Preliminary Environmental Information Report

Volume 4
Appendix 18.1

Preliminary Water Framework Directive Compliance Assessment

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1. Introduction

1.1 Introduction

1.1.1.1 This report addresses the effects of the River Thames Scheme (hereafter referred to as the RTS or the project) on surface water and groundwater bodies in relation to the requirements of the Water Framework Directive (WFD) at the scoping assessment stage.

1.2 WFD Background

1.2.1.1 The Water Framework Directive (2000/60/EC) sets objectives for water bodies to achieve Good status or potential within a set timeframe. The UK Government adopted the Directive through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (hereafter referred to as the WFD Regulations).

1.2.1.2 The WFD stipulates that all water bodies should meet good ecological status (GES) (or good ecological potential (GEP) if an artificial or heavily modified water body) by a set timeframe. A deadline has been set within River Basin Management Plans (RBMPs) for these water bodies to achieve the required status, unless alternative arrangements (e.g., exemptions due to cost and technical feasibility) can be justified. The RBMP WFD cycle of assessments takes place every six years and therefore objectives which have not been achieved by 2015 may roll on to the 2021 cycle, and so on to the 2027 assessment.

1.2.1.3 The 2017 Regulations place a general duty on the Secretary of State (SoS), the Welsh Ministers, the Environment Agency (EA), and Natural Resources Wales (NRW) to exercise their 'relevant functions' so as to secure compliance with the WFD. The SoS will need to consider the implications of the RTS, firstly in relation to the specific duty to have regard to the RBMP and supplementary plans, and secondly, in more general terms in relation to the UK's ability to comply with the WFD, including (if applicable) the derogation provisions of Regulation 19.

1.2.1.4 The Secretary of State will also be mindful of their duties under the Water Framework Regulations as an ‘important and relevant’ consideration that they must have regard to in determining the Development Consent Order (DCO) application for RTS under Section 105 of the Planning Act 2008.

1.2.1.5 This WFD Compliance Assessment is being undertaken to assess whether the project is compliant with the objectives of the WFD and will support the

Environmental Impact Assessment (EIA) and DCO application for the project.

1.3 Scope of this report

1.3.1.1 The scope of this report is to present the findings of the preliminary assessment stage following the screening of water bodies (Stage 1) that could be affected by the RTS. This preliminary assessment (-Stage 2 - scoping) identifies whether there is a potential risk to any of the water bodies screened in during Stage 1 and is undertaken separately for each water body and each activity (or group of activities). This is to ensure that the project is compliant with the requirements of the WFD and any risk to compliance is documented, so that any measures or actions required are clearly identified to support the application for a DCO.

1.3.1.2 This Preliminary WFD Compliance Assessment has been undertaken during the Preliminary Environmental Impact Report (PEIR) stage of the project. Design development is ongoing, and is being informed by consultation, technical surveys and assessments. As such, an understanding of the potential likely significant effects of the RTS upon the water environment is still underway and the information provided within this assessment is preliminary only. This assessment is based on the project description and certain design parameters as set out in Section 2 of the project's PEIR. At the Environmental Statement stage, this preliminary WFD compliance assessment will be reviewed and potentially refined to take account of any developments in the project.

1.4 Previous WFD Assessment work

1.4.1.1 A WFD Compliance Assessment was previously undertaken in 2017 for the outline design of the project (GBV, 2018), which included the Berkshire Channel (Channel Section 1) which is now removed from the design. This assessment reviewed the impacts that the capacity improvements and all three flood channel sections associated with the RTS would have on WFD water bodies within the RTS boundary.

1.4.1.2 The 2017 assessment concluded that the RTS and associated works had the potential to create significant changes and possible deterioration to the status of some of the water bodies within the study area. The following water bodies were taken forward to preliminary assessment:

- Chertsey Bourne (Virginia Water to Chertsey);
- Datchet Common Brook;

- Horton Brook;
- River Thames (Cookham to Egham);
- River Thames (Egham to Teddington);
- Thorpe Park Lakes;
- Wraysbury No.2;
- Thames Upper;
- Chobham Bagshot Beds; and,
- Lower River Thames Gravels.

1.4.1.3 Following this assessment, the following water bodies were considered to be at risk of deterioration and were taken forward to detailed assessment:

- Datchet Common Brook;
- Horton Brook;
- Wraysbury No. 2;
- Thames (Cookham to Egham);
- Thames (Egham to Teddington); and,
- Thorpe Park Lakes.

1.4.1.4 The 2017 WFD Compliance Assessment concluded that the modifications proposed as part of the RTS had the potential to undermine the WFD objectives for Wraysbury No. 2 lake, Thorpe Park Lakes, Datchet Common Brook and Horton Brook WFD water bodies. Article 4.7 (now Regulation 19 in the WFD) test statements were compiled for all four of the water bodies. It was found that the four tests under Article 4.7 of the Directive could be met sufficiently to demonstrate that the project would be compliant with the WFD. Following removal of the Berkshire Channel, Wraysbury No. 2 lake, Datchet Common Brook and Horton Brook are no longer intersected by the proposed flood channel.

2. Methodology

2.1 Background

2.1.1.1 This section sets out the approach to the WFD Compliance Assessment for the RTS.

2.1.1.2 The WFD was transposed into national law in the UK by means of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017) updated the previous regulations of 2003. The 2017 Regulations are currently in force in England following the departure of the UK from the European Union under the provisions of the European Union (Withdrawal Agreement Act 2020) but as amended by the Flood and Water (Amendment etc.) (EU Exit) Regulations 2019.

2.1.1.3 The WFD aims to protect and enhance water bodies within Europe, and this WFD Compliance Assessment includes lakes, rivers, groundwater and transitional waters. Within each water body, the WFD sets overall, ecological and chemical objectives. The overall objective for all natural water bodies is to attain a current status of 'Good', which comprises 'Good Ecological Status (GES)' and 'Good Chemical Status', and for all Artificial or Heavily Modified Water Bodies (A/HMWB) there is a requirement to meet Good Ecological Potential (GEP). A deadline has been set within River Basin Management Plans (RBMPs) for these water bodies to achieve the required status, unless alternative arrangements (e.g. exemptions due to cost and technical feasibility) can be justified.

2.1.1.4 Groundwaters are assessed in a different way to surface waters. Instead of GES and GEP, groundwaters are classified as either good or poor in terms of quantity (groundwater levels, flow directions) and quality (pollutant concentrations and conductivity). UKTAG have provided guidance on how groundwater quantity and quality is assessed (UKTAG, 2012 & 2019).

2.1.1.5 Regulation 19 of the regulations sets out the circumstances in which 'A failure to achieve good groundwater status, good ecological status or (where relevant) good ecological potential, or to prevent deterioration in the status of a body of surface water or groundwater' is allowed.

2.1.1.6 The WFD categorises areas requiring special protection under other EC Directives and waters used for the abstraction of drinking water as protected areas. These areas have their own additional objectives and standards in relation to the other Directives.

2.1.1.7 The RBMP identifies protected area designations for water bodies. Those relevant to this WFD Compliance Assessment include: the Habitats Directive (1992/43/EC), the Birds Directive (2009/147/EEC), the Nitrates Directive (1991/676/EEC), and the Urban Waste Water Treatment Directive (1991/271/EEC) (UWWTD). If these are located within the study area, then these may also require consideration within the WFD Compliance Assessment.

2.1.1.8 The RBMP WFD cycle of assessments takes place every six years and therefore objectives which have not been achieved by 2015 may roll on to the 2021 cycle, and so on to the 2027 assessment. The relevant RBMP for the project is the Thames River Basin District 2021 RBMP (Environment Agency, 2021).

2.2 Assessing WFD status

2.2.1 Surface water body status

2.2.1.1 Under the WFD, the Environment Agency (as the competent authority) classifies overall surface water body status on the basis of chemical and ecological status or potential. Ecological status is assigned to surface water bodies that are natural and not judged to be significantly modified for anthropogenic purposes. Ecological potential is assigned to A/HMWB; that is natural water bodies that are substantially changed in character as a result of physical alterations by human activity or are artificial.

2.2.1.2 The ecological status or potential classification is composed of up to five different assessments:

- Assessment of biological quality elements;
- Assessment of physico-chemical conditions;
- Assessment of concentrations of specific pollutants;
- Assessment of hydromorphology, although this is only used in determining High status; and
- Assessment of additional supporting elements, such as expert judgement and an assessment of mitigation measures (in relation to A/HMWBs).

2.2.1.3 As shown in Figure 1, for all quality elements, class boundary values have been developed corresponding to a High, Good, Moderate, Poor or Bad classification. However, when determining the water body’s overall and ecological status / potential, the hydromorphology and physio-chemical supporting elements can only influence status down to Good and Moderate respectively (Environment Agency, 2022). Furthermore, invasive species can only influence status down to Good. Only biological quality elements can determine Poor or Bad status (Figure 1). A summary of the quality and supporting elements is presented in Figure 1.

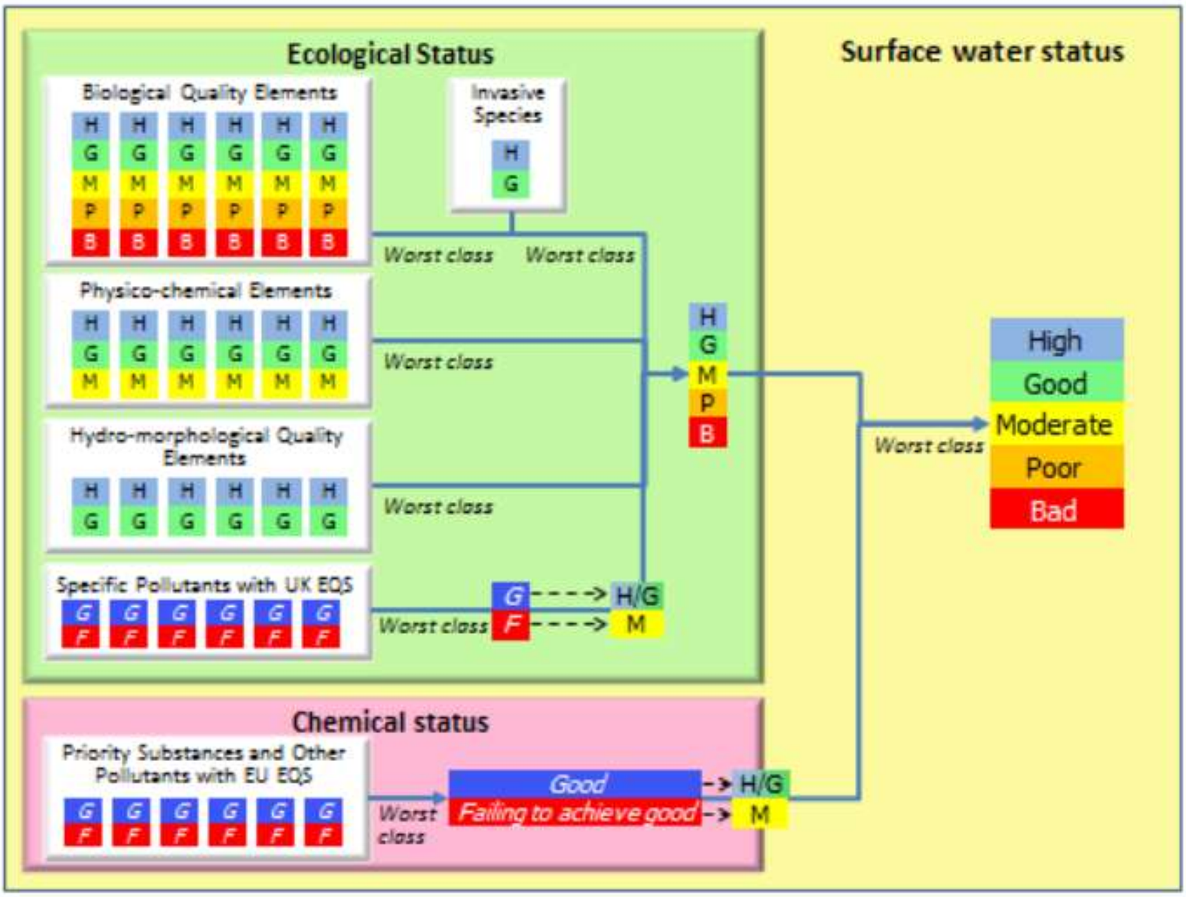

Figure 1: Classification of surface water bodies (Environment Agency, 2022)

2.2.1.4 For A/HMWBs, ecological potential is determined by including an assessment of whether measures are properly in place to mitigate the impacts of any modification on the ecology of the water body (Environment Agency, 2022). If all mitigation measures are in place, the water body is classified as being at Good potential, unless other elements are worse than Good. If one or more identified mitigation measure is absent (i.e. not in place), the water body is classified as Moderate potential, unless other biological quality elements are worse than Moderate.

2.2.1.5 For water bodies which have no monitoring data, the Environment Agency has used expert judgement to classify the water body overall. The rules of applying expert judgement and their effect on overall water body status are set out in Environment Agency guidance on assessing surface water body status / potential (Environment Agency, 2022). The overall water body status is determined by the lowest classed element in the 'One-Out, All-Out' classification system.

2.2.1.6 Chemical status refers to the compliance with environmental standards for chemicals. Surface water bodies are only monitored for priority substances where there are existing discharges.

2.2.2 Groundwater body status

2.2.2.1 Groundwater body status is classified, by the Environment Agency (as the competent authority) based on the assessment of quantitative and chemical status. 'Quantitative status' is defined by the quantity of groundwater available as base flow for different resources. 'Chemical status' is a function of several components indicative of groundwater quality.

2.2.2.2 A summary of the quality elements for all water body types is presented in Table 1a and Table 1b.

Table 1a: Summary of WFD classification elements for surface water bodies

Assessment / classification element	Specific Quality Elements (Rivers)	Specific Quality Elements (Transitional)	Specific Quality Elements (Lakes)
Ecological status/ potential (Biological)	Fish	Phytoplankton	Fish
Ecological status/ potential (Biological)	Macrophytes and phytobenthos	Macroalgae and angiosperms	Phytoplankton
Ecological status/ potential (Biological)	Phytoplankton		Macrophytes and phytobenthos
Ecological status/ potential (Physico-chemical)	Thermal conditions	Thermal conditions	Thermal conditions
Ecological status/ potential (Physico-chemical)	Oxygenation conditions	Transparency	Oxygenation conditions
Ecological status/ potential (Physico-chemical)	Salinity	Oxygenation conditions	Salinity
Ecological status/ potential (Physico-chemical)	Acidification status	Nutrient conditions	Acidification status
Ecological status/ potential (Physico-chemical)	Nutrient conditions (Phosphate)		Nutrient conditions (TP and TN)
Ecological status/ potential (Physico-chemical)			Transparency

Ecological status/ potential (Specific pollutants)	Arsenic (As)	Arsenic (As)	Arsenic (As)
Ecological status/ potential (Specific pollutants)	Copper (Cu)	Copper (Cu)	Copper (Cu)
Ecological status/ potential (Specific pollutants)	Iron (Fe)	Iron (Fe)	Iron (Fe)
Ecological status/ potential (Specific pollutants)	Zinc (Zn)	Zinc (Zn)	Zinc (Zn)
Ecological status/ potential (Specific pollutants)	Manganese (Mg)	Manganese (Mg)	Manganese (Mg)
Hydromorphology	Quantity and dynamics of water flow	Depth variation	Quantity and dynamics of water flow
Hydromorphology	Connection to groundwater bodies	Quantity, structure and substrate of the bed	Residence Time
Hydromorphology	River continuity	Structure of the inter-tidal zone	Connection to groundwater bodies
Hydromorphology	River depth and width variation	Freshwater flow	Lake depth variation
Hydromorphology	Structure and substrate of the riverbed	Wave exposure	Quantity, structure and substrate of the lake bed
Hydromorphology	Structure of the riparian zone		Structure of the lake shore
Hydromorphology	Hydrological regime (flow, abstraction and physical)		
Chemical Status	Priority hazardous substances		Priority hazardous substances
Chemical Status	Priority substances		Priority substances
Chemical Status	Other pollutants		Other pollutants

Table 2b: Summary of WFD classification elements for groundwater bodies

Assessment / classification element	Specific Quality Elements
Quantitative Status	Saline or other intrusions
Quantitative Status	Quantitative Dependent Surface Water Body Status
Quantitative Status	Groundwater dependent terrestrial ecosystems
Quantitative Status	Water balance
Chemical Status	Saline or other intrusion
Chemical Status	Chemical Dependent Surface Water Body Status
Chemical Status	Groundwater dependent terrestrial ecosystems
Chemical Status	Drinking Water Protected Areas
Chemical Status	General quality assessment

2.2.3 Assessing deterioration

2.2.3.1 The two key environmental objectives against which new developments have to be assessed are whether they are likely to:

- Cause deterioration of status (or potential) of a surface or groundwater body; and
- Prevent the achievement of Good status or potential for water bodies currently failing to achieve this status or potential.

2.2.3.2 In this WFD Compliance Assessment, effects arising from any modifications have been categorised using a colour coded system to indicate the existing WFD classification, as presented in the RBMP, of each element or overall status and the predicted scale of effect (in terms of potential for a change in WFD class for each element) associated with the modifications on each WFD element.

2.2.3.3 The system used in this WFD Compliance Assessment is presented in Table 3.

2.2.3.4 Where an existing WFD classification has not been presented in the RBMP no colour coding has been applied and other baseline data (where available) have been utilised and used to assess the potential for deterioration or potential to prevent achievement of Good status in the future; for example, there is no classification for fish fauna in the WFD lakes, therefore the results of recent fish surveys have been used.

Table 3: Colour coded system utilised to indicate existing (baseline) WFD classification in WFD Compliance Assessment.

Red	Bad classification
Amber	Poor classification
Yellow	Moderate classification (or 'does not Support Good')
White	No status
Green	Good classification (or Supports Good)
Blue	High classification

2.2.3.5 When assessing the project effects on WFD quality elements consideration needs to be made as to whether the effects are short-term and whether ecological conditions will recover in an acceptable timescale or are permanent. Fluctuations in the condition of water bodies can sometimes occur due to short-duration activities, such as construction works.

2.2.3.6 There is no definition in the WFD for a 'short period of time'. For this assessment, short-term (also referred to as temporary) is defined as three years or less (it is recognised that this differs from the short term and temporary timeframes used in the EIA, as the timeframes for the WFD assessment are more reflective of the RBMP cycles).

2.2.3.7 If the water body a) is only impacted for a short period of time, b) recovers within a short period of time, or c) recovers without the need for any restoration measures within a short period of time, this will not constitute deterioration of status and application of Regulation 19 will not be required. For example, if there is evidence to indicate that a short term river diversion would impact all quality elements for a period of less than three years before the watercourse is restored to its original course and baseline condition, this impact would be considered short-term and not permanent. Activities (irrelevant of whether permanent or not) that result in short-term deterioration would still require the same environmental mitigation as all other activities such that the overall residual impact would be as low as possible. The environmental mitigation for the project is outlined in the Environmental Mitigation section of this report and in Section 2 of the project's PEIR.

2.2.3.8 Any impact of longer duration than three calendar years from the commencement of works would be considered permanent.

2.2.3.9 A 2013 ruling by the Court of Justice of the European Union called the 'Bund Ruling'[1], has provided clarification on how the WFD's environmental objectives should be interpreted when assessing a project's effect on a WFD water body:

- Deterioration of the status of the relevant body of surface water includes a fall by one class of any element of the 'quality elements' within the meaning of Annex V of the WFD even if the fall does not result in the fall of the status of the body of surface water as a whole;
- Consent for the development must not be granted by an authorising authority where a project may cause a deterioration in the status of a body of surface water or where it jeopardises the attainment of Good surface water status or of Good ecological potential and Good surface water chemical status by the date laid down in the Directive, unless a derogation is granted; and
- If the quality element is already in the lowest class, any deterioration of that element represents deterioration of status within the meaning of WFD Article 4(1) (a) (i).

2.2.3.10 The ruling does not clearly define whether 'quality elements' include the hydromorphological and physico-chemical supporting elements. However, these supporting elements underpin the status of the biological quality elements and therefore risks of deterioration and consequent effects on biology need to be considered. Guidance by the EC Common Implementation Strategy (CIS) on exemptions according to Article 4.7 (European Commission CIS, 2017) (transposed as Regulation 19 of the Water Environment Regulations 2017) highlights that deterioration in any of these supporting conditions indicates a significant risk to one or more of the biological quality elements. Therefore, any deterioration in these conditions will influence any decisions on whether a proposed modification may lead to deterioration and therefore require a Regulation 19 Test.

2.2.3.11 Furthermore, although the ruling does not specifically relate to groundwater bodies or the chemical status of water bodies these have been assessed in the same way, to be consistent with the principles in the judgement and following judgements which have considered it.

2.2.3.12 Consequently, using a precautionary principle approach, for this assessment, any fall in the classification of any element (quality or supporting), or any deterioration of an element already in its lowest class

[1] See Case Ruling C-461/13 Bund für Umwelt und Naturschutz Deutschland e.V. versus Bundesrepublik Deutschland: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:62013CC0461&from=EN

will be taken as triggering the requirement to review the need for the development of Article 4.7/Regulation 19 documentation.

2.3 WFD Compliance Assessment

2.3.1 Process

2.3.1.1 A comprehensive published methodology for the assessment of plans or projects in relation to undertaking WFD compliance assessment is not available. There are, however, several sets of guidance, policies and legislation which are beneficial in undertaking such assessments for different water body types. Those considered to be the most relevant to the RTS are:

- Planning Inspectorate (2017) guidance entitled Advice Note 18: The Water Framework Directive provides an outline methodology for WFD as part of the DCO process
- Environment Agency WFD risk assessment on how to assess the risk of activities (2016a)
- Environment Agency guidance on protecting and improved the water environment: WFD compliance of physical works in rivers (2016c) and associated supplementary guidance. These are internal Environment Agency documents.
- Environment Agency guidance on the hydromorphological quality elements for rivers and links with ecology (2015a and b). These are internal Environment Agency documents.
- UKTAG guidance on Morphological Alterations and the Pressures and Impacts Analyses (2003)
- EU Common Implementation Strategy guidance on defining Groundwater Dependent Terrestrial Ecosystems (2011).

2.3.1.2 This assessment has also been informed by the project description within the EIAPEIR for the project (GBV, 2022b).

2.3.1.3 For non-designated WFD water bodies that exist throughout the project area, an assessment has been made of their impact to the water bodies designated within the RBMP i.e., if activities occur directly or indirectly to a non-designated WFD river water body that flows into a designated WFD water body, then an assessment will be made of the impact to the adjoining WFD water body's classification and objectives. An assessment has not been completed of the non-WFD water body in terms of its own compliance. This approach is in accordance with EU horizontal guidance (CIS, 2003) where non-WFD water bodies are protected and enhanced where required, in order not to compromise the achievement of objectives for water bodies to which they are directly or indirectly connected. An assessment of the effects to non-designated WFD water bodies will be undertaken as part of the EIA.

2.3.1.4 The stages undertaken for this WFD Compliance Assessment are summarised below and shown in Figure 2. To fit within the terminology from the Planning Inspectorate Advice Note 18, each stage of the WFD Compliance process has been stated in brackets.

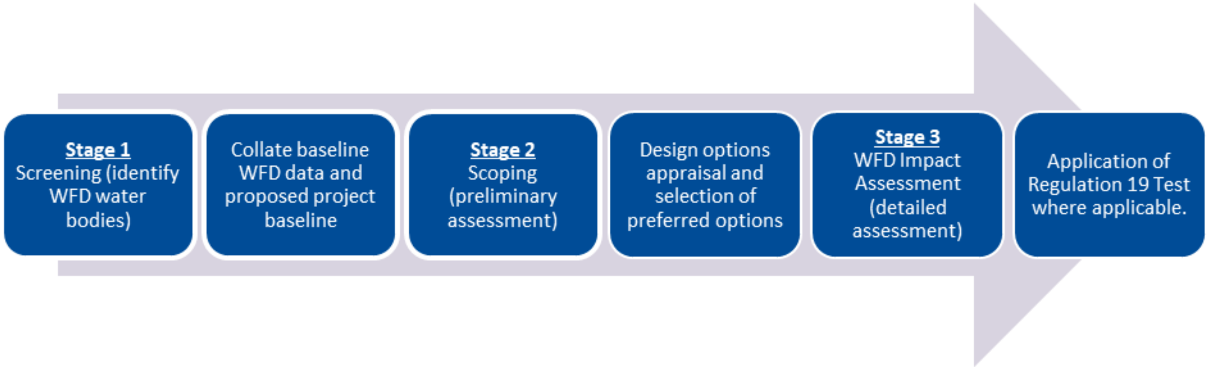

Figure 2: Stages in the WFD Compliance Assessment process.

2.3.2 Stage 1: Screening

2.3.2.1 Initial high-level screening was undertaken to identify WFD water bodies (based on their locations) that could be affected by the Project, and the physical modifications being undertaken by the Project, which have the potential to affect any surface water and groundwater bodies. Water bodies were identified using the Environment Agency’s Catchment Data Explorer http://environment.data.gov.uk/catchment-planning/ GIS system (Environment Agency, 2023) using a study area of up to 500m from the Project Boundary, or the extent of the 1 in 100 year floodplain affected by the project, whichever was the greater. This has been developed consistent with the PEIR process. See Appendix A for WFD waterbodies within the study area for the WFD compliance assessment (note that this is the same extent as the study area used for the water environmental topic in the EIA PEIR).

2.3.2.2 Water bodies identified were either ‘screened in’ or ‘screened out’ of further WFD compliance assessment by determining whether project construction and operation activities have the potential to lead to any non-temporary effects on the water body.

2.3.3 Collate baseline data

2.3.3.1 Baseline information on the 'screened in' water bodies was collated and reviewed for this report. Data sources include:

- The RBMP: Thames River Basin District RBMP (Environment Agency, 2021);
- The Environment Agency's Catchment Data Explorer for RBMP Cycle 3 (2019) for 2019 baseline classification data;
- WFD Water Bodies in England: 2019 status, objectives and protected area designations for the update to the River Basin Management Plans - Cycle 3 dataset.

2.3.3.2 These provided the initial baseline information for undertaking the overall assessment including reason for designation, current overall WFD status, objectives, and ecological and chemical status. Classification data for individual biological quality elements, supporting hydromorphological and physico-chemical elements (if available), as well as protected area designations was also collated. This stage also included the collation of the WFD mitigation measures from the Environment Agency, for A/HMWBs, which aim to support as good an ecological system as possible. The outcomes are included in the Preliminary Assessment Tables undertaken as part of Stage 2.

2.3.3.3 Further background baseline information is being utilised to aid this WFD Compliance Assessment and will be particularly relevant for the detailed assessment stage. These include various studies and surveys undertaken to inform the design and support the wider EIA process, including, but not limited to:

- River Thames and lake water quality monitoring 2012 - 2015 (monthly to bi-annual[2]);
- Lake water quality monitoring 2016 - 2022 (up to monthly - ongoing);
- Groundwater monitoring (level and quality);
- Lake level monitoring 2012 – to date (continuous monitoring at 15-minute intervals using level loggers in situ, corrected using gauge board readings taken monthly to bi-annually, ongoing);
- Spot flow monitoring on key tributaries 2019 - to date (monthly, ongoing);
- RTS Ecological Monitoring Project (Environment Agency, 2016b) and associated data collected which included: monitoring of lake and River Thames water levels and quality, as well as some measures of ecological function (phytoplankton, zooplankton, phytobenthos,

[2] For the purposes of this report, bi-annual refers to samples every six months.

macroinvertebrates, macrophytes). Surveys were undertaken from 2012-2015;

- Macrophyte surveys undertaken in 2022 (GBV, 2022);
- Macroinvertebrate surveys undertaken in 2022 (GBV, 2022);
- Bathymetric surveys of lakes undertaken in 2016 (40Seven, 2016);
- RTS Hydrological and Hydraulic Modelling Report (GBV, 2016a), sediment modelling – basic analysis report (GBV 2017b) and outputs from hydraulic, and flood models (all modelling undertaken in 2017);
- Ground investigation surveys (GBV, 2022-2023);
- Water Balance, groundwater, water quality and cohesive sediments modelling report (DHI/Stantec, 2023);
- UKCEH QUESTOR and Protech modelling report: Water quality modelling of impacts of augmentation flow scenarios in proposed Thames flood relief channels (Hutchins, Elliott and Qu, 2022);
- Aquatic and Terrestrial INNS gap analysis (GBV, 2022a);
- RTS Preliminary Ecological Appraisal 2023 (PEA) (WBi, 2023);
- Groundwater conditions and flow directions from the project Site Investigation works (GBV, 2017c);
- RTS Macroinvertebrate survey results 2022 (GBV, 2022e);
- RTS Macrophyte survey results 2022 (GBV, 2022f);
- Water quality datasets obtained from the Environment Agency's WIMS database (EA, 2023); and,
- Studies and datasets that are relevant to an individual water body, such as Chertsey Bourne Flood Risk Management Strategy - Geomorphological Scoping Study (Black & Veatch, 2005) were also used as part of this WFD compliance assessment.

2.3.3.4 Further monitoring is being undertaken during 2023 which will inform and update the findings of this WFD compliance assessment. This comprises of the following:

- Phytoplankton and phytobenthos monitoring;
- Fish surveys;
- Continued surface water quality monitoring;
- Continued groundwater quality monitoring;
- Continued groundwater level monitoring;
- Continued lake level monitoring;
- Continued river flow monitoring;

- Additional high-flow suspended sediment monitoring; and,
- Geomorphological surveys of the River Thames and its tributaries within the boundary for EIA scoping.

2.3.4 Stage 2: Scoping (preliminary assessment)

2.3.4.1 This stage of the assessment determined which quality elements associated with water bodies that have been 'screened in' would be included within the detailed assessment. Details about the characteristics of the water body including information on protected area designations (if applicable) and summary of ecological and chemical status, ecological potential and objectives were summarised. Classification data of the individual biological quality elements, supporting physico-chemical elements, hydromorphological supporting conditions and chemical status were also included. Results of the RTS Ecological Monitoring Project (Environment Agency, 2016b) were included, to help characterise the baseline conditions, especially where no official WFD classification was available.

2.3.4.2 Where a potential link has been identified, a preliminary assessment of the potential impacts from the different project modifications on each of the relevant WFD elements was undertaken. This stage determined whether there was a likelihood of a non-temporary effect (i.e. permanent or significant enough over a three year period/more than half of a WFD RBMP cycle) to potentially cause deterioration in the status of individual quality elements at the water body level and allow for the identification of some mitigation to be built-in to the Project.

2.3.4.3 In order to achieve GEP, A/HMWBs have an associated list of 'mitigation measures', which, once in place, will allow the water body to provide a range of functional habitats needed to support as good an ecological system as possible. The preliminary assessment determined whether existing A/HMWB measures (using Cycle 2 measures as Cycle 3 measures are not yet published) proposed for these water bodies could still be implemented with the proposed works in place, and if the Project could contribute to improvements provided by them.

2.3.4.4 This assessment also considers whether any of the identified effects associated with activities of the RTS could be additive or combine in such a manner that they could lead to a change in a WFD water body status beyond the effect predicted for the individual components alone. This was undertaken for both the construction and operation phases.

2.3.4.5 Additionally, a requirement of the WFD is to examine the potential for a plan or project that may not, on its own, be a risk to WFD compliance, but when considered cumulatively with other projects or plans may cause deterioration (EC CIS, 2017). It was therefore necessary to identify other plans and projects which may give rise to inter-project cumulative effects.

2.3.4.6 The Zone of Influence (ZOI) for the WFD Cumulative Effects Assessment (CEA) is defined as the surface water study area outlined in Section 5.14 in the PEIR - Chapter 5 Site Description.

2.3.4.7 In undertaking the cumulative effects assessment, only plans and projects which have a spatial and / or temporal overlap with RTS were considered, or if a plan or project inside or outside of the ZOI, presents a risk of water of differing quality entering the water column within the ZOI. These included:

- Developments and other projects which have been approved in the national and local planning system, or are at the pre-planning stage and have published EIA information; and
- Development and management plans which have been adopted or approved by the Local Planning Authority or have a published Strategic Environmental Assessment (SEA).

2.3.4.8 The list of plans and projects (in Appendix C) was compiled for the PEIR following receipt of information from the Local Planning Authorities and Statutory Bodies and consideration of PINS's National Infrastructure Planning portal.

2.3.5 Stage 3: WFD Impact Assessment (detailed assessment)

2.3.5.1 Following completion of this scoping assessment, those WFD elements identified as requiring further assessment (those identified as having potential to cause a risk of deterioration or preventing a water body achieving Good in the future) will be taken forward to the detailed assessment. Each water body scoped in will be assessed in terms of effects on specific WFD quality and supporting element(s), including cumulative effects if required. Data utilised at this stage of the assessment will provide further information and context on the relevant baseline conditions.

2.3.5.2 The detailed assessment utilises a greater source of data and more comprehensive analysis of the potential effects than the scoping assessment, therefore, in some instances the risk of deterioration to a quality element will be updated accordingly.

2.3.5.3 Where beneficial effects on the WFD water bodies have been identified, as a result of the project, these have will be reported in this WFD Compliance Assessment.

2.3.6 Application of Regulation 19

2.3.6.1 Following completion of the impact assessment, the WFD compliance process will consider whether the project complies with the WFD objectives. For projects judged to be causing deterioration in the classification of a quality or supporting element of a water body or preventing the water body meeting its ecological objectives it may be appropriate to use Regulation 19 in defence. To be compliant with Regulation 19 the following conditions must be met:

- All practicable steps are taken to mitigate the adverse impact on the status of the water body;
- The beneficial objectives served by the modifications or alterations of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option;
- The reasons for the modifications or alterations are of overriding public interest and/or the benefits to the environment and to society of achieving the WFD objectives are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development; and,
- The reasons for the modifications or alterations are specifically set out and explained in the RBMP and the objectives are reviewed every six years.

2.3.7 Assumptions and uncertainties

2.3.7.1 Design development is ongoing, and is being informed by consultation, technical surveys and assessments. As such, an understanding of the potential likely significant effects on the water environment as a result of the RTS is still underway and the information provided within this assessment is preliminary only. This assessment is based on certain design parameters, as set out in the PEIR and will be reviewed and refined as the project design develops.

2.3.7.2 This includes the following construction method assumptions:

- The flood channels will most likely be constructed within a ‘rolling coffer dam’, using the side piling of the permanent works (where these exist) and moving upstream as works progress.
- Sheet piled coffer dams will be used to exclude groundwater and river water to enable construction of flow and water level control structures and capacity improvements to the River Thames weirs. Sheet piling depths into the bed are not yet confirmed. Following completion of each structure, the coffer dams will not be removed. Sheet piling on the bank sides will be incorporated into the channel banks and the upstream / downstream sides will be cut down to below river bed level to ensure the structure does not become undermined at the bed.
- The flood channels intakes and outfalls are likely to be constructed using a floating pontoon.
- Long-term dewatering is assumed to be longer than six months and may potentially last a year (maximum). Dewatering will take place at the weir capacity improvements so the construction can be carried out in the dry. Pumping of the coffer dam will be required throughout construction. Prior to discharge of pumped seepage into the River Thames it will be required to pass through silt traps, if required.
- Dewatering will also be needed for construction of the flood channel. Through landfill and those areas of natural ground which will not be dug ‘wet’, sheet piling, and dewatering will be required. All water arising from excavations will be treated to remove any chemicals and sediments, in order to meet all water quality standards required for discharging into the River Thames.
- Temporary wharves on the banks will be required to enable transport of construction materials on barges along the Thames. These wharfs will be constructed using sheet piles along the bank to carry some of the load (i.e. support cranes and materials) and stabilise the bank. Current estimations are for three temporary wharves to be fixed during construction within the Thames (Egham to Teddington) water body.
- The duration of three wharfs is assumed to be:
  - Runnymede Channel inlet up to 3 years;
  - Runnymede Channel outlet up to 18 months; and,
  - Land South of Chertsey Road up to 18 months.
- Sizing is assumed to be approximately 30m long (up and downstream length), and approximately 10m out into the channel, dependent on water depths, to allow barges to be filled and not rest on the riverbed.

- River transport is also likely to be possible for the capacity improvement works.
- Construction will adhere to a Construction Environmental Management Plan (CEMP) and Construction Surface Water Management Plan.
- The process of undertaking the bed lowering downstream of Desborough Cut will involve a barge mounted excavator lowering the bed by an average of 0.7m (likely to be more where there is accretion on the bends) at a width of 20m in the centre of the channel cross section.
- At this stage, the works to construct the Abbey River crossing are assumed to involve construction of temporary piled walls for approximately 80m. This will enable flows to be maintained within the Abbey River and not discharge into the works under construction. No dewatering is anticipated at the time of writing.
- Where the flood relief channel passes through landfill sites the channel will be sheet piled using a sealed impervious system. The system selected, which will be chosen using a risk-based approach, may include a low permeability wax-based sealant or bentonite grouting behind the sheet pile lines. Where the channel is sheet piled within areas of natural ground (e.g., adjacent to Thorpe Hay Meadow), a sealed system will not be necessary, are often observed to self-seal through silt settling within the gap between sheet piles.

2.3.7.3 The following operational details have been assumed at the time of writing:

- The assessment refers to a 'depleted reach' due to the abstraction of an augmented flow from the River Thames, which is currently assumed to be up to 1.0m3/s. This can be viewed as three separate depleted sections:
    - Runnymede Channel inflow to Spelthorne Channel inflow – depleted by 1.0m3/s;
    - Spelthorne Channel inflow to Runnymede Channel outfall (Abbey River in non-flood conditions) – depleted by 2.0m^3/s;
    - Runnymede Channel outfall to Spelthorne Channel outfall – depleted by 1.0m^3/s.
- An augmented flow procedure has not yet been confirmed. This assessment assumes an augmented flow of up to 1.0m^3/s which can be adapted to mitigate for adverse impacts on water resources, water quality and biodiversity in the River Thames or within the Runnymede or Spelthorne channel lake systems. This could include temporarily reducing flow to an appropriate level, ceasing or alternating flow between the flood channels. Details on the trigger levels for which the

augmented flow will be adapted during periods of low flow or drought, are yet to be developed.

- During detailed design, localised risks will be addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP.

2.3.7.4 Additional assumptions and uncertainties in drafting this preliminary assessment are as follows:

- The WFD baseline classification data used in this assessment were taken from the Environment Agency Cycle 3 RBMPs, which provides data for 2019. These classifications are the formal baseline against which the Environment Agency will assess compliance with the no deterioration objective in 2027 (based on timescales for the Project); this is considered to provide the current best estimate of status.
- Limitations in respect of baseline information have been identified. Where baseline data is limited, professional judgement has been used in the assessment of effects and a precautionary approach taken.
- This WFD Compliance Assessment considers the embedded mitigation within the design; these are stated in the EIA PEIR.
- The A/HMWBs Mitigation Measures used in this assessment are for Cycle 2. At the time of writing, the Cycle 3 HMWB mitigation measures are still in draft and not yet finalised for use.

2.3.8 Environmental Mitigation

2.3.8.1 Certain primary (embedded) environmental mitigation has been included in the project design to date and will be refined as part of the EIA process. This includes for example:

- The provision of five fish passes on flow control structures along the new flood channel (see Section 2 of the PEIR for further details);
- Enhancement of habitats immediately downstream of three weirs on the River Thames in the reach bypassed by the flood channel (at Penton Hook, Chertsey and Shepperton). Implementation of enhancements will be subject to the EIA confirming effects on these habitats from diverting water along the flood channel, but could include macrophyte planting;
- Subject to the results of ground investigations (GI), prior removal, isolation, or treatment of contaminated sediments that may be disturbed during construction works, capacity improvements (particularly bed lowering downstream of Desborough Island) and

through scour of bed material during operation of the flood channel will be undertaken;

- The augmented flow of up to 1m^3/s along the flood channel (when not being operated with a larger flow during major flooding), which aims to avoid nutrient enrichment of existing lakes and allow for fish passage over water level control structures on the channel. Potential management of augmented flow during periods of dry flow is also being considered, as stated in the above section;
- Within the Thorpe Park Lakes WFD water body, the existing connection between Manor Lake and Fleet Lake will be infilled to limit the nutrient inputs from the River Thames reaching Manor Lake. Similarly, the water level control structure between St Ann's Lake and Abbey Lake will isolate St Ann's Lake (part of the Southwest London Waterbodies Special Protection Area (SPA)) from the flood channel again limiting nutrient inputs from the River Thames.

2.3.8.2 Any works within or affecting landfills or involving waste will be subject to the requirement for an environmental permit under the Environmental Permitting (England and Wales) Regulations 2016. As part of the permitting process, a range of risk assessments will be required, which will be subject to scrutiny by the Environment Agency's National Permitting Service to ensure that they are robust. Suitable measures to mitigate effects on the environment to an acceptable level will be proposed and put in place, which the Environment Agency will review and scrutinise in terms of their adequacy and appropriateness for mitigating the risks and impacts identified.

2.3.8.3 An environmental permit will only be granted if the Environment Agency's National Permitting Service is satisfied that effects on the environment (and human health) are acceptable. The environmental permits will include appropriate permit conditions to limit effects on the environment (and human health) and ensure that the activities are subject to suitable controls. For the purposes of this preliminary WFD assessment, environmental permits for waste (and the mitigation measures that they would secure) have been assumed to be in place.

2.3.8.4 However, where an element is in its lowest class the residual risk acceptable for the permits may not be acceptable under the WFD Regulations and therefore a precautionary approach has been taken in this assessment (see Section 2.2.3.9, final bullet point).

2.3.8.5 Other primary (embedded) and secondary (additional)[3] environmental mitigation is documented in the PEIR and will be developed further at the ES stage. In addition, proposed tertiary (standard practice) mitigation[4] is documented in the PEIR and relates to measures such as recognised means of pollutants control on construction sites, controlled within an overall Construction Environmental Management Plan (CEMP). Primary and tertiary mitigation are considered to form part of the RTS, and therefore have been considered when determining if the project is likely to be a risk to WFD compliance.

2.3.8.6 Refer to the PEIR for further information on the primary, secondary and tertiary mitigation already identified.

2.3.8.7 Where any impacts are considered permanent (longer than three years) from temporary or permanent activities, an appropriate type and level of mitigation would be applied proportionate to the level of potential impact and the sensitivity of the watercourse that would be impacted.

3. WFD Compliance Assessment Results

3.1 Introduction

3.1.1.1 This section presents the results of the WFD Compliance Assessment for the RTS to date. This includes the screening assessment (Stage 1 – Screening) and the preliminary assessment (Stage 2 – Scoping). This section of the report will be updated following completion of the detailed assessment and any subsequent stages of the WFD compliance process.

3.2 Screening assessment

3.2.1.1 The project is situated within the Thames River Basin District and within several management catchments, namely the:

- Colne;
- Maidenhead and Sunbury; and
- Wey and Trib catchments for surface waters; and
- the Thames GW catchment for groundwaters.

[3] Secondary mitigation are those actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent, or be identified as necessary through the EIA and included in the ES.
[4] Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.

3.2.1.2 As set out and explained in Appendix D, a total of 36 water bodies were identified for the screening assessment but only 22 (20 surface water bodies and 2 groundwater bodies) were screened into the preliminary assessment (Table 4). Of these 22 water bodies, 14 are classified as Artificial or Heavily Modified Water Bodies (A/HMWB). The water bodies that have not been screened in for further assessment can be found in the RTS WFD Second Re-screening assessment (in Appendix D, ENVIMSE500260-GBV-ZZ-3ZZ-RP-EN-10138). This assessment was issued in September 2022 and at the time of writing did not include several design updates that are assessed within the preliminary assessment. These changes include assessment of River Thames bridges, and temporary wharves in the design, and the change in terminology from Habitat Creation Areas (HCAs) to Priority areas for habitat creation, mitigation, or enhancement. A third re-screening assessment will be issued in Spring 2024 in accordance with the RTS DCO programme which will include any additional project design updates since the second rescreening.

3.2.1.3 The WFD water bodies listed in Table 4, include those that intersect with, and could be impacted by, the proposed flood relief channels, the capacity improvements on the River Thames weirs, priority areas for habitat creation, mitigation and enhancement, and the additional modifications associated with the Project. It also considers the upstream and downstream water bodies connected to those intersecting the Project.

Table 4: WFD water bodies and summary of the reason they have been screened in for preliminary assessment (Stage 2- Scoping)

Water body name	A/HMWB	Cycle 3 2019 RBMP	Reason for waterbody screened in to preliminary assessment
Chertsey Bourne (Chertsey to River Thames confluence) (WB ID: GB106039017030)	Not A / HMWB (Supports Good)	Poor	New structure to formalise existing overflow on Chertsey Bourne into St Ann's Lake. Creation of a narrow channel, bank lowering and bank protection. Increased risk of INNS and pathogens affecting WFD compliance. No expected changes to hydrological conditions. Construction activities will be present around water body.
Chertsey Bourne (Virginia Water to Chertsey) (WB ID: GB106039017070)	HMWB	Moderate	New structure to formalise existing overflow on Chertsey Bourne into St Ann's Lake. Creation of a narrow channel, bank lowering and bank protection. Increased risk of INNS and pathogens

Water body name	A/HMWB	Cycle 3 2019 RBMP	Reason for waterbody screened in to preliminary assessment
			affecting WFD compliance. No expected changes to hydrological conditions. Construction activities will be present around water body.
Colne Brook (WB ID: GB106039023010)	HMWB	Moderate	Enabling and HCA works at land south of Wraysbury Reservoir may lead to impacts on ecology and water quality. No changes to connectivity of river to existing water bodies. Construction works around water body.
Thames (Cookham to Egham) (WB ID: GB106039023231)	HMWB	Moderate	No major construction works except for works at land south of Wraysbury Reservoir within this water body catchment. The flood channels could result in changes to hydromorphological elements upstream within this water body.
Thames (Egham to Teddington) (WB ID: GB106039023232)	HMWB	Poor	Major construction works and modifications to channel intakes and outfalls, bed lowering and capacity improvements at Sunbury weir, Molesey weir and Teddington weir. Seven priority areas for habitat creation, mitigation, and enhancement lie within this waterbody. Alterations to hydrological regime and water quality. Increased risk of INNS and pathogens affecting WFD compliance.
The Moat at Egham (WB ID: GB106039017060)	HMWB	Poor	Replacement of flood control structure (FCS9) located in water body, resulting in construction activities present in water body. High risk of increase in INNS during flood events.
Mole (Hersham to River Thames Conf at East Molesey) (WB ID: GB106039017622)	HMWB	Moderate	No works or change to connectivity. A change in flood risk as a result of the project is expected (1–100-year event) therefore impacts on hydrology, ecology and chemical elements are limited. Grove Farm priority area for habitat creation, mitigation, and enhancement lies within the water body boundary, construction and operation of HCA might have impacts on ecology and water quality in water body.
Colne (Confluence with Chess to River	HMWB	Moderate	No modification or change to connectivity to existing water bodies. Reduction in flood risk

Water body name	A/HMWB	Cycle 3 2019 RBMP	Reason for waterbody screened in to preliminary assessment
Thames) (WB ID: GB106039023090)			possible during 1 in 100-year event. Land south of Wraysbury Reservoir priority area for habitat creation, mitigation, and enhancement lies within the water body boundary, enabling and construction of HCA could impact on ecology and water quality.
Thorpe Park Lakes (WB ID: GB30642753)	Artificial	Poor	Runnymede channel passes through Fleet and Abbey lakes, incorporating these into the flood relief channel. St Anns lake separated from Fleet and Abbey Lake. Formalisation of existing overspill into St Anns into Chertsey Bourne, FCS7 created between St Anns and Abbey lakes ad replacement of FCS9 to allow flow back into Chertsey Bourne downstream. Changes in residence times, water quality and sediment regimes, mainly from Runnymede Channel and Chertsey Bourne and increased risk of introduction and spread of INNS and pathogens affecting WFD compliance from upstream water bodies.
Wraysbury Reservoir (WB ID: GB30642417)	Artificial	Moderate	No expected changes in connectivity between flood relief channel and Wraysbury Reservoir. Construction activities proposed directly adjacent to this water body.
Thames Upper (WB ID: GB530603911403)	HMWB	Moderate	Changes in water quality and new pathways created for potential contaminated sediment created by the Runnymede and Spelthorne channel. Risk of introduction and spread of INNS and pathogens affecting WFD compliance due to new connectivity with flood channels.
Thames Middle (WB ID: GB530603911402)	HMWB	Moderate	Water body located downstream of all proposed works. Possible changes in water quality due to new connections. Risk of introduction and spread of INNS and pathogens affecting WFD compliance due to new connectivity with flood channels.

Water body name	A/HMWB	Cycle 3 2019 RBMP	Reason for waterbody screened in to preliminary assessment
Queen Mary Reservoir (WB ID: GB30642639)	Artificial	Poor	No works proposed within or adjacent to this water body. Reservoir intake from Thames located downstream of Runnymede channel intake and upstream of the Spelthorne channel intake and Runnymede channel outlet. Potential of reduced abstractions allowances during low flows. Potential to impact on water levels in reservoir. Subsequent impacts on hydromorphological, physiochemical and ecological quality elements.
Knight Reservoir (WB ID: GB30642791)	Artificial	Moderate	Reservoir intake is on Thames (Egham to Teddington), downstream of bed lowering works at Desborough cut and Spelthorne channel outfall. Potential changes in water quality due to quality of abstracted water as a result of new connections.
Bessborough Reservoir (WB ID: GB30642779)	Artificial	Moderate	Reservoir intake is on Thames (Egham to Teddington), downstream of bed lowering works at Desborough cut and Spelthorne channel outfall. Potential changes in water quality due to quality of abstracted water as a result of new connections.
Kempton Park East Reservoir (WB ID: GB30642614)	Artificial	Good	Reservoir intake is on Thames (Egham to Teddington), downstream of bed lowering works at Desborough cut and Spelthorne channel outfall. Potential changes in water quality due to quality of abstracted water as a result of new connections.
Queen Elizabeth 2 Storage Reservoir (WB ID: GB30642813)	Artificial	Good	Reservoir intake is on Thames (Egham to Teddington), downstream of bed lowering works at Desborough cut and Spelthorne channel outfall. Potential changes in water quality due to quality of abstracted water as a result of new connections.
Island Barn Reservoir (WB ID: GB30642841)	Artificial	Moderate	Reservoir intake is on Thames (Egham to Teddington), downstream of bed lowering works at Desborough cut and Spelthorne channel outfall. Potential changes in water quality due to

Water body name	A/HMWB	Cycle 3 2019 RBMP	Reason for waterbody screened in to preliminary assessment
			quality of abstracted water as a result of new connections.
Lockwood Reservoir (WB ID: GB30641865)	Artificial	Moderate	Reservoir intake (Thames-Lee Tunnel) is on Thames (Egham to Teddington), downstream of bed lowering works at Desborough cut and Spelthorne channel outfall. Potential changes in water quality due to quality of abstracted water as a result of new connections.
Banbury Reservoir (WB ID: GB30647003)	Artificial	Moderate	Reservoir intake is on Thames (Egham to Teddington), downstream of bed lowering works at Desborough cut and Spelthorne channel outfall. Potential changes in water quality due to quality of abstracted water as a result of new connections.
Chobham Bagshot Beds (WB ID: GB40602G601400)	N/A	Poor	Construction and operation of the channels has the potential to alter hydraulic connectivity between surface water and groundwater. Possible alteration to groundwater flows during construction and operation of RTS. There is also the potential for the mobilisation of contaminated sediment in and around landfill sites and other contaminated land within the project extent.
Lower Thames Gravels (WB ID: GB40603G000300)	N/A	Poor	Construction and operation of the channels has the potential to alter hydraulic connectivity between surface water and groundwater. Possible alteration to groundwater flows during construction and operation of RTS. There is also the potential for the mobilisation of contaminated sediment in and around landfill sites and other contaminated land within the project extent.

3.3 Preliminary assessment

3.3.1.1 Table 5 below presents the screened in water bodies and the associated project construction modifications deemed to have the potential to influence WFD status, followed by Table 6 which presents the screened in waterbodies and the project operational modifications resulting from the operation of the RTS deemed to have the potential to influence WFD status.

Table 5: Construction modifications (1 to 6) to occur within or in proximity to screened in water bodies

Water body	1) General construction and earthworks[5]	2) INNS and Pathogen management - dewatering and direct removal of INNS	3) Long term de-watering of water bodies	4) Construction compounds, material processing and storage sites	5) Construction of the flow control structures and Thames weir capacity improvements	6) Temporary wharfs and river transport of construction material and waste
Chertsey Bourne (Chertsey to River Thames confluence)	✓	✓	×	✓	×	×
Chertsey Bourne (Virginia Water to Chertsey)	✓	✓	×	✓	✓	×
Colne Brook	✓	✓	×	✓	×	×
Thames (Cookham to Egham)	✓	×	×	×	×	✓
Thames (Egham to Teddington)	✓	✓	✓	✓	✓	✓
The Moat at Egham	✓	✓	×	✓	×	×
Mole (Hersham to River Thames Conf at East Molesey)	✓	✓	×	✓	×	×
Colne (Confluence with Chess to River Thames)	✓	✓	×	✓	×	×
Thorpe Park Lakes	✓	✓	✓	✓	×	×
Wraysbury Reservoir	✓	✓	×	✓	×	×

[5] Consideration of INNS and pathogen risk, disturbance of ground (incl. through landfill), release of fine sediment, and spillage of hazardous materials and material stockpiles, and movement to the road network. Includes construction of Priority areas for habitat creation, mitigation or enhancement.

Water body	1) General construction and earthworks[5]	2) INNS and Pathogen management - dewatering and direct removal of INNS	3) Long term de-watering of water bodies	4) Construction compounds, material processing and storage sites	5) Construction of the flow control structures and Thames weir capacity improvements	6) Temporary wharfs and river transport of construction material and waste
Thames Upper	✓	×	×	✓	✓	×
Thames Middle	✓	×	×	✓	×	×
Queen Mary Reservoir	✓	×	×	✓	×	×
Knight Reservoir	✓	×	×	✓	×	×
Bessborough Reservoir	✓	×	×	✓	×	×
Kempton Park East Reservoir	✓	×	×	✓	×	×
Queen Elizabeth 2 Storage Reservoir	✓	×	×	✓	×	×
Island Barn Reservoir	✓	×	×	✓	×	×
Lockwood Reservoir	✓	×	×	✓	×	×
Banbury Reservoir	✓	×	×	✓	×	×
Chobham Bagshot Beds	✓	×	✓	✓	✓	×
Lower Thames Gravels	✓	×	✓	✓	✓	×

Key

✓	Modification present at this water body
×	Modification not present at this water body

3.4 Modifications as a result of RTS operation

3.4.1.1 The list below outlines the 11 modifications that will occur as a result of the operational aspect of the RTS. These modifications include:

A. Flood relief channel - new cut into ground (incl. sheet piling);
B. Channel intake or outfall structures (and assoc. bank protection);

C. Flood relief channel through existing lake water body (including an augmented flow through the channel and channel maintenance);
D. Flood relief channel entering existing river water body;
E. Flow control structures (including fish passage provision and associated bank protection);
F. Culverts - new or works to existing culverts;
G. Existing Thames weir capacity improvements (consider fish passes);
H. Intersecting of Abbey River and operation of the Abbey Meads floodway.
I. Operation of new green and blue open space and/or Priority areas for habitat creation, mitigation or enhancement;
J. Surface water abstraction from the River Thames during operation of RTS in flood and non-flood conditions;
K. Proposed new pedestrian/cycle bridges across River Thames (One bridge will cross from north of Chertsey Weir to north of Littleton South lake. The other bridge will cross from Ferry Lane Lake to Desborough Island).

Table 6: Modifications present at water bodies that are scoped in due to operation of RTS (A to K)

Water body	A) Flood relief channel - new cut into ground (incl. sheet piling)	B) Channel intake or outfall structures (and assoc. bank protection)	C) Flood relief channel through existing lake water body[6]	D) Flood relief channel entering existing river water body	E) Flow control structures[7]	F) Culverts - new or works to existing culverts	G) Existing Thames weir capacity improvements[8]	H) Intersecting of Abbey River	I) Operation of new green and blue open space and/or Priority areas[9]	J)Surface water abstraction from the River Thames during operation of RTS in flood and non-flood conditions	K) New pedestrian/cycle bridges across River Thames
Chertsey Bourne (Chertsey to River Thames confluence)	×	×	×	×	✓	×	×	×	×	×	×
Chertsey Bourne (Virginia Water to Chertsey)	×	×	×	×	✓	×	×	×	×	×	×
Colne Brook	×	×	×	×	×	×	×	×	✓	×	×
Thames (Cookham to Egham)	×	×	✓	×	×	×	×	×	×	×	×
Thames (Egham to Teddington)	×	✓	×	✓	×	×	✓	✓	✓	×	✓

[6] including a continuous augmented flow through the channel and channel maintenance
[7] including fish passage provision and associated bank protection
[8] including fish passes
[9] for habitat creation, mitigation, or enhancement

Water body	A) Flood relief channel - new cut into ground (incl. sheet piling)	B) Channel intake or outfall structures (and assoc. bank protection)	C) Flood relief channel through existing lake water body[6]	D) Flood relief channel entering existing river water body	E) Flow control structures[7]	F) Culverts - new or works to existing culverts	G) Existing Thames weir capacity improvements[8]	H) Intersecting of Abbey River	I) Operation of new green and blue open space and/or Priority areas[9]	J)Surface water abstraction from the River Thames during operation of RTS in flood and non-flood conditions	K) New pedestrian/cycle bridges across River Thames
The Moat at Egham	×	×	×	×	✓	×	×	×	×	×	×
Mole (Hersham to River Thames Conf at East Molesey)	×	×	×	×	×	×	×	×	✓	×	×
Colne (Confluence with Chess to River Thames)	×	×	×	×	×	×	×	×	✓	×	×
Thorpe Park Lakes	×	×	✓	×	✓	×	×	×	✓	×	×
Wraysbury Reservoir	×	×	×	×	×	×	×	×	✓	×	×
Thames Upper	×	×	×	✓	×	×	✓	×	×	×	×
Thames Middle	×	×	×	✓	×	×	✓	×	×	×	×

Water body	A) Flood relief channel - new cut into ground (incl. sheet piling)	B) Channel intake or outfall structures (and assoc. bank protection)	C) Flood relief channel through existing lake water body[6]	D) Flood relief channel entering existing river water body	E) Flow control structures[7]	F) Culverts - new or works to existing culverts	G) Existing Thames weir capacity improvements[8]	H) Intersecting of Abbey River	I) Operation of new green and blue open space and/or Priority areas[9]	J)Surface water abstraction from the River Thames during operation of RTS in flood and non-flood conditions	K) New pedestrian/cycle bridges across River Thames
Queen Mary Reservoir	×	×	×	×	×	×	×	×	×	✓	×
Knight Reservoir	×	×	×	×	×	×	×	×	×	✓	×
Bessborough Reservoir	×	×	×	×	×	×	×	×	×	✓	×
Kempton Park East Reservoir	×	×	×	×	×	×	×	×	×	×	×
Queen Elizabeth 2 Storage Reservoir	×	×	×	×	×	×	×	×	×	✓	×
Island Barn Reservoir	×	×	×	×	×	×	×	×	×	✓	×
Lockwood Reservoir	×	×	×	×	×	×	×	×	×	✓	×
Banbury Reservoir	×	×	×	×	×	×	×	×	×	✓	×

Water body	A) Flood relief channel - new cut into ground (incl. sheet piling)	B) Channel intake or outfall structures (and assoc. bank protection)	C) Flood relief channel through existing lake water body[6]	D) Flood relief channel entering existing river water body	E) Flow control structures[7]	F) Culverts - new or works to existing culverts	G) Existing Thames weir capacity improvements[8]	H) Intersecting of Abbey River	I) Operation of new green and blue open space and/or Priority areas[9]	J)Surface water abstraction from the River Thames during operation of RTS in flood and non-flood conditions	K) New pedestrian/cycle bridges across River Thames
Chobham Bagshot Beds	✓	✓	×	×	✓	×	×	✓	✓	×	×
Lower Thames Gravels	✓	✓	×	×	✓	×	×	✓	✓	×	×

Key:

✓	Modifications present at this water body
×	Modifications not present at this water body

3.5 Results of the Preliminary Assessment

3.5.1.1 The preliminary assessment determined which of the quality elements associated with the screened in water bodies should be included within the detailed assessment based on whether they interacted and whether there would be a potential risk of compliance with the WFD from any of the RTS modifications listed in Table 5 and Table 6. The preliminary assessment for each of the 22 water bodies screened in (as listed in Table 4) is provided in Appendix B.

3.5.1.2 This preliminary assessment of effects on the individual quality elements enabled a total of 8 water bodies to be ruled out of further assessment on the basis that potential effects were likely to be negligible. Those water bodies not taken forward to the detailed assessment stage included:

- Colne (Confluence with Chess to River Thames);
- Colne Brook;
- Mole (Hersham to River Thames Confluence at East Molesey;
- Chertsey Bourne (Chertsey to River Thames confluence);
- Wraysbury Reservoir;
- Kempton Park East Reservoir;
- Lockwood Reservoir; and
- Banbury Reservoir.

3.5.1.3 In summary, 14 water bodies were identified as requiring further detailed assessment and further consideration as to whether a Regulation 19 test will be required:

- Thames (Cookham to Egham);
- The Moat at Egham;
- Chertsey Bourne (Virginia Water to Chertsey);
- Thames (Egham to Teddington);
- Thorpe Park Lakes;
- Queen Mary Reservoir;
- Knight Reservoir;
- Bessborough Reservoir;
- Queen Elizabeth 2 Reservoir;
- Island Barn Reservoir

- Thames Upper;
- Thames Middle;
- Chobham Bagshot Beds; and,
- Lower Thames Gravels.

3.5.1.4 Table 7 shows all water bodies considered as part of the preliminary assessment and the associated risks of deterioration to each as a result of construction and / or operation of the RTS.

Table 7: All water bodies considered as part of the preliminary assessment and the associated construction and operation risks of deterioration from the RTS.

Water body Name (Draft RBMP WFD Cycle 3)	Construction Elements where risk to WFD compliance identified	Operation Elements where risk to WFD compliance identified
Chertsey Bourne (Chertsey to River Thames confluence)	No risk identified	No risk identified
Chertsey Bourne (Virginia Water to Chertsey)	No risk identified	Fish
Colne Brook	No risk identified	No risk identified
Thames (Cookham to Egham)	No risk identified	All BQE's (INNS and pathogens only)
Thames (Egham to Teddington)	All hydromorphological elements (excluding structure of the riparian zone), ammonia, nutrient conditions, specific pollutants, macrophytes & phytobenthos, benthic invertebrates, fish, priority hazardous substances and priority substances.	All hydromorphological elements, oxygen conditions, ammonia, nutrient conditions, specific pollutants, all biological quality elements, priority hazardous substances and priority substances
The Moat at Egham	No risk identified	Fish
Mole (Hersham to River Thames Confluence at East Molesey)	No risk identified	No risk identified
Colne (Confluence with Chess to River Thames)	No risk identified	No risk identified
Thorpe Park Lakes	Benthic invertebrates, fish and priority hazardous substances.	All hydromorphological elements, transparency, oxygen conditions, nutrient conditions (total nitrogen and total phosphorus), specific pollutants, all biological

Water body Name (Draft RBMP WFD Cycle 3)	Construction Elements where risk to WFD compliance identified	Operation Elements where risk to WFD compliance identified
		quality elements, priority hazardous substances, priority substances and specific mitigation measures.
Wraysbury Reservoir	No risk identified	No risk identified
Thames Upper	No risk identified	All biological quality elements (INNS and pathogens only)
Thames Middle	No risk identified	All biological quality elements (INNS and pathogens only)
Queen Mary Reservoir	No risk identified	All hydromorphological supporting elements, dissolved oxygen, nutrient conditions (total nitrogen and total phosphorus) and all biological quality elements.
Knight Reservoir (supplied by Walton Intake)	No risk identified	All physico-chemical supporting elements (except salinity), all biological quality elements, priority hazardous substances.
Bessborough Reservoir (supplied by Walton Intake)	No risk identified	All physico-chemical supporting elements (except salinity), all biological quality elements, priority hazardous substances.
Kempton Park East	No risk identified	No risk identified
Queen Elizabeth 2 Storage Reservoir (supplied by Walton Intake)	No risk identified	All physico-chemical supporting elements (except salinity), all biological quality elements, priority hazardous substances.
Island Barn Reservoir (supplied by Surbiton Intake)	No risk identified	All biological quality elements (INNS and pathogens only) and priority hazardous substances
Lockwood Reservoir	No risk identified	No risk identified

Water body Name (Draft RBMP WFD Cycle 3)	Construction Elements where risk to WFD compliance identified	Operation Elements where risk to WFD compliance identified
Banbury Reservoir	No risk identified	No risk identified
Chobham Bagshot Beds	*Quantitative elements:* Dependent surface water body status, water balance, *Chemical elements:* Drinking Water Protected Areas, General chemical quality assessment	*Quantitative elements:* Saline or other intrusions, Dependent surface water body status, Groundwater Dependent Terrestrial Ecosystems *Chemical elements:* Saline or other intrusions, Chemical Dependent Surface Water Body Status, Drinking Water Protected Areas and General chemical quality assessment
Lower Thames Gravels	*Quantitative elements:* Dependent surface water body status and water balance	*Quantitative elements:* Dependent surface water body status and water balance *Chemical elements:* Dependent surface water body status and General chemical quality assessment

4. Next Steps

4.1.1.1 The WFD Compliance Assessment for the design and delivery of the project is iterative. As further information is gathered, mitigation measures refined and the design is updated for the ES, this preliminary assessment and subsequent detailed assessment will be reviewed and updated.

4.1.1.2 This preliminary WFD compliance assessment (Stage 2: Scoping) has identified several effects which will not be pursued further within the WFD compliance assessment at this PEIR stage as they are not considered to be significant at the water body scale on a non-temporary basis. Nevertheless, these will be considered further as part of the EIA process.

4.1.1.3 The key next steps of the WFD compliance process are as follows:

1. A detailed assessment (Stage 3: Compliance Assessment) of the water bodies and elements scoped in for the preliminary WFD compliance assessment during the PEIR stage will be undertaken, this will likely include further development of mitigation measures to ensure compliance;
2. Following completion of the detailed assessment, review whether work needs to be undertaken to meet the tests under Article 4.7/ Regulation 19 if it appears likely the RTS cannot meet the environmental objectives of the Directive and Regulations at that stage (Stage 4);
3. At the ES stage, further work will be done to refine mitigation measures to alleviate the identified effects which have been described in this report – the implications of these and any other relevant design changes will be assessed within an updated screening, preliminary and detailed WFD compliance assessment and Article 4.7/Regulation 19 test documentation if required; and
4. It may be necessary to reassess the potential for cumulative effects with other plans and schemes as the project progresses as more schemes are likely to be developed and emerge from the local authority development plans.

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Appendices

Appendix A – WFD Waterbodies Maps

River Thames Scheme

PROTECTING our communities
SECURING our economy
ENHANCING our Thames

Appendix B: RTS Preliminary WFD Compliance Assessment Tables

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Chertsey Bourne (Chertsey to River Thames Confluence) - GB106039017030 - Not designated as a Heavily Modified Water Body. Overall Status (2019) – Poor – Catchment area (km2): 12.249 – Length (km): 4.928

Designated/protected sites associated - Drinking Water safeguard Zone

Key

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks
2) Construction compounds, material processing and storage sites
3) INNS and Pathogen management – dewatering and direct removal of INNS

Operation elements of the project affecting this water body are:

1) Flow control structures - New structure to formalise existing overflow on Chertsey Bourne into St Ann's Lake with lowering of 20 m of river bank by 0.25-0.5m and bank protection on the Chertsey Bourne at St Ann’s Lake inlet (FCS8) (~1km upstream of water body). Creation of a narrow channel (~0.5m wide) with adjustable stoplogs (FCS9) at St Ann’s Lake outlet to the Chertsey Bourne (via The Moat) to replace the existing outlet weir (~0.7km upstream of water body). This structure will limit flood outflows into the Chertsey Bourne via The Moat.

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
Hydromorphological supporting conditions								
Quantity and dynamics of water flow	Supports Good	**EA Gauged flow data; Hydraulic modelling (DHI/Stantec, 2023);**	Construction activities associated with FCS8 and FCS9 construction could lead to greater levels of fine sediment runoff	Compounds, material processing and storage sites could cause greater levels of fine sediment to	Management of INNS is not anticipated to have an impact on this element. If any impacts occur from INNS and pathogen	The formalisation of the existing overspill arrangement (FCS8) from Chertsey Bourne into St Ann’s Lake, will occur approximately 1 km upstream within the Chertsey Bourne	No risk from any individual modification identified.	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued.

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
		Flow monitoring (2019 – 2022) (GBV, 2022)	which may enter this water body. This could then impact upon the flow dynamics. However, tertiary mitigation will be in place to ensure any impacts are likely to be temporary and within the footprint of the works. No further assessment required.	be produced in proximity to the water body. With increased areas of hard standing, this could lead to localised changes in volume, velocity, and distribution of overland flows of fine sediment into this river water body. However, tertiary mitigation, such as through adherence to a CEMP and a Construction Surface Water Management Plan. Appropriate drainage and silt control will be in place to reduce fine sediment run-off and minimise any impacts to flow dynamics.	treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	(Virginia Water to Chertsey) water body. This will reduce the volume of water in this Chertsey Bourne water body when the overflow structure within the into St Ann's Lake operates. The change would only occur at around bankfull flow, as only the peak flow will be taken from the Chertsey Bourne and would not affect the water body in non-flood conditions. However, flow from the Chertsey Bourne already overtops into St Ann's Lake at high flows, the works are formalising an existing connection, limiting the change. The FCS9 structure on a tributary of this water body (The Moat) will also limit the amount of water that returns to the Chertsey Bourne via The Moat, in flood conditions. In non-flood conditions, this outfall replacement will very much mimic existing flow arrangement, so no impact on the quantity and dynamics of flow in this water body. No further assessment required.	No in-combination construction effects[2] identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	

[2] This considers whether any identified effects associated with an activity could be additive or combine with effects from other activities in such a manner that they could lead to a change in a WFD water body status for this element beyond the effect predicted for the individual components alone.

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	**Construction compounds, material processing and storage sites**	**INNS and Pathogen management**	**Flow control structures (including associated bank protection)**		
				No further assessment required.				
Connection to groundwater bodies		**EA Gauged flow data; Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022)**	Construction of the formalisation of the overflow (FCS8) and the flow control structure, FCS9, will occur outside this water body. The use of a coffer dam for the construction of FCS9 may alter groundwater pathways, however the works are small (~0.5m wide) and therefore any effects will be limited to the footprint of the work (outside this water body). In addition, earthworks and compression from material stockpiles may also alter pathways, however tertiary mitigation will be in place, minimising effects. These impacts on the groundwater body are temporary and are not expected to affect the exchange of water between the river channel, the hyporheic zone and deeper groundwaters.	Material processing sites and hard standing construction compounds may impact groundwater pathways. However, construction impacts on the groundwater body are temporary and are not expected to adversely impact at a groundwater body scale. No further assessment required.	INNS and pathogen management will have no impact on this hydromorphological supporting element. If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	No change to connectivity of this water body to groundwater is expected as the flow control structures lie outside this water body and there is no mechanism for impact. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued.

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
			No further assessment required.					
River continuity		**EA Gauged flow data: hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019-2022) (GBV, 2022)**	Construction of the formalisation of the overflow (FCS8) and the narrow channel with adjustable stoplogs (FCS9), will occur outside of the water body. No impact is anticipated. No further assessment required.	No impact anticipated from this modification on river continuity. No further assessment required.	If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	No permanent changes to continuity within this Chertsey Bourne water body are proposed. The bank protection and the bank lowering associated with formalisation of the FCS8 control structure into St Ann's Lake upstream of this water body will create a more defined connection with the Thorpe Park lakes in flood conditions but this is not expected to change the continuity of this water body. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued. This will update the findings of the Chertsey Bourne River Corridor Survey (Environment Agency, 1999).
River depth and width variation		**EA, 1999, Chertsey Bourne River Corridor Survey:** Where the Moat joins the Chertsey Bourne, the channel is flanked by the Twynersh Fishing Lakes - the channel has been realigned and embanked in places. **Chertsey Bourne Flood Risk Management Strategy - Geomorphological Scoping Study**	Construction of the formalisation of the overflow (FCS8) and the outflow from St Ann's Lake (FCS9) will occur outside of the water body. No impact is anticipated on depth and width variation within this water body. No further assessment required.	No impact anticipated from this modification on river depth and variation. No further assessment required.	If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	There will be no alteration to the depth and width of the channel caused by these structures outside of this water body. The overflow structure (FCS8) will alter the cross section for a length of 20m in the upstream water body (Chertsey Bourne (Virginia Water to Chertsey), however any impacts to natural channel evolution will be localised and not extend into this water body. The structure will reduce water quantity during high flow periods and therefore mitigate any potential bank erosion caused from high flow conditions.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued. This will update the findings of the Chertsey Bourne River Corridor Survey (Environment Agency, 1999).

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
		(Black & Veatch, 2005)				No further assessment required.		
Structure and substrate of the river bed		**Chertsey Bourne Flood Risk Management Strategy - Geomorphological Scoping Study (Black & Veatch, 2005)**	There will be some changes to structure and substrate within the dry-working areas for construction within the Chertsey Bourne (Virginia Water to Chertsey) water body and within St. Anns Lake (Thorpe Park Lakes) to enable construction of FCS8 and FCS9, however, this will not impact upon the river bed downstream in this water body. No further assessment required.	Compounds, material processing and storage sites could cause greater levels of fine sediment to be produced in proximity to the water body. This could enter the river water body and smother the river bed. However, tertiary mitigation, such as appropriate drainage and silt control through adherence to a CEMP and Construction Surface Water Management Plan will be in place during construction to reduce fine sediment run-off and minimise such impacts. No further assessment required.	If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	No impacts anticipated as direct impacts from flow control structures will be outside the water body. It is unlikely this will impact sediment transport regime significantly to alter the substrate and structure of the bed. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued. This will update the findings of the Chertsey Bourne River Corridor Survey (Environment Agency, 1999).

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
Structure of the riparian zone		**Chertsey Bourne River Corridor Survey (Environment Agency, 1999):** The upstream route of the Bourne passes beneath the M3 to pass within a narrow corridor flanked by the woodland verge of the M3 and St Ann's Lake. The channel remains heavily shaded by the riparian woodland and dense banks of nettle and bramble.	No direct changes to the riparian zone currently proposed as works will be outside of this water body. If any removal of vegetation does occur, then where possible, vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. No further assessment required.	Local removal of riparian vegetation for the construction compounds, material processing and storage sites could occur within this water body. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. No change at the water body scale. No further assessment required.	If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	No impact anticipated as permanent operational changes that may impact on the riparian zone are outside of this water body. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued. This will update the findings of the Chertsey Bourne River Corridor Survey (Environment Agency, 1999).
Physico-chemical supporting elements								
Salinity	Not used to classify WFD status	**GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022**	Any impacts to salinity from construction activities would be localised and negligible risk. Tertiary mitigation will be in place. No further assessment required.		No impacts anticipated. No further assessment required.	No impacts anticipated. No further assessment required.	**Scoped out** of detailed assessment.	N/A
Oxygenation conditions (DO)	Good	**GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both of these construction modifications. This could alter DO within the water column, pH and temperature. However, tertiary mitigation will be in place to minimise		No impacts anticipated. No further assessment required.	The permanent changes to the flow connection upstream will not cause changes in organic matter, vegetation cover, shading and flow or depth of water under non-flood conditions, therefore there will be no changes in	No risk from any individual modification identified. No in-combination construction effects identified due to	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
		Modelling (CEH, 2022)	the risk of this occurring and subsequent decreases in DO. Furthermore, due to the footprint of the works within this water body, any impacts are negligible. No further assessment required.			the physico-chemical conditions at a local or water body scale. No further assessment required.	implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Acidification status (pH)	High	**GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**						
Temperature	High							
Ammonia	High	**GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	An increase in fine sediment release and accidental spills of hazardous substances from construction activities could enter the water body from both of these construction modifications. This could increase concentrations of ammonia, phosphate and specific pollutants within the water column. However, tertiary mitigation will be in place to minimise the risk of this occurring and leading to adverse impacts on these elements. No further assessment required.		No impacts anticipated. No further assessment required.	There will be no changes in the ammonia, phosphate, or specific pollutant conditions. The formalised overflow works, and bank protection changes upstream will not alter the input of landfill leachates or nutrients from the surrounding area. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Awaiting results of site investigation to establish presence of contaminants within soils of former landfill and within the Thorpe Park lakes water body sediments. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Nutrient conditions (Total Phosphorus)	Poor							
Specific pollutants	High (Iron & Triclosan)							
Biological quality elements								
Macrophytes and phytobenthos	Poor	No additional information	Not likely to be any change in prevailing conditions for macrophytes at the water body scale, as none of the supporting conditions are expected to change in this water body from construction activities. There is a risk that an increase in fine sediment or accidental spillage of hazardous substances entering the watercourse, associated		No adverse impact anticipated. Any management that occurs could have minor, localised improvements to the water body. It may reduce any existing impact that INNS are	No change in prevailing conditions for macrophytes at the water body scale, as none of the supporting conditions are expected to change in this water body. There is potential for an increase in INNS and	No risk from any individual modification identified. No in-combination construction effects identified due to	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with the Environment Agency (and Natural England).

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
			with construction, could have adverse impacts on macrophytes. However, works will be take place outside the water body and tertiary mitigation will be in place to minimise the risk of this occurring. There is potential for an increase in INNS presence and prevalence as a result of construction activities. However, as the connection already exists between Chertsey Bourne and St. Anns Lake, any increase in INNS that may have an indirect impact on macrophytes within this water body, is considered negligible. No further assessment required.		currently having on macrophytes and phytobenthos. No further assessment required.	pathogen presence and prevalence as a result of the more formalised connection at FCS8 upstream between the Chertsey Bourne and St Ann's Lake. However, as this connection already exists, any increase in INNS that may have an indirect impact on macrophytes within this water body, is considered negligible. No further assessment required.	implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Fish fauna	Poor	No additional information	Not likely to be any change in prevailing conditions for fish at the water body scale, as none of the supporting conditions are expected to change in this water body from construction activities. Any noise and vibration impacts are considered to be too far upstream to have a noticeable impact upon fish populations. Secondary mitigation will also be in place to minimise any noise and vibration from construction. No further assessment required.		No adverse impact anticipated. Any positive impacts would be negligible and highly localised. No further assessment required.	Formalisation of the connection (FCS8) between St Ann's Lake, upstream of this water body is unlikely to alter fish fauna status for this water body. The formalisation of the connection between St Ann's Lake and Chertsey Bourne (FCS8) will only be operational during high flow and existing designs do not currently include a fish passage arrangement. There is potential for an increase in INNS and pathogens presence and prevalence as a result of the more formalised connection upstream between the Chertsey Bourne and St.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of secondary and tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Discussions on fish friendly design of the FCS8 are currently ongoing. Fish surveys to be undertaken in Spring/Summer 2023 Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year on this water body.

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
						Anns Lake. However, as this connection already exists, any increase in INNS and pathogens downstream within this water body that may have an indirect impact on fish within this water body, is negligible. No further assessment required.		
Benthic Invertebrates	High	No additional information	Not likely to be any change in prevailing conditions for macroinvertebrates at the water body scale, as none of the supporting conditions are expected to change in this water body from construction activities. There is a risk that an increase in fine sediment or accidental spillage of hazardous substances entering the watercourse, associated with construction, could have adverse impacts on macroinvertebrates. However, tertiary mitigation will be in place to minimise the risk of this occurring. There is potential for an increase in INNS and pathogen presence and prevalence as a result of construction activities. However, as the connection already exists between Chertsey Bourne and St. Anns Lake, any increase in INNS and pathogens that may have an indirect impact on macroinvertebrates within this water body, is considered negligible. No further assessment required.		No adverse impact anticipated. Any management that occurs could have minor improvements to the water body. It may reduce any existing impact that INNS and pathogens are currently having on invertebrates. No further assessment required.	No change in prevailing conditions for invertebrates at the water body scale, as none of the supporting conditions are expected to change in this water body. There is potential for an increase in INNS or pathogens presence and prevalence as a result of the more formalised connection upstream between the Chertsey Bourne and St. Anns Lake. However, as this connection already exists, any increase in INNS or pathogens that may have an indirect impact on macroinvertebrates within this water body, is considered negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Chemical elements								

Ecological Objective - Moderate by 2039 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2039	Current Cycle 3 2019 RBMP Status[1]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Flow control structures (including associated bank protection)		
Priority hazardous substances	Fail (PFOS, PBDE)	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022)**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both of these construction modifications. This could contain high concentrations of priority hazardous substance and priority substances which could be adhered to fine sediments or runoff in the water column into the water body. Potential effects from these works will only occur in the short-term (less than three years). Furthermore, the risk will be minimised through the implementation of tertiary (standard practice) mitigation and environmental permits to minimise sediment runoff. No further assessment required as potential effect will be short-term.		No impacts anticipated. No further assessment required.	The permanent changes to formalise the existing overflow upstream are not considered to increase the risk of priority hazardous substance and priority substances entering this water body. The changes will only formalise a connection that already exists. If there is an increase in these substances as a result of works within Fleet and Abbey Lakes, it is considered unlikely that increased concentrations will reach Chertsey Bourne due to the functioning of the flow control structure (FCS7) (allowing flow only from St Ann's to Abbey lake). No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Priority substances	Fail (Cypermethrin)							
Other Pollutants	Does not require assessment	Not assessed	Not assessed			Not assessed	N/A	Not required

Chertsey Bourne (Virginia Water to Chertsey) - GB106039017070 - Heavily Modified Water Body. Overall Status (2019) – Moderate - Catchment area (km^2): 34.419 – Length (km): 10.61

Designated/protected sites associated - Surface Water Safeguard Zone, SPA, SAC and Ramsar site

Key

WFD classification (baseline)/Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks including construction of FCS8 control structure
2) INNS and Pathogen management – dewatering and direct removal of INNS
3) Construction compounds, material processing and storage sites

Operational elements of the project affecting this water body are:

1) Flow control structures - New structure (FCS8) to formalise existing overflow on Chertsey Bourne into St Ann's Lake. This includes associated lowering of 20 m of river bank by 0.25-0.50m and bank protection on the Chertsey Bourne at St Ann's Lake inlet.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
Hydromorphological supporting elements								
Quantity and dynamics of flow	Supports Good	**EA Gauged flow data; Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022)**	Construction activities will lead to greater levels of fine sediment produced in proximity to the water body. With greater areas of hard standing, this could lead to	Compounds, material processing and storage sites could cause greater levels of fine sediment to be produced	Management of INNS is not anticipated to have an impact on this element. No further assessment required.	Currently, the Chertsey Bourne overtops into St Ann's Lake approximately once a year. With the RTS in place, specifically FCS8, the volume of flood water that spills from Chertsey Bourne to St Ann's Lake is expected to increase, however the frequency of flooding is expected to remain broadly similar (GBV, 2017). Therefore, the volume of water in the	No risk from any individual modification identified. No in-combination construction effects identified due to	Detailed construction methods and plans yet to be issued including the scale of sheet piling required for construction. Geomorphological walkover report not yet issued.

[3] Current 2019 RBMP status data extracted from the Environment Agency Catchment Data Explorer http://environment.data.gov.uk/catchment-planning/ in March 2023

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
			localised changes in volume, velocity, and distribution of overland flows into this river water body. This could increase runoff of fine sediment into the river water body. During periods of heavy rainfall and increased overland flow, this could lead to scour of the river bed. However, tertiary mitigation will be in place during construction to reduce fine sediment run-off and minimise any impacts to flow dynamics. Construction within this water body includes the FCS8 control Structure. Works may also release fine sediment into the water column, however tertiary mitigation will be in place to ensure impacts are minimised. There are likely to be temporary and localised disruption	in proximity to the water body. With increased areas of hard standing, this could lead to localised changes in volume, velocity, and distribution of overland flows into this river water body. However, tertiary mitigation will be in place during construction to reduce fine sediment run-off and minimise any impacts to flow dynamics. No further assessment required.		Chertsey Bourne water body will be reduced when the overflow structure operates. The change would only occur at around bankfull flow, as only the peak flow will be taken from the Chertsey Bourne and would not affect the water body in normal conditions. Flows would be diverted back from St Ann's Lake into the Chertsey Bourne. No change is expected from the bank protection associated with this structure. No further assessment required.	implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
			to flows as a coffer dam and some sheet piling may be required, to construct the formalisation of the overflow with bank lowering and protection. Sheet piling and coffer dams will change the roughness of the channel bed and banks, temporarily affecting flow dynamics. Implementation of tertiary mitigation will ensure impacts will be minimised and negligible at a water body scale. No further assessment required.					
Connection to groundwater bodies	Supports Good	**EA Gauged flow data; Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022)**	Coffer dams associated with construction of FCS8 will alter local groundwater pathways. Earthworks and compression from material stockpiles may impact groundwater pathways. However, construction impacts on the groundwater body	Compression from material stockpiles and compounds may impact groundwater pathways. However, these impacts to the groundwater body are considered temporary	Management of INNS is not anticipated to have an impact on this element. No further assessment required.	Sheet piling will be cut down following construction but retained on the left bank for 20m to ensure structure stability. The piling will therefore permanently change groundwater pathways and exchange; however, this impact will be highly localised given the length of piling installed and there is no risk of deterioration. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination	Detailed construction methods and plans yet to be issued including the scale of sheet piling required for construction. Geomorphological walkover report not yet issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
			are temporary, within the footprint of the works (~20m in length and sheet piling ~3m deep) and are not expected to affect the exchange of water between the channel, he hyporheic zone and deeper groundwaters. . Tertiary mitigation in place will minimise impacts. No further assessment required.	and are not expected to adversely impact at a groundwater body scale. Tertiary mitigation in place will minimise impacts. No further assessment required.			operational effects identified. **Scoped out** of detailed assessment	
River continuity	Supports Good	**EA Gauged flow data: hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019-2022)(GBV, 2022)**	Construction activities may involve sheet piling for the construction of FCS8, limiting connection of the river to its floodplain or wetland features. Impact is localised on a water body scale and within the footprint of the works.	No impact anticipated from this modification on river continuity. No further assessment required.	If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	There are no weirs or locks affecting the continuity of the river in this section. No permanent changes to continuity along existing Chertsey Bourne are proposed. The formalised overflow into St Ann's Lake will create a more defined connection with the Thorpe Park lakes that is otherwise only connected during floods. No change to connectivity of this water body is expected from associated bank protection. The bank lowering associated with formalisation of the connection will also not impact on continuity. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
River depth and width variation	Supports Good	**EA, 1999, Chertsey Bourne River Corridor Survey:** Where the Moat joins the Chertsey Bourne, the channel is flanked by the Twynersh Fishing Lakes - the channel has been realigned and embanked in places. **Chertsey Bourne Flood Risk Management Strategy - Geomorphological Scoping Study (Black & Veatch, 2005)**	Construction is not expected to change river depth or width at more than a localised scale for FCS8. Coffer dams and sheet piling may have a temporary localised impact. No further assessment required.	No impact anticipated from this modification on river depth and variation. No further assessment required.	If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	Lowering of 20m of the left bank of the Chertsey Bourne for FCS8 will alter the existing cross section for this length and could have some impacts on channel evolution upstream and downstream of the structure. There could be changes in erosion and deposition patterns at a local scale from the structure. However, changes will be very minor – the lowering accounts for only 0.19% of the water body and will only formalise an existing arrangement. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued.
Structure and substrate of the river bed	Supports Good	**Chertsey Bourne Flood Risk Management Strategy - Geomorphological Scoping Study (Black & Veatch, 2005)**	There will be some changes to structure and substrate within the dry-working areas for construction of FCS8. However, this will be temporary and localised. The dry working area will be removed, and the bed restored following completion of activities. Risk of runoff into the water body from general construction and	Compounds, material processing and storage sites could cause greater levels of fine sediment to be produced in proximity to the water body. This could enter the river water body and smother the river bed. However, control measures,	If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	As the overflow structure will only be operational in periods of peak flows, there is not likely to be any significant change in sediment transport processes that would influence the river bed in this reach. Potential influence from overflow returned to the Chertsey Bourne from St Ann's Lake, however effects are limited as there will already be informal mixing between the two waterbodies. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
			earthworks in proximity to the water body, will be minimised by tertiary mitigation. No further assessment required.	such as appropriate drainage and silt control through adherence to tertiary mitigation during construction to reduce fine sediment run-off and minimise such impacts. No further assessment required.			**Scoped out** of detailed assessment.	
Structure of the riparian zone	Supports Good	**Chertsey Bourne River Corridor Survey (Environment Agency, 1999):** The upstream route of the Bourne passes beneath the M3 to pass within a narrow corridor flanked by the woodland verge of the M3 and St Ann's Lake. The channel remains heavily shaded by the riparian woodland and dense banks of nettle and bramble.	There will be local removal of riparian vegetation during construction and will be small scale and localised. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. No further assessment required.		There may be minor improvements to the structure of the riparian zone following removal of established plant INNS, but this is considered negligible on a water body scale. No further assessment required.	Any local removal of riparian vegetation for construction of the formalised overflow will be small scale and localised. An approximate area of 91m^2 of riparian vegetation will be removed representing 0.26% of the catchment area. Therefore, there will be no change at water body scale. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Geomorphological walkover report not yet issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
Physico-chemical supporting elements								
Salinity	Not used to classify WFD status	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022)**	Any impacts to salinity from construction activities would be localised and negligible risk. No further assessment required.	Any impacts to salinity from construction activities would be localised and negligible risk. No further assessment required.	No impacts anticipated. No further assessment required.	No impacts anticipated. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Oxygenation conditions (DO)	Moderate	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022)**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both of these construction modifications. This could alter DO within the water column, pH and temperature. However, tertiary mitigation will be in place to minimise the risk of this occurring and subsequent decreases in DO. Furthermore, due to the footprint of the works within this water body, any impacts are negligible. No further assessment required.		If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	The proposed works will not cause changes in organic matter, vegetation cover, shading and flow or depth of water under non-flood conditions, therefore there will be no changes in the physico-chemical conditions at a local or water body scale. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Awaiting results of site investigation to establish presence of contaminants within soils of former landfill and within the Thorpe Park lakes water body sediments. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Acidification status (pH)	High							
Temperature	High							

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
							Scoped out of detailed assessment.	
Ammonia	High	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022)** **Ground investigation surveys (GBV, 2022-23)**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both of these construction modifications. This could contain concentrations of ammonia, phosphates and specific pollutants which could be adhered to fine sediments or runoff in the water column into the water body. However, tertiary mitigation will be in place to minimise the risk of this occurring and subsequent decreases in DO. Furthermore, due to the small footprint of the works within this water body, any impacts are negligible. No further assessment required.		No impacts anticipated. No further assessment required.	The formalised overflow works and bank protection changes will not alter the input of landfill leachates or nutrients from the surrounding area, therefore there will be no changes in the ammonia, phosphate or specific pollutant conditions. If there is an increase in these substances as a result of works within Fleet and Abbey Lakes, it is considered unlikely that increased concentrations will reach Chertsey Bourne due to the functioning of the flow control structure (FCS8) (allowing flow only from St. Ann's to Abbey lake). No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Awaiting results of site investigation to establish presence of contaminants within soils of former landfill and within the Thorpe Park lakes water body sediments. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Nutrient conditions (phosphates)	Good							
Specific pollutants	High Permethrin							
Biological quality elements								
Macrophytes and Phytobenthos	Good	**Chertsey Bourne River Corridor Survey (EA, 2009)**: A River Corridor Survey of the Chertsey Bourne in 1999 identified a notable abundance and diversity of macrophytes.	Not likely to be any change in prevailing conditions for macrophytes at the water body scale, as none of the supporting conditions are expected to change in this water body from construction activities. There is a risk that an increase in fine sediment or accidental spillage of hazardous substances entering the watercourse, associated with construction, could have adverse		No adverse impact anticipated. Any management that occurs could have minor, localised improvements to the water body. It may	Not likely to be any change in prevailing conditions for macrophytes at the water body scale, as none of the supporting conditions are expected to change in this water body. There is potential for an increase in INNS presence and prevalence as a result of the more formalised connection between the Chertsey Bourne and St Ann's Lake. However,	No risk from any individual modification identified. No in-combination construction effects identified due to implementation	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	**Construction compounds, material processing and storage sites**	**INNS and pathogen management**	**Flow control structures (including associated bank protection)**		
		Chertsey Bourne Flood Risk Management Strategy - River Corridor & Phase 1 Habitat Surveys (Black & Veatch, 2005)	impacts on macrophytes. However, tertiary mitigation will be in place to minimise the risk of this occurring. There may be a very small direct loss of macrophytes in the footprint of the construction area on this water body, but this will be localised. There is potential for increases in INNS and pathogens presence and prevalence as a result of construction activities. However, as the connection already exists between Chertsey Bourne and St. Ann's Lake, any increase in INNS that may have an indirect impact on macrophytes within this water body, is considered negligible. Secondary mitigation through an Aquatic INNS management plan will also be in place. No further assessment required.		reduce any existing impact that INNS are currently having on macrophytes and phytobenthos. No further assessment required.	as this connection already exists, any increase in INNS that may have an indirect impact on macrophytes within this water body, is considered negligible. Secondary mitigation through an Aquatic INNS management plan will also be in place. No further assessment required.	of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Benthic invertebrates	Good	**Chertsey Bourne River Corridor Survey (EA, 2009)**: A River Corridor Survey of the Chertsey Bourne in 1999 identified a notable abundance and diversity of macrophytes. Chertsey Bourne Flood Risk Management Strategy - River Corridor & Phase 1 Habitat Surveys (Black & Veatch, 2005)	Not likely to be any change in prevailing conditions for macroinvertebrates at the water body scale, as none of the supporting conditions are expected to change in this water body from construction activities. There is a risk that an increase in fine sediment or accidental spillage of hazardous substances entering the watercourse, associated with construction, could have adverse impacts on macroinvertebrates. However, tertiary mitigation will be in place to minimise the risk of this occurring. There may be a very small direct loss of macroinvertebrates in the footprint of the construction area on this		No adverse impact anticipated. Any management that occurs could have minor improvements to the water body. It may reduce any existing impact that INNS and pathogens are currently having on invertebrates.	Not likely to be any change in prevailing conditions for invertebrates at the water body scale, as none of the supporting conditions are expected to change in this water body. There is potential for an increase in INNS and pathogens presence and prevalence as a result of the more formalised connection between the Chertsey Bourne and St. Ann's Lake. However, as this connection already exists, any increase in INNS that may have an indirect impact on macroinvertebrates within this water body, is considered negligible. Secondary mitigation through an	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
			water body but this will be localised. There is potential for an increase in INNS and pathogen presence and prevalence as a result of construction activities. However, as the connection already exists between Chertsey Bourne and St. Anns Lake, any increase in INNS and pathogens that may have an indirect impact on macroinvertebrates within this water body, is considered negligible. Secondary mitigation through an Aquatic INNS management plan will also be in place. No further assessment required.	No further assessment.	Aquatic INNS management plan will also be in place. No further assessment required.		**Scoped out** of detailed assessment.	
Fish fauna	Bad	**Chertsey Bourne River Corridor Survey (EA, 2009)**: A River Corridor Survey of the Chertsey Bourne in 1999 identified a notable abundance and diversity of macrophytes. Chertsey Bourne Flood Risk Management Strategy - River Corridor & Phase 1 Habitat Surveys (Black & Veatch, 2005)	Not likely to be any change in prevailing conditions for fish at the water body scale, as none of the supporting conditions are expected to change in this water body from construction activities. If a dry working area with sheet piling is used, this may have direct impacts on fish. Any fish within the working area will require netting and translocated to another section of the water body. There could be noise and vibration impact on fish in proximity to the works, however due to the length of the water body and the absence of any obstructions to fish passage, fish will be able to swim away from the works. Secondary and tertiary mitigation will also be adhered to, to reduce any adverse		No adverse impact anticipated. No further assessment required.	Formalising the flow between Chertsey Bourne and St. Anns Lake (part of Thorpe Park Lakes WFD water body) through the permanent FCS8 control structure is unlikely to alter fish fauna as there is already informal mixing of the water bodies during periods of peak flows. However, as there are no fish passes on St Ann's Lake, any fish that enter the lake from Chertsey Bourne will become trapped. This is the same as the current situation, but will potentially prevent the water body from achieving good in the future. There is potential for an increase in INNS presence and prevalence as a result of the more formalised connection between the Chertsey Bourne and St. Anns Lake. However, as this connection already exists (floods approximately once a year)	**Scoped in** to detailed assessment due the overspill structure into St Ann's Lake potentially causing fish to become trapped in the lake.	Detailed construction methods and plans yet to be issued. Fish surveys to be undertaken in Summer 2023 Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
			temporary impacts from the construction of FCS8. The working areas will be small relative to the size of the overall river water body and it is likely there will remain sufficiently large areas for fish to shelter and inhabit during works. There is potential for an increase in INNS and pathogens presence and prevalence as a result of construction activities. However, as the connection already exists between Chertsey Bourne and St. Ann's Lake, any increase in INNS that may have an indirect impact on fish within this water body, is negligible. Secondary mitigation through an Aquatic INNS management plan will also be in place. No further assessment required.			and the frequency of connectivity is not anticipated to change any increase in INNS and pathogens that may have an indirect impact on fish within this water body, is negligible. Secondary mitigation through an Aquatic INNS management plan will also be in place. No further assessment required.		
Chemical elements								
Priority hazardous substances	Fail (PFOS and PBDE)	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022)**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both of these construction modifications. This could contain high concentrations of priority hazardous substance and priority substances which could be adhered to fine sediments or runoff in the water column into the water body. Tertiary mitigation and environmental permits will be in place to minimise the risk of this occurring and potential effects		No adverse impact anticipated. No further assessment required.	The permanent changes to formalise the existing overflow are not considered to increase the risk of priority hazardous substance and priority substances entering this water body. The changes will only formalise a connection that already exists. If there is an increase in these substances as a result of works within Fleet and Abbey Lakes, it is considered unlikely that increased concentrations will reach Chertsey Bourne due to the functioning of the flow control structure (FCS7) (allowing flow only from St Ann's to Abbey lake).	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Priority substances	Fail (Cypermethrin)							

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[3]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and pathogen management	Flow control structures (including associated bank protection)		
			from these works will only occur in the short-term. No further assessment required.			No further assessment required.	operational effects identified. **Scoped out** of detailed assessment.	
Other Pollutants	Does not require assessment	Not assessed	Not assessed				N/A	Not required

Chertsey Bourne (Virginia Water to Chertsey) Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
4. Remove or soften hard banks	Not in place	None	The works will involve the construction of a new overspill structure, with the lowering of a 20m stretch of the left bank. The works would be very small scale, albeit permanent, but are not anticipated to prevent the future implementation of this WFD measure throughout the majority of this WFD water body.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Haul routes will be planned across site to minimise effects. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish.
5. Preserve or restore habitats	Not in place	None	There is the potential for some very small direct loss of habitats over a small area within this WFD water body, albeit permanent. The works are to formalise an existing overflow and therefore no significant effects are anticipated on the supporting elements or habitats. Consequently, the project will not prevent the subsequent implementation of this WFD measure in the future.	See 4 above.
6. In channel morphological diversity	Not in place	None	Potential for a very small alteration in the in-channel morphological diversity, which will be permanent. However, it will not lead to significant changes due to the length of bank to be impacted. It will not prevent implementation of this WFD measure in the remaining WFD water body in the future.	N/A
7. Bank rehabilitation	Not in place	None	The works would be very small scale, albeit permanent, but with the implementation of the proposed project mitigation measures wherever feasible, adverse effects will be minimised. The project is unlikely to prevent the future implementation of this WFD measure throughout the majority of this WFD water body.	See 4 above.
16. Fish passes	Not in place	None	The new overspill structure would almost mimic existing conditions and therefore it would enable the same level of fish movement as presently occurs. Thus, no significant effects are anticipated, and it is not anticipated that the project would prevent the future implementation of this WFD measure over the majority of this WFD water body.	N/A
19. and 56. Enhance ecology (recreation and structural modifications)	Not in place	None	The works will be small scale, albeit permanent on the ecology which is not anticipated to be significant. Any adverse impacts on fish would be temporary during construction of the	See 4 above.

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
			formalisation of overflows. Where feasible, project mitigation measures will be implemented, and it is not anticipated to prevent the future implementation of this WFD measure within the majority of the remaining WFD water body.	
20. Changes to locks etc.	Not applicable	N/A	N/A	N/A
21-27. Dredging, sediment management and disposal measures	Not applicable	N/A	N/A	N/A
28.Manage disturbance	Not applicable	N/A	N/A	N/A
32. Phased dewatering	Not applicable	None	N/A	N/A
33-35. Vegetation control	Not in place	None	Any local removal of riparian vegetation for construction of the formalised overflow will be small scale and localised. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. Proposed project mitigation measures will give due consideration to any vegetative control measures that may be required in the future.	Access for management activities will be discussed with the relevant landowners/managers and/or Natural England prior to commencement of the works to ensure where possible these activities can continue. Access requirements for management will be built into traffic management plans.
36 and 52 Invasive species techniques and awareness	Not in place	None	The works involving the formalisation of an existing overspill, will only affect a very small area, albeit permanent. There is not considered to be a risk associated with the spread of invasives in this location. A number of project mitigation measures have been proposed as part of the design which will give due regard to minimising the spread of invasives. It is not anticipated that the project would compromise the future implementation of these combined WFD measures.	A biosecurity action plan for INNS will be produced, detailing mitigation measures, including consideration of equipment and materials entering the site.
49-51 and 53 Navigation: Modify vessel design; vessel management, boats in central track, boat wash awareness	Not applicable	None	N/A	N/A
55. Recreation awareness	Not in place	None	The works will only affect a small area and therefore is unlikely to give rise to adverse effects on recreation and it is considered unlikely that it would compromise the future implementation of this WFD measure.	N/A

Colne Brook - GB106039023010 - Heavily Modified Water Body. Overall Status (2019) – Moderate - Catchment area (km2): 10.031 – Length (km): 15.206

Designated/protected sites associated - Drinking Water Safeguard Zones.

Key

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks
2) INNS and Pathogen management – dewatering and direct removal of INNS
3) Construction compounds, material processing and storage sites

Operation elements of the project affecting this water body are:

1) Operation of Priority areas for habitat creation, mitigation or enhancement (Land South of Wraysbury Reservoir)

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
Hydromorphological supporting elements								
Hydromorphological supporting elements (Quality and dynamics of flow, Connection to groundwater bodies, River continuity, River depth and width variation, Structure and substrate of the river	Supports Good	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme**	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation. Construction activities could lead to an increase in fine sediment entering this area of the water body. Increased levels of fine sediment could alter water body depth and substrate of	Management of INNS is likely to occur within the boundary of the priority area for habitat creation. However, as the water body is not located within this boundary, it is	There is also a risk of fine sediment release from construction compounds and material processing and storage sites which could runoff into the section of the Colne Brook adjacent to the boundary of the priority area for habitat	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation (Land South of Wraysbury Reservoir) and as the brook is not within the boundary for this area there is no risk anticipated to	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	Detailed construction methods and plans yet to be issued. Designs of the new green open spaces or the priority areas for habitat creation, mitigation or

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
bed, and Structure of riparian zone)		**Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	the river bed. However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.	anticipated that there will be no risk to hydromorphological supporting elements. No further assessment required.	creation. However, the tertiary mitigation will be in place to prevent a significant increase in fine sediment entering the Thames, and subsequently being abstracted. No further assessment required.	hydromorphological supporting elements. No further assessment required.	No in-combination operational effects identified. **Scoped out** of detailed assessment.	enhancement have not been finalised.
Physico-chemical supporting elements								
Salinity	Not used to classify WFD status		Construction activities may create bare soil surfaces, that are prone to erosion, which could lead to increased salinity in run off. However, it is anticipated that there will be no risk to the salinity of this water body due to it been located outside of the Land South of Wraysbury priority area for habitat creation boundary. Tertiary mitigation will be in place to reduce runoff and accidental spills. Overall risk to this element is considered to be low. No further assessment required.	Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	Material processing and construction compounds could include salt storage, especially in winter months, this could runoff into the water body adjacent to the Priority areas for habitat creation boundary. However, this risk is considered negligible as. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off. No further assessment required.	The existence of the priority habitat area is likely to reduce any bare ground adjacent to Colne Brook, reducing the likelihood of erosion associated with bare ground. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Design of the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Temperature	High	**Ecological Surveys Project data;** **GBV (2022)**	Potential for localised changes within the water body during the construction period from an increase in fine sediment release which could enter the section of this water body that is adjacent to the boundary of	Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water	There is risk of fine sediment release from construction compounds and material processing and storage sites which could runoff into the section of the Colne	Depending on design there could be potential for additional shading from planted trees, however this will have very low risk on the temperature of this water	No risk from any individual modification identified. No in-combination construction effects	Designs of the priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
		River Thames Scheme Surface Water Quality Data 2012 – 2022 **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	the priority area for habitat creation and reduce light penetration to the river bed. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any risk to the temperature of the water body. No further assessment required.	body is outside the red line boundary. No further assessment required.	Brook adjacent to the boundary of the priority area for habitat creation. However, tertiary mitigation will be in place to prevent a significant increase in fine sediment entering the Thames, and subsequently being abstracted. No further assessment required.	body as it is not located within the priority area for habitat creation boundary. No further assessment required.	identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Oxygenation conditions (DO)	High		Potential for localised changes within the water body during the construction period from an increase in fine sediment release which could enter the section of this water body that is adjacent to the boundary of the priority area for habitat creation and reduce light penetration to the river bed as well as creating an oxygen demand within the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off. No further assessment required.	Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	Potential for localised changes within the water body during the construction period from an increase in fine sediment release which could enter the section of this water body that is adjacent to the boundary of the priority area for habitat creation and reduce light penetration to the river bed. There is also a potential for accidental spillages and runoff of hazardous substances which could reduce dissolved oxygen conditions in this water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off. No further assessment required.	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation and as the brook is not within the boundary, there is very low risk anticipated to DO through the operation of this area. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
Acidification status (pH)	High		Construction activities, including removal of INNS could result in accidental spillage of hazardous substances that may alter pH should runoff enter a water body. This could impact upon pH locally and would likely to be temporary in nature. However, as there are no in channel works within this water body and the water body itself is not situated within the priority areas for habitat creation boundary, it is anticipated that there is no risk from construction activities. No further assessment required.	Not anticipated to impact upon pH.	There is potential for accidental release of hazardous substances from compounds, processing and storage sites and haul roads, which could then runoff into this water body adjacent to the priority areas for habitat creation. This could impact upon pH locally and would likely to be temporary in nature. However, as there are no in channel works within this water body and the water body itself is not situated within the priority areas for habitat creation boundary, it is anticipated that there is no risk from construction activities. No further assessment required.	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation and as the brook is not within the boundary, there is very low risk anticipated to pH through the operation of this area. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.
Ammonia	High		Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain ammonia compounds. This sediment could be released and runoff into the section of the water body adjacent to the priority area for habitat creation. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and	Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain ammonia compounds. This sediment could be released and runoff into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation and as the brook is not within the boundary of this area there is no risk anticipated to pH. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
			minimise any impacts to this element. No further assessment required.		run-off and minimise any impacts to this element. No further assessment required.		**Scoped out** of detailed assessment.	
Nutrient conditions (Phosphate)	Poor		Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain concentrations of phosphorus. This sediment could be released and runoff into the section of the water body adjacent to the priority area for habitat creation. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment required.	Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. INNS and pathogen management could alter the nutrient availability and improve productivity levels of native plants but is not anticipated to be at a water body scale. No further assessment required.	Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain concentrations of phosphorus. This sediment could be released and runoff into this water body adjacent to the priority area for habitat creation. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment required.	The priority habitat area is likely to include planting, which will increase nutrient uptake. However, this will not impact the water body as it is not located within the boundary of this area. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.
Specific pollutants	High (Iron, Triclosan, copper, manganese, zinc)		Construction activities and earthworks could lead to changes in flow pathways. Accidental spillage of hazardous substances and through earthworks could lead to the release into the water body. There could be mobilisation of landfill leachate which could runoff into this water body without tertiary mitigation. However, it is considered that a low risk of increased input of specific	Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	Potential for localised changes within the water body during the construction period from an increase in fine sediment supply originating from compounds and processing and storage sites. This could contain high Copper concentrations and other specific pollutants. This sediment could be	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation and as the brook is not within the priority areas for habitat creation boundary there is negligible risk from specific pollutants to this water body. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
			pollutants into the water body remains as it is not within the boundary of the priority area for habitat creation. No further assessment required.		released and runoff into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment required.		**Scoped out** of detailed assessment.	
Biological quality elements								
Macrophytes and phytobenthos combined (Macrophytes sub element)	Good		Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen. Spillage of hazardous substances could also lead to toxic adverse impacts to Macrophytes and phytobenthos. Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. However, control measures, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. As the water body is not located within the boundary for priority areas for habitat creation construction works, it is anticipated to be at no risk from construction.	There is no anticipated risk from INNS and pathogen management on the Colne Brook as it is not situated within the priority areas for habitat creation boundary. Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	Increased fine sediment released from compounds and processing and storage sites, into the water body could smother macrophytes and phytobenthos. Reduced light penetration and dissolved oxygen because of high inputs of fine sediment could also indirectly impact growth. Additionally, accidental spillage of hazardous substances could also lead to toxic adverse impacts. However, control measures, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element.	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation and as the brook is not within the priority areas for habitat creation boundary there is no risk anticipated to macrophytes and phytobenthos. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
			No further assessment required.		As the water body is not located within the boundary for priority areas for habitat creation construction works, it is anticipated to be at no risk from construction. No further assessment required			
Fish fauna	Poor		Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen. Spillage of hazardous substances could also lead to toxic adverse impacts to fish fauna. Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. As the water body is not located within the boundary for priority areas for habitat creation construction works, it is anticipated that fish fauna is at no risk from construction. No further assessment required.	There is no anticipated risk from INNS and pathogen management on the Colne Brook as it is not situated within the priority areas for habitat creation boundary. Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	Increased fine sediment released from compounds and processing and storage sites, into the water body could smother bed habitats. Reduced light penetration and dissolved oxygen because of high inputs of fine sediment could also indirectly reduce fish fauna availability. Additionally, accidental spillage of hazardous substances could also lead to toxic adverse impacts. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. As the water body is not located within the boundary for priority areas for habitat creation construction works, it is anticipated to be at no risk from construction.	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation and as the brook is not within the priority areas for habitat creation boundary there is no risk anticipated to fish fauna. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
					No further assessment required.			
Benthic Invertebrates	High		Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen. Spillage of hazardous substances could also lead to toxic adverse impacts to invertebrates. Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. As the water body is not located within the boundary for priority areas for habitat creation construction works, it is anticipated that invertebrates are at no risk from construction. No further assessment required.	There is no anticipated risk from INNS and pathogen management on the Colne Brook as it is not situated within the priority areas for habitat creation boundary. Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	Increased fine sediment released from compounds and processing and storage sites, into the water body could smother bed habitats. Additionally, accidental spillage of hazardous substances could also lead to toxic adverse impacts. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. As the water body is not located within the boundary for priority areas for habitat creation construction works, it is anticipated to be at no risk from construction. No further assessment required.	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation and as the brook is not within the priority areas for habitat creation boundary there is no risk anticipated to invertebrates. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.
Chemical elements								

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status4	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Priority area for habitat creation, mitigation or enhancement		
Priority hazardous substances	**Fail (PFOS & PBDE)**		No significant change is predicted in the chemical conditions of this water body as works at Land South of Wraysbury Reservoir within this water body catchment will adhere to tertiary mitigation and environmental permit requirements to prevent any pollutants reaching this water body. Any residual effects from these activities will be short-term, further minimising the risk of deterioration. No further assessment required.	There is no anticipated risk from INNS and pathogen management on the Colne Brook as it is not situated within the priority areas for habitat creation boundary. Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain priority hazardous or priority substances. This sediment could be released and runoff into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment required.	A section of the Colne Brook is adjacent to the boundary of the priority area for habitat creation and as the brook is not within the priority areas for habitat creation boundary and no anticipated changes to the flow pathways of the Colne Brook there is no risk anticipated. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment. .	Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.
Priority substances	Good							Designs of priority areas for habitat creation, mitigation or enhancement have not been finalised.
Other Pollutants	Does not require assessment	Not assessed	N/A				N/A	Not required

Colne Brook Mitigation Measures Assessment

Key:

Type of effect

High risk of compromising the measure
Medium risk of compromising the measure
Low risk of compromising the measure
No risk of compromising the measure
Potential for positive contribution towards the measure
Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
2. Remove obsolete structures	Not in place	None	Currently there are no plans to remove obsolete structures, and therefore the works are unlikely to compromise implementation of this measure in the future.	N/A
4. Remove or soften hard banks	Not in place	• Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	A priority area for habitat creation, enhancement or mitigation is adjacent to a very small area of this water body. Designs are still to be refined but could include softening of hard banks if applicable. The works will not prevent the future implementation of this WFD measure throughout the WFD water body.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish.
5 and 19 and 37. Retain, preserve or restore habitats and enhance ecology	Not in place	• Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	The design for the priority area for habitat creation, enhancement or mitigation is still to be refined but could include improvements in riparian habitats. The area has been selected for potential to improve biodiversity net gain. These works are on a very small scale for the WFD water body but could have a long term positive impact and will not prevent the measure being implemented in the future.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish.
6. In channel morphological diversity	Not in place	None	Currently there are no plans for alternations within the channel therefore the works are unlikely to compromise implementation of this measure in the future.	N/A
8 and 9. Re-opening culverts and altering culvert channel beds	Not in place	None	Currently there are no plans for alterations for any culverts within the water body, therefore the works are unlikely to compromise implementation of this measure in the future.	N/A
10 – 12. Flood bunds, set back embankments and floodplain connectivity	Not in place	• Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	The design for the priority area for habitat creation, enhancement or mitigation is still to be refined but could include improvements in floodplain connectivity. These works are on a very small scale for the WFD water body but could have a long-term positive impact.	N/A

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
16. Fish passes	Not in place	None	Currently there are no plans for fish passes within the water body, therefore the works are unlikely to compromise implementation of this measure in the future.	N/A
18. Reduce fish entrainment	Not applicable	N/A	N/A	N/A
20. Changes to locks etc.	Not in place	None	Currently there are no plans for changes to locks within the water body, therefore the works are unlikely to compromise implementation of this measure in the future.	N/A
33-35. Vegetation control	Not in place	Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	There may be some vegetation maintenance required (trimming, replacement, coppicing trees etc.). Proposed project mitigation measures will give due consideration to any vegetative tertiary mitigation that may be required in the future as part of the management of the priority area for habitat creation enhancement or mitigation. It is not anticipated that the project would compromise the future implementation of these combined WFD measures.	Access for management activities will be discussed with the relevant landowners/managers and/or Natural England prior to commencement of the works to ensure where possible these activities can continue. Access requirements for management will be built into traffic management plans.
36. Invasive species techniques	Not in place	Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	The potential for RTS to increase the spread of invasives is considered no risk at this location. A number of project mitigation measures have been proposed as part of the design which will give due regard to minimising the spread of invasives. It is not anticipated that the project would compromise the future implementation of these combined WFD measures.	A biosecurity action plan for INNS will be produced, detailing mitigation measures, including consideration of equipment and materials entering the site.
38 – 40. Management and maintenance of sediment	Not in place	Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	Currently there are no plans for changes within the water body itself that might impact sediment management, so the works are unlikely to compromise implementation of this measure in the future.	Utilisation of a construction management plan and a CEMP (tertiary standard practice mitigation) will minimise the risk of sediment entering the channel associated with construction works.
41 and 47. Water level management and align and attenuate flow.	Not applicable	N/A	N/A	N/A
56. Educate landowners	Not applicable	N/A	N/A	N/A

River Thames (Cookham to Egham) - GB106039023231 - Heavily Modified Water Body. Overall Status (2019) – Moderate - Catchment area: 65.884km^2 – Length 30.056km

Designated/protected sites associated – Surface Water Safeguard Zone, Drinking Water Protected Area, Nitrates Directive, Urban Waste Water Treatment Directive, Ramsar site & SPA

Key

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks
2) Temporary wharves and river transport of construction materials and waste

Operational elements of the project affecting this water body are:

1) Flood relief channel through existing lake water body including a continuous augmented flow through the channel

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Cycle 3 2019 RBMP classification[5]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Temporary wharfs and river transport of construction materials and waste	Operation of the flood relief channel and their interactions with the river water body		
Hydromorphological supporting elements							
Hydromorphological supporting elements (Quantity and dynamics of flow, connection to groundwater body, river continuity, river depth and width variation, structure and substrate of the river bed, structure of the riparian zone) .	Not used to classify this water body	**Hydraulic modelling (DHI/Stantec, 2023);** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)** **Flow monitoring (2019 – 2022) (GBV, 2022)**	The only general construction and earthworks within this water body catchment will be the proposed habitat creation, mitigation, or enhancement area at Land South of Wraysbury Reservoir. Works will adhere to tertiary (standard practice) mitigation to minimise any runoff of fine sediment, pollutants or INNS and pathogens into the Thames (Cookham to Egham). All other construction works associated with RTS will be downstream of this water body. No further assessment required.	No changes to hydromorphological supporting elements are expected. Temporary wharves are not within this water body and transport of construction materials by barge will not impact hydromorphology.	All physical works for this project are downstream of this water body, predominately in Thames (Egham to Teddington), however when the flood channel is in operation during flood conditions, hydraulic modelling predicts there will be a drawdown from the Runnymede channel and that water levels will be lower upstream, within this water body. Modelling (WBi, 2023) predicts that downstream of Bell Weir (1.5km from the downstream water body boundary) there will be a <0.3m reduction in water levels in a 1 in 10 year flood. By Datchet, the change in water levels is less than <0.1m. Given that these changes to water levels will only occur during flood events and the largest effect is in the most downstream 1.5km (5%) of the water body the effect on hydromorphological supporting elements is negligible. Water levels in this water body will not be affected by the augmented flow.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of the detailed assessment	N/A

[5]Current 2019 RBMP status data extracted from the Environment Agency Catchment Data Explorer http://environment.data.gov.uk/catchment-planning/ in March 2023

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Cycle 3 2019 RBMP classification[5]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Temporary wharfs and river transport of construction materials and waste	Operation of the flood relief channel and their interactions with the river water body		
					No further assessment required.		
Physico-chemical supporting elements							
Temperature	High	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022)**	No significant change is predicted in physico-chemical conditions of this water body as works at Land South of Wraysbury Reservoir within this water body catchment will adhere to tertiary mitigation to prevent any pollutants reaching the Thames and impacting physico-chemical supporting elements. All other construction works associated with RTS are all downstream of this water body. No further assessment required.	Temporary wharves are not within this water body and transport of construction materials by barge will not impact physico-chemical conditions. Safe transport of materials will be ensured through tertiary (practice) mitigation. No further assessment required.	No change is predicted in physico-chemical conditions of this water body as no long-term pathways or sources of pollutants are anticipated for this water body. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of the detailed assessment	N/A
Oxygenation conditions (DO)	High						
Salinity	Not used to classify WFD status						
Acidification status (pH)	High						
Ammonia	High						
Nutrient conditions (phosphate)	Moderate						
Specific pollutants	High (Arsenic, Copper, Iron, Zinc, Toluene & Manganese)						
Biological elements							
Macrophytes and phytobenthos (not used to classify this water body). Macrophytes sub element (High)	High	**Limited aquatic ecology data is available, surveys are planned for 2023.**	No significant change is predicted in water quality or hydromorphological conditions which would impact biological elements in this water body. Works at Land South of Wraysbury Reservoir within this water body catchment will adhere to tertiary mitigation to prevent any pollutants reaching the Thames and	Temporary wharves are not within this water body and transport of construction materials by barge will not impact biological elements. Safe transport of materials will be ensured through tertiary standard practice mitigation.	As the project will be connecting previously isolated water bodies to the River Thames, there is a risk that INNS and pathogens present in the isolated water bodies move upstream and reach this water body. This could increase the presence and prevalence of INNS and pathogens within the water body, impacting	**Scoped in** of the detailed assessment due to risk of introducing INNS and pathogens into this water body	Aquatic ecology and fish surveys are scheduled for 2023 and are to include this water body as a control location.
Benthic Invertebrates	Not used to classify this water body					**Scoped in** of the detailed assessment due to risk of introducing INNS and pathogens into this water body	

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Cycle 3 2019 RBMP classification[5]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Temporary wharfs and river transport of construction materials and waste	Operation of the flood relief channel and their interactions with the river water body		
Fish fauna	Not used to classify this water body		impacting biological elements. All other construction works associated with RTS are all downstream of this water body. No further assessment required.		upon biological quality elements. INNS and pathogens management plans will be in place throughout the project during operation and risk is deemed low, however further assessment is required.	**Scoped in** of the detailed assessment due to risk of introducing INNS and pathogens into this water body	
Chemical elements							
Priority hazardous substances (Overall fail and for PFOS and PBDE)	Fail	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022)**	No significant change is predicted in the chemical conditions of this water body as works at Land South of Wraysbury Reservoir within this water body catchment will adhere to tertiary mitigation and environmental permit requirements to prevent any pollutants reaching the Thames and impacting chemical elements. Any residual effects from these activities will be short-term, further minimising the risk of deterioration. All other construction works associated with RTS are all downstream of this water body. No further assessment required.	Temporary wharves are not within this water body and transport of construction materials by barge will not impact chemical conditions. Safe transport of materials will be ensured through tertiary (standard practice) mitigation. No further assessment required.	No change is predicted in chemical conditions of this water body as no long-term pathways or sources of pollutants are anticipated for this water body. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of the detailed assessment	N/A
Priority substances	Good						
Other Pollutants	Good						

River Thames (Cookham to Egham) Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016)	State of Measure	Specific WFD Mitigation Measures Identified	Scale and Certainty of Impact (Spatial and Temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
2. Remove obsolete structures	Not Applicable	N/A	N/A	N/A
3. Re-engineer river	Not in place	None identified	There are no physical works planned in this water body. RTS is not anticipated to compromise implementation of this WFD measure in the future, within the water body.	N/A
4. Remove or soften hard banks	Not in place	None identified	There are no physical works planned in this water body. RTS is not anticipated to compromise implementation of this WFD measure in the future, within the water body.	N/A
Preserve or restore habitats (5) and maintenance-minimise habitat impacts (37 and 39), Enhance ecology (19).	Not in place (5); In place (37 and 39)	None identified	There are no physical works planned in this water body. Downstream of this water body, permanent fish passes are to be installed on the River Thames. Within the catchment, there is a proposed priority area for habitat creation, enhancement and mitigation. The design for the area is still being developed but will aim to achieve biodiversity net gain. These implementations will assist in achieving this WFD measure in the future, within the water body.	N/A
6. In channel morphological diversity	Not in place	None identified	There are no physical works planned in this water body. RTS is not anticipated to compromise implementation of this WFD measure in the future, within the water body.	N/A
7. Bank rehabilitation	Not in place	None identified	There are no physical works planned in this water body. RTS is not anticipated to compromise implementation of this WFD measure in the future, within the water body.	N/A
8 and 9. Re-opening and altering culverts	Not in place	None identified	There are no physical works planned in this water body. RTS is not anticipated to compromise implementation of this WFD measure in the future, within the water body.	N/A
10 - 12. Flood bunds, Set back embankments and flood plain connectivity	Not in place	None identified	There are no physical works planned in this water body. RTS is not anticipated to compromise implementation of this WFD measure in the future, within the water body.	N/A
16 - 18. Fish passes, flow releases and reducing fish entrainment	Not in place	None identified	There are no physical works planned in this water body and RTS will not prevent the implementation of these WFD measures in the future, within the water body.	N/A

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016)	State of Measure	Specific WFD Mitigation Measures Identified	Scale and Certainty of Impact (Spatial and Temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
			Flows and water levels in this water body have not been modelled to be affected by RTS downstream.	
20. Changes to locks etc.	Not applicable	N/A	N/A	N/A
21-29, 38 and 40. Dredging, disposal and sediment management	Not in place or not applicable	None identified	No dredging is required for this project on this section of the River Thames. RTS and construction downstream of this water body is not anticipated to compromise implementation of this WFD measure in the future.	N/A
30, 31, 32 and 41. Manage artificial drawdown, management of seasonal water levels and phased dewatering.	Not applicable	N/A	N/A	N/A
33-35 Vegetation control	In place	None identified	There are no physical works planned in this water body. Within the catchment, there is a proposed priority area for habitat creation, enhancement and mitigation. Appropriate vegetation control will be incorporated into the design. RTS is not anticipated to compromise implementation of this WFD measure in the future, within the water body.	Access for management activities will be discussed with the relevant landowners/managers and/or Natural England prior to commencement of the works to ensure where possible these activities can continue.
36 and 52. Invasive species techniques (in place) and awareness (not applicable)	In place and not applicable	None identified	There are no physical works planned in this water body and RTS will not the achievement of these WFD measures. Within the catchment, there is a proposed priority area for habitat creation, enhancement and mitigation. Any risk of spread of INNS via construction equipment will be mitigated as part of an INNS management plan.	INNS surveys have been undertaken. Any risk of spread of INNS via construction equipment will be mitigated as part of an INNS management plan.
42. Access to feeder streams	Not applicable	N/A	N/A	N/A
41, 43-47. Water Management: Downstream flow regime, sediment movement, DO, temperature levels (not applicable) and attenuate flows (not in place)	Not applicable and not in place	N/A	There are no physical works planned in this water body and RTS will not prevent the implementation of these WFD measures in the future, within the water body. Flows, water levels and water quality in this water body have not been modelled to be affected by RTS downstream.	N/A
50, 51 and 53. Navigation: Vessel Management; Boats in the Central Tract; and Boat Wash Awareness	Not in place	Engagement and awareness raising of impacts of navigation when moving materials required for RTS. Reduce suspension of sediment, bank erosion and preserve bank habitat. Not in place.	The project is very unlikely to adversely affect navigation in this water body during construction and operation. Overall, the project will not prevent implementation of this measure in the future.	Impacts associated with the movement of construction materials will be discussed with owners/operators, with measures identified which may include timing, phasing and/or positioning of works to minimise disruption to navigation; incorporation of tertiary mitigation measures to reduce potential cumulative effects associated with navigation including consideration of methods to reduce suspended sediments, bank erosion and preservation of bank habitats as well as raising awareness in operators of any vessels/vehicles working on RTS of these potential effects.

River Thames (Egham to Teddington) - GB106039023232 - Heavily Modified Water Body. Overall Status (2019) – Poor

Catchment area (km^2): 44.822 – Water body length (km): 31.523

Designated/protected sites associated - Drinking Water Protected Area, Surface Water Safeguard Zone, Urban Waste Water Treatment Directive, SPA & Ramsar site

Key

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction activities and earthworks within the water body and in proximity to the water body (this includes construction associated with bed lowering for a 1km stretch from the confluence of the Desborough Cut with the River Thames to just downstream of Walton Marina downstream of Desborough Cut). Including:
    a. Sheet piling installation to enable construction of the flood channel through landfill, made ground and natural ground.
    b. Excavation through landfill and other sources of contamination to construct the sections of Runnymede and Spelthorne flood channels.
    c. Construction of the New green and blue open spaces and/or Priority areas for habitat creation, mitigation, or enhancement.
2) Construction of the flow control structures and Thames Weir Capacity improvements.
3) INNS and Pathogen management - dewatering and direct removal of INNS
4) Long term dewatering to enable construction of the weir capacity improvements.
5) Construction compounds, material processing and storage sites in proximity to the water body.
6) Temporary wharves and river transport of materials and waste.

Due to the volume of construction and operational elements potentially affecting this water body, operational elements are considered in two subsequent tables.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
Hydromorphological supporting elements								
Quantity and dynamics of flow	Not used to classify this water body	**Hydraulic modelling (DHI/Stantec, 2023)** **Flow monitoring (2015 – 2023)** **EA Gauged flow data** **GI works including in Desborough Cut area (2023)** **Desborough Cut Alternatives (GBV, 2019)**	All construction activities will lead to greater levels of fine sediment produced in proximity to the water body. With increased areas of hard standing and compaction associated with material stockpiles, this could lead to localised changes in volume, velocity, and distribution of overland flows. This could increase runoff of fine sediment into this water body and impact on flows. However, negative impacts are unlikely at a water body scale due to implementation of tertiary mitigation (standard practice). Impacts to flows will be within the footprint of the works. Temporary wharf infrastructure will require some bank reinforcement or bed penetration. This will involve sheet piling. However, given the scale of the three new temporary wharves and the tertiary mitigation in place, this activity will only have localised impacts on flows within the footprint of the works (approximately 30m in length and 10m wide into the channel). The works to construct the Abbey River crossing may involve construction of temporary piled walls for approximately 80m. This	There may be some localised removal of INNS prior to construction, to minimise spread, however any impacts on flow would only be very minor, temporary and localised within the footprint of the works. No risk of deterioration is anticipated.	Dewatering will have localised impacts to flow if areas are made dry for an extended period. This is expected to be limited to areas around where coffer dams are required for Molesey weir and for the construction of fish passes within the River Thames. This will alter flow patterns and velocities at the local scale, around these areas. However, due to the small size (all <500m^2) of the structures relative to the total size of the water body (45km^2) and their distance from each other (>5km) any effects from the construction of this element will be temporary and localised, limited to the area immediately around the structures. No further assessment required.	There are likely to be temporary and localised disruption to flows as coffer dams comprising of sheet piling will be required. Sheet piling will change the roughness of the channel bed and banks, temporarily affecting flow dynamics. However, due to the small size (all <500m^2) of the structures relative to the total size of the water body (45km^2) and their distance from each other (>5km) any effects from sheet piling will be temporary and localised, limited to the area immediately around the structures. No further assessment required.	**Scoped in** to detailed assessment due to risk of deterioration from bed lowering.	Construction plans are not yet finalised, including the scale of sheet piling required for construction, dewatering locations, temporary wharf and INNS and pathogen management locations. Geomorphological walkover report not yet issued.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			will enable flows to be maintained within the Abbey River and not discharge into the works under construction. There is no risk to deterioration to the quantity and flow dynamics from these construction activities and tertiary mitigation will be in place. No further assessment required. Bed lowering will affect flow dynamics temporarily during the dredging works, but this will be localised and short term. In-channel tertiary mitigation measures will be implemented to minimise impacts to downstream sections during the process of bed lowering. The volume of water through Desborough Cut would be increased permanently, this will cause localised changes in the quantity and dynamics of water flow downstream of Desborough Cut (lowering the bed downstream will lower the water levels downstream of Desborough Cut, and thus increase flow and velocity through both Desborough Loop and Cut). There may be some changes to flow circulation patterns which would in turn alter the sediment regime. These changes are potentially localised, however more than 2% of the water body length will be directly altered. Detailed assessment for this activity is required.					

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
Connection to groundwater body	Not used to classify this water body	**Hydraulic modelling (DHI/Stantec, 2023)** **Flow monitoring (2015 – 2023)** **GI works including in Desborough Cut area (2023)** **Desborough Cut Alternatives (GBV, 2019)**	In general, there is a good hydraulic connection between the superficial aquifer and the River Thames, with groundwater levels responding rapidly to changes in river level (EA, 2014). Earthworks and compression from material stockpiles may impact groundwater pathways. However, implementation of tertiary (standard practice) mitigation throughout will minimise any adverse impacts to groundwater-surface water interactions. No further assessment required. Temporary wharf infrastructure including piling could have some minor impacts to groundwater connection, however this is likely to be within the footprint of the works (30m in length) and tertiary mitigation measures will be implemented to remove risk. Bed lowering downstream of Desborough Cut will be to a shallow depth of up to 0.7m and it is unlikely there will be significant change to vertical water exchange or rates of groundwater recharge, as the water body is already in good hydraulic connection to groundwater. However, there is potential that localised increases in river depth may create disproportional pathways between this water body and groundwater, and as the bed lowering exceeds 2% of	No impacts from this modification anticipated. No further assessment required.	Construction of the capacity improvements at Molesey weir will be within a coffer dam cell which will be dewatered. Dewatering may also take place for construction of the fish passes within the River Thames. The dewatering will reduce water exchange between the channel and the hyperheic zone during construction. However, due to the small size (all <500m^2) of the structures relative to the total size of the water body (45km^2) and their distance from each other (>5km), any effects from the construction of this element will be temporary and localised, limited to the area immediately around the structures. No risk of deterioration. No further assessment required.	Construction of coffer dams using sheet piling will alter groundwater pathways forming a barrier, altering the direction of flow and / or restructuring flows. All structures will be built within coffer dams, sheet piled into the impermeable clay to control the amount of groundwater escaping into the excavated area. Due to the size of the structures relative to the total size of the water body (45km^2) and their distance from each other (>5km), any effects will be temporary, localised and limited to the area immediately around the structures. No risk of deterioration. No further assessment required.	**Scoped in** to detailed assessment due to risk of deterioration from bed lowering.	Construction plans are not yet finalised, including the scale of sheet piling required for construction, dewatering locations, temporary wharf and INNS and pathogen management locations.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			the water body length, there is a potential risk to this element from the project. Detailed assessment will be required for this activity.					
River continuity	Not used to classify this water body	**Hydraulic modelling (DHI/Stantec, 2023)** **Flow monitoring (2015 – 2023)** **EA Gauged flow data** **GI works including in Desborough Cut area (2023)** **Desborough Cut Alternatives (GBV, 2019)**	All construction activities will lead to greater levels of fine sediment produced within the floodplain of this water body. With increased areas of hard standing and compaction associated with material stockpiles, this could lead to localised changes in volume, velocity, and distribution of overland flows. This could alter rates of fine sediment delivery into this water body. However, negative impacts are unlikely at a water body scale due to implementation of tertiary mitigation, which will minimise the delivery of sediment into the water body. Impacts to flows will be within the footprint of the works and no deterioration anticipated. Temporary wharf infrastructure will include sheet piling installed into the river bed adjacent to the banks. This is likely to cause minor changes to flow dynamics but will not inhibit existing lateral or longitudinal connectivity. Tertiary (standard practice) mitigation will prevent impacts beyond the footprint of the works. Sheet piling to create the new channel planform intersecting through the existing floodplain will cause some alterations to lateral connectivity by changing floodplain flow pathways and	No impact anticipated from this modification. No further assessment required.	Long term dewatering to create dry-working areas for construction of the Molesey weir capacity improvement, and fish passes within the River Thames will cause some minor changes to river continuity but only at a very localised scale. Long term dewatering of up to a year is expected to be limited to within the coffer dam cells. There may be localised changes to sediment transport, erosion and deposition rates downstream at the dewatering sites. These changes are likely to be within the footprint of these structures. However, due to the small size (all <500m^2) of the structures relative to the total size of the water body (45km^2) and their distance from each other (>5km), any effects from the construction of this element will be temporary and localised, limited to the	Sheet piling installed into the channel bed to create coffer dams for Molesey weir capacity improvements and the fish passes within the River Thames will impede longitudinal and lateral connectivity for water and sediment. This has the potential to cause adverse impacts on biological quality elements. However, due to the small size (all <500m^2) of the structures relative to the total size of the water body (45km^2) and their distance from each other (>5km), any effects from the construction of this element will be temporary and localised, limited to the area immediately around the structures. No risk of deterioration. No further assessment required.	**Scoped in** to detailed assessment due to risk of deterioration from bed lowering.	Geomorphological walkover report not yet issued. Construction plans are not yet finalised, including the scale of sheet piling required for construction, dewatering locations, temporary wharf and INNS and pathogen management locations.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			altering the rates of water and sediment delivery to the Thames channel. Tertiary (standard practice) mitigation will ensure these changes are kept to a minimum and at a local scale. For the construction of the Abbey River crossing, it is expected temporary walls (height unknown) will be erected to allow longitudinal flow continuity to be maintained within the river and not discharge into the works under construction. This will limit lateral connectivity for a maximum of 80m in length. However, these walls will be removed following construction, and lateral connectivity will be reinstated, albeit with a different cross sectional arrangement (this permanent change is assessed in the operational table). No further assessment is required. Bed lowering downstream of Desborough Cut will impact river continuity by deepening the channel (0.7m depth over the middle 20m of the channel for 1km downstream of Desborough Cut), therefore increasing flow and velocity in Desborough Loop and Cut (upstream of the dredged area). The works would result in a loss of bed sediment from the system and decrease sediment supply to the downstream reaches of this water body (GBV, 2019). This is likely to be small		area immediately around the structures. No risk of deterioration. No further assessment required.			

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			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			relative to the water body scale, however, due to bed lowering exceeding 2% of the water body length, detailed assessment will be required.					
River depth and width variation	Not used to classify this water body	**Hydraulic modelling (DHI/Stantec, 2023)** **Flow monitoring (2015 – 2023)** **GI works including in Desborough Cut area (2023)** **Desborough Cut Alternatives (GBV, 2019)**	All construction activities will lead to greater levels of fine sediment produced in proximity to the water body. Additional sediment has the potential to affect river depth, however impacts are unlikely at a water body scale due to implementation of tertiary (standard practice) mitigation to minimise sediment runoff. Temporary floating wharf infrastructure will slightly alter depth and width variation, protruding into the existing channel. However, given the average channel width (approximately 60-80m) on this water body, a temporary reduction of approximately 10m in cross-section on the surface of the water would be minor. With regard to the bed lowering, the bed level is relatively stable in this area and thought to be at equilibrium (as concluded in the Halcrow Lower Thames sediment studies and supported by bathymetric data (GBV, 2019)). The cross sectional area of the channel will increase with bed lowering of 0.7m depth over the middle 20m of the channel for 1km. Modelling of this element of the project predicts that there will be a small amount of erosion in	No impact anticipated from this modification.	No impacts anticipated from this modification.	Construction of the Molesey weir capacity improvement and fish passes within the River Thames through sheet piling will, temporarily, reduce the cross-sectional width due to the creation of the coffer dam cell within the channel. However, due to the small size (all <500m^2) of the structures relative to the total size of the water body (45km^2) and their distance from each other (>5km), any effects from the construction of this element will be temporary and localised, limited to the area immediately around the structures. No further assessment required.	**Scoped in** to detailed assessment due to risk of deterioration from bed lowering.	Geomorphological walkover report not yet issued. Construction plans are not yet finalised, including the scale of sheet piling required for construction, dewatering locations, temporary wharf and INNS and pathogen management locations.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			the section dredged and deposition downstream of Walton Bridge (GBV, 2019). The deposition is predicted to be approximately 50mm over a 25 year period. However, due to bed lowering exceeding 2% of the water body length, detailed assessment will be required.					
Structure and substrate of the river bed	Not used to classify this water body	**Hydraulic modelling (DHI/Stantec, 2023)** **GI works including in Desborough Cut area (2023)** **Desborough Cut Alternatives (GBV, 2019)**	All construction activities will lead to greater levels of fine sediment produced in proximity to the water body. This could runoff and settle on the river bed altering the sediment size distribution. Tertiary mitigation including best construction practices for water and materials management will control the risk. Construction is also likely to involve concrete pouring and there is a risk of concrete being accidentally released into the channel which could impact upon the river bed substrate. However, construction will minimise these impacts through tertiary mitigation (adherence to a CEMP and a Construction Surface Water Management Plan). Temporary wharf infrastructure could involve some penetration of the river bed through sheet piling to enable the wharf infrastructure to be fixed in place. This may have minor impacts to the river	No impacts anticipated from this modification. No further assessment required.	Dewatering will be required for up to a year to maintain some dry-working areas, at the channel intakes and capacity improvements. Silt traps (tertiary mitigation) will be used to prevent discharge back into the water column and settling of excess silt on the river bed during construction. There will be changes to structure and substrate within the dry-working areas for construction. As the areas of bed will be dry for an extended period and likely to be disturbed, the structure of the bed could change in these areas. However, this change will be restricted to the footprint of the works. No risk to deterioration is anticipated and no	There may be removal of small amounts of sediment in the Thames adjacent to the intakes and outfalls of the flood channels and at the capacity improvements of Molesey weir. This will be restricted to the footprints of the works and will have negligible impact on overall sediment balance. Due to the small amount removed this will have a localised impact on the bed structure in the vicinity of the weirs, however there could be indirect impacts to biological quality elements if any bedforms are removed that are critical to biological quality elements. Sheet piling to depths of at least 12m into	**Scoped in** to detailed assessment due to risk of deterioration from bed lowering and construction of sheet piling for flow control structures and capacity improvements.	Geomorphological walkover report not yet issued. Construction plans are not yet finalised, including the scale of sheet piling required for construction, dewatering locations, temporary wharf and INNS and pathogen management locations. Erosion and deposition predictions are based on limited sediment composition data. GI work will confirm sediment type and value.

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			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			bed but will restricted to a small area. There will be significant disturbances to the bed during the process of bed lowering downstream of Desborough Cut. This will have considerable impact upon the existing structure and substrate by removing the top layer of sediment (0.7m). However, as bed lowering will be undertaken in the middle section of the channel, substrate to be removed is considered less likely to be valuable than at the margins within this section (to be confirmed following GI analysis). Despite this, there will be subsequent impacts on biological quality elements in the 1km section to be lowered. Primary mitigation from this activity should include the re-use of any coarse material for channel enhancement elsewhere to mitigate for any bedforms lost, if possible. The impacts of bed lowering on a stable channel can be unpredictable, and potentially could result in one or more of the following effects: • increased coarse sedimentation reducing any gained capacity and creating a regular maintenance requirement which is both unsustainable and environmentally damaging,		further assessment required.	the channel bed to create coffer dam cells for capacity improvements will disturb the structure of the bed at the surface and subsurface. If bed sediments are compacted in these areas, pile driving will loosen the surrounding bed sediments and could lead to greater quantities of bedload being mobilised. As the sheet piles will be cut down but retained below bed level following construction, there will be some permanent changes from the existing bed sediment structure within the footprint of the works. Secondary and tertiary mitigation around construction including will be in place including consideration of alternative methods for pile driving reducing vibration and noise. Further assessment required.		

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			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			• bed and bank erosion leading to increased release of finer sediment, with potential impacts on in-channel and bank features. Due to the potential impacts listed above and the bed lowering exceeding 2% of the water body length, detailed assessment will be required.					
Structure of the riparian zone	Not used to classify this water body	**Desborough Cut Alternatives (GBV, 2019)**	Local removal of riparian vegetation for the construction of channel inlet and outlets and temporary wharf infrastructure will be small scale works. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. Reprofiling of some banks will be undertaken, wherever possible, as part of the project. Primary mitigation will also be implemented. Therefore, no change at the water body scale anticipated as impacts will be in the footprint of the work. Bed lowering downstream of Desborough cut is not expected to impact the riparian zone. Works will not impact the banks and will be confined to a central 20m wide section of the channel. No further assessment is required.	There could be some positive improvements to riparian structure from terrestrial INNS removal. This may allow a greater range of native species to establish and an improved structure of the riparian zone. No further assessment is required.	No impacts anticipated from this modification. No further assessment is required.	There will be some loss of trees and bank vegetation cover during the construction of the control structures and capacity improvements. A channel will be cut through the vegetated mid-channel island at Sunbury and Teddington weir complexes. This will remove an established vegetated strip. At Chertsey, the fish pass cut into the right-hand floodplain will be approximately 5m in width for approximately 30m in length[7] (approximate area of 3,500m^2). The weir and adjacent fish pass at Sunbury	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued. Construction plans are not yet finalised, including the scale of temporary wharfs and INNS and pathogen management locations.

[7] The dimensions provided for the River Thames weir fish passes are approximate and will be developed further in a subsequent iteration of this assessment.

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			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
						will be approximately 19m (16m wide weir and 3m wide fish pass) for around 22m in length and a total approximate area of 2,100m^2. At Teddington, the new weir through the Central Ait will be approximately 22m wide by 22m in length (approximate area of 482m^2). In total, the total footprints of the works within the riparian zone are approximately 0.0061km^2 of the catchment area, which is insignificant at a water body scale. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. Reprofiling of some banks will be undertaken, wherever possible, as part of the project. No change at the water body scale. No further assessment is required.		

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
Physico-chemical supporting elements								
Thermal conditions	Moderate	GBV Water Quality Monitoring (2015 – 2023) UKCEH QUESTOR and Protech Modelling (CEH, 2022) Water quality modelling (DHI/Stantec, 2023)	All construction activities are not considered to impact the thermal conditions of the waterbody. No further assessment is required.	No impacts anticipated from this modification. No further assessment is required.	This modification is not anticipated to impact on thermal conditions. No further assessment is required.	This modification is not anticipated to impact on thermal conditions. No further assessment is required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment	Construction plans are not yet finalised, including the scale of sheet piling required for construction, temporary wharf and INNS and pathogen management locations.
Oxygenation conditions (DO)	Good		There is potential for an increase in fine sediment and hazardous substances entering the water body from accidental spills during construction which would affect DO conditions. Excavation through areas of landfill and disturbance from sheet piling could also lead to mobilisation of landfill leachate which could runoff into this water body and reduce DO concentrations. There is also a risk that fine sediment and hazardous substances accidentally enter the water body because of the transport of materials between the temporary wharves and barges. However, tertiary mitigation will be in place to minimise the risk of accidental spills and runoff	No impacts anticipated from this modification. No further assessment required.	The areas to be made dry from dewatering will be small relative to the size of this water body. Impacts to DO concentrations will be negligible and tertiary mitigation will prevent impacts beyond the footprint of works. Water that is removed from the working area will be tested and silt control measures will be applied, before discharging back to the Thames. No further assessment required.	See 'General construction and earthworks' for potential effects from these modifications. Tertiary mitigation will prevent impacts beyond the footprint of works. No further assessment is required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment	Construction plans are not yet finalised, including the scale of sheet piling required for construction, temporary wharf and INNS and pathogen management locations.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			occurring and subsequent decreases in DO. Bed lowering downstream of Desborough Cut may temporarily increase DO in the water body whilst dredging is taking place but will not have a long-lasting impact on a water body scale. Impacts will be localised to the footprint of the works and no further assessment is required.					
Acidification status (pH)	High	GBV Water Quality Monitoring (2015 – 2023)	No risk anticipated to these elements from this modification. Tertiary mitigation will be in place to minimise risk. No further assessment required.	No risk anticipated to these elements from this modification. INNS management plan still to be drafted but expected to include measures to limit spread of INNS to and from other waterbodies due to construction. No further assessment required.	No risk anticipated to these elements from this modification. Tertiary mitigation will be in place to minimise risk. No further assessment required.	No risk anticipated to these elements from this modification. Tertiary mitigation will be in place to minimise risk. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment due to no risk of deterioration.	Construction plans are not yet finalised, including the scale of sheet piling required for construction, temporary wharf and INNS and pathogen management locations. Ground investigation and water quality data will be analysed as part of detailed assessment.
Acid neutralising capacity	High	GBV Water Quality Monitoring (2015 – 2023)						
Ammonia	High	GBV Water Quality Monitoring (2015 – 2023)	General construction and earthworks could lead to increased fine sediment and hazardous substance runoff into the water body. Sources of ammonia, nutrients and specific	No risk anticipated to these elements from this modification. INNS management plan still to be drafted but	No risk anticipated to these elements from this modification. No further assessment required.	There is a risk of accidental spillage of construction and waste materials associated with construction of	**Scoped in** to detailed assessment due to bed lowering.	Construction plans are not yet finalised, including the scale of sheet piling required for construction, temporary wharf and

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
Nutrient conditions (phosphates)	Moderate	GBV Water Quality Monitoring (2015 – 2023)	pollutants associated with fine sediments could runoff within drainage. This could lead to increases in their overall concentrations within the water body. With tertiary mitigation and environmental permits in place the risk to these elements is negligible at a water body scale. There will also be discharge of treated water back to the River Thames from landfill excavations. However, discharged water will adhere to permit conditions to minimise risk to negligible. There is also potential for ammonia, phosphates, and specific pollutants to be released during Desborough bed lowering. Ground investigation work will confirm any risk associated with contaminated sediment in the area and inform disposal or reuse plans. Tertiary mitigation will be in place to minimise sediment dispersal, however, there remains a risk to this element. Further assessment of the existing bed conditions is required at detailed assessment.	expected to include measures to limit spread of INNS to and from other waterbodies due to construction. This is expected to minimise risk to negligible. No further assessment required.		wharves, flow control structures and weir capacity improvements. This could contain ammonia, phosphates and specific pollutants which enter the water column. Tertiary mitigation will be in place to minimise the risk of this occurring. It is therefore considered to be negligible risk these elements. No further assessment required.		INNS and pathogen management locations. Ground investigation and water quality data will be analysed as part of detailed assessment.
Specific pollutants	High (Arsenic, Chlorothalonil, Copper, Diazinon, Dimethoate, Iron, Manganese, Pendimethalin, Zinc)	GBV Water Quality Monitoring (2015 – 2023)						
Biological quality elements								
Phytoplankton	Not used to classify this water body	UKCEH QUESTOR and Protech Modelling (CEH, 2022) GBV Aquatic ecology	Fine sediment released during construction including bed lowering will reduce transparency of the water column and may reduce populations. Sediment released will be mitigated through tertiary mitigation, such as the use of silt curtains and	No risk anticipated to this element from this modification. INNS management plan still to be drafted but expected to include measures to limit spread of	Dewatering will reduce available habitat but this will not have an impact on a waterbody scale to phytoplankton. No further assessment required.	Fine sediment released during construction will reduce transparency of the water column and may reduce populations. Sediment released will be	No risk from any individual modification identified. No in-combination construction	N/A

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			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
		Monitoring (2022/2023)	construction management plans and will be a temporary impact. Temporary wharf infrastructure will require some bank reinforcement or bed penetration from sheet piling and potential vegetation clearance along the riverbanks which could have some localised indirect impacts on phytoplankton within the footprint of the wharf. No further assessment required.	INNS to and from other waterbodies due to construction. This is expected to minimise risk to negligible. No further assessment required.		mitigated through tertiary mitigation such as silt curtains and construction management plans. Impacts will be temporary. No further assessment required.	effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment	
Macrophytes (High) and phytobenthos	Poor	**RTS Baseline Surveys: Aquatic ecology surveys (APEM, 2023)** Macrophyte sampling in 2021 and 2022 found the number of hydrophytes collected at all locations to be low. The percentage cover of algae was also low.	Runoff of fine sediment and spillage of hazardous substances from construction works, compounds and material processing sites could adversely impact on suitable conditions for macrophytes and phytobenthos. There may be localised losses of macrophytes and phytobenthos associated with construction of the wharf infrastructure. However, changes are likely to be within the scale of changes that might occur during a particularly large flow event. Desborough bed lowering for a length of 1km is likely to result in some direct loss of submerged macrophytes and phytobenthos and there could be mobilisation of fine sediment from the bed lowering which may smother macrophytes and phytobenthos downstream. There could also be an increase in photic depth due to the removal of bed sediment.	No risk anticipated to these elements from this modification. INNS management plan (secondary mitigation) still to be drafted but expected to include measures to limit spread of INNS to and from other waterbodies due to construction. This is expected to minimise risk to negligible. No further assessment required.	Dewatering may lead to direct loss of macrophytes that have colonised within the working area, however this is expected to be at a small scale within the footprint of the works. No further assessment required.	There may be localised losses of macrophytes and phytobenthos associated with these modifications. However, changes are likely to be within the scale of changes that might occur during a particularly large flow event. No further assessment required.	**Scoped in** to detailed assessment due to risk of deterioration from bed lowering.	INNS and pathogen management plan still to be drafted.

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			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			Tertiary mitigation such as silt curtains will be in place but there is a risk of deterioration and further assessment should be undertaken.					
Benthic invertebrate fauna	Poor	**Results of the Macroinvertebrate surveys of the River Thames (2021-2022) (APEM, 2023).** Macroinvertebrate sampling in 2022 (APEM, 2023) found there to be nine notable macroinvertebrate species across all sampling locations on the Thames. Eight were deemed 'Nationally scarce' and one was designated as 'IUCN Near Threatened'. (APEM, 2023).	Runoff of fine sediment and spillage of hazardous substances from construction works, compounds and material processing sites could adversely impact on suitable conditions for benthic invertebrate fauna. Tertiary (standard practice) mitigation will be in place. There may be localised losses of benthic invertebrate fauna associated with construction of the wharf infrastructure, however, changes are likely to be within the scale of changes that might occur during a particularly large flow event. Desborough bed lowering for a length of 1km is likely to result in direct loss of benthic invertebrates, presenting a risk to the element status and objectives. Further assessment is therefore required.	No risk anticipated to this element from this modification INNS management plan (secondary mitigation) still to be drafted but expected to include measures to limit spread of INNS to and from other waterbodies due to construction. This is expected to minimise risk to negligible. No further assessment required.	There may be a minor direct loss of benthic invertebrates and habitat within the sections of the water body that are de-watered, however this will be at a localised scale. Any disturbance and release of fine sediment from over pumping could adversely impact benthic invertebrates, however, best management silt control practices (tertiary mitigation) will be in place to ensure this risk is minimised. No further assessment required.	There will be localised losses of benthic invertebrate fauna due to sediment removal at each structure location which will likely have a direct adverse impact. However, due to the small amount of sediment to be removed any impacts are likely to be within the scale of changes that might occur during a particularly large flow event. No further assessment is required.	**Scoped in** to detailed assessment due to risk of deterioration from bed lowering.	N/A
Fish fauna	Not used to classify this water body, due to the format of the available historic data.	Desborough Cut Alternatives – Phase 2 (GBV, 2019) GBV Fish surveys (2023)	There is a risk to fish through construction of the channel, construction of the Abbey River channel crossing and the bed lowering downstream of Desborough Cut. Risks include injury to fish from the removal of sediment (e.g. eels within removed sediment), increased suspended sediment, possible re-	No risk anticipated to this element from this modification. INNS and pathogens management plan still to be drafted but expected to include measures to limit spread of INNS and pathogens to and	Dewatering at the weir capacity improvement works will reduce available habitat and obstruct fish. The working areas will be small relative to the size of the overall water body and fish will be able to avoid the works.	There will be localised losses of habitat and areas of shelter used by fish due to sediment removal at each structure, which potentially will have a direct adverse impact on fish.	**Scoped in** to detailed assessment due to risk to fish from the bed lowering and risk to fish from dewatering at weir capacity improvements.	Piling methodology to be confirmed. INNS and pathogen management plan still to be drafted.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			mobilisation of contaminated sediment, and sags in dissolved oxygen. Impacts will be minimised through tertiary mitigation such as using silt curtains and avoiding sensitive times of year for construction for fish such as spawning or migratory periods. There will be noise and vibration impacts associated with construction activities along this water body, which will disturb fish for the duration of construction. Due to the ground conditions, in some parts of the project, silent piling will not be possible. However, where possible secondary mitigation of alternative piling methods to reduce noise and vibration will be used alongside tertiary mitigation (standard practice). Secondary mitigation comprising fish rescues will be undertaken within the dewatering as secondary mitigation. Furthermore, due to the size of the water body, fish will easily be able to swim away from the noise source. No further assessment required.	from other waterbodies due to construction. This is expected to minimise risk to negligible. No further assessment required.	However, there is a risk that valuable bed habitat is lost which could impact upon fish. If dewatering associated with weir capacity improvements are undertaken concurrently, there is also a risk of in-combination effects on fish due to the cumulative loss of habitat. Further assessment should be undertaken to determine the impact to bed habitats on fish associated with dewatering.	There will be noise and vibration impacts associated with this modification, which will disturb fish for the duration of construction. However, the working areas will be small relative to the size of the overall river water body, and it is likely there will remain sufficiently large areas for fish to shelter and inhabit during works, minimising any potentially adverse effects. No further assessment required.		
Chemical elements								
Priority hazardous substances	Fail (PFOS and PBDE and Tributyltin Compound)	Ground Investigation work (GBV, 2023) GBV Water Quality Monitoring (2015 – 2023)	There is potential for specific pollutants to be released during the Desborough bed lowering and other works. Ground investigation work will confirm any risk associated with contaminated sediment in the area and inform disposal or reuse plans.	No risk anticipated to these elements from this modification. INNS management plan (secondary mitigation) still to be drafted but expected	No risk anticipated to these elements from this modification. Dewatering will not be on a large enough scale to influence chemical	There could be runoff of polluted water from these works which could contain priority hazardous and priority substances which enter the water column. Tertiary	**Scoped in** to detailed assessment due to risk of deterioration from bed lowering and construction of structures.	Ground investigation and water quality data will be analysed as part of detailed assessment.
Priority substances	Fail (Cypermethrin)							

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Overall Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[6]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering). Construction compounds, material processing and storage sites	INNS and Pathogen Management	Long term dewatering for construction of flow control structures, Thames weir capacity improvements and fish passes	Construction of flow control structures, Thames weir capacity improvements and fish passes		
			Secondary and tertiary mitigation, and environmental permit requirements will be in place to minimise sediment dispersal, however disturbance to the bed could release substances into the water column from the sediment and subsequently disperse further downstream, increasing concentrations. Further assessment of the existing bed conditions is required at detailed assessment and consideration of whether the residual risk is acceptable for this element.	to include measures to limit spread of INNS to and from other waterbodies due to construction. This is expected to minimise risk to negligible.	concentrations in the water body.	mitigation and environmental permits will minimise the risk of this occurring, but further assessment is required to assess whether the residual risk is acceptable for this element		
Other Pollutants	Does not require assessment	Not assessed	Not assessed				N/A	Not required

Operational elements affecting this water body are:
1) Channel intake or outfall structures - Inlet to Runnymede channel of the flood relief channel at Egham and outlet of Runnymede channel of the flood relief channel at Chertsey weir, inlet to Spelthorne channel of the flood relief channel at Laleham and outlet of Spelthorne channel of the flood relief channel at Shepperton.
2) Operation of the flood relief channel and their interactions with the river water body.
3) Capacity improvement works at Sunbury weir, Molesey weir, Teddington weir (at the downstream extent of the water body).
4) Intersecting of Abbey River with RTS in operation.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
Hydromorphological supporting elements								
Quantity and dynamics of water flow	Not used to classify this water body	Impact of Augmentation Flow on Flow Dependent Habitat (GBV, 2019); Hydraulic modelling of flow and sediment regime with RTS in operation and with differing augmented flows (DHI/Stantec, 2023) River Thames Scheme Flood modelling report (2023) High-level hydrological assessment (WBi, 2023)	The intake and outfall structures, associated bank protection and flood embankments are not expected to lead to a change in quantity and dynamics of flow at a water body scale. Any impacts will be at a localised scale and will be limited by current modifications and barriers within the water body. No change to quantity and dynamics of water flow from this modification of this water body is expected. The flood embankment on the left hand bank of the Thames is to be raised. This will have a height of up to 2 m high (with a minimum top-width of 3m) for a total length of 270m which represents a small proportion (0.86%) of the	The flood channel will only operate for flood conditions once flow in the River Thames exceeds a certain threshold flow value of ~230m^3/s (i.e. bank full). The peak flow in the sections of the water body between the Channel Section 2 inlet and the Channel Section 3 outlet (~8km) will be reduced by the volume of water diverted into the flood relief channel instead of remaining in the River Thames. It is anticipated that the project will have a small change in the frequency of bank full events between 1 in 2 year and 1 in 20-year events. In the River Thames, flood events less than a 1 in 2 year event do not reach bank full. Furthermore, modelling	The capacity improvement works will cause localised changes in the quantity and dynamics of water flow up and downstream of the weirs. As the existing weir structures and operation to maintain standard head water level for navigation are in place and dictate normal flow conditions, the increased capacity will only come into effect in larger flood events and would not affect the water body in non flood conditions.	Quantity and dynamics of flow in the Abbey River will change with the connection of the Runnymede channel to the Abbey River. In non-flood conditions in the upper reach of the Abbey River (from Penton Hook to the channel intersection) there will be negligible change to the quantity of flows from existing conditions. However, in the reach downstream of the channel, the Abbey River will receive an increase in flows due to the input of an additional continuous 1m^3/s augmented flow from the Runnymede channel. Existing flow monitoring has observed an average flow of 0.36 m^3/s between 2019 and 2022. There will therefore be a	**Scoped in** to detailed assessment due to changes to Abbey River flow quantity and dynamics, changes to the flow dynamics of Chertsey weir pool and augmented flow impact to flow quantity and dynamics in the main Thames.	Augmented flow procedure not yet confirmed. Geomorphological walkover report not yet issued. No account of losses (to the gravels or evaporation) has been incorporated into the assessment.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
		Abbey River flow monitoring data (GBV, 2019 – 2022) Water quality modelling of impacts of augmentation flow scenarios in proposed Thames flood relief channels (CEH, 2022)	water body length. It will increase the volume of water that can be contained within the water body, however the change would only occur at high flows and would not affect the water body in non-flood conditions. Other flood embankments are within the right hand floodplain set away from the water body. No further assessment required.	has shown that in most situations the project will not remove the existence of bankfull events, only delay the timing of them. The river will continue to respond to the natural seasonal variation of within bank river flows and gate operations at Thames weirs. An augmentation flow (up to 1m^3/s) will be taken out of this water body in non flood conditions, which will deplete flows in 8km of this water body (from the intake of the Runnymede Channel to outfall of the Spelthorne Channel) (approximately 30% of the water body). Furthermore, a section of the water body (approximately 0.5 km/~1.5% of the water body), from Spelthorne channel intake to the Runnymede outfall, will be depleted by both flood channels. Within this reach, up to 2m^3/s will be removed from the Thames in non flood conditions. These reductions in flows could lead to indirect impacts on physico-chemical and biological quality elements and also impact abstraction and		small increase in the amount of water conveyed through this reach of Abbey River. This could reduce the flow variability within the Abbey River compared to existing conditions and velocities will also increase as a result of the rise in discharge in non-flood conditions. During flood flows, the quantity and dynamics will also change downstream of the channel crossing compared to existing conditions. The total flow in the downstream reach of the Abbey River will be lower with the RTS in place than without RTS, due to increased capacity provided by the Runnymede channel and the presence of a throttling control structure (FCS11). A small proportion of the Runnymede channel flow will be routed down the Abbey River downstream reach whilst the rest of the flow is directed into Abbey 2 and then into Abbey Meads. Due to the extent of changes to the Abbey River flow quantity and dynamics, further assessment will be required.		

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
				navigation within the water body. There will be negligible change to the quantity and dynamics of flow at Penton Hook and Shepperton weirs during flood and non flood conditions. Water levels in the weir pools are fully controlled by downstream gate operations at low/normal river flow magnitudes. With flows below ~ 50m^3/s, the hydrometric data and modelling results show that water levels are independent of flows. Therefore, the augmentation flow will have no impact on water depths in the weir pools. This is due to gate movements and the use of 'summer board" to increase crest levels (GBV, 2019). There will be change in the distribution and quantity of flow Chertsey weir pool. Flow returned from Runnymede channel on the downstream side of Chertsey weir via the Abbey River will alter distribution and variability of velocities from the existing conditions. This presents a risk to an extensive shoal currently supported by the weir pool.				

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	**Operation of the flood relief channel and their interactions with the river water body**	**Existing Thames weir capacity improvements including fish passes**	**Intersecting of Abbey River with RTS in operation**		
				Further assessment of these impacts to the weir pool is therefore required.				
Connection to groundwater bodies	Not used to classify this water body	**Groundwater modelling (DHI/Stantec, 2023); Conceptual Water Modelling Workshop: Technical Report; Site Investigation works; River level monitoring**.	The flood embankment on the left bank of the Thames at Chertsey Weir will increase the height of an existing flood embankment. It will have the same footprint as existing, therefore causing no impact to this sub-element. No further assessment required. Sheet piling used to construct the intakes and outfalls will be cut down and retained as part of the permanent structure. This will represent a permanent change to surface-subsurface flow pathways at the River Thames margins, however impacts will be localised within the footprint of the works and no further assessment required.	The exchange of water between the River Thames channel, the hyporheic zone and deeper groundwaters will not be affected by this element as no works are proposed within the river itself. There is a risk that the rates of groundwater recharge from the floodplain may be affected. Within the catchment of this water body, groundwater modelling (DHI/Stantec, 2023) predicts that in non flood conditions, there will be a rise in groundwater levels of 0.5 to 1.7m. During flood conditions there will be a reduction in peak groundwater levels by up to about 1.75m, which will tend to reduce groundwater flood risk.. Further assessment of these effects will need to be undertaken. See groundwater body assessments for further details on the potential effects to groundwater.	Sheet piling used to construct the fish passes and weir capacity improvements will be cut down and retained as part of the permanent structure. This will represent a permanent change to surface-subsurface flow pathways at the River Thames channel margins, however impacts will be localised within the footprint of the works and no further assessment required. It will not affect the exchange of water between the channel, the hyporheic zone and deeper groundwaters at a water body scale.	Connection to groundwater is likely to change within the Abbey River due to alterations to the flow regime as a result of the project and the modification to the existing channel at the channel intersection. However, in the vicinity of the Abbey River, changes to groundwater flows will predominantly be as a result of the operation of the flood channel. No further assessment is required.	**Scoped in** due to the operation of the flood channel leading to changes in groundwater recharge.	Focused groundwater study of DHI/Stantec model outputs. May-Sept 23.
River continuity	Not used to classify this water body	**Impact of Augmentation Flow on Flow Dependent**	The raising of an existing flood wall for 270m on the left hand bank just upstream of Chertsey weir will reduce any	No change to longitudinal continuity along existing River Thames is expected, as there will be no changes to existing weirs	No expected change as works are within the existing structures and will not change continuity	The Abbey River crossing with the Runnymede channel will change the connectivity of the river in this section.	**Scoped in** to detailed assessment due to changes to lateral connectivity with RTS and changes to	Augmented flow procedure not yet confirmed.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
		Habitat (GBV, 2019);	lateral connectivity in high flows. However, due to the small length (<1% of the water body length) of channel to be altered and the heavily modified condition of this section of the water body (Chertsey weir intersects the river at this location, separating the two banks and there is an existing flood wall), impacts are expected to be negligible and do not require further assessment. The flood embankments within the floodplain along a sections of both channels total 1.3km in length. This will reduce the Rivers Thames connectivity to the floodplain, forming a barrier to surface water flow pathways and thus slightly reduce the amount of sediment delivered to the Thames from the floodplain. However, due to the total length of floodplain embankments being less than 5% of the total water body length, and all are set away from the River Thames, the embankments do not present a risk to deterioration and no further assessment is required.	that would reduce river continuity. In addition, the channel intakes have been designed with a step to encourage bedload to remain in the river. The flood relief channels will create a more defined connection with parts of the natural Thames floodplain that are otherwise only inundated during floods in existing conditions. Sediment modelling (GBV, 2020) concluded that the RTS will have a minor effect on the sediment regime within the River Thames, with a ~4% reduction in sediment load passing downstream into the River Thames beyond Shepperton compared to existing conditions during flood conditions. However, within the areas of floodplain adjacent to the flood channels, there will be reduced lateral connectivity with the Thames, altering rates of sediment delivery, water exchange and movement of aquatic organisms compared to existing conditions. Therefore, detailed assessment of this change will be required.	of sediment and flow transfer.	Upstream of the crossing, flows will be depleted by up to 1m^3/s (due to the augmented flow). This reduced flow could reduce longitudinal connectivity of sediment transfer and movement of aquatic organisms to the downstream reach. The flow control structures (TCS10 and TCS11) will change longitudinal connectivity through regulating the amount of flow travelling downstream of the crossing to 1m^3/s. This could reduce the variability of sediment delivery to the downstream reach and lateral connectivity will also be changed due to the channel intersection. In non-flood conditions the input of the augmented flow into Abbey River will provide an additional sediment and organic matter source, however this will be regulated by the control structures. In flood conditions, there is likely to be increased inundation of the floodplain due to the connection of the crossing with Abbey 2	continuity of the Abbey River.	Geomorphological walkover report not yet issued.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
						and the Abbey Meads floodway. Further assessment will be required to assess the extent of change to continuity within the Abbey River.		
River depth and width variation	Not used to classify this water body	**Impact of Augmentation Flow on Flow Dependent Habitat (GBV, 2019)**; **High-level hydrological summary (WBi, 2023)**	Due to the heavily modified condition, with banks stabilised by revetments, the river is not free to adjust its planform. The intake and outfall structures and associated bank protection will not change the river planform and will have limited effects on the existing channel cross section. Throughout large sections of this water body, the Thames has been straightened and confined by bank protection. Any additional bank protection, in localised sections of the water body, will not therefore significantly change the depth and variation from the existing situation. Creation of flood embankments will slightly increase the depth of flow that can be contained within the channel during a flood event, which could result in scour of the bed and banks. However, the	Water levels in the River Thames between the Runnymede Channel intake and the Spelthorne Channel outfall will change during flood and non-flood conditions as a result of the RTS (~8km). During flood conditions, the water body will no longer receive out of bank flows and during non-flood conditions the augmented flow will abstract 1m^3/s, which will affect river levels. Furthermore, the flow distribution will change within Chertsey weir pool due to flow entering from the outflow of the Runnymede channel. This could result in changes to erosion and deposition patterns that may over time alter weir pool bathymetry. Detailed assessment of this risk is therefore required.	Changes in water flow dynamics from the capacity improvements have the potential to change the location and shape of the weir pools and gravel shoals downstream of the works. These changes are only expected to be localised and within the scale of changes that might occur during a particularly large flow event. The new structures will also avoid the main weir pools. At Sunbury and Teddington, the new structures are downstream of the main weir pools and the works at Molesey are ~250m upstream of the main weir pool. No expected changes at a water body scale and no further assessment required.	The flow regime of the Abbey River will change at reach scales due to the increase of 1m^3/s augmented flow into the lower reach of the Abbey River downstream of the crossing. This could increase velocities through this section which could change rates of erosion and deposition. There are sections of natural bank throughout the Abbey River with some sections of hard bank protection. In the long term, a change to the flow regime in the lower reach could increase the width-depth ratio of the channel. In flood conditions, reduced out of bank flows of the Abbey River, with RTS in operation could change the channel planform over time. Furthermore, at the Abbey River crossing with the Runnymede	**Scoped in** to detailed assessment due to potential changes to the water body levels in flood and non-flood conditions, the Chertsey weir pool bathymetry and the alterations to the Abbey River.	Augmented flow procedure not yet confirmed. Geomorphological walkover report not yet issued.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
			defences will only come into effect during infrequent high flow events and therefore the scale of this impact is likely to be negligible. Where banks will be raised within the flood plain - there will be no change to river width or depth in this water body. No risk of deterioration, no further assessment required.			channel, the cross section is likely to change due to the presence of control structures and sheet piling. The Runnymede channel will cross an 80m length of the existing Abbey River. This will lead to direct impacts to the channel planform and long profile at the crossing and indirect impacts upstream and downstream. Detailed assessment is required.		
Structure and substrate of the river bed	Not used to classify this water body	**Additional Sediment Studies, (GBV, 2019); Flood Channel Sediment Transport Modelling (GBV, 2020); Sediment and flow regime modelling (DHI/Stantec, 2023); CH2M/EA River Thames Bathymetric Data Analysis 2016 report;**	There is likely to be some change to the structure and substrate of the bed at the intake and outfall structures. This will have some localised erosion and deposition but only within the footprint of the structures. No further assessment required.	The existing sediment regime has been controlled by a series of weirs and locks for over a century. These structures present obstructions to the natural movement of sediment, and dredging has, historically, been undertaken to maintain a navigable channel. Occasional shoal management is still carried out where it poses a risk to the navigation. There are areas of erosion and deposition associated with structures, meanders and secondary channels throughout the water body. Based on the modelled predictions of changes to flow in the Thames there is not likely to be any significant change in	The modification of the direction of water flow by the new gates when in operation is likely to lead to subtle changes in the pattern of scour and deposition in the immediate downstream. These changes are only expected to be localised and within the scale of changes that might occur during a particularly large flow event. The changes in velocity are predicted to be relatively slight and would not significantly cause increased erosion of coarser material or river bed features. No expected changes at a water body scale.	The dominant bed type of the Abbey River is silt which maintains a low morphological diversity. It has been frequently dredged and re-sectioned in places. Permanent changes to the flow regime in the Abbey River with RTS in non-flood conditions, may lead to some minor changes to the structure and substrate of the river bed due to an increase in velocities associated with an additional 1.0m^3/s of flow. Furthermore, with reduced Abbey River out-of-bank flows in flood conditions with the RTS, the transfer of fine sediment from the floodplain to the channel could decrease. There	**Scoped in** to detailed assessment due to potential changes to the Thames sediment regime and Chertsey weir pool with RTS in operation.	Limited information about existing river bed conditions (substrate size). High flows suspended sediment monitoring to be completed. Geomorphological walkover report not yet issued.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
				sediment transport processes that would alter the river bed as a result of the flood channels (GBV, 2019). Sediment load in the Thames downstream of RTS beyond Shepperton will be reduced by 6% (GBV, 2020), and locations and proportions of erosion and deposition will change in the river. This reduction is likely to link to relatively modest levels of deposition in the lakes or the channel (GBV, 2020). Although changes could be small scale, further investigation should be undertaken at detailed assessment stage to ensure no risk of deterioration from changes to the structure and substrate of the bed. There is potential for changes to the structure and substrate of Chertsey weir pool as a result of the alterations to flow distributions described in quantity and dynamics of flow. Further assessment of changes to the weir pool is also required.	No further assessment required.	could therefore be improvements to the structure and substrate within the lower reach of Abbey River. No further assessment is therefore required.		

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
Structure of the riparian zone	Not used to classify this water body	**Flood relief channel Preliminary Ecological Appraisal and Phase 1 Habitat Survey (GBV, 2016c), Weirs** **Preliminary Ecological Appraisal and Phase 1 Habitat Survey (GBV, 2015).**	Large sections of the River Thames in this water body are observed to be quite high and are frequently reinforced for long stretches (particularly through the urban sections) and often lacking vegetation. However, there are also extensive sections of natural and vegetated bank. There is likely to be some permanent loss of riparian vegetation and change to the structure of the riparian zone as a result of all these modifications, which will impact on shading and leaf litter supply. Where possible, vegetation will be replanted or allowed to naturally regenerate. This will be further mitigated through areas for habitat creation, mitigation and enhancement, and areas of new open green space. Further assessment of the scale of change to the riparian zone from all three operational modifications is required at detailed assessment to ensure no risk of deterioration.			The structure of approximately 160 m (80 m on each bank) of the riparian zone along the Abbey River will be changed as a result of the intersection with the Runnymede channel. Where possible, vegetation will be replanted or allowed to naturally regenerate. This will be further mitigated through areas for habitat creation, mitigation and enhancement, and areas of new open green space. Due to the small scale of change to the riparian zone on the Abbey River, no further assessment is required.	**Scoped in** to detailed assessment due to potential impacts on riparian zone from the intake and outfall structures, flood embankments, and the weir capacity improvements.	Embankment locations and height detail not yet confirmed. Geomorphological walkover report not yet issued.
Physico-chemical supporting elements								
Thermal conditions	Moderate	QUESTOR and PROTECH water quality modelling (CEH, 2022)	The proposed works will not cause changes in organic matter, vegetation cover, shading and flow or depth of water under non-flood conditions, therefore there will be no changes in the physico-chemical conditions at a local or water body scale. No further assessment required.	No significant change predicted to temperature conditions in this water body. UKCEH (2022) modelling found that any change in mean water temperature in the main Thames will be minimal. The temperature of water returning to the River Thames from the flood relief channel may vary slightly, but will mix with and return to within range of non-flood conditions. UKCEH (2022) found that mean water temperature is well below 20c in existing conditions and with RTS.	The proposed works will not cause changes in organic matter, vegetation cover, shading and flow or depth of water under non-flood conditions, therefore there will be no changes in the physico-chemical conditions at a local or water body scale. No further assessment required.	The proposed changes to the Abbey River may have some minor permanent alterations to thermal conditions in the lower reach downstream of the channel crossing, with the addition of the continuous augmented flow in non-flood conditions. However, these changes are considered to be negligible relative to the scale of the water body. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** due to no risk of deterioration.	N/A

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
				For the modelled 98th percentile temperature at Chertsey (downstream of the Runnymede channel) outflow, the temperature with a 1.0m^3/s augmented flow, is predicted to increase marginally in the 2013 scenario from 19.22c to 19.24c and in the 2019 scenario from 20.87c to 20.92c. No further assessment is therefore required.				
Oxygenation conditions (DO)	Good	QUESTOR and PROTECH water quality modelling (CEH, 2022)	The proposed permanent structures will not cause changes in organic matter, vegetation cover, shading and flow or depth of water conditions, therefore there will be no changes in the oxygenation conditions at a local or water body scale.	During non-flood flows (especially lower flows), there is a risk to the dissolved oxygen concentrations within the depleted reach of this water body. An augmentation flow of up to 1m^3/s is likely to deplete dissolved oxygen conditions for the whole of the depleted reach and downstream of Shepperton Lock. Water quality modelling predicts the greatest depletion is from Abbey Chase/Chertsey to Shepperton Lock (CEH, 2022). In the Desborough area, modelling found poor DO conditions to be less	The proposed weir capacity improvements will not cause changes in organic matter, vegetation cover, shading and flow or depth of water conditions, therefore there will be no changes in the oxygenation conditions at a local or water body scale.	The proposed changes to the Abbey River are likely to improve oxygenation levels in non-flood conditions in the reach downstream of the channel crossing. The addition of the augmented flow, will provide a permanent increase of 1.0m^3/s. There are no adverse impacts anticipated to this element. No risk of deterioration or further assessment.	Risk of deterioration. **Scoped In** for further assessment due to risk of depletion to dissolved oxygen conditions within the Thames.	Augmented flow procedure not yet confirmed. Further work to be undertaken to model dissolved oxygen changes under a drought/low flow event (scenarios yet to be confirmed).

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
				prevalent but worse than upstream of the flood channels. This reduction in DO is compounded by large abstractions in this area. These pressures could lead to levels deteriorating below the threshold of concern of 6 mg/l. There could be further depletion if any phytoplankton blooms became more frequent and prolonged. At the scale of the water body, the area at risk to low DO conditions represents an approximate 17 % (5.5 km) of the water body. This risk will be prevalent during non-flood conditions and is a risk to BQE status and objectives. Detailed assessment is therefore required. Further modelling work will also be undertaken to assess impacts to the water body in a drought event.				
Acidification status (pH)	High		The proposed permanent structures are not anticipated to cause any permanent change to pH of this water body. No further assessment required.	Acidification of rivers generally occur when acidic materials are deposited where rocks and soils have a low buffering capacity. There is no significant change to any long-term pathways or sources from these modifications in this water body.	The proposed weir capacity improvements are not anticipated to cause any permanent change to pH of this water body. No further assessment required.	No significant change to any long-term pathways or sources that will affect pH conditions in this water body. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** due to no risk of deterioration.	N/A

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
Acid neutralising capacity	High			No further assessment required.			No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** due to no risk of deterioration.	N/A
Ammonia	High		No change to any long-term pathways or sources of pollutants from these modifications.	Where the channel passes through sections of landfill, the channel will be separated from it by sheet piling the sides and replacing the base of the channel with inert natural material or capping it with concrete. Therefore, no significant change in ammonia conditions, from the mobilisation of landfill leachate is expected. There is also a risk that ammonia bound to lake bed sediment is disturbed and flushed through the lakes and the flood channel systems at flood flows. This could lead to an increase in ammonia concentrations within the River Thames. Further assessment is therefore required to assess risk of deterioration.	The weir modifications will not alter the inputs of ammonia from the wider catchment.	There is a risk that ammonia in the water column of the Runnymede channel or bound to lake bed sediment is disturbed and flushed through the lakes and the flood channel systems into Abbey River. This could lead to an increase in ammonia concentrations within the Abbey River, due to the connection to the downstream reach of the Runnymede Channel. However, due to the small length of the downstream reach of Abbey River (1.5km), this is not considered to be a risk at a water body scale. Increased flows within this section are also likely to dilute concentrations of ammonia, minimising risk to the water body. No further assessment required.	**Scoped in** due to risk of increase in concentrations entering the water body from the flood channels.	N/A

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
Nutrient conditions (phosphates)	Moderate	QUESTOR and PROTECH water quality modelling (CEH, 2022) Water quality modelling (DHI/Stantec, 2023)	These modifications will not alter the inputs of nutrients from the wider catchment.	Potential for changes in nutrient conditions from mixing of river water with lake water that has flowed through the channels. Within the reaches of depleted flows, from Runnymede inflow to Spelthorne outfall, it is predicted that phosphate concentrations will remain similar, or decline during non-flood flows (CEH, 2022). This is because there are no additional inputs of P in the reach, so concentrations will not be affected. Downstream of the channel, modelling predicts that concentrations of P will decline due to nutrient uptake in the channels in non flood conditions (CEH, 2022). During flood flows, there is a risk that high concentrations of phosphate could enter the water body from the flood channel outfalls. Phosphate within the lake bed sediment and in the water column of the lake system could be flushed through into the Thames and increase concentrations. Further assessment required to assess risk of deterioration.	The weir modifications will not alter the inputs of nutrients from the wider catchment.	There is a risk that phosphate in the water column of the Runnymede channel or bound to lake bed sediment is disturbed and flushed through the lakes and the flood channel systems at flood flows into Abbey River. This could lead to an increase in phosphate concentrations within the Abbey River, due to the connection to the downstream reach at the channel crossing. However, due to the small length of the downstream reach of Abbey River (1.5km), this is not considered to be a risk at a water body scale. Increased flows in non-flood conditions within this section are also likely to dilute concentrations of phosphates, minimising risk to the water body. No further assessment required.	**Scoped in** due to risk of increase in concentrations entering the water body from the flood channels in flood conditions.	Augmented flow procedure not yet confirmed. High flows suspended sediment monitoring to be completed.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
Specific pollutants	High (Arsenic, Chlorothalonil, Copper, Diazinon, Dimethoate, Iron, Manganese, Pendimethalin, Zinc)		No change to any long-term pathways or sources of pollutants from these modifications.	Where the channel passes through sections of landfill, the channel will be separated from it by sheet piling the sides and replacing the base of the channel with either inert natural material (gravel or clay) or sealing it with a slab of unreinforced concrete (depending on the contents of the remnant landfill). Therefore, no significant change in specific pollutant conditions from the mobilisation of landfill leachate is expected. There is a risk that specific pollutants in the water column of the flood channels or bound to lake bed sediment is disturbed and flushed through the lakes and the flood channel systems at flood flows into the Thames and increase concentrations. Further assessment required to assess risk of deterioration.	No change to any long-term pathways or sources of pollutants.	There is a risk that specific pollutants in the water column of the Runnymede channel or bound to lake bed sediment is disturbed and flushed through the lakes and the flood channel systems at flood flows into the Abbey River. This could lead to an increase in specific pollutant concentrations within the Abbey River, due to the connection to the downstream reach. However, due to the small length of the downstream reach of Abbey River (1.5km), this is not considered to be a risk at a water body scale. Increased flows in non-flood conditions within this section are also likely to dilute concentrations of specific pollutants, minimising risk to the water body. No further assessment required.	**Scoped in** due to risk of increase in concentrations entering the water body from the flood channels.	N/A
Biological quality elements								
Macrophytes and phytobenthos	Poor	**RTS Baseline Surveys: Aquatic ecology surveys (APEM, 2023)** Macrophyte sampling in	There may be some localised losses to the abundance and diversity of macrophyte and phytobenthos as a result of intake and outfall infrastructure, however these losses will be minor and mitigated by	Non-flood conditions in this water body coupled with the project are not expected to adversely affect macrophytes and phytobenthos at a water body scale. There could be some adverse impacts during drought periods	The proposed works are predicted to have only a very localised effect on the abundance and diversity of macrophytes and phytobenthos in the weir pools downstream of the weirs and around the weir by changes to	The proposed changes to the Abbey River will not impact on this quality element at a water body scale. There may be some small direct losses of macrophytes and phytobenthos due to the permanent changes to	**Scoped in** to detailed assessment due to risk of adverse impacts to macrophytes and phytobenthos with RTS in operation.	Augmented flow procedure not yet confirmed. Acceptable levels of spread of INNS and pathogens is yet to be agreed

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
		2021 and 2022 found the number of hydrophytes collected at all locations the River Thames to be low. The percentage cover of algae was also low.	embedded habitat enhancements downstream of Penton Hook, Chertsey and Shepperton weirs. No further assessment required.	from reductions in water levels and changes to flow, an adaptive augmented flow is being developed to, in part, minimise these potential effects. There is also a risk during flood flows that, sediment, high nutrient concentrations and other pollutants are flushed out of the lakes and into the Thames via the channel. Furthermore, it is possible that INNS are spread from the Runnymede and Spelthorne channel lakes into the Thames which could adversely impact on abundance and diversity. Further assessment of this risk is required.	local flow. These changes are only expected to be localised and within the scale of changes that might occur during a particularly large flow event. Furthermore, the new structures will also avoid the main weir pools.	the channel at the Abbey River crossing, and in response to flow regime alterations in non-flood conditions within the lower reach. Alterations to the bed substrate due to changes in flow dynamics, may affect macrophytes. However these changes are likely to be localised. No further assessment required.		with Natural England. Analysis of macrophyte survey results to be completed. Water quality modelling of drought conditions not yet completed.
Benthic invertebrate fauna	Poor	**Results of the Macroinvertebrate surveys of the River Thames (2021-2022) (APEM, 2023).** Macroinvertebrate sampling in 2022 (APEM, 2023) found there to be nine notable macroinvertebrate species across all sampling locations on the Thames. Eight were deemed 'Nationally scarce' and one	There may be some localised loss of benthic invertebrate habitat as a result of the permanent intake and outfall infrastructure, however these losses will be minor and mitigated by habitat enhancements downstream of Penton Hook, Chertsey and Shepperton weirs. No further assessment required.	Non-flood conditions in this water body coupled with the project could adversely affect benthic invertebrates. Changes to flow quantity and dynamics due to the augmented flow especially during drought periods, particularly in the section of twice depleted flows have the potential to affect abundance and diversity. an adaptive augmented flow is being developed to, in part, minimise these potential effects. There is also a risk during flood flows that sediment, high nutrient concentrations and other pollutants are	The proposed works are predicted to have only a very localised effect on the abundance and diversity of benthic invertebrates in the weir pools downstream of the weirs and around the weir by changes to local flow. These changes are only expected to be localised and within the scale of changes that might occur during a particularly large flow event. Furthermore, the new structures will also avoid the main weir pools. No further assessment required.	The proposed changes to the Abbey River will not impact on this quality element at a water body scale. There may be small scale losses of macroinvertebrates due to the permanent changes to the channel at the Abbey River crossing, and in response to flow regime alterations in non-flood conditions within the lower reach. However, these changes are likely to be localised. No further assessment required.	**Scoped in** to detailed assessment due to risk of adverse impacts to invertebrates with RTS in operation.	Augmented flow procedure not yet confirmed. Further work to be undertaken to model water dissolved oxygen changes in a drought event. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Analysis of macroinvertebrate survey results to be completed.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[8]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements				Scoped in or scoped out of detailed assessment	Uncertainties / Gaps
			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
		was designated as 'IUCN Near Threatened'. (APEM, 2023).		flushed out of the lakes and into the Thames. This could adversely impact on abundance and diversity. In addition, the anticipated effects to Chertsey weir pool from the outfall of the Runnymede Channel also risk adversely effecting benthic invertebrate abundance and diversity. Although impacts may not be at a water body scale, further impact assessment is also required due to the presence of the 'notable' species within this water body. There is a further risk that INNS and pathogens spread could lead to adverse impacts on invertebrate fauna, due to connecting of previously offline lakes with the main River Thames. Further assessment required.				
Fish fauna	There is no baseline WFD classification for fish in this River Thames water body. Not used to classify this water body due to the	**Flood relief channel Preliminary Ecological Appraisal report (GBV, 2016b); Weirs Preliminary Ecological Appraisal**	There may be slight losses of existing fish habitat with the installation of the inflow and outflow structures, however this would highly localised and not impact on populations as are not believed to be in critical fish habitat areas.	Increased connectivity with previously isolated lakes has the potential to lead to changes in fish populations, mixing of fish stocks and changes in fish community structure (including increasing the spread of INNS and pathogens).	Changes because of these works are expected to be within the scale of natural changes caused by major flow events. Furthermore, the new structures will also avoid the main weir pools. The installation of multi-species fish passes	There is a risk to fish movement due to the permanent changes to the Abbey River at the intersection with the Runnymede channel due to the loss of longitudinal river continuity. This will be minimised by provision of a fish pass on Abbey River (primary mitigation) and all the	**Scoped in** to detailed assessment due to risk of adverse impacts to fish with RTS in operation.	Augmented flow procedure not yet confirmed. Further work to be undertaken to model water dissolved oxygen changes in a drought event.

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			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
	format of the available historic data.	**report (GBV, 2015)**	No further assessment required.	The installation of primary mitigation: a fish pass at Chertsey, will enable fish passage to the Abbey River and Thorpe Park Lakes. This will represent a considerable increase in available habitat for fish shelter and spawning for both fish from the Thames or fish currently resident within the existing lakes. There is a risk the outfall structures in place will allow aquatic INNS to spread. High risk INNS that are currently present in Thorpe Park lakes may enter this water body and increase presence and prevalence. This could impact adversely on native fish populations within the Thames (Egham to Teddington) water body. As a result of changes to flow distribution into Chertsey weir pool, this could lead to adverse impacts to weir pool habitat that currently benefits fish. Further hydromorphological and ecological assessment will be required of the weir pool to understand the extent of potential change. There could be some adverse impacts during drought periods, with potential for dissolved oxygen sags, particularly	(primary mitigation) at five locations on this water body represents an improvement in fish passage from the baseline. It is also possible that the additional works may also lead to the creation of new weir pools. The capacity improvements at Teddington and Sunbury are set away from the existing weirs so there is potential for new erosional and depositional features to establish over time. No further assessment is required as no risk to deterioration.	flow control structures in the channel, to enable access for fish to the upper reach and into the River Thames upstream of the channel. Furthermore, an increase of 1.0m^3/s flow in non-flood conditions is likely to improve oxygenation conditions for fish within the lower reach of the river. Further assessment is required due to the loss of longitudinal river continuity on the Abbey River.		Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Further fish surveys to be completed in 2023.

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			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
				in the section of the twice depleted reach. An adaptive augmented flow is being developed to, in part, minimise these potential effects. There is also a risk during flood flows that high nutrient concentrations and other pollutants are flushed out of the lakes and into the Thames. This could increase toxicity within the water column to fish. Further assessment is required due to this risk.				
Chemical elements								
Priority hazardous substances	Fail (PFOS and PBDE and Tributyltin Compounds)	**Water quality data as above includes data that monitors a range of substances for drinking water intakes in particular; Site Investigation data (GBV, 2023)**	No change to any long-term pathways or sources of pollutants from inflow and outfall structures, bank protection or flood embankments. No further assessment required.	Where the channel passes through sections of landfill, the channel will be separated from it by sheet piling the sides and replacing the base of the channel with inert natural material or capping it with concrete. However there is a risk of leakage from sheet piling, over time. . In addition, there is a risk that priority hazardous and priority substances in the water column of the flood channels or bound to lake bed sediment is disturbed and flushed through the lakes and the flood channel systems during flood flows into the Thames increasing concentrations.	The weir modifications will not alter the inputs of substances from the wider catchment. No further assessment required.	There is a risk that priority hazardous and priority substances in the water column of the Runnymede channel or bound to lake bed sediment is disturbed and flushed through the lakes and the flood channel systems at flood flows into Abbey River. This could lead to an increase in specific pollutant concentrations within the Abbey River, due to the connection to the downstream reach at the channel crossing. Further assessment is therefore required to assess risk of deterioration.	**Scoped in** due to risk of increase in concentrations entering the water body from the flood channels.	N/A
Priority substances	Fail (Cypermethrin)							

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			Channel intake or outfall structures, associated bank protection and flood embankments	Operation of the flood relief channel and their interactions with the river water body	Existing Thames weir capacity improvements including fish passes	Intersecting of Abbey River with RTS in operation		
				Further assessment is therefore required to assess risk of deterioration.				
Other Pollutants	Does not require assessment	Not assessed	Not assessed				N/A	Not required

Continued operation modifications
5) Pedestrian cycle bridges across the Thames.
6) New green and blue open space and/or Priority areas for habitat creation, mitigation, or enhancement.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[9]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements		Scoped in or scoped out	Uncertainties / Gaps
			Operation of new green or blue open space and/or Priority areas for habitat creation, mitigation, or enhancement	New pedestrian/cycle bridges across River Thames		
Hydromorphological supporting elements						
Quantity and dynamics of water flow	Not used to classify this water body	**Desborough Cut Alternatives – Phase 2 (GBV, 2019)** **Impact of Augmentation Flow on Flow Dependent Habitat (GBV, 2019);** **Hydraulic modelling of flow and sediment regime with RTS in operation and with differing augmented flows (DHI/Stantec, 2023)**	No change to quantity and dynamics of water flow in this water body is expected from areas of habitat creation, mitigation, or enhancement. Desborough Island and the Former Laleham Golf Course and Abbey Meads are the only areas that directly border the WFD waterbody, therefore any changes to the river bank as part of this work will result in no overall change on a waterbody scale. The proposed blue open space along the Abbey River may alter the quantity and dynamics of flow at a reach scale. This could involve in-channel river restoration interventions or physical alterations to in-channel structures, that could benefit this section of Abbey River. Negligible changes are expected from the proposed new green open spaces to this element. No further assessment required.	No change to quantity and dynamics of water flow in this water body is expected as a result of the bridges on a waterbody scale. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement and pedestrian/cycle bridges have not been finalised.
Connection to groundwater bodies	Not used to classify this water body	**Groundwater modelling (DHI/Stantec, 2023); Conceptual Water Modelling Workshop: Technical Report; Site Investigation works;**	No change to connectivity of water body to groundwater is expected from the areas of habitat creation, mitigation, or enhancement within this water body. Any changes are on a localised, negligible scale. The proposed blue open space along the Abbey River may alter surface-groundwater	No change to quantity and dynamics of water flow in this water body is expected as a result of the bridges on a waterbody scale. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement and pedestrian/cycle bridges have not been finalised.

[9] Current 2019 RBMP status data extracted from the Environment Agency Catchment Data Explorer http://environment.data.gov.uk/catchment-planning/ in March 2023

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			Operation of new green or blue open space and/or Priority areas for habitat creation, mitigation, or enhancement	New pedestrian/cycle bridges across River Thames		
		River level monitoring.	interactions at a reach scale due to in-channel river restoration interventions or physical alterations to in-channel structures. This could benefit this section of Abbey River but not at a Thames (Egham to Teddington) water body scale. Negligible changes are expected from the proposed new green open spaces to this element. No further assessment required.			
River continuity	Not used to classify this water body	**Desborough Cut Alternatives – Phase 2 (GBV, 2019)**	No change to connectivity of water body to groundwater is expected from the areas of habitat creation, mitigation or enhancement within this water body. Any changes are on a localised, negligible scale. The proposed blue open space along the Abbey River may improve lateral and longitudinal connectivity due to in-channel river restoration interventions or physical alterations to in-channel structures. This could benefit this section of Abbey River but not at a Thames (Egham to Teddington) water body scale. Negligible changes are expected from the proposed new green open spaces to this element. No further assessment required.	The two bridges proposed are not expected to change the river continuity on a waterbody scale. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement and pedestrian/cycle bridges have not been finalised.
River depth and width variation	Not used to classify this water body	**River Thames Bathymetric Data Analysis report (CH2M/EA, 2016) Desborough Cut Alternatives – Phase 2 (GBV, 2019) Ground Investigations**	No changes to channel depth and width within the existing water body is expected from the areas of habitat creation, mitigation or enhancement within this water body. The pr82proposed blue open space along the Abbey River may improve the cross-section along the reach due to in-channel river restoration interventions or physical	No change to river depth and width variation are expected as a result of the bridges on a waterbody scale. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement and pedestrian/cycle bridges have not been finalised.

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[9]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements		Scoped in or scoped out	Uncertainties / Gaps
			Operation of new green or blue open space and/or Priority areas for habitat creation, mitigation, or enhancement	New pedestrian/cycle bridges across River Thames		
		work (Spring 2023)	alterations to in-channel structures. This could benefit the Abbey River but not at a Thames (Egham to Teddington) water body scale. Negligible changes are expected from the proposed new green open spaces to this element. No further assessment required.			
Structure and substrate of the river bed	Not used to classify this water body	**Desborough Cut Alternatives – Phase 2 (GBV, 2019)** **Ground Investigations work (Spring 2023).**	No change in the sediment regime is expected from the areas of habitat creation, mitigation or enhancement within this water body. The proposed blue open space along the Abbey River may improve the structure and substrate of the reach. The existing bed is heavily silted and any in-channel river restoration interventions or physical alterations to in-channel structures may improve river bed condition. No further assessment required.	No change in the sediment regime is expected as a result of the pedestrian/cycle bridges. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement and pedestrian/cycle bridges have not been finalised.
Structure of the riparian zone	Not used to classify this water body	**Outline Design for the Channel**	The potential habitat creation within Abbey / Abbey Meads and on Desborough Island and the former Laleham Golf Course have the potential to improve the structure of the riparian zone of this water body and the Abbey River (which falls within this water body). The proposed blue open space along the Abbey River may also improve riparian structure as part of any river enhancements. No further assessment required.	Depending on bridge design there could be an impact to the riparian zone, through the areas of hard standing required for the structure on both banks. This is likely to remove some riparian habitat, however any vegetation lost will where possible be replanted or allowed to naturally regenerate. This will be further mitigated through areas for habitat creation, mitigation and enhancement, and areas of new open green space. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement and pedestrian/cycle bridges have not been finalised.
Physico-chemical supporting elements						

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[9]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements		Scoped in or scoped out	Uncertainties / Gaps
			Operation of new green or blue open space and/or Priority areas for habitat creation, mitigation, or enhancement	New pedestrian/cycle bridges across River Thames		
Thermal conditions	Moderate	**Ground Investigations work (Spring 2023)** **Water Quality Monitoring Programme (GBV, 2012 – 2024)**	The habitat creation may create beneficial changes in organic matter, vegetation cover and shading under non-flood conditions, depending on design, although this will be localised and therefore there will be no changes in the physico-chemical conditions at a water body scale. The proposed blue open space along the Abbey River may also improve these physico-chemical elements as part of any river enhancements at a reach scale. No further assessment required.	The proposed works are unlikely to cause changes in organic matter, vegetation cover, shading and flow or depth of water under non-flood conditions, therefore there will be no changes in the physico-chemical conditions at a local or water body scale. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement and pedestrian/cycle bridges have not been finalised. Water quality monitoring programme is still ongoing
Oxygenation conditions (DO)	Good					
BOD	Good					
Acidification status (pH)	High		The proposed changes from new green or blue open spaces or habitat creation are unlikely to cause alterations in organic matter, vegetation cover, shading and flow or depth of water under non-flood conditions, therefore there will be no changes in the physico-chemical conditions at a local or water body scale. No further assessment required.	The proposed works will not cause changes in organic matter, vegetation cover, shading and flow or depth of water under non-flood conditions, therefore there will be no changes in the physico-chemical conditions at a local or water body scale. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	
Acid neutralising capacity	High					
Ammonia	High	**Ground Investigations work (Spring 2023)** **Water Quality Monitoring Programme (GBV, 2012 – 2024)**	The new green or blue open spaces or habitat creation will not alter the inputs of ammonia, phosphates or specific pollutants from the wider catchment. The proposed habitat creation locations directly adjacent to the Thames are within areas of natural ground, not landfill. Design for each site will consider potential landfill contamination and environmental permits implemented, if required. No further assessment required.	The proposed bridges will not result in a change in ammonia, phosphates or specific pollutant concentrations No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	GI work will confirm if contaminated sediments are present. Water quality monitoring programme is still ongoing
Nutrient conditions (phosphates)	Moderate	**Ground Investigations work (Spring 2023)** **Water Quality Monitoring**			No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Water quality monitoring programme is still ongoing

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[9]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements		Scoped in or scoped out	Uncertainties / Gaps
			Operation of new green or blue open space and/or Priority areas for habitat creation, mitigation, or enhancement	New pedestrian/cycle bridges across River Thames		
Specific pollutants	High (Arsenic, Chlorothalonil, Copper, Diazinon, Dimethoate, Iron, Manganese, Pendimethalin, Zinc)	**Programme (GBV, 2012 – 2024)**			No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	Water quality monitoring programme is still ongoing
Biological quality elements						
Macrophytes and phytobenthos	Poor	**RTS Baseline Surveys: Aquatic ecology surveys (APEM, 2023)** Macrophyte sampling in 2021 and 2022 found the number of hydrophytes collected at all locations to be low. The percentage cover of algae was also low.	Not likely to be any change in prevailing conditions for macrophytes at the water body scale, as none of the supporting conditions are expected to change in this water body as a result of this element of the project. There may be some reach scale improvements from proposed interventions as part of the blue open space Abbey River enhancements No further assessment required.	Not likely to be any change in prevailing conditions for macrophytes at the water body scale, as none of the supporting conditions are expected to change in this water body as a result of this element of the project. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	N/A
Benthic invertebrate fauna	Poor	**Results of the Macroinvertebrate surveys of the River Thames (2021-2022) (APEM, 2023).** Sampling in 2022 found there to be nine notable macroinvertebrate species across all sampling locations on the Thames. Eight were deemed 'Nationally scarce' and one designated 'IUCN Near Threatened'. (APEM, 2023).	Not likely to be any change in prevailing conditions for invertebrates at the water body scale, as none of the supporting conditions are expected to change in this water body as a result of this element of the project. There will be some improvements to habitats on tributaries of the Thames that flow through proposed habitat creation areas, such as Abbey River blue open space enhancements and enhancements downstream of the weir capacity improvements. This could improve invertebrate fauna populations. No further assessment required.	Not likely to be any change in prevailing conditions for invertebrates at the water body scale, as none of the supporting conditions are expected to change in this water body as a result of this element of the project. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	N/A

Ecological Objective – Poor by 2015 Chemical Objective – Good by 2063 Overall Objective – Poor by 2015	Current Cycle 3 2019 RBMP classification[9]	Evidence and data sources	Operational modifications to water body (from Table 6 in WFD Preliminary Assessment Report) – Potential effects of modifications on WFD quality elements		Scoped in or scoped out	Uncertainties / Gaps
			Operation of new green or blue open space and/or Priority areas for habitat creation, mitigation, or enhancement	New pedestrian/cycle bridges across River Thames		
Fish fauna	Not used to classify this water body due to the format of the available historic data.	**River Thames Water LTOA Technical Appendix E2 - Freshwater Fish; Ecological Surveys Project data; Flood relief channel Preliminary Ecological Appraisal report (GBV, 2016b); Weirs Preliminary Ecological Appraisal report (GBV, 2015)**	There will be some improvements to habitats on tributaries of the Thames that flow through proposed habitat creation areas, such as Abbey River blue open space enhancements and enhancements downstream of the weir capacity improvements. This could improve fish fauna populations. No further assessment required.	The bridges will not the fish classification in the River Thames. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	N/A
Chemical elements						
Priority hazardous substances	Fail (PFOS and PBDE and Tributyltin Compounds)	**Water quality monitoring (GBV, 2012 – 2024). Data includes range of substances for drinking water intakes; Ground Investigation data (GBV, 2023)**	The priority areas for habitat creation, mitigation or enhancement, and the green and blue open spaces will not alter the input of substances from the wider catchment. Design for each site will consider potential landfill contamination. Depending on design, areas could include wetlands that may reduce pollutants entering the waterbody. Improvements only on a localised scale. No further assessment required, however WFD compliance will be reassessed when the design is finalised.	The bridges will not alter the inputs of substances from the wider catchment. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	N/A
Priority substances	Fail (Cypermethrin)				No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment	N/A
Other Pollutants	Does not require assessment	N/A	Not assessed		N/A	Not required

Thames (Egham to Teddington) Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Measures Identified	Scale and Certainty of Impact	Mitigation
2. Remove obsolete Structures	Not applicable	• None		N/A
3. Re-engineer river	In place	None.	There will be some phased re-engineering of mostly existing modified aquatic areas during construction. Consequently, the impact of the project is considered to be small scale, with mostly temporary, but also some permanent effects anticipated. The project has involved extensive consultation to date which has incorporated the required mitigation and therefore it is not anticipated that the project would compromise future implementation of this proposed WFD measure.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas.
4. Remove or soften hard banks	Not in place	• Replace hard defences such as sheet piling with soft engineering	Within the Thames, there will be some alterations to mostly existing modified banks (e.g. raising banks). Within the RTS channels, measures to limit the amount of hard banks have been incorporated into the project, (e.g. shallow bank margins, bankside wetlands) wherever possible, thus making a positive contribution to this measure. The project is anticipated to lead to effects that will be small scale which will be permanent.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible affected vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish.
5, 37 and 39. Preserve/ restore habitats and maintenance -minimise habitat impacts 19. Enhance ecology	Not in place	• Improvements to fish passage, including multi-species fish passes at 5 weirs on the Thames (Chertsey Weir, Beasley's Ait, Sunbury Weir, Molesey Weir and Teddington Weir) • Riparian enhancements to provide habitat for otters, marginal planting and management of shading over lakes within the channel • Bank reprofiling • Sinking of trees to provide habitat for macrophytes • Shallowing of Lake margins • Removal of hard engineering structures/ bank rehabilitation/re-profiling. • Floating biohavens and provision of cover for fish along the channel.	There may be some small loss of aquatic vegetation in this water body as a result of the project during construction and operation. The project has incorporated a range of habitat and ecology enhancements that will result in positive permanent changes. The project has potential for positive contribution towards the measure.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Haul routes will be planned across site to minimise effects. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. Reprofiling of affected banks, will be undertaken wherever possible as part of the project. Creation of new areas of habitat will also be undertaken at a number of locations throughout the water body.

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Measures Identified	Scale and Certainty of Impact	Mitigation
6. In channel morphological diversity	Not in place	-Create wetland and backwater habitats and enhance riverbank -Create low flow channels in over-widened/over-deepened channels -Create reed fringes -Create shallow margin in front of hard defence -Reconnect and restore historic aquatic habitats. -Abbey River enhancements which could include bed raising with coarse substrate, re-meandering of the river and improved floodplain connection. -Removal of hard engineering structures (e.g. naturalisation) -Replace existing structures with new structural designs -Recreate a sinuous river channel (re-meandering)	There will some small scale, mostly temporary, but with some permanent alteration of the in-channel morphology at localities within this WFD water body including downstream of Desborough Cut. A positive contribution is anticipated as part of the project for this water body. Within RTS, trees removed during construction will be sunk within backwaters of the Thames to provide alternative, niche habitats for macrophytes to colonise and provision of cover to protect fish from predation.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. Reprofiling of the backwater lake banks and those along the River Thames, will be undertaken wherever possible as part of the project. Bathymetric surveys will be undertaken to monitor the operation of the project.
7. Bank rehabilitation	Not in place	None	There will be some alterations to mostly existing modified banks (e.g. raising banks) which are likely to be small scale, with some permanent changes. Measures have been incorporated into the project, (e.g. soft landscaping) wherever possible, thus making a positive contribution to this measure. The project is unlikely to compromise implementation of this measure for the majority of the water body or specific WFD measures identified.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. Reprofiling of the backwater lake banks and those along the River Thames, will be undertaken wherever possible as part of the project.
8. Re-opening culverts	Not in place	None	No culverts will be affected within this water body. Other culverts in the backwater areas will be improved, such as under the M3 which will involve some clearing and rehabilitation which will be a positive contribution to this measure. There may also be some construction of new culverts. The project will also make a positive contribution towards the site specific WFD measure at Molesey weir with the installation of a multispecies fish pass. The project is not anticipated to compromise implementation of this measure, or the measure at Teddington weir, in the future for this water body.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. A multispecies fish pass will be installed at Molesey weir.
9. Alter culvert bed	Not in place	None	As above.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible vegetation will be replanted if feasible or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish.
10. Flood bunds	Not in place	None	There will be no flood bunds directly within this water body. Consequently, the works are not anticipated to prevent the future implementation of this measure or specific WFD measures identified.	N/A

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Measures Identified	Scale and Certainty of Impact	Mitigation
11. Set back flood embankments	Not in place	Replace hard defence with soft engineering in places.	The project will not include set back flood embankments within this WFD water body and therefore the project would not compromise future implementation of this measure or specific WFD measures identified.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible affected vegetation will be replanted if feasible or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish.
12. Flood plain connectivity	Not in place	Lateral connectivity improvements at Abbey Meads and adjacent to Littleton North	There will be an increase in connectivity between the lakes and the main River Thames, making a positive contribution to this measure across the flood plain area. Additional lateral connectivity improvements adjacent to the Thames.	N/A
16. Fish passes	Not in place	• Multispecies fish passes are to be installed at Chertsey Weir, Beasley's Ait, Sunbury Weir, Molesey Weir and Teddington Weir. • Fish passes on all flow control structures as part of the channel	Capacity improvements at Molesey weir which will include replacement of a salmonid fish pass with multi species fish and eel passes. A fish pass solution will also be installed at Abbey Chase on the Abbey River, to enable fish passage along Channel Section 2. Both of these works will make a positive contribution towards this WFD measure. Plus the Chertsey, Beasley's Ait, Sunbury and Teddington fish passes.	A multi species fish pass will be installed at Molesey weir, Chertsey, Beasley's Ait weir, Sunbury and Teddington.
17. Fish pass flow releases	Not applicable	None.	Only limited changes in flow conditions are anticipated in this water body and therefore no adverse effects are anticipated on fish. In the backwaters, under non-flood conditions, there will be a augmentation flow through the new flood relief channel, which should be favourable to supporting and facilitating some fish passage along the backwater flood plain area. Thus, it is considered unlikely that the project would compromise the implementation of this measure in the future.	The project will include an augmented flow which will support fish species.
18. Reduce fish entrainment	Not in place	None	No works associated with RTS. The project is not anticipated to adversely affect this measure and it is unlikely to have adverse effects on the specific WFD measures identified at particular localities.	Fish passes within the channels and the design of the intake structures and associated structures will enable fish to move freely into the channels and exit at appropriate points.
20. Changes to locks etc.	Not in place	Change maintenance technique to minimise disturbance.	There are no changes expected locks, RTS will not compromise the implementation of this measure in the future.	N/A
21.Avoid the need to dredge 22. Dredging disposal strategy 23. Reduce impact of dredging 24-28 , 38 and 40. Dredging, disposal and sediment management	Not in place	None.	Bed lowering is required on this project downstream of the Desborough Cut. There will be some disturbance of sediment during construction which is anticipated to be small scale and temporary. Thus, it is unlikely that the Project will compromise implementation of the WFD measure within this water body.	Minimise disturbance to bottom sediments during construction by working within clearly defined marked areas. Potential measures may include use of silt curtains around working areas to minimise the spread of sediment in backwater areas. Chemical testing of sediments in localities most at risk from disturbance (e.g. banks of the River Thames) and backwater lakes. Periodic bathymetric surveys will be undertaken to monitor silt levels. Any requirements to reinstate the design profile will include the use of silt curtains or other appropriate measures to minimise the dispersion of sediment.

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Measures Identified	Scale and Certainty of Impact	Mitigation
				Chemical testing of sediments will be undertaken in localities most at risk from disturbance and containing elevated contaminants. Re use of coarse sediment for enhancement.
30. Manage artificial drawdown	Not in place	None.	Water control structures have been built into the design to control groundwater levels in the flood relief channels. During a flood the operation of RTS is unlikely to result in adverse effects on drawdown within this WFD water body. During non-flood conditions there will be an augmented flow within the channel (up to 1m³/s) to support ecological receptors. It is not anticipated that this will adversely affect water levels in the main River Thames in most flow conditions, but in the event of extreme low flows then the augmented flow will potentially be adapted to minimise adverse impacts within the Thames whilst balancing the impacts of water levels within the lake systems (depending on outcomes of planned environmental modelling). Whilst this will not adversely affect this WFD water body the potential effect on the new channel and ecological receptors will also need to be carefully managed.	Water control structures will be built into the project to maintain groundwater levels in the newly created flood relief channels; the flow through the flood relief channel during non-flood conditions has been designed to be as small as possible (up to 1m³/s); to reduce risk to PWS abstraction it is proposed that the flow may be reduced under drought conditions; monitoring of future ecological communities within the flood channels should be undertaken to assess the potential effects of reducing the augmentation flow.
31 and 41. Manage seasonal water levels and water level management	Not applicable	None.	A raft of project measures have been incorporated to manage water levels in this water body and surrounding areas, some of these include: at the weirs the work will be undertaken in the summer months to minimise flood risk; upgrades to the three River Thames weirs; other water level control structures will maintain existing groundwater levelsthe flood relief channel will also maintain flows in the Chertsey Bourne; and bed lowering downstream of Desborough Cut will allow more water to pass through it. Potential opportunities to adjust the timing of Thames Water abstractions are also being explored. This would be undertaken in accordance with an agreed protocol with the Environment Agency and Thames Water. With these measures, it is therefore considered unlikely that the project will adversely affect this measure. During low flow or drought conditions there is a potential risk that the augmented flow will exacerbate low flow conditions within the Thames between the Runnymede intake and Spelthorne outfall.	Works at the weirs will be timed to be undertaken during the summer to avoid periods when high flows are more likely; Thames water will increase abstraction during peak flows; The flow through the flood relief channel during non-flood conditions has been designed to be as small as possible (up to 1m³/s), when there is a risk to PWS abstraction it is proposed that the flow will be reduced. This assessment assumes an augmented flow of up to 1.0m³/s which can be adapted to mitigate for adverse impacts on water resources, water quality and biodiversity in the River Thames or within the Runnymede or Spelthorne channel lake systems. This could include temporarily reducing flow to an appropriate level, ceasing or alternating flow between the flood channels. Details on the trigger levels for which the augmented flow will be adapted during periods of low flow or drought, are yet to be developed.

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Measures Identified	Scale and Certainty of Impact	Mitigation
32. Phased dewatering	Not applicable	None.	There are currently no plans to undertake phased dewatering within this WFD water body. Consequently, the project is not anticipated to adversely affect this WFD measure in the main River Thames and it is not envisaged that the project will compromise future implementation of this measure.	This risk will be managed through built-in mitigation including good construction practices in accordance with a CEMP, following standard practice in handling excavating contaminated material and CIRIA, Government and BS guidance. This is likely to include dewatering of excavations, control of runoff from disturbed ground with water collection systems, keeping hard standings clean and covering stockpiled material.
33-35. Selective vegetation control and timing	In place	None.	There will be some vegetation maintenance required (trimming, replacement, coppicing trees etc.) required in a relatively small area. It is considered unlikely that the project will adversely affect vegetation control that may be in place within this water body or proposed in the future.	Access for management activities will be discussed with the relevant landowners/managers and/or Natural England prior to commencement of the works to ensure where possible these activities can continue. Access requirements for management will be built into traffic management plans.
36 and 52. Invasive species techniques and awareness	In place	None.	The project has the potential to affect invasive species during construction, and operationally with the increased connectivity between the River Thames and the lakes which has the potential to increase the rate of spread of some species. Mitigation has been proposed as part of the design, which will serve to reduce some of the adverse effects. Thus, there is potential for the project to affect these receptors which have associated WFD measures. Seeding enclosures form part of the mitigation measures to ensure colonisation of Channel by desirable species and reduce risk of INNS out-competing these.	Separation embankments have been built in where possible to keep portions of the lakes off-line. If there is considered to be a risk of spread and a significant effect, then INNS surveys will be undertaken as required. A biosecurity action plan for INNS will be produced, detailing mitigation measures, including consideration of equipment and materials used between sites.
42. Access to feeder streams	Not applicable	None.	Access to feeder streams from this water body will not be adversely affected as a result of the project. Thus, this measure will not be compromised in the future.	N/A
43-47. Downstream flow regime, sediment movement, DO, temperature, align and attenuate flows	Not applicable	None.	The project may lead to some localised changes in the downstream flow, sediment, DO and temperature levels. These are not anticipated to lead to significant adverse effects for physico-chemical parameters. Consequently, it is not anticipated that the project will compromise the implementation of the various WFD measures .	For construction related activities measures will include: Good construction practices in accordance with CEMP and Government 'Pollution Prevention for Businesses' guidelines to ensure chemicals and liquids are stored safely will be implemented. Water quality and sediment modelling is currently being undertaken to assess the effects and to inform subsequent mitigation.
49-53 Vessels	Not in place	Engaging with navigation users to reduce bank erosion and sediment input. Encourage use of environmentally friendly vessel design. Lateral zoning to concentrate boats within a central channel. Limit number of mooring permits available.	The project is likely to have minimal effects on navigation, but this will be carefully managed through discussions with stakeholders in order to minimise effects. The project is therefore unlikely to significantly compromise this measure in the future.	Mitigation to be discussed further with owners/operators, with measures identified which may include timing, phasing and/or positioning of works to minimise disruption to navigation; incorporation of measures in the CEMP to reduce potential cumulative effects associated with navigation including

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Measures Identified	Scale and Certainty of Impact	Mitigation
				consideration of methods to reduce suspended sediments, bank erosion and preservation of bank habitats as well as raising awareness in operators of any vessels/vehicles working on the RTS project of these potential effects.
54. Educate landowners	Not in place		Liaison will be undertaken with landowners as part of the project and it is not anticipated that this would adversely affect future implementation of the project.	Liaison with landowners will be undertaken as required for the project.

The Moat at Egham - GB106039017060- Heavily Modified Water Body. Overall Status (2019) – Poor - Catchment area (km2): 14.478 – Length (km): 4.937

Designated/protected sites associated - SPA and Drinking Water Safeguard Zone

Key:

WFD classification (baseline) / Type of effect	
(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction modifications affecting this water body are:

1) General construction activities and earthworks within the water body and in proximity to the water body - the footprint of the replacement flow control structure (FCS9) will be within this water body, downstream of St Ann's Lake.
2) INNS and Pathogen management - dewatering and direct removal of INNS
3) Construction compounds, material processing and storage sites

Operational modifications affecting this water body are:

1) A flow control structure (and associated bank protection). Structure FCS9 will control flow along a narrow channel with adjustable stoplogs from St Ann's Lake outlet to Chertsey Bourne, incorporating the downstream section of the Moat at Egham where it flows through Twynersh Lakes.

The Moat at Egham flows into Thorpe Park Lakes and outflows at the south east corner of St Ann's Lake. The section of the water body within Thorpe Park Lakes has not been assessed in this table and is instead covered in the Thorpe Park Lakes table.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	**INNS and pathogen management**	**Construction compounds, material processing and storage sites**	**Flow control structures (including associated bank protection)**		
Hydromorphological supporting elements								
Hydromorphological supporting elements: quantity and dynamics of water flow, connection to groundwater bodies, river continuity, river depth and width variation, structure and substrate of the river bed and structure of the riparian zone.	Supports Good (note – the hydrological regime 'does not support good')	**EA Gauged flow data; Hydraulic modelling (DHI/Stantec, 2023);**	General construction associated with the channels is adjacent to and downstream of the Moat at Egham, so will have a negligible impact. Construction associated with the flow control structure (FCS9) will introduce greater levels of fine sediment into the proximity of the water body, but this is very unlikely to have an impact on river bed depth or structure on a water body scale. The impacts of sediment will be managed through tertiary mitigation, reducing any risk to negligible. Construction of the flow control structure may result in temporary disruption of flow due to temporary use of coffer dams, however on a water body scale this	Management of INNS is not anticipated to have an impact on this element. If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale. No further assessment required.	Construction compounds and material processing in the area will introduce greater levels of fine sediment into the proximity of the water body which could impact river depth and bed structure and substrate. The impacts of sediment will be managed through tertiary mitigation, reducing any risk to negligible. There will be local removal of riparian vegetation during construction and will be small scale and localised. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. There are no impacts expected	Operation of the FCS07 control structure between St. Ann's Lake and Abbey Lake will permanently change flow dynamics of this water body. All flows from the Mead Lake Ditch will no longer enter St. Anns Lake due to this structure and there will be a subsequent loss of flow to the downstream 400m of the water body. Operation of FCS9 (flow control structure between St Ann's Lake and the Moat at Egham) will formalise an existing pathway that occurs during flood conditions. FCS9 will be a replacement of the existing outlet weir to restrict flood outflows to the Chertsey Bourne,	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued Monitoring and modelling data for the Moat at Egham are limited.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Construction compounds, material processing and storage sites	Flow control structures (including associated bank protection)		
			impact will be negligible. There are no impacts expected associated with changes to water flow, connection to groundwater bodies or structure of the riparian zone and therefore the overall impact on the hydromorphological supporting elements is negligible. No further assessment required.		associated with changes to water flow, connection to groundwater bodies, river continuity and therefore the overall impact on the hydromorphological supporting elements is negligible. No further assessment required.	via the Moat at Egham (400m from the downstream extent of the water body). This will be a change from existing flood conditions where the current structure does not regulate outflows from St Ann's to the Chertsey Bourne. The stop-log regulating structure will have a small footprint with less than 3m of bank being raised locally (~1.1m on each bank) with a channel width of 0.5m. There may be some minor changes to width and depth of the channel, the structure and substrate of the bed and the riparian zone, however these will be limited to the footprint of the structure and negligible on a water body scale. Overall, there will be negligible impacts on the hydromorphological supporting elements of the water body.		

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	**INNS and pathogen management**	**Construction compounds, material processing and storage sites**	**Flow control structures (including associated bank protection)**		
						No further assessment required.		
Physico-chemical supporting elements								
Temperature	High	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022) for Thorpe Park Lakes and Chertsey Bourne**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from general construction modifications. This could alter DO within the water column, pH and temperature. However, tertiary mitigation will be in place to minimise the risk of this occurring and subsequent decreases in DO. Overall, considering the footprint of the works within this water body, any impacts are negligible. No further assessment required.	INNS and pathogen management in the water body could lead to a localised improvement in physico-chemical conditions in the water body (less pressure on DO concentrations), but on a water body scale the impact is likely to be negligible. No further assessment required.	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from general construction modifications. This could alter DO within the water column, pH and temperature. However, tertiary mitigation will be in place to minimise the risk of this occurring and subsequent decreases in DO. Overall, considering the footprint of the works within this water body, any impacts are negligible. No further assessment required.	The flow control structure is part of formalising an existing pathway that occurs during flood conditions. The changes to the physico-chemical conditions with the operation of FCS9 are within the normal range of conditions experienced by the water body. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Monitoring and modelling data for the Moat at Egham are limited.
Oxygenation conditions (DO)	Bad							
Acidification status (pH)	High							
Salinity	Not used to classify this water body	**RTS Surface Water Quality Data 2012 – 2022 GBV (2022)**	No impacts expected on salinity from all construction and operation modifications.				No risk from any individual modification identified. No in-combination construction effects identified due to	Monitoring and modelling data for the Moat at Egham are limited.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	**INNS and pathogen management**	**Construction compounds, material processing and storage sites**	**Flow control structures (including associated bank protection)**		
							implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Ammonia	Good	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022) for Thorpe Park Lakes and Chertsey Bourne**	General construction associated with the channels is adjacent to and downstream of the Moat at Egham, so will have a negligible impact. Construction associated with the flow control structure (FCS9) on the water body is upstream of any area of historic landfill, so there is a negligible risk of ammonia from leachate is negligible. DHI groundwater flow monitoring does not predict a change in groundwater flow direction that would increase this risk. No further assessment required.	No impacts anticipated.	General construction associated with the channels is adjacent to and downstream of the Moat at Egham, so will have a negligible impact. Construction associated with the flow control structure (FCS9) on the water body is upstream of any area of historic landfill, so there is a negligible risk of ammonia from leachate is negligible. No further assessment required.	No adverse impacts anticipated. The permanent change to the flows from Abbey to St. Ann's Lake due to FCS07 could reduce any ammonia, phosphate and specific pollutant inputs into the Moat that may originate from Mead Lake Ditch, Fleet Lake and Abbey Lake. The flow control structure is part of formalising an existing pathway that occurs during flood conditions. The changes to the physico-chemical conditions with the operation of FCS9 are within the normal range of conditions experienced by the water body. There will be no additional sources of ammonia, nutrients	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Nutrient conditions (phosphates)	Moderate		Sediment release including sediment bound phosphates is possible during construction of the flow control	No impacts anticipated. No further assessment required.	Sediment release including sediment bound phosphates is possible from the construction compounds and		No risk from any individual modification identified. No in-combination construction effects	

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Construction compounds, material processing and storage sites	Flow control structures (including associated bank protection)		
			structure; however, sediment release will be controlled through adherence to tertiary mitigation. As the footprint of the works is very small on a water body scale, any risk of increased phosphates is considered negligible. No further assessment required.		materials management; however, any sediment release will be controlled using tertiary mitigation therefore presenting negligible risk. No further assessment required.	or specific pollutants. No further assessment required.	identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Specific pollutants	Not used to classify this water body		Any risks of pollutants associated with construction works will be negligible due to the size of the works compared to the size of the water body. Any potential release of pollutants will be mitigated through tertiary mitigation. No further assessment required.	No impacts anticipated.	Any risks of pollutants associated with construction compounds and material processing will be mitigated to negligible through tertiary mitigation. No further assessment required.		No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Biological quality elements								

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Construction compounds, material processing and storage sites	Flow control structures (including associated bank protection)		
Macrophytes and phytobenthos	Moderate	**No additional information**	There are not likely to be any change in prevailing conditions for macrophytes, phytobenthos and benthic invertebrates at the water body scale, as none of the supporting conditions are expected to change in this water body from construction activities. There is a risk that an increase in fine sediment or accidental spillage of hazardous substances entering the watercourse, associated with construction, could have adverse impacts on macrophytes. However, tertiary mitigation will be in place to minimise the risk of this occurring. There may be a very small direct loss of macrophytes and benthic invertebrate fauna in the footprint of the construction area on this water body but this will be localised. No further assessment required.	INNS and pathogen management in the water body could lead to a localised improvement in physico-chemical conditions in the water body (especially DO), which may improve habitat conditions but on a water body scale the impact is likely to be negligible. No further assessment required.	Not likely to be any change in prevailing conditions for macrophytes at the water body scale, as none of the supporting conditions are expected to change in this water body from construction activities. There is a risk that an increase in fine sediment or accidental spillage of hazardous substances entering the watercourse, associated with construction, could have adverse impacts on macrophytes. However, tertiary mitigation will be in place to minimise the risk of this occurring. No further assessment required.	The permanent change to the flows from Abbey to St. Ann's Lake due to FCS07 could reduce the spread of INNS and pathogens that reach the Moat from Mead Lake Ditch, Fleet Lake and Abbey Lake. This could have positive impacts on these biological elements with a reduction of INNS reaching the downstream 400m section of the Moat. For the upstream section of the water body, there will be no change to macrophytes and phytobenthos conditions. As FCS9 is the formalisation of an existing connection, there is not expected to be any change in water quality conditions for macrophytes and phytobenthos or benthic invertebrate fauna. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Benthic invertebrates	Poor	**No additional information**						

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Construction compounds, material processing and storage sites	Flow control structures (including associated bank protection)		
Fish fauna	Not used to classify WFD status	**No additional information**	No changes in the prevailing conditions for fish at the water body scale are expected, as none of the supporting conditions are expected to change in this water body from construction activities. A dry working area with sheet piling may have direct impacts on fish. Any fish within the working area will require netting and translocation to another section of the water body. There could be noise and vibration impact on fish in proximity to the works, however due to the length of the water body and the absence of any obstructions to fish passage, fish will be able to swim away from the works. The working areas will be small relative to the size of the overall river water body and it is likely there will remain sufficiently large areas for fish to shelter and inhabit during works. Secondary	No impacts anticipated. No further assessment required.	No impacts anticipated. No further assessment required.	The permanent change to the flows from Abbey to St. Ann's Lake due to FCS07 could reduce the spread of INNS and pathogens that reach the Moat from Mead Lake Ditch, Fleet Lake and Abbey Lake. This could have positive impacts on fish with a reduction of INNS reaching the downstream 400m section of the Moat. The flow control structure (FCS9) in the downstream section of the water body is part of formalising an existing pathway that occurs during flood conditions. The changes to water quality and hydromorphology with the operation of FCS9 are within the normal range of conditions experienced by the water body, so no adverse impacts are anticipated. There is currently no fish passage on The Moat as the current structure at	**Scoped in** to detailed assessment due to potential effects on fish	Detailed construction methods and plans yet to be issued including the scale of sheet piling required for construction.. Fish surveys to be undertaken in Spring/Summer 2023

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Construction compounds, material processing and storage sites	Flow control structures (including associated bank protection)		
			mitigation will also be in place during construction to minimise noise and vibration risk to fish. No further assessment required. There is potential for an increase in INNS and pathogens presence and prevalence as a result of construction activities. FCS9 formalises an existing connection so any INNS and pathogens are likely to already be present in both waterbodies. Secondary mitigation will be adhered to minimise this risk. No further assessment required.			the location of FCS9 does not include a fish pass. There are no plans for a fish pass to be included in the design of the replacement structure (FCS9), which will maintain the current situation. This will potentially prevent the water body from achieving good in the future. Further assessment required.		
Chemical elements								
Priority hazardous substances	Fail (PBDE)	**River Thames Scheme Surface Water Quality Data 2012 – 2022 GBV (2022)**	Any risks of pollutants associated with construction works will be short-term and negligible due to the size of the works compared to the size of the water body.	No impacts anticipated. No further assessment required.	Any risks of pollutants associated with construction compounds and material processing will be mitigated to negligible through tertiary mitigation.	No adverse impacts anticipated. No adverse impacts anticipated. The permanent change to the flows from Abbey to St. Ann's Lake due to FCS07	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[10]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Construction compounds, material processing and storage sites	Flow control structures (including associated bank protection)		
Priority substances	Good		Any potential release of pollutants will be mitigated through tertiary mitigation. No further assessment required.		No further assessment required.	could reduce any ammonia, phosphate and specific pollutant inputs into the Moat that may originate from Mead Lake Ditch, Fleet Lake and Abbey Lake. The FCS9 flow control structure is part of formalising an existing pathway that occurs during flood conditions. There will be no additional sources of Priority and priority hazardous substances No further assessment required.	No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Other Pollutants	Does not require assessment		Not assessed				N/A	Not required

The Moat at Egham Mitigation Measures Assessment

Key:

Type of effect

	Type of effect
Red	High risk of compromising the measure
Orange	Medium risk of compromising the measure
Yellow	Low risk of compromising the measure
White	No risk of compromising the measure
Green	Potential for positive contribution towards the measure
Blue	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
4.Remove or soften hard bank	In place	A flow control structure (including associated bank protection). Structure FCS9 will control flow along a narrow channel with adjustable stoplogs from St Ann's Lake outlet to Chertsey Bourne River, incorporating the downstream section of the Moat at Egham where it flows through Twynersh Lakes.	Construction footprint will be confined to a small area where FCS9 (detailed design currently unknown) is constructed. Compaction of the riverbank is possible during construction works. Small areas of hardened bank are likely to be present along the riverbank adjacent to FCS9. The total length of bank to be changed is less than 3m (~1.1m of hard engineering to each bank). Presence of hard banks will however be localised and due to the minor extent of this, there will be no risk.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation, and shading to re-establish.
5 and 19 . Preserve or restore habitats and enhance ecology	Not in place	A flow control structure (and associated bank protection). Structure FCS9 will control flow along a narrow channel with adjustable stoplogs from St Ann's Lake outlet to Chertsey Bourne River, incorporating the downstream section of the Moat at Egham where it flows through Twynersh Lakes.	The impacts upon habitats along this water body are discussed in greater detail within the Thorpe Park lakes mitigation measures table. As these lakes are upstream of FCS9 (detailed design currently unknown), construction and operation here will have greater impacts on habitats. Due to the small footprint and scale of FCS9 the impact on habitats will be negligible.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation, and shading to re-establish.

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
6.In-channel morph diversity	Not in place	A flow control structure (including associated bank protection). Structure FCS9 will control flow along a narrow channel with adjustable stoplogs from St Ann's Lake outlet to Chertsey Bourne River, incorporating the downstream section of the Moat at Egham where it flows through Twynersh Lakes.	There will be minor impacts on this mitigation measure due to the small footprint of FCS9 (detailed design currently unknown) construction and operation. Further detail can be found in Thorpe Park lakes mitigation measures table regarding in-channel morphology.	Minimise the footprint of the working area and in channel works wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation, and shading to re-establish.
7.Bank rehabilitation	Not in place	A flow control structure (including associated bank protection). Structure FCS9 will control flow along a narrow channel with adjustable stoplogs from St Ann's Lake outlet to Chertsey Bourne River, incorporating the downstream section of the Moat at Egham where it flows through Twynersh Lakes.	Construction footprint will be confined to a small area where FCS9 (detailed design currently unknown) is constructed. Compaction of the riverbank is possible during construction works and this mitigation measure could be at risk. Small areas of hardened bank are likely to be present along the riverbank adjacent to FCS9. Presence of hard banks will however be localised and due to the minor extent of this, there will be no risk.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish.
16.Fish passes	Not in place	None.	There is currently no fish passage on The Moat as the current structure at the downstream end (between St Ann's Lake and the Chertsey Bourne) does not include a fish pass. There are no plans for a fish pass to be included in the design of the replacement structure (FCS9), which will maintain the current situation. This will potentially prevent the implementation of this measure.	If the amount of flow allows, a fish pass should be added to the structure, as required to facilitate fish passage.
20.Changes to locks etc	Not in place	None	Currently there are no plans for changes to locks within the water body, therefore the works are unlikely to compromise implementation of this measure in the future.	N/A

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
21-27. Avoid the need to dredge, dredging disposal strategy, reduce impact of dredging, retime dredging or disposal, dredge disposal site selection. Sediment management and Reduce sediment suspension impacts	Not in place	A flow control structure (including associated bank protection). Structure FCS9 will control flow along a narrow channel with adjustable stoplogs from St Ann's Lake outlet to Chertsey Bourne River, incorporating the downstream section of the Moat at Egham where it flows through Twynersh Lakes.	Although detailed design plans are currently unknown for FCS9, there may be a potential requirement for modifications to the river bed and the use of dredging is currently unlikely. If dredging is to be used it will be on a very small scale and be confined to the footprint of FCS9. Mitigation measures sediment management and reduce sediment suspension will all be considered within the construction management plan. There is no anticipated effect on the ability for these mitigation measures to be met in the future.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Sediment management will be incorporated into any dredging component of design along with a CEMP and a Construction Surface Water Management Plan, reducing any risk to negligible.
28.Manage disturbance	Not In place	A flow control structure (including associated bank protection). Structure FCS9 will control flow along a narrow channel with adjustable stoplogs from St Ann's Lake outlet to Chertsey Bourne River, incorporating the downstream section of the Moat at Egham where it flows through Twynersh Lakes.	There will be minor impacts on this mitigation measure due to the small footprint of FCS9 (detailed design currently unknown) construction and operation. Further detail can be found in Thorpe Park lakes mitigation measures table regarding in-channel morphology. There is no anticipated effect on the ability for these mitigation measures to be met in the future.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Sediment management will be incorporated into any dredging component of design along with a CEMP and a Construction Surface Water Management Plan, reducing any risk to negligible.
32.Phased de-watering	Not applicable	N/A	N/A	N/A
33, 34 and 35. Selective vegetation control and vegetation control timing	Not in place	None	There may be some vegetation maintenance required (trimming, replacement, coppicing trees etc.) as part of construction. Proposed project mitigation measures will give due consideration to any vegetative tertiary mitigation that may be required in the future as part of the management of the priority area for habitat creation enhancement or mitigation. Due to the small scale of FCS9 there will be minimal risk to implementing this mitigation measure in the future along the wider water body.	Access for management activities will be discussed with the relevant landowners/managers and/or Natural England prior to commencement of the works to ensure where possible these activities can continue. Access requirements for management will be built into traffic management plans. Ensure planting along the riparian zone of the water body if implemented following construction where possible.

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
36 and 52. Invasive species techniques and awareness	Not in place	A flow control structure (including associated bank protection). Structure FCS9 will control flow along a narrow channel with adjustable stoplogs from St Ann's Lake outlet to Chertsey Bourne River, incorporating the downstream section of the Moat at Egham where it flows through Twynersh Lakes.	The potential for the RTS project to increase the spread of Invasives is a possible risk within this water body. For further detail regarding INNS and implications for future mitigation measures, refer to Thorpe Park lakes as this is where potential spread of INNS is likely possible and will create a pathway for this spread into this water body.	A biosecurity action plan for INNS will be produced, detailing mitigation measures, including consideration of equipment and materials entering the site.
49 - 51. Modify vessel design, vessel management and boats in central track	Not applicable	None	N/A	N/A
53.Boat wash awareness	Not applicable	None	N/A	N/A
55 and 56 - Recreation awareness and enhance ecology (Recreation)	Not in place	None	There will be no future impact on this mitigation measure as a result of RTS.	N/A
49 and 50. Modify vessel design and Vessel Management	Not applicable	N/A	N/A	N/A

Mole (Hersham to River Thames Conf at East Molesey)- GB106039017622- Heavily Modified Water Body. Overall Status (2019) – Moderate - Catchment area (km2): 21.803 – Length (km): 9.507

Designated/protected sites associated –N/A

WFD classification (baseline) / Type of effect

Bad classification
Poor classification
Moderate classification (or 'does not support Good')
N/A (or no data)
Good classification
High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks
2) Construction compounds, material processing and storage sites
3) INNS and Pathogen management – dewatering and direct removal of INNS

Operation elements of the project affecting this water body are:

1) Operation of Priority area for habitat creation, mitigation or enhancement - Grove Farm priority area for habitat creation (formerly referred to habitat creation area or HCA). Watercourse runs adjacent to priority area for habitat creation boundary, the priority area for habitat creation is located within water body catchment.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	**Current Cycle 3 2019 RBMP Status[11]**	**Other data sources available to assess quality element and initial comments**	**Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements**				**Scoped In or Scoped out of detailed assessment?**	**Uncertainties / Gaps**
			General construction and earthworks	**Construction compounds, material processing and storage sites**	**INNS and Pathogen management**	**Operation of Priority area for habitat creation, mitigation or enhancement**		
Hydromorphological supporting conditions								
Quantity and dynamics of water flow	Supports Good	**Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022**)	General construction including excavation and hard standing areas within the priority area for habitat creation boundary may change drainage pathways and therefore quantity and dynamics of flow may change within this water body. It is anticipated that there will be no risk to quantity and dynamics of water flow within	Construction compounds and material processing sites will increase the presence of hardstanding areas throughout the priority area for habitat creation. Therefore, this could temporarily change drainage pathways and alter quantity and dynamics of water flow. It is anticipated that there will be no risk to quantity and	Management of INNS is not anticipated to have an impact on this element. If any impacts occur from INNS and pathogen treatment, these will be localised and will not affect the element at water body scale.	There will be minor permanent changes to the surface water and groundwater drainage networks for this water body. However, there will be a negligible effect on this hydromorphological supporting element.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	Geomorphological walkover report not yet issued. Detailed construction methods and priority area for habitat creation design plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
			this water body due to the relative size of the priority area for habitat creation to the water body. Tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Mole. No further assessment required.	dynamics of water flow within this water body due to the relative size of the priority area for habitat creation to the water body. However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the River Mole. No further assessment required.	No further assessment required.	No further assessment required.	No in-combination operational effects identified. **Scoped out** of detailed assessment.	Environment Agency (and Natural England). Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.
Connection to groundwater bodies		**Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022)**	General construction including excavation and hard standing areas within the priority area for habitat creation boundary may change drainage pathways and therefore may alter the connection of this water body to groundwater bodies. However, it is anticipated that there will be no risk to this supporting element within this water body due to the relative size of the priority area for habitat creation to the water body. However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the River Mole. No further assessment required.	Construction compounds and material processing sites will increase the presence of hard standing areas within the priority area for habitat creation boundary, this could change drainage pathways. Therefore, there may be negligible changes to the connection of the water body to groundwater bodies. However, it is anticipated that there will be no risk to this supporting element within this water body due to the relative size of the priority area for habitat creation to the water body. No further assessment required.	INNS and pathogen management is anticipated to cause no risk to this water body's connection to groundwater. No further assessment required.	There will be minor permanent changes to the surface water and groundwater drainage networks for this water body. However, there will be negligible effect on this hydromorphological supporting element. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
River continuity		**Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022**)	General construction and earthworks are anticipated to have no impact on river continuity. Although drainage pathways could change due to increased hard standing, the continuity of the river is considered to be at no risk. However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the River Mole. No further assessment required.	Construction compounds and material processing sites are anticipated to have no impact on river continuity. Although drainage pathways could change due to increased hard standing, the continuity of the river is at no risk. However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the River Mole. No further assessment required.	INNS and pathogen management is anticipated to cause no risk to this water body's continuity. No further assessment required.	There will be minor permanent changes to the surface water and groundwater drainage networks for this water body. However, there will be negligible effect to this hydromorphological supporting element as there is no anticipated works or permanent structures to be present within the watercourse itself. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.
River depth and width variation		**Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022**)	General construction including excavation and hard standing areas within the priority area for habitat creation boundary may increase the runoff of fine sediment into this watercourse. Drainage pathways may also change due to priority area for habitat creation construction. However, it is anticipated that there will be negligible impact upon the depth and width variations of this watercourse due to the relative size of the priority area for habitat creation to the water body. There will also be no direct changes to the watercourse itself	Construction compounds and material processing sites will increase the presence of hard standing areas within the priority area for habitat creation boundary and may increase the runoff of fine sediment into this watercourse. Drainage pathways may also change due to priority area for habitat creation construction. However, it is anticipated that there will be negligible impact upon the depth and width variations of this watercourse due to the relative size of the priority area for habitat creation to the water body.	INNS and pathogen management is anticipated to cause no risk to this water body's continuity. No further assessment required.	There will be minor permanent changes to the surface water and groundwater drainage networks for this water body. However, there will be negligible effect to this hydromorphological supporting element as there is no anticipated works or permanent structures to be present within the watercourse itself.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
			However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the River Mole. No further assessment required.	However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the River Mole. No further assessment required.		No further assessment required.	**Scoped out** of detailed assessment.	
Structure and substrate of the river bed		**Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022**)	General construction and excavation processes may increase the amount of fine sediment present within surface water runoff. As this modification is anticipated to change drainage pathways, there may be an increase in the concentration of fine sediment within this water body. However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the River Mole. No further assessment required.	General construction and excavation processes may increase the amount of fine sediment present within surface water runoff. As this modification is anticipated to change drainage pathways, there may be an increase in the concentration of fine sediment within this water body. However, tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the River Mole. No further assessment required.	INNS and pathogen management is anticipated to cause no risk to this water body's continuity. No further assessment required.	There will be minor permanent changes to the surface water and groundwater drainage networks for this water body. However, there will be negligible effect to this hydromorphological supporting element as fine sediment concentrations in the watercourse will be negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.
Structure of the riparian zone		**Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022**)	General construction and earthworks may be present along the riparian zone of this watercourse; however, priority area for habitat creation design plan and construction plan are currently unknown. It is considered that there will be minor impacts upon the structure of the riparian zone	General construction and earthworks may be present along the riparian zone of this watercourse; however, priority area for habitat creation design plan and construction plan are currently unknown. It is considered that there will be negligible impacts upon the	INNS and pathogen management will provide improvements to the structure of the riparian zone and allow native species to grow. No further assessment required.	There will be potential improvements to the structure of the riparian zone of this watercourse because of the priority area for habitat creation	No risk from any individual modification identified. No in-combination construction effects identified due to	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
			and any vegetation lost will be mitigated by replanting of natural regeneration of the riparian zone. No further assessment required.	structure of the riparian zone and any vegetation lost will be mitigated by replanting of natural regeneration of the riparian zone. No further assessment required.		enabling at Grove Farm.	implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	be agreed with Environment Agency (and Natural England). Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.
Physico-chemical supporting elements								
Temperature Salinity	Not used to classify this waterbody	**GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023**	Local changes to hardstanding from these two modifications will temporarily alter drainage networks to the watercourse. An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both of these construction activities. However, tertiary mitigation will be in place to minimise the risk of this occurring and subsequent changes in thermal conditions. Furthermore, due to the footprint of the works within this water body, any impacts are negligible. Any impacts to salinity from construction activities would be localised and negligible risk. No further assessment required.		INNS and pathogen management is anticipated to cause no risk to these supporting elements. No further assessment required.	There will be minor permanent changes to the surface water and groundwater drainage networks for this water body. However, there will be negligible effect to these Physico-chemical supporting element as fine sediment concentrations in the watercourse will be negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year. Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	**Construction compounds, material processing and storage sites**	**INNS and Pathogen management**	**Operation of Priority area for habitat creation, mitigation or enhancement**		
Oxygenation conditions (DO)	High	**GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Local changes to hardstanding from these two modifications will temporarily alter drainage networks to the watercourse. An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both of these construction activities. This could alter DO within the water column, pH and the acid neutralising capacity of the watercourse. However, tertiary mitigation will be in place to minimise the risk of this occurring and subsequent changes in thermal conditions. Furthermore, due to the footprint of the works within this water body, any impacts are negligible. No further assessment required.		INNS and pathogen management is anticipated to cause no risk to these supporting elements. No further assessment required.	There will be minor permanent changes to the surface water and groundwater drainage networks for this water body. This could delay the presence of fine sediment in the watercourse due to greater coverage of vegetation at the priority area for habitat creation site. Therefore, it is considered that there will be no risk effect to these Physico-chemical supporting element as fine sediment concentrations in the watercourse will be negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year. Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.
Acid neutralising capacity	High							
Acidification status (pH)	High							
Ammonia	High	**RTS Surface Water Quality Data 2012 – 2022 GBV (2022)** **Hydraulic modelling (DHI/Stantec, 2023) included water quality**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both of these construction modifications. This could contain concentrations of ammonia, phosphates and specific pollutants which could be adhered to fine sediments or runoff in the water column into the water body. However, tertiary mitigation will be in place to minimise the risk of this occurring and subsequent decreases in DO. Furthermore, due to the small footprint of the works within this water body, any impacts are negligible. No further assessment required.		INNS and pathogen management is anticipated to cause no risk to these supporting elements.	There will be minor permanent changes to the surface water and groundwater drainage networks for this water body. This could delay the presence of fine sediment in the watercourse due to greater coverage of vegetation at the priority area for habitat creation site. Therefore, it is	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year. Designs for new green open space and/or
Nutrient conditions (phosphates)	Poor							

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
Specific pollutants	High (Iron, Triclosan, Arsenic, Copper, Manganese, Permethrin, zinc)	**modelling for Total phosphorus.** **Ground investigation surveys (GBV, 2022-23)**				considered that there will be no risk effect to these Physico-chemical supporting element as fine sediment concentrations in the watercourse will be negligible.	No in-combination operational effects identified. **Scoped out** of detailed assessment.	Priority areas for habitat creation, mitigation or enhancement have not been finalised.
Biological quality elements								
Macrophytes and phytobenthos	Not used to classify WFD status	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023)**	Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen which could adversely impact on macrophytes and phytobenthos. Spillage of hazardous substances could also lead to toxic adverse impacts to these elements. However, due to the location of the watercourse and no in channel modifications, this element is considered to not be at risk. However, tertiary mitigation and environmental permits will be in place to minimise the risk of this occurring and subsequent decreases in DO. Furthermore, due to the small footprint of the works within this water body, any impacts are negligible. No further assessment required.		No adverse impact anticipated. Any management that occurs could have minor, localised improvements to the water body. It may reduce any existing impact that INNS are currently having on Phytoplankton. No further assessment required.	If there is any riparian zone planting of vegetation there is potential for improvements to this element. There is also some possible delay in nutrients entering this system due to changes to drainage pathways, therefore this element is considered to be at no risk. However, these improvements are considered to be localised to the priority area for habitat creation boundary. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year. Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.
Benthic invertebrate	High	**INNS and Pathogen Surveys**	Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen which could adversely impact on benthic invertebrates fauna. Spillage of hazardous substances could also lead to toxic		No adverse impact anticipated. Any management that occurs could have minor,	If there is any riparian zone planting of vegetation there is	No risk from any individual modification identified.	Geomorphological walkover report not yet issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
		(GBV, 2022) **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023)**	adverse impacts to these elements. However, due to the location of the watercourse and no in channel modifications, this element is considered to not be at risk. However, tertiary mitigation and environmental permits will be in place to minimise the risk of this occurring and subsequent decreases in DO. Furthermore, due to the small footprint of the works within this water body, any impacts are negligible. No further assessment required.		localised improvements to the water body. It may reduce any existing impact that INNS are currently having on Phytoplankton. No further assessment required.	potential for improvements to this element. There is also some possible delay in nutrients entering this system due to changes to drainage pathways, therefore this element is considered to be at no risk. However, these improvements are considered to be localised to the priority area for habitat creation boundary. No further assessment required.	No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year. Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.
Fish fauna	Good	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023)**	Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen which could adversely impact on fish fauna. Spillage of hazardous substances could also lead to toxic adverse impacts to these elements. However, due to the location of the watercourse and no in channel modifications, this element is considered to not be at risk. However, tertiary mitigation will be in place to minimise the risk of this occurring and subsequent decreases in DO. Furthermore, due to the small footprint of the works within this water body, any impacts are negligible. No further assessment required.		No adverse impact anticipated. Any management that occurs could have minor, localised improvements to the water body. It may reduce any existing impact that INNS are currently having on Phytoplankton. No further assessment required.	Riparian zone planting may increase shelter at the margins of the river. The potential for increase in invertebrate populations at the margins, could provide increased food source for fish. However, these improvements are considered to be localised to the priority area for habitat creation boundary. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year. Designs for new green open space and/or Priority areas for habitat

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
							Scoped out of detailed assessment.	creation, mitigation or enhancement have not been finalised.
Chemical elements								
Priority hazardous substances	Fail (Mercury and its compounds, PFOS and PBDE)	**GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both construction modifications at the HCA. This could contain concentrations of priority hazardous substances which could be adhered to fine sediments or runoff in the water column into the water body. However, tertiary mitigation and environmental permits will be in place to minimise the risk of this occurring. Furthermore, any residual effects from these activities will be short-term, further minimising the risk of deterioration. No further assessment required.		INNS and pathogen management is anticipated to cause no risk to these supporting elements. No further assessment required.	Any riparian zone planting and the vegetation planting in the priority area for habitat creation could reduce the concentrations of priority hazardous substances within this water body. This will improve water quality further downstream of the priority area for habitat creation site. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year. Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.
Priority substances	Good	**GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both construction modifications. This could contain concentrations of priority substances which could be adhered to fine sediments or runoff in the water column into the water body. However, tertiary mitigation and environmental permits will be in place to minimise the risk of this occurring and to reduce the residual risk to an acceptable level for this element. Furthermore, due to the small footprint of the works within this water body, any impacts are negligible. No further assessment required.		INNS and pathogen management is anticipated to cause no risk to these supporting elements. No further assessment required.	Any riparian zone planting and the vegetation planting in the priority area for habitat creation could reduce the concentrations of priority substances within this water body. This will improve water quality further downstream of the	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Overall Objective - Good by 2063	Current Cycle 3 2019 RBMP Status[11]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	**Construction compounds, material processing and storage sites**	**INNS and Pathogen management**	**Operation of Priority area for habitat creation, mitigation or enhancement**		
						priority area for habitat creation site. No further assessment required.	No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Other Pollutants	Good	**GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023**	An increase in fine sediment release and accidental spills of hazardous substances could enter the water body from both construction modifications. This could contain concentrations of priority hazardous which could be adhered to fine sediments or runoff in the water column into the water body. However, tertiary mitigation and environmental permits will be in place to minimise the risk of this occurring and to reduce the residual risk to an acceptable level for this element. Furthermore, due to the small footprint of the works within this water body, any impacts are negligible. No further assessment required.		INNS and pathogen management is anticipated to cause no risk to these supporting elements. No further assessment required.	Any riparian zone planting and the vegetation planting in the priority area for habitat creation could reduce the concentrations of other pollutants within this water body. This will improve water quality further downstream of the priority area for habitat creation site. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Geomorphological walkover report not yet issued. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year. Designs for new green open space and/or Priority areas for habitat creation, mitigation or enhancement have not been finalised.

Mole (Hersham to River Thames Conf at East Molesey)- Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
2.Remove obsolete structure	Not Applicable	N/A	N/A	N/A
4.Remove or soften hard bank	Not Applicable	N/A	N/A	N/A
5, 19 and 37. Retain, preserve or restore habitats and enhance ecology	Not Applicable	N/A	N/A	N/A
5, 19 and 37. Retain, preserve or restore habitats and enhance ecology	Not in place	Development of a priority area for habitat creation, enhancement, or mitigation adjacent to the water body	The design for the priority area for habitat creation, enhancement or mitigation is still to be refined but could include improvements in riparian habitats. The area has been selected for potential to improve biodiversity net gain. These works are on a very small scale for the WFD water body but could have a long-term positive impact and will not prevent the measure being implemented in the future.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation, and shading to re-establish.
6.In-channel morph diversity	Not in place	None	Currently there are no plans for alternations within the channel. Therefore, the works are unlikely to compromise implementation of this measure in the future.	N/A
6.In-channel morph diversity	Not Applicable	N/A	N/A	N/A
7.Bank rehabilitation	Not Applicable	N/A	N/A	N/A
8.Re-opening culverts	Not Applicable	N/A	N/A	N/A
9.Alter culvert channel bed	Not Applicable	N/A	N/A	N/A
10.Flood bunds	Not Applicable	N/A	N/A	N/A

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
11.Set-back embankments	Not Applicable	N/A	N/A	N/A
12.Floodplain connectivity	Not Applicable	N/A	N/A	N/A
16.Fish passes	Not Applicable	N/A	N/A	N/A
16.Fish passes	Not in place	None	Currently there are no plans for fish passes within the water body, therefore the works are unlikely to compromise implementation of this measure in the future.	N/A
18.Reduce fish entrainment	Not Applicable	N/A	N/A	N/A
20.Changes to locks etc	Not Applicable	N/A	N/A	N/A
20.Changes to locks etc	Not in place	None	Currently there are no plans for changes to locks within the water body, therefore the works are unlikely to compromise implementation of this measure in the future.	N/A
21.Avoid the need to dredge	Not Applicable	N/A	N/A	N/A
22.Dredging disposal strategy, 23.Reduce impact of dredging, 25.Retime dredging or disposal, 27. Dredge disposal site selection	Not Applicable	N/A	N/A	N/A
24.Reduce sediment resuspension	Not Applicable	N/A	N/A	N/A
25.Retime dredging or disposal	Not Applicable	N/A	N/A	N/A
26.Sediment management	Not Applicable	N/A	N/A	N/A
28.Manage disturbance	Not Applicable	N/A	N/A	N/A
32.Phased de-watering	Not Applicable	N/A	N/A	N/A

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
33, 34 and 35. Selective vegetation control and vegetation control timing	In Place	Development of a priority area for habitat creation, enhancement, or mitigation adjacent to the water body	There may be some vegetation maintenance required (trimming, replacement, coppicing trees etc.). Proposed project mitigation measures will give due consideration to any vegetative tertiary mitigation that may be required in the future as part of the management of the priority area for habitat creation enhancement or mitigation. It is not anticipated that the project would compromise the future implementation of these combined WFD measures.	There may be some vegetation maintenance required (trimming, replacement, coppicing trees etc.) along the riparian zone of this water body. Proposed project mitigation measures will give due consideration to any vegetative tertiary mitigation that may be required in the future.
36.Invasive species techniques	In Place	Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	The potential for the RTS project to increase the spread of invasives is considered no risk at this location. Several project mitigation measures have been proposed as part of the design which will give due regard to minimising the spread of invasives. It is not anticipated that the project would compromise the future implementation of these combined WFD measures.	A biosecurity action plan for INNS will be produced, detailing mitigation measures, including consideration of equipment and materials entering the site.
38.Sediment management strategy	Not Applicable	N/A	N/A	N/A
39. Maintenance – minimise habitat impact	In Place	Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	Currently there are no plans for changes within the water body that might impact habitat management, so the works are unlikely to compromise implementation of this measure in the future.	Utilisation of a construction management plan and a CEMP will minimise the risk of construction on the habitats within this water body.
40.Maintenance – prevent sediment transfer	In Place	Development of a priority area for habitat creation, enhancement, or mitigation adjacent to the water body	Currently there are no plans for changes within the water body itself that might impact sediment management, so the works are unlikely to compromise implementation of this measure in the future.	Utilisation of a construction management plan and a CEMP will minimise the risk of sediment entering the channel associated with construction works.
41.Water level management	Not Applicable	N/A	N/A	N/A
47.Align and attenuate flow	Not Applicable	N/A	N/A	N/A
49.Modify vessel design, 50.Vessel Management	Not Applicable	N/A	N/A	N/A
54.Educate landowners	In Place	Development of a priority area for habitat creation, enhancement or mitigation adjacent to the water body	RTS has the potential to further enhance this mitigation measure and therefore increase awareness regarding the potential impacts on this water body.	N/A
55.Recreation awareness	Not Applicable	N/A	N/A	N/A

Colne (Confluence with Chess to River Thames) - GB106039023090 - Heavily Modified Water Body. Overall Status (2019) – Moderate - Catchment area (km2): 89.316 – Length (km): 51.489

Designated/protected sites associated -Drinking Water Safeguard Zone, Special Protection Area (Wraysbury reservoir adjacent). No mitigation measures assigned to this water body

WFD classification (baseline) / Type of effect

- Bad classification
- Poor classification
- Moderate classification (or 'does not support Good')
- N/A (or no data)
- Good classification
- High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks
2) Construction compounds, material processing and storage sites
3) INNS and Pathogen management - dewatering and direct removal of INNS

Operation elements of the project affecting this water body are:

1) Creation of new green open space and/or Priority areas for habitat creation (previously referred to as Habitat Creation Areas or HCAs), mitigation or enhancement, referred to as "Land South of Wraysbury Reservoir HCA" (watercourse does not run through HCA boundary, however water body catchment extends a total area of 0.10km^2 into eastern area of HCA)

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status[12]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
Hydromorphological supporting conditions								
Quantity and dynamics of water flow	Does not support good	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data**	Hydromorphological elements are not at risk as a result of construction and earthworks activities at Land South of Wraysbury HCA. Although the water body catchment extends into the eastern area of the HCA, there is no risk	Hydromorphological elements are not at risk as a result of construction compounds and material processing sites at Land South of Wraysbury HCA. Although the water body catchment extends into the eastern area of the	Hydromorphological elements are not at risk as a result INNS and pathogen management associated with the Land South of Wraysbury HCA. No further assessment required.	Hydromorphological elements are not at risk as a result of the operation of the HCA. Although the water body catchment extends into the eastern area of the HCA, there is no risk from overland flow and runoff of fine sediment from the HCA area due to the distance of the	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Detailed construction methods and plans yet to be issued.
Connection to groundwater bodies								
River continuity								

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status[12]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
River depth and width variation		**(2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	from overland flow and runoff of fine sediment from the HCA area due to the distance of the watercourse itself from the HCA boundary, the location of the M25 and Wraysbury river. Tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.	HCA, there is no risk from overland flow and runoff of fine sediment from the HCA area due to the distance of the watercourse itself from the HCA boundary, the location of the M25 and Wraysbury river. Tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.		watercourse itself from the HCA boundary, the location of the M25 and Wraysbury river. No further assessment required.	**Scoped out** of detailed assessment	Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Structure and substrate of the river bed								
Structure of the riparian zone								
Physico-chemical supporting elements								
Temperature	Good	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Physico-chemical elements of this water body are not at risk as a result of construction and earthworks activities at Land South of Wraysbury HCA. Although the water body catchment extends into the eastern area of the HCA, there is no risk from overland flow and runoff of fine sediment due to the distance of the watercourse itself from the HCA boundary, the location of the	Physico-chemical elements of this water body are not at risk as a result of construction compounds and material processing sites at Land South of Wraysbury HCA. Although the water body catchment extends into the eastern area of the HCA, there is no risk from accidental spillages and contaminated fine sediment due to the distance of the watercourse itself from the HCA boundary, the	Physico-chemical elements are not at risk as a result INNS and pathogen management associated with the Land South of Wraysbury HCA. No further assessment required.	Physico-chemical elements are not at risk as a result of the operation of the HCA. Although the water body catchment extends into the eastern area of the HCA, there is no risk from overland flow and runoff of fine sediment from the HCA area due to the distance of the watercourse itself from the HCA boundary, the location of the M25 and Wraysbury river. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Detailed construction methods and plans yet to be issued. Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Salinity	Not used to classify WFD status							
Oxygenation conditions (DO)	High							
Acidification status (pH)	High							
Ammonia	High							
Nutrient conditions (phosphates)	Poor							
Specific pollutants	High (Arsenic, copper, iron, manganese, permethrin, triclosan and zinc)							

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status[12]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
			M25 and Wraysbury river. Tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.	location of the M25 and Wraysbury river. Tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.				
Biological quality elements								
Macrophytes and phytobenthos	Moderate	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Biological elements of this water body are not at risk as a result of construction and earthworks activities at Land South of Wraysbruy HCA. Although the water body catchment extends into the eastern area of the HCA, there is no risk from overland flow and runoff of fine sediment and subsequent changes to physico-chemical elements due to the distance of the watercourse itself from the HCA boundary, the location of the M25 and Wraysbury river. Tertiary mitigation will be implemented during construction to	Biological elements of this water body are not at risk as a result of construction and earthworks activities at Land South of Wraysbury HCA. Although the water body catchment extends into the eastern area of the HCA, there is no risk from overland flow and runoff of fine sediment and subsequent changes to physico-chemical elements due to the distance of the watercourse itself from the HCA boundary, the location of the M25 and Wraysbury river. Tertiary mitigation will be implemented during construction to minimise any fine sediment run-off and	Biological elements are not at risk as a result INNS and pathogen management associated with the Land South of Wraysbury HCA. No further assessment required.	Biological elements are not at risk as a result of the operation of the HCA. Although the water body catchment extends into the eastern area of the HCA, there is no risk from overland flow and runoff of fine sediment from the HCA area due to the distance of the watercourse itself from the HCA boundary, the location of the M25 and Wraysbury river. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Detailed construction methods and plans yet to be issued. Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Invertebrates	High							
Fish fauna	Good							

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status[12]	Other data sources available to assess quality element and initial comments	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	INNS and Pathogen management	Operation of Priority area for habitat creation, mitigation or enhancement		
			minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.	pollutant risk to the Thames. No further assessment required.				
Chemical elements								
Priority hazardous substances	Fail (PFOS & PBDE)	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	There are no mechanisms that put chemical status at risk due to the distance of the watercourse itself from the HCA boundary, the location of the M25 and Wraysbury river. No further assessment required.				**Scoped out** of detailed assessment No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Detailed construction methods and plans yet to be issued. Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Priority substances	Good							
Other Pollutants	Good							

Colne (Confluence with Chess to River Thames) Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016)	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
4. Remove or soften hard banks	Not in place	None	The works will involve the construction of a new overspill structure, with the lowering of the left bank over 60m. The works would be very small scale, albeit permanent, but are not anticipated to prevent the future implementation of this WFD measure throughout the majority of this WFD water body.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Haul routes will be planned across site to minimise effects. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish.
5. Preserve or restore habitats	Not in place	None	There is the potential for some very small direct loss of habitats over a small area within this WFD water body, albeit permanent. The works are to formalise an existing overflow and therefore no significant effects are anticipated on the supporting elements or habitats. Consequently, the project will not prevent the subsequent implementation of this WFD measure in the future.	See 4 above.
6. In channel morphological diversity	Not in place	None	Potential for a very small alteration in the in-channel morphological diversity, which will be permanent. However, it will not lead to significant changes and will not prevent implementation of this WFD measure in the remaining WFD water body in the future.	N/A
7. Bank rehabilitation	Not in place	None	The works would be very small scale, albeit permanent, but with the implementation of the proposed project mitigation measures wherever feasible, adverse effects will be minimised. The project is unlikely to prevent the future implementation of this WFD measure throughout the majority of this WFD water body.	See 4 above.
16. Fish passes	Not in place	None	The new overspill structure would almost mimic existing conditions and therefore it would enable the same level of fish movement as presently occurs. Thus, no significant effects are anticipated, and it is not anticipated that the project would prevent the future implementation of this WFD measure over the majority of this WFD water body.	N/A

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016)	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
19. Enhance ecology	Not in place	None	The works will be small scale, albeit permanent on the ecology which is not anticipated to be significant. Where feasible, project mitigation measures will be implemented and it is not anticipated to prevent the future implementation of this WFD measure within the majority of the remaining WFD water body.	See 4 above.
20. Changes to locks etc.	Not applicable	None	The project will not affect any locks in this water body and it is considered unlikely that the works in this locality will prevent the future implementation of this WFD measure.	N/A
21-28. Dredging, sediment management and disposal measures	Not applicable		No alteration is anticipated to the sediment regime as a result of the proposed works and the project is not anticipated to prevent the future implementation of these combined WFD measures, if required.	N/A
28.Manage disturbance	Not applicable		The works are very small scale and therefore it is unlikely to cause significant disturbance. Furthermore, the project is unlikely to prevent the future implementation of this WFD measure.	N/A
32. Phased dewatering	Not applicable		No phased dewatering is planned in this location and therefore it is unlikely that the project will prevent the future implementation of this WFD measure.	N/A
33-35. Vegetation control	Not in place		There may be some vegetation maintenance required (trimming, replacement, coppicing trees etc.). Proposed project mitigation measures will give due consideration to any vegetative tertiary mitigation that may be required in the future.	Access for management activities will be discussed with the relevant landowners/managers and/or Natural England prior to commencement of the works to ensure where possible these activities can continue. Access requirements for management will be built into traffic management plans.
36 and 52 Invasive species techniques and awareness	Not in place		The works involving the formalisation of an existing overspill, will only affect a very small area, albeit permanent. The potential for RTS to increase the spread of invasives is considered limited in this location. A number of mitigation measures have been proposed as part of the design which will give due regard to minimising the spread of invasives. It is not anticipated that the project would compromise the future implementation of these combined WFD measures.	A biosecurity action plan for INNS will be produced, detailing mitigation measures, including consideration of equipment and materials entering the site.
49-51 and 53 Navigation: Modify vessel design; vessel management, boats in central track, boat wash awareness	Not applicable; not in place boat wash awareness		The project will not affect any issues surrounding navigation and it is considered unlikely that it would compromise the future implementation of these combined WFD measures.	N/A
55. Recreation awareness	Not in place		The works will only affect a small area and therefore is unlikely to give rise to adverse effects on recreation and it is considered unlikely that it would compromise the future implementation of this WFD measure.	As a precautionary measure the potential for impacts on recreation will be discussed further with owners/operators, with measures identified which may include timing, phasing and/or positioning of works to minimise disruption to recreational activities, if required.
56. Enhance ecology	Not in place		The works are small scale and thus there is limited potential to enhance ecology from a recreational perspective. The project is unlikely to prevent the future implementation of this WFD measure.	N/A

Thorpe Park Lakes - GB30642753 - Artificial. Overall Status (2019) – Poor - Surface area (km2): 0.949 – Catchment area (km2): 71.71 – Mean depth (m): 2.033

Designated/protected sites associated – South West London Waterbodies SPA & Ramsar site

Key

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) INNS and pathogen management – dewatering and direct removal of INNS
2) Long term dewatering of sections of water bodies to enable construction of flow control and water level control structures in the water body.
3) Construction compounds, material processing and storage sites within and/or in proximity to the water body
4) General construction activities and earthworks within the water body and in proximity to the water body including:
    a. Sheet piling installation to enable construction of the flood channel through landfill and made ground for approximately 1 km upstream of Thorpe Park Lakes water body;
    b. Excavation through landfill and other sources of contamination to construct the section of flood channel upstream of Abbey Lake and Fleet Lake; and,
    c. Excavation and earthworks in proximity to the water body to create new green open space (Royal Hythe) and/or Priority areas for habitat creation, mitigation, or enhancement (Norlands Lane).

Due to the number of proposed modifications to this water body during construction and operation, this assessment is presented within separate tables for construction and operation.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
Hydromorphological supporting elements								
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to groundwater body, lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore)	Not used to classify this water body	**Hydraulic modelling (DHI/Stantec, 2023);** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)** **Flow monitoring (2019 – 2022) (GBV, 2022)** **INNS and Pathogen Surveys (GBV, 2022)**	Construction activities will lead to greater levels of fine sediment produced in proximity to the water body. With greater areas of hard standing, this could lead to localised changes in volume, velocity, and distribution of overland flows into this lake water body. This could increase runoff of fine sediment into the lake water body. During periods of heavy rainfall and increased overland flow, this could lead to scour of the lake bed. However, negative impacts are unlikely at a water body scale due to implementation of tertiary mitigation (standard practice) such as appropriate drainage and silt control to reduce fine sediment run-off and minimise any impacts to hydromorphological supporting elements. There is high potential for plant INNS spread into this water body from construction activities and	Management of INNS could have a temporary localised impact on all hydromorphological elements. This could involve temporary draw down of a lake to manage INNS and pathogens. This will impact adversely upon dynamics of flow and connection to groundwater body. The lake substrate could be exposed in places due to the drawdown of levels. However, impacts are anticipated to only be short term whilst INNS and pathogen management is undertaken. If removal of any established plant INNS leads to changes in the lake bed structure, this could in turn alter flow dynamics within the lake and affect biological quality elements. However, impacts at a water body	Over-pumping to create dry working areas will have localised impacts to some hydromorphological supporting elements if areas are made dry for an extended period. There will be minor changes to the quantity and dynamics of flow, residence time and connection to the groundwater body. However, it is anticipated that over pumping in this water body will be short term (i.e., less than six months in duration) and small in scale relative to the overall size of the water body (0.949 km^2). Lake depth variation will change in sections of the lake due to an area of the water body being dewatered. The structure and substrate of the lake bed may also change due to reduction in water levels within the dry working areas,	Greater levels of fine sediment will be produced in proximity to the water body. With increased areas of hard standing, this could lead to localised changes in volume, velocity, and distribution of overland flows into this lake water body. During periods of heavy rainfall and increased overland flow, this could lead to scour of the lake bed. However, negative impacts are unlikely at a water body scale due to implementation of tertiary mitigation (standard practice) such as appropriate drainage and silt control to reduce fine sediment run-off and minimise any impacts to hydromorphological supporting elements. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **All hydromorphological supporting elements scoped out** of detailed assessment as no risk of deterioration due to implementation of primary, secondary and tertiary mitigation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			earthworks, however this is considered to have a negligible risk to flow dynamics, residence time and the connection to the groundwater body. There is a risk to lake depth variation, structure and substrate of the lake bed, structure of the lake shore, if invasive or non-native plants were to colonise within or at the margins of each of the lakes. However, an INNS management plan will be in place during construction to minimise this risk. No further assessment required.	scale are anticipated to be negligible. No further assessment required.	however any adverse impacts are expected to be short term and localised. Best management silt control practices will be implemented throughout any over pumping to ensure this risk is minimised. No further assessment required.			
Physico-chemical supporting elements								
Transparency	Not used to classify this water body	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Potential for a reduction in transparency during the construction period from an increase in fine sediment release which could enter the water body. Any changes to transparency would be temporary. Implementation of tertiary mitigation during construction to reduce fine sediment	This modification is not considered to have an impact to transparency at a water body scale. Drawdown of any lakes to undertake INNS and pathogen management is likely to be short term. This could temporarily increase turbidity within the lake that is drawn down,	There could be some minor impacts upon transparency within the water body if water that is over pumped out of the dry-working areas into the lakes, disturbs fine sediment. This could reduce clarity of the water. However, the duration of over pumping is expected to be short term and tertiary mitigation will	Potential for a reduction in transparency during the construction period from an increase in fine sediment release which could enter the water body. However, tertiary mitigation such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any reduction in water clarity.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment due to no risk of deterioration.	Detailed construction methods and plans yet to be issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			run-off will prevent any long-term reduction in water clarity. Construction could increase the presence of new plant INNS species and/or increase the prevalence of existing INNS. This could have a minor, localised impact upon transparency of the water body due to increased vegetation growth on margins of water body, however an INNS management plan will be in place following construction to mitigate any impacts. No further assessment required.	however due to the short duration of the activity, impacts on transparency will be temporary and negligible. No further assessment required.	be in place to ensure this risk is minimised. No further assessment required.	No further assessment required.		
Thermal conditions	Not used to classify this water body	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Potential for localised changes within the water body during the construction period from an increase in fine sediment release which could enter the water body and reduce light penetration to the lake bed. However, implementation of tertiary mitigation (standard practice) during construction to reduce fine sediment run-off will prevent any impacts to	This modification is not considered to have an impact to transparency as a result of vegetation removal. Drawdown of any lakes to undertake INNS and pathogen management is likely to be short term. This could temporarily increase temperature within the water column due to increased light penetration to	Not anticipated to impact upon thermal conditions anticipated from this modification. No further assessment required.	Potential for localised changes within the water body during the construction period from an increase in fine sediment release which could enter the water body and reduce light penetration to the lake bed. However, implementation of tertiary (standard practice) mitigation during construction to reduce fine sediment run-off will prevent any impacts to hydromorphological supporting elements.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	Detailed construction methods and plans yet to be issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			hydromorphological supporting elements. Construction could increase the presence of new plant INNS species and/or increase the prevalence of existing INNS. This could increase shading if an INNS plant rapidly colonised within the lake, impacting upon temperature of the lake water body. However, this risk is anticipated to be localised to certain parts of the water body. No further assessment required.	the bed, however due to the likely short-term duration of the activity, impacts will be negligible. There may be some localised improvements if an aquatic plant INNS that is currently extensively established, is subsequently removed, and improves water clarity. No further assessment required.		No further assessment required.		
Oxygenation conditions (DO)	Not used to classify this water body (previously classified at 'High' status in 2015).	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Potential for localised changes within the water body during the construction period from an increase in fine sediment release which could enter the water body and reduce dissolve oxygen concentrations. However, tertiary (standard practice) mitigation measures, such as appropriate drainage and silt control, will be in place during construction to reduce fine sediment run-off	Drawdown of any lakes to undertake INNS and pathogen management is likely to be short term. This could temporarily decrease dissolved oxygen concentrations within the lake that is drawn down. Tertiary (standard practice) mitigation will ensure DO levels do not drop below a threshold which could adversely impact on lake ecology.	There could be some minor localised impacts upon dissolved oxygen levels within the water body if water that is over pumped out of the dry-working areas into the lakes, disturbs and releases fine sediment. This could reduce dissolved oxygen concentrations. However, the duration of over pumping is expected to be short term and best management silt control practices will	Potential for localised changes within the water body during the construction period from an increase in fine sediment release which could enter the water body and exert an additional oxygen demand as well as reducing light penetration to the lake bed. There is also potential for accidental spillage of hazardous substances which could runoff into this water body and reduce dissolved oxygen conditions. However, tertiary mitigation, such	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			and minimise any impacts to this element. Excavation through areas of landfill and disturbance through existing ground with sheet piling could lead to mobilisation of landfill leachate which could runoff into this water body and exert an oxygen demand. Construction of the channel will include some dewatering, to remove contaminated leachate in areas of landfill. However, it is considered that this presents a low risk to oxygenation conditions. No further assessment required.	Therefore, adverse impacts to this element will be negligible. No further assessment required.	be in place to ensure this risk is minimised. No further assessment required.	as appropriate drainage and silt control will be in place to reduce this risk and minimise any impacts to this element. No further assessment required.		
Salinity	High	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Storage and use of salt is likely to be required for construction. There is a risk that spills of salt could occur and runoff into the lake system, subsequently increasing its salinity levels. This could be a greater risk during winter months when transporting materials on haul roads. Tertiary mitigation will be in place to reduce runoff and accidental	Not anticipated to impact upon salinity. No further assessment required.	Not anticipated to impact upon salinity. No further assessment required.	Storage and use of salt is likely to be required for construction. There is a risk that spills of salt could occur and runoff into the lake system, subsequently increasing its salinity levels. This could be a greater risk during winter months when transporting materials on haul roads. Tertiary mitigation such as appropriate drainage and salt storage will be in place to reduce runoff	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	Detailed construction methods and plans yet to be issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			spills. No risk of deterioration. No further assessment required.			and accidental spills. No risk of deterioration. No further assessment required.		
Acidification status (pH)	Not used to classify this water body	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Increased spread of plant INNS from construction activities could lead to lowering or raising of pH at a local scale within the water body, but this is considered negligible. Construction activities could also result in accidental spillage of hazardous substances that could runoff into the water body. This could impact upon pH locally and would likely to be temporary in nature. Tertiary (standard practice) mitigation will be in place to prevent risk to this element. There could be mobilisation of landfill leachate which could runoff into this water body. This could impact upon pH levels. Construction of the channel will include some dewatering, to remove contaminated leachate in areas of landfill. However, it is considered that this	Not anticipated to impact upon pH. No further assessment required.	Any impacts from over pumping on acidification status are considered negligible. No further assessment required.	There is potential for accidental release of hazardous substances from compounds, processing and storage sites and haul roads, which could then runoff into this water body. This could impact upon pH locally and would likely to be temporary in nature. Tertiary (standard practice) mitigation will be in place to prevent risk to this element. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			still presents a low risk of altering pH and no risk to deterioration. No further assessment required.					
Nutrient conditions (Total Nitrogen)	Good	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain organic nitrogen tied up within this sediment. This sediment could be released and runoff into the water body. However, tertiary (standard practice) mitigation will be in place, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. Increased presence and/or prevalence of plant INNS from construction activities could alter nutrient availability and alter productivity levels of native plants within the lake, however this is not a risk to this element.	Potential drawdown of lakes to undertake INNS management could temporarily increase the concentration of Total Nitrogen within the lake. This could have some adverse impacts on biological elements, however due to the likely short-term duration of the activity, impacts will be negligible. INNS and pathogen management could alter the nutrient availability and improve productivity levels of native plants but is not anticipated to be at a water body scale. No further assessment required.	Over pumping out of dry-working areas into the lakes could disturb and release fine sediment that could contain Total Nitrogen concentrations. However, the duration of over pumping is expected to be short term and tertiary mitigation will be in place to ensure this risk is minimised. Any impacts from over pumping on Total Nitrogen concentrations within Thorpe Park Lakes are considered negligible. No further assessment required.	Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain Total Nitrogen concentrations. This sediment could be released and runoff into the water body. However, tertiary (standard practice) mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			Mobilisation of landfill leachate could runoff into this water body. which could contain high concentrations of Total Nitrogen. Construction of the channel will include some dewatering, to remove contaminated leachate in areas of landfill. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable level for this element.					
Nutrient conditions (Total phosphorus)	High	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2022** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain high Total Phosphorus concentrations. This sediment could be released and runoff into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element.	Potential drawdown of lakes to undertake INNS management could temporarily increase the concentration of Total Phosphorus within the lake. This could have some adverse impacts on biological elements, however due to the likely short-term duration of the activity, impacts will be negligible. This management could alter the nutrient availability and improve productivity levels of native plants but	Over pumping out of dry-working areas into the lakes could disturbs and release fine sediment that contains nutrients such as phosphorus. However, the duration of over pumping is expected to be short term and best management silt control practices will be in place to ensure this risk is minimised. Any impacts from over pumping on Total Phosphorus concentrations within Thorpe Park Lakes are considered negligible.	Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain high Total Phosphorus concentrations. This sediment could be released and runoff into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	Detailed construction methods and plans yet to be issued.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			Increased presence and/or prevalence of plant INNS from construction activities could alter nutrient availability and alter productivity levels of native plants within the lake. Sediment nutrient conditions could also be impacted by plant INNS. Mobilisation of landfill leachate containing high concentrations of Total Phosphorus could runoff into this water body. Construction of the channel through landfill will include some dewatering, to remove contaminated leachate in areas of landfill. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable level for this element.	is not anticipated to be at a water body scale.				
Specific pollutants	High (Copper)		There could be mobilisation of landfill leachate which could runoff into this water body without tertiary mitigation. This could contain considerable amounts of Copper and other specific	Potential drawdown of lakes to undertake INNS management could temporarily increase the concentration of Copper within the lake due to a	Over pumping out of dry-working areas into the lakes could disturbs and release fine sediment that contains heavy metals such as copper. However, the duration of over pumping is	Potential for localised changes within the water body during the construction period from an increase in fine sediment supply originating from compounds and processing and storage	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	Detailed construction methods and plans yet to be issued. Awaiting results of site investigation

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			pollutants that could adversely impact upon the lake system. Construction of the channel will include some dewatering, to remove contaminated leachate in areas of landfill. Tertiary mitigation and environmental permits will be in place to minimise this risk, reducing the residual risk to an acceptable level for this element.	reduction in water quantity. This could have some adverse impacts on biological elements, however due to the likely short-term duration of the activity, impacts will be negligible. No further assessment required.	expected to be short term and best management silt control practices will be in place to ensure this risk is minimised. Any impacts from over pumping on copper concentrations within Thorpe Park Lakes are considered negligible. No further assessment required.	sites. This could contain high Copper concentrations and other specific pollutants. This sediment could be released and runoff into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment required.	**Scoped out** due to no risk of deterioration.	to establish presence of contaminants within soils of former landfill and within the lake water body sediments.
Biological quality elements								
Phytoplankton	Good	**Ecological Surveys Project data (GBV, 2016)** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen. Spillage of hazardous substances could also lead to toxic adverse impacts to phytoplankton. Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment	Potential drawdown of lakes to undertake INNS management could temporarily increase the likelihood of phytoplankton blooms within the water body as there will be greater availability of nutrients for phytoplankton growth. However, this is not expected to be a risk to the element status, as any drawdown is likely to occur within a short period of time and only under the correct conditions.	There could be some minor localised impacts upon phytoplankton if water that is over pumped out of the dry-working areas into the lakes, disturbs and releases fine sediment. However, the duration of over pumping is expected to be short term and best management silt control practices will be in place to ensure this risk is minimised.	Increased fine sediment released from compounds and processing and storage sites, into the water body could smother bed habitats, reducing light penetration and dissolved oxygen. Spillage of hazardous substances could also lead to toxic adverse impacts to phytoplankton. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	2023 phytoplankton baseline monitoring ongoing. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			run-off and minimise any impacts to this element. Any landfill leachate runoff could lead to changes in phytoplankton growth throughout the water body. Construction of the channel will include some dewatering, to remove contaminated leachate in areas of landfill. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable level for this element.	Completion of this management could reduce any existing impact that INNS are currently having on phytoplankton within the lake, however any change is anticipated to be small relative to the potential for INNS spread due to the new channel and increased lake connections.				
Macrophytes and phytobenthos (combined)	Poor	**Ecological Surveys Project data: Macrophyte data (GBV, 2022), Phytobenthos data 2012 -2014 (GBV, 2016)** **RTS Baseline Surveys: Aquatic ecology surveys (APEM, 2023)** Macrophyte sampling in 2021 and 2022 found the presence of	Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen which could adversely impact on macrophytes and phytobenthos. Spillage of hazardous substances could also lead to toxic adverse impacts to these elements. Additionally, changes to physico-chemistry could lead to loss or	Potential drawdown of lakes to undertake INNS and pathogen management could result in minor loss of macrophytes and phytobenthic habitat, or this could encourage growth due to a potential increase in light availability. However, any change is not expected to be a risk to the element status, as drawdown is likely	There may be a minor direct loss of these elements within the sections of lake that are de-watered, however this will be at a localised scale. Any disturbance and release of fine sediment from over pumping may could adversely impact macrophytes and phytobenthos, however, the duration of over pumping is expected to be short term and best management silt control practices will	Increased fine sediment released from compounds and processing and storage sites, into the water body could smother macrophytes and phytobenthos. Reduced light penetration and dissolved oxygen as a consequence of high inputs of fine sediment could also indirectly impact growth. Additionally, accidental spillage of hazardous substances could also lead to toxic adverse impacts.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	2023 phytobenthos baseline monitoring ongoing. Full LEAFPACS classification not yet finalised for Macrophytes. Due to be completed in 2023. Detailed construction methods and
Macrophytes	Poor							
Phytobenthos	Poor							

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
		five charophyte species at Thorpe Park in 2022 was notable and would qualify the location as a nationally "Important Stonewort Area".	modification of in-channel and riparian habitats. However, tertiary mitigation, will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. Increased presence and/or prevalence of plant INNS from construction activities could also have adverse impacts on the composition and abundance of macrophytes and phytobenthos communities. Any runoff of landfill leachate could lead to adverse impacts on macrophyte and phytobenthos growth and communities throughout the water body. Construction of the channel will include some dewatering, to remove contaminated leachate in areas of landfill. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an	to occur within a short period of time and only under the correct conditions. This modification could have minor improvements. It may reduce any existing impact that INNS are currently having on macrophytes and phytobenthos within the lake, however this is likely to be small relative to the potential for INNS spread due to the new channel and increased lake connections.	be in place to ensure this risk is minimised.	However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element.		plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			acceptable level for this element.					
Benthic invertebrate fauna	Not used to classify this water body	**RTS Baseline Surveys: Aquatic ecology surveys (APEM, 2023)** The rare leech species, *Glossiphonia verrucata*, recorded within Abbey Lake, is often associated with submerged vegetation such as charophytes. The aquatic snail *Gyraulus laevis* is a rare pioneer species of ponds and gravel pits.	Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen which could adversely impact on benthic invertebrate fauna. Spillage of hazardous substances could also lead to direct toxic impacts to benthic invertebrates. Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. Increased presence and/or prevalence of plant or aquatic INNS and pathogens from construction activities could also have adverse impacts composition and abundance of benthic invertebrate fauna. Secondary mitigation	Potential drawdown of lakes to undertake INNS and pathogen management could result in minor loss of benthic invertebrate fauna and their habitat. However, any adverse impact is not expected to be a risk to the element status, as drawdown is likely to occur within a short period of time and only under the correct conditions. This modification could reduce any existing impact that INNS are currently having on benthic invertebrates within the lake, however any change is anticipated to be small relative to the potential for INNS spread due to the new channel and increased lake connections. No further assessment required.	There may be a minor direct loss of benthic invertebrates and habitat within the sections of lake that are de-watered, however this will be at a localised scale. Any disturbance and release of fine sediment from over pumping could adversely impact benthic invertebrates, however, the duration of over pumping is expected to be short term and best management silt control practices (tertiary mitigation) will be in place to ensure this risk is minimised. No further assessment is required.	Increased fine sediment released from compounds and processing and storage sites, into the water body could smother invertebrate habitats, leading to a direct loss of fauna. Reduction in light and changes to dissolved oxygen could also limit the functioning of benthic invertebrate communities. Spillage of hazardous substances could also lead to direct toxic impacts to fish communities, which could inhibit function. Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment is required.	**Scoped in** to detailed assessment due to risk of INNS and pathogen spread within the water body, impacting upon macrophytes and phytobenthos.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			will be in place, but further assessment is required to assess residual risk. If landfill leachate was to runoff into this water body, this could lead to adverse impacts on benthic invertebrate communities throughout the water body. Construction of the channel will include some dewatering, to remove contaminated leachate in areas of landfill. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable level for this element.					
Fish fauna	Not used to classify this water body	**Flood channel Preliminary Ecological Appraisal report; Fish surveys (GBV, 2016b)** **Additional fish surveys undertaken in 2016;** **Other data - sources in Preliminary Ecological**	Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen which could adversely impact on fish fauna. Spillage of hazardous substances could also lead to direct toxic impacts to fish communities, which could inhibit function.	Potential drawdown of lakes to undertake INNS and pathogen management could result in some disturbance to fish populations within the lake. A fish rescue would be carried out prior to drawdown to prevent risk. The removal of some plant INNS	There may be a minor direct loss of fish habitat within the sections of lake that are de-watered, however this will be at a localised scale. There will be increased noise and greater areas of the lake that are obstructed to fish due to the over pumping to create dry working areas associated with culvert creation and	Increased fine sediment released from compounds and processing and storage sites, into the water body could smother bed habitats, reducing light penetration and dissolved oxygen which could adversely impact on fish fauna. Spillage of hazardous substances could also lead to direct toxic impacts to fish	**Scoped in** to detailed assessment due to risk of INNS and pathogen spread within the water body, impacting upon fish.	2023 Fish surveys not yet completed. Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
		Appraisal Report (GBV, 2016b)	Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. If landfill leachate was to runoff into this water body, this could lead to toxic impacts on fish populations throughout the water body. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable level for this element. There could also be adverse impacts to fish from noise and vibrations from sheet piling construction using some percussive piling. However, secondary and tertiary mitigation will be in place to reduce wherever practical. Furthermore, the	may reduce the availability of shelter and habitat within parts of the lake for fish, however in the long term, the management could have a potential improvement on fish populations with increased availability of native macrophyte species within the lake or at the margins. This modification could also reduce any existing impact that INNS and pathogens are currently having on fish fauna within the lake, however any change is anticipated to be small relative to the potential for INNS and pathogen spread due to the new channel and increased lake connections. No further assessment required.	flow control structures. However, the working areas will be small relative to the size of the overall lake water body and it is likely there will remain sufficiently large areas for fish to shelter and inhabit during works. Any disturbance and release of fine sediment from over pumping may could adversely impact benthic invertebrates, however, the duration of over pumping is expected to be short term and best management silt control practices will be in place to ensure this risk is minimised. No further assessment required.	communities, which could inhibit function. Additionally, changes to physico-chemistry could lead to loss or modification of in-channel and riparian habitats. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment required.		Agency (and Natural England).

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			working areas will be small relative to the size of the overall lake water body and it is likely there will remain sufficiently large areas for fish to shelter and inhabit during works. No further assessment required. Increased presence and/or prevalence of plant or aquatic INNS, and pathogens from construction activities could also have adverse impacts on fish communities within the water body. An INNS and pathogen management plan (secondary mitigation) will be in place to reduce risk, however further assessment is required to assess any residual risk.					
Chemical elements								

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
Priority hazardous substances	Fail (PFOS and PBDE)	**GBV (2023) River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities and earthworks could lead to changes in flow pathways. Accidental spillage of hazardous substances and through earthworks could lead to the release into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. There could also be mobilisation of landfill leachate which may runoff into this water body. This could contain high concentrations of Priority hazardous substances, hazardous substance and other pollutants that could impact upon the water body. Tertiary mitigation and environmental permits will be in place to minimise this risk, but further assessment is required to assess whether the residual risk is acceptable for this element.	Potential drawdown of lakes to undertake INNS management could temporarily increase the concentration of priority hazardous and priority substance within the lake due to a reduction in water quantity. This could have some adverse impacts on biological elements, however due to the likely short-term duration of the activity, impacts are temporary and negligible. No further assessment required.	Over pumping out of dry-working areas into the lakes could disturb and release fine sediment that contains priority hazardous or priority substances. However, the duration of over pumping is expected to be short term and best management silt control practices will be in place to ensure this risk is minimised. Any impacts from over pumping on priority hazardous or priority substances concentrations within Thorpe Park Lakes are considered negligible. No further assessment required.	Potential for localised changes within the water body during the construction period from an increase in fine sediment which could contain priority hazardous or priority substances. This sediment could be released and runoff into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. No further assessment required.	**Scoped in** to detailed assessment due to risk of mobilisation of leachate increasing priority and priority hazardous substances concentrations within the water body.	Detailed construction methods and plans yet to be issued. Awaiting results of site investigation to establish presence of contaminants within soils of former landfill and within the lake water body sediments.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
Priority substances	Good (Fluoranthene)	**GBV (2023) River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities and earthworks could lead to changes in flow pathways. Accidental spillage of hazardous substances and through earthworks could lead to the release into the water body. However, tertiary mitigation, such as appropriate drainage and silt control will be in place during construction to reduce fine sediment run-off and minimise any impacts to this element. There could also be mobilisation of landfill leachate which may runoff into this water body. This could contain high concentrations of Priority hazardous substances, hazardous substance and other pollutants that could impact upon the water body. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable limit for this element.				No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** due to no risk of deterioration.	

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of construction modifications on WFD quality elements				Scoped In or Scoped Out?	Uncertainties / Gaps
			General construction activities and earthworks	INNS and pathogen management	Long term dewatering of water bodies	Construction compounds, material processing and storage sites		
			No further assessment.					
Other Pollutants	Does not require assessment	Not assessed	Not assessed				N/A	Not required

Operational elements affecting this water body are:

1) Runnymede Channel will flow through Fleet and Abbey parts of the Thorpe Park Lakes. There are no bunds currently proposed in these lakes to separate the channel. Continuous augmented flow through the flood channel of up $1m^3/s$ will operate in normal flow conditions. Infilling of existing connection between Manor Lake and Fleet Lake.
2) Flow control structures – a gated control structure (nine gates) at the Thorpe Park Lakes outlet (IS2) and a broad crested weir with flap gate and tilting gate at Abbey Lake outlet to St Ann's Lake (there is an existing connection at this point) (FCS7). New flood control structure to formalise existing overflow from Chertsey Bourne into St Ann's Lake (FCS9).
3) Priority areas for habitat creation enhancement or mitigation. Sites and locations for priority areas for habitat creation, enhancement or mitigation have not yet been formalised but could include lake edge reprofiling and shallowing with wetland planting.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	*Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements*			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	**Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).**	**Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement**		
Quantity and dynamics of water flow	Supports Good	**Hydraulic modelling (DHI/Stantec, 2023); Flow monitoring (2019 – 2022) (GBV, 2022)**	Fleet and Abbey Lakes will be become incorporated into the channel. When the flood channel is in operation there will be a substantial increase in the volume of water passing through the lakes which will temporarily significantly change flow dynamics and this section of the water body could function more like a riverine environment. When the flood channel is not in operation there will be some additional flow (up to $1m^3/s$) through the lakes, from the augmented flow, creating some permanent change in the flow dynamics and quantity. Further assessment will be required to assess risk of deterioration to BQEs.	The level retention structures downstream of Thorpe Park Lakes will control the flow through the lakes by retaining the level in relation to existing lake and groundwater levels, limiting changes to dynamics when the flood channel is not in operation during flood flows. The control structure (FCS7) between Abbey Lake and St Ann's Lake will only allow flow in one direction (St Ann's to Abbey) causing some minor localised changes to the flow dynamics around the structure. This structure will also reduce flow quantity entering St Ann's Lake. Currently flows enter from Mead Lake Ditch (via Abbey Lake and Fleet Lake) however this will change once the RTS is in operation in non-flood and flood flows. The existing flow entering St Ann's Lake from The Moat will not be changed by any flow control structures.	Creation of new habitat may lead to some permanent changes to water velocities and discharge patterns through Fleet Lake and Abbey Lake where it will be incorporated into the flood channel. However, this will be highly localised, and therefore of minimal impact to overall status. No further assessment required.	**Scoped in** to detailed assessment due to changes to the lake system with RTS in operation.	Drought scenario modelling to be undertaken. Discussions with Thames and Affinity Water will form part of the design of the drought scenario assessment and will include consideration of potential issues with turbidity.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	*Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements*			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	**Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).**	**Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement**		
				If a formalised flow between Chertsey Bourne and St Ann's Lake is in operation there will be localised changes to the flow dynamics immediately downstream of the intake structure. This will only occur during periods of peak flow in the Chertsey Bourne so will only be a temporary change. The existing connection between Manor and Fleet Lake will be infilled, stopping any water flow between the two sections of the water body. Further assessment required due to scale of potential change to this element.			
Residence time		**Hydraulic modelling (DHI/Stantec, 2023); UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Within the flood relief channel section of the lake water body (Fleet Lake and Abbey Lake) the residence time will be substantially changed, during periods of peak flows, water will pass through the lakes quickly, significantly reducing the residence times compared to the baseline condition. During non-flood conditions there will be some additional flow (1.0 m^3/s augmented flow) through the lakes, creating a permanent reduction in residence time. Further assessment is required due to scale of potential change to this element.	The level retention structures downstream of Thorpe Park Lakes will control lake residence time when the flood channel is not in operation. If a formalised flow between the Chertsey Bourne and St Ann's Lake is in operation, this will change the residence time during periods of peak flow. This will not change the overall lake residence time from the current situation as there is already an informal connection. The control structure between Abbey Lake and St Ann's Lake will minimise the	No changes to residence time on a water body scale are anticipated from habitat creation within the water body. Some localised increases of residence time could occur in areas of marginal wetland planting due to the buffering effect of vegetation. No further assessment required.	**Scoped in** to detailed assessment due to changes to the lake system with RTS in operation.	Drought scenario modelling to be undertaken. Discussions with Thames and Affinity Water will form part of the design of the drought scenario assessment and will include consideration of potential issues with turbidity.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
				effect the flood relief channel will have on residence time by limiting connectivity and not allowing flows from the flood relief channel into St Ann's, however, flows from the Mead Lake Ditch will no longer reach St Ann's Lake, potentially altering its residence time. Infilling of existing connections, will restrict flows into Manor Lake, thereby affecting its lake residence time. Further assessment is required due to scale of potential change to this element.			
Connection to the groundwater body		**Groundwater conditions and flow directions from hydraulic modelling (DHI/Stantec, 2023) Site Investigation works (GBV, 2017 and 2023); Lake level monitoring (GBV, 2022).**	Modelling of groundwater flows when the flood channel and flow control structures are operational (DHI/Stantec, 2023) predicts that the upper reaches of Runnymede Channel will act as a drain, lowering groundwater levels, whilst the lower reach are associated with a rise in the groundwater levels. In the immediate vicinity of Thorpe Park Lakes groundwater levels are predicted to remain similar to existing conditions. When the channel is operating in flood conditions, there is potential for fine sediment deposition in the lakes which may reduce surface-groundwater exchange. This could be a risk to this element and further assessment is therefore required.		No change to connectivity of this water body to groundwater is expected from habitat creation. Any localised risks will be addressed through appropriate review and investigation of ground conditions during the detailed design and as part of the tertiary mitigation.	**Scoped in** to detailed assessment due to changes to the lake system with RTS in operation.	Drought scenario modelling to be undertaken. Discussions with Thames and Affinity Water will form part of the design of the drought scenario assessment and will include consideration of potential issues with turbidity.
Lake depth variation		**Bathymetric Surveys; RTS Flood Modelling Report (2023); Flood Channel Sediment Transport**	During non-flood conditions with a continuous augmented flow, no change to the existing lake depth variation is anticipated.	No change to lake depth is expected from this element of the project. The level retention structures are planned to maintain a similar level and depth to existing conditions.	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting may lead to a minor increase in variation in lake levels at the margins across the water body. This is not expected to have an	**Scoped in** to detailed assessment due to changes to the lake system with RTS in operation.	

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
		Modelling (GBV, 2020)	Water will be deeper when the channel is in operation, in flood flow conditions. There is also potential for a change in the sediment transport regime during flood conditions which may have localised adverse effects on lake depth variation. Overall, around 45% of the sediment entering each of the channels from the Thames is predicted by modelling to be deposited (GBV 2020). A significant proportion of this sediment is predicted to be deposited in the first lake of each channel (in this case, Fleet lake). Bed levels in Fleet Lake are predicted to rise by up to 0.8m but water depths in the lake remain 2.5m or more at the end of the simulation (which covers a 37 year period). There is deposition predicted within Abbey Lake but much less than in Fleet Lake, with a change in bed level of only 0.2m (GBV, 2020). This may have impacts upon physical-chemical and biological elements. Further assessment is required to determine the risk of these changes to this element.	No further assessment required.	adverse impact on this water body element and any improvements will be localised. No further assessment required.		Uncertainty regarding silt levels entering the Thames during flood conditions. High flow storm suspended sediment sampling in progress.
Quantity, structure and substrate of the lake bed		**Flood Channel Sediment Transport Modelling (GBV, 2020); Site Investigation works; Sediment**	Changes in water flow dynamics have the potential to alter the quantity, structure and substrate of the lake bed. The flood relief channel will transfer sediment from the River Thames and other newly connected rivers and	The level control structures and infilled connection between Manor and Fleet will limit the changes in the sediment transport process to only the flood relief channel of the lake once in operation. This may alter the structure	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting may lead to localised improvements morphological diversity. The structure and substrate of the lake bed at the margins may	**Scoped in** to detailed assessment due to changes to the lake system with RTS in operation.	

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			Flood channel through existing lake water body and a continuous augmented flow through the channel	**Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).**	**Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement**		
		Sampling (2015), Bathymetric Survey results for sediment depths (2015/2016).	channel into the lake. When the flood channel is in operation, the increased flow through Fleet and Abbey Lake is likely to substantially alter the lake bed. Erosion is possible when the channel operates at full capacity. Of the deposition described above (under Lake depth variation) for Fleet Lake this comprises around half the sand and coarse silt input load to the flood channel, as well as some finer silt and clay .. Where Fleet Lake widens, more silt is expected to be deposited. As stated above, there is deposition within Abbey Lake but much less than in Fleet Lake, with a change in bed level of only 0.2m. It is mainly silt deposition as all the sand load has already been deposited upstream. . There is a possibility of a relatively small level of deposition (compared to the levels predicted for Fleet and Abbey although not modelled for St. Anns) at very large flood flows from Abbey into St.Anns lake (spilling over the regulating structure), however this is considered to be relatively minor. Overall, a risk to this element from any erosion and deposition has been identified with the flood channel in operation;	and substrate of the lake bed. Additionally, there may be permanent local changes to the bed from the footprint of the control structure infrastructure. Further assessment required.	become more varied, however this is not expected to be at a water body scale. Further assessment required.		

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			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
			therefore, further assessment is required.				
Structure of the lake shore		**Flood Channel Sediment Transport Modelling (GBV, 2020)**	Modelling has predicted some deposition at Fleet and Abbey Lake margins which could change the structure of the lake shore. It is likely that these changes will be localised to the areas of the lake shore where the flood channel joins and leaves the lake. However, further assessment is required to fully determine the level of risk to this element.	No change at water body scale. There will be localised changes where the control structures are constructed but not at a water body scale. No further assessment required.	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting may lead to localised improvements to the structure and substrate of the lake bed at the margins, however this is not expected to be at a water body scale. No further assessment required.	**Scoped in** to detailed assessment due to changes to the lake system with RTS in operation.	Drought scenario modelling to be undertaken.
Physico-chemical supporting elements							
Transparency	Not used to classify this water body	**Ecological Surveys Project data;** **GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	There may be some changes in transparency/turbidity, within the online section of the water body, due to increased sediment suspension and changes in phytoplankton biomass and nuisance algal blooms. This is currently uncertain and needs further consideration as it may result in adverse impacts to other quality elements. Further assessment required.	No change in transparency expected from this element of the project. No further assessment required.	There may be some minor benefits to transparency from any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting. Planting could help stabilise the lake bed at the margins and reduce erosion. It could also limit the amount of nutrient availability in the water body, which could in turn improve transparency. However, these benefits are not expected to be at the water body scale. No further assessment required.	**Scoped in** to detailed assessment due to changes to the lake system with RTS in operation.	
Thermal conditions	Not used to classify this water body		No significant change predicted to temperature conditions in this water body. There may be some change in thermal conditions when the flood channel is in operation, but this will only occur during periods of peak	No change in thermal conditions is expected from this element of the project . No further assessment required.	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting has the potential to change thermal conditions locally. This may provide increased shading and reduce lake water temperature	No risk from any individual modification identified. No in-combination operational effects identified.	

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
			flow and will return to within range of non-flood conditions when not in operation.		at the margins during the summer months. However, this will not have an impact at the lake water body scale. No further assessment required.	**Scoped out** of detailed assessment	
Oxygenation conditions (DO)	Not used to classify this water body	**GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	For the online lakes circulation will improve within Fleet and Abbey lakes due to the continuous augmented flow, reducing the risk of stratification and the likely adverse effects on DO. This will prevent indirect effects related to sediment and nutrient changes or associated biological changes. However, there could be changes to dissolved oxygen within St Ann's and Manor lakes which will not receive any inflow from Fleet or Abbey lakes. Further assessment is therefore required to determine the risk to these sections of the water body.	There could be changes to dissolved oxygen within St Ann's and Manor lakes which will not receive any inflow due to the control structures and infilling of existing connection between Manor Lake and Fleet Lake. Further assessment is therefore required.	There may be some changes to oxygenation conditions from any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting. This may provide increased shading and reduce lake water temperature (affecting DO conditions) at the margins during the summer months. However, this will not have an impact at the lake water body scale. No further assessment required.	**Scoped in** to detailed assessment due to potential risk of changes to dissolved oxygen within St. Anns and Manor Lake.	Augmented flow procedure not yet confirmed.
Salinity	High	**GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023**	No significant change predicted to salinity in this water body as there is no change in links to tidal or saline water. No further assessment required.	No change in salinity is expected from this element of the project. No further assessment required.	No change in salinity is expected from this element of the project. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment.	N/A

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	*Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements*			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
Acidification status (pH)	Not used to classify this water body	**GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2023** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	No significant change predicted to pH in this water body. There may be some change in conditions when the flood channel is in operation, but this will only occur during periods of peak flow and will return to within range of non-flood conditions when not in operation. No further assessment required.	No change in pH is expected from this element of the project. No further assessment required.	There is potential for some localised changes to pH from lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting. However, this will be minor and localised. No further assessment required.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment.	N/A
Nutrient conditions (Total Nitrogen)	Good	**GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2023** **Hydraulic modelling (DHI/Stantec, 2023) included water quality modelling for Total Nitrogen** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Potential for changes in nutrient conditions due to elevated concentrations typically present in the water from rivers and passing through the flood channel into the lakes during flood flows and augmented flows. Flood flows after a dry period could lead to flushing of lake sediments and subsequent release of concentrations of Total Nitrogen. This would have adverse impacts upon biological quality elements. There is therefore a risk of deterioration to this element from this modification. Further assessment required.	The installation of level retention structures and infilled connection will not alter the inputs of nutrients from the wider catchment, but it will limit the proportion of the lake water body affected by the inputs i.e. Manor Lake will no longer receive lake input from Fleet Lake. The formalisation of the Chertsey Bourne spill will potentially change the input of nutrients from the Chertsey Bourne into St Ann's Lake and Manor Lake, by increasing river water inputs, however as there is already an informal connection during periods of peak flows and the spill will only be operational during peak flows, new inputs are likely to be low.	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting could reduce concentrations of Total nitrogen in the lake water body through phytoremediation, however this will be limited to lake margins and is unlikely to prevent risk of deterioration from continuous flow (flood or augmented) from the Thames. No further assessment required.	**Scoped in** to detailed assessment due to risk to this element with operation of the RTS.	Awaiting results of site investigation to establish presence of contaminants within soils of former landfill and within the lake water body sediments. Augmented flow procedure not yet confirmed.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
Nutrient conditions (Total phosphorus)	High	**GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2023** **Hydraulic modelling (DHI/Stantec, 2023) included water quality modelling for Total Nitrogen** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Potential for changes in nutrient conditions due to elevated concentrations typically present in the water from rivers and passing through the flood channel into the lakes during flood flows and augmented flows. Flood flows after a dry period could lead to flushing of lake sediments and subsequent release of high concentrations of Total Phosphorus. This would have adverse impacts upon biological quality elements. There is therefore a risk of deterioration to this element from this modification. Further assessment is required.	The installation of level retention structures and infilled connection will not alter the inputs of nutrients from the wider catchment, but it will limit the proportion of the lake water body affected by the inputs i.e. Manor Lake will no longer receive lake input from Fleet Lake. The formalisation of the Chertsey Bourne spill will potentially change the input of nutrients from the Chertsey Bourne into St. Anns and Manor Lake, by increasing river water inputs, however as there is already an informal connection during periods of peak flows and the spill will only be operation during peak flows, new inputs are likely to be low. No further assessment required.	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting could reduce concentrations of Total phosphorus in the lake water body through phytoremediation, however this will be limited to lake margins and is unlikely to prevent risk of deterioration from continuous flow (flood or augmented) from the Thames. No further assessment required.	**Scoped in** to detailed assessment due to risk to this element with operation of the RTS.	Awaiting results of site investigation to establish presence of contaminants within soils of former landfill and within the lake water body sediments.
Specific pollutants	High (Copper)	**GBV (2022) River Thames Scheme Surface Water Quality Data 2012 – 2023**	Where the channel passes through sections of landfill, the channel will be separated from it by vertical sheet piling the sides and replacing the base of the channel with either inert natural material (clay) or sealing it with a slab of unreinforced concrete (depending on the contents of the remnant landfill). However, there is some risk of leakage. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an	The installation of level retention structures and infilled connection between Manor and Fleet will not alter the inputs of specific pollutants from the wider catchment. No further assessment is required.	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting could reduce Copper concentrations through phytoremediation. However, this will be limited to lake margins and is unlikely to have a positive impact at a water body scale. No further assessment is required.	**Scoped in** to detailed assessment due to risk to this element with operation of the RTS.	Awaiting results of site investigation to establish presence of contaminants within soils of former landfill and within the lake water body sediments.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
			acceptable level for this element. However, there is a risk to this element if mobilisation of contaminated sediment occurs during flood flows. Localised erosion could occur in places, releasing the pollutant into the water column and impacting on biological elements. This represents a risk of deterioration. Further assessment is required.				
Biological quality elements							
Phytoplankton	Good	**Ecological Surveys Project data** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Changes in the nutrient conditions and hydrological conditions have the potential to alter the diversity and abundance of phytoplankton within this water body. Furthermore, the increase in connectivity across a number of flood plain features will affect the phytoplankton community composition. The potential risks will be considered in more detail by interpretation of the water quality modelling and ecological surveys baseline information. There is also a risk to phytoplankton from potential increase in spread of INNS and pathogens. Further assessment is required for both potential adverse impacts.	No change expected due to this element of the project. No further assessment required.	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting will have a negligible impact on phytoplankton. Wetland plants could reduce excessive nutrient concentrations through nutrient uptake and filtering fine sediments, however this is unlikely to reduce any elevated spikes in phytoplankton populations. No further assessment required.	**Scoped in** to detailed assessment due to risk of increased nutrient conditions and INNS and pathogen spread.	Existing Phytoplankton monitoring data is from 2012-2014. New set of monitoring to be undertaken in 2023. Further work required to understand how different augmented flows will affect the spread of INNS and pathogens.

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			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
Macrophytes and phytobenthos (combined)	Poor	**Ecological Surveys Project data: Macrophyte data (GBV, 2022), Phytobenthos data 2012 -2014 (GBV, 2016) RTS Baseline Surveys: Aquatic ecology surveys (APEM, 2023)** Macrophyte sampling in 2021 and 2022 found the presence of five charophyte species that were notable and would qualify the location as a nationally "Important Stonewort Area"	Potential for changes in prevailing conditions for macrophytes and phytobenthos, as the supporting conditions are predicted to change, e.g. changes in flows and substrate conditions, nutrients, transparency, velocity and substrate conditions. There is also the potential for an increase in the spread of INNS and pathogens which could present a risk to macrophytes and phytobenthos. Further assessment required.	No change expected due to this element of the project. No further assessment required.	Potential for improvements to this quality element from any lake edge reprofiling and shallowing with marginal vegetation and wetland planting. However, these improvements are anticipated to be localised to the lake margins but could improve abundance and diversity of macrophytes. No further assessment required.	**Scoped in** to detailed assessment due to risk of increased nutrient conditions and INNS and pathogen spread.	Monitoring results yet to be fully assessed. Full LEAFPACS classification not yet finalised for Macrophytes. Due to be completed in 2023. Further work required to understand how different augmented flows will affect the spread of INNS and pathogens.
Macrophytes	Poor						
Phytobenthos	Poor						
Benthic invertebrate fauna	Not used to classify this water body	**Ecological Surveys Project data: Macroinvertebrate surveys of the River Thames (Apem, 2021)**	Potential for changes in invertebrate communities as the supporting conditions are predicted to change, e.g. changes in flows and substrate conditions, increase in nutrient conditions, changes in connectivity and potentially an increase spread of INNS. Further assessment required.	No change expected due to this element of the project. No further assessment required.	Potential for improvements to invertebrate communities at the lake margins from any establishment of wetland planting and lake margin reprofiling or shallowing. This could also benefit fish populations with increased food availability. However, these improvements are anticipated to be localised to the lake margins. No further assessment required.	**Scoped in** to detailed assessment due to risk of increased nutrient conditions and INNS and pathogen spread.	Monitoring results yet to be fully assessed. Further work required to understand how different augmented flows will affect the spread of INNS and pathogens.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification [13]	Evidence and data sources	Modifications to water body (from Table 5 and 6 in WFD Compliance Assessment Report) - Potential effects of operational modifications on WFD quality elements			Scoped In or Scoped Out?	Uncertainties / Gaps
			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
Fish fauna	Not used to classify this water body	**Flood channel Preliminary Ecological Appraisal report; Fish surveys (GBV, 2016b)**	There will be a significant change from existing conditions as there will now be a connection from the Thames to the lake system. The installation of a fish pass at Chertsey (adjacent to the Runnymede channel outfall) will enable access for fish to the Abbey River and Thorpe Park Lakes. There is no baseline WFD classification for fish in this water body. However, potential hydrological changes may lead to direct and indirect effects on fish. Further effects include potential for changes in suspended solids and deposition on sensitive habitats (e.g. spawning areas), change in connectivity and mixing of fish stocks (including spread of INNS and pathogens). All of these have the potential to affect the fish community structure. A continuous augmented flow with the RTS online is likely to alter the fish communities and distribution throughout the online lakes. Fish from the lakes could be lost into the Thames due to the changes to hydraulic connections. Additionally, fish from the Thames could enter Thorpe Park Lakes via the Abbey River with the RTS in operation.	There is no baseline WFD classification for fish in this water body. Fish passage may become restricted between St Ann's and Abbey Lake and between Manor and Fleet lake with the construction of the control structure. Fish passage (primary mitigation) is to be considered in design and provided for any new or altered structures. No further assessment required.	Potential for improvements to fish fauna with increased shelter at the margins from establishment of marginal planting. The potential for increase in invertebrate populations at the margins, could provide increased food source for fish. No further assessment required.	**Scoped in** to detailed assessment due to risk of increased nutrient conditions and INNS and pathogen spread.	Existing data from 2016, further surveys to be undertaken in 2023. Fish surveys to be undertaken in 2023/24 Further work required to understand how different augmented flows will affect the spread of INNS and pathogens.

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			Flood channel through existing lake water body and a continuous augmented flow through the channel	Flow control structures along new channel (including infill of existing connection between Manor Lake and Fleet Lake).	Operation of new green open space and/or Priority areas for habitat creation, mitigation, or enhancement		
			Due to the risks outlined, further assessment is required.				
Chemical elements							
Priority hazardous substances	Fail (PFOS and PBDE)	**GBV (2022) River Thames Scheme Water Quality Monitoring Data 2012 – 2023**	There is potential for mobilisation of substances present within lake sediments during flood flows following a dry period. This could increase the concentration of substances within the water column and have impacts on biological elements. Therefore, there is a risk to the element status at this stage. Further assessment required.	The proposed works will not alter the inputs of substances from the wider catchment. No further assessment required.	Any lake edge reprofiling and shallowing with marginal vegetation and wetland grassland planting could reduce the concentrations of priority hazardous substances within this water body, however any improvements are anticipated to small and localised. No further assessment required.	**Scoped in** to detailed assessment due to risk to this element with operation of the RTS.	Awaiting results of site investigation to establish presence of contaminants within soils of former landfill and within the lake water body sediments.
Priority substances	Good (Fluoranthene)						
Other Pollutants	Does not require assessment	N/A	Not assessed			N/A	Not required

Thorpe Park Lakes Mitigation Measures Assessment

Key:

Type of effect

(red)	High risk of compromising the measure
(orange)	Medium risk of compromising the measure
(yellow)	Low risk of compromising the measure
	No risk of compromising the measure
(green)	Potential for positive contribution towards the measure
(blue)	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Scale and certainty of the impact (spatial and temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
4. Remove or soften hard banks	Not applicable	The works are considered to be small scale involving some minor works in some bank areas. Mitigation for the project will make a positive contribution towards this measure, it is considered unlikely that the project will compromise implementation of this measure in the future.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible vegetation will be replanted or allowed to naturally regenerate in affected areas, allowing riparian vegetation and shading to re-establish. Reprofiling of the lakes to provide gently sloping edges will be undertaken in Fleet and Abbey lakes.
5. Preserve or restore habitats	Not applicable	The physical works within the boundary of this water body are considered to be small scale involving some minor works for construction. There is potential for alteration of aquatic communities during the operation of the project with the influx of riverine water leading to a change in hydrology and water quality, which would be permanent. Mitigation will be implemented for the project; however, it may be that not all existing habitats can be restored as supporting conditions will alter. Consequently, this measure could be compromised in the future. Shallowing of the lake edges will be undertaken in sections of this water body and others identified as supporting SPA qualifying features to enhance habitats. Further consideration of the effects to aquatic habitats has been encompassed within the detailed assessment of the relevant biological quality elements.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish, promoting successful colonisation by macrophytes. Reprofiling of the affected lake banks will be undertaken wherever possible as part of the project to promote the growth of aquatic vegetation. Extensive habitat enhancement at Abbey Meads and Abbey 1 & 2 lakes, immediately downstream of this water body will be undertaken, this is likely to include a mosaic of: wet grassland (grazing marsh); shallow scrapes; small areas of reedbed; some shallow water bodies (<2m depth); and retain fringing areas of trees. A restoration plan will be prepared and agreed with landowners, managers and relevant stakeholders.
6. In-channel morphological diversity	Not applicable	There may be some alteration to the in-channel/lake morphological diversity during the operation of the project which will be permanent with the inflow of riverine water. Shallowing of the lake edges will be undertaken in sections of this water body and others identified as supporting SPA qualifying features to create morphological diversity. Additional sinking of trees removed during construction in Fleet and Abbey lakes will provide further morphological diversity.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. reprofiling of the affected lake banks will be undertaken wherever possible as part of the project to promote the growth of aquatic vegetation.
7. Bank rehabilitation	Not applicable	Where the project has the potential to adversely affect any banks, mitigation will include the planting of vegetation on the lake margins where possible, making a positive contribution to this measure. It is not anticipated the project would compromise implementation of this measure in the future.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where possible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. Reprofiling of the lakes to provide gently sloping edges will be undertaken.

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Scale and certainty of the impact (spatial and temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
16. Fish passes	Not applicable	Fish passage is to be incorporated into the flow control structures throughout the channel, which is considered to be a positive contribution towards this measure. The Project will prevent fish passage within Fleet to Manor, which could compromise this measure.	Fish passes to be added to structures as required to facilitate fish passage.
19. Enhance ecology	Not applicable	The project will result in both positive and negative effects on various ecological receptors. The potential effects of the project during operation of the channel during flood events and normal periods has the potential to lead to a changes in the ecology of Fleet and Abbey lake which would be permanent (accounting for 25 % of the water body). Manor lake will be subject to reduced nutrient inputs and St Ann's is not expected to change (accounting for 75 % of the water body). Mitigation has been proposed as part of the design, which will serve to reduce some of the effects.	Minimise the footprint of the working area wherever possible, working within clearly defined marked areas. Haul routes will be planned across site to minimise effects. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation and shading to re-establish. Reprofiling of the lake banks, will be undertaken wherever possible as part of the project to promote vegetative growth. Sinking of trees removed during construction in Fleet and Abbey lakes will provide alternative, niche habitats for macrophytes to colonise and provision of cover to protect fish from predation. Further mitigation in riparian habitats includes woodland and scrub planting to provide habitats for otter.
20. Changes to locks	Not applicable	The works will not involve to any locks, it is not anticipated the project would compromise implementation of this measure in the future.	N/A
21.-28. Dredging, disposal and sediment management	Not applicable	There is potential for periodic maintenance dredging between 5 and 10 years within key locations, therefore the project has the potential to affect this measure.	Periodic bathymetric surveys will be undertaken to monitor silt levels. Any requirements to reinstate the design profile will include the use of silt curtains or other appropriate measures to minimise the dispersion of sediment. Chemical testing of sediments will be undertaken in localities most at risk from disturbance and containing elevated contaminants.
32. Phased dewatering	Not applicable	There are currently no plans to undertake phased dewatering within this WFD water body, thus the project will not compromise future implementation of this measure.	N/A
33, 34 and 35. Vegetation control	Not applicable	There may be some vegetation maintenance required (trimming, replacement, coppicing trees etc.) for the project. Considering the small area affected it is considered unlikely that the project will adversely affect vegetation tertiary mitigation that may be required in the future.	Access for management activities will be discussed with the relevant landowners/managers and/or Natural England prior to commencement of the works to ensure where possible these activities can continue.
36 and 52. Invasive species techniques and awareness	Not applicable	The project has the potential to affect the spread of invasive species during construction and due to increased connectivity between the lakes and the River Thames. Mitigation has been proposed as part of the design, which will serve to reduce some of the effects.	A biosecurity action plan for INNS will be produced, detailing mitigation measures, including consideration of equipment and materials entering the site. Further consideration of INNS within the EIA, including potential monitoring and mitigation measures to be developed, as required. Mitigation also includes Seeding enclosures upstream of Thorpe Park Lakes to ensure colonisation of Channel by desirable species and reduce risk of INNS out-competing these.

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Scale and certainty of the impact (spatial and temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
49, 50, 51 and 53. Modify vessel design, vessel management, boats in the central track and boat wash awareness	Not applicable	The area is important for activities involving vessels, including water sports within this WFD water body. The impact of the project on navigation is anticipated to be small scale and temporary, with the implementation of mitigation to minimise adverse effects. The project, therefore, is not anticipated to compromise implementation of this proposed WFD measure in the future.	Mitigation to be discussed further with owners/operators, with measures identified which may include timing, phasing and/or positioning of works to minimise disruption to navigation; incorporation of measures in the CEMP to reduce potential cumulative effects associated with navigation including consideration of methods to reduce suspended sediments, bank erosion and preservation of bank habitats as well as raising awareness to operators of any vessels/vehicles working on RTS of these potential effects.
55 Recreation awareness	Not applicable	The WFD lakes are important for recreational activities and with proposed mitigation, the effects are anticipated to be small scale and temporary. It is considered unlikely that the project would compromise future implementation of this measure.	Mitigation to be discussed further with owners/operators, with measures identified which may include timing, phasing and/or positioning of works to minimise disruption to navigation/recreation.

Wraysbury Reservoir - GB30642417 - Artificial. Overall Status (2019) - Moderate - Surface area (km2): 1.828 – Mean depth (m): 16.8

Designated/protected sites associated - Urban Waste Water Directive, SPA, Drinking Water Protected Areas, Drinking Water Safeguard Zone.

Key

WFD classification (baseline)/Type of effect	
(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks, including construction of the priority area for habitat creation.
2) INNS and Pathogen management – dewatering and direct removal of INNS, including any treatment of terrestrial INNS identified in the priority area for habitat creation.
3) Construction compounds, material processing and storage sites.

Operations elements of the project affecting this water body are:

1) Operation of Priority areas for habitat creation, mitigation or enhancement - ‘Land South of Wraysbury Reservoir’ priority area for habitat creation is adjacent to the water body

Ecological Objective – Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[14]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Operation of Priority area for habitat creation, mitigation or enhancement		
Hydromorphological Supporting Elements								
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to groundwater body, lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore)	**Not used to classify this water body**	**Hydraulic modelling (DHI/Stantec, 2023);** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)** **Flow monitoring (2019 – 2022) (GBV, 2022) INNS and Pathogen Surveys (GBV, 2022)**	The reservoir is upslope from the priority area for habitat creation, construction will have no impact on the hydromorphological elements of the reservoir. No further assessment required.	Management of INNS within Wraysbury Reservoir is unlikely to occur as part of RTS. Removal of terrestrial INNS could occur in the red line boundary for RTS but this would be highly unlikely to have any impact on the hydromorphological supporting elements in the reservoir. No further assessment required.	The reservoir is upslope from the priority area for habitat creation, so there will no impact on the hydromorphological elements of the reservoir as part of the work. No further assessment required.	The boundary of the reservoir is outside of the red line boundary for RTS, so there will be no changes to hydromorphological supporting elements as part of RTS. As the reservoir is upslope from the priority area for habitat creation, the work will not impact the lake shore or lake bed. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Physico-chemical supporting elements								
Transparency, Thermal conditions, Oxygenation conditions (DO), Acidification status (pH)	**Not used to classify this water body**	Water quality monitoring data	The reservoir is upslope from the priority area for habitat creation, construction will have minimal impact on the physico-chemical elements of the reservoir. There is a very low risk of windblown dust affecting transparency and oxygenation conditions, but this is negligible on a water body scale.	Any removal of terrestrial INNS as part of the priority habitat area is not expected to have an impact as the water body is outside the red line boundary. No further assessment required.	The reservoir is upslope from the priority area for habitat creation, construction compounds will have minimal impact on the physico-chemical elements of the reservoir There is a very low risk of windblown dust affecting transparency and oxygenation conditions, but this is	The boundary of the reservoir is outside of the red line boundary for RTS, so there will be no changes to the physico-chemical supporting elements Depending on design, there could be additional shading if trees are planted, but this will not have an impact on a water body scale.	No risk from any individual modification identified. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.

[14] Current 2016 RBMP status data extracted from the Environment Agency Catchment Data Explorer http://environment.data.gov.uk/catchment-planning/ in September 2017

Ecological Objective – Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[14]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Operation of Priority area for habitat creation, mitigation or enhancement		
			No further assessment required.		negligible on a water body scale. No further assessment required.	No further assessment required.		
Salinity	**High**	Water quality monitoring data	Construction activities may create bare soil surfaces, that are prone to erosion, which could lead to increased salinity in run off. As Wraysbury reservoir is upslope from the proposed works, there will be no impact on salinity. No further assessment required.	Removal of terrestrial INNS may create bare soil surfaces, that are prone to erosion. As Wraysbury reservoir is upslope from the proposed works, there will be no impact on salinity through INNS removal. No further assessment required.	Material processing and construction compounds could include salt storage, especially in winter months. As Wraysbury reservoir is upslope from the proposed works, there will be no impact on salinity. No further assessment required.	The existence of the priority habitat area is likely to reduce any bare ground adjacent to Wraysbury reservoir, reducing the likelihood of salt erosion associated with bare ground. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Nutrient conditions (Total Phosphorus and Total Nitrogen)	**Bad (Total nitrogen is not classified)**	Water quality monitoring data	The reservoir is upslope from the priority area for habitat creation, construction will have minimal impact on the physico-chemical elements of the reservoir. There is a possible risk of windblown dust which may be high in nutrients, but this is negligible on a water body scale. No further assessment required.	Removal of terrestrial INNS may create bare soil surfaces, that are prone to erosion and release of total phosphorus in soil disturbance. As Wraysbury reservoir is upslope from the proposed works, there will be no impact on nutrients through INNS removal. No further assessment required.	No impact on reservoir water body. No further assessment required.	The priority habitat area is likely to include planting, which will increase nutrient uptake. However, this will not impact the water body, as it is uphill from the priority habitat area, so will not be impacted by run off. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective – Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[14]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Operation of Priority area for habitat creation, mitigation or enhancement		
Specific pollutants (Copper)	High	Water quality monitoring data	The reservoir is upslope from the priority area for habitat creation, construction will have minimal impact on the physico-chemical elements of the reservoir. There is a possible risk of windblown dust introducing copper, but this is negligible on a water body scale. No further assessment required.	There will be no additional sources of copper that will cause run off into the reservoir from these modifications. No further assessment required.			No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Biological quality elements								
Phytoplankton	**High**	Water quality monitoring data Phytoplankton surveys (2023)	The reservoir is upslope from the priority area for habitat creation, construction will have minimal impact on the biological elements of the reservoir. There is a possible risk of windblown dust which may be high in nutrients, but this is negligible on a water body scale. No further assessment required.	Removal of terrestrial INNS may create bare soil surfaces, that are prone to erosion and release of total phosphorus in soil disturbance. As Wraysbury reservoir is upslope from the proposed works, it is highly unlikely that run off will affect nutrient concentrations and therefore phytoplankton. Any aquatic INNS are outside the boundary for the priority area of habitat creation. No further assessment required.	Materials compounds associated with construction could introduce wind-blown dust into the reservoir. Construction management plans will mitigate any dust will be negligible on a water body scale. No further assessment required.	The priority habitat area is likely to include planting, which will increase nutrient uptake. However, this will not impact the water body, as it is uphill from the priority habitat area, so will not be impacted by run off. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.

Ecological Objective – Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[14]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	INNS and Pathogen management	Construction compounds, material processing and storage sites	Operation of Priority area for habitat creation, mitigation or enhancement		
Biological quality elements (Macrophytes and phytobenthos, benthic invertebrate fauna, fish fauna)	**Not used to classify this water body**	Water quality monitoring data, Aquatic ecology surveys (2022 and 2023) Fish surveys (2023)	The reservoir is upslope from the priority area for habitat creation, construction will have minimal impact on the biological elements of the reservoir. There is a possible risk of windblown dust which may be high in nutrients, but this is negligible on a water body scale.	Removal of terrestrial INNS may create bare soil surfaces, that are prone to erosion and release of total phosphorus in soil disturbance. As Wraysbury reservoir is upslope from the proposed works, it is highly unlikely that run off will affect nutrient concentrations and therefore phytoplankton. Any aquatic INNS are outside the boundary for the priority area of habitat creation.	Materials compounds associated with construction could introduce wind-blown dust into the reservoir. Construction management plans will mitigate any dust will be negligible on a water body scale.	The priority habitat area is likely to include planting, which will increase nutrient uptake. However; this will not impact the water body, as it is uphill from the priority habitat area, so will not be impacted by run off.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Chemical Status								
Priority hazardous substances (Benzo(a)pyrene, dioxins and dioxin-like, heptachlor and cis-heptachlor epoxide, HBCDD, hexchlorobenzene, hexachlorobutadiene, mercury and its compounds, PFOS, PBDE)	Fail (PFOS and PBDE)	Water quality monitoring data	No mechanism for adverse risk on this water body from all modifications. No further assessment required.				No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Designs of the new green open spaces or the priority areas for habitat creation, mitigation or enhancement have not been finalised.
Priority substances (Fluoranthene)	Good							
Other Pollutants	Does not require assessment	Not assessed	Not assessed				Not applicable	Not required

Wraysbury Reservoir Mitigation Measures Assessment

Key:

Type of effect

	Type of effect
Red	High risk of compromising the measure
Orange	Medium risk of compromising the measure
Yellow	Low risk of compromising the measure
White	No risk of compromising the measure
Green	Potential for positive contribution towards the measure
Blue	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
3.Re-engineer river	Not applicable	N/A	N/A	N/A
16.Fish passes 17.Fish pass flow releases 18.Reduce fish entrainment	Not applicable	N/A	N/A	N/A
29.Sediment management regime	Not applicable	N/A	N/A	N/A
30.Manage artificial drawdown 31.Manage seasonal water levels	Not in place	N/A	This reservoir abstracts from the Thames upstream of the RTS. It will therefore not affect abstraction from the Thames into the reservoir, drawdown in the reservoir or seasonal water levels. RTS is not anticipated to prevent the future implementation of this WFD measure throughout the majority of this WFD water body.	N/A
42.Access to feeder-streams 43.Downstream flow regime 44.Flows to move sediment	Not applicable	N/A	N/A	N/A
45.Good downstream DO levels 46.Good downstream temperature	Not applicable	N/A	N/A	N/A

Thames Upper - GB530603911403. Overall Status (2019) – Moderate - Surface area (km2): 3.34

Designated/protects sites associated - Urban Waste Water Treatment Directive

Key

WFD classification (baseline)/Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction activities and earthworks (including Bed lowering downstream of Desborough Cut.
2) Construction compounds, material processing and storage sites including construction of Thames Weir Capacity improvements.

Operational elements of the project affecting this water body are:

1) Operation of the flood relief channels and their interaction with the river water body.
2) Existing Thames weir capacity improvement works including fish passes at Sunbury weir, Molesey weir, Teddington weir.

There are no physical works in this water body. As there is a risk of creating new pollutant pathways, this water body is considered for further assessment on a precautionary basis.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 4 and 5 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
Hydromorphological Supporting Elements								
Depth variation	Not used to classify this water body	**River Thames Bathymetric Data Analysis report (CH2M/EA 2016)** **Additional Sediment Studies, (GBV, 2019);**	Construction is not expected to change river depth or width at more than a localised scale. All construction activities will lead to greater levels of fine sediment produced. Additional sediment has the potential to be conveyed downstream and affect river depth, although appropriate management through tertiary mitigation will be in place to minimise the risk.	There is potential for fine sediments and pollutants to be released within run off during storage, treatment or processing of materials. Tertiary mitigation will be in place to minimise the risk of fine sediment runoff into the Thames. It is therefore considered to be negligible risk to depth variation. No further assessment required.	The existing sediment regime has been controlled by a series of weirs and locks for over a century. These structures present obstructions to the natural movement of sediment, and dredging has, historically, been undertaken to maintain a navigable channel. There are areas of erosion and deposition associated with structures, meanders and secondary	This element of the project will cause changes in water flow dynamics, potentially affecting depth variation. However, these works will be downstream of the known weir pools and gravel shoals, consequently avoiding any impacts to these features. Any changes in depth are only expected to be localised and within the scale of changes that might occur	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Construction plans are not yet finalised.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 4 and 5 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
		Flood Channel Sediment Transport Modelling (GBV, 2020); **Sediment and flow regime modelling (DHI/Stantec, 2023);** **LTS Fluvial Morphology Study (EA, 2005)**	No further assessment required. Modelling of the bed lowering predicts an increase in velocities of 5% in a 1 in 20 year flood event through Desborough Cut and Loop (GBV, 2019). There may be some changes to flow circulation patterns which would in turn alter the sediment regime, however this would be at a localised scale, giving negligible impact to the Thames Upper which is ~14.5km further downstream. No further assessment required.		channels throughout the water body. There is unlikely to be any significant change in sediment transport processes that would alter the river bed as a result of the flood channels further upstream. There is likely to be some change to the structure and substrate of the bed at the outflows of both channels, through localised erosion and deposition but not at a wider scale. However, this is all localised, and unlikely to have any implications downstream to the Thames Upper water body. No further assessment required.	during a particularly large flow event. No expected changes at a water body scale. No further assessment required.	**Scoped out** of detailed assessment	
Quantity, structure, and substrate of the bed	Not used to classify this water body	**River Thames Bathymetric Data Analysis report (CH2M/EA 2016)** **Additional Sediment Studies, (GBV, 2019);** **Flood Channel Sediment Transport Modelling**	There will be temporary disturbances to the bed at Teddington weir during construction, however the bed will be restored following completion. Tertiary mitigation will be in place to minimise adverse impacts to the bed and structure of the intertidal zone. Bed lowering downstream of Desborough Cut will impact the structure and substrate of the river however due to distance of the Thames Upper from these activities, risk is negligible.	There is potential for fine sediments and pollutants to be released within run off during storage, treatment or processing of materials. Tertiary mitigation will be in place to minimise the risk of fine sediment runoff into the Thames to these elements. It is therefore considered to be negligible risk to depth variation. No further assessment required.	The existing sediment regime has been controlled by a series of weirs and locks for over a century. These structures present obstructions to the natural movement of sediment, and dredging has, historically, been undertaken to maintain a navigable channel. There are areas of erosion and deposition associated with structures, meanders, and secondary channels throughout the water body. There is unlikely to be any significant change in sediment transport	The modification of the direction of water flows by the new gates is likely to lead to subtle changes in the pattern of scour and deposition in the immediate downstream. These changes are only expected to be localised. The changes in velocity are anticipated to be relatively slight and would not significantly cause increased erosion of coarser material or river bed features. No expected changes at a water body scale. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Construction plans are not yet finalised.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 4 and 5 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
		(GBV, 2020); **Sediment and flow regime modelling (DHI/Stantec, 2023);** **LTS Fluvial Morphology Study (EA, 2005)**	No further assessment required.		processes that would alter the river bed as a result of the flood channels. There is likely to be some change to the structure and substrate of the bed at the outflows of both channels, through localised erosion and deposition but not at a wider scale. However, this is all localised, and unlikely any implications downstream to the Thames Upper water body. No further assessment required.			
Structure of the intertidal zone and Tidal regime	Not used to classify this water body	**River Thames Bathymetric Data Analysis report (CH2M/EA 2016)** **LTS Fluvial Morphology Study (EA, 2005)**	The proposed operation modifications will not impact the tidal regime or the structure of the intertidal zone No further assessment required.				No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	N/A
Physico-Chemical Elements								
Physico-Chemical elements (Transparency, thermal conditions, oxygen conditions, salinity, nutrient	Not used to classify this water body	Water quality monitoring data	Construction activities could result in accidental release of fine sediment, oils, lubricants and chemicals which could runoff into the River Thames and flow into this water body. An increase in fine sediment supply to the River Thames could lead	There is a risk of accidental release of oils, lubricants and chemicals from construction compounds and material processing and storage sites. This could increase potential for adverse impacts to physico-chemical elements in the River Thames. However, the impact is	CEH modelling has predicted that physico-chemical elements of the River Thames at Desborough are worse than upstream of the RTS channels, however; the water quality recovers with increased distance	This operational modification is not anticipated to lead to significant changes in physico-chemical elements. Any permanent changes would be negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to	N/A

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 4 and 5 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
conditions, specific pollutants)			to adverse impacts to physico-chemical elements such as transparency, thermal conditions, DO and acidification status. The impact is considered negligible due to distance downstream and the effect of dilution within the River Thames meaning this sediment is unlikely to reach this water body at Teddington. There will also be adherence to tertiary mitigation. No further assessment required.	considered negligible due to distance downstream and the effect of dilution within the River Thames meaning this sediment is unlikely to reach the Surbiton intake. There will also be adherence to tertiary mitigation. No further assessment required.	downstream. Modelling does not consider as far downstream as this water body. However, given the dilution from the River Thames itself, River Mole and Hogsmill (and other smaller tributaries) and the distance from the channel outfalls (~18 km), the risk considered negligible. No further assessment required.		implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	
Specific pollutants	Moderate (Zinc)	Water quality monitoring data	General construction and earthworks including bed lowering downstream of Desborough Cut could lead to increased fine sediment and hazardous substance runoff into the water body. Sources of specific pollutants associated with fine sediments could runoff within drainage. This could lead to increases in their overall concentrations within the water body. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable level for this element. No further assessment required.	There is potential for specific pollutants to be released during storage, treatment or processing of materials. Tertiary mitigation will be in place to minimise the risk of this occurring. It is therefore considered to be negligible risk these elements. No further assessment required.	Where the channel passes through sections of landfill, the channel will be separated from it by sheet piling the sides and replacing the base of the channel with either inert natural material (gravel or clay) or sealing it with a slab of unreinforced concrete (depending on the contents of the remnant landfill). Therefore, no significant change in specific pollutant conditions from the mobilisation of landfill leachate is expected. Furthermore, the water body lies approximately 18km downstream of the flood channels, so there is no anticipated risk to concentrations of specific pollutants. No further assessment required.	This operational modification is not anticipated to lead to significant changes specific pollutant concentrations. Any permanent changes would be negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	GI work will confirm the presence of any contaminated sediments, and if present will affect the disposal/reuse of the sediment.

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 4 and 5 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
Biological quality elements								
Phytoplankton, aquatic flora and benthic invertebrates	Good	No additional information	Fine sediment released during construction including during bed lowering will reduce transparency of the water column and may reduce populations which may be conveyed downstream. Sediment released will be mitigated at source through tertiary mitigation. Impacts are considered negligible, and no further assessment required.	There is potential for fine sediments and pollutants to be released within run off during storage, treatment or processing of materials which may reduce populations. Tertiary mitigation will be in place to minimise the risk of this occurring. It is therefore considered to be negligible risk these elements. No further assessment required.	Risk to physico-chemical elements and priority and priority hazardous substances is negligible due to the dilution from the River Thames itself, the River Mole and Hogsmill (and other smaller tributaries) between the channels and this water body. Therefore, no risk is anticipated to biological quality elements and no further assessment required.	The operational modification will not affect the abundance or diversity of phytoplankton as it will not change the supporting conditions of the water body. No further assessment required.	**Scoped in** to detailed assessment due to potential adverse impacts with RTS in operation (INNS & pathogens only).	Construction plans are not yet finalised. Acceptable levels of spread of INNS and pathogens is yet to be agreed with Environment Agency (and Natural England).
Fish fauna	Good	**GBV, 2015, Weirs Preliminary Ecological Appraisal and EIA Scoping report**	Runoff of fine sediment and spillage of hazardous substances could affect fish, however sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary mitigation will be in place to minimise the risk of this occurring. No further assessment required.	Runoff of fine sediment and spillage of hazardous substances could affect fish, however sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary mitigation will be in place to minimise the risk of this occurring. No further assessment required.	There could be an increase in spread of INNS and pathogens due to new connections with some water bodies. This could increase the presence and prevalence of INNS and pathogens within the Thames (Egham to Teddington) which may transfer into this water body, thus impacting upon biological quality elements. INNS and pathogens management plans (secondary mitigation) will be in place throughout the project during operation and risk is deemed low, however further assessment is required.	This element of the Project is predicted to have only a very localised effect on the flow dynamics and marginal habitat. Given distance downstream, any impacts are negligible to status. The provision of a new fish pass at Teddington is likely to provide an improvement from existing conditions. No further assessment required.	**Scoped in** to detailed assessment due to potential adverse impacts with RTS in operation (INNS & pathogens only).	Acceptable levels of spread of INNS and pathogens is yet to be agreed with Environment Agency (and Natural England). Construction plans are not yet finalised.
Chemical elements								

Ecological Objective - Good by 2027 Chemical Objective - Good by 2063 Objective - Good by 2063	Current Cycle 3 2019 RBMP classification	Evidence and data sources	Modifications to water body (from Tables 4 and 5 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped In or Scoped Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks (including bed lowering)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
Priority hazardous substances	**Fail** (Benzo (a,b and K) Benzo (g-h-i), Mercury & its compounds, PBDEs, Tributyltin Compounds)	Water quality data includes data that monitors a range of substances for drinking water intakes in particular. EA, routine, water quality and WFD monitored data at: 1) Teddington (sediment site) 2) AQMA Teddington 3) Teddington Weir	There is potential for hazardous pollutants to be released during excavations. Ground investigation work will confirm any risk associated with contaminated sediment in the area and inform disposal or reuse plans. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk Any residual effects from these activities will be short-term and any contaminants will be flushed through the system once mobilised, further minimising the risk of deterioration. No further assessment required.	There is potential for hazardous pollutants to be released during storage, treatment or processing of materials. Tertiary mitigation will be in place to minimise the risk of this occurring. It is therefore considered to be negligible risk these elements. No further assessment required.	Where the channel passes through sections of landfill, the channel will be separated from it by sheet piling the sides and replacing the base of the channel with either inert natural material (gravel or clay) or sealing it with a slab of unreinforced concrete (depending on the contents of the remnant landfill). Therefore, no significant change in specific pollutant conditions from the mobilisation of landfill leachate is expected. Furthermore, the water body lies approximately 18km downstream of the flood channels, so there is no anticipated risk to concentrations of specific pollutants. No further assessment required.	The proposed works will not alter the inputs of substances from the wider catchment. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Construction plans are not yet finalised. On-going water quality and groundwater monitoring.
Priority substances	**Fail** (Cypermethrin)							
Other Pollutants	Good							

Thames Upper Mitigations Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
2.Remove obsolete structure	Not In Place	None	N/A	N/A
4.Remove or soften hard bank	Not In Place	New weir complex construction at Teddington weir	There is the possibility of localised hardened banks within the proximity of Teddington weir, however, due to scale of weir relative to water body the implementation of this mitigation measure in the future is unlikely to be impacted.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation, and shading to re-establish. Hardstanding areas during construction will be kept to a reasonable level.
5, 19 and 37 . Preserve or restore habitats and enhance ecology	Not In Place	New weir complex construction at Teddington weir	Possible loss of habitat for microphytes and invertebrates, however, due to the small scale of Weir construction and operation relative to the size of the water body, the implementation of this mitigation measure in the future is unlikely to be impacted.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation, and shading to re-establish.
7.Bank rehabilitation	Not In Place	New weir complex construction at Teddington weir	These construction works will not impact structure of riverbank. There is a possibility for improvements to bank structure local to the weir. The implementation of this mitigation measure in the future is unlikely to be impacted.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Construction will consider bank structure and further incorporate possible improvements into the weir design.
13.Realign flood defence	Not In Place	New weir complex construction at Teddington weir	Although weir design is currently unknown, the weir capacity improvements improve realignment of flood defence and therefore, the implementation of this mitigation measure in the future will be improved	Weir capacity improvement designs will incorporate flood defence alignment and further enhance the flood defence locally and further downstream.
16.Fish passes	Not In Place	New weir complex construction at Teddington weir	The operation of Teddington weir will improve to fish pass as a result of a multi species fish pass at the weir. Therefore, improving the ability to implement this mitigation measure in the future	Construction works will consider fish easement during construction processes. Important to keep footprint of construction to a minimum and work within clearly defined areas. Design of fish pass will provide improvements to this mitigation measurement.

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
20.Changes to locks etc	Not In Place	New weir complex construction at Teddington weir	Any impacts upon locks will be associated with construction, however, during weir operation navigation will remain the same. Therefore, no risk is implementation of this mitigation measure in the future	Ensure navigation is considered during design and construction processes incorporate vessel movement through the channel. Consider location of temporary wharfs throughout the construction area and work within clearly defined marked areas.
21-27. Avoid the need to dredge, Dredging disposal strategy, reduce impact of dredging, retime dredging or disposal, dredge disposal site selection. Sediment management and Reduce sediment suspension impacts	Not In Place	New weir complex construction at Teddington weir	Weir design is currently unknown; however it is anticipated that any dredging will be small scale and navigation channels will be incorporated into design for operation. Therefore, there is no risk to the implementation of this mitigation measure in the future	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Sediment management will be incorporated into any dredging component of design along with a CEMP and a Construction Surface Water Management Plan, reducing any risk to negligible.
28.Manage disturbance	Not In Place	New weir complex construction at Teddington weir	Scale of works is not great enough to impact upon disturbance on a water body scale. Construction design will consider any disturbance to the wider water body. Therefore, there is no risk to the implementation of this mitigation measure in the future.	Minimise the footprint of the working area wherever possible and work within clearly defined marked areas. Where feasible vegetation will be replanted or allowed to naturally regenerate, allowing riparian vegetation, and shading to re-establish. Hardstanding areas during construction will be kept to a reasonable level.

Thames Middle - GB530603911402- Heavily Modified Water Body. Overall Status (2019) – Moderate - Surface area (km2): 44.161

Designated/protected sites associated - Urban Waste Water Treatment Directive, SPA

Key

WFD classification (baseline) / Type of effect

Red	Bad classification
Orange	Poor classification
Yellow	Moderate classification (or 'does not support Good')
	N/A (or no data)
Green	Good classification
Blue	High classification

Construction elements of the project affecting this water body are:

1) General construction activities and earthworks (including bed lowering downstream of Desborough Cut)
2) Construction compounds, material processing and storage sites.

Operational elements affecting this water body are:

1) Operation of the flood relief channels and their interaction with the river water body.
2) Capacity improvement works at Sunbury weir, Molesey weir, Teddington weir.

There are no physical works in this water body. As there is a risk of creating new pollutant pathways, this water body is considered for further assessment on a precautionary basis.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks (including bed lowering downstream of Desborough Cut)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
Hydromorphology supporting elements								
Depth variation	Not used to classify this water body	**River Thames Bathymetric Data Analysis report (CH2M/EA 2016)** **Additional Sediment**	Construction is not expected to change river depth or width at more than a localised scale. The closest construction activities will lead will be approximately 22.5km upstream from this water body. Tertiary mitigation will be in place to minimise risk	There is potential for fine sediments and pollutants to be released within run off during storage, treatment or processing of materials. Tertiary mitigation will be in place to minimise the risk of fine sediment runoff into the Thames. It is therefore considered to be negligible risk to depth variation.	The existing sediment regime has been controlled by a series of weirs and locks for over a century. These structures present obstructions to the natural movement of sediment, and dredging has, historically, been undertaken to maintain a navigable channel. There are areas of erosion and deposition associated with structures, meanders and secondary channels throughout the water body.	This operational modification is not anticipated to lead to significant changes in hydromorphological elements. Any permanent changes would be negligible and not anticipated to be realised within this water body as is 22.5km downstream of the works.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	Construction plans are not yet finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks (including bed lowering downstream of Desborough Cut)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
		Studies, (GBV, 2019); **Flood Channel Sediment Transport Modelling (GBV, 2020);** **Sediment and flow regime modelling (DHI/Stantec, 2023);** **CH2M/EA River Thames Bathymetric Data Analysis 2016 report;** **LTS Fluvial Morphology Study (EA, 2005)**	of the additional sediment entering the Thames and flowing downstream into this water body. No further assessment required. Modelling of the bed lowering predicts an increase in velocities of 5% in a 1 in 20 year flood event through Desborough Cut and Loop (GBV, 2019). There may be some changes to flow circulation patterns which would in turn alter the sediment regime, however this would be at a localised scale, giving negligible impact to the Thames Middle which is ~40.5km further downstream. No further assessment required	No further assessment required.	There is unlikely to be any significant change in sediment transport processes that would alter the river bed as a result of the flood channels upstream. There is likely to be some change to the structure and substrate of the bed at the outflows of both channels, through localised erosion and deposition but not at a wider scale. However, this is all localised, and unlikely to have any implications downstream to the Thames Middle water body. No further assessment required.	No further assessment required.	No in-combination operational effects identified. **Scoped out** of detailed assessment	
Quantity, structure and substrate of the bed,	Not used to classify this water body	**River Thames Bathymetric Data Analysis report (CH2M/EA 2016)** **Additional Sediment Studies, (GBV, 2019);**	There will be temporary disturbances to the bed at Teddington weir during construction, however the bed will be restored following completion. Tertiary mitigation will be in place to minimise adverse impacts to the bed and structure of the intertidal zone.	There is potential for fine sediments and pollutants to be released within run off during storage, treatment or processing of materials. Tertiary mitigation will be in place to minimise the risk of fine sediment runoff into the Thames to these elements. It is therefore considered to be negligible risk to depth variation.	The existing sediment regime has been controlled by a series of weirs and locks for over a century. These structures present obstructions to the natural movement of sediment, and dredging has, historically, been undertaken to maintain a navigable channel. There are areas of erosion and deposition associated with structures, meanders, and secondary channels throughout the water body.	This operational modification is not anticipated to lead to significant changes in hydromorphological elements. Any permanent changes would be negligible and not anticipated to be realised within this water body as is 22.5km downstream.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Construction plans are not yet finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks (including bed lowering downstream of Desborough Cut)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
		Sediment and flow regime modelling (DHI/Stantec, 2023); **LTS Fluvial Morphology Study (EA, 2005)**	Bed lowering downstream of Desborough Cut will impact the structure and substrate of the river however due to distance of the Thames Upper from these activities, risk is negligible. No further assessment required.	No further assessment required.	There is unlikely to be any significant change in sediment transport processes that would alter the river bed as a result of the flood channels upstream. There is likely to be some change to the structure and substrate of the bed at the outflows of both channels, through localised erosion and deposition but not at a wider scale. However, this is all localised, and unlikely any implications downstream to the Thames Middle water body. No further assessment required.	No further assessment required.	**Scoped out** of detailed assessment	
Structure of the intertidal zone and tidal regime	Not used to classify this water body		The proposed operation modifications will not impact the tidal regime or the structure of the intertidal zone No further assessment required.				No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	N/A
Physico-chemical supporting elements								
Transparency, Thermal conditions, Salinity	Not used to classify this waterbody		An increase in fine sediment through the release of accidental spills of hazardous substances could enter the water body in addition to sediment	An increase in fine sediment through the release of accidental spills of hazardous substances could enter the water body in addition to sediment	CEH modelling has predicted that physico-chemical elements of the River Thames at Desborough are worse than upstream of the RTS channels, however; the water quality recovers with increased distance downstream. Modelling does not	No further assessment required. Due to the significant distance to Thames Middle water body from	No risk from any individual modification identified. No in-combination construction effects	Construction plans are not yet finalised.
Oxygenation conditions (DO)	Good	Water quality monitoring data						Construction plans are not yet finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks (including bed lowering downstream of Desborough Cut)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
Nutrient conditions	Moderate		release during excavations and impact upon physico-chemical elements. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable limit for this element. The bed lowering downstream of the Desborough Cut will result in increased velocity through the Cut and Loop and deeper water levels through the lowered section. Increased velocity will improve oxygenation conditions locally, however due to distance downstream to the Thames Middle it is likely no change. No further assessment required.	release from construction compounds, material processing and storage sites, impacting upon physico-chemical elements. Tertiary mitigation will be in place to minimise the risk of this occurring. It is therefore considered to be negligible risk these elements. No further assessment required.	consider as far downstream as this water body. However, given the dilution from a number of tributary inflows and the distance from the channel outfalls (~40.5 km), the risk is considered negligible.	the capacity improvements (nearest changes at Teddington 22.5 km from this water body), it is likely no adverse impacts to these physico-chemical elements will be observed this far downstream.	identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Construction plans are not yet finalised.
Specific Pollutants Zinc (only moderate element)	Moderate	Water quality monitoring data	General construction and earthworks including bed lowering downstream of Desborough Cut could lead to increased fine sediment and hazardous substance runoff into the water body. Sources of specific pollutants	There is potential for specific pollutants to be released during storage, treatment or processing of materials. A CEMP and Construction Surface Water Management Plan (tertiary standard practice mitigation) will be in place to minimise	CEH modelling has predicted that physico-chemical elements of the River Thames at Desborough are worse than upstream of the RTS channels, however; the water quality recovers with increased distance downstream. Modelling does not consider as far downstream as this water body. However, given the dilution from a number of tributary inflows and the distance from the	Due to the significant distance to Thames Middle water body from the capacity improvements (nearest changes at Teddington 22.5 km from this water body), it is likely no significant increase in specific pollutants will be observed this far	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	GI work is still ongoing.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks (including bed lowering downstream of Desborough Cut)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
			associated with fine sediments could runoff within drainage. This could lead to increases in their overall concentrations within the water body. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable limit for this element. GI work will confirm the presence of any contaminated sediments, and if present will affect the disposal/reuse of the sediment. The works downstream of Desborough Cut will not alter the inputs of specific pollutants from the wider catchment. No further assessment required.	the risk of this occurring. It is therefore considered to be negligible risk these elements. No further assessment required.	channel outfalls (~40.5 km), the risk is considered negligible. No further assessment required.	downstream with RTS in operation. No further assessment required.	No in-combination operational effects identified. **Scoped out** of detailed assessment	
Biological quality elements								
Phytoplankton	Good	GBV, 2015, Weirs Preliminary Ecological Appraisal and EIA Scoping report Water quality monitoring data	Fine sediment released during construction including during bed lowering will reduce transparency of the water column and may reduce populations which may be conveyed downstream. Sediment released will be mitigated at source	There is potential for fine sediments and pollutants to be released within run off during storage, treatment or processing of materials which may reduce populations. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.	Risk to physico-chemical elements and priority and priority hazardous substances is negligible due to the dilution from major tributaries between the channels and this water body. Therefore, no risk is anticipated to biological quality elements and no further assessment required.	The proposed works will not affect the abundance or diversity of phytoplankton as it will not change the supporting conditions of the water body.	**Scoped in** to detailed assessment due to potential adverse impacts with RTS in operation (INNS & pathogens only).	Construction plans are not yet finalised.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks (including bed lowering downstream of Desborough Cut)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
			through silt curtains and construction management plans and will be a temporary impact.	It is therefore considered to be negligible risk these elements.	There could be an increase in spread of INNS and pathogens due to new connections with some water bodies. This could increase the presence and prevalence of INNS and pathogens within the Thames (Egham to Teddington) which may transfer into this water body, thus impacting upon biological quality elements. INNS and pathogens management plans (secondary mitigation) will be in place throughout the project during operation and risk is deemed low, however further assessment is required.			
Benthic invertebrate fauna	Good		Runoff of fine sediment and spillage of hazardous substances from construction works, could adversely impact on suitable conditions for benthic invertebrate fauna. Sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.	Runoff of fine sediment and spillage of hazardous substances from compounds and material processing sites could adversely impact on suitable conditions for benthic invertebrate fauna. Sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.		There is a risk that the management of INNS within the connected lakes and channels upstream of this water body will increase the spread of INNS into this water body.	**Scoped in** to detailed assessment due to potential adverse impacts with RTS in operation (INNS & pathogens only).	Acceptable levels of spread of INNS is yet to be agreed with Natural England
Fish fauna	Good		Runoff of fine sediment and spillage of hazardous substances could effect fish, however sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.	Runoff of fine sediment and spillage of hazardous substances could effect fish, however sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.		There is a risk that the management of INNS within the connected lakes and channels upstream of this water body will increase the spread of INNS into this water body.	**Scoped in** to detailed assessment due to potential adverse impacts with RTS in operation (INNS & pathogens only).	Acceptable levels of spread of INNS is yet to be agreed with Natural England

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks (including bed lowering downstream of Desborough Cut)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
Angiosperms	Moderate		Runoff of fine sediment and spillage of hazardous substances could affect angiosperms, however sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.	Runoff of fine sediment and spillage of hazardous substances could affect angiosperms, however sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.		Construction of the new gates at Teddington has the potential to have a very localised effect on aquatic flora around the area of construction. It is therefore unlikely this will affect the Thames Middle.	**Scoped in** to detailed assessment due to potential adverse impacts with RTS in operation (INNS & pathogens only).	Construction plans are not yet finalised.
Macroalgae	Good		Runoff of fine sediment and spillage of hazardous substances could affect macroalgae, however sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.	Runoff of fine sediment and spillage of hazardous substances could affect macroalgae, however sediment released will be mitigated at source through silt curtains and construction management plans and will be a temporary impact. Tertiary (standard practice) mitigation will be in place to minimise the risk of this occurring.		Construction of the new gates at Teddington has the potential to have a very localised effect on aquatic flora around the area of construction. It is therefore unlikely this will affect the Thames Middle.	**Scoped in** to detailed assessment due to potential adverse impacts with RTS in operation (INNS & pathogens only).	Construction plans are not yet finalised.
Chemical Status								
Priority hazardous substances	Fail	Water quality monitoring data Site Investigation	There is potential for hazardous pollutants to be released during excavations. Ground investigation work will confirm any risk	There is potential for hazardous pollutants to be released during storage, treatment or processing of materials. Tertiary mitigation will be	Where the channel passes through sections of landfill, the channel will be separated from it by sheet piling the sides and replacing the base of the channel with either inert natural material (gravel or clay) or sealing it	The proposed works will not alter the inputs of substances from the wider catchment.	No risk from any individual modification identified.	Construction plans are not yet finalised. On-going water quality and

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Overall Objective - Moderate by 2015	Current Cycle 3 2019 RBMP Status	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements				Scoped in or out of detailed assessment?	Uncertainties / Gaps
			General construction and earthworks (including bed lowering downstream of Desborough Cut)	Construction compounds, material processing and storage sites	Operation of the flood relief channels and their interaction with the river water body	Existing Thames weir capacity improvements including fish passes		
Priority substances	Good	data (GBV, 2023)	associated with contaminated sediment in the area and inform disposal or reuse plans. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk. Any residual effects from these activities will be short-term and any contaminants will be flushed through the system once mobilised, further minimising the risk of deterioration. No further assessment required.	in place to minimise the risk of this occurring. It is therefore considered to be negligible risk these elements.	with a slab of unreinforced concrete (depending on the contents of the remnant landfill). Therefore, no significant change in specific pollutant conditions from the mobilisation of landfill leachate is expected. Furthermore, the water body lies approximately 40.5km downstream of the flood channels, so there is no anticipated risk to concentrations of specific pollutants. No further assessment required.		No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	groundwater monitoring.
Other Pollutants	Good							

Thames Middle Mitigation Measures Assessment

Type of effect

	High risk of deterioration (e.g. long term and potential deterioration in current classification or any deterioration in Bad) or risk to achieving Good Ecological Status / Potential
	Medium risk of deterioration (e.g. medium to long term and potential change within the current WFD classification)
	Low risk of deterioration (e.g. localised or short term effect)
	No risk or deterioration / Negligible effect
	Potential to improve (e.g. effects have the potential to lead to minor localised or short term benefits)
	Significant potential for improvement (e.g. effects have the potential to lead to permanent / long term improvements in WFD classification)

Potential Relevant Generic WFD Mitigation Measures (Information derived 2016	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
1.Modify channel	Not In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
2.Remove obsolete structure	Not In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
4.Remove or soften hard bank	Not In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
5, 19 and 37 . Preserve or restore habitats and enhance ecology	Not In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
6.In-channel morph diversity	Not Applicable	N/A	N/A	N/A
7.Bank rehabilitation	Not In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
13.Realign flood defence	Not In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
14.Modify structure	Not Applicable	N/A	N/A	N/A
15.Flow manipulation	Not Applicable	N/A	N/A	N/A
16.Fish passes	Not In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A

20.Changes to locks etc	Not In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
21-27. Avoid the need to dredge, Dredging disposal strategy, reduce impact of dredging, retime dredging or disposal, dredge disposal site selection. Sediment management and Reduce sediment suspension impacts	In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
28.Manage disturbance	In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A
48.Indirect mitigation	Not Applic able	N/A	N/A	N/A
49 and 50. Modify vessel design and management	In Place	None	There are no works present within this water body and due to the distance downstream of this water body from RTS, there is considered to be no impact on the implementation of these mitigation measure in the future	N/A

Queen Mary Reservoir - GB30642639 - Artificial. Overall Status (2019) – Poor - Surface area (km2): 2.88 – Mean depth (m): 5.8

Designated/protected sites associated - Surface Water Safeguard Zones, Drinking Water Protected Area

Key

WFD classification (baseline) / Type of effect	
(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction activities and earthworks including potential areas for haul roads and temporary compound areas
2) Construction compounds, material processing and storage sites

Operation elements of the project affecting this water body are:

1) Abstraction of water from the River Thames during operation of RTS, abstraction from the Laleham intake on the River Thames

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Hydromorphological supporting elements: NOT ASSESSED							
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to the groundwater body, lake depth variation, structure and substrate of the lake bed, structure of the lake shore)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	The reservoir intake is on the Thames (Egham to Teddington) water body and downstream of the proposed Runnymede channel intake and upstream of the proposed Spelthorne channel intake and Runnymede channel outlet. Construction of the Runnymede channel could lead to an increase in the amount of fine sediment released into the Thames (Egham to Teddington) water body. This could subsequently	There is also a risk of fine sediment release from construction compounds and material processing and storage sites which could runoff into the Thames, however the CEMP will be in place to prevent a significant increase in fine sediment entering the Thames, and	The augmentation flow to supply the Runnymede reach (up to 1 cumecs) will affect (reduce) flows in the River Thames upstream of the Laleham abstraction which may restrict the amount of water that can be abstracted under low flow and drought conditions. This would affect reservoir levels and therefore hydromorphological supporting elements within the reservoir. Further assessment required.	**All hydromorphological supporting elements scoped in** to detailed assessment due to risk of adverse impacts upon these elements during Thames low-flow conditions with the RTS in operation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			increase levels of fine sediment within abstracted water from the Thames within this reservoir. Increased concentrations of fine sediment could alter reservoir depth variation, structure and substrate of the lakebed and shore. Tertiary (standard practice) mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.	subsequently being abstracted. No further assessment required.			
Physico-chemical supporting elements							
Physico-chemical supporting elements (Transparency, Thermal conditions, Acidification status (pH))	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Construction activities could result in accidental release of fine sediment, oils and lubricants which could runoff into the River Thames and be abstracted into this water body via the Laleham intake. An increase in fine sediment supply to the River Thames could lead to adverse impacts to physico-chemical elements such as transparency, thermal conditions (temperature), oxygenation conditions (DO) and acidification status (pH). Tertiary (standard practice)	There is also a risk of accidental release of oils and lubricants from construction compounds and material processing and storage sites. This could increase potential for adverse impacts to physico-chemical elements in the reservoir. However, tertiary (standard practice) mitigation will be	This reservoir intake is within the depleted reach section associated with the Runnymede channel. It is predicted that physico-chemical supporting elements will remain similar, or decline during non-flood flows (CEH, 2022). This is because there are no There is no significant change to any long-term pathways or sources from these modifications in this section of the River Thames.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of the detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Oxygenation conditions (DO)	Not used to classify this water body	**River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	mitigation will be in place to minimise the risk of this occurring. No further assessment required.	in place to minimise release of chemicals entering the River Thames, and subsequently being abstracted. No further assessment required.	During non-flood flows (especially lower flows), there is a risk to the dissolved oxygen concentrations within the depleted reach of the River Thames. An augmentation flow of up to 1m^3/s is likely to deplete dissolved oxygen conditions for the whole of the depleted reach and downstream of Shepperton Lock. Water quality modelling predicts the greatest depletion is from Abbey Chase/Chertsey to Shepperton Lock (CEH, 2022). This has the potential to affect DO conditions in this reservoir, further assessment is required.	**Scoped in** to the detailed assessment due to potential effects from operation of the channel.	
Salinity	High	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	No change is anticipated, or adverse impact expected on salinity from general construction activities and earthworks. No further assessment required.	No change is anticipated, or adverse impact expected on salinity from construction compounds, material processing and storage sites. No further assessment required.	No change is anticipated, or adverse impact expected on salinity from RTS operation. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Nutrient conditions (Total nitrogen)	Bad	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Construction of the Runnymede channel could lead to an increase in the amount of nutrient containing fine sediment released into the Thames (Egham to Teddington) water body. This could subsequently increase levels of total nitrogen within abstracted water from the Thames, increasing total nitrogen concentration within the reservoir. However, a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation) will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.	There is also a risk of accidental release of diesel exhaust fluid (AdBlue) from construction compounds and material processing and storage sites. This could increase ammonia levels within the River Thames which can be oxidised to nitrate. However, a tertiary (standard practice) mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. No further assessment required.	This water body is within the reaches of depleted flows, from Runnymede inflow to Spelthorne outfall. It is predicted that nitrate concentrations will remain similar, or decline during non-flood flows compared to upstream (CEH, 2022). This is because there are no additional inputs of N in the reach, so concentrations will not be affected. However, given the predicted depleted DO conditions entering the reservoir there is a risk subsequent adverse effects on the nutrient conditions and biological quality elements. Therefore, further assessment is required.	**Scoped in** to the detailed assessment due to potential effects from operation of the channel.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Nutrient conditions (Total phosphorus)	Poor	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling**	Construction of the Runnymede channel could lead to an increase in the amount of fine sediment and associated bound phosphorus released into the Thames (Egham to Teddington) water body. This could subsequently increase levels of fine sediment and phosphorus within abstracted water from the	There is also a risk of accidental release of fine sediment, oils and lubricants from construction compounds and material processing and storage sites. This could increase potential for adverse impacts	The Thames (Egham to Teddington) water body has potential for localised changes to nutrient concentration. Within the reaches of depleted flows, from Runnymede inflow to Spelthorne outfall, it is predicted that phosphorus concentrations will remain similar, or decline during non-flood flows compared to upstream (CEH, 2022).	**Scoped in** to the detailed assessment due to potential effects from operation of the channel.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
		(DHI/Stantec, 2023	Thames within this reservoir. Increased concentrations of fine sediment could therefore increase phosphorus availability within the reservoir water body. However, tertiary mitigation (standard practice) will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. No further assessment required.	to total phosphorus in the reservoir. However, tertiary (standard practice) mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. No further assessment required.	However, given the predicted depleted DO conditions entering the reservoir there is a risk of subsequent adverse effects on the nutrient conditions and biological quality elements within the reservoir. Therefore, further assessment is required.		
Specific pollutants	High (Copper)	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Construction activities could result in accidental release of fine sediment, oils and lubricants into the Thames which could contain specific pollutants. This could increase the concentration of certain specific pollutants within the River Thames, leading to an increase within the water column and sediment of this reservoir. However, construction will minimise these impacts through adherence to environmental permits, a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation). Risk is therefore negligible, and no further assessment is required.	There is also a risk of accidental release and runoff into the Thames of oils and lubricants from construction compounds and material processing and storage sites. This could increase potential for higher concentrations of specific pollutants abstracted into this reservoir. However, tertiary (standard practice) mitigation will be in place to minimise release of chemicals	This reservoir intake is within the depleted reach section associated with the Runnymede channel. There will be no new sources of pollutants and concentrations of pollutants already within the depleted section of the River Thames should not be affected. . Pollutant conditions in the reservoir are unlikely to be affected the project. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Detailed construction methods and plans yet to be issued.

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
				entering the Thames, and therefore risk is deemed to be low. No further assessment is required.			
Biological quality elements							
Phytoplankton	Moderate	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	There is potential for adverse impact upon phytoplankton if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff. This has the potential to increase the likelihood or frequency of phytoplankton blooms within the reservoir. Adherence to a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation) will ensure no risk of deterioration. No further assessment is required.	There is potential for adverse impact upon phytoplankton if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential to increase the likelihood or frequency of phytoplankton blooms within the reservoir. Adherence to a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation) will ensure no risk of deterioration.	This reservoir intake is within the depleted reach section associated with the Runnymede channel. There is a risk that during times of low flow, DO within the River Thames could worsen as a result the augmented flow. Abstraction of this water could alter the quality of water within the reservoir and lead to a potential changes in the abundance and diversity of phytoplankton within the reservoir. Further assessment required.	**Scoped in** to detailed assessment due to risk of adverse impacts upon these elements during Thames low-flow conditions with the RTS in operation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
				No further assessment is required.			
Macrophytes and phytobenthos (combined)	Poor	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	There is potential for adverse impact upon macrophytes and phytobenthos if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential change the abundance and distribution of macrophytes and phytobenthos within the reservoir. The spread of INNS and pathogens as a result of general construction and earth works is thought to be low. However, INNS management plans will be in place throughout the project during operation and risk is deemed low.	There is potential for adverse impact upon macrophytes and phytobenthos if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential change the abundance and distribution of macrophytes and phytobenthos within the reservoir. The spread of INNS and pathogens as a result of general construction and earth works is thought to be low. However, INNS management plans will be in place throughout the project during operation and risk is deemed low.	This reservoir intake is within the depleted reach section associated with the Runnymede channel. There is a risk that during times of low flow, DO within the River Thames could worsen as a result of the augmented flow within the reach. Abstraction of this water could alter the quality of water within the reservoir and lead to changes in the abundance and diversity of macrophytes and phytobenthos, negatively impacting the ecological status of the reservoir.	**Scoped in** to detailed assessment due to risk of adverse impacts upon these elements during Thames low-flow conditions with the RTS in operation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Phytobenthos	Poor		There is potential for adverse impact upon phytobenthos if abstracted water from the River Thames contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential change the abundance and distribution of phytobenthos within the reservoir. The spread of INNS and pathogens as a result of general construction and earth works is thought to be low. However, INNS management plans will be in place throughout the project during operation and risk is deemed low. No further assessment required.	There is potential for adverse impact upon phytobenthos if abstracted water from the River Thames contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential change the abundance and distribution of phytobenthos within the reservoir. The spread of INNS and pathogens as a result of general construction and earth works is thought to be low. However, INNS management plans will be in place throughout the project during operation and risk is deemed low. No further assessment required.	This reservoir intake is within the depleted reach section associated with the Runnymede channel. There is a low risk that during times of low flow, DO of the River Thames could worsen as a result of the augmented flow within the reach. Abstraction of this water could alter the quality of water within the reservoir resulting in eutrophic conditions and lead to changes in the abundance and diversity, negatively impacting the ecological status of the reservoir. Further assessment required.	**Scoped in** to detailed assessment due to risk of adverse impacts upon these elements during Thames low-flow conditions with the RTS in operation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Biological quality elements (Macrophytes, Benthic invertebrate fauna, Fish fauna)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	The potential impacts on macrophytes and phytobenthos described above could result in changes to a range of ecological functions, including habitat and food for other aquatic organisms such as benthic invertebrates and fish. Tertiary mitigation and environmental permits will be in place to minimise this risk, which will reduce the residual risk to an acceptable limit for this element. No further assessment required.	The potential impacts on macrophytes and phytobenthos described above could result in changes to a range of ecological functions, including habitat and food for other aquatic organisms such as benthic invertebrates and fish. Adherence to a tertiary (standard practice) mitigation will ensure this risk remains low. No further assessment required.	The potential impacts on macrophytes and phytobenthos described above could result in changes to a range of ecological functions, including habitat and food for other aquatic organisms such as benthic invertebrates and fish. Further assessment required.	**Scoped in** to detailed assessment due to risk of adverse impacts upon these elements during Thames low-flow conditions with the RTS in operation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS and pathogens is yet to be agreed with Natural England.
Chemical elements							
Priority hazardous substances	Fail (PFOS,PBDE)	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling**	Construction activities could result in accidental release of substances which could runoff into the River Thames and be abstracted into this water body via the Laleham intake. Construction will adhere to tertiary (standard practice) mitigation and environmental permits	Construction compounds and material processing could result in accidental release of substances which could runoff into the River Thames and be abstracted into this water body via the Laleham	This reservoir intake is within the depleted reach section associated with the Runnymede channel. There is a low risk that during times of low flow, chemical elements of the River Thames could worsen as a result of concentration effects through reduced dilution within the reach. Abstraction of this water could alter the chemical	**Scoped in** to detailed assessment due to risk of adverse impacts upon these elements during Thames low-flow conditions with the RTS in operation.	Detailed construction methods and plans yet to be issued.
Priority substances	Good (Fluoranthene)						

Ecological Objective - Poor by 2015 Chemical Objective - Good by 2063 Objective - Poor by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
		(DHI/Stantec, 2023	and risk is therefore negligible. Any residual effects from these activities will be short-term, further minimising the risk of deterioration. No further assessment required.	intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation). With implementation of this mitigation there is considered to be a low risk to these elements. No further assessment required.	concentration of water within the reservoir. However, risk is considered low due to the impact being limited to periods of low flows and a period of rainfall will lead to dilution of any increased concentrations and the dilution effects of the receiving water body. Further assessment required.		
Other Pollutants	Does not require assessment	Not assessed	Not assessed			N/A	Not required

Queen Mary Reservoir Mitigation Measures Assessment

Key:

Type of effect

	Type of effect
Red	High risk of compromising the measure
Orange	Medium risk of compromising the measure
Yellow	Low risk of compromising the measure
White	No risk of compromising the measure
Green	Potential for positive contribution towards the measure
Blue	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
3.Re-engineer river	Not applicable	N/A	N/A	N/A
16.Fish passes 17.Fish pass flow releases 18.Reduce fish entrainment	Not applicable	N/A	N/A	N/A
29.Sediment management regime	Not applicable	N/A	N/A	N/A
30.Manage artificial drawdown 31.Manage seasonal water levels	Not in place	N/A	RTS could affect abstraction from the River Thames during periods of low flows into the reservoir, This may impact on the ability to implement management of artificial drawdown or manage seasonal water levels.	N/A
42.Access to feeder-streams 43.Downstream flow regime 44.Flows to move sediment	Not applicable	N/A	N/A	N/A
45.Good downstream DO levels 46.Good downstream temperature	Not applicable	N/A	N/A	N/A

Knight Reservoir - GB30642791- Artificial. Overall Status (2019) – Moderate - Surface area (km2): 0.189 – Mean depth (m): 8.928

Designated/protected sites associated - Surface Water Safeguard Zones, SPA, Ramsar Site.

Key

WFD classification (baseline) / Type of effect

Red	Bad classification
Orange	Poor classification
Yellow	Moderate classification (or 'does not support Good')
White	N/A (or no data)
Green	Good classification
Blue	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks including construction of flood channels (approx. 5km upstream), bed lowering downstream of Desborough cut and Sunbury weir capacity improvements.
2) Construction compounds and material processing and storage sites

Operation elements of the project affecting this water body are:

1) Abstraction of water from the River Thames during operation of RTS, abstraction from the Walton intake on the River Thames

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Hydromorphological supporting elements							
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to the groundwater body, lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	The reservoir intake is on the River Thames (Egham to Teddington) water body. This location is downstream of both Runnymede and Spelthorne channel outlets. Construction of both channels could lead to an increase in the amount of fine sediment released into the Thames (Egham to Teddington) water body. This could subsequently increase levels of fine sediment within abstracted water from the Thames within this reservoir. Increased concentrations of fine sediment could alter reservoir depth variation, structure and	There is also a risk of fine sediment release from construction compounds and material processing and storage sites which could runoff into the Thames (Egham to Teddington), however tertiary (standard practice) mitigation will be in place to prevent a significant increase in fine sediment entering the Thames, and subsequently being abstracted.	The reservoir intake is on the River Thames (Egham to Teddington) water body. This location is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is no impact anticipated for these supporting elements. The abstraction rate from the River Thames will not be changed as a result of RTS operation.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			substrate of the lakebed and shore. However, tertiary (standard practice) mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. There is a risk to lake depth variation, structure and substrate of the lakebed, structure of the lake shore, if invasive or non-native plants were to colonise and left unmanaged within or at the margins the reservoir, which could impact upon biological quality elements. No further assessment required.				
Physico-chemical supporting elements							

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Physico-chemical supporting elements (Transparency, Thermal conditions, Oxygenation conditions (DO), Acidification status (pH))	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Construction activities could result in accidental release of fine sediment, oils, lubricants and chemicals which could runoff into the River Thames and be abstracted into this water body via the Walton water treatment works intake. An increase in fine sediment supply to the River Thames could lead to adverse impacts to physico-chemical elements such as transparency, thermal conditions (temperature), oxygenation conditions (DO), acidification status (pH) and total nitrogen status. However, construction will minimise these impacts through adherence to tertiary (standard practice) mitigation. However, due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected and therefore reduce the impact of these activities on the reservoir. No further assessment is required.	There is also a risk of accidental release of oils, lubricants and chemicals from construction compounds and material processing and storage sites. This could increase potential for adverse impacts to physico-chemical elements in the reservoir. However, tertiary (standard practice) mitigation will be in place to minimise release of chemicals entering the River Thames, and subsequently being abstracted. No further assessment is required.	The reservoir intake is on the River Thames (Egham to Teddington) water body, downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, physico-chemical elements of the River Thames could worsen as a result of flushing effects through the flood channels. Abstraction of this water could alter the physico-chemical composition of water within the reservoir. Risk is considered low due to dilution effects of the receiving water body. However, further assessment is required.	**Scoped in** to detailed assessment due to risk of adverse impacts upon these elements from flushing events.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Salinity	High	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could result in accidental release of fine sediment, oils and lubricants which could runoff into the Thames and be abstracted into this water body via the Walton intake. An increase in fine sediment	There is also a risk of accidental release of oils, lubricants, and fine sediments from construction compounds and material processing and storage. However, a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation) will be in place to minimise release of chemicals entering the Thames, and	This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is no anticipated impact in a change of salinity because of RTS in operation. Water abstracted from the reservoir is not saline water.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
		Hydraulic modelling (DHI/Stantec, 2023	supply to the Thames could also occur during construction. However, it is not anticipated to have an adverse impact on salinity. construction will minimise these impacts through adherence to tertiary (standard practice) mitigation. No further assessment required.	subsequently being abstracted. No further assessment required.	No further assessment required.	**Scoped out** of detailed assessment.	
Nutrient conditions (Total phosphorus and Total Nitrogen)	Bad (Total Nitrogen is not classified)	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Construction of the Runnymede and Spelthorne channels could lead to an increase in the amount of fine sediment and associated bound nutrients released into the Thames (Egham to Teddington) water body. This could subsequently increase levels of fine sediment and nutrients within abstracted water from the Thames within this reservoir. Increased concentrations of fine sediment could therefore increase nutrient availability within the reservoir water body. However, tertiary (standard practice) mitigation will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. Due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected, but further assessment is required to assess whether the residual	There is also a risk of accidental release of fine sediment, oils and lubricants from construction compounds and material processing and storage sites. This could increase potential for adverse impacts to total phosphorus in the reservoir. However, tertiary (standard practice) mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted.	The Thames (Egham to Teddington)) water body has potential for localised changes to nutrient concentration resulting from the RTS. This reservoir intake is downstream of both channels, the bed lowering and Sunbury weir. There is a risk that during times of high flow water quality in the Thames (Egham to Teddington) could worsen as a result of flushing effects through the flood channels (increases in sediments and associated particulate phosphorus). Abstraction of this water could alter nutrient concentrations within the reservoir. Further assessment required to assess risk of deterioration.	**Scoped in** to detailed assessment due to risk of abstraction of Thames water with increased nutrient concentrations.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			risk is acceptable for this element.				
Specific pollutants	High (Permethrin)	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Construction activities could result in accidental release of fine sediment, oils and lubricants into the Thames which could contain specific pollutants. This could increase the concentration of certain specific pollutants within the Thames, leading to an increase within the water column and sediment of this reservoir. However, construction will minimise these impacts through adherence to tertiary (standard practice) mitigation. Therefore, risk is deemed to be low. Due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected and therefore reduce the impact of these activities on the reservoir. No further assessment required.	There is also a risk of accidental release and runoff into the Thames of oils and lubricants from construction compounds and material processing and storage. This could increase potential for higher concentrations of specific pollutants abstracted into this reservoir. However, a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation) will be in place to minimise release of chemicals entering the Thames. Therefore, no further assessment required.	This reservoir intake is downstream of the depleted reach section associated with the channels. There is a risk that during times of high flow, specific pollutants could be mobilised and of flushed out the flood channels into the River Thames. Abstraction of this water could affect the composition of water within the reservoir. Further assessment required to assess risk of deterioration.	**Scoped in** to detailed assessment due to risk of abstraction of Thames water with increased specific pollutant concentrations.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Biological quality elements							
Phytoplankton	Good	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data**	There is potential for adverse impact upon phytoplankton if abstracted water from the Thames (Egham to Teddington)) contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff. This has the potential to increase the likelihood or frequency of phytoplankton blooms within the reservoir.	There is potential for adverse impact upon phytoplankton if abstracted water from the Thames (Egham to Teddington)) contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential to increase the likelihood or	This reservoir intake is downstream of the depleted reach sections associated with the channels. There is a risk that during times of high flow, nutrient elements of the Thames (Egham to Teddington)) could worsen as a result of flushing effects through the flood channels. Abstraction of this water could	**Scoped in** to detailed assessment due to risk of abstraction of Thames water adversely impacting upon phytoplankton.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
		(2012 – 2023 GBV) **Hydraulic modelling (DHI/Stantec, 2023**	Adherence to tertiary standard practice mitigation will ensure this risk remains low. Due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected and therefore reduce the impact of these activities on the reservoir. No further assessment required.	frequency of phytoplankton blooms within the reservoir. Adherence to a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation) will ensure this risk remains negligible. No further assessment required.	alter the nutrient composition of water within the reservoir. Further assessment required to assess risk of deterioration.		

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Biological quality elements (Macrophytes and phytobenthos (combined), benthic invertebrate fauna and fish fauna)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames (Egham to Teddington)) contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff. This has the potential to cause deterioration of biological quality elements. Adherence to a CEMP and a Construction Surface Water Management Plan (tertiary standard practice mitigation) will ensure this risk remains low. The spread of INNS and pathogens as a result of general construction and earth works is thought to be low. The abstraction of pathogens and INNS can negatively impact upon biological quality elements within the reservoir if abstracted from the Thames (Egham to Teddington)) due to increased competition for resources or the transmission of disease. However, INNS management plans will be in place throughout the project. No further assessment required.	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames (Egham to Teddington)) contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential to cause deterioration of biological quality elements. Adherence to tertiary (standard practice) mitigation will ensure this risk remains low. The spread of INNS and pathogens resulting from construction compounds and material processing and storage sites is thought to be low. However, INNS management plans will be in place throughout the project. The abstraction of pathogens and INNS can negatively impact upon biological quality elements within the reservoir if abstracted from the Thames (Egham to Teddington)) due to increased competition for resources or the transmission of disease. No further assessment required.	This reservoir intake is downstream the flood channels. There is a risk that during times of high flow, nutrient, chemicals and sediments in the Thames (Egham to Teddington)) could worsen as a result of flushing effects through the flood channels. Abstraction of this water could alter the nutrient composition, chemical pollution and sediment loading of water within the reservoir. The spread of INNS and pathogens could also result from the flushing effect during high flows through the flood relief channels. However, INNS management plans will be in place throughout the project. Furthermore, there is potential for introduction of INNS and pathogens not previously present within the water body. Water bodies previously disconnected from the Thames will become connected when the project is in operation. The abstraction of pathogens and INNS into the reservoir can negatively impact upon biological quality elements due to increased competition for resources or the transmission of disease. Further assessment required.	**Scoped in all biological quality elements** to detailed assessment due to potential adverse impacts of abstraction of River Thames water with RTS in operation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Chemical elements							
Priority hazardous substances	Fail (PFOS,PBDE)	**INNS and Pathogen Surveys (GBV, 2022)**	Construction activities could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body	Construction compounds and material processing could result in accidental release of substances which could runoff into the Thames and	This reservoir intake is downstream of the depleted reach sections associated with the channels, however there is a potential risk for	**Scoped in** to detailed assessment due to risk of abstraction of Thames water with increased priority	

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
		River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV) **Hydraulic modelling (DHI/Stantec, 2023**	via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of this tertiary (standard practice) mitigation and environmental permits it is considered to be a low risk to these elements. Due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected thus reducing the impact of these activities on the reservoir. Any residual effects from these activities will be short-term, further minimising the risk of deterioration.	be abstracted into this water body via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan (tertiary (standard practice) mitigation). With implementation of these plans it is considered to be a low risk to these elements.	increased contaminants flushed into the Thames (Egham to Teddington water body) within the water column or bound to suspended sediments. This could then be abstracted into the reservoir, subsequently increasing concentrations of these elements. The construction methods, detailed designs and environmental permit requirements are anticipated to limit release of contaminants from areas of active of historic landfill, with the implementation of suitable measures to mitigate effects, but further assessment is required to assess whether the residual risk is acceptable for this element. Further assessment required.	hazardous substance concentrations. Detailed construction methods and plans yet to be issued.	

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Priority substances	Good (Fluoranthene, Octylphenol)		Construction activities could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of this tertiary (standard practice) mitigation and environmental permits it is considered to be a low risk to these elements. Potential effects from these works will only occur in the short-term. Furthermore, due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected thus reducing the impact of these activities on the reservoir. Any residual effects from these activities will be short-term, further minimising the risk of deterioration.	Construction compounds and material processing could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan (tertiary (standard practice) mitigation). With implementation of these plans it is considered to be a low risk to these elements.	This reservoir intake is downstream of the depleted reach sections associated with the channels, however there is a potential risk for increased contaminants flushed into the Thames (Egham to Teddington water body) within the water column or bound to suspended sediments. This could then be abstracted into the reservoir, subsequently increasing concentrations of these elements. However, the construction methods, detailed designs and environmental permit requirements are anticipated to limit release of contaminants from areas of active of historic landfill, with the implementation of suitable measures to mitigate effects to an acceptable level <u>to reduce the residual risk to an acceptable limit for this element.</u>	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Other Pollutants	Does not require assessment	Not assessed	Not assessed			N/A	Not required

Knight Reservoir Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
16.Fish passes 17.Fish pass flow releases 18.Reduce fish entrainment	Not applicable	N/A	N/A	N/A
29.Sediment management regime	Not applicable	N/A	N/A	N/A
3.Re-engineer river	Not applicable	N/A	N/A	N/A
30.Manage artificial drawdown 31.Manage seasonal water levels	Not applicable	N/A	N/A	N/A
42.Access to feeder-streams 43.Downstream flow regime 44.Flows to move sediment	Not applicable	N/A	N/A	N/A
45.Good downstream DO levels 46.Good downstream temperature	Not applicable	N/A	N/A	N/A

Bessborough Reservoir - GB30642779- Artificial. Overall Status (2019) – Moderate - Surface area (km2): 0.273 – Mean depth (m): 9.221

Designated/protected sites associated - Drinking Water Safeguard Zones, SPA.

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks including construction of flood channels (approx. 5 km upstream), bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. All works upstream of Walton intake
2) Construction compounds and material processing and storage sites

Operation elements of the project affecting this water body are:

1) Abstraction of water from the River Thames during operation of RTS, abstraction from the Walton intake on the River Thames

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to the groundwater body, lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore)	Not used to classify this water body	**EA Gauged flow data; Hydraulic modelling (DHI/Stantec, 2023);** **Flow monitoring (2019 – 2022) (GBV, 2022)** **INNS and Pathogen Surveys (GBV, 2022)**	The reservoir intake is on the River Thames (Egham to Teddington) water body at Walton intake. This location is downstream of both Runnymede and Spelthorne (approx. 5 km). It is also downstream of bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. This could lead to an increase in the amount of fine sediment released into the Thames (Egham to Teddington) water body. This could subsequently increase levels of fine sediment within abstracted water from the Thames within this reservoir. Increased concentrations of fine sediment could alter reservoir depth variation, structure and	There is also a risk of fine sediment release from construction compounds and material processing and storage which could runoff into the Thames, however the CEMP will be in place to prevent a significant increase in fine sediment entering the Thames, and subsequently being abstracted.	Reservoir intake at Walton is downstream of Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. No impact anticipated for these supporting elements.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). **Geomorphological walkover report not yet issued.**

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			substrate of the lake bed and shore. However, a CEMP and a Construction Surface Water Management Plan will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. There is a risk to lake depth variation, structure and substrate of the lake bed, structure of the lake shore, if invasive or non-native plants were to colonise and left unmanaged within or at the margins the reservoir, which could impact upon biological quality elements.				
Physico-chemical supporting elements							
Salinity	High	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could result in accidental release of fine sediment, oils and lubricants which could runoff into the Thames and be abstracted into this water body via the Walton intake. An increase in fine sediment supply to the Thames could also occur during construction. However, it is not anticipated to have an adverse impact on salinity. Construction will minimise these impacts through adherence to a CEMP and a	There is also a risk of accidental release of oils, lubricants, and fine sediments from construction compounds and material processing and storage. However, a CEMP and a Construction Surface Water Management Plan will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. No further assessment required.	This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is no anticipated impact in a change of salinity because of RTS in operation. Water abstracted from the reservoir is not saline water. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped Out** of the detailed assessment	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			Construction Surface Water Management Plan. No further assessment required.				
Nutrient conditions (Total phosphorus and Total nitrogen)	Poor (total nitrogen is not classified)	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could lead to an increase in the amount of fine sediment and associated bound phosphorus released into the Thames (Egham to Teddington) water body. Increased phosphorus Concentrations could be released from fine sediments during construction activities, this could subsequently be abstracted into this water body. This in turn could impact on biological elements within the reservoir. However, due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected and therefore reduce the impact of these activities on the reservoir to low. Construction will minimise these impacts through adherence to a CEMP and a Construction Surface Water Management Plan.	There is also a risk of accidental release of oils, lubricants, and fine sediments (to which phosphorus may be bound) from construction compounds and material processing and storage. This could increase potential for adverse impacts to physico-chemical elements including phosphorus in the reservoir. However, a CEMP and a Construction Surface Water Management Plan will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted.	The Thames (Egham to Teddington)) water body has potential for localised changes to nutrient concentration resulting from the RTS. This reservoir intake is downstream of both channels, the bed lowering and Sunbury weir. There is a risk that during times of high flow water quality in the Thames (Egham to Teddington) could worsen as a result of flushing effects through the flood channels (increases in sediments and associated particulate phosphorus). Abstraction of this water could alter total phosphorus concentrations within the reservoir. Further assessment required to assess risk of deterioration.	**Scoped In** to detailed assessment	

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Physico-chemical supporting elements (Transparency, thermal conditions, oxygenation conditions, acidification status)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of fine sediment, oils and lubricants which could runoff into the Thames and be abstracted into this water body via the Walton intake. An increase in fine sediment supply to the Thames could also occur during construction, leading to adverse impacts to physico-chemical elements such as pH, oxygenation and temperature conditions. However, due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected and therefore reduce the impact of these activities on the reservoir. Construction will also minimise these impacts through adherence to a CEMP and a Construction Surface Water Management Plan. No further assessment required.	There is also a risk of accidental release of oils, lubricants and fine sediments from construction compounds and material processing and storage. This could increase potential for adverse impacts to physico-chemical elements in the reservoir. However, a CEMP and a Construction Surface Water Management Plan will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. No further assessment required.	This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, physico-chemical elements of the River Thames could worsen as a result of flushing effects through the flood channels. Abstraction of this water could alter the physico-chemical composition of water within the reservoir. Further assessment required.	**Scoped in** to detailed assessment due to risk of adverse impacts upon these elements from flushing events.	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Specific pollutants (Permethrin)	High	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of fine sediment, oils and lubricants into the Thames which could contain specific pollutants. This could increase the concentration of permethrin within the Thames, leading to an increase within the water column and sediment of this reservoir. However, due to the distance of the reservoir intake downstream from these	There is also a risk of accidental release and runoff into the Thames of oils and lubricants from construction compounds and material processing and storage. This could increase potential for higher concentrations of specific pollutants abstracted into this reservoir. However, a CEMP and a Construction Surface Water	This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a low risk that during times of high flow, physico-chemical elements of the Thames could worsen as a result of flushing effects through the flood channels. Abstraction of this water could alter the physico-	**Scoped in** to detailed assessment due to risk of abstraction of Thames water with increased specific pollutant concentrations.	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			activities, dilution of contaminated sediment is expected and therefore reduce the impact of these activities on the reservoir. However, construction will minimise these impacts through adherence to a CEMP and a Construction Surface Water Management Plan. Therefore, risk is deemed to be low. No further assessment required.	Management Plan will be in place to minimise release of chemicals entering the Thames, and therefore risk is deemed to be low. No further assessment required.	chemical composition of water within the reservoir. Further assessment is required to assess risk of deterioration.		
Biological quality elements							
Biological quality elements (Phytoplankton)	Good	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023)**	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff. However, due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected and therefore reduce the impact of these activities on the reservoir. Adherence to a CEMP and a Construction Surface Water Management Plan will ensure this risk remains low. No further assessment required.	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals due to runoff from construction compounds and material processing and storage sites. Adherence to a CEMP and a Construction Surface Water Management Plan will ensure this risk remains negligible. No further assessment required.	This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, water quality in the Thames could worsen and water abstracted into this reservoir could be more toxic to biological quality elements. However, dilution effects of the Thames and the receiving water body will reduce this risk to low. Further assessment required to assess risk of deterioration.	**Scoped in** to detailed assessment due to risk of abstraction of Thames water adversely impacting upon phytoplankton.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Biological quality elements (phytobenthos, macrophytes, benthic invertebrates and fish)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff. Adherence to a CEMP and a Construction Surface Water Management Plan will ensure this risk remains low.	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals due to runoff from construction compounds and material processing and storage sites. Adherence to a CEMP and a Construction Surface Water Management Plan will ensure this risk remains low.	This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, water quality in the Thames could worsen and water abstracted into this reservoir could be more toxic to biological quality elements. Furthermore, there is also a risk for increased spread of INNS and pathogens during operation, particularly during high flows, due to connectivity with the flood channels. This could increase the presence and prevalence of INNS within the reservoir, impacting upon biological quality elements. INNS management plans will be in place throughout the project during operation and risk is deemed low, however further assessment is required.	**Scoped in** to detailed assessment due to potential adverse impacts of abstraction of River Thames water with RTS in operation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Chemical elements							
Priority hazardous substances	Fail (PFOS, PBDE)	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of these plans it is considered to be a low risk to these elements.	Construction compounds and material processing could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake. construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of these plans it is considered	This reservoir intake is downstream of the depleted reach sections associated with the channels, however there is a potential risk for increased contaminants flushed into the Thames (Egham to Teddington water body) within the water column or bound to suspended sediments. This could then be abstracted into the reservoir, subsequently increasing concentrations of these elements. The construction	**Scoped in** to detailed assessment due to risk of abstraction of Thames water with increased priority hazardous substance concentrations.	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			Any residual effects from these activities will be short-term, further minimising the risk of deterioration.	to be a low risk to these elements.	methods, detailed designs and environmental permit requirements are anticipated to limit release of contaminants from areas of active of historic landfill, with the implementation of suitable measures to mitigate effects, but further assessment is required to assess whether the residual risk is acceptable for this element. Further assessment required.		
Priority substances	Good		Construction activities could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of these plans it is considered to be a low risk to these elements. Any residual effects from these activities will be short-term, further minimising the risk of deterioration.	Construction compounds and material processing could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake. construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of these plans it is considered to be a low risk to these elements.	This reservoir intake is downstream of the depleted reach sections associated with the channels, however there is a potential risk for increased contaminants flushed into the Thames (Egham to Teddington water body) within the water column or bound to suspended sediments. This could then be abstracted into the reservoir, subsequently increasing concentrations of these elements. However, the construction methods, detailed designs and environmental permit requirements are anticipated to limit release of contaminants from areas of active of historic landfill, with the implementation of suitable measures to mitigate effects to an acceptable level to reduce the residual risk to an acceptable limit for this element.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Other Pollutants	Does not require assessment	Not assessed	Not assessed			N/A	Not required

Bessborough Reservoir Mitigation Measures Assessment

Key:

Type of effect

(red)	High risk of compromising the measure
(orange)	Medium risk of compromising the measure
(yellow)	Low risk of compromising the measure
	No risk of compromising the measure
(green)	Potential for positive contribution towards the measure
(blue)	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
16.Fish passes 17.Fish pass flow releases 18.Reduce fish entrainment	Not applicable	N/A	N/A	N/A
29.Sediment management regime	Not applicable	N/A	N/A	N/A
3.Re-engineer river	Not applicable	N/A	N/A	N/A
30.Manage artificial drawdown 31.Manage seasonal water levels	Not applicable	N/A	N/A	N/A
42.Access to feeder-streams 43.Downstream flow regime 44.Flows to move sediment	Not applicable	N/A	N/A	N/A
45.Good downstream DO levels 46.Good downstream temperature	Not applicable	N/A	N/A	N/A

Kempton Park East Reservoir - GB30642614- Artificial. Overall Status (2019) – Good - Surface area (km2): 0.157 – Mean depth (m): 1

The project proposals affecting this water body are: Drinking Water Safeguard Zones, SPA. No Mitigation Measure are assigned to this water body.

Key

WFD classification (baseline) / Type of effect

Red	Bad classification
Orange	Poor classification
Yellow	Moderate classification (or 'does not support Good')
White	N/A (or no data)
Green	Good classification
Blue	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks
2) Construction compounds and material processing and storage sites

There are no operational elements of the project that will affect this water body as it does not abstract from the River Thames.

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*		Scoped In or Out of the detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites		
Hydromorphological supporting elements						
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to the groundwater body, lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore)	Not used to classify this water body	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	This reservoir does not abstract from the River Thames and therefore will not be impacted by an increase in fine sediment that is released into the Thames as a result of construction activities. The distance of the reservoir from any construction activities, construction compounds and material processing sites mean that there is no risk of construction affecting this water body.		No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Physico-chemical supporting elements						
Physico-chemical supporting elements (Transparency, thermal conditions, oxygenation conditions, acidification status, salinity, nutrient conditions, specific pollutants)	Not used to classify this water body	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of fine sediment, oils, lubricants and chemicals which could runoff into the River Thames, however, this reservoir does not abstract from the River Thames so there is no risk to this water body and the physico-chemical elements. The distance of the reservoir from any construction activities, construction compounds and material processing sites means that there is no risk from construction affecting this water body.		No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued.

Biological quality elements					
Biological quality elements (Phytoplankton, phytobenthos, macrophytes, benthic invertebrates, fish fauna)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **RTS Surface Water Quality Data 2012 – 2023**	There is no risk to biological quality elements as a result of construction activities associated with RTS, as this reservoir does not abstract from the River Thames. The distance of the reservoir from any construction activities, construction compounds and material processing sites means that there is no risk from construction affecting this water body.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Chemical elements					
Priority hazardous substances	Fail (PFOS, PBDE)	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of substances which could runoff into the Thames. However, as the reservoir does not abstract from the Thames, the reservoir is at no risk. The distance of the reservoir from any construction activities, construction compounds and material processing sites means that there is no risk from leachate migration from construction affecting this water body.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued.
Priority substances	Good				
Other Pollutants	Does not require assessment	Not assessed	Not assessed	N/A	Not required

Queen Elizabeth 2 Storage Reservoir- GB30642813 - Artificial. Overall Status (2019) – Good - Surface area (km2): 1.221 – Mean depth (m): 13.101

Protected/ designated sites: Drinking Water Safeguard Zones, SPA and Urban Waste water Treatment Directive.

Key

WFD classification (baseline) / Type of effect

	Bad classification
	Poor classification
	Moderate classification (or 'does not support Good')
	N/A (or no data)
	Good classification
	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks, including construction of flood channels (approx. 5 km upstream of intake), bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. All works upstream of Walton intake
2) Construction compounds, material processing and storage sites

Operation elements of the project affecting this water body are:

1) Abstraction of water from the River Thames during operation of RTS, abstraction from the Walton intake on the River Thames

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Hydromorphological supporting elements							
(Quantity and dynamics of flow, residence time, connection to the groundwater body, lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022))** **River Thames Scheme Surface Water Quality Data 2012 – 2023**	The reservoir intake is on the River Thames (Egham to Teddington) water body at Walton intake. This location is downstream of both Runnymede and Spelthorne (approx. 5 km). It is also downstream of bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. Construction of the Runnymede and Spelthorne channel sections could lead to	There is also a risk of fine sediment release from construction compounds and material processing and storage which could runoff into the Thames, however the CEMP will be in place to prevent a significant increase in fine sediment entering the Thames, and subsequently being abstracted.	Reservoir intake at Walton is situated downstream of Desborough Cut and Runnymede and Spelthorne Channel outfalls as well as downstream on Sunbury Weir. No impact anticipated for these supporting elements as abstraction into the reservoir will remain consistent with operation.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			an increase in the amount of fine sediment released into the Thames (Egham to Teddington) water body). This could subsequently increase levels of fine sediment within abstracted water from the Thames within this reservoir. Increased concentrations of fine sediment could alter reservoir depth variation, structure and substrate of the lake bed and shore. Construction works at the lowering at Desborough cut and capacity improvement of Sunbury weir could also cause an increase in temporary fine sediment concentrations within the Thames, however, the impact of construction on this water body is considered negligible due to the dilution effect of the river Thames. However, a CEMP and a Construction Surface Water Management Plan will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. There is a risk to lake depth variation, structure and substrate of the lake bed, structure of the lake shore, if invasive or non-native plants were to colonise and left unmanaged within or at the margins the reservoir, which could impact upon biological quality elements.				
Physico-chemical supporting elements							

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Physico-chemical supporting elements (Transparency, thermal conditions, oxygenation conditions, acidification status)	Not used to classify this water body	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of fine sediment, oils and lubricants which could runoff into the Thames and be abstracted into this water body via the Walton intake. An increase in fine sediment supply to the Thames could also occur during construction, leading to adverse impacts to physico-chemical elements such as pH, oxygenation and temperature conditions. However, construction will minimise these impacts through adherence to a CEMP and a Construction Surface Water Management Plan.	There is also a risk of accidental release of oils and lubricants from construction compounds and material processing and storage. This could increase potential for adverse impacts to physico-chemical elements in the reservoir. However, a CEMP and a Construction Surface Water Management Plan will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted.	This reservoir intake is downstream of the depleted reach section associated with the channels. There is a low risk that during times of high flow, physico-chemical elements of the Thames could worsen as a result of flushing effects through the flood channels. Abstraction of this water could alter the physico-chemical composition of water within the reservoir. Further assessment required	**Scoped in** to detailed assessment due to risk of adverse impact upon physico-chemical conditions from flushing events	Detailed construction methods and plans yet to be issued.
Salinity	Not used to classify this water body	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could result in accidental release of fine sediment, oils and lubricants which could runoff into the Thames and be abstracted into this water body via the Walton intake. An increase in fine sediment supply to the Thames could also occur during construction. However, it is not anticipated to have an adverse impact on salinity. Construction will minimise these impacts through adherence to tertiary mitigation. No further assessment required.	There is also a risk of accidental release of oils, lubricants, and fine sediments from construction compounds and material processing and storage. However, tertiary mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. No further assessment required.	This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is no anticipated impact in a change of salinity because of RTS in operation. Water abstracted from the reservoir is not saline water. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped Out** of the detailed assessment	

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Nutrient conditions (Total phosphorus and Total nitrogen)	Not used to classify this water body	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could lead to an increase in the amount of fine sediment and associated bound nutrients released into the Thames (Egham to Teddington) water body. Increased nutrient concentrations could be released from fine sediments during construction activities, this could subsequently be abstracted into this water body. This in turn could impact on biological elements within the reservoir. However, due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected and therefore reduce the impact of these activities on the reservoir to low. Construction will minimise these impacts through adherence to tertiary mitigation. No further assessment required.	There is also a risk of accidental release of oils, lubricants, and fine sediments (to which phosphorus may be bound) from construction compounds and material processing and storage. This could increase potential for adverse impacts to physico-chemical elements including nutrients in the reservoir. However, tertiary mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. No further assessment required.	The Thames (Egham to Teddington) water body has potential for localised changes to nutrient concentration resulting from the RTS. This reservoir intake is downstream of both channels, the bed lowering and Sunbury weir. There is a risk that during times of high flow water quality in the Thames (Egham to Teddington) could worsen as a result of flushing effects through the flood channels (increases in sediments and associated particulate phosphorus). Abstraction of this water could alter total phosphorus and nitrogen concentrations within the reservoir. Further assessment required to assess risk of deterioration.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped In** to detailed assessment due to risk of adverse impact upon nutrient conditions from flushing events	
Specific pollutants	Not used to classify this water body	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of fine sediment, oils and lubricants into the Thames which could contain specific pollutants. This could increase the concentration of certain specific pollutants within the Thames, leading to an increase within the water column and sediment of this	There is also a risk of accidental release and runoff into the Thames of oils and lubricants from construction compounds and material processing and storage. This could increase potential for higher concentrations of specific pollutants	This reservoir intake is downstream of the depleted reach section associated with the channels. There is a low risk that during times of high flow, physico-chemical elements of the Thames could worsen as a result of flushing effects through the flood	**Scoped in** to detailed assessment due to risk of abstraction of Thames water with increased specific pollutant concentrations.	

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			reservoir. However, construction will minimise these impacts through adherence to a tertiary mitigation. Therefore, risk is deemed to be low. No further assessment required.	abstracted into this reservoir. However, a tertiary mitigation will be in place to minimise release of chemicals entering the Thames, and therefore risk is deemed to be low No further assessment required.	channels. Abstraction of this water could alter the physico-chemical composition of water within the reservoir. Further assessment is required to assess risk of deterioration.		
Biological elements							
(Phytoplankton, macrophytes and phytobenthos, benthic invertebrates and fish fauna)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients, and chemicals due to construction runoff. Adherence to a tertiary mitigation will ensure this risk remains low. No further assessment required.	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames contains increased concentrations of fine sediment, nutrients and chemicals due to runoff from construction compounds and material processing and storage sites. Adherence to tertiary mitigation will ensure this risk remains low. No further assessment required.	This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, water quality in the Thames could worsen and water abstracted into this reservoir could be more toxic to biological quality elements. Furthermore, there is also a risk for increased spread of INNS and pathogens during operation, particularly during high flows, due to connectivity with the flood channels. This could increase the presence and prevalence of INNS within the reservoir, impacting upon biological quality elements. INNS management plans will be in place throughout the project during operation	**Scoped in** to detailed assessment due to potential adverse impacts of abstraction of River Thames water with RTS in operation.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
					and risk is deemed low, however further assessment is required.		
Chemical elements							
Priority hazardous substances	Fail (Mercury and its Compounds, PFOS, PBDE)	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of this tertiary (standard practice) mitigation and environmental permits it is considered to be a low risk to these elements. Potential effects from these works will only occur in the short-term. Furthermore, due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected thus reducing the impact of these activities on the reservoir. Any residual effects from these activities will be short-term, further minimising the risk of deterioration.	Construction compounds and material processing could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan (tertiary (standard practice) mitigation). With implementation of these plans it is considered to be a low risk to these elements.	This reservoir intake is downstream of the depleted reach sections associated with the channels, however there is a potential risk for increased contaminants flushed into the Thames (Egham to Teddington water body) within the water column or bound to suspended sediments. This could then be abstracted into the reservoir, subsequently increasing concentrations of these elements. The construction methods, detailed designs and environmental permit requirements are anticipated to limit release of contaminants from areas of active of historic landfill, with the implementation of suitable measures to mitigate effects, but further assessment is required to assess whether the residual risk is acceptable for this element. Further assessment required.	**Scoped in** to detailed assessment due to risk of abstraction of Thames water with increased priority hazardous substance concentrations. Detailed construction methods and plans yet to be issued.	
Priority substances	Good	**River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction activities could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Walton intake.	Construction compounds and material processing could result in accidental release of substances which could	This reservoir intake is downstream of the depleted reach sections associated with the channels, however there is a potential risk for	No risk from any individual modification identified. No in-combination construction effects identified due to	

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of this tertiary (standard practice) mitigation and environmental permits it is considered to be a low risk to these elements. Potential effects from these works will only occur in the short-term. Furthermore, due to the distance of the reservoir intake downstream from these activities, dilution of contaminated sediment is expected thus reducing the impact of these activities on the reservoir. Any residual effects from these activities will be short-term, further minimising the risk of deterioration.	runoff into the Thames and be abstracted into this water body via the Walton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan (tertiary (standard practice) mitigation). With implementation of these plans it is considered to be a low risk to these elements.	increased contaminants flushed into the Thames (Egham to Teddington water body) within the water column or bound to suspended sediments. This could then be abstracted into the reservoir, subsequently increasing concentrations of these elements. However, the construction methods, detailed designs and environmental permit requirements are anticipated to limit release of contaminants from areas of active of historic landfill, with the implementation of suitable measures to mitigate effects to an acceptable level to reduce the residual risk to an acceptable limit for this element.	implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Other Pollutants	Does not require assessment	Not assessed	Not assessed			N/A	Not required

Queen Elizabeth 2 Storage Reservoir Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
3.Re-engineer river	Not applicable	N/A	N/A	N/A
16.Fish passes 17.Fish pass flow releases 18.Reduce fish entrainment	Not applicable	N/A	N/A	N/A
29.Sediment management regime	Not applicable	N/A	N/A	N/A
30.Manage artificial drawdown 31.Manage seasonal water levels	Not applicable	N/A	N/A	N/A
42.Access to feeder-streams 43.Downstream flow regime 44.Flows to move sediment	Not applicable	N/A	N/A	N/A
45.Good downstream DO levels 46.Good downstream temperature	Not applicable	N/A	N/A	N/A

Island Barn Reservoir - GB30642841- Artificial. Overall Status (2019) – Moderate - Surface area (km2): 0.475 – Mean depth (m): 8.558

Designated/protected sites associated - Surface Water Safeguard Zones.

Key

WFD classification (baseline) / Type of effect

	Bad classification
	Poor classification
	Moderate classification (or 'does not support Good')
	N/A (or no data)
	Good classification
	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks, including construction of flood channels (approx. 11 km upstream of the Surbiton intake), bed lowering downstream of Desborough cut and weir capacity improvements at Sunbury and Molesey Weir.
2) Construction compounds and material processing and storage sites.

Operation elements of the project affecting this water body are:

1) Abstraction of water from the River Thames during operation of RTS from the Surbiton intake.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Hydromorphological supporting elements							
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to the groundwater body, lake depth variation, quantity, structure and substrate of the lakebed, structure of the lake shore).	Not used to classify this water body	**EA Gauged flow data; Hydraulic modelling (DHI/Stantec, 2023);** **Flow monitoring** (2019 **– 2022) (GBV, 2022)** **INNS and Pathogen Surveys (GBV, 2022) Hydraulic modelling (DHI/Stantec, 2023**	The reservoir intake is on the River Thames (Egham to Teddington) at Surbiton, downstream of both Runnymede and Spelthorne channel outfalls (approx. 11 km). It is also downstream of bed lowering downstream of Desborough cut and Sunbury and Molesey weir capacity improvements Construction of both channels could lead to an increase in the amount of fine sediment released into the Thames (Egham to Teddington) water body. This could subsequently increase levels of fine sediment within abstracted water from the Thames within this reservoir.	There is a risk of fine sediment release from construction compounds and material processing and storage sites which could runoff into the Thames (Egham to Teddington), however the CEMP will be in place to prevent a significant increase in fine sediment entering the Thames, and subsequently being abstracted. The impact is considered negligible.	There is no impact anticipated from the operation of the project for these supporting elements. The abstraction rate from the River Thames will be unlikely to be affected due to the distance downstream from the channels and also the fact that the abstraction intake is downstream of the confluence with the River Mole, diluting any effects.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Detailed construction methods and plans yet to be issued. CEH modelling only considers conditions as far downstream as just downstream as Desborough Cut, this distance downstream has not been modelled.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			Increased concentrations of fine sediment could alter reservoir depth variation, structure and substrate of the lakebed and shore. Construction at the weirs (notably Molesey) also presents a risk of increased sediment release into the Thames. However, a Construction Environmental Management Plan (CEMP) and a Construction Surface Water Management Plan will be implemented during construction to minimise any fine sediment run-off and pollutant risk to the Thames. There is a risk to lake depth variation, structure and substrate of the lakebed, structure of the lake shore, if invasive or non-native plants were to colonise and left unmanaged within or at the margins the reservoir, which could impact upon biological quality elements. Given the distance from the majority of the construction works, and the smaller scale of the weir works compared to the water body size, any risk is considered negligible.				
Physico-chemical supporting elements							

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Physico-chemical supporting elements (Transparency, thermal conditions, oxygenation conditions, acidification status)	Not used to classify this water body	**River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023)** **UKCEH QUESTOR and Protech Modelling (CEH, 2022)**	Construction activities could result in accidental release of fine sediment, oils, lubricants and chemicals which could runoff into the River Thames and be abstracted into this water body via the Surbiton intake. An increase in fine sediment supply to the River Thames could lead to adverse impacts to physico-chemical elements such as transparency, thermal conditions, DO and acidification status . The impact is considered negligible due to distance downstream and the effect of dilution within the River Thames meaning this sediment is unlikely to reach the Surbiton intake. There will also be adherence to tertiary mitigation. No further assessment required.	There is a risk of accidental release of oils, lubricants and chemicals from construction compounds and material processing and storage sites. This could increase potential for adverse impacts to physico-chemical elements in the reservoir. However, The impact is considered negligible due to distance downstream and the effect of dilution within the River Thames meaning this sediment is unlikely to reach the Surbiton intake. There will also be adherence to tertiary mitigation. No further assessment required.	CEH modelling has predicted that physico-chemical elements of the River Thames at Desborough are worse than upstream of the RTS channels, however; the water quality recovers with increased distance downstream. Modelling does not consider as far downstream as the Surbiton. However given the dilution from the River Mole (and other smaller tributaries) and the distance from the channel outfalls (11km), the risk considered negligible.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of the detailed assessment	Detailed construction methods and plans yet to be issued. CEH modelling only considers conditions as far downstream as just downstream as Desborough Cut, this distance downstream has not been modelled.
Salinity	High	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	No change anticipated to salinity in the water body as a result of this modification.	No change anticipated to salinity in the water body as a result of this modification.	No change anticipated to salinity in the water body as a result of this modification.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of the detailed assessment	Detailed construction methods and plans yet to be issued.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Nutrient conditions (Total phosphorus and Total nitrogen)	Bad (Total nitrogen is not classified)	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Construction of the Runnymede and Spelthorne channels and capacity improvement works at the weirs could lead to an increase in the amount of fine sediment and associated bound nutrients released into the Thames (Egham to Teddington) water body. This could subsequently increase levels of fine sediment and nutrients within abstracted water from the Thames within this reservoir. Increased concentrations of fine sediment could therefore increase nutrient availability within the reservoir water body. However, the impact is considered negligible due to distance of the abstraction point from the construction works, the impact of dilution in the water body and the use of a CEMP and a Construction Surface Water Management Plan to minimise any fine sediment run-off and pollutant risk to the Thames.	There is a risk of fine sediment release from construction compounds and material processing and storage sites. This could increase potential for adverse impacts to nutrient conditions in the reservoir. However, a CEMP and a Construction Surface Water Management Plan will be in place to minimise release of chemicals entering the River Thames, and subsequently being abstracted. The impact is considered negligible.	The Thames (Egham to Teddington) water body has potential for localised changes to nutrient concentration resulting from the RTS, especially in low flow conditions and the impact of flushing in high flow conditions. CEH modelling has predicted that physico-chemical elements of the River Thames at Desborough are worse than upstream of the RTS channels, however; the water quality recovers with increased distance downstream. Modelling does not consider as far downstream as the Surbiton. However given the dilution from the River Mole (and other smaller tributaries) and the distance from the channel outfalls (11km), the risk considered negligible.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. CEH modelling only considers conditions as far downstream as just downstream as Desborough Cut, this distance downstream has not been modelled.
Specific pollutants	High (Copper and Permethrin)	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	Construction activities could result in accidental release of fine sediment, oils and lubricants into the Thames which could contain specific pollutants. This could increase the concentration of certain specific pollutants within the Thames, leading to an increase within the water column and sediment of this reservoir. However, construction will minimise	There is also a risk of accidental release and runoff into the Thames of oils and lubricants from construction compounds and material processing and storage. This could increase potential for higher concentrations of specific pollutants abstracted into this reservoir. A CEMP and a Construction Surface Water Management Plan will be in place to minimise release of chemicals entering the Thames, and,	The reservoir intake is on the River Thames (Egham to Teddington) at Surbiton, downstream of both Runnymede and Spelthorne channel outfalls (approx. 11 km). There is a low risk that during times of high flow, physico-chemical elements of the Thames could worsen as a result of flushing effects through the flood channels. Abstraction of this water could alter the physico-chemical composition of water	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation.	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			these impacts through adherence to a CEMP and a Construction Surface Water Management Plan, and considering the distance downstream from the construction works and the risk is considered very low due to the dilution effect of the river Thames and the distance of the intake from the RTS flood relief channels. Negligible risk to this element, no further assessment required.	considering the distance downstream from the construction compounds and the effect of dilution in the water body, the risk is deemed to be negligible. No further assessment required.	within the reservoir. However given the dilution from the River Mole (and other smaller tributaries) and the distance from the channel outfalls (11km), the risk considered negligible.	No in-combination operational effects identified. **Scoped out** of detailed assessment	
Biological quality elements							
Phytoplankton	High	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	There is potential for adverse impact upon phytoplankton if abstracted water from the Thames (Egham to Teddington) contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff. This has the potential to increase the likelihood or frequency of phytoplankton blooms within the reservoir. Adherence to a tertiary mitigation will ensure this risk remains low. The risk of INNS spread from construction works into this reservoir will be prevented through implementation of secondary mitigation INNS management plans. No further assessment required.	There is potential for adverse impact upon phytoplankton if abstracted water from the Thames (Egham to Teddington) contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential to increase the likelihood or frequency of phytoplankton blooms within the reservoir. Adherence to a tertiary mitigation will ensure this risk remains low. No further assessment required.	Risk to physico-chemical elements and priority and priority hazardous substances is negligible due to the dilution from the River Mole (and other smaller tributaries) on the River Thames prior to abstraction . Therefore, no risk is anticipated to biological quality elements and no further assessment required. There could be an increase in spread of INNS and pathogens due to new connections with some water bodies. This could increase the presence and prevalence of INNS within the reservoir, impacting upon biological quality elements. INNS and pathogens management plans will be in place throughout the project during operation and risk is deemed low, however further assessment is required.	**Scoped in** to detailed assessment due to potential adverse impacts of abstraction of River Thames water with RTS in operation (INNS & pathogens only).	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Biological quality elements (phytobenthos, macrophytes, benthic invertebrates, fish fauna)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023**	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames (Egham to Teddington)) contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff. Adherence to a CEMP and a Construction Surface Water Management Plan will ensure this risk remains low. The spread of INNS and pathogens as a result of general construction and earth works is thought to be low. However, INNS management plans will be in place throughout the project. The abstraction of pathogens and INNS can negatively impact upon biological quality elements within the reservoir if abstracted from the Thames (Egham to Teddington)) due to increased competition for resources or the transmission of disease. Overall risk is negligible given the distance of the Surbiton intake from the rest of the project. No further assessment required.	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames (Egham to Teddington) contains increased concentrations of fine sediment, nutrients and chemicals from construction compounds and material processing and storage sites. This has the potential to cause deterioration of biological quality elements. Adherence to a CEMP and a Construction Surface Water Management Plan will ensure this risk remains low. The spread of INNS and pathogens resulting from construction compounds and material processing and storage sites is thought to be low. However, INNS management plans will be in place throughout the project. The abstraction of pathogens and INNS can negatively impact upon biological quality elements within the reservoir if abstracted from the Thames (Egham to Teddington) due to increased competition for resources or the transmission of disease. Overall risk is negligible as dilution in the water body will reduce the impact of any sediment, nutrients or chemicals that may negatively affect biological elements. No further assessment required.	Risk to physico-chemical elements and priority hazardous substances is negligible due to the dilution from the River Mole (and other smaller tributaries) on the River Thames prior to abstraction . Therefore, no risk is anticipated to biological quality elements and no further assessment required. There could be an increase in spread of INNS and pathogens due to new connections with some water bodies. This could increase the presence and prevalence of INNS within the reservoir, impacting upon biological quality elements. INNS and pathogens management plans will be in place throughout the project during operation and risk is deemed low, however further assessment is required.	**Scoped in** to detailed assessment due to potential adverse impacts of abstraction of River Thames water with RTS in operation (INNS & pathogens only).	Detailed construction methods and plans yet to be issued.
Chemical elements							
Priority hazardous substances	Fail (Mercury and its compounds PFOS,PBDE)	**River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)**	Construction activities could result in accidental release of substances which could runoff into the Thames and be	Construction compounds and material processing could result in accidental release of substances which could runoff into the	The reservoir intake is on the River Thames (Egham to Teddington) at Surbiton, downstream of both Runnymede	**Scoped in** to detailed assessment due to risk of abstraction	Detailed construction methods and

Ecological Objective - Moderate by 2015 Chemical Objective - Good by 2063 Objective - Moderate by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence to be used	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or Out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds, material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
		Hydraulic modelling (DHI/Stantec, 2023)	abstracted into this water body via the Surbiton intake. Construction will adhere tertiary mitigation. With implementation of these plans it is considered to be a negligible risk to these elements. Any residual effects from these activities will be short-term, further minimising the risk of deterioration.	Thames and be abstracted into this water body via the Surbiton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of these plans it is considered to be a negligible risk to these elements.	and Spelthorne channel outfalls (approx. 11 km). There is a low risk that during times of high flow, pollutants could enter the River Thames due of flushing effects through the flood channels. Abstraction of this water could alter the priority substance concentrations of water within the reservoir. The dilution from the River Mole (and other smaller tributaries) and the distance from the channel outfalls (11km), the risk considered low, however given the status of this element is already in the lowest class further assessment is required to assess whether the residual risk is acceptable for this element.	of Thames water with increased priority hazardous substance concentrations. Detailed construction methods and plans yet to be issued.	plans yet to be issued.
Priority substances	Good	**River Thames Scheme Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023)**	Construction activities could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Surbiton intake. Construction will adhere tertiary mitigation. With implementation of these plans it is considered to be a negligible risk to these elements. Any residual effects from these activities will be short-term, further minimising the risk of deterioration.	Construction compounds and material processing could result in accidental release of substances which could runoff into the Thames and be abstracted into this water body via the Surbiton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of these plans it is considered to be a negligible risk to these elements.	The reservoir intake is on the River Thames (Egham to Teddington) at Surbiton, downstream of both Runnymede and Spelthorne channel outfalls (approx. 11 km). There is a low risk that during times of high flow, pollutants could enter the River Thames due of flushing effects through the flood channels. Abstraction of this water could alter the priority substance concentrations of water within the reservoir. However, given the dilution from the River Mole (and other smaller tributaries) and the distance from the channel outfalls (11km), the risk considered negligible.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Other Pollutants	Does not require assessment	Not assessed	Not assessed			N/A	Not required

Island Barn Reservoir Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
3.Re-engineer river	Not applicable	N/A	N/A	N/A
6.In-channel morph diversity	Not applicable	N/A	N/A	N/A
7.Bank rehabilitation	Not applicable	N/A	N/A	N/A
16.Fish passes 17.Fish pass flow releases 18.Reduce fish entrainment	Not applicable	N/A	N/A	N/A
21.Avoid the need to dredge 22.Dredging disposal strategy 23.Reduce impact of dredging 24.Reduce sediment resuspension 25.Retime dredging or disposal 26.Sediment management 27. Dredge disposal site selection 28.Manage disturbance 32.Phased de-watering 4.Remove or soften hard bank	Not applicable	N/A	N/A	N/A
49.Modify vessel design 50.Vessel Management 51.Boats in central track 52.Invasive species awareness 53.Boat wash awareness 55.Recreation awareness	Not applicable	N/A	N/A	N/A

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
16.Fish passes 33.Selective vegetation control 34.Vegetation control 35.Vegetation control timing 36.Invasive species techniques 5. Preserve or restore habitats				
29.Sediment management regime	Not applicable	N/A	N/A	N/A
30.Manage artificial drawdown 31.Manage seasonal water levels	Not applicable	N/A	N/A	N/A
42.Access to feeder-streams 43.Downstream flow regime 44.Flows to move sediment	Not applicable	N/A	N/A	N/A
45.Good downstream DO levels 46.Good downstream temperature	Not applicable	N/A	N/A	N/A
20.Changes to locks etc	Not applicable	N/A	N/A	N/A

Lockwood Reservoir - GB30641865- Artificial. Overall Status (2019) – Good - Surface area (km2): 0.266 – Mean depth (m): 6.27

Designated/protected sites associated - Drinking Water Safeguard Zones, SPA, nitrate directive, drinking water protected area.

Key

WFD classification (baseline) / Type of effect

Bad classification
Poor classification
Moderate classification (or 'does not support Good')
N/A (or no data)
Good classification
High classification

Construction elements of the project affecting this water body are:
1) General construction and earthworks, including construction of flood channels (approx. 5 km upstream), bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. All works downstream of Hampton intake
2) Construction compounds and material processing and storage sites

Operation elements of the project affecting this water body are:
1) Abstraction of water from the River Thames during operation of RTS, abstraction from the Hampton intake on the River Thames

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to the groundwater body, lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022))** **River Thames Scheme Surface Water Quality Data 2012 – 2023**	The reservoir intake is on the River Thames (Egham to Teddington) water body at Hampton intake, all abstracted water travels ~30km through the Thames Lee-Tunnel before reaching the reservoir. The reservoir receives approximately two thirds of its water from the River Thames, whilst the rest is abstracted from the Lee catchment. The Hampton intake downstream of both Runnymede and Spelthorne Channels (approx. 5 km). It is also downstream of the bed lowering and Sunbury weir capacity improvements. The construction activities, including bed lowering, could lead to an increase in the amount of fine sediment released into the Thames (Egham to Teddington) water body. There is a potential risk of increased fine sediment concentrations in the River Thames because of construction, compounds, material processing and storage sites. However, with the implementation of tertiary mitigation and due to the distance of this reservoir from these modifications, and the dilution		It is anticipated that there will be no risk to this reservoir from these activities. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			from the Lee catchment, it is anticipated that there will be negligible risk to hydromorphology. No further assessment required.				
Physico-chemical supporting elements							
Salinity	High	**N/A**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could result in accidental release of fine sediment, oils and lubricants which could runoff into the Thames and be abstracted into this water body via the Hampton intake. However, tertiary mitigation will be in place to prevent any increase in salinity. No change anticipated and no further assessment required.		This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is no anticipated impact in a change of salinity because of RTS in operation. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Nutrient Conditions (Total Nitrogen)	Bad	**N/A**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could lead to an increase in the amount of fine sediment and associated bound nitrogen released into the Thames (Egham to Teddington) water body. Increased Total nitrogen concentrations could be released in sediments during construction activities, that could subsequently be abstracted into this water body. However, tertiary mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. Negligible risk to this element and no further assessment required.		The Thames (Egham to Teddington) water body has potential for localised changes to nutrient concentration resulting from the RTS. This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a low risk that during times of high flow, physico-chemical elements of the River Thames could worsen as a result of flushing effects through the flood channels. However, Lockwood reservoir receives approximately one third of its water from the Lee catchment and the remainder from the River Thames via the Thames-Lee Tunnel. Therefore, given that the risk of effects on water quality in the River Thames are low and only during periods of high flow, it is considered that any increase in concentrations entering Lockwood reservoir will be diluted by the input of water from the Lee catchment and the risk to these elements is negligible.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Nutrient Conditions (Total Phosphorus)	Bad	**N/A**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could lead to an increase in the amount of fine sediment and associated bound phosphorus released into the Thames (Egham to Teddington) water body. Increased phosphorus concentrations could be released in fine sediments				

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			during construction activities, this could subsequently be abstracted into this water body. However, tertiary mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. Negligible risk to this element and no further assessment required.		No further assessment required.		
Physico-chemical supporting elements (Transparency, thermal conditions, oxygenation conditions, acidification status, nutrient conditions)	Moderate	**INNS and Pathogen Surveys (GBV, 2022) GBV (2022)** **River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could lead to an increase in the amount of fine sediment and associated physico-chemical elements released into the Thames (Egham to Teddington) water body. Increased concentrations of fine sediment could be released from fine sediments during construction activities, this could subsequently be abstracted into this water body. However, tertiary mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. Negligible risk to this element and no further assessment required.				
Specific pollutants (Copper)	High		Construction activities could result in accidental release of fine sediment, oils and lubricants into the Thames which could contain specific pollutants. This could increase the concentration of certain specific pollutants within the Thames, leading to an increase within the water column and sediment of this reservoir. However, construction will minimise these impacts through adherence to tertiary mitigation. Negligible risk to this element and no further assessment required.		This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a low risk that during times of high flow, physico-chemical elements of the Thames could worsen as a result of flushing effects through the flood channels. However, Lockwood reservoir receives approximately one third of its water from the Lee catchment and the remainder from the Thames via the Thames-Lee Tunnel. Therefore, given that the risk of effects on water quality in the River Thames are low and only during periods of high flow, it is considered that any increase in concentrations entering Lockwood reservoir will be diluted by the input of water from the	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped In or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
					Lee catchment and the risk to this element is negligible. No further assessment required.		
Biological quality elements							
Phytoplankton	Good	**INNS and Pathogen Surveys (GBV, 2022)** **RTS Surface Water Quality Data (2012 – 2023 GBV)** **Hydraulic modelling (DHI/Stantec, 2023)**	There is potential for adverse impact upon phytoplankton if abstracted water from the Thames (Egham to Teddington) contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff and material processing and storage sites. However, there is a negligible risk of phytoplankton blooms within the reservoir due to adherence to tertiary mitigation. No further assessment required.		Risk to physico-chemical elements and priority and priority hazardous substances is negligible due to the input of water from the Lee catchment into the reservoir. Therefore, no risk is anticipated to phytoplankton and no further assessment required. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	
Biological quality elements (phytobenthos, macrophytes, benthic invertebrates, fish fauna)	Good		There is potential for adverse impact upon biological quality elements if abstracted water from the Thames (Egham to Teddington)) contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff, construction compounds, material processing and storage sites. However, due to the distance of the Hampton intake from the construction activities related to RTS and subsequent dilution of fine sediment, nutrients and chemicals no risk is anticipated to this reservoir. Adherence to tertiary mitigation will ensure this risk remains negligible. The risk of INNS spread from construction works into this reservoir will be prevented through implementation of secondary mitigation INNS management plans. No further assessment required.		Risk to physico-chemical elements and priority and priority hazardous substances is negligible due to the input of water from the Lee catchment into the reservoir. Therefore, no risk is anticipated to biological quality elements and no further assessment required. There could be an increase in spread of INNS and pathogens however due to distance of travel through the Thames-Lee tunnel into Lockwood reservoir, it is unlikely that any INNS or pathogens would survive and remain a risk at the outflow to the reservoir. Secondary mitigation through INNS management plans will also be in place throughout the project to reduce any risk to negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).
Chemical elements							
Priority hazardous substances	Fail (PFOS, PBDE)	**INNS and Pathogen**	Construction activities could result in accidental release of substances which could runoff into the		This reservoir intake is downstream of the Runnymede and Spelthorne channel sections,	No risk from any individual modification identified.	Detailed construction

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Compliance Assessment Report) - Potential effects of modifications on WFD quality elements			Scoped In or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Priority substances	Good	**Surveys (GBV, 2022) GBV (2022)** **River Thames Scheme Surface Water Quality Data 2012 – 2023**	Thames. However, this is no risk to this reservoir due to the distance of the Hampton intake from the construction activities related to RTS and subsequent dilution of substances before reaching Hampton intake. Construction will adhere to a CEMP and a Construction Surface Water Management Plan. With implementation of these plans, it is considered to be a low risk to these elements. Any residual effects from these activities will be short-term, further minimising the risk of deterioration.		bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, priority substances of the Thames could worsen as a result of flushing effects through the flood channels. However, Lockwood reservoir receives approximately one third of its water from the Lee catchment and the remainder from the Thames via the Thames-Lee Tunnel. Therefore, given that the risk of effects on water quality in the River Thames are low and only during periods of high flow, it is considered that any increase in concentrations entering Lockwood reservoir will be diluted by the input of water from the Lee catchment and the risk to this element is negligible. No further assessment required.	No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	methods and plans yet to be issued.
Other Pollutants	Not used to classify this water body		No assessment required.			N/A	

Lockwood Reservoir Mitigation Measures Assessment

Key:

Type of effect

	Type of effect
Red	High risk of compromising the measure
Orange	Medium risk of compromising the measure
Yellow	Low risk of compromising the measure
White	No risk of compromising the measure
Green	Potential for positive contribution towards the measure
Blue	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
3.Re-engineer river	Not applicable	N/A	N/A	N/A
16.Fish passes 17.Fish pass flow releases 18.Reduce fish entrainment	Not applicable	N/A	N/A	N/A
29.Sediment management regime	Not applicable	N/A	N/A	N/A
30.Manage artificial drawdown 31.Manage seasonal water levels	Not in place	N/A	RTS will not affect abstraction from the Thames into the reservoir, drawdown in the reservoir or seasonal water levels. RTS is not anticipated to prevent the future implementation of this WFD measure throughout the majority of this WFD water body.	N/A
42.Access to feeder-streams 43.Downstream flow regime 44.Flows to move sediment	Not applicable	N/A	N/A	N/A
45.Good downstream DO levels 46.Good downstream temperature	Not applicable	N/A	N/A	N/A

Banbury Reservoir - GB30647003 - Artificial. Overall Status (2019) – Moderate – Surface area (km2): 0.28 – Mean depth (m): 7.692

Designated/protected sites associated - Drinking Water Safeguard Zones, Nitrate Directive, SPA and Drinking Water Protected Area.

Key

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks, including construction of flood channels (approx. 5 km upstream of intake), bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. All works upstream of Hampton intake
2) Construction compounds and material processing and storage sites

Operation elements of the project affecting this water body are:

1) Abstraction of water from the River Thames during operation of RTS, abstraction from the Hampton intake on the River Thames

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
Hydromorphological supporting elements							
Hydromorphological supporting elements (Quantity and dynamics of flow, residence time, connection to the groundwater body, lake depth variation, quantity, structure and substrate of the lake bed, structure of the lake shore)	Not used to classify this water body	**EA Gauged flow data; Hydraulic modelling (DHI/Stantec, 2023);** **Flow monitoring (2019 – 2022) (GBV, 2022)** **INNS and Pathogen Surveys (GBV, 2022)**	The reservoir intake is on the River Thames (Egham to Teddington) water body at Hampton intake, all abstracted water travels ~30km through the Thames Lee-Tunnel before reaching the reservoir. The reservoir receives approximately two thirds of its water from the River Thames, whilst the rest is abstracted from the Lee catchment. The Hampton intake is downstream of both Runnymede and Spelthorne Channels (approx. 5 km). It is also downstream of the bed lowering and Sunbury weir capacity improvements. The construction activities, including bed lowering, could lead to an increase in the amount of fine sediment released into the Thames (Egham to Teddington) water body. There is a potential risk of increased fine sediment concentrations in the Thames because of construction, compounds, material processing and		There will be no risk to this reservoir from these activities. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England).

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
			storage sites. However, with the implementation of tertiary mitigation and due to the distance of this reservoir from these modifications and the dilution from the Lee catchment, it is anticipated that there will be negligible risk to hydromorphology. No further assessment required.				
Physico-chemical supporting elements							
Physico-chemical supporting elements (Transparency, thermal conditions, oxygenation conditions, acidification status, salinity, nutrient conditions (total phosphorus and total nitrogen))	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data 2012 – 2023**	Construction of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements could lead to an increase in the amount of fine sediment and associated physico-chemical elements released into the Thames (Egham to Teddington) water body. Increased concentrations of fine sediment could be released from fine sediments during construction activities, this could subsequently be abstracted into this water body. However, this is at no risk due to the distance and subsequent dilution of total nitrogen and fine sediment before reaching the reservoir. However, tertiary mitigation will be in place to minimise release of chemicals entering the Thames, and subsequently being abstracted. No further assessment required.		The Thames (Egham to Teddington) water body has potential for localised changes to nutrient concentration resulting from the RTS. This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, physico-chemical elements of the Thames could worsen as a result of flushing effects through the flood channels. However, Banbury reservoir receives approximately one third of its water from the Lee catchment and the remainder from the Thames via the Thames-Lee Tunnel. Therefore, given that the risk of effects on water quality in the River Thames are low and only during periods of high flow, it is considered that any increase in concentrations entering Banbury reservoir will be diluted by the input of water from the Lee catchment and the risk to these elements is negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Specific pollutants	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames**	Construction activities could result in accidental release of fine sediment, oils and lubricants into the Thames which could contain specific pollutants. This could increase the concentration of certain specific pollutants within the Thames, leading to an increase within the water column and sediment of this		This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, physico-chemical elements of the Thames could	No risk from any individual modification identified. No in-combination construction effects identified	Detailed construction methods and plans yet to be issued. Baseline Surface Water and Groundwater water

Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[1]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*			Scoped in or out of detailed assessment	Uncertainties / Gaps
			General construction and earthworks	Construction compounds and material processing and storage sites	Abstraction of water from the River Thames with RTS in operation		
		Scheme Surface Water Quality Data 2012 – 2023	reservoir. However, construction will minimise these impacts through adherence to tertiary mitigation. Negligible risk to this element and no further assessment required.		worsen as a result of flushing effects through the flood channels. However, Banbury reservoir receives approximately one third of its water from the Lee catchment and the remainder from the Thames via the Thames-Lee Tunnel. Therefore, it is considered that any increase in concentrations entering Banbury reservoir will be diluted by the input of water from the Lee catchment and the risk to this element is negligible. No further assessment required.	due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	quality monitoring is to be completed this year.
Biological quality elements							
Biological quality elements (phytoplankton, phytobenthos, macrophytes, benthic invertebrates, fish fauna)	Not used to classify this water body	**INNS and Pathogen Surveys (GBV, 2022)** **River Thames Scheme Surface Water Quality Data 2012 – 2023**	There is potential for adverse impact upon biological quality elements if abstracted water from the Thames (Egham to Teddington)) contains increased concentrations of fine sediment, nutrients and chemicals due to construction runoff, construction compounds, material processing and storage sites. However, due to the distance of the Hampton intake from the construction activities related to RTS and subsequent dilution of fine sediment, nutrients and chemicals no risk is anticipated to this reservoir. Adherence to a tertiary mitigation will ensure this risk remains low. There is no risk to the spread of INNS and pathogens as a result of general construction and earth works. However, secondary mitigation through INNS management plans will be in place throughout the project. No further assessment required.		Risk to physico-chemical elements and priority and priority hazardous substances is negligible due to the input of water from the Lee catchment into the reservoir. Therefore, no risk is anticipated to biological quality elements and no further assessment required. There could be an increase in spread of INNS and pathogens due to new connections with some water bodies, however due to distance of travel through the Thames-Lee tunnel into Banbury reservoir, it is unlikely that any INNS or pathogens would survive and remain a risk at the outflow to the reservoir. Secondary mitigation through INNS management plans will also be in place throughout the project to reduce any risk to negligible. No further assessment required.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Detailed construction methods and plans yet to be issued. Acceptable levels of spread of INNS is yet to be agreed with Environment Agency (and Natural England). Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.
Chemical elements							

<table>
<tr><th rowspan="2">Ecological Objective - Good by 2015 Chemical Objective - Good by 2063 Objective - Good by 2015</th><th rowspan="2">Current Cycle 3 2019 RBMP classification[1]</th><th rowspan="2">Evidence and data sources</th><th colspan="3">Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements</th><th rowspan="2">Scoped in or out of detailed assessment</th><th rowspan="2">Uncertainties / Gaps</th></tr>
<tr><th>General construction and earthworks</th><th>Construction compounds and material processing and storage sites</th><th>Abstraction of water from the River Thames with RTS in operation</th></tr>
<tr><td>Priority hazardous substances</td><td>Fail (PFOS, PBDE)</td><td rowspan="2">INNS and Pathogen Surveys (GBV, 2022)

River Thames Scheme Surface Water Quality Data 2012 – 2023</td><td colspan="2" rowspan="2">Construction activities could result in accidental release of substances which could runoff into the Thames. However, this is no risk to this reservoir due to the distance of the Hampton intake from the construction activities related to RTS and subsequent dilution of substances before reaching Hampton intake. Construction will adhere tertiary mitigation. With implementation of these plans, there is negligible risk to the status of these elements.

Any residual effects from these activities will be short-term, further minimising the risk of deterioration.

No further assessment required.</td><td rowspan="2">This reservoir intake is downstream of the Runnymede and Spelthorne channel sections, bed lowering downstream of Desborough cut and Sunbury weir capacity improvements. There is a risk that during times of high flow, priority substances of the Thames could worsen as a result of flushing effects through the flood channels.

However, Banbury reservoir receives approximately one third of its water from the Lee catchment and the remainder from the Thames via the Thames-Lee Tunnel. Therefore, given that the risk of effects on water quality in the River Thames are low and only during periods of high flow, it is considered that any increase in concentrations entering Lockwood reservoir will be diluted by the input of water from the Lee catchment and the risk to this element is negligible.

No further assessment required.</td><td rowspan="2">No risk from any individual modification identified.

No in-combination construction effects identified due to implementation of tertiary mitigation.

No in-combination operational effects identified.

Scoped out of detailed assessment.</td><td rowspan="2">Detailed construction methods and plans yet to be issued.

Baseline Surface Water and Groundwater water quality monitoring is to be completed this year.</td></tr>
<tr><td>Priority substances (Fluroanthene)</td><td>Good</td></tr>
<tr><td>Other Pollutants</td><td>Does not require assessment.</td><td>Not assessed</td><td colspan="3">Not assessed</td><td>N/A</td><td>Not required</td></tr>
</table>

Banbury Reservoir Mitigation Measures Assessment

Key:

Type of effect

	High risk of compromising the measure
	Medium risk of compromising the measure
	Low risk of compromising the measure
	No risk of compromising the measure
	Potential for positive contribution towards the measure
	Significant positive contribution towards the measure

Potential Relevant Generic WFD Mitigation Measures	State of Measure	Specific WFD Mitigation Measures Identified	Scale and certainty of the impact (spatial/ temporary)	Actions for WFD Compliance (including proposed mitigation during design and implementation of works)
3.Re-engineer river	Not applicable	N/A	N/A	N/A
16.Fish passes 17.Fish pass flow releases 18.Reduce fish entrainment	Not applicable	N/A	N/A	N/A
29.Sediment management regime	Not applicable	N/A	N/A	N/A
30.Manage artificial drawdown 31.Manage seasonal water levels	Not in place	N/A	RTS will not affect abstraction from the River Thames into the reservoir, drawdown in the reservoir or seasonal water levels. RTS is not anticipated to prevent the future implementation of this WFD measure throughout the majority of this WFD water body.	N/A
42.Access to feeder-streams 43.Downstream flow regime 44.Flows to move sediment	Not applicable	N/A	N/A	N/A
45.Good downstream DO levels 46.Good downstream temperature	Not applicable	N/A	N/A	N/A

Chobham Bagshot Beds - GB40602G601400. Overall Status (2019) – Poor - Surface area (km2): 355.581

Key

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks - part of Runnymede Channel and all of Spelthorne Channel will be cut into ground which is underlain by the Chobham Bagshot Beds groundwater body and will include the use of sheet piling. Includes:
    a. Spillage of hazardous materials during their movement to the road network and creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation.
    b. Lowering of river bed downstream of Desborough Cut within the Chobham Bagshot Beds groundwater body.
2) Construction of the flow control structures - Level retention structures consisting of shallow weirs along the southern part of Runnymede Channel and all of Spelthorne Channel and construction of the channel intake structures for Spelthorne Channel and outfall structures for Runnymede Channel and Spelthorne Channel.
3) Construction compounds, material processing and storage sites within the water body (including spillage of hazardous materials during their storage).

Operation elements of the project affecting this water body are:

1) Operation of the flood relief channel.
2) Operation of the channel intake structures for Spelthorne Channel and outfall structures for Runnymede Channel and Spelthorne Channel.
3) Flow control structures - Level retention structures consisting of shallow weirs along the southern part of Runnymede Channel and all of Spelthorne Channel.
4) Creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification [15]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements						Scoped in or out of detailed assessment	Uncertainties / Gaps
			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
Quantitative Elements										
Saline or other intrusions This test is designed to identify any long-term intrusion of saline (or other poor water quality), as a result of groundwater abstraction, which is leading to a sustained upward trend in pollutant concentratio ns or significant impact on one or more groundwater abstractions.	Good	**Ecological Surveys** **Project borehole monitoring records / water levels** **Site Investigation boreholes** **Groundwater monitoring data** **DHI/Stantec modelling, 2023**	Construction of the flood relief channel, typically dug 'wet' through natural ground and sheet piled, using a sealed impervious system in sections of landfill (see Assumptions and Uncertainties Section in the main report), will not cause any sustained intrusion of saline or other poor water quality as it will not create any new pathways into the groundwater body. Once in operation, groundwater modelling (DHI/Stantec, 2023) predicts that in non-flood conditions, there will be a rise in groundwater levels of 0.5 to 1.7m across a wide area within this groundwater body, which includes Chertsey and Littleton North. This risks potentially introducing poorer quality water from the wider River Thames catchment into the groundwater in this area, which could risk failure of this test.	Construction of the intake and outfall structures will not alter the quantitative classification for saline or other intrusions. See 'Construction and operation of flood relief channel' section for potential effects from operation of these structures.	Construction of the level retention structures will not alter the quantitative classification for saline or other intrusions as they will not create any new pathways into the groundwater body. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	Given there is a good hydraulic connection between surface waters and groundwater in the study area (Environment Agency, 2014), it is anticipated that the River Thames is already hydraulically connected to the groundwater in the vicinity of the proposed bed lowering. Therefore, no additional saltwater or poor quality water infiltration into the aquifer nor abstraction/loss of freshwater leading to intrusion is expected as a	No additional saline or other intrusions into the aquifer nor abstraction/loss of freshwater leading to saline or other intrusions is expected as a result of construction or operation.	No additional saline or other intrusions into the aquifer nor abstraction/loss of freshwater leading to saline or other intrusions is expected as a result of construction or operation.	**Scoped in** to detailed assessment due to risk of potentially introducing poorer quality water into the groundwater in this area during operation.	Detailed analysis of baseline water quality conditions have yet to be undertaken. Detailed construction methods and plans have not yet been issued.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification [15]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements						Scoped in or out of detailed assessment	Uncertainties / Gaps
			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
						result of construction or operation of bed lowering downstream of Desborough Cut.				
Dependent surface water body status This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies.	Good	**DHI/Stantec modelling, 2023** **Groundwater monitoring data** **Ecological Surveys**	Construction of the channel will include some below ground dewatering (to remove contaminated leachate in areas of landfill). This will be small scale, temporary and limited to the landfill site and therefore will not affect any dependent surface water bodies supported by groundwater. The operation of the flood relief channel will not include any dewatering or abstraction of the aquifer. Where the flood relief channel passes through landfill sites, it will be sheet piled for up to 2.1km using a sealed impervious system (approximately 0.9 kilometres in length in the Runnymede Channel and 1.2 kilometres in length in the Spelthorne Channel). The sheet piled sections risk altering groundwater pathways, potentially diverting flows away from groundwater dependent surface water	The installation of channel intake and outtake structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and/or restructuring flows. All structures will be built within coffer dams, deep piled into the impermeable clay. See 'Construction and operation of flood relief channel' section for potential effects from operation of the	Water level control structures, either gated or fixed level control structures have been built-in to the design to control groundwater levels in areas surrounding the new flood relief channel. The installation of these structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and / or restructuring flows. All structures will	There is a good hydraulic connectivity between surface waters and groundwater in the study area (Environment Agency, 2014). It is anticipated that the average total depth of bed lowering will be 0.7 metres. There is no expected abstraction of the aquifer, therefore, bed lowering is not expected to have any impact on quantitative dependent surface water body status.	There will be some dewatering during construction of the control structures, such as to remove contaminated water or soils from the working areas. Although this will be temporary, it could be a maximum period of 1 year for each structure. Therefore, given the potential for multiple locations of dewatering during the construction period, there is a risk this element will increase pressures on groundwater which may affect dependent surface waters. Operation will not include any	There is no expected abstraction from the aquifer, therefore these construction activities are not expected to have any impact on quantitative dependent surface water body status.	**Scoped in** to detailed assessment due to the operation of the flood channels and dewatering during construction potentially affecting the supply to groundwater dependent surface waters	Drought modelling scenario yet to be undertaken Detailed construction methods and plans have not yet been issued. Detailed analysis of the Desborough bed lowering ground investigations to confirm substrate conditions yet to be undertaken.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification [15]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements						Scoped in or out of detailed assessment	Uncertainties / Gaps
			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
			bodies, thus preventing them from meeting their required flow standards. Water level control structures have been built-in to the design to control groundwater levels in areas surrounding the new flood relief channel. Modelling of groundwater flows when the flood channel and flow control structures are operational (DHI/Stantec, 2023) suggests that the effects of the RTS on groundwater levels are likely to vary between flood and non-flood conditions. In non-flood conditions, the lower reaches of the Runnymede Channel (within this water body) are associated with a rise in groundwater levels of 0.5 to 1.7m. Meanwhile, under flood conditions, groundwater levels along the River Thames are likely to be lower relative to the baseline. Given there is a good hydraulic connection between surface waters and groundwater in the study area and the predicted changes in groundwater levels during operation, especially in non-flood conditions, there is a risk of	control structures.	be built within coffer dams, deep piled into the impermeable clay. Due to the size of the structures (up to 100m wide) any effects from the construction of this element will be temporary, localised and limited to the area immediately around the structures. See ‘Construction and operation of flood relief channel’ section for potential effects from operation of the control structures.		dewatering or abstractions of the aquifer associated with new green open space or priority areas for habitat creation, enhancement or mitigation. At operation, compaction of the ground may lead to altering the flow or limiting infiltration into the aquifer thereby limiting available resource to surface water. This will be highly localised, and therefore will have a negligible impact on overall status.			

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			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
			effects on groundwater dependent surface waters.							
Groundwater Dependent Terrestrial Ecosystems (GWDTE's) This test is designed to identify where groundwater abstraction is leading to "significant damage" to terrestrial ecosystems which depend directly on the groundwater body.	Good	**Groundwater Dependent Terrestrial Ecosystems (England only) Cycle 2 WFD. Based on SSSI outlines from Natural England, filtered to include only those sites with wetland vegetation communities listed in UK Technical Advisory Group paper 5 a-b (2004).** **UK Habitat surveys** **Reconnaissance surveys** **DHI/Stantec modelling, 2023** **Groundwater monitoring data**	Water level control structures have been built-in to the design to control groundwater levels in areas surrounding the new flood relief channel, aiming to prevent any substantial changes in groundwater conditions. Relevant GWDTE's within EIA scoping boundary: Dumsey Meadow SSSI At Dumsey Meadow, groundwater modelling (DHI/Stantec, 2023) shows that in non-flood conditions there may be a small increase in groundwater levels, up to 0.2m. However, when the channel is in operation in flood conditions, groundwater levels will likely fall by 0.8-1.6m. This change groundwater regime risks potentially altering the habitat quality of the SSSI.	The intake and outfall structures will not affect the quantitative classification for GWDTE's, as no sites are in close (>500m) proximity to these structures. See 'Construction and operation of flood relief channel' section for potential effects from operation intake and outfall structures.	Water level control structures, either gated or fixed level control structures (WBi, 2023a)will not affect the quantitative classification for GWDTE's, as no sites are in close (>500m) proximity to these structures. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	The proposed bed lowering is over 3 and 5km from Dumsey Meadow SSSI. It is not expected to have any impact on GWDTE's related to the Chobham and Bagshot Beds.	No anticipated construction impacts to quantitative classification for GWDTE's. At operation, compaction of the ground may lead to altering the flow or limiting infiltration into the aquifer thereby limiting available resource, however this will be highly localised, and therefore negligible impact on overall status.	Compaction of natural ground from presence of material stockpiles may alter infiltration and flow pathways, however this will be highly localised. Dumsey Meadow SSSI is within 800m of the stockpile site, however barriers to flow in-between include the M3 and the River Thames and therefore considered unlikely that localised changes at stockpiles will affect quantitative supply.	**Scoped in** to detailed assessment due to the changes in the groundwater regime, during operation, potentially altering the habitat quality of the GWDTE.	Identification of GWDTE that are not classified by the Environment Agency are not yet completed. GWDTE identified by the Environment Agency are for Cycle 2 only, Cycle 3 is not yet available. This will require review at the next assessment stage.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification [15]	Evidence and data sources	*Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements*						Scoped in or out of detailed assessment	Uncertainties / Gaps
			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
Water balance This test is designed to identify groundwater bodies where groundwater abstraction exceeds the "available groundwater resource" at the water body scale.	Good	**DHI/Stantec modelling, 2023**	Where the flood relief channel passes through landfill sites, it will be sheet piled for up to 2.1km, using a sealed impervious system (approximately 0.9 kilometres in length in the Runnymede Channel and 1.2 kilometres in length in the Spelthorne Channel). These sheet piled sections risk altering groundwater pathways, leading to dewatering and a drop in levels. During operation, it is not expected that the overall water balance of the groundwater body will negatively change at the water body scale. Water level control structures have been built-in to the design to control groundwater levels in areas surrounding the new flood relief channel, aiming to prevent any substantial changes in the groundwater regime across the water body. Groundwater modelling (DHI/Stantec, 2023) predicts that in non-flood conditions, there will be a rise in groundwater levels of 0.5 to 1.7m within the vicinity of Affinity Water's Chertsey abstraction sites, which has	The installation of channel intake and outtake structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and/or restructuring flows. However, it is not anticipated to affect the water balance at a water body scale. All structures will be built within coffer dams, deep piled into the impermeable clay. Due to the size of the structures, any effects from this element of the project will be temporary, localised, and limited to the area immediately	The installation of level retention structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and/or restructuring flows. However, it is not anticipated to affect the water balance at a water body scale. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	Bed lowering is not expected to affect water balance.	There will be some dewatering during construction of the control structures, such as to remove contaminated water or soils from the working areas. Although this will be temporary, it could be a maximum period of 1 year for each structure. Therefore, given the potential for multiple locations of dewatering during the construction period, there is a risk this element will increase pressures on groundwater, affecting the overall water balance at the water body scale. At operation, compaction of the ground may lead to altering the flow or limiting infiltration into the aquifer thereby depleting the aquifer.	Compaction of natural ground from presence of material stockpiles may alter infiltration and flow pathways, however this will be only be in the vicinity of the works and the sites will still allow for infiltration into the ground surrounding the stockpiles. Therefore, although re-charge rate may be slightly reduced due to additional distance to find permeable ground, overall water balance at the water body scale will be unaffected.	**Scoped in** to detailed assessment due to dewatering during construction potentially increasing pressures on groundwater.	Drought scenario modelling to be undertaken. Discussions with Thames and Affinity Water will form part of the design of the drought scenario assessment and will include consideration of potential issues with turbidity. Detailed construction methods and plans have not yet been issued.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification [15]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements						Scoped in or out of detailed assessment	Uncertainties / Gaps
			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
			the potential to increase the long term annual average recharge of the water body and therefore result in more available groundwater resource. During flood conditions there will be a reduction in peak groundwater levels by up to about 1.75m, which will tend to reduce groundwater flood risk.	around the structures. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.			However, this will only be in the vicinity of the areas of new green open space and infiltration into the ground surrounding the sites will still occur. Therefore, although the local re-charge rate may be slightly reduced due to additional distance for local run-off to travel to encounter permeable ground, overall water balance at the water body scale will be unaffected.			
Chemical elements										
Saline or other intrusions This test is designed to identify groundwater bodies where the intrusion of poor-quality water, such as saline water, as a	Good	**Ecological Surveys Project borehole monitoring records** **Site Investigation boreholes** **Groundwater monitoring data DHI/Stantec modelling, 2023**	Construction of the flood relief channel, typically dug 'wet' through natural ground and sheet piled in sections of landfill (using a sealed impervious system), will not cause any sustained intrusion of saline or other poor water quality. Once in operation, groundwater modelling (DHI/Stantec, 2023) predicts that in non-flood conditions, there will be a rise in	Construction of the intake and outfall structures will not alter the chemical classification for saline or other intrusions. See 'Construction and operation of flood relief channel' section for potential	Construction of the level retention structures will not alter the chemical classification for saline or other intrusions. See 'Construction and operation of flood relief	Bed lowering will not alter the chemical classification for saline or other intrusions. No additional saltwater or poor quality water infiltration into the aquifer nor abstraction/loss of freshwater leading to	No additional saline or other intrusions into the aquifer nor abstraction/loss of freshwater leading to saline or other intrusions is expected as a result of construction or operation.	No additional saline or other intrusions into the aquifer nor abstraction/loss of freshwater leading to saline or other intrusions is expected as a result of construction or operation.	**Scoped in** to the detailed assessment due to the risk from operation of the flood channel.	Detailed analysis of baseline water quality conditions have yet to be undertaken. Detailed construction methods and plans have not yet been issued.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification [15]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements						Scoped in or out of detailed assessment	Uncertainties / Gaps
			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
result of groundwater abstraction, is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.			groundwater levels of 0.5 to 1.7m across a wide area which includes Chertsey and Littleton North. This risks potentially introducing poorer quality water from the wider River Thames catchment into the groundwater in this area, which would increase concentrations of pollutants or significant impact on groundwater abstractions.	effects from operation of the control structures.	channel' section for potential effects from operation of the control structures.	intrusion is expected as a result of construction or operation.				
Chemical Dependent Surface Water Body Status This test is designed to identify groundwater bodies where chemical inputs from groundwater is leading to a significant diminution of the ecological status of associated surface	Poor	**DHI/Stantec modelling, 2023** **Site water quality monitoring (surface water and groundwater)**	During construction, contaminated groundwater will be dewatered within the channel, where necessary. This will be localised and temporary, therefore not expected to affect any surface water bodies dependent on groundwater. The operation of the flood relief channel will not include any dewatering or abstraction of the aquifer. Where the flood relief channel passes through landfill sites, it will be sheet piled for up to 2.1km (approximately 0.9 kilometres in length in this water body) using a sealed impervious system in sections of landfill. The sheet piling aims to	There is potential for the construction of the intake and outfall structures to disperse or mobilise landfill leachate where the structures are located within, causing changes in groundwater quality which may lead to impacts on surface water quality. However, due to the size of the structures any effects from this	There is potential for the construction of the level retention structures to disperse or mobilise landfill leachate where the structures are located within or near landfill sites, causing changes in groundwater quality which may lead to impacts on surface water quality.	Excavation during bed lowering may release contaminated sediments and leachate that may enter groundwater. As this work is within a surface water body, the disturbance of contaminated sediments will not result in inputs to groundwater affecting the ecological status of the	There is a risk that contaminated excavated material will be re-used (within new green open space or priority areas for habitat, creation, enhancement or mitigation) leading to infiltration and subsequent contamination of the aquifer. This is likely to be a localised impact and addressed through appropriate review and investigation of ground conditions and material screening. This will	There is potential for spillage of hazardous or contaminated water during storage causing changes in groundwater quality which may lead to impacts on surface water quality. However this risk will be localised and temporary and will be addressed through appropriate	**Scoped in** to the detailed assessment due to the construction and operation of the flood channel and potential mobilisation of contaminants during construction.	Hydrogeological Risk Assessment has yet to be completed.

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			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
water bodies.			minimise leachate input into the channel and downstream surface waters, however there is a risk of leakages and their presence also risks altering leachate pathways, both aspects will potentially increase chemical inputs into groundwater dependent surface waters. Once in operation, groundwater modelling (DHI/Stantec, 2023) predicts that in non-flood conditions, there will be a rise in groundwater levels of 0.5 to 1.7m across a wide area which includes Chertsey and Littleton North. This risks potentially introducing poorer quality water from the wider River Thames catchment into the groundwater in this area, which would potentially increase concentrations of pollutants in other dependent surface water bodies and affect their ecological status Maintenance of the channels will require dredging which may release contaminated leachate. This will be localised and temporary and risk will be addressed through appropriate review and investigation of ground	element of the project will be temporary, localised, and limited to the area immediately around the structures (some of which are already within areas of contaminated land) Therefore, the effect from construction of these structures is negligible. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	However, due to the size of the structures any effects from this element of the project will be temporary, localised, and limited to the area immediately around the structures. Therefore, the effect from construction of these structures is negligible. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	surface water body. Furthermore, this risk will be localised and temporary and will be addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP.	form part of the hydrogeological risk assessment with methodology captured within the EAP/CEMP. In addition, tertiary mitigation and environmental permits will be in place to minimise this risk, but further assessment is required to assess whether the residual risk is acceptable for this element.	review and investigation of ground conditions prior to material excavations and will form part of the hydrogeological risk assessment and methodology captured within the EAP/CEMP.		

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			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
			conditions and as part of the hydrogeological risk assessment and EAP/CEMP.							
GWDTE's This test is designed to identify groundwater bodies where chemical contribution from groundwater is leading to "significant damage" to terrestrial ecosystems which critically depend on the groundwater body flows and / or chemical inputs.	Good	**Groundwater Dependent Terrestrial Ecosystems (England only) Cycle 2 WFD. Based on SSSI outlines from Natural England, filtered to include only those sites with wetland vegetation communities listed in UK Technical Advisory Group paper 5 a-b (2004).** **UK Habitat surveys** **Reconnaissance surveys** **DHI/Stantec modelling, 2023** **Groundwater monitoring data**	Relevant GWDTE's within EIA scoping boundary: 1. Dumsey Meadow SSSI At its closest point, the channel is over 500m from the SSSI and separated by the River Thames, other water bodies and / or existing landfills. There is no direct connection between the Project and Dumsey Meadow SSSI. The Project has the potential to create new preferential pathways due to the length of some of the sections of sheet piling (up to ~2.1km). At Dumsey Meadow, during non flood conditions, groundwater modelling (DHI/Stantec, 2023) predicts that groundwater levels will be largely unchanged (0-0.2m increase in levels), whilst during flood conditions there will be a 0.8-1.6m reduction in groundwater levels. Therefore, there will be reduced risk of groundwater contamination due to reduced risk of flooding.	The intake and outfall structures will not effect the chemical classification for GWDTE's, as no sites are in close proximity (>500m) to these structures. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	The level retention structures will not effect the chemical classification for GWDTE's, as no sites are in close proximity (>500m) to these structures. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	Excavation during bed lowering may release contaminated sediments and leachate that may enter groundwater. However, this risk will be localised and temporary and not within the proximity to GWDTE's.	There is a risk that contaminated excavated material will be re-used (within new green open space or priority areas for habitat, creation, enhancement or mitigation) leading to infiltration and subsequent contamination of the aquifer. This is likely to be a localised impact and addressed through appropriate review and investigation of ground conditions and material screening. This will form part of the hydrogeological risk assessment with methodology captured within the EAP/CEMP. In addition, tertiary mitigation and environmental permits will be in place to minimise	There is potential for spillage of hazardous or contaminated water during storage causing changes in groundwater quality. However this risk will be localised and temporary and will be addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP. Dumsey Meadow SSSI is within 800m of the proposed stockpile site, however barriers to flow in-between	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment.	Identification of GWDTE that are not classified by the Environment Agency are not yet completed. GWDTE identified by the Environment Agency are for Cycle 2 only, Cycle 3 is not yet available. This will require review at the next assessment stage. Detailed construction methods and plans have not yet been issued.

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			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
							this risk, so that the residual risk is at an acceptable level for this element	include the M3 and the River Thames and therefore considered unlikely that localised changes at stockpiles will affect GWDTE's.		
Drinking Water Protected Areas (DrWPAs) *Designated DrWPA, SPZ 1, 2 and 3.* This test is designed to identify whether there is deterioration in groundwater quality due to anthropogenic influences that could lead to an increase in purification	Good	**DHI/Stantec modelling, 2023** **Groundwater monitoring data**	There are two groundwater abstraction sites intended for human consumption within this groundwater body and the RTS study area, Chertsey and Desborough Island. The channel at Abbey Meads (adjacent to abstractions at Chertsey) has been designed to be a wide, shallow and predominantly dry floodway. This will enable physical contact to the SPZ1 aquifer to be avoided during construction and to minimise effects on groundwater levels at the abstractions points. Where the flood relief channel passes through landfill sites, it will be sheet piled for up to 2.1km. This will minimise landfill leachates reaching the channel, however there is still a risk of some leakages.	There is potential for the creation of new preferential pathways of mobilised landfill leachate due to the installation of the intake and outfall structures. However, due to the size of the structures any effects from the construction of this element will be temporary and limited to the area immediately around the structures. See 'Construction and operation of	There is potential for the creation of new preferential pathways of mobilised landfill leachate due to the installation of the level retention structures. However, due to the size of the structures any effects from this element of the project will be localised and limited to the area immediately around the structures.	Bed lowering downstream of Desborough Cut is downstream of the two groundwater abstraction sites within the study area. Excavation during bed lowering may release contaminated sediments and leachate that may enter groundwater. However this risk will be localised and temporary and will be addressed through appropriate	There is a risk that contaminated excavated material will be re-used within these areas leading to infiltration and contamination of the aquifer. This is likely to be a localised impact and addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment, environmental permits and EAP/CEMP.	There is potential for spillage of hazardous or contaminated water during causing changes in groundwater quality. However this risk will be localised and temporary and will be addressed through appropriate review as part of the hydrogeological risk assessment and EAP/CEMP.	**Scoped in** to the detailed assessment due to the operation of the flood channel.	Drought scenario modelling to be undertaken. Discussions with Thames and Affinity Water will form part of the design of the drought scenario assessment and will include consideration of potential issues with turbidity. It is noted that the gravels have already been extensively

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			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
treatment. The assessment is required at the point of abstraction for drinking water.			Furthermore, the sheet piled sections could also risk altering leachate pathways. At operation, during non flood conditions, there will be a augmentation flow (of up to 1m^3/s). Groundwater modelling (DHI/Stantec, 2023) predicts that in non flood conditions, there will be a rise in groundwater levels of 0.5 to 1.7m within the vicinity of Affinity Water's Chertsey abstraction sites. This change in resource from the northern section of the channel, where it passes through landfill sites and introduces River Thames water to the groundwater, risk deteriorating the groundwater quality at Chertsey which could lead to an increase in purification treatment. During periods of low flows on the River Thames, the augmentation flow will potentially need to be adapted to minimise any effects (quality and quantity) on public water supply. The effects of this are currently being investigated, and therefore considered a risk to WFD compliance at this stage.	flood relief channel' section for potential effects from operation of the control structures.	See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP.				disturbed by previous gravel extractions and landfilling, affecting groundwater flows and directions in the area. Detailed construction methods and plans have not yet been issued.

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			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
			Maintenance of the channels will require dredging which may release contaminated leachate. This will be localised and temporary and risk will be addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP.							
General chemical quality assessment This test is designed to is to assess if the impact of groundwater pollution is sufficiently widespread to compromise the use of the groundwater resource either currently or in the future. It is not intended to assess local	Poor	**DHI/Stantec modelling, 2023** **Groundwater monitoring data**	Local changes in groundwater quality are likely to occur where the flood relief channel passes through landfill sites, as a result of the sheet piled sides altering groundwater pathways. However, it is expected that these changes will be localised and contained with the landfill and their margins. Given the historic landfills date from an era before current environmental and regulatory legislation and were likely installed following the “dilute and disperse” principle (WBi, 2022), it is likely that many of the pollutants will already infiltrate into the aquifer. However, these sites and linkages with the groundwater body have not yet been investigated, and	There is potential for the creation of new preferential pathways of mobilised landfill leachate and changes in groundwater quality due to the installation of the intake and outfall structures. However, due to the size of the structures any effects from this element of the project will be localised and limited to the area immediately around the structures.	There is potential for the creation of new preferential pathways of mobilised landfill leachate and changes in groundwater quality due to the installation of the water level control structures. However, due to the size of the structures any effects from this element of the project will be localised and limited to the area	Excavation during bed lowering may release contaminated sediments and leachate that may enter groundwater. This risk will be localised and temporary and will be addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP. Further	There is a risk that contaminated excavated material will be re-used within these areas leading to infiltration and contamination of the aquifer. This is likely to be a localised impact and addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP.	There is potential for spillage of hazardous or contaminated water during storage causing changes in groundwater quality. However this risk will be localised and temporary and addressed through appropriate mitigation as part of the EAP/CEMP.	**Scoped in** to the detailed assessment due to risk from the operation of the channel and bed lowering downstream of Desborough Cut	Specific sites have not been identified where historic landfills are already infiltrating contaminated leachate to the groundwater body. Detailed construction methods and plans have not yet been issued. Hydrogeological risk assessment

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification [15]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements						Scoped in or out of detailed assessment	Uncertainties / Gaps
			Construction and operation of flood relief channel	Construction and operation of channel intake or outfall structures	Construction and operation of flow control structures along new channel (weirs)	Bed lowering downstream of Desborough Cut	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites		
pollution impacts.			therefore there remains a risk of a pathway for contamination. During detailed design, localised risks will be addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP. At operation, the design of the channel is lined, within the landfill sections, to minimise groundwater-surface interchange within landfill areas. However, there is potential for pollutants from the wider River Thames catchment to enter the groundwater body via the channel, which has the potential to compromise the use of groundwater resource.	See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	immediately around the structures. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	assessment is required to assess whether the residual risk is acceptable for this element.				has yet to be completed

Lower Thames Gravels - GB40603G000300. Overall Status (2019) – Poor - Surface area (km2): 269.867

Designated/protected sites associated - Drinking Water Protected Area, Nitrates Directive, SPA & Ramsar site

Key

WFD classification (baseline) / Type of effect

(red)	Bad classification
(orange)	Poor classification
(yellow)	Moderate classification (or 'does not support Good')
	N/A (or no data)
(green)	Good classification
(blue)	High classification

Construction elements of the project affecting this water body are:

1) General construction and earthworks - part of Runnymede Channel and all of Spelthorne Channel will be cut into ground which is underlain by the Chobham Bagshot Beds groundwater body and will include the use of sheet piling. Includes:
    a. Spillage of hazardous materials during their movement to the road network and creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation.
    b. Lowering of river bed downstream of Desborough Cut within the Chobham Bagshot Beds groundwater body.
2) Construction of the flow control structures - Level retention structures consisting of shallow weirs along the southern part of Runnymede Channel and all of Spelthorne Channel and construction of the channel intake structures for Spelthorne Channel and outfall structures for Runnymede Channel and Spelthorne Channel.
3) Construction compounds, material processing and storage sites within the water body (including spillage of hazardous materials during their storage).

Operation elements of the project affecting this water body are:

1) Operation of the flood relief channel.
2) Operation of the channel intake structures for Runnymede Channel.
3) Flow control structures - Level retention structures consisting of shallow weirs along Runnymede Channel.
4) Creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
Quantitative Elements										
Saline or other intrusions This test is designed to identify any long-term intrusion of saline (or other poor water quality), as a result of groundwater abstraction, which is leading to a sustained upward trend in pollutant concentrations or significant impact on one or more groundwater abstractions.	Good	**Ecological Surveys Project borehole monitoring records / water levels** **Groundwater conditions and flow directions from the project Site Investigation works (GBV, 2017c)** **Site Investigation boreholes** **Groundwater monitoring data** **DHI/Stantec modelling**	Construction of the flood relief channel, typically dug 'wet' through natural ground and sheet piled, using a sealed impervious system in sections of landfill (see Assumptions and Uncertainties Section in the main report), will not cause any sustained intrusion of saline or other poor water quality. Once in operation, groundwater modelling (DHI/Stantec, 2023) predicts that in non flood conditions, the upper reaches of the Runnymede Channel (within this groundwater body) are acting as a drain, lowering groundwater levels by up to 0.8m. Due to this decline in groundwater levels, it is not anticipated there will be any intrusion of saline (or other poor quality water) which would be a risk failure of this test.	Construction of the intake and outfall structures will not alter the quantitative classification for saline or other intrusions. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	Construction of the level retention structures will not alter the quantitative classification for saline or other intrusions. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	No additional saline or other intrusions into the aquifer nor abstraction/loss of freshwater leading to saline or other intrusions is expected as a result of construction or operation.	No additional saline or other intrusions into the aquifer nor abstraction/loss of freshwater leading to saline or other intrusions is expected as a result of construction.	Construction of the capacity improvement works at Teddington Weir have the potential to create pathways for saline surface water infiltration into the groundwater body due to below ground construction elements in a tidal area. However, given the existing close proximity of the groundwater body to the tidal area and although the official tidal limit of the River Thames is at Teddington, in reality, tidal influence is observed as far upstream at Molesey in some conditions, it is unlikely that these works will result in a change potential intrusion conditions	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped Out** of detailed assessment	Detailed construction methods and plans have not yet been issued.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
								at a water body scale. With regards to risks of other intrusions, groundwater is already in good hydraulic connectivity to the River Thames at the capacity improvements, therefore it is not anticipated that there will be any new intrusions. Particular construction details are not available, however it is expected that the methodology will incorporate measure to ensure there is no saline intrusion as part of the EAP/CEMP.		

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
Dependent Surface Water Body Status This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies.	Good	**DHI/Stantec modelling** **Groundwater monitoring data** **Ecological Surveys**	Construction of the channel will include some below ground dewatering (to remove contaminated leachate in areas of landfill). The dewatering will be small scale, temporary and limited to the landfill site and therefore will not affect any dependent surface water bodies supported by groundwater. The operation of the flood relief channel will not include any dewatering or abstraction of the aquifer. Where the flood relief channel passes through landfill sites, it will be sheet piled for approximately 0.9km in length, using a sealed impervious system, within this water body. The sheet piled sections risk altering groundwater pathways, potentially diverting flows away from groundwater dependent surface water bodies, thus preventing them from meeting their required flow standards. Water level control structures have been	The installation of channel intake and outtake structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and / or restructuring flows. All structures will be built within coffer dams, deep piled into the impermeable clay. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	Water level control structures, either gated or fixed level control structures (WBi, 2023a) have been built-in to the design to control groundwater levels in areas surrounding the new flood relief channel. The installation of these structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and / or restructuring flows. All structures will be built within coffer dams, deep piled into the impermeable clay. Due to the size of the structures (up to 100m wide) any effects from the construction of this element will be localised and limited to the area	Construction will include some dewatering during construction of the control structures, such as to remove contaminated water or soils from the working areas. Although this will be temporary, it could continue for a maximum period of 1 year for each structure. Therefore, given the potential for multiple locations of dewatering during the construction period, there is a risk this element will increase pressures on groundwater which may affect dependent surface waters. Operation will not include any dewatering or abstractions of the aquifer associated with new green open space or priority areas for habitat creation, enhancement or mitigation.	There is no expected abstraction of the aquifer, therefore these construction activities are not expected to have any impact on quantitative dependent surface water body status.	Construction of the capacity improvement works at all three River Thames weirs will be undertaken within coffer dams, piled into the impermeable clay below. This will seal the working areas, stopping any groundwater from the surrounding area being drawn into the excavation. The coffer dam will create a barrier to groundwater flows in the area immediately surrounding the works, however this change will be very small and localised, ensuring any effect is negligible.	**Scoped in** to detailed assessment due to risk from the operation of the flood channel and dewatering during construction	Drought modelling scenario yet to be undertaken Detailed construction methods and plans have not yet been issued.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
			built-in to the design to control groundwater levels in areas surrounding the new flood relief channel. Modelling of groundwater flows when the flood channel and flow control structures are operational (DHI/Stantec, 2023) suggests that in non flood conditions, the upper reaches of the Runnymede Channel (within this groundwater body) are acting as a drain, lowering groundwater levels by up to 0.8m. Meanwhile, under flood conditions, groundwater levels along the River Thames are likely to be lower relative to the baseline. Given there is a good hydraulic connection between surface waters and groundwater in the study area and the predicted reduction in groundwater levels during operation, there is a risk of effects on groundwater dependent surface waters.		immediately around the structures. See ‘Construction and operation of flood relief channel’ section for potential effects from operation of the control structures.	At operation, compaction of the ground may lead to altering the flow or limiting infiltration into the aquifer thereby limiting available resource to surface water. This will be highly localised, and therefore negligible impact on overall status.				

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
Groundwater Dependent Terrestrial Ecosystems (GWDTE's) This test is designed to identify where groundwater abstraction is leading to "significant damage" to terrestrial ecosystems which depend directly on the groundwater body.	Good	Groundwater Dependent Terrestrial Ecosystems (England only) Cycle 2 WFD. Based on SSSI outlines from Natural England, filtered to include only those sites with wetland vegetation communities listed in UK Technical Advisory Group paper 5 a-b (2004). UK Habitat surveys Reconnaissance surveys DHI/Stantec modelling Groundwater monitoring data	Relevant GWDTE's within EIA scoping boundary: 1. Thorpe Hay Meadow SSSI Water level control structures have been built-in to the design to control groundwater levels in areas surrounding the new flood relief channel, preventing any substantial changes in groundwater conditions. Groundwater modelling (DHI/Stantec, 2023) shows that the project will lower groundwater levels in Thorpe Hay Meadow by up to 0.8m which will improve drainage in Spring, reduce the incidence of flooding and bring groundwater levels back to historic conditions (GBV, 2016a). This will reduce the existing negative abiotic factors currently degrading the meadow (GBV, 2016). However, the principal effect on the site is currently thought to be limited access for active management (e.g. to enable aftermath	The installation of channel intake and outtake structures has the potential to change groundwater levels by forming a barrier and/or altering the direction of flows. All structures will be built within coffer dams, deep piled into the impermeable clay. The intake for the Runnymede Channel is approximately 400m from Thorpe Hay Meadow. Due to the size of the structures, any effects on the GWDTE during construction will be temporary, localised, and limited to the area immediately around the structures. Therefore, any	Water level control structures, either gated or fixed level control structures (WBi, 2023a) have been built-in to the design to control groundwater levels in areas surrounding the new flood relief channel. The closest proposed control structure to Thorpe Hay Meadow is approximately 2.3km away, downstream of Thorpe Park Lakes. The installation of the structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and / or restructuring flows. All structures will be built within coffer dams, deep piled	No anticipated construction impacts to quantitative classification for GWDTE's. At operation, compaction of the ground may lead to altering the flow or limiting infiltration into the aquifer thereby limiting available resource, however this will be highly localised, and therefore negligible impact on overall status.	Compaction of natural ground from presence of material stockpiles may alter infiltration and flow pathways, however this will be highly localised. Thorpe Hay Meadows SSSI is adjacent to the proposed material processing site, however the site will still allow for infiltration into the ground surrounding the stockpiles and therefore overall no affect to quantitative supply.	The capacity improvements works will not alter the quantitative classification for GWDTE's.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Identification of GWDTE that are not classified by the Environment Agency are not yet completed. GWDTE identified by the Environment Agency are for Cycle 2 only, Cycle 3 is not yet available. This will require review at the next assessment stage.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
			grazing) (Natural England, 2023) (which will be improved with the Project in place); therefore the effect from changes in groundwater levels is unlikely to be significant.	effects on Thorpe Hay Meadow will be negligible. See 'Construction and operation of flood relief channel' section for potential effects from operation intake and outfall structures.	into the impermeable clay. Due to the structures distance from Thorpe Hay Meadow any effects from the construction of this element will not damage the GWDTE. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.					
Water balance This test is designed to identify groundwater bodies where groundwater abstraction exceeds the "available groundwater resource" at the water body scale.	Poor	DHI/Stantec modelling	Where the flood relief channel passes through landfill sites, it will be sheet piled for approximately 0.9km in this groundwater body. These sheet piled sections and the introduction of the augmented flow risk altering groundwater pathways, leading to a drop in levels. During operation, modelling of groundwater flows during non-flood conditions (DHI/Stantec, 2023) suggests that the	The installation of channel intake structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and/or restructuring flows. However, it is not anticipated to affect the water balance at a water body scale.	The installation of level retention structures has the potential to change groundwater levels by forming a barrier, altering the direction of flow and/or restructuring flows. However, it is not anticipated to affect the water balance at a water body scale.	Construction will include some dewatering during construction of the control structures, such as to remove contaminated water or soils from the working areas. Although this will be temporary, it could continue for a maximum period of 1 year for each structure. Therefore, given the potential for multiple locations of dewatering during the construction	Compaction of natural ground from presence of material stockpiles may alter infiltration and flow pathways, however this will only be in the vicinity of the work and the sites will still allow for infiltration into the ground surrounding the stockpiles. Therefore, although re-	Construction of the capacity improvement works at all three River Thames weirs will be undertaken within coffer dams, which will be piled into the impermeable clay below. This will seal the working areas, stopping any groundwater from the surrounding area being drawn into the excavation, ensuring this is	**Scoped in** to detailed assessment due to risk from the operation of the flood channel and dewatering during construction.	Drought scenario modelling to be undertaken. Discussions with Thames and Affinity Water will form part of the design of the drought scenario assessment and will include consideration of potential

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
			upper reaches of the Runnymede Channel (within this groundwater body) are acting as a drain, lowering groundwater levels by up to 0.8m. Although the water will return downstream near Chertsey and Shepperton, this is within the Chobham Bagshot Beds groundwater body. Therefore, there is a risk to the water balance of this groundwater body during operation.	All structures will be built within coffer dams, deep piled into the impermeable clay. Due to the size of the structures, any effects from this element of the project will be temporary, localised, and limited to the area immediately around the structures. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	period, there is a risk this element will increase pressures on groundwater, affecting the overall water balance at the water body scale. At operation, compaction of the ground may lead to altering the flow or limiting infiltration into the aquifer thereby depleting the aquifer. However, this will be highly localised and infiltration into the ground surrounding the sites will still occur. Therefore, although re-charge rate may be slightly reduced due to additional distance to find permeable ground, overall water balance will be unaffected.	charge rate may be slightly reduced due to additional distance to find permeable ground, overall water balance at the water body scale will be unaffected.	only a negligible effect on the water balance at the water body scale.		issues with turbidity. Detailed construction methods and plans have not yet been issued.
Chemical elements										
Saline or other intrusions This test is designed to identify	Good	Ecological Surveys Project borehole monitoring records	Construction of the flood relief channel, typically dug 'wet' through natural ground and sheet piled in sections of landfill, will not cause any sustained	Construction of the intake and outfall structures will not alter the chemical classification for	Construction of the level retention structures will not alter the chemical classification for saline or other intrusions.	No additional saline or other intrusions into the aquifer nor abstraction/loss of freshwater leading to saline or other intrusions is	No additional saline or other intrusions into the aquifer nor abstraction/loss of freshwater leading to saline	Construction of the capacity improvement works at Teddington Weir have the potential to create pathways for saline surface	No risk from any individual modification identified. No in-combination construction effects	Detailed construction methods and plans have not yet been issued.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
groundwater bodies where the intrusion of poor-quality water, such as saline water, as a result of groundwater abstraction, is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.		Site Investigation boreholes Groundwater monitoring data DHI/Stantec modelling	intrusion of saline or other poor water quality. Once in operation, groundwater modelling (DHI/Stantec, 2023) predicts that in non-flood conditions, the Runnymede Channel will act as a drain, lowering groundwater levels by up to 0.8m within this groundwater body. Consequently, there will be no saline or other intrusion into this water body as a consequence of the project.	saline or other intrusions. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	expected as a result of construction or operation.	or other intrusions is expected as a result of construction or operation.	water infiltration into the groundwater body due to below ground construction elements in a tidal area. However, given the existing close proximity of the groundwater body to the tidal area and although the official tidal limit of the River Thames is at Teddington, in reality, tidal influence is observed as far upstream at Molesey in some conditions, it is unlikely that these works will result in a change potential intrusion conditions at a water body scale. Particular construction details are not available, however it is expected that the methodology will incorporate measure to ensure there is no saline	identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
								intrusion as part of the EAP/CEMP.		
Dependent Surface Water Body Status This test is designed to identify groundwater bodies where chemical inputs from groundwater is leading to a significant diminution of the ecological status of associated surface water bodies.	Good	DHI/Stantec modelling Site water quality monitoring (surface water and groundwater	During construction, contaminated groundwater will be dewatered within the channel, where necessary. This will be localised and temporary, and therefore not expected to affect any surface water bodies dependent on groundwater. The operation of the flood relief channel will not include any dewatering or abstraction of the aquifer. Where the flood relief channel passes through landfill sites, it will be sheet piled for up to 0.9km within this groundwater body. The sheet piling aims to minimise leachate input into the channel and downstream surface waters, however there is a risk of leakages and their presence also risks altering leachate pathways, both aspects will potentially increase chemical inputs into groundwater dependent surface waters.	There is potential for the construction of the intake and outfall structures to disperse or mobilise landfill leachate where the structures are located within, causing changes in groundwater quality which may lead to impacts on surface water quality. However, due to the size of the structures any effects from this element of the project will be localised and limited to the area immediately around the structures(some of which are already within areas of contaminated land). Therefore, the effect from construction of	There is potential for the construction of the level retention structures to disperse or mobilise landfill leachate where the structures are located within or near landfill sites, causing changes in groundwater quality which may lead to impacts on surface water quality. However, due to the size of the structures any effects from this element of the project will be localised and limited to the area immediately around the structures. Therefore, the effect from construction of these structures is negligible. See 'Construction and operation of flood relief channel' section for potential	There is a risk that contaminated excavated material will be re-used (within new green open space or priority areas for habitat, creation, enhancement or mitigation) leading to infiltration and subsequent contamination of the aquifer. This is likely to be a localised impact and addressed through appropriate review and investigation of ground conditions and material screening. This will form part of the hydrogeological risk assessment with methodology captured within the EAP/CEMP. In addition, tertiary mitigation and environmental permits will be in place to minimise this risk, so that the residual risk is at an acceptable level for this element	There is potential for spillage of hazardous or contaminated water during storage causing changes in groundwater quality which may lead to impacts on surface water quality. However this risk will be localised and temporary and will be addressed through appropriate review and investigation of ground conditions prior to material excavations and will form part of the hydrogeological risk assessment and methodology captured within the EAP/CEMP.	The capacity improvements are not known to be within areas of contaminated land, reducing the risk of mobilising leachates during construction. The works will be constructed within a coffer dam, which will be piled down the to impermeable clay, ensuring no contaminants within the coffer dam can be dispersed into the surrounding area. Furthermore, due to the size of the structures any effects from this element of the project will be temporary, localised and limited to the area immediately around the structures.	**Scoped in** to detailed assessment due to the risk from the operation of the flood channel	

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
			During detailed design, localised risks will be addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP. Further assessment is required to assess whether the residual risk is acceptable for this element.	these structures is negligible. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	effects from operation of the control structures.					
GWDTE's This test is designed to identify groundwater bodies where chemical contribution from groundwater is leading to "significant damage" to terrestrial ecosystems which critically depend on the groundwater body flows and / or chemical inputs.	Good	**Groundwater Dependent Terrestrial Ecosystems (England only) Cycle 2 WFD. Based on SSSI outlines from Natural England, filtered to include only those sites with wetland vegetation communities listed in UK Technical Advisory Group paper 5 a-b (2004).** **UK Habitat surveys**	Relevant GWDTE's within EIA scoping boundary: 1. Thorpe Hay Meadow SSSI Where the channel passes through areas of landfill, the channel will be heavily engineered with sheet piled sides to ensure any landfill leachates cannot reach surface waters or GWDTE's via the channel. The project has the potential to create new preferential pathways due to the length of some of the sections of sheet piling up to 0.9km in this groundwater body. Although Thorpe Hay	The intake and outfall structures will not effect the chemical classification for GWDTE's, as no sites are in proximity to these structures. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	The level retention structures will not effect the chemical classification for GWDTE's, as no sites are in proximity to these structures. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	There is a risk that contaminated excavated material will be re-used (within new green open space or priority areas for habitat, creation, enhancement or mitigation) leading to infiltration and subsequent contamination of the aquifer. This is likely to be a localised impact and addressed through appropriate review and investigation of ground conditions and material screening. This will form part of the hydrogeological risk assessment with	Thorpe Hay Meadows is adjacent to a proposed material processing site. There is potential for spillage of hazardous or contaminated water during storage causing changes in groundwater quality. However, this risk will minimised through suitable measures proposed and put in place as conditions of the environmental permits.	The capacity improvements works will not alter the chemical classification for GWDTE's.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Identification of GWDTE that are not classified by the Environment Agency are not yet completed. GWDTE identified by the Environment Agency are for Cycle 2 only, Cycle 3 is not yet available. This will require review at the next assessment stage.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
		Reconnaissance surveys **DHI/Stantec modelling, 2023** **Groundwater monitoring data**	Meadow is adjacent to known historic landfill sites, analysis of groundwater quality data found there are currently no exceedances that indicate a significant impact on groundwater quality from the surrounding landfills (GBV, 2016). Groundwater modelling (DHI/Stantec, 2023) shows that the project will lower groundwater levels under the meadow, reducing the potential impact from any leachate, if present, on the meadow.			methodology captured within the EAP/CEMP. In addition, tertiary mitigation and environmental permits will be in place to minimise this risk, so that the residual risk is at an acceptable level for this element				
Drinking Water Protected Areas (DrWPAs) This test is designed to identify whether there is deterioration in groundwater quality due to anthropogenic influences that could lead to an increase in	Good		Within this water body, there is a groundwater drinking water abstraction site at Egham, over 2km upstream of the Runnymede Channel. Groundwater modelling (DHI/Stantec, 2023) shows that at Egham, the project will have minimal effects on groundwater, up to 0.2m increase in levels during non-flood conditions. In addition, there are two groundwater abstraction sites intended for human consumption within the	There is potential for the creation of new preferential pathways of mobilised landfill leachate due to the installation of the intake and outfall structures. However, as the closest drinking water abstraction site in this groundwater body is over 2km upstream, construction of	There is potential for the creation of new preferential pathways of mobilised landfill leachate due to the installation of the flow control structures. However, as the closest drinking water abstraction site in this groundwater body is over 2km upstream, construction of these structures will not affect abstractions.	There is a risk that contaminated excavated material will be re-used within these areas leading to infiltration and contamination of the aquifer. This is likely to be a localised impact and addressed through suitable measures proposed and put in place as conditions of the environmental permits. As the closest drinking water abstraction site in	There is potential for spillage of hazardous or contaminated water during construction, causing changes in groundwater quality. However, this risk will be localised and temporary and will be addressed through suitable measures proposed and put in place as conditions of the environmental permits.	The capacity improvements works will not alter the chemical classification for DrWPAs.	No risk from any individual modification identified. No in-combination construction effects identified due to implementation of tertiary mitigation. No in-combination operational effects identified. **Scoped out** of detailed assessment	Specific sites have not been identified where historic landfills are already infiltrating contaminated leachate to the groundwater body. Detailed construction methods and plans have

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
purification treatment. The assessment is required at the point of abstraction for drinking water.			RTS study area, Chertsey and Desborough Island. Although nearby, both are within the Chobham Bagshot Beds groundwater body. Assessment of this test is required at the point of abstraction (UKTAG, 2019). As the groundwater abstraction sites of concern for this project are not within this groundwater body, there is no risk of deterioration to this element for this groundwater body. See Chobham Bagshot Beds for potential effects on the groundwater abstraction sites at Chertsey and Desborough Island.	these structures will not affect abstractions. See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	See 'Construction and operation of flood relief channel' section for potential effects from operation of the control structures.	this groundwater body is over 2km upstream, construction of these structures will not affect abstractions.	As the closest drinking water abstraction site in this groundwater body is over 2km upstream, construction of these structures will not affect abstractions.			not yet been issued. Hydrogeological risk assessment has yet to be completed
General chemical test This test is designed to is to assess if the impact of groundwater pollution is sufficiently widespread to compromise the use of the groundwater	Good	**DHI/Stantec modelling, 2023** **Groundwater monitoring data**	Local changes in groundwater quality are likely to occur where the flood relief channel passes through landfill sites, as a result of the sheet piled sides altering groundwater pathways. However, it is expected that these changes will be localised and contained with the landfill. Given the historic landfills date from an era before current	There is potential for the creation of new preferential pathways of mobilised landfill leachate and changes in groundwater quality due to the installation of the intake and outfall structures. However, due to	There is potential for the creation of new preferential pathways of mobilised landfill leachate and changes in groundwater quality due to the installation of the water level control structures. However, due to the size of the structures any	There is a risk that contaminated excavated material will be re-used within these areas leading to infiltration and contamination of the aquifer. This is likely to be a localised impact and addressed through appropriate review and investigation of ground conditions and as part of the	There is potential for spillage of hazardous or contaminated water during storage causing changes in groundwater quality. However this risk will be localised and temporary and addressed through appropriate	The capacity improvements are not known to be within areas of contaminated land, reducing the risk of mobilising leachates during construction. The works will be constructed within a coffer dam, which will be piled down the to impermeable clay, ensuring no	**Scoped in** due to the detailed assessment due to the risk from the operation of the channels	Hydrogeological risk assessment has yet to be completed Detailed construction methods and plans have not yet been issued.

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
resource either currently or in the future. It is not intended to assess local pollution impacts.			environmental and regulatory legislation and were likely installed following the “dilute and disperse” principle (WBi, 2022), it is likely that many of the pollutants will already infiltrate into the aquifer. However, these sites and linkages with the groundwater body have not yet been investigated, and therefore there remains a risk of a pathway for contamination. At operation, the design of the channel is lined within the landfill sections and the sheet piling will use a sealed system, to minimise groundwater-surface interchange. In addition, given that this groundwater body is already in good hydraulic connectivity to the wider Thames catchment, the input of potentially polluted surface water from the River Thames into the flood relief channels is not anticipated to affect groundwater quality at the water body scale.	the size of the structures any effects from this element of the project will be localised and limited to the area immediately around the structures. See ‘Construction and operation of flood relief channel’ section for potential effects from operation of the control structures.	effects from this element of the project will be localised and limited to the area immediately around the structures. See ‘Construction and operation of flood relief channel’ section for potential effects from operation of the control structures.	hydrogeological risk assessment and EAP/CEMP.	mitigation as part of the EAP/CEMP.	contaminants within the coffer dam can be dispersed into nearby aquifers and there will be negligible changes in groundwater quality.		

Quantitative Objective - Good by 2015 Chemical Objective - Good by 2015 Overall Objective - Good by 2015	Current Cycle 3 2019 RBMP classification[16]	Evidence and data sources	Modifications to water body (from Tables 5 and 6 in WFD Preliminary Assessment Report) - Potential effects of modifications on WFD quality elements							
			Construction and operation of flood relief channel	Construction and operation of channel intake structures	Construction and operation of flow control structures along new channel (weirs)	General construction activities and earthworks (including creation of new green open space and creation of priority areas for habitat creation, enhancement or mitigation)	Construction compounds, material processing and storage sites	Existing River Thames weir capacity improvement	Scoped In or Out of detailed assessment	Uncertainties / Gaps
			During detailed design, localised risks will be addressed through appropriate review and investigation of ground conditions and as part of the hydrogeological risk assessment and EAP/CEMP. Further assessment is required to assess whether the residual risk is acceptable for this element.							

Preliminary Environmental Information Report

Volume 4
Appendix 18.1

Appendix C

Initial Screening of Projects

The table below includes a list of projects identified and considered for potential cumulative effects for WFD. The PEIR long list of projects (PEIR Appendix 19.1) has been refined to assess only those projects that may have a water connection.

Project	Distance to RTS (closest element)	Brief description of works	Potential for direct (site specific) impact to a WFD water body included within RTS preliminary screening[1]	Potential for indirect (upstream/ downstream) impact to a WFD water body included within RTS preliminary screening[1]	Initial screening and reason	In/Out of further assessment
Western Rail Link to Heathrow (129088-JAC REP-EMF-000001 Rev A02).	4km from Land South of Wraysbury Reservoir priority area	Western Rail Link to Heathrow. A new rail connection on the Great Western Main Line, providing a more direct rail route for passengers travelling to Heathrow.	**NO**	**NO**	**SCREENED OUT:** The scoping report for this project has not identified any potential impacts to water bodies screened in to the WFD assessment.	**OUT**
Shepperton Studios expansion (7210693 / 18/01212/OUT)	0.85km from Sheepwalk Lakes priority area	The redevelopment of Shepperton Studios: demolitions and new builds, new vehicular and pedestrian access from Shepperton Road and the relocation of existing access off Studios Road.	**YES** • Chobham Bagshot Beds Groundwater body. • Surrey Ash (Screened out of the WFD assessment).	**NO**	**SCREENED OUT:** The Shepperton Studio expansion has no direct connectivity to any RTS screened in surface water bodies. Alteration to surface drainage will be minor and highly localised. Direct effects will be limited as remediation of land and groundwater protection measures will be included within the design of the project.	**OUT**
Brett Aggregates Ltd (Surrey CC Ref 2021/0023) (Surrey CC Ref 2021/0013) / (Surrey CC Ref 2021/0030) / (Surrey CC Ref 2020/0052)	2.2km from Laleham Reach priority area	Installation of a concrete screed plant including silo, water tank, batch tower and aggregate storage bin for use in connection with existing concrete batching plant at Queen Mary Quarry (retrospective).	**YES** • Chobham Bagshot Beds groundwater body. • Lower Thames Gravels groundwater body. • Queen Mary Reservoir • Surrey Ash (Screened out of the WFD assessment.	**NO**	**SCREENED OUT:** This project concluded no likely impacts to surface or groundwater bodies.	**OUT**
Brett Aggregates Ltd (Surrey CC Ref 2012/0061)	0.3km to Laleham Reach priority area	Extraction of sand and gravel and restoration to landscaped lakes for nature conservation after use at Manor Farm, Laleham and provision of a dedicated area on land at Manor Farm adjacent to Buckland School for nature conservation study; processing of the sand and gravel in the existing Queen Mary Quarry (QMQ) processing plant and retention of the processing plant for the duration of operations; erection of a concrete batching plant and an aggregate bagging plant within the existing QMQ aggregate processing and stockpiling areas. Installation of a field conveyor for the transportation of mineral and use for the transportation of mineral from Manor Farm to the QMQ processing plant; and construction of a tunnel beneath the Ashford Road to accommodate a conveyor link between Manor Farm and QMQ for the transportation of mineral.	**YES** • Chobham Bagshot Beds groundwater body. • Lower Thames Gravels groundwater body. • Queen Mary Reservoir • Surrey Ash (Screened out of the WFD assessment).	**NO**	**SCREENED IN:** This project involves below ground working with potential for changes in water levels and contamination to groundwater bodies in common with the RTS.	**IN**
Brett Aggregates Ltd (Surrey CC Ref 2019/0099 / SCC Ref 2020/0049)	2.2km to Laleham Reach priority area	Land at Queen Mary Quarry, west of Queen Mary Reservoir, Ashford Road, Laleham, Staines - Construction of a new double weighbridge and office building and the subsequent demolition of the existing double weighbridge and office building.	**YES** • Chobham Bagshot Beds groundwater body. • Lower Thames Gravels groundwater body. • Queen Mary Reservoir • Surrey Ash (Screened out of the WFD assessment).	**NO**	**SCREEENED OUT:** This Project is expected to be a like-for-like replacement of the existing buildings and therefore is not predicted to have any additional impacts that could be considered cumulative with the RTS.	**OUT**
CEMEX UK Operations Ltd (Surrey CC Ref 2021/0023)	2.3km from Runnymede Channel	Extraction of sand and gravel from land at Whitehall Farm together with the erection of processing plant and associated mineral infrastructure, the provision of a new access from Stroude Road, restoration involving the importation of inert materials to agriculture, parkland, wet grassland, reedbeds, and new woodland on a site of approximately 38 Ha, and the temporary closure of	**YES** - The Moat at Egham	**YES**	**SCREENED IN:** This project involves below ground working with potential for changes in water levels and contamination to groundwater bodies in common with the RTS.	**IN**
Brett Aggregates Ltd. Surrey CC Ref (2021/0141)	0.3km to Laleham Reach priority area	Manor Farm Quarry, Ashford Road, Laleham - Section 73 planning application to vary conditions 2, 44 and 48 of planning permission SP/2012/01132 for the extraction of sand and gravel at Manor Farm Quarry including ancillary development and the restoration of the site.	**YES** • Chobham Bagshot Beds groundwater body. • Lower Thames Gravels groundwater body. • Queen Mary Reservoir • Surrey Ash (Screened out of the WFD assessment).	**NO**	**SCREENED OUT** - It is considered that any potential impacts on water bodies will be managed through the implementation of tertiary mitigation and therefore is not predicted to have any additional impacts that could be considered cumulative with the RTS.	**OUT**

Project	Distance to RTS (closest element)	Brief description of works	Potential for direct (site specific) impact to a WFD water body included within RTS preliminary screening[1]	Potential for indirect (upstream/ downstream) impact to a WFD water body included within RTS preliminary screening[1]	Initial screening and reason	In/Out of further assessment
Thames Valley Flood Scheme	0.0km overlaps with Project Boundary for EIA PEIR	The Thames Valley Flood Scheme is investigating ways to manage flood risk on a large scale across the Thames Valley catchment. This is the area of land around the non-tidal section of the River Thames and the rivers and streams that flow into it. This includes everything from the source of the Thames in Gloucestershire to the tidal limit in West London.	**YES** - All water bodies screened in, in the RTS WFD Assessment	**YES**	**SCREENED IN:** The project has not progressed to a stage with detailed measures and environmental assessments. However, it is acknowledged that the operation of the scheme could impact cumulatively with the construction and/or operation of the RTS	**IN**
Datchet to Hythe End Improvement Measures Project	0.0km overlaps with Project Boundary for EIA PEIR	The River Thames from Datchet to Hythe End was previously included in the River Thames Scheme as Channel 1. The Datchet to Hythe End Flood Improvement Measures project was therefore established. It aims to better protect communities, including approximately 3,700 properties, that would previously have benefited from Channel 1. Flood risk remains a very real threat in the area, with a history of floods that have hit communities. The main scheme is currently being developed and there is limited details on the measures to be implemented.	**YES** • Thames (Cookham to Egham) • Thames (Egham to Teddington)	**YES**	**SCREENED IN:** The project has not progressed to a stage with detailed measures and environmental assessments. However, it is acknowledged that the operation of the scheme could impact cumulatively with the construction and/or operation of the RTS	**IN**
Severn to Thames Transfer (STT)	0.0km overlaps with Project Boundary for EIA PEIR	This is a water transfer from the North West and Midlands to the South East to support the South East of England during drought events. The water would be provided from the River Severn itself, with additional sources of water provided by Severn Trent Water and United Utilities. The water would be moved from the River Severn to the River Thames either by a new pipeline or restoration of the Cotswold canals.	**YES** • Thames (Cookham to Egham) • Thames (Egham to Teddington) • Thames Upper • Thames Middle • Chobham Bagshot Beds groundwater body. • Lower Thames Gravels groundwater body.	**YES**	**SCREENED IN -** potential for waters of differing quality to interact with the RTS, which would cumulatively deteriorate/alter WQ conditions.	**IN**
South East Regional Resource Option (SESRO)	0.0km overlaps with Project Boundary for EIA PEIR	The South East Strategic Reservoir Option (SESRO)- would be built in the Upper Thames catchment, south west of Abingdon in Oxfordshire with live capacity of 100Mm3. It would be filled with raw water from the River Thames during periods of high river flow. When river levels drop or demand for water increases, water would be released back into the River Thames for re-abstraction downstream.	YES • Thames (Cookham to Egham) • Thames (Egham to Teddington) • Thames Upper • Thames Middle • Chobham Bagshot Beds groundwater body. • Lower Thames Gravels groundwater body.	**YES**	**SCREENED IN -** potential for waters of differing quality to interact with the RTS, which would cumulatively deteriorate/alter WQ conditions.	**IN**
South East Regional Resource Option (SESRO)	0.0km overlaps with Project Boundary for EIA PEIR	The South East Strategic Reservoir Option (SESRO)- would be built in the Upper Thames catchment, south west of Abingdon in Oxfordshire. It would be filled with raw water from the River Thames during periods of high river flow. When river levels drop or demand for water increases, water would be released back into the River Thames for re-abstraction downstream.	YES • Thames (Cookham to Egham) • Thames (Egham to Teddington) • Thames Upper • Thames Middle • Chobham Bagshot Beds groundwater body. • Lower Thames Gravels groundwater body.	**YES**	**SCREENED IN -** potential for waters of differing quality to interact with the RTS, which would cumulatively deteriorate/alter WQ conditions.	**IN**
London Water Recycling (Teddington Direct River Abstraction)	0.0km overlaps with Project Boundary for EIA PEIR	Highly treated recycled water would be moved from Mogden sewage treatment works upstream to compensate for the additional water abstraction from the Thames. This means water is put into the River Thames upstream of Teddington Weir.	**YES** • Thames (Egham to Teddington) • Thames Upper • Thames Middle	**YES**	**SCREENED IN -** potential for waters of differing quality to interact with the RTS, which would cumulatively deteriorate/alter WQ conditions.	**IN**

Project	Distance to RTS (closest element)	Brief description of works	Potential for direct (site specific) impact to a WFD water body included within RTS preliminary screening[1]	Potential for indirect (upstream/ downstream) impact to a WFD water body included within RTS preliminary screening[1]	Initial screening and reason	In/Out of further assessment
Mogden Water Recycling Scheme	0.0km overlaps with Project Boundary for EIA PEIR	Recycled water would be transferred in a new pipeline for discharge into the freshwater River Thames at an outfall upstream of the existing Thames Water Walton WTW intake. Additional abstraction for public water supply would be through existing intakes on the River Thames. Waste streams from the advanced water recycling plant would be returned to Mogden STW via pipeline, for treatment prior to being discharged into the Thames Tideway.	**YES** • Thames (Egham to Teddington) • Thames Upper	**NO**	**SCREENED IN -** potential for waters of differing quality to interact with the RTS, which would cumulatively deteriorate/alter WQ conditions.	**IN**
Surrey County Hall (21/03939/FUL / PP-10416630).	Approx 1.5km	Refurbishment, restoration and extension of Surrey County Hall (Grade II*).	**YES** • Thames (Egham to Teddington) • Thames Upper • Thames Middle	**YES**	**SCREENED OUT -** It is considered that any potential impacts on water bodies will be managed through the implementation of tertiary mitigation and therefore is not predicted to have any additional impacts that could be considered cumulative with the RTS.	**OUT**
Hanson Quarry Products (Surrey CC Ref 2009/0015)	1.8km from Runnymede channel	Mineral extraction together with the erection of processing plant and associated ancillary infrastructure, mineral processing and concrete production, the provision of a new roundabout access into Stroude Road and the restoration of the site to open grazed parkland and grassland through the importation of inert materials on a site of some 57 Ha.	**YES** - The Moat at Egham	**YES**	**SCREENED OUT -** It is considered that any potential impacts on water bodies will be managed through the implementation of tertiary mitigation and therefore is not predicted to have any additional impacts that could be considered cumulative with the RTS.	**OUT**
Longcross Garden Village (RU.22/0393 Runnymede)	Approx. 1km from Drinkwater Pit priority area	Outline planning application for a mixed use Garden Village development (1800 units) comprising: residential development (Use Classes C3), care home/extra care accommodation (Use Class C2), land reserved for up to 10 travelling show people plots (sui generis), retail, food and drink (Use Classes E and F.2), public house (sui generis), community facilities (Use Classes E, F1 and F2), employment use (Use Class E), a primary school including early years provision (Use Class F1), public open space including allotments, sports pitches and ancillary facilities (Use Class F2), Suitable Alternative Natural Greenspace (SANG) (Use Class F2), landscaping and associated infrastructure and works including enabling demolition and ground works (Environmental Statement submitted).	**YES** - Chertsey Bourne (Virginia Water to Chertsey)	**YES**	**SCREENED OUT -** It is considered that any potential impacts on surface and groundwater bodies will be managed through the implementation of a CEMP, good environmental practices and incorporation of SUDS and therefore is not predicted to have any additional impacts that could be considered cumulative with the RTS.	**OUT**
Norlands Lane Landfill. (RU.23/0470 Runnymede / Surrey CC 2023-0043)	0.0km from Norlands Lane priority area	Importation and recovery of inert engineering materials to allow improvements to gas management and surface water drainage, together with the provision of a long-term sustainable landform with associated biodiversity enhancements.	**YES** - Thorpe Park Lakes	**YES**	**SCREENED OUT -** It is considered that any potential impacts on surface and groundwater bodies will be managed through the implementation of a CEMP, good environmental practices and incorporation of SUDS and therefore is not predicted to have any additional impacts that could be considered cumulative with the RTS.	**OUT**
Norlands Lane Residential. (RU.23/0374 Runnymede (Original planning was RU.18/0703))	0.0km from Norlands Lane priority area	Alterations and change of use of offices to form 56 Extra Care apartments and communal facilities, and erection of 23 Extra Care apartments (79 in total) together with access and parking provisions to form a Continuing Care Retirement Community (Class C2).	**YES** - Thorpe Park Lakes	**YES**	**SCREENED OUT -** It is considered that any potential impacts on surface and groundwater bodies will be managed through the implementation of a CEMP, good environmental practices and incorporation of SUDS and therefore is not predicted to have any additional impacts that could be considered cumulative with the RTS.	**OUT**

Project	Distance to RTS (closest element)	Brief description of works	Potential for direct (site specific) impact to a WFD water body included within RTS preliminary screening[1]	Potential for indirect (upstream/ downstream) impact to a WFD water body included within RTS preliminary screening[1]	Initial screening and reason	In/Out of further assessment
Weylands Old Treatment Works. (2022/1444 Elmbridge)	Approx. 1km from Grove Farm priority area	Proposed hybrid development of an employment-led mixed-use development comprising of employment (B1, B2, B8 and Class E), affordable housing (C3) and in-building waste recycling (sui generis) following demolition of existing buildings and structures on site.	**YES** - Mole (Hersham to R. Thames conf at East Molesey)	**YES**	**SCREENED OUT -** It is considered that any potential impacts on surface and groundwater bodies will be managed through the implementation of a CEMP, good environmental practices and incorporation of SUDS and therefore is not predicted to have any additional impacts that could be considered cumulative with the RTS.	**OUT**

1 - Only water bodies included in the RTS preliminary WFD screening have been included as this is the limit of the potential impact of the RTS and therefore cumulative effects. Although some may have been screened out at the preliminary assessment stage they have been included here to account for the potential of cumulative effects resulting in a significant impact.

Screening decision

OUT	No further assessment required
IN	Further assessment required of cumulative impacts

Initial Screening of Plans

The table below includes a list of plans identified and considered for potential cumulative effects for WFD. Only plans which have been approved have been considered (i.e. only those which have gained permission to proceed).

Plan	Distance to RTS (closest element)	Plan and aims	Potential for direct (site specific) impact to a WFD water body included within RTS preliminary screening[1]	Potential for indirect (upstream/downstream) impact to a WFD water body included within RTS preliminary screening [1]	Initial screening and reason	In/Out of further assessment
Thames Estuary 2100 (TE2100) Plan - overall plan (further specific action plans are provided below) - Environment Agency	Lower reaches of the River Thames (Tidal Section)	High level policy document for managing flood risk through London and the Thames estuary up to 2100. The Thames Estuary 2100 project was established by the Environment Agency in 2002 with the aim of developing a strategic flood risk management plan for London and the River Thames estuary through to the end of the century. The Plan primarily looks at tidal flooding, though other sources of flooding including high river flows as a result of heavy rainfall and surface water flooding are considered. Very few specific projects are identified and sufficient detail on the likelihood, type of work and timeframes is not provided. The majority of the plan is high level although some specific habitat creation/replacement areas are detailed (see below).	**Yes** **Transitional water bodies:** • River Thames Upper	**Yes** **River water bodies:** • River Thames Upper Transitional • River Thames (Egham to Teddington)	**SCREENED IN:** As the Plan includes the entire River Thames estuary, it is necessary to take into consideration the plans and projects that may evolve (further to those listed below) during the RTS timeframe, and how they will affect the upstream water bodies and WFD.	**IN**
Thames Estuary 2100 (TE2100) Plan - Action Zone 1 - Richmond - Environment Agency	0km away from Teddington Weir Capacity Improvements	No specific projects identified as yet. There are five levels of flood risk management policies within TE2100. Richmond has been assigned to Policy 3: - The Plan is to continue maintenance and operation on existing defences. - Create and safeguard new habitats. And Policy 5: - Take further action to reduce the risk of flooding, including upgrading the defences to cope with future sea level rise.	**Yes** **Transitional water bodies:** • River Thames Upper	**Yes** **Transitional water bodies:** • River Thames Upper	**SCREENED OUT:** Insufficient information on actual activities or locations to allow identification of effects.	**OUT**
Thames Estuary 2100 (TE2100) Plan - Action Zone 1 - Twickenham - Environment Agency	0km away from Teddington Weir Capacity Improvements	No specific projects identified as yet. There are five levels of flood risk management policies within TE2100. Richmond has been assigned to Policy 3: - The Plan is to continue maintenance and operation on existing defences. - Create and safeguard new habitats. And Policy 5: - Take further action to reduce the risk of flooding, including upgrading the defences to cope with future sea level rise.	**Yes** **Transitional water bodies:** • River Thames Upper	**Yes** **Transitional water bodies:** • River Thames Upper	**SCREENED OUT:** Insufficient information on actual activities or locations to allow identification of effects.	**OUT**
Thames Estuary 2100 (TE2100) Plan - Action Zone 1 - Barnes & Kew - Environment Agency	0km away from Teddington Weir Capacity Improvements	No specific projects identified as yet. There are five levels of flood risk management policies within TE2100. Barnes & Kew has been assigned to Policy 5: - Take further action to reduce the risk of flooding (now or in the future). - The Plan is to continue maintenance and operation on existing defences. - Create and safeguard new habitats.	**Yes** **Transitional water bodies:** • River Thames Upper	**Yes** **Transitional water bodies:** • River Thames Upper	**SCREENED OUT:** Insufficient information on actual activities or locations to allow identification of effects.	**OUT**
Thames Estuary 2100 (TE2100) Plan - Action Zone 1 - Hammersmith - Environment Agency	6km away from Teddington Weir Capacity Improvements	No specific projects identified as yet. There are five levels of flood risk management policies within TE2100. Hammersmith has been assigned to Policy 5: - Take further action to reduce the risk of flooding (now or in the future). - The Plan is to continue maintenance and operation on existing defences. - Create and safeguard new habitats.	No	**Yes** **Transitional water bodies:** • River Thames Upper	**SCREENED OUT:** Insufficient information on actual activities or locations to allow identification of effects.	**OUT**

1 - Only water bodies included in the RTS preliminary WFD screening have been included as this is the limit of the potential impact of the RTS and therefore cumulative effects. Although some may have been screened out at the preliminary assessment stage they have been included here to account for the potential of cumulative effects resulting in a significant impact.

Plan	Distance to RTS (closest element)	Plan and aims	Potential for direct (site specific) impact to a WFD water body included within RTS preliminary screening[1]	Potential for indirect (upstream/downstream) impact to a WFD water body included within RTS preliminary screening [1]	Initial screening and reason	In/Out of further assessment

Screening decision

OUT	No further assessment required
IN	Further assessment required of cumulative impacts

Further Assessment of Cumulative Effects

The projects and plans listed have been screened in as having the potential to result in cumulative effects with the RTS. The effect is given as either DIRECT (site specific) or INDIRECT (upstream/downstream).

Projects / Plans	WFD water bodies effected	Direct cumulative impact (site specific)	Indirect cumulative impact (upstream/downstream)	Assumptions	Risk to WFD Compliance pre-mitigation	Actions for WFD Compliance (including proposed mitigation during design and implementation of works).	Risk to WFD compliance post mitigation
Brett Aggregates Ltd	**YES** • Chobham Bagshot Beds groundwater body • Lower Thames Gravels groundwater body • Queen Mary Reservoir • Surrey Ash (Screened out of the WFD assessment)	Although this project involves below ground working with potential for changes in water levels and contamination to groundwater bodies in common with the RTS, this projects environmental statement concluded there would not result in any adverse impact to groundwaters nor land drainage or water quality.	**None**	N/A	None	None	None
Thames Estuary 2100 (TE2100) Plan	**YES** • River Thames Upper Transitional • River Thames (Egham to Teddington)	Although the TE2100 project may result in additional flood protection such as lengths of embanked and/or walled channel these sections are likely to be highly localised (although this is dependent on the specific projects which emerge as a result of the plan). The RTS is predicted to have affect on the River Thames Egham to Teddington and the Upper Transitional water body biological elements, therefore there is a possibility of cumulative effect in this water body.	**None**	N/A	None	None - If specific projects emerge from the development plan prior to RTS consent, the potential for cumulative effects should be re-assessed.	None
CEMEX UK Operations Ltd (Surrey CC Ref 2021/0023)	**YES** • The Moat at Egham	The projects Environmental Statement stated that mineral will be excavated wet without dewatering, and therefore there will be a negligible impact to groundwater levels at the Site and in the surrounding area as a result of the mineral extraction. No water will be discharged from the Site, so any impact on water quality and flows in local watercourses will be minimal.	**None**	N/A	None	None	None
Datchet to Hythe End Improvement Measures	**YES** • River Thames (Cookham to Egham) • River Thames (Egham to Teddington)	Direct construction impacts are anticipated to be minimal due to adherence to best practice measures. However, there is a risk that the project exposes pollutants if the project involves excavation through landfill. This could impact on physico-chemical supporting elements and chemical status. Operation may have direct impacts upon hydromorphological elements of the Thames (Cookham to Egham) water body which could have indirect impacts on biological quality elements. Any changes to flows could lead to a cumulative impact with RTS impacts on the flow regime.	Risk of increase in pollutants if the project involves excavation of landfill in upstream water bodies. This could impact on physico-chemical supporting elements and chemical status. Potential for indirect operation impacts to Thames (Egham to Teddington) hydromorphological elements as a result of changes in flows upstream from project measures.	Assumed flow regime changes within the Thames with limited information on the improvement measures planned.	None	None - If specific projects emerge from the Datchet to Hythe End Improvement Project prior to RTS consent, the potential for cumulative effects should be further re-assessed.	None
Thames Valley Flood Scheme	**YES** • River Thames (Cookham to Egham) • River Thames (Egham to Teddington)	None - there are currently no details on specific measures for this project. If specific projects emerge from the scheme prior to RTS consent, the potential for cumulative effects should be re-assessed.	None	N/A	None	None - there are currently no details on specific measures for this project. If specific projects emerge from the scheme prior to RTS consent, the potential for cumulative effects should be re-assessed.	None
Severn to Thames Transfer (STT)	**YES** • Thames (Cookham to Egham) • Thames (Egham to Teddington)	None as discharge point into the Thames outside the water bodies assessed within the RTS WFD assessment.	**NO** **Construction (~from 2029)** No construction impacts have been identified for these water bodies within the WFD Compliance Assessment at Gate 2. It is assumed that due to distance from the works and adherence to construction best practice, there will be no adverse impacts and therefore no cumulative impacts with RTS. **YES** **Operation (~from 2033)** The WFD produced for Gate 1 assessed effects on the River Thames to be WFD Regulations compliant, in part due to the treatment systems included before discharge into the River Thames. There is potential for introducing impediments to target status in the following water bodies of the Thames downstream of Culham to tidal limit reach. The risk of non-compliance is associated with a potential increase in phosphate concentrations during the early phase and full STT solution. • Thames (Cookham to Egham) - GB106039023231 • Thames (Egham to Teddington) - GB106039023232 In the c.140 km of the River Thames from Culham (discharge location) to the tidal limit at Teddington, modelled water quality predicts a benefit to a small benefit to dissolved oxygen saturation, and a small benefit to PFOS and the polyaromatic hydrocarbon benzo(g,h,i)perylene. Although, any betterment from STT Solution would not lead to EQS being achieved in the River Thames for these chemicals (Severn Trent, Thames Water, United Utilities, 2023). There is a risk that the above impacts when in combination with impacts from the RTS, could result in a class deterioration.	The Gated process for assessing feasibility of this strategic option is not yet complete. Further iterations of a WFD compliance assessment are expected at Gate 3 by 2025, ahead of a DCO application. The hydraulic modelling of the River Thames for this project at Gate 2 is stated to be of limited reliability, and outcomes have been assessed with low confidence. This may have impacts on the reliability of water quality modelling in the River Thames. The hydraulic model itself requires further work for use in Gate 3 and further flow scenarios will be required to progress the assessment made at Gate 2. Further scenario modelling using hydraulic and water quality models will be undertaken during Gate 3. Further analysis of weir pool habitats is required, once hydraulic modelling in the Middle Thames has been further developed and improved. For some WFD chemicals, there are difficulties with commercially available limits of detection not being sufficiently low compared to EQS values. This means olfactory effects on fish have been presented with low-medium confidence (Severn Trent, Thames Water, United Utilities, 2023.	Yes - potential risk of class deterioration and non WFD compliance with RTS and STT in operation.	None - at the time of writing the WFD for this project is still to be developed further through improved modelling. If further detailed assessment and certainty of timeframes for the project emerge, then cumulative effects will be re-assessed.	None
South East Regional Resource Option (SESRO)	**YES** • Thames (Cookham to Egham) • Thames (Egham to Teddington)	None as discharge point into the Thames outside the water bodies assessed within the RTS WFD assessment.	**NO** **Construction (~from 2029)** No construction impacts have been identified for these water bodies within the WFD Compliance Assessment at Gate 2. It is assumed that due to distance from the works and adherence to construction best practice, there will be no adverse impacts and therefore no cumulative impacts with RTS. **YES** **Operation (~from 2033)** The WFD produced for Gate 1 assessed effects on the River Thames to be WFD Regulations compliant, in part due to the treatment systems included before discharge into the River Thames. There is potential for introducing impediments to target status in the following water bodies of the Thames downstream of Culham to tidal limit reach. The risk of non-compliance is associated with a potential increase in phosphate concentrations during the early phase and full STT solution. • Thames (Cookham to Egham) - GB106039023231 • Thames (Egham to Teddington) - GB106039023232 In the c.140 km of the River Thames from Culham (discharge location) to the tidal limit at Teddington, modelled water quality predicts a benefit to a small benefit to dissolved oxygen saturation, and a small benefit to PFOS and the polyaromatic hydrocarbon benzo(g,h,i)perylene. Although, any betterment from STT Solution would not lead to EQS being achieved in the River Thames for these chemicals (Severn Trent, Thames Water, United Utilities, 2023).	The Gated process for assessing feasibility of this strategic option is not yet complete. Further iterations of a WFD compliance assessment are expected at Gate 3 by 2025, ahead of a DCO application. Until further assessments of the hydrological and water quality models and potential impacts on the River Thames impacts cannot be fully discounted and so would be assessed again during subsequent project stages.	None	None - at the time of writing the WFD conclusions for this project would conclude that there is no risk of cumulative impact with RTS. However, the gated process is still ongoing and further modelling and environmental assessments will be undertaken during Gate 3. If further detailed assessment of impacts from the project emerge, then cumulative effects will be re-assessed.	None
London Water Recycling (Teddington Direct River Abstraction (DRA))	YES • Thames (Egham to Teddington) • Thames Upper	**NONE** **Construction (from~2027)** No construction impacts have been identified for these water bodies within the WFD Compliance Assessment at Gate 2. It is assumed that due to distance from the works and adherence to construction best practice, there will be no adverse impacts and therefore no cumulative impacts with RTS. **NONE** **Operation (from ~2031)** The WFD for this scheme assessed abstractions of 50 Ml/d, 75 Ml/d, 100 Ml/d or 150 Ml/d for Teddington DRA scheme. It concluded no potential for status deterioration was identified for Thames (Egham to Teddington) or Thames Upper. It may lead to minor changes in the general physico-chemical environment compared to the baseline conditions. The magnitude of change assessed is very low and if assessed locally, rather than at a water body scale, would not be expected to lead to class deterioration for any physico-chemical status elements. Therefore no cumulative impacts with RTS.	**NO** **Construction (~from 2029)** No construction impacts have been identified for these water bodies within the WFD Compliance Assessment at Gate 2. It is assumed that due to distance from the works and adherence to construction best practice, there will be no adverse impacts and therefore no cumulative impacts with RTS. **NO** **Operation (from ~2031)** The magnitude of change is assessed in the WFD for this scheme as very low and at a local scale and therefore there is no anticipated indirect impacts to water bodies which could cumulatively impact with RTS.	The Gated process for assessing feasibility of this strategic option is not yet complete. Further iterations of a WFD compliance assessment are expected at Gate 3 by 2025, ahead of a DCO application.	None	None - at the time of writing the WFD conclusions for this project would conclude that there is no risk of cumulative impact with RTS. However, the gated process is still ongoing and further modelling and environmental assessments will be undertaken during Gate 3. If further detailed assessment of impacts from the project emerge, then cumulative effects will be re-assessed.	None

Mogden Water Recycling Scheme	YES • Thames (Egham to Teddington) • Thames Upper	**NONE** **Construction (from~2027)** No construction impacts from the water transfer pipeline that could lead to non-compliance with WFD have been identified in the WFD assessment at Gate 2 stage. **Operation (from ~2031)** Dependent on the preferred scheme option (50 Ml/d, 100Ml/d, 150Ml/d, 200Ml/d), there will be an increase in flows with Mogden STW final effluent entering the Thames (Egham to Teddington) at Walton Bridge outfall, upstream of Walton intake. The below text for a 200 mL/d option provides relevant findings from the WFD Assessment for this project and confirms no further assessment required. When Mogden water recycling scheme is in operation for water resources purposes, all flow (from this scheme) would be abstracted at one of Thames Water's downstream intakes (likely at Walton or Hampton). The largest flow changes are anticipated to be in the reach between Walton Bridge these intakes. As water abstracted at the Hampton intake is transferred to the Lee Valley Reservoirs via the Thames-Lee Tunnel, the relative split between abstraction at Walton and Hampton would partly be dependent on storage locally in the Lee Valley Reservoirs. It is unlikely there would be change in flow further than 5.4km downstream of Walton, after the Thames Water Hampton intake (Thames Water, 2022) The scheme anticipates there will be minor increases in flow velocity at Sunbury weir pool but no likely change at Molesey Weir.	**NO** **Construction (~from 2027)** No construction impacts have been identified upstream or downstream within the WFD Compliance Assessment at Gate 2. It is assumed that due to distance from the works and adherence to construction best practice, there will be no adverse impacts and therefore no cumulative impacts with RTS. **NO** **Operation (from ~2031)** The magnitude of change is assessed in the WFD for this scheme as negligible and within Thames (Egham to Teddington) and Thames Upper. Therefore, there is no anticipated indirect impacts to water bodies which could cumulatively impact with RTS.	The Gated process for assessing feasibility of this strategic option is not yet complete. Further iterations of a WFD compliance assessment are expected at Gate 3 by 2025, ahead of a DCO application.	None	None - at the time of writing the WFD conclusions for this project conclude that there is no risk of cumulative impact with RTS. However, the gated process is still ongoing and further modelling and environmental assessments will be undertaken during Gate 3. If further detailed assessment of impacts from the project emerge, then cumulative effects will be re-assessed.	None
		Minor changes to physico-chemical water quality were predicted in the River Thames (Egham to Teddington), and do not prevent achieving element objectives. Quality improvements for dissolved oxygen saturation, ammoniacal nitrogen and phosphorus are predicted as treat the water will be treated to a very high standard with only traces of ammonia and BOD and c0.04mg/l phosphorus. Some minor localised impacts may also occur around a Mogden water recycling outfall but no potential for status deterioration or introducing impediments to target status were identified in the Thames Upper (GB530603911403) water body for any Mogden water recycling scheme size. Impact to the benthic invertebrate community may be limited and impact is expected to be minor, temperature increases are not likely to exceed tolerable range and a possible increase in metabolic rates of species present. Changes in oxygen saturation and ammonia may have minor positive impacts for some invertebrates, and pH changes are not likely to exceed tolerable range. Potential changes in flow or local velocity are not considered to be of a magnitude to affect the resident fish communities, but thermal plume modelling has identified potential impacts to Atlantic salmon and sea trout under a 200 Ml/d scenario for limited periods of time under rare flow conditions. Based on the above findings, cumulative impacts with RTS are considered negligible and no further assessment required.					

Appendix D

Water Framework Directive Compliance Assessment: Second Re-screening

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Contents

Introduction

This second Water Framework Directive (WFD) re-screening assessment has been prepared for the proposed River Thames Scheme (RTS), here forth referred to as 'the project', which will form part of the WFD Assessment for the Development Consent Order (DCO) application for the project.

This second re-screening assessment has been completed with reference to previous work undertaken for previous iterations of the project design:

- Water Framework Directive Compliance Assessment, 2018[1]
- Water Framework Directive Compliance Assessment: First Re-screening Assessment[2], 2022
- Lower Thames Strategy Strategic Environmental Assessment: Environmental Report (2009)[3]
- Lower Thames Strategy Study (LTSS) Water Framework Directive Compliance Assessment[4]
- River Thames Scheme Capacity Improvements and Flood Channel Project, Water Framework Directive Compliance Assessment[5]

WFD Background

The Water Framework Directive (WFD) (2000/60/EC) sets objectives for water bodies to achieve Good status or potential within a set timeframe. The Environment Agency, as competent authority in England and Wales, are responsible for delivering the Directive through the Environment (Water Framework Directive) (England and Wales) Regulations 2017.

The WFD stipulates that all water bodies should meet good ecological status (GES) (or good ecological potential (GEP) if an artificial or heavily modified water body) by

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[1] GBV (2018) Water Framework Directive Compliance Assessment, September 2018, Doc ref: 122368-BVL-Z0-SW-RP-V-00106.docx

[2] GBV (2022) Water Framework Directive Compliance Assessment: First Re-screening Assessment. IMSE500260, 12 May 2022

[3] Environment Agency (2009) Lower Thames Strategy Strategic Environmental Assessment: Environmental Report, September 2009.

[4] Environment Agency (2010), Lower Thames Strategy Stage WFD Assessment, 28 June 2010.

[5] GBV (2018), River Thames Scheme Capacity Improvements and Flood Channel Project Water Framework Directive Compliance Assessment, IMSE500260-0016.

a set timeframe. A deadline has been set within River Basin Management Plans (RBMPs) for these water bodies to achieve the required status, unless alternative arrangements (e.g. exemptions due to cost and technical feasibility) can be justified. The RBMP WFD cycle of assessments takes place every six years and therefore objectives which have not been achieved by 2015 may roll on to the 2021 cycle, and so on to the 2027 assessment.

The 2017 Regulations place a general duty on the Secretary of State (SoS), the Welsh Ministers, the Environment Agency (EA), and Natural Resources Wales (NRW) to exercise their ‘relevant functions’ so as to secure compliance with the WFD. The SoS will need to consider the implications of the RTS, firstly in relation to the specific duty to have regard to the RBMP and supplementary plans, and secondly, in more general terms in relation to the UK’s ability to comply with the WFD, including (if applicable) the derogation provisions of Regulation 19[6].

A WFD Compliance Assessment is being be undertaken to assess whether the project is compliant with the objectives of the WFD and will support the Environmental Impact Assessment (EIA) and Development Consent Order (DCO) application for the project.

[6] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, Part 5, Regulation 19 (formally known as Article 4.7)

The WFD Compliance Assessment Process

WFD Assessments follow a three-stage approach[7]:

- **Stage 1 – WFD Screening:** to determine if there are any activities associated with the RTS that don't require further consideration
- **Stage 2 – WFD Scoping (Preliminary Assessment):** to identify risks of the RTS's activities to receptors based on the relevant water bodies and their water quality elements (including information on status, objectives, and the parameters for each water body)
- **Stage 3 – WFD Impact Assessment (Compliance Assessment):** a detailed assessment of water bodies and their quality elements that are considered likely to be affected by the RTS, identification of any areas of noncompliance; consideration of mitigation measures, enhancements and contributions to the RBMP objectives.

This second rescreening assessment (stage 1) has been prepared in parallel with an EIA scoping exercise to determine likely significant effects of the project that need to be scoped into the EIA and associated assessments.

The Planning Inspectorate (PINS) Advice Note Eighteen[8] states that 'decisions taken at the WFD screening stage should be considered and reviewed periodically. This will be particularly important as and when more detailed information regarding the RTS becomes available'. On that basis, this second rescreening assessment will inform a first preliminary assessment (stage 2) and first compliance assessment (stage 3), which will be presented alongside the Preliminary Environmental Information Report (PEIR) as part of consultation on the EIA and associated assessments for the project. A third rescreening assessment (stage 1) will be completed after consultation on the PEIR based on a refined design and any updated information on relevant River Basin Management Plans (RBMPs) and water bodies. The third rescreening will inform a second preliminary assessment and second compliance assessment (, which will part of the information accompanying the DCO application for the project.

[7] WFD stages as per PINS Advice Note Eighteen (National Infrastructure Planning (2017): The Water Framework Directive and Environment Agency Guidance 'Water Framework Directive assessment: estuarine and coastal waters'. Preliminary assessment and compliance assessment terminology aligns with previous WFD Compliance Assessment completed at the outline design stage (GBV, 2018).
[8] National Infrastructure Planning (2017), Advice Note Eighteen: The Water Framework Directive.

Further work such as updated flow modelling, water quality and level monitoring, and consultation with key stakeholders such as Thames Water, to confirm interactions with the project, is ongoing. Once further information is available it will be used to inform decision making in future stages of the WFD compliance assessment.

Assumptions made in this second rescreening assessment are based on current design detail, available model outputs and existing reports (as of July 2022). The assessment has also considered the outputs from the Invasive Non-Native Species (INNS) and aquatic pathogen gap analysis exercises[9] [10] and any potential impacts on the identified waterbodies. Both the INNS and aquatic pathogens assessments review existing information and identify any required surveys to determine the current and future spread of INNS and aquatic pathogens.

For this second re-screening assessment, the current design includes the following components:

- Runnymede and Spelthorne Channels (previously referred to as Channel Sections 2 (CS2) and 3 (CS3) respectively), with proposed flows of up to 150 m^3/s during flood conditions (when River Thames flows exceed $200m^3/s$), and a 0.5 – $1.5m^3/s$ augmented flow during normal and low flow (non-flooding) conditions (operating mode for at least 95% of the time);
- Sunbury, Molesey and Teddington weir capacity improvements;
- Fish passage improvements on Sunbury, Molesey, Teddington, Chertsey and Abbey Chase weirs;
- Bed lowering in the River Thames for approximately 1km downstream of Desborough Cut to below Walton Marina;
- 11 habitat creation areas (HCAs) locations including Land South of Wraysbury Reservoir, Laleham Reach, Land between Desborough Cut and Engine River, Drinkwater Pit, Grove Farm, Norlands Lane, Laleham Golf Course, Littleton Lane (Brett's Land), Chertsey Road Tip, Land South of Chertsey Road, and Desborough Island;
- New areas of green open space (five being considered) and areas of active travel;
- Environmental mitigation (such as lake edge shallowing)
- Material storage;

[9] GBV (2022) Aquatic and Terrestrial Invasive Non-Native Species Gap Analysis, 13 April 2022

[10] GBV (2022) Aquatic Pathogens Gap Analysis, 11th April 2022

- Compounds;
- Flood embankments;
- scour protection;
- Flow control structures on inlets, outfalls and gated structures on Spelthorne and Runnymede Channels; and
- New road bridges for passage of Spelthorne and Runnymede Channels below existing highways.

The extent to which the augmented flow for the flood relief channel will impact the current Thames Water abstraction regime is currently unknown, however the maximum augmented flow will be limited to 1.5 m^3/s. Current modelling studies are investigating a range of augmentation flow scenarios. In addition to this, there are ongoing conversations with Thames Water regarding changes to abstraction pumping from the River Thames into the existing reservoirs in the period shortly prior to the peak of large floods to reduce the peak flood levels. Once changes to Thames Water's abstraction regime are fully understood, they will be incorporated into future iterations of the WFD compliance assessment.

Project components considered for this re-screening assessment are shown in Appendix A, Figures 1 (WFD surface water bodies) and 2 (WFD ground water bodies).

In developing this re-screening assessment, reference has been made to European commission 'Common Implementation Strategy' guidance documents and technical reports, which provide information to assist stakeholders to implement the Water Framework Directive[11].

Screening Methodology

Overview

Regulation 5(2) (l) (iii) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) (the APFP Regulations)[12] requires each Nationally Significant Infrastructure Project (NSIP) Applicant (where applicable) to provide with their application 'a plan with accompanying information identifying … water bodies in a river basin management plan, together with an assessment of any effects on such … bodies likely to be caused by the RTS'.

[11] European Commission, Common Implementation Strategy' guidance, Guide - Water Framework Directive - Environment - European Commission (europa.eu).

[12] The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 as amended) (the APFP Regulations).

PINS Advice Note Eighteen transposes the legislative requirements of those Regulations and the Water Framework Directive and Regulations into guidance for each stage of the WFD Compliance Assessment. The Advice Note states that WFD screening for NSIPs should address and identify the following:

- the relevant RBMPs and water bodies;
- the ZoI based on aspects of the RTS that could affect the identified water bodies;
- any aspects of the RTS that have been screened out and why.

This second rescreening assessment identifies the relevant RBMPs, water bodies and ZoI based on aspects of the RTS included in the current design stage (presented in Appendix A, Figures 1 and 2). A precautionary approach has been taken. As such, all project components (listed above) are therefore screened in for further assessment due to the presence in the ZoI, and subsequent direct and indirect impact pathways.

Due to the scale and complexity of the project and the various changes in environmental variables, it has been difficult to confirm the likely resulting effects with certainty. Consequently, expert judgement and a precautionary approach have been taken and will continue to be applied as the project develops.

Zone of Influence

The ZoI for this assessment is concurrent with the surface water and groundwater study areas used for EIA scoping; the extent of the surface and groundwater water bodies that lie within the project boundary for EIA scoping plus a 500m buffer combined with the area of the 1 in 100-year floodplain that will experience a change in flood extent due to the RTS (whichever is the greater area). This includes waterbodies that intersect with, and could be impacted by, the proposed project, including: flood relief channels, River Thames weir capacity improvement works, HCAs, new areas of open green space, flow control structures and other works. It also considers upstream and downstream water bodies connected to those intersecting the project. The ZoI includes the extent to which potential changes to water flows, water levels, water quality, spread of INNS and aquatic pathogens, and any additional impacts to aquatic ecology or WFD and other water body designated sites may occur.

In addition, potential effects arising from the change in flood risk resulting from the project have been considered. Updated flood risk modelling for the current project design assumes that a change in flood risk is likely to be seen as far upstream as

Datchet. This has therefore been used as the upstream extent for the ZoI for potential changes to water flows and water levels. This will be verified when the new flood risk model becomes available for the third re-screening exercise.

As per Environment Agency Guidance[13], 'temporary effects' considered in this document refer to those effects from short-duration activities like construction or maintenance, that are not considered to result in deterioration in WFD status if the water body would recover in a short time without any restoration measures (less than three years).

Screening Assessment

The water bodies considered in this screening exercise are presented in Table 1. Their locations in relation to the project components are presented in Appendix A, Figures 1 and 2. Table 1 summarises the relevant River Basin District (RBD) / RBMP and Environment Agency management catchment for each waterbody, with the current status (2019 RBMP Cycle 2) and current Reasons For Deterioration (RFD) / Reasons For Not Achieving Good (RNAG). The relevant RBMP for the project at present is the Thames River Basin District 2019 RBMP (Cycle 2). Draft objectives for RBMP Cycle 3 have been released and incorporated in this assessment.[14]

A total of 36 surface water bodies and two groundwater bodies were identified as being in the ZoI for the project and were included in the screening assessment (Appendix A). An additional six surface water bodies were outside the ZoI for the current project design but have been included in Table 1 as they formed part of the previous screening decisions made during the assessment of the Lower River Thames Strategy (2010) and Outline Design Stage (2018) which included an additional channel section (CS1). For the purpose of this rescreening exercise, these previous screening decisions have been included in the screening table with any supporting text, to provide an audit trail and further context where screening outcomes have changed.[15]

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[13] Environment Agency (2016) Water Framework Directive assessment: estuarine and coastal waters guidance, https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters. Last updated 9 November 2017.

[14] Once RBMP Cycle 3 objectives are confirmed, these will be incorporated into future re-screening assessments and further WFD Compliance Assessment deliverables.

[15] These columns are added to provide additional context and an audit trail. Columns referring to previous project designs will be removed before submission of the final WFD compliance assessment to support the DCO application.

Of these water bodies, 31 are categorised as Artificial / Heavily Modified Water Bodies (A/HMWB). A total of 20 surface water bodies and two groundwater bodies have been screened in for further assessment and the potential effects on these water bodies will be considered in more detail at Stage 2 (Preliminary Assessment).

Table 1 Screening assessment of water bodies within the RTS study area

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph-ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
Chertsey Bourne (Chertsey to River Thames confluence)	GB10 60390 17030	River	Thames, Wey and Trib	Not A / HMWB (Supports Good)	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Moderate Ecological Status Chemical Status – Does not require assessment	Poor Ecological Status Hydromorphological Supporting Elements – Supports good Chemical Status - Fail	Fish - Physical modification (urban and transport - urbanisation – urban development) Macrophytes and Phytobenthos Combined – Point source (sewage discharge - continuous) Dissolved oxygen – Point sources (sewage discharge – continuous, Water Industry - incidents), Natural (other natural conditions) Phosphate – Point source (sewage discharge - continuous)	Moderate Ecological Status by 2039 (Disproportionately expensive: Disproportionate burdens. Natural conditions: Ecological recovery time for Macrophytes and Phytobenthos Combined element. Technically infeasible: No known technical solution is available for Phosphate element). Good Chemical Status by 2063	Upstream - The Moat at Egham, Addlestone Bourne (Mill/Hale to Chertsey Bourne) and Chertsey Bourne (Virginia Water to Chertsey). Downstream - River Thames (Egham to Teddington)	"New structure to formalise existing overflow into St Ann's Lake. This will reduce flood flows down the river through Chertsey town, altering the hydrological regime, but there is no likely impact on the chemical or ecological status of this river."	**Screened Out** - There will be no change in flow conditions in this water body, except during periods of flood. Flow from the flood relief channel will not reach this water body and although water will be diverted away from this water body as a result of the formalisation of the existing overflow into St Ann's Lake this will only occur during periods of high flows which will be temporary and infrequent.	**In**	No works are proposed within this WFD water body. No flow from the Runnymede Channel will enter this water body. Previous analysis of the potential impacts the project will have on the interactions between the River Thames and Chertsey Bourne[18] and Chertsey Bourne works options testing using the Thames Lower 1D-2D model[19] was undertaken in 2017. These outputs have been used to inform this screening decision. When Chertsey Bourne floods, water will be diverted away from Chertsey Bourne (Chertsey to River Thames Confluence) as a result of the formalisation of the existing overflow into St Ann's Lake (FCS8) in the upstream water body (see Appendix A). This flow will then be diverted to the Runnymede Channel via a new flow control structure between St Ann's Lake and Abbey Lake (FCS7), or return from St Ann's lake, back into this WFD water body downstream via FCS9, reducing the impacts of flooding on Chertsey Bourne. When the River Thames floods at the same time as Chertsey Bourne, less water will be diverted away from Chertsey Bourne than when Chertsey Bourne alone floods due to the increased flows through the Runnymede Channel from the River Thames, preventing flow from St Ann's Lake to Abbey Lake. Flows from Chertsey Bourne will continue to flow into St Ann's lake, then back into Chertsey Bourne. In these larger flood conditions (1 in 50, 75, 100 and 200-year floods), the project is still anticipated to improve flooding conditions on Chertsey Bourne, as it will prevent flows from the River Thames entering St Ann's Lake and entering Chertsey Bourne. Changing the hydrological regime can impact on the ecological status. Change in hydrological regime is only anticipated during flood events which will be temporary and infrequent (as per predicted flood frequencies already mentioned). No other components of the project are anticipated to impact the hydrological regime of this water body. The INNS gap analysis has identified several 'high risk' INNS within Fleet Lake, Abbey Lake and St. Ann's Lake. Although the existing hydraulic connection will not change as a result of the scheme, there is a risk that the prevalence of INNS could increase within this water body. During flood events, INNS could spread from Fleet Lake, Abbey Lake and St. Ann's Lake via FCS9 and into the northern Twynersh Lakes and then into this water body. Further discussion with stakeholders will be undertaken and management plans produced to reduce the risk of increased INNS prevalence.

[16] Environment Agency (2010). Lower Thames Strategy Stage WFD Assessment. 28 June 2010.
[17] GBV (2018). River Thames Scheme Capacity Improvements and Flood Channel Project, Water Framework Directive Compliance Assessment. March 2018.
[18] GBV (2017). River Thames Scheme Capacity Improvements and Flood Channel Project, Chertsey Bourne – Interaction with the River Thames Scheme. September 2017.
[19] GBV (2017). River Thames Scheme Chertsey Bourne Option Testing Modelling Report. July 2017.

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph -ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
														At present, no pathogen records are known within this water body. Records have previously been found upstream on lakes connected to the Thames (Egham to Teddington) water body. There may be a connection to this water body as a result of the scheme, however this is unknown at the time of writing. Further investigations are ongoing to ascertain any potential increase in risk of pathogens within this water body as a result of construction activities and operation of the scheme. **The potential for increased prevalence of INNS in this water body could therefore cause measurable direct / indirect impacts to the current ecological or chemical status of this water body. This could affect its ability to achieve future RBMP objectives. This water body was previously screened Out at the first re-screening stage but is now screened into the preliminary assessment following a review of the INNS gap analysis results.**
Addlestone Bourne (Mill / Hale to Chertsey Bourne)	GB10 60390 17020	River	Thames, Wey and Trib	Not A / HMWB	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Good Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Hydromorpho logical Supporting Elements – Supports good Chemical Status - Fail	Macrophytes and Phytobenthos Combined – Point source (sewage discharge - continuous) Phosphate – Point source (sewage discharge - continuous)	Good Ecological Status by 2027 Good Chemical Status by 2063	Upstream - Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge) and Hale/Mill Bourne (Bagshot to Addlestone Bourne confluence near Chobham) Downstream - Chertsey Bourne (Chertsey to River Thames confluence)	Not mentioned in Strategy WFD Assessment.	**Screened Out -** There will be no impact on this river as there will be no modification or change to connectivity of the river to existing water bodies or the proposed channel. No change in hydrology or water quality anticipated from any changes in the flood regime as a result of the project.	**Out**	This water body is upstream of the proposed works. There will be no modification or change to the connectivity of the river to existing water bodies or the proposed channels. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph-ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
Chertsey Bourne (Virginia Water to Chertsey)	GB10 60390 17070	River	Thames, Wey and Trib	HMWB	SPA (South West London Waterbodies (St Ann's Lake water body adjacent) - UK9012171), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016) and SAC (Thursley, Ash, Pirbright & Chobham SAC - UK0012793, upstream of the study area)	Good Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Hydromorphological Supporting Elements – Supports good Chemical Status - Fail	Fish - Physical modifications (Reservoir/ Impoundment – non flow related, barriers – ecological discontinuity) Dissolved oxygen - Physical modification (barriers- ecological discontinuity) Mitigation Measures Assessment - Physical modification (recreation)	Good Ecological Status by 2027 Good Chemical Status by 2063	Upstream – Chertsey Bourne (Ascot to Virginia Water) and Chertsey Bourne (Sunningdale to Virginia Water). Downstream - Chertsey Bourne (Chertsey to River Thames confluence)	Not mentioned in Strategy WFD Assessment.	**Screened In -** Footprint of new flow control structure/bank protection for spill structure will be within this water body. The formalisation of the existing overspill into St Ann's lake is not expected to change hydrological conditions in this water body as the informal overspill already diverts flows away from this section of the Chertsey Bourne.	**In**	Previous analysis of the potential impacts the project will have on the interactions between the River Thames and Chertsey Bourne and Chertsey Bourne works options testing using the Thames Lower 1D-2D model was undertaken in 2017. These outputs have been used to inform this screening decision. The footprint of the new flow control structure/bank protection for spill structure will be within this water body, therefore this water body is screened in for further assessment. Changing the hydrological regime can impact on the ecological status. However, the formalisation of the existing overspill into St Ann's Lake (FCS8) (see Appendix A) is not expected to change hydrological conditions in this water body as the informal overspill already diverts flows away from this section of the Chertsey Bourne during flood conditions. The INNS gap analysis has identified several 'high risk' INNS within Fleet Lake, Abbey Lake and St. Ann's Lake. There is a risk that the prevalence of INNS could increase within this water body. INNS could spread from Fleet Lake, Abbey Lake and St. Ann's Lake during flood events into the northern Twynersh Lakes and into this water body. Further discussion with stakeholders will be undertaken and management plans produced to reduce the risk of increased INNS prevalence. At present, no pathogen records are known within this water body. Records have previously been found upstream on lakes connected to the Thames (Egham to Teddington) water body. There may be a connection to this water body as a result of the scheme, however this is unknown at the time of writing. Further investigations are ongoing to ascertain any potential increase in risk of pathogens within this water body as a result of construction activities and operation of the scheme. **Works are proposed within this water body and there is potential for increased prevalence of INNS; therefore, it is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Colne Brook	GB10 60390 23010	River	Thames, Colne	HMWB	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Moderate Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Hydromorphological Supporting Elements – Supports good Chemical Status - Fail	Phosphate - Point source (sewage discharge - continuous), Diffuse sources (contaminated land, urbanisation – urban development) Fish - Physical modification (flood protection – structures)	Moderate Ecological Status by 2015 (Disproportionately expensive: Unfavourable balance of costs and benefits for Phosphate element) Good Chemical Status by 2063	Upstream - Horton Brook and Alderbourne Downstream - Thames (Cookham to Egham)	"No likely direct impact (earlier strategy options that would have severely impacted this waterbody were rejected)"	**Screened Out -** There will be no direct impact on Colne Brook, as there will be no modification or change to connectivity of the river to existing water bodies or the proposed channel. Colne Brook's confluence with River Thames is between Channel Sections 1 and 2. This water body is	**In**	This water body is approximately 3km upstream of the Runnymede Channel. There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels. During 1 in 100-year flood events on the River Thames, this water body may experience a reduction in flood risk, and subsequent changes to hydrological regime. These changes are anticipated to be temporary and infrequent (1 in 100-years). This water body was previously screened out in first rescreening assessment.

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								Mitigation Measures Assessment - Physical modification (Local and Central Government)				close to the proposed flood embankment (FW2b), but good construction practices will avoid any effect. No change or measurable indirect impact in hydrology or water quality anticipated from any changes in the flood regime as a result of the project..		The Land South of Wraysbury Reservoir HCA lies within the water body boundary. The enabling and construction works for this HCA may lead to impacts on the ecology and water quality of the water body. **Works are proposed within this water body. HCA enabling and construction works could impact the current WFD status of this water body, as well as its ability to meet future WFD objectives, based on proximity to the water body. This water body is therefore screened in for further assessment.**
Datchet Common Brook	GB10 60390 23520	River	Thames, Maidenhead and Sunbury	HMWB	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016) and SPA (South West London Waterbodies (Wraysbury Lake within 200m of water body) – UK9012171)	Poor Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Hydromorphological Supporting Elements – Supports good Chemical Status - Fail	Fish - Diffuse source (urbanisation – urban development), Physical modification (urbanisation – urban development and transport) Macrophytes and Phytobenthos Combined - Diffuse source (transport drainage), Point source (Water Industry) Dissolved oxygen - Unknown Phosphate -Point source (Water Industry), Diffuse source (transport drainage) Mitigation Measures Assessment - Physical modification (agriculture and rural land management, and urban and transport)	Good Ecological Status by 2027 Good Chemical Status by 2063	Downstream - Thames (Cookham to Egham)	"This stream may be incorporated into Channel Section 1. Up to 1km of impacted brook."	**Screened In -** Datchet Common Brook would be intersected by proposed channel between Datchet and Sunnymeads (CS1).	**Out**	This water body is approximately 8.5km upstream of the Runnymede Channel. There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels. During 1 in 100-year flood events on the River Thames, this water body may experience a slight reduction in flood risk, and subsequent changes to hydrological regime. These changes are anticipated to be temporary and infrequent (1 in 100-years). **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph -ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
Horton Brook	GB10 60390 23040	River	Thames, Colne	Not A / HMWB	SPA - Horton Brook flows into Wraysbury No. 2 water body Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Moderate Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Hydromorpho logical Supporting Elements – Supports good Chemical Status - Fail	Phosphate - Diffuse source (urbanisation – urban development), Point source (misconnections) Invertebrates - Physical modifications (Reservoir / Impoundment – non flow related, urbanisation – urban development), Point sources (Trade/Industry discharge, misconnections), Diffuse source (urbanisation – urban development)	Good Ecological Status by 2027 Good Chemical Status by 2063	Wraysbury No. 2 water body intersects Horton Brook. Downstream - Colne Brook	"This stream is likely to be incorporated into Channel Section 1. Up to 1km of impacted brook."	**Screened In -** Horton Brook would be intersected by proposed channel north of Wraysbury No. 2 water body - note the river already flows into Wraysbury No. 2 water body in north-east corner of the lake. In addition, Horton Brook will be canalised between the east and west halves of Kingsmead Island lake with penstock or tilting weir at inlet to the lake.	**Out**	This water body is approximately 3km upstream of the Runnymede Channel. There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels. Following design changes, this water body is no longer within the ZoI, and is therefore screened out from further assessment. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**
Surrey Ash	GB10 60390 23480	River	Thames, Colne	HMWB	SPA (King George VI Reservoir within 200m of water body), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Moderate Ecological Status Good Chemical Status	Moderate Ecological Status Hydromorpho logical Supporting Elements – Supports good Chemical Status - Fail	Phosphate - Point sources (sewage discharge – continuous, misconnections), Diffuse source (urbanisation – urban development) Mitigation Measures Assessment - Physical modifications (urban and transport, Local and Central Government)	Moderate Ecological Status by 2015 (Disproportionately expensive: Unfavourable balance of costs and benefits for Phosphate element) Good Chemical Status by 2063	Upstream - River Colne (confluence with Chess to River Thames). Downstream - Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	**Screened Out -** There will be no direct impact on this river as there will be no modification or change to connectivity of the river to existing water bodies or the proposed channel. The River Surrey Ash's confluence with River Thames is downstream of the flood relief channel and upstream of Sunbury Weir. A change in flood risk is as a result of the Project (during a 1 in 100-year flood event) is expected, however this effect will be temporary and infrequent and therefore the effects are considered to be negligible.	**Out**	There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels, therefore no direct impact in water quality is anticipated as a result of the project. The Surrey Ash's confluence with River Thames is downstream of the Shepperton Channel and the bed lowering downstream of Desborough Cut, and downstream of Sunbury Weir. A change in flood risk in this water body as a result of the Project is expected, this effect will be temporary and infrequent (only during a 1 in 100-year flood event) and therefore the potential effects on hydrological, ecological and chemical elements are considered to be negligible. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**

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Thames (Cookham to Egham)	GB10 60390 23231	River	Thames, Maidenhead and Sunbury	HMWB	Drinking Water Protected Area (UKGB106039 023231), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016) , Nitrates Directive (Roundmoor Ditch to Boveney Ditch NVZ S466 – ID S466), Urban Waste Water Treatment Directive (River Thames - UKENRI17), SPA (South West London Waterbodies – UK9012171)	Moderate Ecological Status Chemical Status – Fail	Moderate Ecological Status Hydromorphological Supporting Elements – Not assessed Chemical Status - Fail	Phosphate - Diffuse sources (transport drainage, agriculture and rural land management), Point source (sewage discharge - continuous) Mitigation Measures Assessment - Physical modification (navigation, Water Industry, Local and Central Government) Hydrological Regime (flow – surface water abstraction)	Moderate Ecological Status by 2015 (Disproportionately expensive: Unfavourable balance of costs and benefits for Phosphate element) Good Chemical Status by 2063	Upstream - Thames (Reading to Cookham) plus other tributaries. Downstream - Thames (Egham to Teddington)	"Modification in the areas of the channel offtakes and outfalls. Potential water quality and ecological issues due to return of diversion channel water. Potential entrainment of fish within diversion channels. Overall improved connectivity of River with its floodplain in Reach 3 [Datchet to Walton Bridge] due to presence of new channels."	**Screened In -** Point modification at Channel Section inlet and outlet. Changes to flow quantity during channel operation although only at high flows. There will also be an augmented flow of 0.5-1.5m^3/s into the flood relief channel during normal conditions. There may be changes in water quality through the lakes and excavated land, this may affect this WFD water body where the flood relief channel re-enters River Thames. Operation of the scheme may result in changes to hydromorphological conditions; reducing stream power, the movement of coarser materials and potentially reducing habitat forming opportunities. Note that Channel Section 1 re-enters River Thames 1.6km upstream of the boundary between the Cookham to Egham and Egham to Teddington water bodies, so this water body is unlikely to be substantially influenced by water quality changes.	In	No works are proposed within this water body. There will be no change to connectivity of the water body to existing water bodies or the proposed channels therefore no direct or indirect impacts to water quality are anticipated as a result of the project. This water body is immediately upstream of the WFD water body the Runnymede and Spelthorne Channels intersect (Thames (Egham to Teddington)). The downstream boundary of this water body is approximately 1.5km upstream of the Runnymede Channel intake, therefore, operation of the project could result in changes to hydromorphological conditions; reducing stream power, the movement of coarser materials and potentially reducing habitat forming opportunities, which may have subsequent impacts on biological quality elements. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Thames (Egham to Teddington)	GB10 60390 23232	River	Thames, Maidenhead and Sunbury	HMWB	Drinking Water Protected Area (UKGB106039 023232, Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016) , Urban Waste Water Treatment Directive (River Thames - UKENRI17),	Poor Ecological Status Chemical Status – Fail	Poor Ecological Status Hydromorphological Supporting Elements – Not assessed Chemical Status - Fail	Macrophytes and Phytobenthos Combined - Diffuse source (agriculture and rural land management – poor nutrient management), Point source (sewage discharge - continuous) Phosphate - Diffuse sources	Poor Ecological Status by 2015 (Disproportionately expensive: Disproportionate burdens; and Technically infeasible: No known technical solution is available for Phosphate and Macrophytes and Phytobenthos Combined elements)	Upstream - Thames (Cookham to Egham) plus other tributaries. Downstream - Thames Upper (Transitional Water Body)	"Modification in the areas of the channel offtakes and outfalls. Potential water quality and ecological issues due to return of diversion channel water. Potential entrainment of fish within diversion channels. Overall improved	**Screened In -** Point modification at Channel Section 2 and 3 inlets and outlets and the capacity improvements at Desborough Cut, Sunbury weir, Molesey weir and Teddington weir. Changes to flow quantity during channel operation although only at high flows as water will be diverted into the flood relief channels when flows exceed	In	The following proposed works fall within the boundary of this WFD water body: point modification at Runnymede and Spelthorne Channel intakes and outfalls, bed lowering downstream of Desborough Cut, and capacity improvements at Sunbury Weir, Molesey Weir and Teddington Weir. Seven HCAs also lie within this water body (Laleham Reach, Laleham Golf Course, Chertsey Road Tip, Land South of Chertsey Road, Desborough Island and the Land Between Desborough Cut and Engine River. Operation of the project will result in alterations to the hydrological regime. Changes to flow quantity during channel operation are anticipated, during flood conditions as water will be diverted into the flood relief

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					SPA (South West London Waterbodies – UK9012171)			(agriculture and rural land management - poor nutrient management, urban and transport), Point source (sewage discharge - continuous) Temperature - Low flow (not drought), Physical modification (water level management in impounded water bodies), Point source (sewage discharge - continuous) Mitigation Measures Assessment - Physical modification (Local and Central Government, Water Industry, navigation) Hydrological Regime (flow – surface water abstraction)	Good Chemical Status by 2063		connectivity of River with its floodplain in Reach 3 due to presence of new channels. Additional modification through Reach 4 (Desborough Cut, weir improvements). Possible bankside improvements (e.g. lowering) and habitat creation in localised areas such as Hurst Park."	$200m^3/s$. There will be an augmented flow of $0.5\text{-}1.5m^3/s$ into the flood relief channels during normal conditions. There may be changes in water quality through the lakes and excavated land, this may affect this WFD water body where the flood relief channels re-enters River Thames. Operation of the scheme may result in changes to hydromorphology conditions; reducing stream power, the movement of coarser materials and potentially reducing habitat forming opportunities.		channels when flows exceed $200m^3/s$. There will be an augmented flow of up to $1.5m^3/s$ into the flood relief channels during normal and low flow conditions. Operation of the project may result in changes to hydromorphology conditions; reducing stream power, the movement of coarser materials and potentially reducing habitat forming opportunities, which may have subsequent impacts on biological quality elements. This augmented flow may also pose risks to the water quality and ecology of the River Thames by impacting flow and dilution at times of normal/low flow. There may be changes in water quality as a result of construction and operational activities as it will create new connections to other water bodies the proposed channels will intersect. The flood relief channels will create new transport pathways between sources of potentially contaminated sediment and the River Thames, including through disturbance to lake surface sediment the channels intersect, through excavated land for the channel creation, and through bed lowering downstream of Desborough Cut. The construction and operation (through management and maintenance) of the HCAs may also present a risk to the ecology and water quality of this water body. There is also a risk of introducing aquatic INNS and fish pathogens into the River Thames as a result of the connections with new water bodies the Runnymede and Spelthorne Channels will intersect. Further work is ongoing to investigate the potential risk of increased INNS prevalence. Further discussion with stakeholders will be undertaken, and management plans produced to reduce this risk. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
The Moat at Egham	GB10 60390 17060	River	Thames, Wey and Trib	HMWB	SPA (South West London Waterbodies (St Ann's Lake water body adjacent) - UK9012171), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Poor Ecological Status Chemical Status – Does not require assessment	Poor Ecological Status Hydromorphological Supporting Elements – Does not support good Chemical Status – Fail	Invertebrates – Point source (sewage discharge – intermittent), Natural (drought), Physical modification (barriers – ecological discontinuity, agriculture and rural land management – land drainage) Macrophytes and Phytobenthos Combined – Diffuse source (urban and transport – transport	Good Ecological Status by 2027 Good Chemical Status by 2063	Thorpe Park Lakes, St Ann's Lake (the river intersects these lakes). Downstream - Chertsey Bourne (Chertsey to River Thames confluence)	"This river flows into St Ann's Lake, but would not be directly impacted by the scheme."	**Screened Out -** The Moat at Egham will not be directly impacted by the Scheme upstream (west of) of St Ann's Lake. It also flows out of the Thorpe Park lakes in the south east corner before flowing into the Chertsey Bourne. Replacement of an existing control structure in this downstream section (400m from the confluence with the Chertsey Bourne) is not expected to affect the hydrological conditions of the water body. Furthermore, flows from the flood relief channel	In	Works are located within this water body. The footprint of the replacement flow control structure (FCS9) will be within this water body, downstream of St Ann's Lake. The flow control structure may have the potential to result in hydromorphological changes. Norlands Lane HCA also lies within this water body boundary. There is potential that construction and operation of this HCA may impact upon ecology and water quality of the water body. The INNS gap analysis has identified several 'high risk' INNS within Fleet Lake, Abbey Lake and St. Ann's Lake. Although the existing hydraulic connection will not change as a result of the scheme, there is a risk that the prevalence of INNS could increase within this water body. During flood events, INNS could spread from Fleet Lake, Abbey Lake and St. Ann's Lake via FCS9 and into the northern Twynersh Lakes which form part of this water body. Further discussion with stakeholders will be undertaken and management plans produced to reduce the risk of increased INNS prevalence.

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								drainage), Natural (drought), Point source (sewage discharge – intermittent), Physical modification (agriculture and rural land management – land drainage) Phosphate – Point sources (sewage discharge – continuous, and sewage discharge – intermittent), Diffuse source (urban and transport – transport drainage) Dissolved oxygen – Natural (drought) Mitigation Measures Assessment – Physical modification (recreation) Hydrological Regime – Flow (surface water abstraction)				will not reach this water body. No measurable affect is anticipated.		At present, no pathogen records are known within this water body. Records have previously been found upstream on lakes connected to the Thames (Egham to Teddington) water body. There may be a connection to this water body as a result of the RTS, however this is unknown at the time of writing. Further investigations are ongoing to ascertain any potential increase in risk of pathogens within this water body as a result of construction activities and operation of the project. **Therefore, it is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Mole (Hersham to River Thames Conf at East Molesey)	GB10 60390 17622	River	Thames, Mole	HMWB	N/A	Moderate Ecological Status Good Chemical Status	Moderate Ecological Status Hydromorphological Supporting Elements – Supports good Chemical Status - Fail	Phosphate – Point source (sewage discharge – continuous) Mitigation Measures Assessment – Physical modification (recreation, Local and Central Government, urban and transport)	Moderate Ecological Status by 2015 (Disproportionately expensive: Disproportionate burdens; and Technically infeasible: No known technical solution is available for Phosphate element) Good Chemical Status by 2063	Upstream - River Mole (Horley to Hersham) Downstream - Thames (Egham to Teddington)	Not included.	**Screened Out -** There will be no direct impact on the River Mole as there will be no modification or change to connectivity of the river to existing water bodies or the proposed channel. No change in hydrology or water quality anticipated from any changes in the flood regime as a result of the project as the Mole flows into River Thames downstream of Molesey Weir. A change in flood risk is as a result of the Project (during a 1 in 100-year flood event) is expected, however this	**In**	There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels. No change in hydrology or water quality is anticipated from any changes in the flood regime as a result of the project as the Mole flows into River Thames downstream of Molesey Weir. A change in flood risk as a result of the project is expected, this effect will be temporary and infrequent (only during a 1 in 100-year flood event) and therefore the potential effects on hydrology, ecological and chemical elements are considered to be negligible. This water body was previously screened out during the first rescreening assessment prior to confirmation of the proposed HCAs. The Grove Farm HCA lies within the water body boundary. The northern boundary of the HCA lies adjacent to the river. The construction and operation (through management and maintenance) of the HCA may lead to impacts on the ecology and water quality of the water body. **This water body was previously screened out at the first re-screening stage. However, works are**

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												effect will be temporary and infrequent and therefore the effects are considered to be negligible.		**now proposed within this water body. HCA enabling and construction works could impact the current WFD status of this water body, as well as its ability to meet future WFD objectives, based on proximity to the water body. This water body is therefore screened in for further assessment.**
Wey (Shalford to River Thames confluence at Weybridge)	GB10 60390 17630	River	Thames, Wey and Trib	HMWB	Drinking Water Protected Area (Wey (Shalford to River Thames confluence at Weybridge) – UKGB1060390 17630), and Drinking Water Safeguard Zones (Surface Water) (SWSGZ4016 and SWSGZ4015)	Moderate Ecological Status Chemical Status - Fail	Moderate Ecological Status Hydromorpho logical Supporting Elements – Supports good Chemical Status - Fail	Fish – Physical modification (Urban and transport – urbanisation, navigation – inland boating and structures, navigation – impoundment – u/s elevated water level, barriers – ecological discontinuity, navigation – reservoir / impoundment – non flow related) Macrophytes and Phytobenthos Combined – Point source (sewage discharge – continuous) Phosphate – Point source (sewage discharge – continuous) Mitigation Measures Assessment – Physical modification (Local and Central Government, navigation, recreation)	Good Ecological Status by 2039 Good Chemical Status by 2063	Upstream - Wey Navigation (Pyrford Reach), Wey (Tilford to Shalford) and other tributaries. Downstream - Thames (Egham to Teddington)	Not included.	**Screened Out -** There will be no direct impact on this river as there will be no interaction between the flood relief channel and the Wey. A change in flood risk is as a result of the Project (during a 1 in 100-year flood event) is expected, however this effect will be temporary and infrequent and therefore the effects are considered to be negligible.	**Out**	The Wey confluence with the River Thames is approximately 2.5km upstream of the proposed dredging in the River Thames, downstream of Desborough Cut. Flow control structures are in place on the Wey upstream of the point of confluence with the Thames, A change in flood risk is as a result of the Project is expected, this effect will be temporary and infrequent (only during a 1 in 100-year flood event) and therefore the potential effects on hydrology, ecological and chemical elements are considered to be negligible. No impacts to hydrological regime, or subsequent impacts to ecological or chemical elements in the Wey are anticipated. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**
Colne (Confluence with Chess to	GB10 60390 23090	River	Thames, Colne	HMWB	Drinking Water Safeguard Zone (Surface	Poor Ecological Status	Moderate Ecological Status	Macrophytes and Phytobenthos Combined –	Moderate Ecological Status by 2015	Upstream - Colne (from Confluence	Not included.	**Screened Out -** There will be no direct impact on this river as there	**In**	This water body is approximately 1.5km upstream of the Runnymede Channel. There will be no

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River Thames)					Water) (SWSGZ4016) SPA (Wraysbury Reservoir adjacent)	Chemical Status - Fail	Hydromorphological Supporting Elements: Does not support good Chemical Status - Fail	Natural (drought), Flow (groundwater abstraction), Physical modification (urban and transport – urbanisation), Diffuse source (urban and transport – urbanisation), Point sources (sewage discharge – continuous, private sewage treatment, sewage discharge – intermittent, misconnections – Domestic General Public) Hydrological Regime – Flow (groundwater abstraction), Physical modification (urban and transport – urbanisation) Phosphate – Point sources (misconnections – Domestic General Public, private sewage treatment, sewage discharge – continuous, sewage discharge – intermittent), Diffuse source (urban and transport – urbanisation) Mitigation Measures Assessment – Physical modification (recreation, Local and Central Government)	(Disproportionately expensive: Unfavourable balance of costs and benefits for Phosphate and Hydrological Regime elements. Good status for Fish element prevented by A/HMWB designated use: Action to get biological element to good would have significant adverse impact on use) Good Chemical Status by 2063	with Ver to Gade), Chess, Pinn, and Misbourne. Downstream - Thames (Egham to Teddington)		will be no modification or change to connectivity of the river to existing water bodies or the proposed channel. The Colne flows into River Thames between Channel Sections 1 and 2. A change in flood risk is as a result of the Project (during a 1 in 100 year flood event) is expected, however this effect will be temporary and infrequent and therefore the effects are considered to be negligible.		modification or change to connectivity of the river to existing water bodies or the proposed channels. During 1 in 100-year flood events on the River Thames, this water body may experience a reduction in flood risk, and subsequent changes to hydrological regime. However, these changes are anticipated to be temporary and infrequent (1 in 100-years). This water body was previously screened out in the first rescreening assessment. The Land South of Wraysbury Reservoir HCA lies within the water body boundary. The enabling and construction works for this HCA may lead to impacts on the ecology and water quality of the water body. **Works are proposed within this water body. HCA enabling and construction works could impact the current WFD status of this water body, as well as its ability to meet future WFD objectives, based on proximity to the water body. This water body is therefore screened in for further assessment.**

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Heron Lake	GB30642538	Lake	Thames, Colne	Artificial	Drinking Water Protected Area (Heron Lake – UKGB30642538), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Good Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Chemical Status - Fail	Mitigation Measures Assessment – Physical modification (Water Industry)	Good Ecological Status by 2027 Good Chemical Status by 2063	None (County Ditch (not WFD water body) flows in and out of Heron Lake)	"No likely direct impact."	**Screened Out -** There are not expected to be any interactions or connectivity between the flood relief channel and Heron Lake and therefore no impact is expected.	**Out**	No works are proposed within or adjacent to this water body. There are not expected to be any interactions or connectivity between the flood relief channel and Heron Lake. Following updated design changes, this water body is no longer within the ZoI, and is therefore screened out from further assessment. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**
The Queen Mother Reservoir	GB30642334	Lake	Thames, Colne	Artificial	Drinking Water Protected Area (The Queen Mother Reservoir – UKGB30642334), Urban Waste Water Treatment Directive (Queen Mother Reservoir – UKENLK176), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Poor Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Chemical Status - Fail	Mitigation Measures Assessment – Physical modification (Water Industry)	Good Ecological Status by 2021 Good Chemical Status by 2063	None	Not mentioned in Strategy WFD Assessment.	**Screened Out -** There are not expected to be any interactions or connectivity between the flood relief channel and the reservoir and therefore no impact is expected.	**Out**	No works are proposed within or adjacent to this water body. There are not expected to be any interactions or connectivity between the flood relief channel and The Queen Mother Reservoir. Following updated design changes, this water body is no longer within the ZoI, and is therefore screened out from further assessment. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**
Queensmead	GB30642569	Lake	Thames, Colne	Artificial	Drinking Water Protected Area (Queensmead – UKGB30642569), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Good Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Chemical Status - Fail	Mitigation Measures Assessment – Physical modification (Water Industry, recreation)	Good Ecological Status by 2027 Good Chemical Status by 2063	None	Not mentioned in Strategy WFD Assessment.	**Screened Out -** There are not expected to be any interactions or connectivity between the flood relief channel and Queensmead Lake and therefore no impact is expected.	**Out**	No works are proposed within or adjacent to this water body. There are not expected to be any interactions or connectivity between the flood relief channel and Queensmead Lake. Following updated design changes, this water body is no longer within the ZoI, and is therefore screened out from further assessment. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**
Thorpe Park Lakes	GB30642753	Lake	Thames, Wey and Trib	Artificial	SPA (St Ann's Lake, South West London Waterbodies – UK9012171)	Moderate Ecological Status Chemical Status – Does not require assessment	Poor Ecological Status Chemical Status - Fail	Macrophytes and Phytobenthos Combined – Physical modification (rural land management – land drainage)	Good Ecological Status by 2027 Good Chemical Status by 2063	Downstream - The Moat at Egham	"Channel would pass through Fleet and Abbey Lakes, which would become online lakes incorporated into the diversion channel. There is likely to be a significant change in the water quality of these lakes, due to inputs of water from River	**Screened In -** Potential for changes in lake residence times, water quality and sediment regime, mainly from flood channel and from Chertsey Bourne formalised spill. Part of water body is SPA designated and other areas are SPA supporting sites, so it is an important site to join	**In**	The Runnymede Channel will pass through Fleet and Abbey Lakes, incorporating the lakes into the flood relief channel. Manor Lake will be separated from Fleet Lake. St. Ann's Lake will be separated from Fleet and Abbey Lakes (and the Runnymede Channel), there will a formalisation of the existing overspill into St Ann's lake from Chertsey Bourne (FCS8), a flow control structure between St Ann's and Abbey Lakes (FCS7) and replacement of a control structure to allow flows back into the Chertsey Bourne downstream (FCS9) are proposed. There will likely be changes in lake residence times, water quality and sediment regime, mainly from the Runnymede Channel and Chertsey Bourne. Part of

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											Thames. Structures will be added to St Ann's Lake to formalise existing flood spills from the Chertsey Bourne into St Ann's Lake, to allow them to be diverted down the flood relief channel. There are no likely impacts on Manor Lake."	up WFD and HRA assessments.		the water body is an SPA designation and other areas are SPA supporting sites. There is also a risk of introducing aquatic INNS and fish pathogens from upstream water bodies to Abbey and Fleet Lakes once the Runnymede Channel is in operation, and from the Chertsey Bourne during flood events. Further work is ongoing to investigate the potential risk of increased INNS prevalence. Further discussion with stakeholders will be undertaken, and management plans produced to reduce this risk. At present, no pathogen records are known within this water body. Records have previously been found upstream on lakes connected to the Thames (Egham to Teddington) water body. There may be a connection to this water body as a result of the RTS, however this is unknown at the time of writing. Further investigations are ongoing to ascertain any potential increase in risk of pathogens within this water body as a result of construction activities and operation of the project. Manor Lake will be separated from the other Thorpe Park Lakes as part of the project, and therefore have no connectivity with the Runnymede Channel. There may be impacts to ecological quality elements in the Thorpe Park Lakes, as the connectivity between the lakes is lost. Construction of this bund between Manor and Fleet lake will be within the footprint of the water bodies. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Wraysbury Lake	GB30642430	Lake	Thames, Maidenhead and Sunbury	Artificial	SPA (Wraysbury Lake, South West London Waterbodies – UK9012171)	Moderate Ecological Status Chemical Status – Does not require assessment	Poor Ecological Status Chemical Status - Fail	Phytoplankton – Diffuse sources (other) Macrophytes and Phytobenthos Combined – Diffuse sources (other) Mitigation Measures Assessment – Physical modification (other)	Good Ecological Status by 2027 Good Chemical Status by 2063	None	"No likely direct impact although likely site for mitigation works for the SPA."	**Screened Out -** There are not expected to be any interactions or connectivity between the flood relief channel and the lake and therefore no impact is expected. Although this lake is close to the flood relief channel, it is separated by a railway line and all construction works will be on the other side of the railway and good construction practices (detailed in a CEMP) will ensure this water body is not effected.	**Out**	No works are proposed within or adjacent to this water body. There are not expected to be any interactions or connectivity between the flood relief channel and Wraysbury Lake. Following updated design changes, this water body is no longer within the ZoI, and is therefore screened out from further assessment. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**

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Wraysbury No. 2	GB30 64248 9	Lake	Thames, Colne	Artificial	SPA (Wraysbury No. 2 water body, South West London Waterbodies – UK9012171), Urban Waste Water Treatment Directive (Wraysbury II Gravel Pit/ Wellapool Lake), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Poor Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Chemical Status - Fail	Mitigation Measures Assessment – Physical modification (other)	Good Ecological Status by 2027 Good Chemical Status by 2063	Existing inflow and outflow from/back into Horton Brook	"The flood relief channel will run through this lake, with a new separation embankment to separate the channel from the lake. The remainder of the lake that lies outside the channel could see improvements in water quality, through reduced spillages of nutrient rich water from the Colne Brook."	**Screened In -** Changes to the hydrological regime and water quality are expected as the channel will flow through the Lake. The new separation embankment to separate the channel from the lake in the north western section of the northern lake; and the removal of the separation embankment between the northern and southern lake will lead to water quality effects. Part of water body is SPA designated and other areas are SPA supporting sites, so it is an important site to join up WFD and HRA assessments.	**Out**	No works are proposed within or adjacent to this water body. There are not expected to be any interactions or connectivity between the flood relief channels and Wraysbury No. 2 Lake. Following updated design changes, this water body is no longer within the ZoI, and is therefore screened out from further assessment. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**
Wraysbury Reservoir	GB30 64241 7	Lake	Thames, Colne	Artificial	SPA (Wraysbury Reservoir, South West London Waterbodies – UK9012171), Drinking Water Protected Area (Wraysbury Reservoir – UKGB3064241 7), Urban Waste Water Treatment Directive (Wraysbury Reservoir – UKENLK177), Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Poor Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Chemical Status - Fail	Total Phosphorous – Point sources (sewage discharge – intermittent, sewage discharge – continuous), Diffuse sources (urban and transport – urbanisation, agriculture and rural land management – poor livestock management) Mitigation Measures Assessment – Physical modification (Water Industry)	Moderate Ecological Status by 2015 (Technically infeasible: No known technical solution is available for Total Phosphorus element) Good Chemical Status by 2063	Abstraction inflow from Thames (Cookham to Egham)	Not mentioned in Strategy WFD Assessment.	**Screened Out -** There are not expected to be any interactions or connectivity between the flood relief channel and the reservoir and therefore no impact is expected.	**In**	There is not expected to be any connectivity between the flood relief channels and Wraysbury Reservoir. This water body remains in the ZoI due to its proximity to the Habitat Creation Area (HCA) 'Land South of Wraysbury Reservoir'. Works are proposed immediately adjacent to this water body. **It is anticipated that HCA enabling and construction works could impact the current WFD status of this water body, as well as its ability to meet future WFD objectives, based on proximity to the water body. This water body is therefore screened in for further assessment.**

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Thames Upper	GB53 06039 11403	Transitional	Thames, Thames TraC	HMWB	Urban Waste Water Treatment Directive (River Wandle – UKENRI157)	Moderate Ecological Status Chemical Status - Fail	Moderate Ecological Status Hydromorphological Supporting Elements: Does not support good Chemical Status - Fail	Chemical elements (Cypermethrin (Priority hazardous), Zinc, Benzo(b)fluoranthene, Benzo(g-h-i_perylene, Benzo(k)fluoranthene) – Unknown Tributyltin Compounds – Diffuse sources (urban and transport – contaminated water body bed sediments, urban and transport – urbanisation), Point sources (navigation – use of restricted substances, Industry – contaminated land, Waste treatment and disposal – landfill leaching, sewage discharge – continuous) Mitigation Measures Assessment – Physical modification (Local and Central Government) Phytoplankton (High to Good deterioration, no action required, RFD only) Hydrological Regime (Flow – surface water abstraction)	Good Ecological Status by 2027 Good Chemical Status by 2063	Upstream - Thames (Egham to Teddington) and other tributaries. Downstream - Thames Middle	Not mentioned in Strategy WFD Assessment however SEA States3: "Waterbodies downstream on River Thames could be subject to minor temporary adverse impacts during the construction phase (e.g. through release of sediment) however it is not considered that this would be significant or compromise the objectives of the RBMP for that waterbody. The Strategic Appropriate Assessment for example, scoped out potential impacts on River Thames Estuary SPA due to its distance downstream."	**Screened In -** This water body is 15km downstream of Desborough Cut, where the last section of flood relief channel returns to River Thames, and therefore no direct impact from the new flood relief channel is expected. The proposed works at Teddington Weir are on the boundary between River Thames (Egham to Teddington) WFD water body and this transitional water body. Therefore, there is potential for an effect on this water body. Consideration of the change in the sediment regime will need to be undertaken to ascertain if there will be any indirect effects from the flood relief channel and the weir works from increases in suspended sediment.	**In**	This water body is approximately 14km downstream of the bed lowering works at Desborough Cut, and approximately 15km downstream of the Spelthorne Channel Outfall. The proposed works at Teddington Weir are on the boundary between River Thames (Egham to Teddington) WFD water body and this transitional water body. There may be changes in water quality as a result of new connections to other water bodies the channels will intersect as a result of construction and operation of the project. The Runnymede and Spelthorne Channels will create new transport pathways between the River Thames and sources of potentially contaminated sediment and potentially contaminated water bodies, including through disturbance to lake sediments, excavation of land for the channel creation, and through bed lowering downstream of Desborough Cut. This water body is currently failing for Chemical Status, therefore using a precautionary approach, 'any deterioration' in quality elements in the lowest class constitutes deterioration as defined by the WFD, as per the CJEU Bund Case ruling. There is also a risk of introducing aquatic INNS and fish pathogens into the River Thames as a result of the connections with new water bodies the Runnymede and Spelthorne Channels will intersect. Further discussion with stakeholders will be undertaken and management plans produced to reduce this risk. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Thames Middle	GB53 06039 11402	Transitional	Thames, Thames TraC	HMWB	Urban Waste Water Treatment Directive (Lea Navigation & River Lea – EKENRI59), SPA (Thames	Moderate Ecological Status Chemical Status – Fail	Moderate Ecological Status Hydromorphological Supporting Elements: Not assessed	Chemical elements (Zinc, Benzo(b)fluoranthene, Benzo(g-h-i_perylene,– Unknown Tributyltin Compounds –	Moderate Ecological Status by 2015 (Disproportionately expensive: Unfavourable balance of costs and benefits for	Upstream – Thames Upper Downstream – Thames Lower	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	This transitional water body is downstream of all works. There may be changes in water quality as a result of new connections between the water body upstream (Thames (Egham to Teddington)) and other water bodies the channels will intersect as a result of construction and operation of the project. As there is a risk of creating new pollutant pathways to the upstream water body, this water body is

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph-ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
					Estuary & Marshes – UK9012021)		Chemical Status – Fail	Diffuse sources (urban and transport – contaminated water body bed sediments, urban and transport – urbanisation), Point sources (navigation – use of restricted substances, Industry – contaminated land, Waste treatment and disposal – landfill leaching, sewage discharge – continuous) Mitigation Measures Assessment – Physical modification (Local and Central Government) Phytoplankton (High to Good deterioration, no action required, RFD only) Angiosperms – Physical modification (Local and Central Government – land drainage structures)	Dissolved Inorganic Nitrogen element. Good status for Angiosperms element prevented by A/HMWB designated use: Action to get biological element to good would have significant adverse impact on use). Good Chemical Status by 2063					considered for further assessment on a precautionary basis. Due to the proximity to the project, as well as the increased dilution effects of the tidal extent downstream of this transitional water body, no further downstream water bodies are considered in the zone of influence. This water body is currently failing for Chemical Status, therefore using a precautionary approach, 'any deterioration' in quality elements in the lowest class would constitute deterioration as defined by the WFD, as per the CJEU Bund Case ruling. There is also a risk of introducing aquatic INNS and fish pathogens into the River Thames as a result of the connections with new water bodies the Runnymede and Spelthorne Channels will intersect. Further work is ongoing to investigate the potential risk of increased INNS prevalence. Further discussion with stakeholders will be undertaken, and management plans produced to reduce this risk. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Queen Mary Reservoir	GB30642639	Lake	Thames, Colne	Artificial	Drinking Water Safeguard Zone (SWSGZ4016), Drinking Water Protected Area (Queen Mary Reservoir – UKGB30642639)	Poor Ecological Status Chemical Status – Does not require assessment	Poor Ecological Status Chemical Status - Fail	Mitigation Measures Assessment – Physical modification (Water Industry) Total Phosphorus – Point sources (sewage discharge – continuous, sewage discharge – intermittent), Diffuse sources (urban and transport – urbanisation,	Poor Ecological Status by 2015 (Technically infeasible: No known technical solution is available for Macrophytes and Phytobenthos Combined, Phytoplankton, and Total Phosphorus elements) Good Chemical Status by 2063	Abstraction inflow (Laleham Intake) from Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	No works are proposed within or adjacent to this water body. The intake to this reservoir is on the water body 'Thames (Egham to Teddington)', downstream of the Runnymede Channel intake and upstream of the Spelthorne Channel intake and Runnymede Channel outlet. There is therefore potential to be reduced abstraction allowances during low flows, as the Runnymede and Spelthorne Channels will require an augmented flow of 0.5-1.5m^3/s into the flood relief channels from the River Thames during normal conditions. This has the potential to impact water levels in the reservoir, which may have subsequent impacts on hydromorphological, physicochemical and ecological quality elements. **It is anticipated that the project could impact the current status or future WFD objectives of this**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph-ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
								agriculture and rural land management – poor livestock management) Phytoplankton – Point sources (sewage discharge continuous, sewage discharge – intermittent), Diffuse source (agriculture and rural land management – poor livestock management) Macrophytes and Phytobenthos Combined - Point sources (sewage discharge continuous, sewage discharge – intermittent), Diffuse source (agriculture and rural land management – poor nutrient management)						**water body. This water body is therefore screened in for further assessment.**
Knight Reservoir	GB30642791	Lake	Thames, Maidenhead and Sunbury	Artificial	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016), SPA (South West London Waterbodies – UK9012171)	Moderate Ecological Status Good Chemical Status	Moderate Ecological Status Chemical Status - Fail	Total Phosphorus – Point source (sewage discharge – intermittent)	Moderate Ecological Status by 2015 (Disproportionately expensive: Unfavourable balance of costs and benefits for Total Phosphorus element) Good Chemical Status by 2063	Abstraction inflow from Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	The intake to this water body is on 'Thames (Egham to Teddington)', downstream of the bed lowering works at Desborough Cut, and the Spelthorne Channel Outfall. There may therefore be changes in water quality in this reservoir due to changes to quality of abstracted water as a result of new connections to other water bodies the channels will intersect as a result of construction and operation of the project. The Runnymede and Spelthorne Channels will create new transport pathways between the River Thames and sources of potentially contaminated sediment and potentially contaminated water bodies, including through disturbance to intersected lake sediments, through excavated land for the channel creation, and through bed lowering downstream of Desborough Cut. This water body is currently failing for Chemical Status, therefore 'any deterioration' in quality elements in the lowest class would constitute deterioration as defined by the WFD, as per the CJEU Bund Case ruling. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph -ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
Bessborough Reservoir	GB30642779	Lake	Thames, Maidenhead and Sunbury	Artificial	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016), SPA (South West London Waterbodies – UL9012171)	Moderate Ecological Status Good Chemical Status	Moderate Ecological Status Chemical Status – Fail	Total Phosphorus – Point source (sewage discharge – intermittent)	Moderate Ecological Status by 2015 (Disproportionately expensive: Unfavourable balance of costs and benefits for Total Phosphorus element) Good Chemical Status by 2063	Abstraction inflow from Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	The intake to this water body is on 'Thames (Egham to Teddington)', downstream of the bed lowering works at Desborough Cut, and the Spelthorne Channel Outfall. There may therefore be changes in water quality in this reservoir due to changes to quality of abstracted water as a result of new connections to other water bodies the channels will intersect. The Runnymede and Spelthorne Channels will create new transport pathways between the River Thames and sources of potentially contaminated sediment and potentially contaminated water bodies, including through disturbance to intersected lake sediments, through excavated land for the channel creation, and through bed lowering downstream of Desborough Cut. This water body is currently failing for Chemical Status, therefore 'any deterioration' in quality elements in the lowest class would constitute deterioration as defined by the WFD, as per the CJEU Bund Case ruling. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Kempton Park East Reservoir	GB30642614	Lake	Thames, London	Artificial	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016), SPA (South West London Waterbodies – UK9012171)	Good Ecological Status Chemical Status – Does not require assessment	Good Ecological Status Chemical Status - Fail	N/A	Good Ecological Status by 2015 Good Chemical Status by 2063	Abstraction inflow from Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	The intake to this water body is on 'Thames (Egham to Teddington)', downstream of the bed lowering works at Desborough Cut, and the Spelthorne Channel Outfall. There may therefore be changes in water quality in this reservoir due to changes to quality of abstracted water as a result of new connections to other water bodies the channels will intersect. The Runnymede and Spelthorne Channels will create new transport pathways between the River Thames and sources of potentially contaminated sediment and potentially contaminated water bodies, including through disturbance to intersected lake sediments, through excavated land for the channel creation, and through bed lowering downstream of Desborough Cut. This water body is currently failing for Chemical Status, therefore 'any deterioration' in quality elements in the lowest class would constitute deterioration as defined by the WFD, as per the CJEU Bund Case ruling. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**

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Queen Elizabeth 2 Storage Reservoir	GB30642813	Lake	Thames, Mole	Artificial	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016), Urban Waste Water Treatment Directive (Queen Elizabeth II Storage Reservoir – UKENLK175)	Moderate Ecological Status Chemical Status – Does not require assessment	Good Ecological Status Chemical Status – Fail	N/A	Good Ecological Status by 2015 Good Chemical Status by 2063	Abstraction inflow from Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	The intake to this water body is on 'Thames (Egham to Teddington)', downstream of the bed lowering works at Desborough Cut, and the Spelthorne Channel Outfall. There may therefore be changes in water quality in this reservoir due to changes to quality of abstracted water as a result of new connections to other water bodies the channels will intersect. The Runnymede and Spelthorne Channels will create new transport pathways between the River Thames and sources of potentially contaminated sediment and potentially contaminated water bodies, including through disturbance to intersected lake sediments, through excavated land for the channel creation, and through bed lowering downstream of Desborough Cut. This water body is currently failing for Chemical Status, therefore 'any deterioration' in quality elements in the lowest class would constitute deterioration as defined by the WFD, as per the CJEU Bund Case ruling. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Island Barn Reservoir	GB30642841	Lake	Thames, Mole	Artificial	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	Moderate Ecological Status Good Chemical Status	Moderate Ecological Status Chemical Status - Fail	Total Phosphorus – Point source (sewage discharge – intermittent)	Moderate Ecological Status by 2015 (Disproportionately expensive: Unfavourable balance of costs and benefits for Total Phosphorus element). Good Chemical Status by 2063	Abstraction inflow from Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	The intake to this water body is on 'Thames (Egham to Teddington)', downstream of the bed lowering works at Desborough Cut, and the Spelthorne Channel Outfall. There may therefore be changes in water quality in this reservoir due to changes to quality of abstracted water as a result of new connections to other water bodies the channels will intersect. The Runnymede and Spelthorne Channels will create new transport pathways between the River Thames and sources of potentially contaminated sediment and potentially contaminated water bodies, including through disturbance to intersected lake sediments, through excavated land for the channel creation, and through bed lowering downstream of Desborough Cut. This water body is currently failing for Chemical Status, therefore 'any deterioration' in quality elements in the lowest class would constitute deterioration as defined by the WFD, as per the CJEU Bund Case ruling. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph-ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
Lockwood Reservoir	GB30641865	Lake	Thames, London	Artificial	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4006), Nitrates Directive (LEE NVZ S443), SPA (Lee Valley – UK9012111), Drinking Water Protected Area (Lockwood Reservoir – UKGB30641865)	Moderate Ecological Status Good Chemical Status	Moderate Ecological Status Chemical Status - Fail	Mitigation Measures Assessment – Physical modification (Water Industry) Total phosphorus – Point source (sewage discharge – continuous)	Moderate Ecological Status by 2015 (Disproportionately expensive: Unfavourable balance of costs and benefits; and Technically infeasible: No known technical solution is available for Total Phosphorus element). Good Chemical Status by 2063	Abstraction inflow from Thames (Egham to Teddington) via Thames-Lee Tunnel	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	The intake to this water body (Thames-Lee Tunnel) is on 'Thames (Egham to Teddington)', downstream of the bed lowering works at Desborough Cut, and the Spelthorne Channel Outfall. There may therefore be changes in water quality in this reservoir due to changes to quality of abstracted water as a result of new connections to other water bodies the channels will intersect. The Runnymede and Spelthorne Channels will create new transport pathways between the River Thames and sources of potentially contaminated sediment and potentially contaminated water bodies, including through disturbance to intersected lake sediments, through excavated land for the channel creation, and through bed lowering downstream of Desborough Cut. This water body is currently failing for Chemical Status, therefore 'any deterioration' in quality elements in the lowest class would constitute deterioration as defined by the WFD, as per the CJEU Bund Case ruling. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**
Banbury Reservoir	GB30647003	Lake	Thames, London	Artificial	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4006), Nitrates Directive (LEE NVZ S443), SPA (Lee Valley – UK9012111), Drinking Water Protected Area (Banbury Reservoir – UKGB30647003)	Good Ecological Status Chemical Status – Does not require assessment	Moderate Ecological Status Chemical Status – Fail	N/A	Good Ecological Status by 2021 Good Chemical Status by 2063	Abstraction inflow from Thames (Egham to Teddington) via Thames-Lee Tunnel	Not mentioned in Strategy WFD Assessment.	Not included.	**In**	The intake to this water body is on 'Thames (Egham to Teddington)', downstream of the bed lowering works at Desborough Cut, and the Spelthorne Channel Outfall. There may therefore be changes in water quality in this reservoir due to changes to quality of abstracted water as a result of new connections to other water bodies the channels will intersect. The Runnymede and Spelthorne Channels will create new transport pathways between the River Thames and sources of potentially contaminated sediment and potentially contaminated water bodies, including through disturbance to intersected lake sediments, through excavated land for the channel creation, and through bed lowering downstream of Desborough Cut. This water body is currently failing for Chemical Status, therefore 'any deterioration' in quality elements in the lowest class would constitute deterioration as defined by the WFD, as per the CJEU Bund Case ruling. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph -ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
Portlane Brook	GB10 60390 23451	River	Thames, London	HMWB	Drinking Water Safeguard Zone (Surface Water) (SWSGZ4016)	N/A	Moderate Ecological Status Hydromorphological Supporting Elements: Supports good Chemical Status – Fail	Phosphate – Point source (Trade/Industry discharge), Diffuse source (urban and transport – urbanisation) Invertebrates – Natural (drought), Diffuse source (urban and transport – urbanisation)	Good Ecological Status by 2027 Good Chemical Status by 2063	Downstream – Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	**Out**	There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels. No change in hydrology or water quality is anticipated from any changes in the flood regime as a result of the project as the Portlane Brook flows into River Thames downstream of Sunbury Weir. A change in flood risk as a result of the Project is expected, however this effect will be temporary and infrequent (only during a 1 in 100-year flood event) and therefore the potential effects on hydrological, ecological and chemical elements are considered to be negligible. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**
Longford River	GB80 61001 09	Surface water transfer	Thames, Thames AWB	Artificial	None	N/A	Moderate Ecological Status Chemical Status - Fail	Mitigation Measures Assessment – Physical modification (urban and transport)	Good Ecological Status by 2027 Good Chemical Status by 2063	Downstream – Thames Egham to Teddington	Not mentioned in Strategy WFD Assessment.	Not included.	**Out**	There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels. No change in hydrology or water quality is anticipated from any changes in the flood regime as a result of the project as the Longford River flows into River Thames downstream of Sunbury Weir. A change in flood risk as a result of the Project is expected, however this effect will be temporary and infrequent (only during a 1 in 100-year flood event) and therefore the potential effects on hydrology, ecological and chemical elements are considered to be negligible. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**
Rythe	GB10 60390 17650	River	Thames, Mole	HMWB	None	Bad Ecological Status Chemical Status – Does not require assessment	Poor Ecological Status Hydromorphological Supporting Elements: Supports good Chemical Status - Fail	Mitigation Measures Assessment - Physical modification (Local and Central Government, urban and transport) Invertebrates - Point sources (Water Industry – incidents, Domestic General Public – misconnections, Water Industry – leaking utility sewers), Physical modification	Good Ecological Status by 2027 Good Chemical Status by 2063	Downstream – Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	**Out**	There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels. No change in hydrology or water quality is anticipated from any changes in the flood regime as a result of the project as the Rythe flows into River Thames downstream of Molesey Weir. A change in flood risk as a result of the Project is expected, however this effect will be temporary and infrequent (only during a 1 in 100-year flood event) and therefore the potential effects on hydrology, ecological and chemical elements are considered to be negligible. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph -ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
								(urban and transport – urbanisation) Phosphate - Point sources (Water Industry – incidents, Domestic General Public – misconnections, Water Industry – leaking utility sewers) Fish - Physical modification (barriers – ecological discontinuity, Local and Central Government – flood protection - structures), Diffuse source (urban and transport – urbanisation) Macrophytes and Phytobenthos Combined - Point sources (Water Industry – incidents, Domestic General Public – misconnections, Water Industry – leaking utility sewers)						
Hogsmill	GB10 60390 17440	River	Thames, London	HMWB	Nitrates Directive (Hogsmill NVZ S450)	Moderate Ecological Status Good Chemical Status	Moderate Ecological Status Hydromorph ological Supporting Elements: Supports good Chemical Status - Fail	Fish – Unknown Phosphate – Point source (Domestic General Public – misconnections, sewage discharge – continuous, sewage discharge – intermittent) Invertebrates – Physical modification (urban and transport – urbanisation, flood protection structures), Point sources (sewage discharge –	Moderate Ecological Status by 2015 (Disproportionately expensive: Disproportionate burdens; Good status for Fish element prevented by A/HMWB designated use: Action to get biological element to good would have significant adverse impact on use. Technically infeasible: No known technical solution is available	Downstream – Thames (Egham to Teddington)	Not mentioned in Strategy WFD Assessment.	Not included.	Out	There will be no modification or change to connectivity of the river to existing water bodies or the proposed channels. No change in hydrology or water quality is anticipated from any changes in the flood regime as a result of the project as the Hogsmill flows into River Thames downstream of Molesey Weir. A change in flood risk as a result of the Project is expected, however this effect will be temporary and infrequent (only during a 1 in 100-year flood event) and therefore the potential effects on hydrology, ecological and chemical elements are considered to be negligible. **It is not anticipated that the project will result in changes or measurable direct / indirect impacts to the current ecological or chemical status of this water body. In addition, it is also not anticipated to affect its ability to achieve future RBMP objectives.**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph-ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
								continuous, Domestic General Public – misconnections, sewage discharge – intermittent, Water Industry – leaking utility sewers) Dissolved oxygen – High to Good deterioration, no action required (RFD only) Ammonia (Phys-chem) - High to Good deterioration, no action required (RFD only) Mitigation Measures Assessment – Physical modification (Local and Central Government – other) Cypermethrin (Priority hazardous) - Unknown	for Phosphate element). Good Chemical Status by 2063					
Chobham Bagshot Beds	GB40602G601400	Groundwater	Thames, Thames GW	N/A	Drinking Water Protected Area (Chobham Bagshot Beds – UKGB40602G601400), Nitrates Directive (Emm Brook Nitrate Vulnerable Zone (NVZ) S460)	Good Overall Status Good Quantitative Status Good Chemical Status	Poor Overall Status Good Quantitative Status Poor Chemical Status	Trend Assessment – Diffuse source (Agriculture and rural land management – poor nutrient management)	Good Overall Status by 2015 Good Quantitative Status by 2015 Good Chemical Status by 2015	N/A	Not mentioned in Strategy WFD Assessment however SEA States3: 'Potential for poorer River Thames flood water to infiltrate to ground waters which could also lead to fluctuations in ground water levels. Potential mobilisation of contaminants in and around landfill sites. Potential impacts on groundwater fed sources at Heron Lake, Abbeymeads	**Screened In -** Construction of the channel has the potential to alter the hydraulic connectivity between surface waters and groundwater levels and also to cause changes in water quality. Potential mobilisation of contaminants in and around landfill sites risks affecting groundwater.	**In**	Construction and operation of the channels (during low flow, and flood conditions) has the potential to alter the hydraulic connectivity between surface waters and groundwater levels. There may also be alteration to groundwater flows from construction activities and operation of the RTS. There is also potential to mobilise contaminants in and around landfill sites and other contaminated land within the project extent, and cause changes to groundwater quality. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**

Water body Name (Draft RBMP WFD Cycle 3)	Water body ID	Water body type	RBD / RBMP and Environment Agency Management Catchment	Hydromorph-ological Designation	Protected/ Designated sites (e.g. SPA)	Cycle 1 2009 RBMP Status	Current Cycle 2 2019 RBMP Status	Cycle 2 reasons for not achieving good (RNAG) and reasons for deterioration (RFD)	Draft Cycle 3 2021 RBMP Objectives	Upstream / downstream water bodies	Lower River Thames Strategy WFD Assessment outcomes (2010)[16]	Outline Design WFD Assessment Screening outcomes and reasoning (2018)[17]	Screened In / Out of Preliminary WFD Assessment	Screening assessment reasoning (based on proposed works and hydraulic connectivity)
											(Chertsey) and Walton."			
Lower Thames Gravels	GB40603G000300	Groundwater	Thames, Thames GW	N/A	Drinking Water Protected Area (Lower Thames Gravels – UKGB40603G000300), Nitrates Directive (Roundmoor Ditch and Boveney Ditch NVZ S460)	Good Overall Status Good Quantitative Status Good Chemical Status	Poor Overall Status Poor Quantitative Status Poor Chemical Status	Trend Assessment – Point source (sewage discharge – continuous)	Good Overall Status by 2015 Good Quantitative Status by 2015 Good Chemical Status by 2015	N/A	Not mentioned in Strategy WFD Assessment however SEA States3: 'Potential for poorer River Thames flood water to infiltrate to ground waters which could also lead to fluctuations in ground water levels. Potential mobilisation of contaminants in and around landfill sites. Potential impacts on groundwater fed sources at Heron Lake, Abbeymeads (Chertsey) and Walton."	**Screened In -** Construction of the channel has the potential to alter the hydraulic connectivity between surface waters and groundwater levels and also to cause changes in water quality. Potential mobilisation of contaminants in and around landfill sites risks affecting groundwater.	**In**	Construction and operation of the channels (during low flow and flood conditions) has the potential to alter the hydraulic connectivity between surface waters and groundwater levels. There may also be alteration to groundwater flows from construction activities and operation of the RTS. There is also potential to mobilise contaminants in and around landfill sites and other contaminated land within the project extent, and cause changes to groundwater quality. **It is anticipated that the project could impact the current status or future WFD objectives of this water body. This water body is therefore screened in for further assessment.**

References

Please refer to ‘References’ section at the end of the River Thames Scheme Environmental Impact Assessment Scoping Report for full details.

Appendix A: WFD Screening – Water Bodies in the ZoI

Figure 1: Surface water bodies within the Zone of Influence. Figure ref: ENVIMSE500260-GBV-ZZ-3ZZ-DR-EN-10016
Figure 2: Groundwater bodies within the Zone of Influence. Figure ref: ENVIMSE500260-GBV-ZZ-3ZZ-DR-EN-10017

The River Thames Scheme represents a new landscape-based approach to creating healthier, more resilient and more sustainable communities by reducing the risk of flooding and creating high quality natural environments.