere Dyke and the Ordinary Watercourse / ditch network)
- Reach 9 Sandford Brook (source to Ock)
- Reach 11 Moor Ditch and Ladygrove Ditch

5.10.45 This is due to the presence and operation of Project components within or adjacent to the watercourses, such as watercourse diversions and watercourse crossings.

5.10.46 Permanent beneficial significant effects related to the fluvial geomorphology of Reach 4 Childrey and Woodhill Brooks, Reach 6 Letcombe Brook and Reach 10 Ginge Brook and Mill Brook are expected as a result of the Project, due to land-use changes in the form of Project PABs.

5.10.47 Modification, creation or enhancement of waterbodies and associated riparian habitat may result in beneficial impacts to the local channel morphology and habitats. Due to the high sensitivity of these receptors, even where small beneficial changes in fluvial geomorphology are anticipated, this may result in identification of significant effects.

5.10.48 Most of these receptors are classified 'high' or 'very high' sensitivity, therefore even where small changes in fluvial geomorphology are anticipated, this may result in identification of significant effects.

5.10.49 There is also the potential for likely short-term adverse significant effects related to the fluvial geomorphology of Reach 14 Thames (Evenlode to Thame) associated with operation of the reservoir, including the abstraction regime and emergency drawdown testing of the reservoir. This has the potential to periodically cause changes in the flows and levels in the Thames, which may impact fluvial geomorphology.

Summary of likely non-significant operation effects

5.10.50 This section summarises the justification for operation effects that are initially anticipated to be 'non-significant' through the preliminary assessment of effects for the water environment. In particular, it pulls out the key embedded design mitigation and standard good practice mitigation that will be applied and are anticipated to reduce certain adverse effects to be non-significant.

Operational effects to surface water receptors

5.10.51 With regard to surface water receptors, there are non-significant adverse effects anticipated in relation changes in water quality, hydrology and fluvial geomorphology as a result of operation activities.

5.10.52 This is due to a combination of receptors typically being of lower sensitivity to project activities, and the implementation of embedded design and standard good practice measures. These include measures to protect and maintain water quality and flows during operation and protect the form and functioning of watercourses, for example through the provision of scour protection on the River Thames, operation phase surface water management and a Drainage Strategy to align with national and local planning policy and guidance.

Operational effects to groundwater receptors

5.10.53 With regard to groundwater receptors, potential adverse impacts have been identified relating to the potential for changes in water quality, flows and levels in the groundwater as a result of construction activities. However, the preliminary impact assessment and Preliminary HIA (Appendix 5.2) has determined that adverse impacts would not be

significant with the implementation of embedded design mitigation. These include the lining of key surface water features where necessary, a drainage strategy and measures to manage groundwater levels and flow routes which will likely include, but not be limited to, appropriately designed groundwater drain and tunnels.

Operational effects to flood risk receptors

5.10.54 With regard to flood risk, the preliminary assessment has concluded that although there is potential for the operation phase to affect flood risk, with embedded design and standard good practice, there would be no increases in flood risk and therefore no significant effects. Furthermore, all non-significant effects are considered to be neutral, and no adverse effects related to flood risk are anticipated.

5.10.55 Embedded mitigation including design of drainage and culverts to prevent flooding, the inclusion of an operation phase surface water management plan and measures for safe reservoir operation will all assist in ensuring there is no detriment to flood risk receptors during operation. Furthermore, there will be a Drainage Strategy which will align with national and local planning policy and guidance to prevent adverse effects to flood risk.

5.11 Next steps

5.11.1 As part of next steps, the Project is proactively developing the design, refining the construction approach and continuing to define the environmental baseline, in conjunction with ongoing consultation and engagement. These activities will inform the EIA process and provide a robust evidence base for the ES. The aim is that where initial likely significant effects are identified at this stage, these may ultimately be determined as not significant in the ES once data gaps are addressed, and the design and mitigation proposals are further developed. Effects that remain after the implementation of all mitigation are referred to as 'residual effects'. These effects are not reported in the PEI Report as additional mitigation is not assumed to be implemented at this stage of the assessment. The assessment of the significance of residual effects after all mitigation is applied is a key outcome of the EIA process and will be reported within the ES, which will be submitted with the DCO application.

5.11.2 The next steps anticipated to be undertaken in relation to the Water environment assessment prior to completion of the ES and submission of the DCO application are explained below.

Further exploration of additional mitigation

5.11.3 A key aspect of the next steps is to further explore additional mitigation that may reduce adverse effects that the preliminary assessment has initially identified as likely to be significant. Additional mitigation that has been identified for the Water environment assessment is noted against relevant likely significant effects in Appendix 5.4: Preliminary assessment of effects for Water environment. All additional mitigation that has been identified in relation to the Water environment assessment to date is listed below in Table 5.14 along with a description of what each measure entails. Each measure has a unique Additional Mitigation ID to enable cross reference between Appendix 5.4: Preliminary assessment of effects for Water environment and Table 5.14. As noted previously above, the preliminary assessment presented in the PEI Report assumes that additional mitigation

is not yet applied, as the precise nature and extent of any additional mitigation measures is not confirmed at this stage in the EIA process.

Table 5.14 Additional mitigation identifed to date in relation to the Water environment assessment

Additional mitigation ID	Additional mitigation name	Description of additional mitigation measure
AM-01	Stabilisation of river banks	After excavating and connecting water to newly created river channels, the banks could be planted, where appropriate, with suitable species to prompt stabilisation and improve water quality.
AM-17	Measures to manage and protect water flows in watercourses	Measures are being explored to manage and protect water flows within the River Thames during water abstraction and augmentation. Example measures may include: - The development and application of an appropriate hands-off flow regime in liaison with the Environment Agency to manage or prevent water abstraction when river flows are low enough that further reductions could significantly harm the aquatic environment. - The development and application of an abstraction and discharge regime with incremental flow adjustments to manage flow velocities as the project progresses (with necessary environmental permit(s)). Furthermore, where appropriate, river habitats at other watercourses could be designed to mitigate potential changes in flow and habitat quality.
AM-18	Measures to manage Biochemical Oxygen Demand concentrations	Potential measures to manage Biochemical Oxygen Demand concentrations in the reservoir could include mixing and aeration (including consideration of low carbon/low energy options) and the use of alternative draw off depths within the reservoir.
AM-19	Measures to offset any residual effects on water quality within the Ock Catchment	Catchment or point source measures could be developed to offset any residual effects on water quality within the Ock Catchment (e.g. the lowermost Childrey Brook, Letcombe Brook to the upper reaches of the Cow Common Brook). This may include exploring opportunities to change land use such as modifications to agricultural practices, changes to point source loads and/or development of nature based solutions for pollution mitigation (e.g. reed beds).
AM-35	Water quality monitoring and subsequent remedial activities where these are required	Water quality monitoring will be required post construction to identify potential impacts to water bodies sensitive to changes in water quality. If required, subsequent remedial activities may be undertaken, where these are able to reduce impacts to hydromorphological, water quality and biological conditions in the waterbodies. Examples of potential remedial activities include: • the aeration of waterbodies • Planting vegetation

Additional mitigation ID	Additional mitigation name	Description of additional mitigation measure
		• Silt removal • Biomanipulation techniques and circulation measures • Use of additional chemicals to manage water quality in the event algal load increases.
AM-37	Scour protection required for watercourse diversions	Scour protection may be required for the watercourse diversions. Where appropriate, this will be implemented as a part of the design.

Other next steps

5.11.4 Other steps that are continuing or are planned to be undertaken to support the Water environment assessment prior to completion of the ES and submission of the DCO application are noted below with an explanation of how these will inform the EIA process:

- Ongoing surveys to be undertaken and additional information collated, including water quality monitoring, geomorphology (including MoRPh) surveys, hydrometric monitoring, ground investigation and information on private water abstractions. These ongoing surveys and data collation will enable a better understanding of the baseline conditions and receptors.
- Specific engagement not already covered in the engagement section above (Section 5.3: Consultation, engagement and scoping): Ongoing Technical Liaison Groups with Environment Agency, Natural England and Oxfordshire County Council including in relation to methodologies being used to undertake related water environment monitoring, modelling and assessments and consents and permitting requirements
- Specialist studies and modelling to be undertaken, including modelling of fluvial flooding, groundwater levels and flow, river flows, levels and water quality, water resources, and reservoir physical and water quality parameters. These will enable a better understanding of the impact magnitude the Project will have on the water environment and the significance of effects. These will also help in understanding how to refine the design and further mitigation.
- Aspect-specific assessments: Water Framework Directive Compliance Assessment, Hydrogeology Impact Assessment, Flood Risk Assessment, Water Resources Assessment, Water Quality Assessment to better understand potential impacts of the Project on different aspects of the water environment and inform the ES.
- Opportunities to enhance the existing water environment, including improvements to watercourses, will be identified through ongoing design development and informed by the results of ongoing surveys

5.11.5 Abstraction of water from the River Thames into the reservoir and discharge of water back into the River Thames would be subject to the conditions of a license/permit from the Environment Agency. This would include the need to comply with measures in order to avoid adversely affecting flows and water quality within the River Thames and further downstream. The Environment Agency's Permitting service will be consulted on requirements for abstraction licences and discharge permits that would be required by the Project.

References

It should be noted that the Institute of Environmental Management and Assessment (IEMA) has recently rebranded as the Institute of Sustainability and Environmental Professionals (ISEP). Guidance that was historically published by IEMA is still referenced under that institute name.

Bathing Water Regulations 2013. Accessed February 2025. https://www.legislation.gov.uk/uksi/2013/1675/contents/made

British Geological Survey (BGS) (2025a). GeoIndex Onshore: 1:50,000 geology. Accessed February 2025. https://www.bgs.ac.uk/map-viewers/geoindex-onshore/

British Geological Survey (BGS) (2025b). Susceptibility to Groundwater Flooding dataset. Received August 2025.

Conservation of Habitats and Species Regulations 2017. Accessed February 2025. https://www.legislation.gov.uk/uksi/2017/1012/contents/made

Culham Parish Council (2022) Culham Neighbourhood Plan 2020-2041. Accessed February 2025. https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2022/07/Culham-NP_Submission-Plan_June-2022-compressed.pdf

Defra (2025). Multi-Agency Geographic Information for the Countryside (MAGIC). Accessed February 2025. https://magic.defra.gov.uk/MagicMap.html

Department for Environment, Food & Rural Affairs (2020) Flood and coastal erosion risk management: policy statement. Accessed February 2025. https://www.gov.uk/government/publications/flood-and-coastal-erosion-risk-management-policy-statement

Department for Environment, Food & Rural Affairs (2023a) Environmental Improvement Plan 2023. Accessed 2025. https://www.gov.uk/government/publications/environmental-improvement-plan

Department for Environment, Food and Rural Affairs (2023b) National LIDAR Programme. Accessed February 2025. https://www.data.gov.uk/dataset/f0db0249-f17b-4036-9e65-309148c97ce4/national-lidar-programme.

Department for Environment, Food & Rural Affairs (2023c) Plan for Water: our integrated plan for delivering clean and plentiful water. Accessed February 2025. https://www.gov.uk/government/publications/plan-for-water-our-integrated-plan-for-delivering-clean-and-plentiful-water/plan-for-water-our-integrated-plan-for-delivering-clean-and-plentiful-water

Department for Environment, Food & Rural Affairs (2025) National Policy Statement for water resources infrastructure. Accessed August 2025. https://www.gov.uk/government/publications/national-policy-statement-water-resources-infrastructure

Department for Environment, Food and Rural Affairs and Environment Agency (2025) Water Quality Archive. Accessed February 2025. https://environment.data.gov.uk/water-quality/view/landing

Department for Transport (2025) TAG unit A3 environmental impact appraisal. Accessed February 2025. https://www.gov.uk/government/publications/tag-unit-a3-environmental-impact-appraisal

East Hanney Parish Council (2023) East Hanney Neighbourhood Plan 2021-2031. Accessed February 2025. https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2023/04/East-Hanney-Neighbourhood-Plan.pdf

Environment Act 1995. Accessed February 2025. https://www.legislation.gov.uk/ukpga/1995/25/contents

Environment Act 2021. Accessed February 2025. https://www.legislation.gov.uk/ukpga/2021/30/contents

Environment Agency (2007). Hydrogeological impact appraisal for dewatering abstractions. Accessed February 2025. https://www.gov.uk/government/publications/hydrogeological-impact-appraisal-for-dewatering-abstractions

Environment Agency (2019a). Kennet and Vale of White Horse Abstraction Licensing Strategy. Accessed February 2025. https://assets.publishing.service.gov.uk/media/5cb70475e5274a4f43fa5077/Kennet-and-Vale-of-White-Horse-Abstraction-Licensing-Strategy.pdf

Environment Agency (2019b). Thames Abstraction Licensing Strategy. Accessed February 2025. https://assets.publishing.service.gov.uk/media/5de4ebc940f0b650c268495f/Thames-Abstraction-Licensing-Strategy.pdf

Environment Agency (2022a). Flood and coastal risk projects, schemes and strategies: climate change allowances. Accessed February 2025. https://www.gov.uk/guidance/flood-and-coastal-risk-projects-schemes-and-strategies-climate-change-allowances

Environment Agency (2022b). Flood risk assessments: climate change allowances. Accessed February 2022. https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Environmental Agency (2022c). Flood risk management plans 2021 to 2027: national overview (part a). Accessed August 2025. https://www.gov.uk/government/publications/flood-risk-management-plans-2021-to-2027-national-overview-part-a

Environmental Agency (2022d). River basin management plans: updated 2022. Accessed August 2025. https://www.gov.uk/guidance/river-basin-management-plans-updated-2022

Environment Agency (2022e). Thames river basin district river basin management plan: updated 2022. Accessed February 2025. https://www.gov.uk/guidance/thames-river-basin-district-river-basin-management-plan-updated-2022

Environment Agency (2023). Thames river basin district flood risk management plan. Accessed February 2025. https://www.gov.uk/government/publications/thames-river-basin-district-flood-risk-management-plan

Environment Agency (2024a). Groundwater Dependent Terrestrial Ecosystems (England only). Accessed February 2025. https://www.data.gov.uk/dataset/72a149a2-1be7-441f-bc37-94a77f261e27/groundwater-dependent-terrestrial-ecosystems-england-only

Environment Agency (2024b). Hydrology Data Explorer: Sutton Courtenay. Accessed August 2024. https://environment.data.gov.uk/hydrology/station/b0713e87-cab3-46e4-bfb3-f0bbb91cedf6

Environment Agency (2025a). Abstraction licences. Received May 2025.

Environment Agency (2025b). Catchment Data Explorer. Accessed February 2025. https://environment.data.gov.uk/catchment-planning/

Environment Agency (2025c). Check the long term flood risk for an area in England. Accessed February 2025. https://www.gov.uk/check-long-term-flood-risk

Environment Agency (2025d). Consented Discharges. Received May 2025.

Environment Agency (2025e). Flood Map for Planning. Accessed January 2025. https://flood-map-for-planning.service.gov.uk/

Environment Agency (2025f). Groundwater Dependent Terrestrial Ecosystems (England only). Accessed February 2025. https://www.data.gov.uk/dataset/72a149a2-1be7-441f-bc37-94a77f261e27/groundwater-dependent-terrestrial-ecosystems-england-only

Environment Agency (2025g). Hydrology Data Explorer. Accessed February 2025. https://environment.data.gov.uk/hydrology/landing

Environment Agency (2025h). Statutory Main River Map. Accessed February 2025. https://www.data.gov.uk/dataset/4ae8ba46-f9a4-47d0-8d93-0f93eb494540/statutory-main-river-map

Environment Agency and Department for Environment, Food & Rural Affairs (2024). Groundwater protection. Accessed February 2025. https://www.gov.uk/government/collections/groundwater-protection

Environment Agency, Natural Resources Wales and The Water Services Regulation Authority (2023). Water resources planning guideline. Accessed February 2025. https://www.gov.uk/government/publications/water-resources-planning-guideline

Environmental Damage (Prevention and Remediation) (England) Regulations 2015. Accessed February 2025. https://www.legislation.gov.uk/uksi/2015/810/contents

Environmental Permitting (England and Wales) Regulations 2016. Accessed February 2025. https://www.legislation.gov.uk/uksi/2016/1154/contents

Environmental Protection Act 1990. Accessed February 2025. https://www.legislation.gov.uk/ukpga/1990/43/contents

Environmental Simulations Incorporated (2008). Groundwater model of the Corallian aquifer.

Environmental Targets (Water) (England) Regulations 2023. Accessed February 2025. https://www.legislation.gov.uk/uksi/2023/93/contents/made

Flood and Water Management Act 2010. Accessed February 2025. https://www.legislation.gov.uk/ukpga/2010/29/contents

Flood Risk Regulations 2009. Accessed February 2025. https://www.legislation.gov.uk/uksi/2009/3042/contents

Freshwater Habitats Trust (2025). Ock Catchment Partnership. Accessed February 2025. https://freshwaterhabitats.org.uk/our-work/conservation-and-practical-delivery/catchment-partnerships/ock-catchment-partnership

Google (2025). Google Earth imagery. Accessed February 2025. https://earth.google.com/web/

Groundwater (Water Framework Directive) (England) Direction 2016. Accessed February 2025. https://www.gov.uk/government/publications/the-groundwater-water-framework-directive-england-direction-2016

Groundwater Regulations 1998. Accessed February 2025. https://www.legislation.gov.uk/uksi/1998/2746/contents

Highways Act 1980. Accessed February 2025. https://www.legislation.gov.uk/ukpga/1980/66/contents

HM Government (2023). A Green Future: Our 25 Year Plan to Improve the Environment. Accessed February 2025. https://assets.publishing.service.gov.uk/media/65fd713d65ca2f00117da89e/CD1.H_HM_Government_A_Green_Future_Our_25_Year_Plan_to_Improve_the_Environment.pdf

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Accessed February 2025. https://www.legislation.gov.uk/uksi/2017/572/contents

Institute of Geological Sciences (1978). Hydrogeological map of the south west Chilterns and the Berkshire and Marlborough Downs. Accessed February 2025. https://largeimages.bgs.ac.uk/iip/hydromaps.html?id=south-west-chilterns.jp2

Integrated Catchment Modelling (n.d.). Baseline model outputs from the main channel of the River Thames and the Ock catchment simulated in a water quality model run using the model software Infoworks ICM. Accessed November 2024.

Kwan, J., Dickinson, C. and MacLeod, C. (2023). Environmental good practice on site guide (fifth edition) (C811). CIRIA.

Land Drainage Act 1991. Accessed February 2025. https://www.legislation.gov.uk/ukpga/1991/59/contents

Masters-Williams, H., Heap, A., Kitts, H., Greenshaw, L., Davis, S., Fisher, P., Hendrie, M. and Owens, D. (2001). Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA.

McBain, W. and Styles, T. (2019). Water in Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities. ICE Publishing.

Ministry of Housing, Communities and Local Government (2025). National Planning Policy Framework. Accessed February 2025. https://www.gov.uk/government/publications/national-planning-policy-framework--2

Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities (2024). Planning practice guidance. Accessed February 2025. https://www.gov.uk/government/collections/planning-practice-guidance

Mott MacDonald (2024). Hydraulic model of the River Ock. Received October 2024.

Mott MacDonald (2024). Hydraulic model of the River Thames. Received September 2024.

Murnane, E., Heap, A. and Swain, A. (2006). Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA.

Mustow, S.E., Burgess, P.F. and Walker, N. (2007). Practical Methodology for Determining the Significance of Impacts on the Water Environment.

National Highways (2020a). Design Manual for Roads and Bridges (DMRB): LA 104 – Environmental assessment and monitoring. Accessed February 2025. https://www.standardsforhighways.co.uk/search/0f6e0b6a-d08e-4673-8691-cab564d4a60a

National Highways (2020b). Design Manual for Roads and Bridges(DMRB): LA 113 – Road drainage and the water environment. Accessed February 2025. https://www.standardsforhighways.co.uk/search/d6388f5f-2694-4986-ac46-b17b62c21727

National River Flow Archive (2024a). 39018 – Ock at Abingdon. Accessed August 2024. https://nrfa.ceh.ac.uk/data/station/otherDatasets/39018

National River Flow Archive (2024b). 39046 – River Thames at Sutton Courtenay. Accessed August 2024. https://nrfa.ceh.ac.uk/data/station/meanflow/39046

National River Flow Archive (2024c). 39061 – Letcombe Brook at Letcombe Bassett. Accessed August 2024. https://nrfa.ceh.ac.uk/data/station/info/39061

National River Flow Archive (2024d). 39081 – Ock at Abingdon. Accessed August 2024. https://nrfa.ceh.ac.uk/data/station/meanflow/39081

National River Flow Archive (2024e). 39112 – Letcombe Brook at Arabellas Lake. Accessed August 2024. https://nrfa.ceh.ac.uk/data/station/info/39112

National River Flow Archive (2024f). 39113 – Manor Farm Brook at Letcombe Regis. Accessed August 2024. https://nrfa.ceh.ac.uk/data/station/info/39113

Ordnance Survey (2025). Ordnance Survey maps. Accessed February 2025. https://maps.nls.uk/os/

Oxfordshire County Council (2011). Preliminary Flood Risk Assessment Draft Report. Accessed February 2025. https://www.oxfordshirefloodtoolkit.com/wp-content/uploads/2018/04/Oxfordshire-PFRA-Main-Report-2011.pdf

Oxfordshire County Council (2024). Local Nature Recovery Strategy (draft). Accessed February 2025. https://www.oxfordshire.gov.uk/residents/environment-and-planning/local-nature-recovery-strategy

Oxfordshire County Council (2025). Oxfordshire Local Flood Risk Management Strategy. Accessed February 2025. https://www.oxfordshirefloodtoolkit.com/wp-content/uploads/2025/01/Oxfordshire-Local-Flood-Risk-Management-Strategy-v5.0-updated.pdf

Planning Inspectorate (2018). Nationally Significant Infrastructure Projects: Advice Note Nine – Rochdale Envelope. Accessed June 2025. https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope

Planning Inspectorate (2024). Scoping Opinion: Proposed South East Strategic Reservoir Option (SESRO). Accessed February 2025. https://nsip-documents.planninginspectorate.gov.uk/published-documents/WA010005-000017-SESRO%20Scoping%20Opinion%202017%20EIA%20Regs%20FINAL.pdf

Planning Inspectorate (2025). Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive. Accessed February 2025. https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive

Sear, D., Newson, M. and Thorne, C. (2009). Guidebook of Applied Fluvial Geomorphology. Emerald Publishing Limited.

South Oxfordshire District Council (2020). South Oxfordshire Local Plan 2011–2035. Accessed February 2025. https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2021/02/SODC-LP2035-Publication-Feb-2021.pdf

South Oxfordshire District Council and Vale of White Horse District Council (2024a). Joint Local Plan 2041. Accessed February 2025. https://www.whitehorsedc.gov.uk/vale-of-white-horse-district-council/planning-and-development/local-plan-and-planning-policies/local-plan-2041/

South Oxfordshire District Council and Vale of White Horse District Council (2024b). Level 1 Strategic Flood Risk Assessment (SFRA). Accessed February 2025. https://www.southandvale.gov.uk/app/uploads/2024/09/Level-1-SFRA.pdf

South Oxfordshire District Council and Vale of White Horse District Council (2024c). Level 2 Strategic Flood Risk Assessment(SFRA). Accessed February 2025. https://www.southandvale.gov.uk/app/uploads/2024/10/Level-2-SFRA.pdf

Sutton Courtenay Parish Council (2024). Sutton Courtenay Neighbourhood Plan 2031. Accessed February 2025. https://www.whitehorsedc.gov.uk/wp-content/uploads/sites/3/2024/02/Sutton-Courtnenay-NDP-Referendum-Version.pdf

Steventon Parish Council (2024). Steventon Parish Neighbourhood Development Plan 2022–2031. Accessed February 2025. https://www.southandvale.gov.uk/app/uploads/sites/3/2024/10/Steventon-Parish-Neighbourhood-Development-Plan-.pdf

Thames Conservancy Act 1932. Accessed February 2025. https://www.legislation.gov.uk/ukla/1932/37/contents/enacted

Thames Water (2022). Drought Plans. Accessed August 2025. https://www.thameswater.co.uk/media-library/afqhcxiq/thames-water-drought-plan-2022.pdf

Thames Water (2023a). Drainage and Wastewater Management Plan. Accessed August 2025. https://www.thameswater.co.uk/about-us/regulation/drainage-and-wastewater-management/our-dwmp

Thames Water (2023b). TMS26 Enhancement Case: WINEP. Accessed February 2025. https://www.thameswater.co.uk/media-library/o5udnasq/winep.pdf

Thames Water (2024a). South East Strategic Reservoir Option: Environmental Impact Assessment Scoping Report. Accessed July 2025. https://nsip-documents.planninginspectorate.gov.uk/published-documents/WA010005-000010-SESRO%20EIA%20Scoping%20Report.pdf

Thames Water (2024b). Water Resources Management Plan 2024: Section 3 – Demand Forecast. Accessed May 2025. https://www.thameswater.co.uk/about-us/regulation/water-resources/previous-plans#revised

Thames Water (2025). South East Strategic Reservoir Option (SESRO) – Non-statutory Public Consultation 2024: Statement of Response. Accessed May 2025. https://thames-sro.co.uk/media/mpicfw51/sesro-statement-of-response-to-our-non-statutory-public-consultation-2024.pdf

The Nitrate Pollution Prevention Regulations 2015. Accessed February 2025. https://www.legislation.gov.uk/uksi/2015/668/contents

UK Centre for Ecology & Hydrology (2025). UK Lakes Portal. Accessed February 2025. https://uklakes.ceh.ac.uk/

UK Centre for Ecology & Hydrology (n.d.). Protech model for algal levels in the reservoir. Received November 2024.

UK Technical Advisory Group on the Water Framework Directive (2004). Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems.

Urban Waste Water Treatment (England and Wales) Regulations 1994 (transposed from the EU Directive 91/271/EEC). Accessed February 2025. https://www.legislation.gov.uk/uksi/1994/2841/contents

Vale of White Horse District Council (2016). Local Plan 2031. Accessed February 2025. https://www.whitehorsedc.gov.uk/vale-of-white-horse-district-council/planning-and-development/local-plan-and-planning-policies/local-plan-2031/

Water Abstraction and Impounding (Exemptions) Regulations 2017. Accessed February 2025. https://www.legislation.gov.uk/uksi/2017/1044/contents

Water Act 2014. Accessed February 2025. https://www.legislation.gov.uk/ukpga/2014/21/contents

Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Accessed February 2025. https://www.legislation.gov.uk/uksi/2017/407/contents

Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. Accessed February 2025. https://www.legislation.gov.uk/uksi/2015/1623/resources

Water Industry Act 1991. Accessed February 2025. https://www.legislation.gov.uk/ukpga/1991/56/contents

Water Resources (Abstraction and Impounding) Regulations 2006. Accessed February 2025. https://www.legislation.gov.uk/uksi/2006/641/contents

Water Resources Act 1991. Accessed February 2025. https://www.legislation.gov.uk/ukpga/1991/57/contents

Water Supply (Water Quality) Regulations 2018. Accessed February 2025. https://www.legislation.gov.uk/wsi/2018/647/contents

It's everyone's water