Surrey Heath Water Cycle Study - Stage 2

Final Report

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Surrey Heath Borough Council

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This report describes work commissioned by Surrey Heath Borough Council, by an instruction dated 07 October 2024. The Client's representative for the contract was Keiran Bartlett of Surrey Heath Borough Council. Dylan Nattrass, Elsa Holm, and Paul Eccleston of JBA Consulting carried out this work.

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Abbreviations

25YEP	25-Year Environment Plan
AMP	Asset Management Plan
BNG	Biodiversity Net Gain
BOD	Biochemical Oxygen Demand
BRAVA	Baseline Risk and Vulnerability
BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Methodology
CAMS	Catchment Abstraction Management Strategy
CAPEX	Capital Expenditure
CIRIA	Construction Industry Research and Information Association
CSO	Combined Sewer Overflow
CSP	Catchment Strategic Plan
DLUHC	Department for Levelling Up, Housing & Communities (replaced by MHCLG)
DrWPA	Drinking Water Protected Areas
DWF	Dry Weather Flow
DWI	Drinking Water Inspectorate
DWMP	Drainage and Wastewater Management Plan
DYAA	Dry Year Annual Average
EA	Environment Agency
EDM	Event Duration Modelling
EFI	Environmental Flow Indicator
EIP	Environmental Improvement Plan
EP	Environmental Permit
EU	European Union
FCT	Favourable Condition Target
FFT	Flow to Full Treatment
FMfP	Flood Map for Planning
FWMA	Flood and Water Management Act
GEP	Good Ecological Potential
GES	Good Ecological Status
GIS	Geographic Information Systems
HQM	Home Quality Mark
HRA	Habitats Regulations Assessment

IWMS ..... Integrated Water Management Strategy
JBA..... Jeremy Benn Associates
JNCC..... Joint Nature Conservation Committee
l/p/d ..... Litres per person per day
LLFA..... Lead Local Flood Authority
LNRS..... Local Nature Recovery Strategy
LPA ..... Local Planning Authority
MHCLG ..... Ministry of Housing Communities and Local Government
Ml/d ..... Mega (Million) litres per day
NFM ..... Natural Flood Management
NMP ..... Nutrient Management Plan
NPPF..... National Planning Policy Framework
NRN ..... Nature Recovery Network
OEP..... Office for Environmental Protection
Ofwat..... Water Service Regulation Authority
OPEX ..... Operational Expenditure
PPG..... Planning Practice Guidance
RAG ..... Red / Amber / Green assessment
RBD..... River Basin District
RBMP..... River Basin Management Plan
RNAG..... Reasons for Not Achieving Good
RwH ..... Rainwater Harvesting
SAC..... Special Area of Conservation
SBP ..... Strategic Business Plan
SfA ..... Sewers for Adoption
SFRA..... Strategic Flood Risk Assessment
SHBC ..... Surrey Heath Borough Council
SODRP ..... Storm Overflows Discharge Reduction Plan
SPA..... Special Protection Area
SPZ ..... Source Protection Zone
SS ..... Suspended Solids
SSD..... Small Sewage Discharge
SSSI ..... Sites of Special Scientific Interest
STW ..... Sewage Treatment Works
SU ..... Sewerage Undertaker

SuDS.....Sustainable Drainage Systems

SWMP.....Surface Water Management Plan

UKWIR.....UK Water Industry Research

uPBT.....Ubiquitous, Persistent, Bioaccumulative and Toxic Priority Substance

UV.....Ultra-Violet

WCS.....Water Cycle Study

WFD.....Water Framework Directive

WINEP.....Water Industry National Environment Programme

WRMP.....Water Resource Management Plan

WRZ.....Water Resource Zone

WwTW.....Wastewater Treatment Works

Glossary

Term	Description
Abstraction Point	The location where water is either taken or extracted from a surface or groundwater waterbody.
Agricultural Management	The farming techniques and practices used to produce food and manage livestock.
Abstraction Licencing Strategy	Sets out the Environment Agency's (EA) approach to managing new and existing abstraction and impoundments within their river management catchments.
Asset Management Plan (AMP) Period	Price limit periods in the water sector are sometimes known as Asset Management Plan (AMP) periods. The current period (2020-25) is commonly known as AMP 7 because it is the seventh price review period since privatisation of the water industry in 1989. AMP periods are five years in duration and begin on 1 April in the years ending in 0 or 5. Every five years the industry submits a Business Plan to the Water Service Regulation Authority (Ofwat) for a Price Review (PR). These plans set out the companies' operational expenditure (OPEX) and capital expenditure (CAPEX) required to maintain service standards, enhance service (for example where sewer flooding occurs), to accommodate growth and to meet environmental objectives defined by the EA. Ofwat assesses and compares the plans with the objective of ensuring what are effectively supply monopolies and operating efficiently.
Aquifer	A rock and/or sediment body that holds groundwater.
Dry Weather Flow (DWF)	The average daily flow of wastewater to a Waste Water Treatment Works (WwTWs) during a period without rain.
Effluent	The liquid waste produced from residential, commercial and industrial processes.
Environmental Flow Indicator (EFI)	The proportion of natural flows that are required to support the environment of a waterbody.
Groundwater Body	The management unit under the Water Framework Directive (WFD) which represents a distinct body of groundwater with its own hydrogeological characteristics.
Lead Local Flood Authority (LLFA)	A county council or unitary authority which leads in managing local flood risks (i.e., risks of flooding from surface water, ground water and ordinary (smaller) watercourses). Their duties are outlined in the Flood and Water Management Act (FWMA).
Natural Flood	The use of natural processes to reduce the risk of

Term	Description
Management (NFM)	flooding and coastal erosion.
Per Capita Consumption	The average volume of water used by one person in a day. It is defined as the sum of the measured household consumption of clean water and unmeasured household consumption of clean water divided by the total household population. This is often expressed in litres per person per day (l/p/d).
Permitted Headroom	The difference between the volume of treated wastewater a treatment works is allowed to discharge under its Environmental Permit (EP), and volume it currently discharges. It can be used to estimate the number of properties that could be connected to a wastewater treatment works (WwTW) catchment before a flow permit is exceeded.
Sustainable Drainage Systems (SuDS)	Drainage solutions that provide a natural alternative to the direct channelling of surface water through an artificial network of pipes and sewers to nearby watercourses.
Waterbodies	Areas of water – both salt and fresh, large and small – which are distinct from one another in various ways. All surface waters (including rivers, lakes, estuaries and stretches of coastal water) and groundwaters have been divided up into discrete units called water bodies. Water bodies are the basic unit that are used to assess the quality of the water environment and to set targets for environmental improvements.
Water and wastewater company	Companies that provide both water and sewerage services. In England and Wales, there are eleven 'water and wastewater' companies.
Water Framework Directive (WFD)	A river basin management planning system which was implemented to help protect and improve the ecological health of the UK's rivers, lakes, estuaries and coastal and groundwaters.
Water Framework Directive Classification Status	Rivers, lakes, estuaries and coastal waters can be awarded one of five Water Framework Directive statuses: High, Good, Moderate, Poor, or Bad. Groundwater can be awarded one of two statuses: Good or Poor.
Water Framework Directive – Reasons for not achieving good (RNAG)	Where a Water Framework Directive element is classified as being at less than good status, a reason for the failure to meet the good status is attributed, including the sector deemed responsible or a pressure affecting a biological element.

Term	Description
Water Framework Directive objectives	The Water Framework Directive objectives are set out in Regulation 12 and Regulation 8 of the Water Environment Regulations 2017.
Water Industry National Environment Programme (WINEP)	The programme of work in which water companies in England must meet their obligations from environmental legislation and UK government policy.
Water-only company	Companies that only provide water services. In England and Wales there are five 'water-only' companies.
Water Resource Management Plan (WRMP)	Statutory documents that all water companies must produce at least every five years. They set out how the water company intends to achieve a secure water supply for their customers while protecting and enhancing the environment.
Water Recycling Centres (WRC)	A wastewater treatment works receives flows from the sewerage system and treats it so it can be discharged back into a river. They may also be called Sewage Treatment Works (STW), or water recycling centre (WRC).
Water Resource Zone (WRZ)	An area in which the abstraction and distribution of water is self-contained and is used to meet demand within that area.
Wastewater Treatment Works (WwTW)	A wastewater treatment works receive flows from the sewerage system and treats it so it can be discharged back into a river. They may also be called Sewage Treatment Works (STW) or Water Recycling Centres (WRCs).

Executive Summary

JBA Consulting was commissioned by Surrey Heath Borough Council (SHBC) to update the Water Cycle Study (WCS) for the Surrey Heath borough. The purpose of the WCS is to form part of a comprehensive and robust evidence base to inform the delivery of the Surrey Heath Local Plan. This report replaces the 'Hart, Rushmoor and Surrey Heath' WCS published in May 2017. A Regulation 19 consultation on the draft Local Plan was undertaken in Summer 2024 and submitted to the Secretary of State on the 10 December 2024. This WCS has been prepared as a result of representations received to the Regulation 19 consultation.

Unmitigated future development and climate change can adversely affect the environment and water infrastructure capability. A WCS will provide the required evidence, together with an agreed strategy to ensure that planned growth occurs within environmental constraints, with the appropriate infrastructure in place in a timely manner so that planned allocations are deliverable.

New homes require the provision of clean water, safe disposal of wastewater, and protection from flooding. The allocation of large numbers of new homes in certain locations may result in the capacity of existing available infrastructure being exceeded, a situation that could potentially cause service failures to water and wastewater customers, adverse impacts to the environment, or high costs for the upgrade of water and wastewater assets being passed on to the bill payers.

In addition to increased urbanisation, future climate change including increased intense rainfall events and a higher frequency of drought periods is likely to present further challenges to the existing water infrastructure network. Sustainable planning for water must take this into account.

This WCS provides robust evidence to support delivery of allocations within Surrey Heath and ensure the allocations have a minimal impact on the environment, water quality, water resources, infrastructure, and flood risk. This has been achieved by identifying areas where there may be conflict between any proposed development, and the requirements of the environment (and the environmental legislative tests). The Stage 2 WCS builds on the Hart, Rushmoor and Surrey Heath WCS (2017). Section 2 sets out the approach used to assess planned growth within Surrey Heath and neighbouring Local Planning Authorities (LPAs) as part of the WCS.

Relevant environmental and water industry policy and legislation is presented in Section 3 to provide context for the following sections. The report is then divided into sections assessing the impact of growth on each topic in relation or in connection to the water cycle.

Water resources and supply

Surrey Heath receives its water from two water-only companies, Affinity Water and South East Water. In the Water Resource Zones (WRZs) covering Surrey Heath, the forecast percentage growth in the final Water Resource Management Plans 2024 (WRMP24s) is slightly higher than the expected growth during the Local Plan period.

The Water Industry National Environment Programme (WINEP) is a set of actions that the Environment Agency (EA) have requested that all 20 water companies operating in England complete in a particular Asset Management Period (AMP) as part of their environmental commitments. A number of investigations are already underway or planned to ensure that abstraction of water from both groundwater and rivers is not resulting in unsustainable reductions in flow. Development and population growth can increase abstraction of water, therefore SHBC has an opportunity to contribute to the actions identified in the WINEP indirectly by pursuing policies that promote water efficiency in new developments. In addition, water companies can also support the delivery of objectives outlined in Catchment Management Plans and the priorities of the emerging Surrey Local Nature Recovery Strategies (LNRS) through their contribution to partnership working on environmental improvement schemes alongside other stakeholders.

We are already experiencing the adverse impacts of climate change, and their frequency and severity are projected to increase. Therefore, to tackle the challenges associated with climate change, SHBC aims to achieve net-zero carbon emissions by 2030 as an organisation and work with communities to contribute to making the Borough net zero by 2050 (with the aspiration for net zero by 2030), as set out in the Surrey Heath Climate Action Plan. Climate change is predicted to increase pressure on water resources, increasing the potential for a supply-demand shortage in the future, and resulting in environmental damage associated with likely over abstraction of water resources. Furthermore, the delivery of water and wastewater supply and heating up of water at home require high energy inputs, contributing directly to emissions of greenhouse gases. Water efficiency results in reduced energy use and decreased carbon emissions.

It is important therefore that new developments do not contribute to an unsustainable increase in water abstraction. This can be done in a number of ways from reducing the water demand from new developments through to achieving 'water neutrality' in a region by offsetting a new development's water demand by improving efficiency in existing buildings.

Defra has signalled their intention to review the water efficiency standards for new homes, including consideration of a new national 105l/p/d standard and 100l/p/d where there is a clear local need.

Water resources are under significant pressure in the UK, and the direction of travel in their planning is to achieve a reduction per capita consumption in new build developments below the optional building regulations standard of 110 l/p/d. Currently this approach is not adequately supported in building regulations. The National Planning Policy Framework (NPPF) and policies requiring water efficiency standards of less than 100l/p/d may only be supported by the Local Plan inspection where exceptional circumstances, such as a direct link between water abstraction and damage to a Special Area of Conservation (SAC) occur. Until this changes, LPAs should encourage developers to go beyond building regulations. This is supported by the water companies' incentives for water efficient design in new builds outlined in Section 3.5 where significant incentives are offered to reduce design consumption below 110l/p/d.

A domestic water efficiency target of 110 l/p/d was included within SHBCs Regulation 19 Local Plan following recommendations from the previous Hart, Rushmoor and Surrey Heath WCS (2017). Given the evidence of pressures on the environment, and on public water supply, it is recommended that SHBC considers an updated domestic water efficiency target of 100 l/p/d for all new homes and works with the water suppliers to incentivise even lower consumption.

Wastewater network and treatment

Thames Water is a water and wastewater company that provides wastewater services for Surrey Heath. Developments in areas where there is limited wastewater network capacity will increase pressure on the network, increasing the risk of a detrimental impact on existing customers, and increasing the likelihood of storm overflow operation. Early engagement with developers and the sewerage providers is required and modelling of the network may be required when a site has planning approval. Furthermore, in the Thames Water network, there are areas where the drainage is a combined system, and separation on site must be provided before connecting to the existing system where appropriate.

Early engagement between developers, SHBC and Thames Water is recommended to allow time for the strategic infrastructure required to serve these developments to be planned.

It is widely recognised that the water industry in the UK faces significant challenges to meet the expectations of customers, regulators, and government and confront the challenges of climate change mitigation and a growing population. At the same time, the industry is committed to becoming net zero by 2030. Consideration should be given to using capacity in existing permits as this provides a lower carbon cost than upgrading capacity at existing Waste Water Treatment Works (WwTW) or building new treatment works, as this helps to avoid or defer investment in carbon-intensive new infrastructure.

Within Surrey Heath, Camberley WwTW and Lightwater WwTW have been identified as operating at capacity and will require upgrades and/or a change in permit to serve additional growth over the Local Plan period. Upgrade schemes are planned at these WwTWs as part of Thames Water's Waste Asset Assurance Programme, which will improve flow to treatment performance but not dry weather flow (DWF) capacity. The Lightwater upgrade is due to be completed in 2027, while the Camberley upgrade is due to be completed in 2028. SHBC are engaging with Thames Water through a Statement of Common Ground (SoCG) prepared in July 2024 to support the Local Plan process.

Water quality and environmental impact

An increase in the discharge of effluent from WwTW as a result of development and growth in the area in which they serve can lead to a negative impact on the quality of the receiving watercourse. Under the Water Framework Directive (WFD), a watercourse is not allowed to deteriorate from its current WFD classification (either as an overall watercourse or for individual elements assessed).

It is EA policy to model the impact of increasing effluent volumes on the receiving watercourses. Where the scale of development is such that a deterioration is predicted, a

variation to the Environmental Permit (EP) may be required for the WwTW to improve the quality of the final effluent, so that the increased pollution load will not result in a deterioration in the water quality of the watercourse. This is known as 'no deterioration' or 'load standstill'. The need to meet river quality targets is also taken into consideration when setting or varying a permit.

Water quality modelling was performed using the EA's SIMCAT modelling tool. A baseline scenario was run, updating the existing EA model to the latest flow from WwTW to account for growth since the model was created. A future scenario was then run using the growth forecast for the end of the Local Plan period and the results compared to check for deterioration in water quality. A further test then investigated whether deterioration could be prevented by improvements in upstream treatment. No significant deterioration as a result of planned development is predicted at each WwTW serving growth over the Local Plan period, and growth alone will not prevent Good Ecological Status (GES) being achieved in the future, should improvements in upstream water quality be made.

Development sites within the study area could be sources of diffuse pollution from surface runoff. Sustainable drainage systems (SuDS) are currently required on all development sites. Their design should consider both water quantity and water quality and site level investigations should be undertaken to define the most appropriate SuDS types for each specific development. Surrey County Council should be consulted at an early stage of development to ensure that SuDS are implemented and designed in response to site characteristics and policy factors.

It should be noted that Schedule 3 of the Flood and Water Management Act (FWMA) is due to be implemented in England, which will make SuDS mandatory. It is also expected to establish Surrey County Council as a SuDS Approving Body (SAB), responsible for the approval and adoption of SuDS. The SAB approval of SuDS designs will form a separate process to the planning system. The previous government affirmed its commitment for enacting Schedule 3; however, it is currently unknown whether the new government intends to do this or what the proposed timescales would be.

1 Introduction

1.1 Terms of reference

JBA Consulting was commissioned by Surrey Heath Borough Council (SHBC) to update the Water Cycle Study (WCS) to support their new Local Plan. This will provide an assessment of the impact of the growth options on water infrastructure and the water environment.

This study builds on the WCS completed in 2017 as a joint study for the three neighbouring local authorities of Hart District Council, Rushmoor Borough Council, and SHBC. This Stage 2 WCS is specific to SHBC and will replace the evidence provided in the previous study.

The purpose of the WCS is to form part of a comprehensive and robust evidence base to inform the delivery of the new Local Plan, which will set out where and how development will take place during the plan period and will be used to inform decisions on the location of future development. A Regulation 19 consultation on the draft Local Plan was undertaken in Summer 2024 and submitted to the Secretary of State on the 10 December 2024. This WCS has been prepared as a result of representations received to the Regulation 19 consultation.

Unmitigated future development and climate change can adversely affect the environment and water infrastructure capability. A WCS will provide the required evidence, together with a strategy to ensure that planned growth occurs within environmental constraints, with the appropriate infrastructure in place in a timely manner so that planned allocations are deliverable.

1.2 Structure of report

The requirements and objectives of the WCS are set out in the section below. Planned growth in and around Surrey Heath is characterised in Section 2 of the report, before relevant environmental and water industry policy and legislation is presented in Section 3 to provide context for the following assessment. The report is then divided into sections assessing the impact of growth on each topic in the WCS.

1.3 The water cycle

Planning Practice Guidance (PPG) on Water Supply, Wastewater and Water Quality (gov.uk) describes a WCS as:

'a voluntary study that helps organisations work together to plan for sustainable growth. It uses water and planning evidence and the expertise of partners to understand environmental and infrastructure capacity. It can identify joined up and cost-effective solutions, that are resilient to climate change for the lifetime of the development.

The study provides evidence for Local Plans and sustainability appraisals and is ideally done at an early stage of plan-making. Local authorities (or groups of local authorities) usually lead water cycle studies, as a chief aim is to provide evidence for sound Local Plans, but other partners often include the Environment Agency and water companies.'

The Environment Agency's (EA's) guidance on WCS (gov.uk) recommends a phased approach:

- Stage 1: Scoping study, identifies if the water infrastructure capacity could constrain growth and if there are any gaps in the evidence you need to make this assessment. It will identify:
  - the area and amount of proposed development;
  - the existing evidence;
  - main partners to work with; and
  - evidence gaps and constraints on growth.
- Stage 2: Detailed study, to provide the evidence to inform an integrated water management strategy. It will identify the water and flood management infrastructure that will mitigate the risks from too little or too much water. It will also identify what you need to do to protect and enhance the water environment.

Due to the advanced stage of the SHBC Local Plan, with the spatial extent of development already defined in SHBC's submitted Local Plan, this WCS has been prepared as a detailed study.

As a WCS is not a mandatory document, Local Planning Authorities (LPAs) are advised to prioritise the stages of the WCS to integrate with their Local Plan programme. Figure 1-1 shows the main elements that comprise the Water Cycle.

The natural water cycle describes the continuous transfers of water around the planet, from atmosphere to surface and back via evaporation, transpiration and precipitation, and the various flows and storage processes that occur. The artificial water cycle looks at the availability of water resources for human consumption, its treatment and supply to homes and business, its use and consequently the generation of wastewater. It then looks at how wastewater is taken away, treated, and finally what happens when it is returned to the environment.

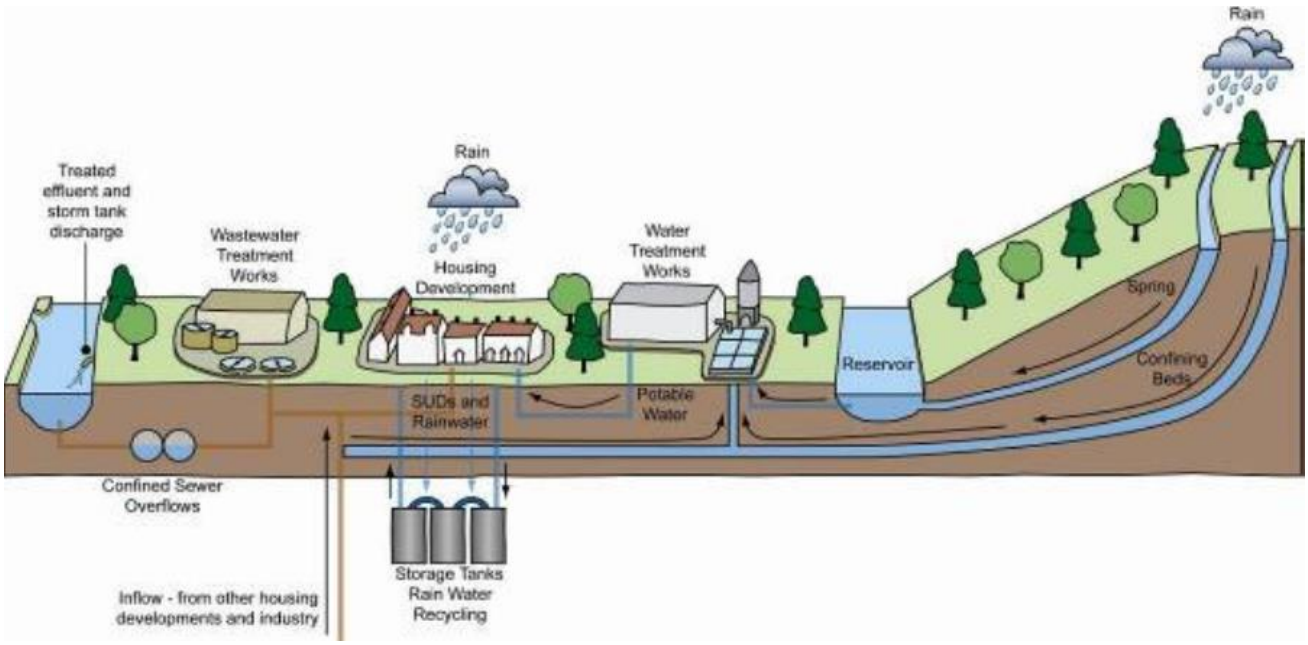


Figure 1-1: The Water Cycle.

1.4 Impacts of development on the water cycle

New homes require the provision of clean water, safe disposal of wastewater, and limitation of flood risk. It is possible that allocating large numbers of new homes at some locations may result in the capacity of the existing available infrastructure being exceeded. This situation could potentially lead to service failures to water and wastewater customers, have adverse impacts on the environment, or cause the high cost of upgrading water and wastewater assets being passed on to bill payers. Climate change presents further challenges such as increased intensity and frequency of rainfall and a higher frequency of drought events that can be expected to put greater pressure on the existing infrastructure. Development, when planned correctly, can also offer opportunities to reduce flood risk to existing properties and increase community resilience, contribute to nature recovery, and allow a collaborative approach to infrastructure.

1.5 Objectives

This Stage 2 Detailed WCS is written to support SHBC's new Local Plan. The overall objective of the WCS is to understand the environmental and physical constraints of development and identify opportunities for more sustainable planning and improvements that may be required to achieve the required level of development.

This WCS will consider the following issues:

- Water resources, demand, and supply.
- Wastewater infrastructure and treatment.
- Water quality and environmental impact.

1.6 Study area

SHBC is located in the northwest of Surrey, in the southeast of England. The borough covers an area of approximately 95 km^2 and is mainly urban in character. The study area has a population of 90,500 (based on the 2021 census data).

The western part of the borough comprises of Camberley (main centre), Old Dean, and Heatherside. Frimley is located in the southwest, as well as the villages of Frimley Green, Mytchett, and Deepcut. The eastern half of the borough is mostly rural, but includes the villages of Bisley, Bagshot, Lightwater, West End, Windlesham, and Chobham.

The key watercourses which flow through the borough are the River Blackwater, which flows in a northerly direction along the western border, and the River Bourne (also known as the Addlestone Bourne), which flows in a south-easterly direction through the eastern side of the borough. Chertsey Bourne also flows east along a small part of the northern boundary, between Bagshot Road and Devenish Road. The Basingstoke Canal runs through the southernmost area of the borough.

There are two water-only companies within SHBC. South East Water supplies the western side of the borough, and Affinity Water supplies the eastern side. Thames Water is a water and wastewater company that serves as the sewerage provider for the entire borough. Locations that are supplied by these companies can be found on UK Parliament website (parliament.uk).

The study area is shown in Figure 1-2.

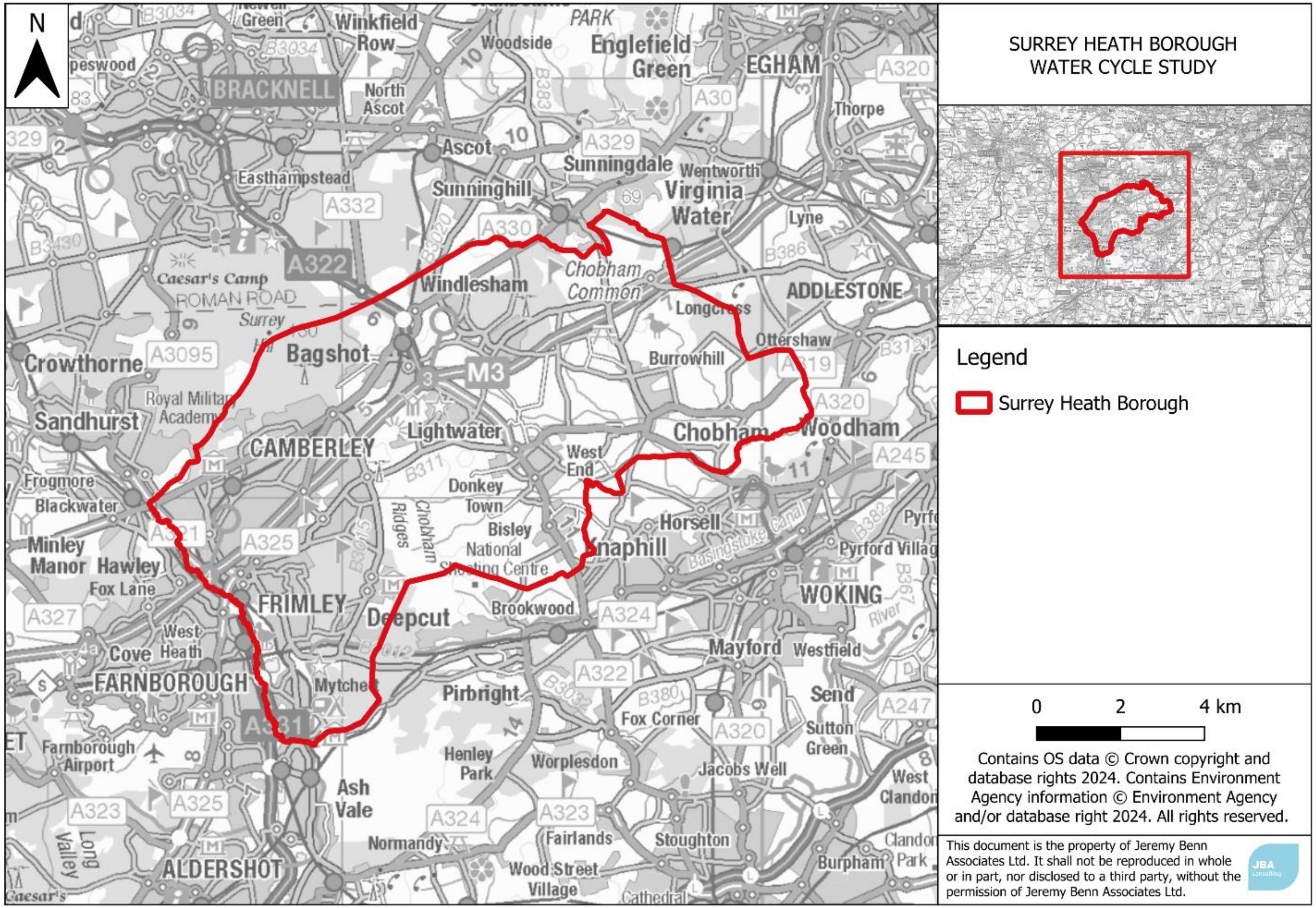


Figure 1-2: Study area.

1.7 Water resource and wastewater management authorities

Within SHBC there are a number of authorities and regulators responsible or involved in supplying, managing, and overseeing water supply, wastewater, and the environment. Table 1-1 below explains the responsibilities of various bodies within the local plan area.

Table 1-1: Responsibilities of authorities within Surrey Heath.

Authority name	Key responsibilities
Environment Agency	The EA are the environmental regulator in the UK with responsibilities for water quality, flood risk and administering licences for water abstraction. They are a statutory consultee for many development plan documents and for some planning applications. They advise on environmental and infrastructure capacity issues across the water cycle.
Natural England	Natural England are the Government's advisors on the natural environment, which they have a responsibility to protect and enhance. In a WCS they may provide information on the conservation objectives and guidance on the protection of designated sites.
Ofwat	Ofwat, also known as the Water Services Regulation Authority, are responsible for the economic regulation of the privatised water and sewerage industry in England and Wales. They are a non-ministerial government department whose duties include protecting consumers' interests and determining the appropriate level of investment.
South East Water	South East Water is a water-only company that supplies the western part of the borough, covering 64% of properties[1]. The area supplied includes: Camberley, Old Dean, Heatherside, Frimley, Frimley Green, Deepcut, and Mytchett. As the water supplier for these parts of Surrey Heath, South East Water have the responsibility to maintain an efficient and economical system of water supply.
Affinity Water	Affinity Water is a water-only company that supplies the eastern part of the borough, covering 36% of properties[1] but a larger geographical area than South East Water. The region supplied includes: Lightwater, Bagshot, West End, Bisley, Windlesham, Valley End, and Chobham. As the water supplier for these parts of Surrey Heath, Affinity Water have the responsibility to maintain an

1 Constituency information: Water companies, UK Parliament (2024). Accessed online at: https://commonslibrary.parliament.uk/constituency-information-water-companies/#datasources on: 14/11/2024.

Authority name	Key responsibilities
	efficient and economical system of water supply.
Thames Water	Thames Water is a water and wastewater company that acts as the Sewerage Undertaker (SU) for the whole of Surrey Heath. They are responsible for providing, improving, and extending a system of public sewers (for both domestic and trade flows), and to make provision for the emptying of those sewers.
Retail suppliers to non-household customers	Businesses and other non-household customers are supplied via non-household water and wastewater service retailers. The 'wholesale supplier' remains the local supplier of water and/or wastewater services in that area. Retail suppliers were introduced with the intention of providing competition in the monopolistic water market.

1.8 Record of engagement

1.8.1 Overview

Preparation of a WCS requires significant engagement with stakeholders including water and wastewater utilities, the EA, and, where there may be cross-boundary issues, with neighbouring local authorities. This section forms a record of engagement for the WCS.

1.8.2 Engagement

The preparation of this WCS was supported by the following engagement:

Inception meeting

- **Engaged parties:** SHBC (LPA).
- **Details:** Scope of works and data collection requirements.

Neighbouring authorities

- **Engaged parties:** All 7 neighbouring LPAs (Bracknell Forest, Guildford, Hart, Rushmoor, Runnymede, Windsor and Maidenhead, and Woking).
- **Details:** Request and receipt of site allocation and commitment data**.**

Collaboration with Water Companies and Risk Management Authorities

- **Engaged parties:** SHBC (LPA), Surrey County Council Lead Local Flood Authority (LLFA), Affinity Water, South East Water, Thames Water, and the EA.
- **Details:** Scope of works and data collection requirements.

2 Future growth in Surrey Heath

2.1 Growth in Surrey Heath

SHBC's new Local Plan is currently planned to be adopted in Autumn 2025 and cover the period from 2019 to 2038. The plan will direct future growth and associated infrastructure across the area and will include new housing and employment requirements for Surrey Heath.

The following section summarises expected growth across Surrey Heath borough during the plan period. This generates a forecast that can be used to estimate the volume of water and wastewater required in the future, and assess the impact of the resulting pressure on water infrastructure.

This forecast consists of:

- Allocations - sites specifically defined in the Local Plan.
- Committed sites - sites which have been granted planning permission.
- Recent completions - sites completed in the last year that may not yet appear in flow data provided by water companies. This does not include completions from 2019 to April 2023 as these are already represented in baseline water company flow data.
- Non-allocated SLAA sites - identified as having capacity to deliver between five and nine net dwellings in Appendix 2 of the SLAA 2023.
- Windfall - sites that have not been specifically identified in the Local Plan, normally comprised of previously developed sites that have unexpectedly come available.
- Neighbouring authority growth - growth located outside of Surrey Heath, but which will be served by infrastructure within or shared with the study area.

The Submitted Local Plan states that land must be identified for a minimum of 5,578 homes over the plan period (2019 to 2038). The Spatial Strategy in the Local Plan sets out that Surrey Heath will deliver at least 6,012 net new homes over the Local Plan period, with 4,848 in the West of the Borough, 727 in the East, and the remaining supply including windfalls.

SHBC provided information on expected growth during the plan period which was collated into a forecast for housing and employment. This is summarised in Table 2-1. Note that the net increase in employment space is very small, due to a number of applications to change use to residential or demolish existing employment spaces. SHBC also provided their employment modelling data so this could be included in qualitative assessments relating to wastewater infrastructure capacity due to uncertainty around the volume of growth at each site. Employment space gain from this work is included as a “residual need” in Table 2-2, for office space the figure reprentes the lower limit of SHBC’s calculated need, and for Industrial and Logistics the figure represents the upper limit. Table 2-1.

Table 2-1: Overall growth in the Surrey Heath area from April 2023.

Type of Growth	Potential Number of Houses
Proposed allocations (includes sites from Appendix 2 of the SLAA 2023)	2693
Adopted allocations	Included within commitments and proposed allocations
Commitments	1063
Recent Completions (from April 2023)	762
Windfall	487
Total	**5,005**

Table 2-2 Employment growth in the Surrey Heath area from April 2023

Type of Growth	Potential Employment Space (m^2)
Recent Completions	-137
Commitments	15,762
Residual need: Office (lower end of range identified in employment needs forecast)	11,306
Residual need: Industrial and Logistics (upper end of range identified in employment needs forecast)	22,591
Total	**49,522**

The spatial distribution of proposed growth in Surrey Heath is presented in Figure 2-1. The distribution of planned development is not even, with over 75% of new development projected to be in the west of the borough around Camberley and Frimley, roughly 11% is projected to be in the central area of the borough including Lightwater, Bagshot and Windlesham, with the remaining volume of growth forecast to occur in the east of the Borough around Chobham.

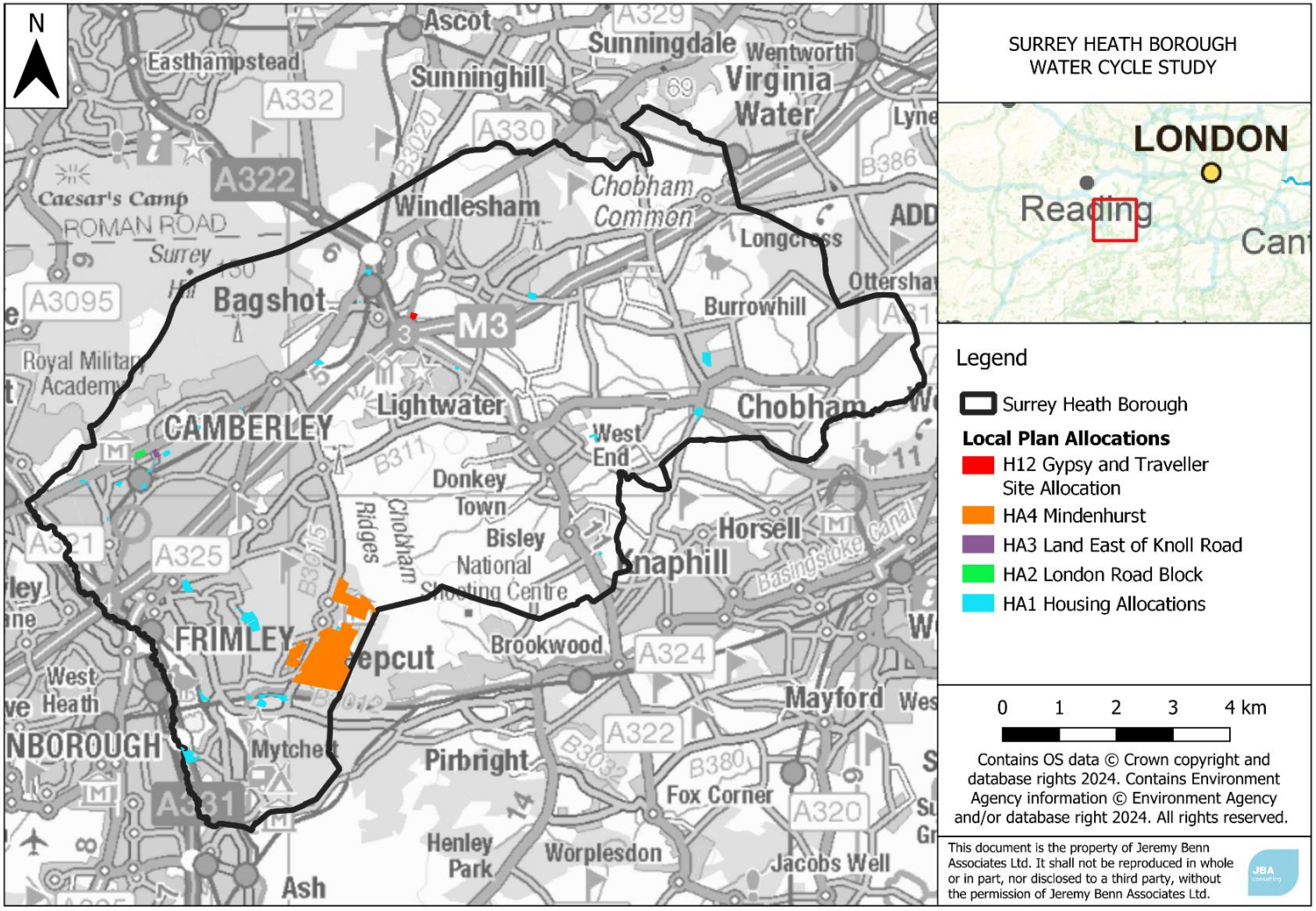


Figure 2-1: Proposed allocations in SHBC's Local Plan.

2.2 Windfall

Windfall sites are sites that are not specifically allocated in the Local Plan or neighbourhood plans. Local Plans usually provide an allowance to cover this circumstance, consistent with the National Planning Policy Framework (NPPF). Windfall sites were provided by SHBC alongside the local area that they are projected to be delivered in based on historic delivery, therefore assigning these sites to a Water Resource Zone and wastewater treatment works involved a degree of assumption. Windfall development was assigned to the largest treatment works covering that settlement. The windfall allowance of 37 homes per year across Surrey Heath was advised by SHBC to inform this study. This may be different in the published Local Plan and may change as a result of subsequent monitoring.

2.3 Growth outside Surrey Heath

2.3.1 General approach

Where growth within a neighbouring LPA area may be served by infrastructure within or shared with Surrey Heath, the LPA were contacted as part of a Duty to Cooperate request to provide information on:

- The latest growth forecast (housing and employment) for the local plan area.
- Details of future growth within the catchments of Wastewater Treatment Works (WwTW) which serve part of their council area and Surrey Heath.

The neighbouring authorities to Surrey Heath are shown in Figure 2-2. The neighbouring authorities in this study are as follows:

- Hart District.
- Bracknell Forest.
- Guildford Borough.
- Runnymede Borough.
- Rushmoor Borough.
- Royal Borough of Windsor and Maidenhead.
- Woking Borough.

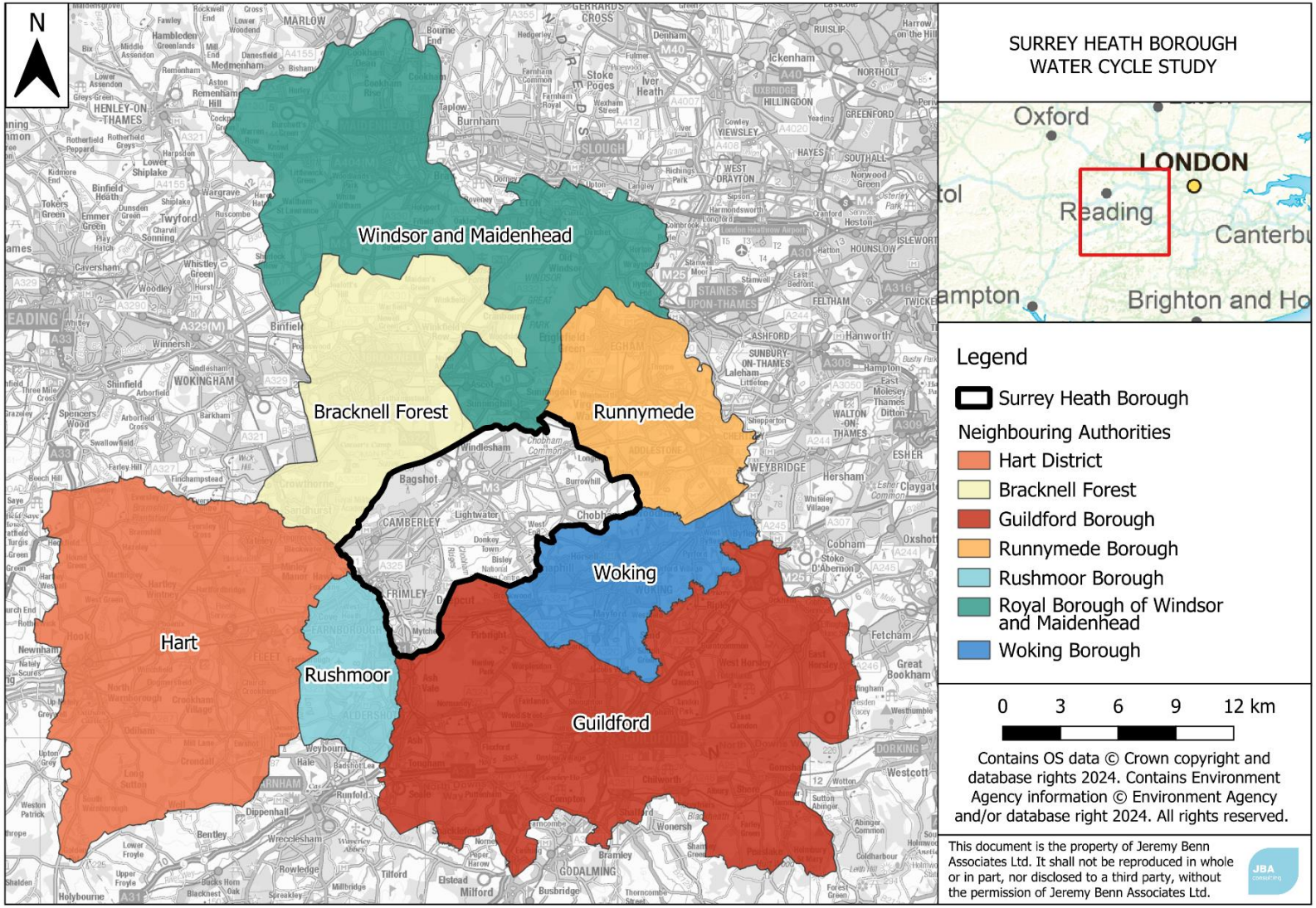


Figure 2-2: Neighbouring authorities to Surrey Heath.

2.3.2 Neighbouring authority growth

Growth within neighbouring authorities to SHBC is summarised, alongside the WwTW infrastructure that is shared.

2.3.2.1 Windsor and Maidenhead

Windsor and Maidenhead provided their housing and employment commitments for the study. These sites would be served by Lightwater STW which is shared with Surrey Heath.

Table 2-3: Summary committed growth in Windsor and Maidenhead served by infrastructure shared with Surrey Heath.

WwTW	Number of Houses	Employment
Lightwater WwTW	40	None identified

2.3.2.2 Woking

At this stage, Woking Borough Council have not provided growth information for the study. Sites in Woking could potentially be served by Chobham STW which is shared with Surrey Heath. However, the area shared is small, only covering a small area between Scotts Grove Road and Guildford Road, to the south of Chobham, therefore it is unlikely that significant development sites would be served by Chobham WwTW.

2.3.2.3 Other neighbouring authorities

Commitments and allocations data was assessed for the other neighbouring authorities. However, no sites were identified as sharing wastewater infrastructure with developments in Surrey Heath.

2.4 Growth and water demand

A forecast of the impact of the planned housing and employment growth in and around Surrey Heath on water demand was prepared as set out in the following sections.

2.4.1 Water demand from housing

Data from the water supply companies' final Water Resource Management Plan 2024 (WRMP24) market information tables was used. The forecast for water demand is based on per-capita consumption for the year 2023-2024, as published in the final WRMP24s. As a result of this, the forecast represents the baseline 'business-as-usual' scenario, not accounting for water efficient design and supply and demand measures from the water companies' WRMPs. Water efficient design is explored further in Section 3.4, while measures set out in the WRMP24s are reviewed in Section 4.4.

2.4.2 Water demand from employment sites

Demand from employment sites was calculated assuming a rate of 100l/d per employee. Where the forecast number of employees for a site was not specified by SHBC, employment floorspace and assumed density based on employment use classes was used to calculate an indicative number of employees for a site. Table 2-4 below outlines the assumed densities of employment space derived from the Employment Density Guide (kirklees.gov.uk). This guide pre-dates recent changes in working practices as a result of the Covid-19 pandemic, technological changes to support working from home, and automation.

Table 2-4: Employment use classes and assumed densities used to calculate water demand.

Use class	Description	Density (m2/employee)
B1	Offices (assumed)	13
B1a	Offices	8
B1b	R&D space	40
B1c	Light industrial	47
B2	Industrial and manufacturing	36
B8	Storage and distribution	70
Mixed B	Mixed	28
Mixed	Mixed	40
SG	Data centres	180
A1	Retail	15
A2	Finance and professional services	16
A3	Restaurants and cafes	15
Mixed A	Mixed	15
C1	Hotels	requires bed count
C2	Residential institutions	requires bed count
D1	Cultural Attraction	36
D2	Leisure	65

2.4.3 Business as usual water demand forecast

The impact of planned growth across the SHBC's Local Plan period on water demand is summarised in Figure 2-3, displaying demand from each source of growth outlined in Section 2.1 and from neighbouring authorities. Additional water demand from planned development in Surrey Heath is forecast to grow by 1.95 megalitres per day (Ml/d) across the water industry's four Asset Management Plan (AMP) periods spanning the timeframe of the Local Plan.

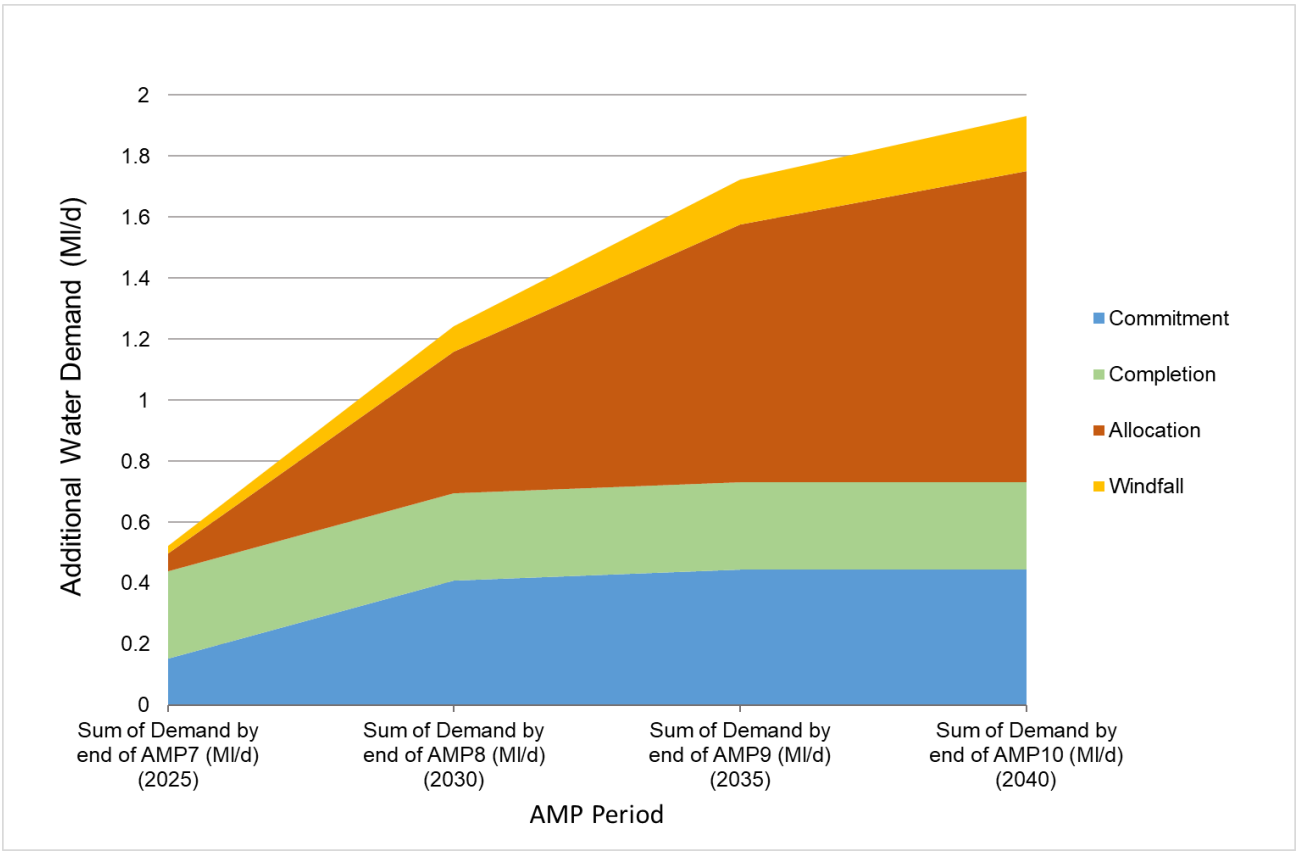


Figure 2-3: Additional water demand (Ml/d) forecast across the Local Plan period.

3 Policy and legislation

3.1 Introduction

The following sections introduce several national, regional, and local policies that must be considered by the LPA, water companies, and developers during the planning stage. Key extracts from these policies are presented as well as links to the full text. Whilst care has been taken to ensure that the information presented in this report was up to date at the time of writing, policy and guidance can change rapidly and the reader should ensure that the most up to date information is sought.

3.2 Plan-making

The NPPF (2024) (gov.uk) was originally published in 2012 as part of reforms to make the planning system less complex and more accessible, to protect the environment, and to promote sustainable growth.

Local Plans are the primary mechanism by which plan-led spatial planning is implemented in England. The NPPF states that Local Plans must be prepared by LPAs and include:

- Strategic policies which set out the 'overall strategy for the pattern, scale and design duality of places…', including for the provision of infrastructure, transportation and community facilities (Paragraph 20).
- Non-strategic policies, which 'set out more detailed policies for specific areas, neighbourhoods or types of development. This can include allocating sites, the provision of infrastructure and community facilities at a local level...' (Paragraph 29).

Under the Localism Act (legislation.gov.uk) new rights were provided to allow local communities to come together and shape the development and growth of their area by preparing Neighbourhood Development Plans, or Neighbourhood Development Orders, where the ambition of the neighbourhood is aligned with strategic needs and priorities for the area. Neighbourhood Plans can make non-strategic policies, aligned to the strategic policies of the Local Plan. As neighbourhoods draw up their proposals, LPAs are required to provide technical advice and support to communities.

It should be noted that the latest update to the NPPF was published during the production of this study (December 2024), while SHBCs Local Plan is being assessed under the previous version of the NPPF published in December 2023.

3.3 Water and the planning system

3.3.1 National Planning Policy Framework and water

The NPPF (2024) provides guidance to planning authorities to take account of flood risk and water and wastewater infrastructure delivery in their Local Plans. Key paragraphs include:

- Paragraph 35: 'Plans should set out the contributions expected from development. This should include setting out the levels and types of affordable housing provision required, along with other infrastructure (such as that needed for education, health, transport, flood and water management, green and digital infrastructure). Such policies should not undermine the deliverability of the plan.'
- Paragraph 162: 'Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply...'
- Paragraph 187e: '…preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.'

3.3.2 Planning Practice Guidance overview

The PPG was originally issued in 2014 by the Department for Communities and Local Government, with the intention of providing guidance on the application of the NPPF. The individual guidance documents are updated periodically. The following guidance documents are particularly relevant to a WCS:

- Water Supply, Wastewater and Water Quality (gov.uk).
- Housing - Optional Technical Standards (gov.uk).
- Flood Risk and Coastal Change (gov.uk).

3.3.3 PPG - Water supply, wastewater and water quality

Two key passages from the PPG (Paragraph 002) provide an overview of what needs to be considered by plan-making authorities, and provide a basis for the work contained in a WCS or an Integrated Water Management Strategy (IWMS):

- 'Early discussions between strategic policy-making authorities and water and sewerage companies can help to ensure that proposed growth and environmental objectives are reflected in company business plans. Growth that requires new water supply should also be reflected in companies' long-term water resources management plans. This will ensure that the necessary infrastructure is funded through the water industry's price review.'
- 'Strategic policy-making authorities will also need to consider the objectives in the government's 25 Year Environment Plan to reduce the damaging abstraction of water from rivers and groundwater, and to reach or exceed objectives for rivers, lakes, coastal and ground waters that are specially protected.'

A summary of the advice for plan-makers and for planning applications is contained below but it is recommended that the full text is reviewed.

Plan-making considerations - Infrastructure (Paragraph 005)

- Identification of suitable sites for new or enhanced infrastructure, including the location of existing and proposed development.
- Consider whether new development is appropriate near to water and wastewater infrastructure (for example due to odour concerns).
- Phasing new development so that water and wastewater infrastructure will be in place when needed. Infrastructure should also be in place before any environmental effects occur on designated sites of importance for biodiversity.

Plan-making considerations - Water quality (Paragraph 006)

- How to help protect and enhance local surface water and groundwater in ways that allow new development to proceed and avoids costly assessment at the planning application stage.
- The type or location of new development where an assessment of the potential impacts on water bodies may be required.
- Whether measures to improve water quality, (e.g., Sustainable drainage systems (SuDS) schemes) can be used to address water quality in addition to flood risk.

Plan-making considerations - Wastewater (Paragraph 007)

- The sufficiency and capacity of wastewater infrastructure.
- The circumstances where wastewater from new development would not be expected to drain to a public sewer (such as via a package treatment Sewage Treatment Works (STW) or septic tank).
- The capacity of the environment to receive effluent from development without preventing statutory objectives being met.

Early engagement with the LPA, the EA, and relevant water and sewerage companies can help establish whether any particular water and wastewater issues need to be considered.

Considerations for planning applications - Water supply (Paragraph 016)

Water supply planning would normally be addressed through the LPA's strategic policies and reflected in the water companies WRMPs. Water supply is therefore unlikely to be a consideration for most planning applications. However, some exceptions might include:

- Large developments not identified in plans that are likely to require a large volume of water; and/or
- significant works required to connect the water supply; and/or
- where a plan requires enhanced water efficiency in new development as part of a strategy to manage water demand locally.

Considerations for planning applications - Water quality (Paragraph 016)

Water quality is only likely to be a significant planning concern where a proposal would:

- Involve physical modifications to a water body such as flood storage areas, channel diversions and dredging, removing natural barriers, construction of new locks, new culverts, major bridges, new barrages or dams, new weirs, and removal of existing weirs; and/or

- Indirectly affect water bodies, for example:
    - As a result of new development such as the redevelopment of land that may be affected by contamination, mineral workings, water and wastewater treatment, waste management facilities and transport scheme including culverts and bridges.
- Result in runoff into surface water sewers that drain directly, or via a combined sewer, into sensitive waterbodies e.g., waterbodies with a local, national or international habitat designation.
    - Through a lack of adequate infrastructure to deal with wastewater.
    - Through a local of adequate infrastructure to deal with wastewater where development occurs in an area where there is strategic water quality plan e.g., a Nutrient Management Plan (NMP), RBMP, WCS, Diffuse Water Pollution plan or sewerage undertakers' drainage strategy which set out strategies to manage water quality locally and help deliver new development.

3.3.4 PPG - Housing - Optional technical standards

This guidance advises planning authorities on how to gather evidence to set optional requirements, including for water efficiency. It states that: 'All new homes already must meet the mandatory national standard set out in the Building Regulations (of 125 litres /person /day). Where there is a clear local need, LPAs can set out Local Plan policies requiring new dwellings to meet the tighter Building Regulations optional requirement of 110 litres/person/day.'

Planning authorities are advised to consult with the EA and water companies to determine where there is a clear local need, and also to consider the impact of setting this optional standard on housing viability. The evidence for adopting the optional requirements is outlined in Section 4.8. Viability is reviewed in Section 3.4.4.

3.3.5 PPG - Flood risk and coastal change

This guidance sets out how spatial planners, planning authorities and developers should manage flood risk to and from proposed developments, including assessing risk, avoiding flood risk, controlling, managing and mitigating flood risk.

Full details of the 2022 PPG updates are set out in the Strategic Flood Risk Assessment (SFRA).

3.3.6 PPG - Climate change

This guidance advises how to identify suitable mitigation and adaptation measures in the planning process to address the impacts of climate change. Planning can help increase resilience to climate change impact through the location, mix and design of development. There is a statutory duty on LPAs to include policies in their Local Plan to tackle climate change and its impact.

3.3.7 Levelling-up and Regeneration Act 2023

The Levelling-up and Regeneration Act 2023 (legislation.gov.uk) aims to support the Government's commitment to reducing geographical disparities between different parts of the UK. Within the Act there are several parts relating to the water environment.

Part 7 relates to nutrient pollution standards. Where the Secretary of State considers that a habitats site that is wholly or partly in England is in an unfavourable condition by virtue of pollution from nutrients in water comprising phosphorus or compounds, or nitrogen or compounds, the Secretary of State may designate the catchment area for the habitats site as a phosphorus or nitrogen sensitive area.

It requires Sewerage Undertakers (Sus) in England to upgrade phosphorus or nitrogen significant plants in its sewerage system by 2030 in order to meet phosphorus or nitrogen pollution standards.

A phosphorus or nitrogen significant plant is defined as one that discharges treated effluent into a sensitive catchment area and is not exempt in relation to the pollution standard. Unless otherwise defined, the treatment standard for phosphorus is 0.25mg/l, and for nitrogen is 10mg/l.

3.4 Water and design

3.4.1 Building regulations

The Building Regulations (2010) Part G (gov.uk) was amended in early 2015 to require that all new dwellings must ensure that the potential water consumption must not exceed 125 litres/person/day, or 110 litres/person/day where required under planning conditions (see Section 3.3.4).

The Environmental Improvement Plan (EIP) (gov.uk), discussed in Section 3.7.2, contains a commitment to consider a new standard for new homes in England of 105 litres per person per day (l/p/d) and 100 l/p/d where there is a clear local need, such as in areas of serious water stress. Whilst this new standard is only under consideration, it demonstrates the direction of travel for water efficiency standards, and it is highly likely that this or a similar standard will be adopted.

3.4.2 Building Research Establishment

The Building Research Establishment (BRE) publish an internationally recognised environmental assessment methodology for assessing, rating, and certifying the sustainability of a range of buildings.

New homes are most appropriately covered by the Home Quality Mark (HQM) (breeam.com) and commercial, leisure, educational facilities, and mixed-use buildings by the Building Research Establishment Environmental Assessment Methodology (BREEAM) UK New Construction Standard (files.bregroup.com).

Using independent, licensed assessors, BREEAM/HQM assesses criteria covering a range of issues in categories that evaluate energy and water use, health and wellbeing, pollution, transport, materials, waste, ecology, and management processes.

In the HQM, 400 credits are available across 11 categories and lead to a star rating. 18 credits are available for water efficiency and water recycling. A greater number of credits are awarded for homes using water efficient fittings (with the highest score achieving 100l/p/d or less), and further credits are awarded for the percentage of water used in toilet flushing that is either sourced from rainwater or from grey water.

The BREEAM New Construction Standard awards credits across nine categories, four of which are related to water: water consumption, water monitoring, leak detection and water efficient equipment. This leads to a percentage score and a rating from 'Pass' to 'Outstanding'.

Through the Local Plan, SHBC has the opportunity to seek BREEAM certification, or an equivalent status, for all new, residential, and non-residential buildings.

3.4.3 Energy and water

18% of the UK's domestic energy usage is for water heating[2]. If less water was being used within the home, for instance through more water efficient showers, less water would need to be heated, and overall domestic energy usage would be reduced.

The Government is currently analysing the results of a 2019 consultation on a Future Homes Standard that will involve changes to Part L (conservation of fuel and power) of the Building Regulations for new dwellings. While there is no direct mention of water efficiency in this consultation, there is an important link between water use and energy use, and therefore between water use and the whole-life carbon cost of developments.

3.4.4 Viability

The evidence for the costs of meeting the optional 110l/p/d water efficiency target in new homes indicate that the costs are minimal:

- A 2014 study into the cost of implementing sustainability measures in housing found that meeting a standard of 110 litres per person per day would cost only £12 (at 2023 prices) for a four-bedroom house[3].
- The Committee on Climate Change report, UK Housing: Fit for the Future (2019) (theccc.org.uk), stated that the cost of 'requiring all homes in England to be built to 110 l/p/d is possible under Part G of regulations and would be no additional cost'.

2 Energy consumption in the UK, Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy (2022). Accessed online at: https://www.gov.uk/government/statistics/energy-consumption-in-the-uk-2022 on 13/01/2025.

3 Housing Standards Review: Cost Impacts, E.C. Harris (2014). Accessed online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/353387/021c_Cost_Report_11th_Sept_2014_FINAL.pdf on 13/01/2025.

- Heating water accounts for 18% of energy used in the home[2]. Looking at the combined costs of gas and electric, this would cost a 2-3 person, 3-bed household an average of £327 per year in energy at 2025 costs according to British Gas (britishgas.co.uk). Water efficiency is therefore not only viable but of positive economic benefit to both private homeowners and tenants.

There is less evidence available on the costs of going below 110l/p/d. The Sussex North Water Neutrality Strategy (crawley.gov.uk) found that the additional cost to meet 85l/p/d using water efficient fittings would be between £349 and £431 per dwelling, or £1,049 to £1,531 where white-goods appliances would not otherwise have been installed in the dwelling (2022 prices).

3.5 The water industry

3.5.1 The water industry in England

Water and sewerage services in England and Wales are provided by eleven 'water and wastewater' companies and five 'water-only' companies. The central legislation relating to the industry is the Water Industry Act 1991. The companies operate as regulated monopolies within their supply regions, although very large water users and developments are able to obtain water and/or wastewater services from alternative suppliers - known as inset agreements.

The Water Act 2014 (legislation.gov.uk) aims to reform the water industry to make it more innovative and to increase resilience to droughts and floods. Key measures that could influence the future provision of water and wastewater services include:

- non-domestic customers being able to switch their water supplier and/or SU;
- new businesses being able to enter the market to supply these services;
- measures to promote a national water supply network; and
- enabling developers to make connections to water and sewerage systems.

The water industry is primarily regulated by three regulatory bodies:

- **Economic regulation:** Office of Water Services (Ofwat) are the economic regulator. They have a statutory duty to protect the interests of consumers, ensuring water companies carry out their functions (customer service standards, environmental rules, drinking water standards etc) and can finance them. Part of this role is setting the limits on pricing of water and sewerage services.
- **Environmental regulation:** The EA are the environmental regulator. They are responsible for monitoring the impact of the water industry (as well as others) on the environment and issuing permits for abstraction of water and discharge of wastewater.
- **Drinking water regulation:** The Drinking Water Inspectorate (DWI) implement standards for drinking water and can take enforcement measures against water companies if those standards are not met.

3.5.2 Planning and funding of the water industry

The water industry works on a five-year cycle called the Asset Management Plan period or AMP periods. Every five years a water company submits a Business Plan to Ofwat for a Price Review. These plans set out the companies' operational expenditure (OPEX) and capital expenditure (CAPEX) required to maintain service standards, enhance service (for example where sewer flooding occurs), to accommodate growth and to meet environmental objectives defined by the EA. Ofwat assesses and compares the plans with the objective of ensuring that what are effectively supply monopolies are operating efficiently, and that the company is meeting its obligations. It then sets the allowable price increase for consumers based on the retail prices index, the business plan, and taking into consideration affordability for consumers. The current AMP period is AMP 7 (2020-2025), and the price of water for this period was set by Ofwat late in 2019 in a process referred to as Price Review 19 (PR19). The new price came into effect in April 2020. The next price review will be 2024 (PR24) and will set prices from 2025 to 2030, coming into effect in April 2025. This system gives stability in pricing. Within this price review process there may also be incentives and penalties on the water company for exceeding or failing to meet targets.

When considering investment requirements to accommodate growing demand, water companies are required to ensure a high degree of certainty that additional assets will be required before funding them. Longer term growth is, however, considered by the companies in their internal asset planning processes and in their 25-year Strategic Direction Statements and WRMPs.

The Water Industry National Environment Programme (WINEP) is a set of actions that are defined by the EA and given to all water companies operating in England for completion during a particular AMP period. The aim of the programme is to support the objectives in the Environment Act, Water Framework regulations, Habitats regulations and other environmental objectives. Examples of typical actions could include investigations into the sustainability of an abstraction, a reduction in an abstraction to support river flows, or new permit limits at a wastewater treatment works.

Water and wastewater infrastructure requires significant lead-times to plan, obtain planning and other permissions, finance and construct. The time required to provide new or upgraded infrastructure to serve a development or a larger spatial plan is highly locally specific. The following is provided as an indicative guide to lead-times.

Table 3-1: Indicative lead-times (years for new infrastructure to serve development).

Scale of development	Water supply	Water resources	Wastewater network	Wastewater treatment
Minor	1	N/A	1	N/A
Major	1-3	1-5	1-5	3-5
Strategic / Plan	3-5	10-20	5-10	5-10

3.5.3 Planning for water

Water resource management plans

WRMPs are 25-year strategies that water companies are required to prepare, with updates every five years. In reality, water companies prepare internal updates more regularly. WRMPs are required to assess:

- Future demand (due to population and economic growth).
- Future water availability (including the impact of sustainability reductions).
- Demand management and supply-side measures (e.g., water efficiency and leakage reduction, water transfers and new resource development).
- How the company will address changes to abstraction licences.
- How the impacts of climate change will be mitigated.
- Where necessary, the requirements for developing additional water resources to meet growing demand and describe how the balance between water supply and demand will be balanced over the period 2015 to 2040.
- Using cost-effective demand management, transfer, trading and resource development schemes to meet growth in demand from new development and to restore abstraction to sustainable levels.
- In the medium to long term, that sufficient water continues to be available for growth and that the supply systems are flexible enough to adapt to climate change.

Affinity Water's WRMP24 (affinitywater.uk.engagementhq.com) is reviewed in detail for the study in Section 4.4.4.

South East Water's WRMP24 (southeastwater.co.uk) is reviewed in detail for the study in Section 4.4.3.

Thames Water's WRMP24 (thameswater.co.uk) is published on their website.

Drought Plan

Linked to the WRMP is a water company's drought plan. This is a requirement under the Water Industry Act 1991 (as amended by the Water Act 2003). A water company must state how it will maintain a secure water supply and protect the environment during dry weather and drought. The plan will contain:

- Drought triggers - these are points where a water company will take action to manage supply and demand. They are based on monitoring of rainfall levels, river flows, groundwater levels, and reservoir stocks.
- Demand management actions - how a water company will reduce demand for water during a drought. Actions that save water before taking more water from the environment must be prioritised. These could include:
    - reducing leakage;
    - carrying out water efficiency campaigns with customers;
    - reducing mains pressure; and

    - restricting water use, for example through temporary use band which limit hosepipe and sprinkler use.
- Supply management actions - how a water company will maintain water supply during a drought. Actions that have the least effect on the environment must be prioritised. This could include:
    - carrying out engineering work to improve its supply;
    - transferring water in bulk from other water companies;
    - using drought permits and drought orders to abstract more water;
    - using desalination - permanent or temporary plants; and
    - using tankers to supply customers with water directly.
- Extreme drought management actions - the actions it could take in an extreme drought. These could delay the need to use emergency restrictions standpipes and rota cuts.
- Communicating during a drought - a water company must set out how it will communicate in a clear and timely way during a drought with customers, partners or other stakeholders.
- Environmental assessment, monitoring and mitigation. A drought plan must include:
    - an environmental assessment;
    - an environmental monitoring plan for each supply management action; and
- details of mitigation measures the company plans to take for each supply management action.
- End of a drought - a water company must explain how it will identify when a drought is over or ending and the actions it will take during this stage, communicate this information to customers, and review its performance.

Regional water resource planning

Water resource planning is taking an increasingly regional focus, recognising the need for collaboration between water companies and sectors in order to address the challenges of climate change, increasing demand for water and protecting the water environment. Five regional groupings having been formed, including the Water Resources South East (WRSE) group which covers Surrey Heath. An advisory group consisting of their regulators (EA and Ofwat) and Defra regularly attend meetings of WRSE.

WRSE prepared a draft regional water resource plan, published in 2022, which have informed the latest round of company WRMPs, published in 2024/2025. As part of this process, they have published an initial water resource position statement which sets out the water resources challenges and opportunities within the region.

3.5.4 Planning for wastewater

21st Century Drainage

The UK Water Industry Research (UKWIR) '21st Century Drainage' programme has brought together water companies, governments, regulators, local authorities, academics, and environmental groups to consider how planning can help to address the challenges of

managing drainage in the future. These challenges include climate change, population growth, urban creep and meeting the Water Framework Directive (WFD).

The group recognised that great progress has been made by the water industry in its drainage and wastewater planning over the last few decades, but that, in the future, there needs to be greater transparency and consistency of long-term planning. The Drainage and Wastewater Management Plan (DWMP) framework (water.org.uk) sets out how the industry intends to approach these goals. Companies were required to published finalised DWMPs in 2023 to inform their business plans for the 2024 Price Review.

Drainage and Wastewater Management Plans

Drainage and Wastewater Management Plans (DWMPs) are consistently structured plans delivered at three spatial scales; company-wide, regional groupings, and individual wastewater catchments. The framework defines drainage to include all organisations and all assets which have a role to play in drainage, although, as the plans will be water company led, it does not seek to address broader surface water management within catchments.

LPAs and LLFAs are recognised as key stakeholders and are invited to join, alongside other stakeholders, the Strategic Planning Groups (SPGs) organised broadly along River Basin District (RBD) catchments.

DWMPs aim to provide more transparent and consistent information on sewer flooding risks and the capacity of sewerage networks and treatment works, and this should be taken into account in SFRAs, Water Cycle Studies, as well as in site-specific FRAs and Drainage Strategies.

Thames Water's DWMP (thameswater.co.uk) is reviewed in detail for the study area in Section 6.2.1.

3.5.5 Developer contributions and connection charges

A significant part of water company business is the interface with developers to facilitate connection to the public water supply and sewerage systems, through their developer services functions. Developments with planning permission have a right to connect to the public water and sewerage systems, (where this is for domestic use), however, there is no guarantee that the capacity exists to serve a development.

Developers may requisition a water supply connection or sewerage system or self-build the assets and offer these for adoption by the water company or SU. Self-build and adoption are usually practiced for assets within the site boundary, whereas requisitions are normally used where an extension of upgrading the infrastructure requires construction on third party land. The cost of requisitions is shared between the water company and developer as defined in the Water Industry Act 1991.

The above arrangements are third party transactions because the Town and Country Planning Act Section 106 agreements and Community Infrastructure Levy agreements may not be used to obtain funding for water or wastewater infrastructure.

Ofwat, published revised charging rules (ofwat.gov.uk) covering how water and wastewater companies may charge customers for new connections. These rules have applied to all companies in England since April 2018. The key changes include:

- More charges will be fixed and published on water company websites. This will provide greater transparency to developers and will also allow alternative connection providers to offer competitive quotations more easily.
- There will be a fixed infrastructure charge for water and one for wastewater.
- The costs of network reinforcement will no longer be charged directly to the developer in their connection charges. Instead, the combined costs of all of the works required on a company's networks, over a five-year rolling period, will be covered by the infrastructure charges paid for all new connections.
- The definition of network reinforcement has changed and will now apply only to works required as a direct consequence of the increased demand due to a development. Where the water company has not been notified of a specific development, for example when developing long-term strategic growth schemes, the expenditure cannot be recovered through infrastructure charges.

Affinity Water publish their charging arrangements (affinitywater.co.uk) annually. These include incentives to encourage good design by developers, including:

- A discount to the infrastructure charge for new developments that evidence water efficiency design to a standard of <110 l/p/d. For 2024/2025, this is -£589 per infrastructure charge.

Thames Water publish their charging arrangements (thameswater.co.uk) annually. These include incentives to encourage good design by developers, including:

- An Environmental Discount Scheme available for developments consuming <100l/p/d.
- An incentive payment for the inclusion of technologies in developments that capture and/or reuse water, including rainwater harvesting (RwH) and greywater recycling.
- A Water Neutrality (see Section 4.7.1) discount for developments delivering water savings in the surrounding areas. First requiring adherence to the former two criteria, this can be achieved by fixing internal leaks and retrofitting water saving devices.
- Sustainable surface water incentives, offering discounts to developments where surface water run-off is discharged into the Thames Water sewerage network.

South East Water publish their charging arrangements (southeastwater.co.uk) annually on their website. They are in the process of developing their water efficiency incentives for new developments.

3.5.6 Water companies and the planning system

Water companies are currently not statutory consultees to planning applications, although they do monitor planning applications and respond to potentially significant applications, or where requested to do so by the LPA. Defra are intending to consult on making water companies statutory consultees for some applications (Department for Environment, Food & Rural Affairs, 2023).

Where a water company is concerned that a new development may impact upon their service to customers or the environment (for example by causing foul sewer flooding or pollution) they may request the LPA to impose a Grampian condition, whereby the planning permission cannot be implemented until a third-party secures the necessary upgrading or contributions.

The condition might enable a water company to agree a drainage or water strategy with the developer, the preferred point of connection, as well as consider existing capacity and to programme any necessary upgrading work to the sewerage or water system. If an existing wastewater or water network does not have capacity for flows from a new development, then the LPA may impose a condition on a planning permission which requires that new infrastructure enabling sufficient capacity in the network, is put in place to accommodate the new development prior to occupation.

Defra has issued National Policy Statements (NPSs) on Nationally Significant Infrastructure Projects (NSIPs) for wastewater (2012) (gov.uk) and water (2023) (gov.uk), to be used as the primary basis when considering applications for Development Consent Orders (DCOs).

3.6 Flood risk and surface water

3.6.1 Flood and Water Management Act 2010

The Flood and Water Management Act (FWMA) 2010 (legislation.gov.uk) aims to improve both flood risk management and the way water resources are managed.

The FWMA has created clearer roles and responsibilities and helped to define a more risk-based approach to dealing with flooding. This included the creation of a lead role for Local Authorities (LAs), as LLFAs, designed to manage local flood risk (from surface water, ground water and ordinary watercourses) and to provide a strategic overview role of all flood risk for the EA.

The content and implications of the FWMA provide considerable opportunities for improved and integrated land use planning and flood risk management by LAs and other key partners. The integration and synergy of strategies and plans at national, regional, and local scales, is increasingly important to protect vulnerable communities and deliver sustainable regeneration and growth.

Schedule 3 of the FWMA 2010 will provide a framework for the approval and adoption of drainage systems, a SuDS Approving Body (SAB) within unitary and county councils, and national standards on the design, construction, operation, and maintenance of SuDS for the

lifetime of the development. The previous Government affirmed its commitment for enacting Schedule 3; however, it is currently unknown whether the new Government intends to do this or what the proposed timescales would be.

3.6.2 Local Flood Risk Management Strategy

Local Flood Risk Management Strategies set out how LLFAs will manage local flood risk from surface water runoff, groundwater, and ordinary watercourses, for which they have a responsibility as LLFA. They also detail the work that other Risk Management Authorities are doing to manage flood risk within the area.

The LFRMS for Surrey (surreycc.gov.uk) was published in 2017. It sets out seven principles that support the strategy's vision: 'To make Surrey more resilient to flooding on a long-term basis through a co-ordinated approach with residents and partners'. These are:

- A long term vision: we will reduce the impact of flooding in Surrey and future proof project outcomes on a sustainable, long term basis that considers the effect of climate change.
- A catchment-based approach: we will use a holistic catchment based approach to assess and manage the integrated flood risk within Surrey and upstream/downstream river catchments.
- Partnership working: we will work in co-operation with partner risk management authorities to mitigate the risk of flooding in the county while achieving cross-cutting corporate goals.
- Community resilience: we will empower communities to be more resilient to flooding by supporting them to reduce risk, recover from incidents more quickly and lessen the disruptive impacts of flooding.
- Enhancing growth and wellbeing: we will ensure that efforts to reduce flood risk in Surrey enhance and protect the social, environmental and economic wellbeing of Surrey.
- Sustainable flood risk management through planning and development: we will use the opportunities presented by new development and regeneration to make communities more resilient to flooding.
- Capital investment: we will invest in flood alleviation schemes that reduce the risk of flooding to people, property and the natural environment where a robust business case indicates that this will provide value for money and that wide social, environmental and economic benefits will be achieved.

The LFRMS then sets out eight objectives, covering information, maintenance, risk management and authority responsibility, land owner responsibility, resilience, planning, investment, and investigation, which describe the main ways in which local flood risk is managed in Surrey.

3.6.3 Strategic Flood Risk Assessment

All LPAs are required, under NPPF, to prepare a SFRA, which forms a key part of the evidence base for their Local Plan. The SFRA must consider flood risks from all sources, collating up-to-date flood risk data and in some cases developing new flood risk modelling. The SFRA is used to inform the sequential test, by which Local Plan allocations should be sequentially selected to direct development towards areas of lower flood risk, taking into consideration the vulnerability to flooding of the proposed land use. An updated Level 1 SFRA was published in January 2025, and an updated Level 2 SFRA is being prepared alongside this WCS.

3.6.4 Surface Water Management Plan

Surface Water Management Plans (SWMPs) outline the preferred surface water management strategy in a given location and establish a long-term action plan to manage surface water. SWMPs are undertaken, when required, by LLFAs in consultation with key local partners who are responsible for surface water management and drainage in their area. SHBC does not currently have a published SWMP.

3.6.5 Sustainable Drainage Systems

From April 2015, LPAs have been given the responsibility for ensuring that sustainable drainage is implemented on developments of ten or more homes or other forms of major development through the planning system. Under the new arrangements, the key policy and standards relating to the application of SuDS to new developments are:

- The NPPF, which requires that development in areas already at risk of flooding should give priority to SuDS.
- The House of Commons written statement setting out governments intentions that LPAs should 'ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate' and 'clear arrangements in place for ongoing maintenance over the lifetime of the development.' This requirement is also incorporated in the NPPF (paragraph 182). In practice, this has been implemented by making LLFAs statutory consultees on the drainage arrangements of major developments.
- The Defra non-statutory technical standards for sustainable drainage systems (gov.uk). These set out the government's high-level requirements for managing peak flows and runoff volumes, flood risk from drainage systems and the structural integrity and construction of SuDS. This very short document is not a design manual and makes no reference to the other benefits of SuDS, for example water quality, habitat, and amenity.

Surrey County Council is the LLFA and plays a key role in ensuring that the proposed drainage schemes for all new developments comply with technical standards and policies in relation to SuDS. Further information on surface water drainage can be found here.

An updated version of the Construction Industry Research and Information Association (CIRIA) SuDS Manual was published in 2015. The guidance covers the planning, design,

construction and maintenance of SuDS for effective implementation within both new and existing developments. The guidance is relevant for a range of roles with the level of technical detail increasing throughout the manual. The guidance does not include detailed information on planning requirements, SuDS approval and adoption processes and standards, as these vary by region and should be checked early in the planning process. The manual itself can be found on the CIRIA website.

CIRIA also published 'Guidance on the Construction of SuDS' (C768) (ciria.org), which contains detailed guidance on all aspects of SuDS construction, with specific information on each SuDS component available online as a downloadable chapter, free to CIRIA members.

Thames Water discuss their shift from predominantly engineering solutions to SuDS on their Surface Water Management Programme (thameswater.co.uk) webpage.

3.6.6 Design and Construction Guidance

The Design and Construction Guidance (DCG), part of a new Codes for Adoption covering the adoption of new water and wastewater infrastructure by water companies, contains details of the water sector's approach to the adoption of SuDS, which meet the legal definition of a sewer. This replaces the formerly voluntary Sewers for Adoption (SfA). The new guidance came into force in April 2020 and compliance by water companies in England is mandatory.

The previous standards, up to and including SfA Version 7, included a narrow definition of sewers to mean below-ground systems comprising of gravity sewers and manholes, pumping stations and rising mains. This essentially excluded the adoption of SuDS by water companies, except for below-ground storage comprising of oversized pipes or chambers.

The new guidance provides a mechanism for water companies to secure the adoption of a wide range of SuDS components which are now compliant with the legal definition of a sewer. There are however several non-adoptable components such as green roofs, pervious pavements, and filter strips. These components may still form part of a drainage design so long as they remain upstream of the adoptable components.

The Design and Construction Guidance states that the drainage layout of a new development should be considered at the earliest stages of design. It is hoped that the new guidance will lead to better managed and more integrated surface water systems which incorporate amenity, biodiversity, and water quality benefits.

3.7 Environmental protection and biodiversity

3.7.1 The Environment Act 2021

The Environment Act (legislation.gov.uk) came into UK law in November 2021 with the aim of protecting and enhancing the environment. The Act has objectives to improve air and water quality, biodiversity, waste reduction and resource efficiency. The

implementation of the policies within the Environment Act has begun and legally binding environmental targets are being developed. This will be enforced by the Office for Environmental Protection (OEP). More information is available on the OEP website (theoep.org.uk).

The Environment Act (Part 5) contains policies concerning improvements to the water environment. These policies have the following aims:

- Effective collaboration between water companies through statutory water management plans.
- Minimise the damage that water abstraction may cause on environment.
- Modernise the process for modifying water and sewerage company licence conditions.

Further to this, there is specific legislation regarding storm overflows aiming to reduce the discharge of untreated sewage into waterways. This plan includes requirements for water companies to:

- Report on the discharges from storm overflows;
- Monitor the quality of water potentially affected by discharges;
- Progressively reduce the harm caused by storm overflows; and
- Report on elimination of discharges from storm overflows.

3.7.2 25-year Environment Plan

The EIP is the first revision of the 25-year environment plan (25YEP) (gov.uk), published in 2018 and updated in 2023. It contains ten goals which are shown in Figure 3-1. The government must review and revise the plan, if needed, every five years to ensure continued progress against the ten 25YEP goals.

Of particular importance to a WCS is Goal 3 - Clean and plentiful water.

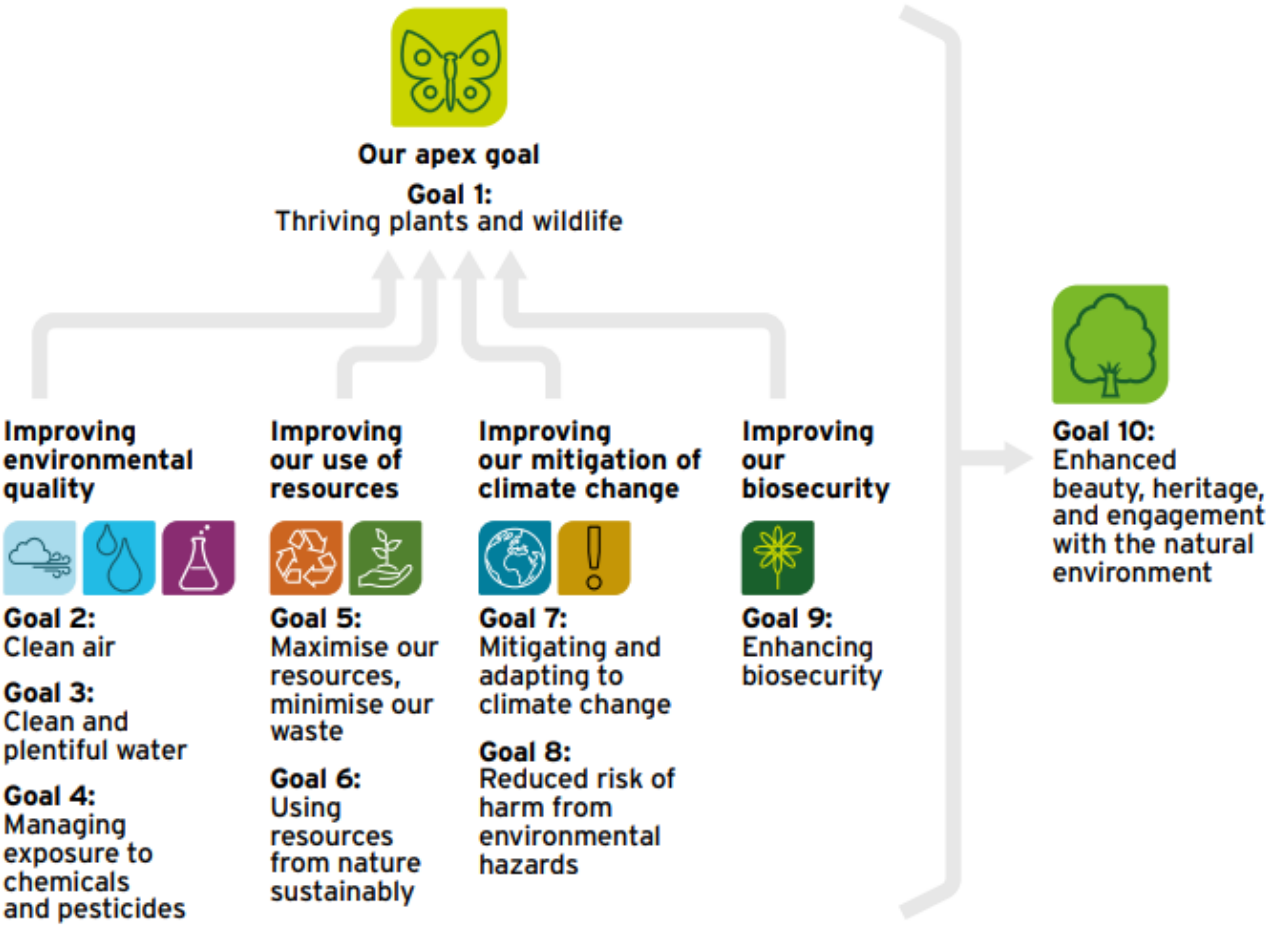


Figure 3-1: the 10 Environmental Improvement Plan goals.

Under Goal 3 - Clean and plentiful water, there are eight sets of targets and commitments relating to different aspects of the water environment:

- 'Reduce nitrogen, phosphorus, and sediment pollution from agriculture into the water environment by at least 40% by 2038, compared to a 2018 baseline, with an interim target of 10% by 31 January 2028, and 15% in catchment containing protected sites in unfavourable condition due to nutrient pollution by 2028.
- Reduce phosphorus loadings from treated wastewater by 50% by 2028 and 80% by 2038 against a 2020 baseline.
- Halve the length of rivers polluted by harmful metals from abandoned mines by 2038, against a baseline of around 1,500km (approximately 930 miles).
- Reduce the use of public water supply in England per head of population by 20% from the 2019-20 baseline, 2038, with interim targets of 9% by 2027 and 14% by 2032, and to reduce leakage by 20% 2027 and 30% by 2032.
- Restore 75% of our water bodies to good ecological status.
- Require water companies to have eliminated all adverse ecological impact from sewage discharges at all sensitive sites by 2035, and at all overflows by 2050.
- Target a level of resilience to drought so that emergency measures are needed only once in 500-years.'

To deliver these goals, the EIP outlines action across these areas:

- Improving wastewater infrastructure and water company environmental performance.
- Reducing pressures on the water environment from agriculture.
- Enabling the sustainable use of water for people, business and the environment
- Tackling pressures from chemicals and pollutants.
- Restoring natural function and iconic water landscapes.
- Joined-up management of the water system.

Progress towards delivering the EIP will be monitored annually.

3.7.3 Defra Plan for Water

Defra's Plan for Water (gov.uk) provides further detail on the actions towards achieving Goal 3 of the EIP23. It promotes an integrated approach to water management as the foundation of the plan. Whilst many of the actions contained within the Plan for Water are outside of the responsibilities of areas of influence of the LPAs, the following summarises those actions that LPAs should have regard to:

- Require standardised SuDS in new housing developments in 2024, subject to final decisions on scope, threshold, and process following consultation in 2023.
- Designate all chalk catchments as water stressed and high priority under the sewer overflows reduction plan, driving action to improve water management.
- The plan reflects the predicted 4 billion litre per day (4,000 ml/d) gap between supply and demand across England and contains measures to both boost supply and reduce demand. Of interest to LPAs is the plan to reduce demand which will address half of the gap.
- A key component in reducing demand for water is improving water efficiency and there is a target under the Environment Act to reduce the use of public water supply in England per head of population by 20% by 2038. A road map on water efficiency in new developments and retrofits has been developed with ten actions to improve water efficiency:
- **Action 1 -** Implement schedule 3 to the Flood and Water Management Act 2010. The 2024 consultation will consider rainwater harvesting in developing the statutory SuDS National Technical Standards.
    - **Action 2 -** Review the Water Supply (Water Fittings) Regulations 1999, the Water Supply (Water Quality) Regulations 2016 and/or any other relevant legislation to address wasteful product issues with toilets and enable new water efficient technologies.
    - **Action 3 -** Develop clear guidance on ‘water positive’ or ’net zero water’ developments and roles for developers and water companies.
    - **Action 4 -** Review water efficiency options in planning, building regulations and through voluntary schemes for non-household buildings.

- **Action 5 -** Work with Ofwat to ensure the water industry can play a central role in retrofitting water efficient products in households, businesses, charities and the public sector.
    - **Action 6 -** Work across government to integrate water efficiency into energy efficiency advice and retrofit programmes.
    - **Action 7 -** Review the Building Regulations 2010, and the water efficiency, water reuse and drainage standards including considering a new standard for new homes in England of 105l/p/d and 100 l/p/d where there is a clear local need.
    - **Action 8 -** Mandatory water efficiency labelling scheme.
    - **Action 9 -** Investigate dual pipe systems (rainwater harvesting) and water reuse options for new housing development as part of the review of the planning framework.
    - **Action 10 -** Enable innovative water efficiency approaches in buildings, including technologies and approaches to funding and maintenance.

3.7.4 Biodiversity Net Gain

Biodiversity Net Gain (BNG) is designed to contribute to the recovery of nature while developing land. The principle is that the natural environment is in measurably better state after development than it was before. The Environment Act 2021 requires all planning permissions granted in England (except for small sites) to achieve 10% BNG since February 2024. This has been required on small sites since April 2024.

Defra publishes a biodiversity metric tool, the latest version of which must be used for calculating the BNG deriving from a proposed development.

3.7.5 Local Nature Recovery Strategy

The Environment Act 2021 established a duty to prepare, by March 2025, Local Nature Recovery Strategies (LNRS), recognising that England is one of the most nature-depleted countries in the world. Surrey County Council are the authority responsible for preparing the LNRS for Surrey. They are tasked with working with local partners to agree priorities for nature recover and identify 'practical, achievable proposals'[4] to address these priorities. The LNRS should also co-ordinate with neighbouring strategies to form a national Nature Recovery Network (NRN).

There is a close linkage with BNG, as developments proposing to create, enhance or recover habitat in locations mapped by the LNRS receive a higher value in the biodiversity metric calculator than in other locations.

4 Local nature recovery strategies, Department for Environment, Flood & Rural Affairs (2023). Accessed online at: https://www.gov.uk/government/publications/local-nature-recovery-strategies/local-nature-recovery-strategies on: 13/01/2025.

3.7.6 Storm overflow reduction plan

The Environment Act 2021 placed a legal duty on water companies to progressively reduce the adverse impacts of discharges from storm overflows. The storm overflow discharge reduction plan (gov.uk) sets the following targets:

- By 2035, water companies will have: improved all overflows discharging into or near every designated bating water; and improved 75% of overflows discharging to high priority sites.
- By 2050, no storm overflows will be permitted to operate outside of unusually heavy rainfall or to cause any adverse ecological harm.

There is also an expectation that water companies ensure their infrastructure keeps pace with increasing external pressures, such as urban growth and climate change, without these pressures leading to greater numbers of discharges.

3.7.7 The Water Framework Directive and water environment regulations

The European Union (EU) WFD 2000 is currently transposed into English and Welsh law by the Water Environment Regulations 2017 (legislation.gov.uk). They apply to all waterbodies (watercourses, canals, lakes, estuaries and coastal waters), with the objective of meeting Good Ecological Status (GES) or, where heavily modified, Good Ecological Potential (GEP). To meet GES or GEP, a water body must achieve a good or high score for all elements - in the case of surface water, these are biological, physico-chemical, specific pollutants and hydromorphology. These elements are shown in Figure 3-2, which is from the webpage on how to use the Catchment Data Explorer (environment.data.gov.uk). UK policy remains to meet GES or GEP for all waterbodies by 2027.

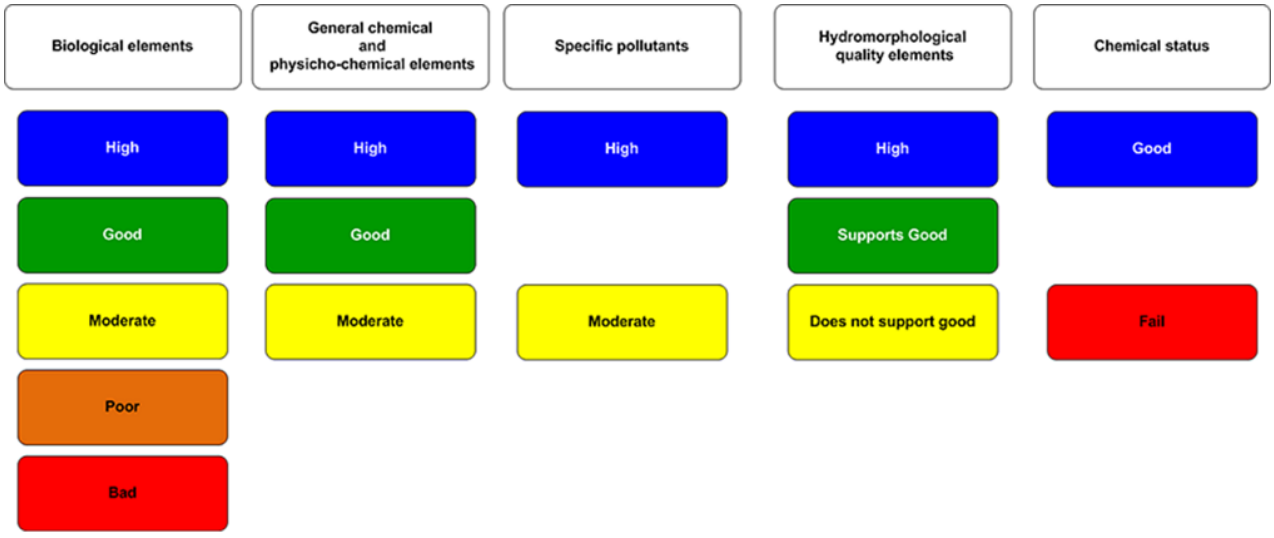


Figure 3-2: Status classification for surface water.

Chemical Status is separately assessed. The WFD and the EA recognise a group of ubiquitous chemicals which are persistent, bioaccumulative or toxic (uPBT), and without which over 90% of England's waterbodies would achieve Good Chemical Status. Mercury, Perfluorooctanesulfonic acid (PFOS) and Polybrominated diphenyl ethers (PBDE) are the

most ubiquitous causes of failures. Due to the persistent nature of these chemicals, the date for getting all waterbodies to Good Chemical Status is set for 2063.

River Basin Management Plans

River Basin Management Plans (RBMPs) are required under the WFD and document the baseline classification of each waterbody in the plan area, the objectives, and a programme of measures to achieve those objectives. Surrey Heath falls within the Thames RBMP (gov.uk). The third cycle RBMPs were published in 2022. A primary WFD objective is to ensure 'no deterioration' in environmental status, therefore all water bodies must meet the class limits for their status class as declared in the Thames RBMP. Another equally important objective requires all water bodies to achieve GES. Future development needs to be planned carefully so that it helps towards achieving the WFD and does not result in further pressure on the water environment and compromise WFD objectives. The WFD objectives as outlined in the updated RBMPs are summarised below:

- Preventing deterioration of the status of surface waters and groundwater.
- Achieving objectives and standards for protected areas.
- Aiming to achieve good status for all water bodies.
- Reversing any significant and sustained upward trends in pollutant concentrations in groundwater.
- Cessation of discharges, emissions and losses of priority hazardous substances into surface waters.
- Progressively reducing the pollution of groundwater and preventing or limiting the entry of pollutants.
- LPAs must have regard to the WFD as implemented in the RBMPs. It is of primary importance when assessing the impact of additional wastewater flows on local river quality.
- Alongside the RBMP documents, the data behind them can be explored further using the Catchment Data Explorer (environment.data.gov.uk) and map viewer (environment.maps.arcgis.com).

Protected Area Objectives

The Water Environment Regulations specify that areas requiring special protection under other EC Directives, and waters used for the abstraction of drinking water, are identified as protected areas. These areas have their own objectives and standards.

Some areas may require special protection under more than one piece of EU-derived legislation or may have additional (surface water and/or groundwater) objectives. In these cases, all the objectives and standards must be met.

The types of protected areas are:

- areas designated for the abstraction of water for human consumption (Drinking Water Protected Areas);
- areas designated for the protection of economically significant aquatic species (Freshwater Fish and Shellfish);

- bodies of water designated as recreational waters, including Bathing Waters;
- nutrient-sensitive areas, including areas identified as Nitrate Vulnerable Zones under the Nitrates Directive or areas designated as sensitive under Urban Waste Water Treatment Regulations; and
- areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection including relevant Natura 2000 sites.

3.7.8 Conservation of Habitats Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 (legislation.gov.uk), commonly referred to as the Habitats Regulations, consolidated the Conservation (Natural Habitats, &c.) Regulations 1994 (legislation.gov.uk), and transposed the EU Habitats Directive in England and Wales which was aimed at protecting plants, animals and habitats that make up the natural environment. The regulations were further amended in 2017 (gov.uk).

The Habitats Regulations define the requirement for a Habitats Regulations Assessment (HRA) to be carried out. The purpose of this is to determine if a plan or project may affect the protected features of a 'habitats site'. These include:

- A Special Area of Conservation (SAC) or candidate SAC.
- A Site of Community Importance (SCI).
- A site hosting a priority natural habitat type or priority species protected in accordance with Article 5(4) of the Habitats Directive.
- A Special Protection Area (SPA) or potential SPA.
- Ramsar sites.

All plans and projects (including planning applications) which are not directly connected with, or necessary for the conservation management of a habitat site require consideration of whether the plan or project is likely to have significant effects on that site.

This is referred to as the 'Habitats Regulations Assessment screening' and should take into account the potential effects of both the plan/project itself and in combination with other plans or projects.

Part 6 of the conservation of Habitats and Species Regulations 2017 states that where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view of the site's conservation objectives.

The competent authority may agree to the plan or project only after having ruled out adverse effects on the integrity of the habitats site.

If adverse effects cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured.

The 'People over Wind' ECJ ruling (C-323/17) clarifies that when making screening decisions for the purposes of deciding whether an appropriate assessment is required, competent authorities cannot take into account any mitigation measures. This must be part of the appropriate assessment itself.

The implementation of the Conservation of Habitats Regulations have had particular significant implications in two areas related to water and planning:

- **Nutrient Neutrality**: Natural England (NE) has identified a number of catchment areas where Habitats Sites are in unfavourable condition due to eutrophication (an excess of the nutrients phosphorus and/or nitrogen in water). NE have advised that developments in these catchments must demonstrate that they do not cause harm, and that one way to do this is to introduce mitigation measures in the catchment area which offset the additional nutrients emitted as a result of the development, an approach known as nutrient neutrality. There are no nutrient neutrality areas currently designated within Surrey Heath.
- **Water Neutrality**: NE has issued a position statement that it cannot be concluded with sufficient certainty that groundwater abstractions in the Arun Valley, West Sussex are causing no adverse effect on Habitats Sites. NE have advised that developments in Sussex North Water Resource Zone (WRZ) must demonstrate that they do not cause harm, and that one way to do this is to introduce mitigation measures in the zone which offset the additional water consumed as a result of the development, an approach known as water neutrality. There are no parts of the study area which are currently within a water neutrality zone, however NE may designate additional areas in the future.

Both nutrient and water neutrality designations have resulted in significant impacts on the granting of planning permission in the designated areas.

3.7.9 Wildlife and Countryside Act

Sites of Special Scientific Interest (SSSI) are designated and legally protected under the Wildlife and Countryside Act 1981 (legislation.gov.uk). Section 28G (legislation.gov.uk) places a duty to take reasonable steps, consistent with the proper exercise of the authority's functions, to 'further to the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which the site is of special scientific interest.'

The Government's 25-year Environment Plan has a target of 'restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term.' In line with this, and the Wildlife and Countryside Act 1981, LAs should look put forward options that contribute to conservation or restoration of favourable condition, and at the very least must not introduce policies that hinder the restoration of favourable condition by increasing existing issues.

A site is said to be in 'favourable condition' when the designated feature(s) within a unit are being adequately conserved and the results from monitoring demonstrate that the feature(s) in

the unit are meeting all the mandatory site-specific monitoring targets set out in the favourable condition targets (FCT).

3.7.10 Ramsar

The Convention on Wetlands of International Importance, more commonly known as the Ramsar convention, aims to protect important wetland sites. Member counties commit to:

- Wise use of all their wetlands.
- Designating sites for the Ramsar list of 'Wetlands of International Importance' (Ramsar Sites) and their conservation.
- Cooperating on transboundary wetlands and other shared interests.
- 'Wise use' of wetlands (ramsar.org) is defined under the convention as 'the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development'.
- In the UK, Ramsar Sites are designated by the Joint Nature Conservation Committee (JNCC).

In general, the designation of UK Ramsar sites is underpinned through prior notification of these areas as SSSIs. Additionally, the NPPF states, (Paragraph 194), that Ramsar sites should be given the same protection in the planning process as sites designated under the EU Habitats Directive.

3.7.11 Bathing Water Regulations

The Bathing Water Directive was first published in 2006 and are currently transposed into English and Welsh law through the Bathing Water Regulations 2013. The aims of the directive are the protection of public health whilst bathing, standardisation of publicly available water quality information and to improve management practices at bathing waters.

The UK has over 600 designated bathing waters defined as areas of inshore waters designated for public swimming, these areas are typically characterised by large numbers of swimmers and visitors per year. The EA are required to monitor water quality at these sites regularly (usually weekly) throughout the Bathing Water season, between 15th May and 30th September.

Water quality standards are based on the incidence of potentially harmful bacteria, E. coli and intestinal enterococci and are categorised as ‘excellent’, ‘good’, ‘sufficient’ or ‘poor’ on the basis of bacteria levels. Sites are rated annually and on a short-term basis in response to any temporary pollution incidents.

Achieving compliance with the Bathing Water Directive has driven some £2.5bn of investment by UK water companies since the early 1990s to reduce the impact of sewerage systems and treated wastewater discharges. Measures have included storage and surface water management to reduce storm overflow spills, moving or extending effluent outfalls and improving wastewater treatment, including ultra-violet (UV) treatment of final effluent.

In contrast to some other European nations, the UK has not previously designated stretches of river as bathing waters, however five new inland bathing waters have been designated since 2021, and across England there are numerous campaigns by NGOs and members of the public to designate other stretches of river. Defra has published guidance on applying for bathing water status (gov.uk), including a requirement for at least 100 bathers per day during the season.

3.7.12 Environmental Permitting Regulations

Environmental permitting is a process used to manage and regulate activities which may cause harm to the environment. The Environmental Permitting Regulations 2016 (legislation.gov.uk) were introduced in order to streamline a wide-ranging number of environmental permitting laws under one set of regulations. These include permits for emissions to air, water and land, and cover a range of industrial sectors and waste management streams.

Of particular relevance to this study are the regulations for permitting sewage effluent discharges to surface waters and groundwaters (gov.uk), known as water discharge activities.

- The regulations are used to permit discharges from water company and private wastewater treatment works, and for sewer overflows.
- The EA will usually object to applications for a new private Package Treatment Plan (PTP) or septic tank where it is feasible to connect the development to a public sewerage system. A general rule of 30m per dwelling is used to define a reasonable distance from the site boundary to a public sewer. Hence a development of 10 homes should connect to a public sewer within 300m of the boundary, unless there are significant barriers, such as a river or motorway.
- Where an existing or new development treats its own wastewater, a PTP must be installed if the discharge is directly to surface water. Where the discharge is to ground, a PTP or septic tank may be used, but must be connected to a suitably designed drainage field.

3.7.13 Groundwater protection

Under the regulations, the EA have published a set of groundwater protection position statements (gov.uk), on protecting groundwater from various activities. The statements that are relevant to this study with regard to discharges to groundwaters, include surface water drainage and the use of SuDS, discharges from contaminated surfaces (e.g., lorry parks) and from treated sewage effluent.

The EA also maintain a set of maps of Groundwater Source Protection Zones (SPZs) to help identify high risk areas within which pollution prevention measures should be implemented. The SPZs show the risk of contamination to public water supplies from activities that may cause pollution in the area, the closer the activity, the greater the risk:

- **Zone 1 (Inner protection zone)** This zone is designed to protect against the transmission of toxic chemicals and water-borne disease. It indicates the area in which pollution can travel to the borehole within 50 days from any point within the zone and applies at and below the water table. There is also a minimum 50 metre protection radius around the borehole.
- **Zone 2 (Outer protection zone)** This zone indicates the area in which pollution takes up to 400 days to travel to the borehole, or 25% of the total catchment area, whichever area is the largest. This is the minimum length of time the EA think pollutants need to become diluted or reduce in strength by the time they reach the borehole.
- **Zone 3 (Total catchment)** This is the total area needed to support removal of water from the borehole, and to support any discharge from the borehole.
- **Zone of special interest** This is defined on occasions, usually where local conditions mean that industrial sites and other polluters could affect the groundwater source even though they are outside the normal catchment.

3.8 Summary of key new and emerging policy and legislation

The policy and legislation covering the water environment, water and wastewater services and planning is wide and frequently changing. The new and emerging policy and legislation below have been identified as particularly important for consideration in the development of the Local Plan:

- In July 2024 a new Government was formed and committed to reform the planning system.
- A new NPPF was published in December 2024.
- Schedule 3 of the FWMA will designate LLFAs as SuDS Approval Bodies (SABs) with a duty to adopt new SuDS and removing the automatic right to connect to public sewers. The previous Government affirmed its commitment for enacting Schedule 3; however, it is currently unknown whether the new Government intends to do this or what the proposed timescales would be.
- Defra have signalled their intention, with the Plan for Water, to review the water efficiency standards for new homes, including consideration of a new national 105l/p/d standard and 100l/p/d where there is a clear local need.
- All development sites are expected to demonstrate at least a 10% biodiversity net gain.
- The designation of specific catchments in England as requiring to demonstrate Nutrient Neutrality under the Conservation of Habitats Regulations has led to significant limitations to development in these areas, as well as the development of offsetting schemes to enable nutrient-neutral development.
- Similarly, the availability of water resources, and the impact of new water demand on the environment, has led to restrictions on granting planning permission in Sussex North WRZ and a requirement to demonstrate water-neutral development in Cambridge Water WRZ. It is anticipated that LPAs will be increasingly required to demonstrate that there will be sufficient water resources to supply development

without causing further harm to the environment through the life of their Local Plans.

4 Water Resources

4.1 Introduction

4.1.1 Objectives

The aim of the water resources assessment is to ensure that sufficient water is available in the region to serve the proposed level of growth, and that it can be abstracted without a detrimental impact on the environment, both during the plan period and into the future. The assessment characterises the study area, identifying the key surface water and groundwater bodies, and local geology. It highlights the pressures on water resources in the region, identifies existing constraints on abstraction, and provides evidence for adopting tighter water efficiency targets.

4.1.2 Water resources in the UK

It is important to set water resources in Surrey Heath within the context of the overall national picture.

The EA (Environment Agency, 2024) have published a summary of England's revised draft regional and water resources management plans (gov.uk) which includes their view on the overall state of water resources in the UK and the challenges the country faces. They state that:

'In England, our climate is changing, our population is growing, and as a nation we want an improved environment along with a thriving economy, enabled by resilient water supplied. Action is required now to meet these objectives'.

'The scale of the challenge we face increases with time, and, by 2050, we are looking at a shortfall of nearly 5 billion litres of water per day between the sustainable water supplied available and the expected demand.'

'Demand reductions are crucial, particularly in the short term. The Environment Act 2021 sets a target to reduce the use of public water supply in England, per head of population, by 20% by 2037-38 from the 2019-20 baseline.'

'Government will be looking to water companies to act quickly and take significant steps forward on installing smart meters and delivering on their wider water efficiency commitments and reducing leakage. This will happen alongside the introduction of a mandatory water label which will enable water efficient decisions across the country. The government has also committed to review water efficiency requirements of building regulations which will be a key action to ensure new homes are water efficient.'

There have been several important documents published in recent years, all highlighting the growing awareness and concern about this issue. The National Water Resources Framework led to the creation of the regional water resources planning groups and defined the objective to achieve an average household water efficiency of 110l/p/d by 2050 (including existing housing).

The Government's EIP published in January 2023 contains a roadmap for improving water efficiency in new developments and retrofits. This contains an action to review Building Regulations (2010) and consider a new standard for new homes in England of 105 l/p/d and 100 l/p/d where there is a clear local need, such as in areas of serious water stress. Whilst this is not current policy, it is likely that a tighter standard than the 110 l/p/d will be adopted in Building Regulations early in the Local Plan period.

4.2 Characterisation of the study area

4.2.1 Surface waters

Figure 4-1 shows the main watercourses within the study area, which are summarised below:

The River Blackwater is a main river flowing in a northerly direction along the western border, with its unnamed tributaries draining the western portion of the borough. The other main river is the River Bourne (also known as the Addlestone Bourne), which flows in a south-easterly direction through the eastern side of the borough. The Windle Brook, Clappers Brook, Trulley Brook, Chobham Park Brook, Mill Bourne and Hale Bourne all drain the eastern portion of the catchment, before ultimately joining the Bourne River and flowing east. Tributaries of these watercourses include smaller ordinary watercourses and numerous unnamed drains. There are also several ponds and lakes within the study area. Chertsey Bourne (Sunningdale to Virginia Water) also flows east along a small part of the northern boundary, between Bagshot Road and Devenish Road.

There is one canal within the borough, namely the Basingstoke Canal. The Basingstoke Canal runs through the southernmost area of the borough, parallel to the South Western Main Line and then along the eastern side of Mytchett and Frimley Green.

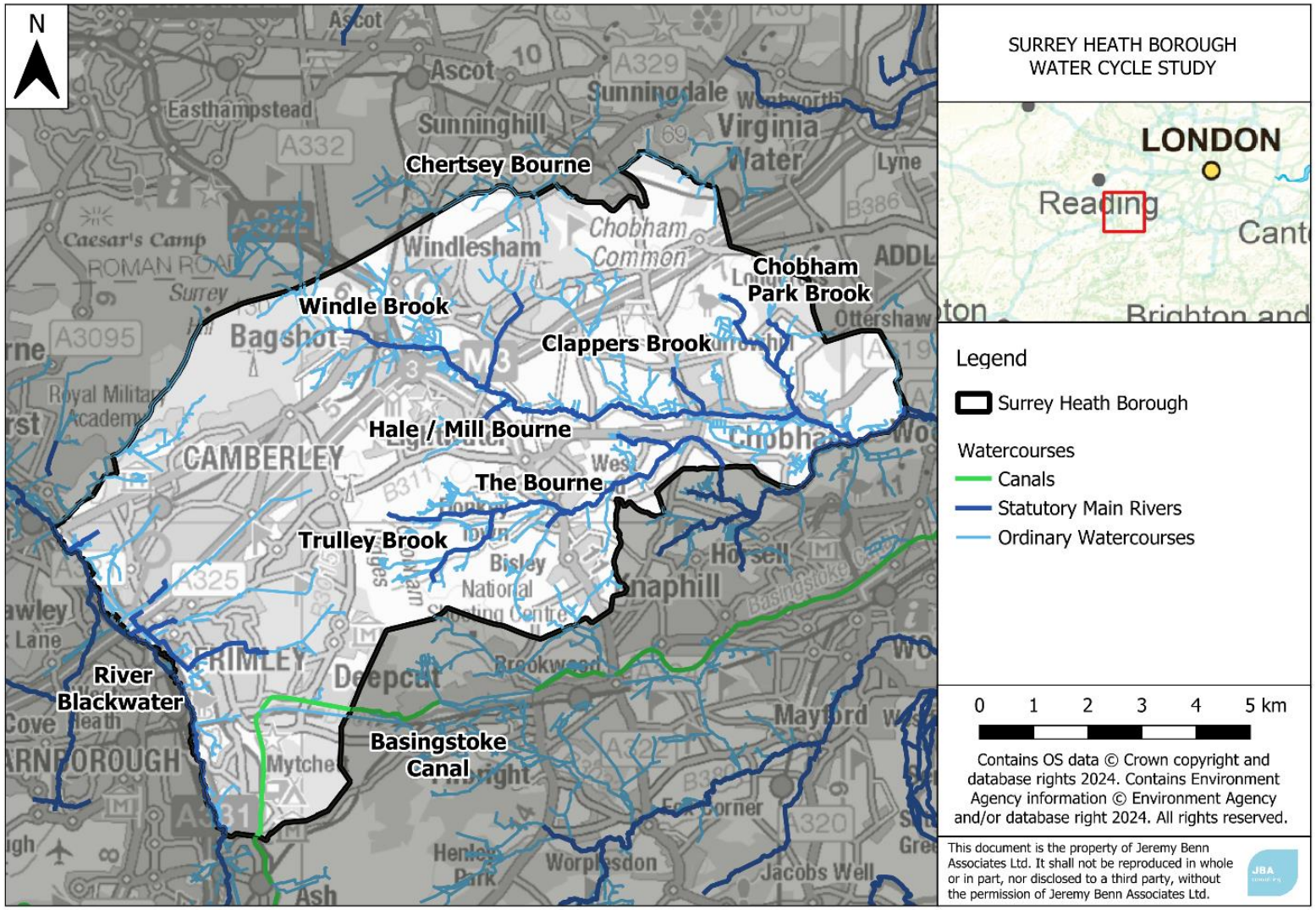


Figure 4-1: Watercourses within Surrey Heath.

4.2.2 Groundwaters

A WFD groundwater body represents a distinct body of groundwater flow with a coherent flow unit including recharge and discharge areas with little flow across the boundaries. There are two groundwater bodies within the study area which are shown in Figure 4-2 and their corresponding WFD classification is summarised in Table 4-1 below.

Chobham Bagshot Beds has a poor chemical and overall status, meaning this groundwater body has the potential to impact waterbodies within the study area.

Table 4-1: WFD status of groundwater bodies.

Groundwater Body	Quantitative Status	Chemical Status	Overall Status - WFD Cycle 2 (2019)
Chobham Bagshot Beds	Good	Poor	Poor
Farnborough Bagshot Beds	Good	Good	Good

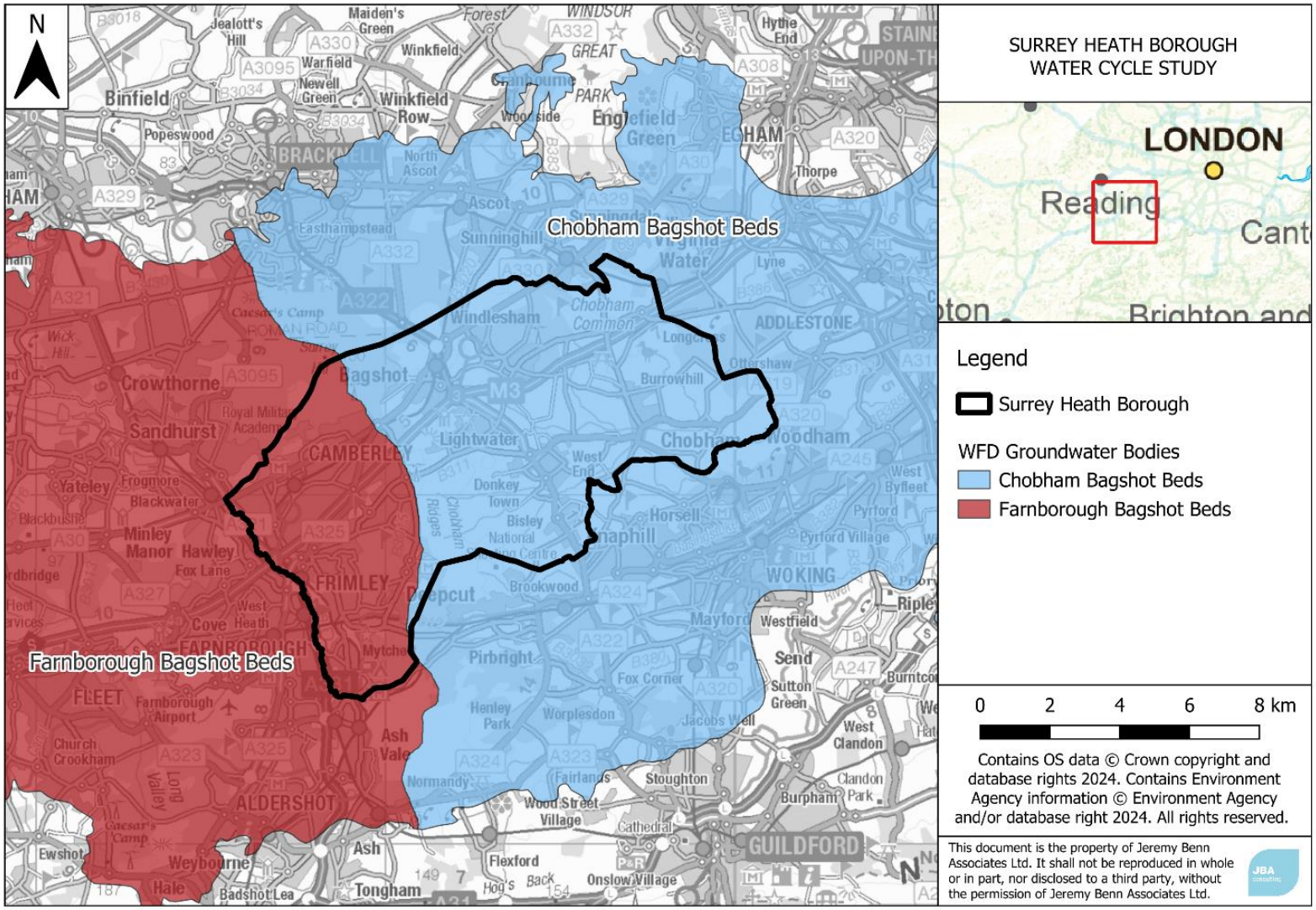


Figure 4-2: Groundwater bodies.

4.2.3 Geology

The geology of the catchment can be an important influencing factor in the way that water runs off the ground surface, and also locally on the type of SuDS that is appropriate for development sites. This is primarily due to variations in the permeability of the surface material and bedrock stratigraphy.

The bedrock geology of the study area is largely comprised of sand formations, which are generally relatively permeable. The western areas of the borough are mostly underlain by the Camberley Sand Formation, consisting of sand. This formation is found under the settlements of Mytchett, Deepcut, Frimley and the eastern parts of Camberley. Within the north western areas of the borough, the Albany Industrial Estate, Frimley and the western areas of Camberley, including the Thames Water WwTW and Yorktown Industrial Estate, are located above the Windlesham Formation which comprises of sand, silt, and clay.

The Windlesham Formation is also found within the central areas of the borough between the settlements of Bagshot, Windlesham, Lightwater, West End and Bisley. To the north of Windlesham and south east of Brick Hill, there are a couple of isolated patches of the Camberley Sand Formation amongst the Windlesham Formation. To the south and eastern areas of the borough at the settlements of Chobham and Mimbridge, the bedrock largely comprises of the Bagshot Formation, also consisting of sand. There are also some patches of the Windlesham Formation located towards the eastern boundary of the borough at Fairoaks Airport.

The majority of the superficial (at the surface) deposits are River Terrace Deposits (sand and gravel), covering western parts of the borough, such as Frimley, Frimley Green, and Mytchett, as well as areas of Heatherside, Camberly, and Frith Hill. There are also River Terrace Deposits in the east, including around Chobham. Alluvium deposits are also present, running along the western boundary and covering a large area in the east near Chobham. Peat is present in areas, including north of Lightwater and northeast of Burrowhill. In the northwest, mainly between Bagshot and Camberly, there is Surrey Hill Gravel Member (sand and gravel) present. There are also head deposits (clay, silt, sand, and gravel) in the west of the borough, including along the western boundary, as well as in Bagshot and Pirbright Ranges.

A map detailing the extents of the bedrock and the superficial geology across the borough can be viewed online in the British Geology Society Geology Viewer (bgs.ac.uk).

4.3 Availability of water resources

4.3.1 Abstraction Licensing Strategy

The EA, working through their Resource Assessment Methodology (which replaces the former Catchment Abstraction Management Strategy (CAMS) process), prepare an Abstraction Licensing Strategy (ALS) for each sub-catchment within a river basin. Surrey Heath is covered by three ALS areas: Loddon, Wey, and Thames Corridor. These are shown in Figure 4-3.

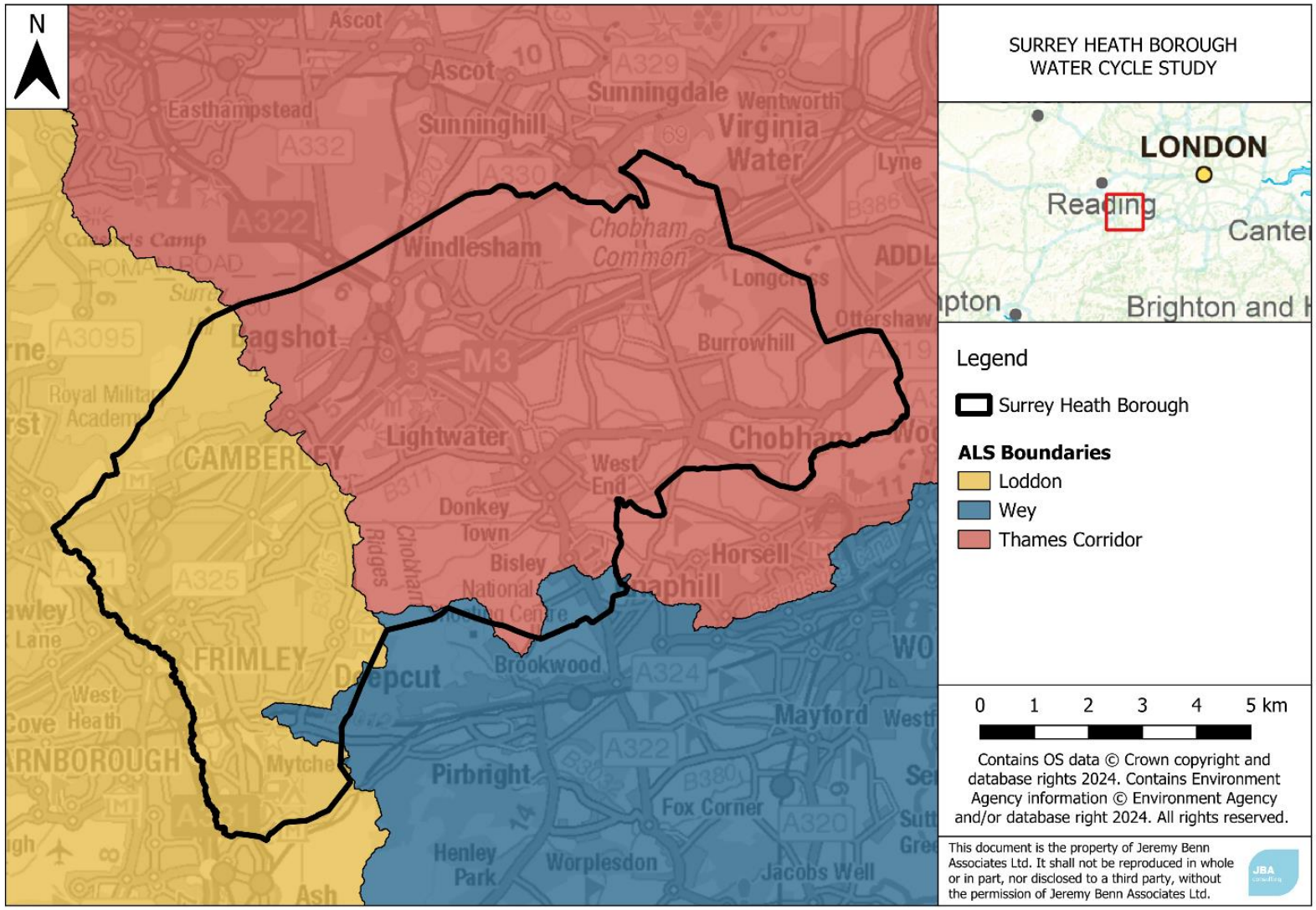


Figure 4-3: ALS boundaries covering Surrey Heath.

4.3.2 Resource availability assessment

In order to abstract surface water, it is important to understand what water resources are available within a catchment and where abstraction for consumptive purposes may pose a risk to resources or the environment. The EA has developed a classification system which shows:

- The relative balance between the environmental requirements for water and how much has been licensed for abstraction;
- whether there is more water available for abstraction in the area; and
- areas where abstraction may need to be reduced.

The availability of water for abstraction is determined by the relationship between the fully licensed (all abstraction licences being used to full capacity) and recent actual flows (amount of water abstracted in the last six years) in relation to the Environmental Flow Indicator (EFI). Results are displayed using different water resource availability colours, further explained in Table 4-2. In some cases, water may be scarce at low flows, but available for abstraction at higher flows. Licences can be granted that protect low flows, this usually takes the form of a Hands-off Flow (HoF) or Hands-off Level (HoL) condition on a licence, which mean abstractions have to stop when the river flow or level falls below a particular value. This value is known as the HoF or HoL and ensures there is always a minimum flow in the river. Surface Water Flows can be assessed at Assessment Points (APs) which are significant points on the river, often where two main rivers join or at a gauging station.

Groundwater availability as a water resource is assessed similarly, unless better information on principle aquifers is available or if there are local issues that need to be considered.

Table 4-2: Implications of surface water resource availability colours.

Water resource availability colour	Implications for licensing
BLUE - High hydrological regime	There is more water than required to meet the needs of the environment. Due to the need to maintain the near pristine nature of the water body, further abstraction is severely restricted.
GREEN - Water available for licensing	There is more water than required to meet the needs of the environment. Licences can be considered depending on local/downstream impacts.
YELLOW - Restricted water available for licensing	Fully Licensed flows fall below the EFI. If all licensed water is abstracted there will not be enough water left for the needs of the environment. No new consumptive licences would be granted. It may also be appropriate to investigate the possibilities for reducing fully licensed

Water resource availability colour	Implications for licensing
	risks. Water may be available via licence trading.
RED - Water not available for licensing	Recent Actual flows are below the EFI. This scenario highlights water bodies where flows are below the indicative flow requirement to help support GES. No further licences will be granted. Water may be available via licence trading.
GREY – Heavily modified waterbodies (HMWBs) (and /or discharge rich water bodies)	These water bodies have a modified flow that is influenced by reservoir compensation releases, or they have flows that are augmented. There may be water available for abstraction in discharge rich catchments.

Water resource availability is assessed under four different flow conditions:

- Q95 – very low flows which are exceeded 95% of the time.
- Q70 – low flows which are exceeded 70% of the time.
- Q50 – median flows which are exceeded 50% of the time.
- Q30 – high flows which are exceeded 30% of the time.

4.3.3 Bespoke licensing strategies

According to the EA's papers on abstraction licensing strategies (gov.uk), the Lower River Thames and the Lower River Wey are classed as 'water not available for licensing' due to their importance for water resources. Consumptive abstraction from the tributaries of the Thames, such as the Loddon and Wey catchments respectively, will reduce flow in the Lower River Wey and the Lower River Thames. As such, flow requirements of these rivers need to be accounted for in the licensing strategies.

Resource availability is greatly impacted by highly restrictive HoFs that protect the Lower River Wey and Thames. However, there is no indication that these HoFs will improve the river or its ecological balance. Therefore, bespoke strategies have been devised with a multi-tier HoF that still protects the health of the rivers, but also protects existing abstractors' rights and supports future water use. More information on the specific HoFs and the required conditions of the bespoke strategies for each ALS area can be found on the government website (gov.uk).

The resource availability for Loddon, Wey, and Thames Corridor ALSs are summarised below, also detailing the availability once the bespoke strategy has been applied. The Water resource ALSs within the study area are presented graphically in Figure 4-4.

4.3.4 Loddon

The Loddon ALS sets out how water is sustainably managed in the Loddon catchment to both provide water for abstraction and protect the environment. Water availability is the same for surface water and groundwater.

At Q30, restricted water is available for licensing. However, at Q50, Q70, and Q95 water becomes unavailable for licensing in this area of Surrey Heath.

When the bespoke licencing strategy is applied, water is available for licensing at Q30. It becomes restricted at Q50 and is unavailable for licensing at Q70 and Q95.

4.3.5 Wey

The Wey ALS sets out how water is sustainably managed in the Wey catchment to both provide water for abstraction and protect the environment. Water availability is the same for surface water and groundwater.

At Q30, restricted water is available for licensing. However, at Q50, Q70, and Q95 water becomes unavailable for licensing in this area of Surrey Heath.

When the bespoke licencing strategy is applied, water is available for licensing at Q30. It becomes restricted at Q50 and is unavailable for licensing at Q70 and Q95.

4.3.6 Thames Corridor

The Thames ALS sets out how water is sustainably managed in the Thames catchment to both provide water for abstraction and protect the environment. Water availability is the same for surface water and groundwater.

At Q30, restricted water is available for licensing. However, at Q50, Q70, and Q95 water becomes unavailable for licensing in this area of Surrey Heath.

When the bespoke licencing strategy is applied, water is available for licensing at Q30. It becomes restricted at Q50 and is unavailable for licensing at Q70 and Q95.

In summary, considering the resource availability for Loddon, Wey, and Thames Corridor ALSs, it would not be feasible to rely upon increased abstraction or new sources within the borough to supply growth. This is because water is only available for a small proportion of the time.

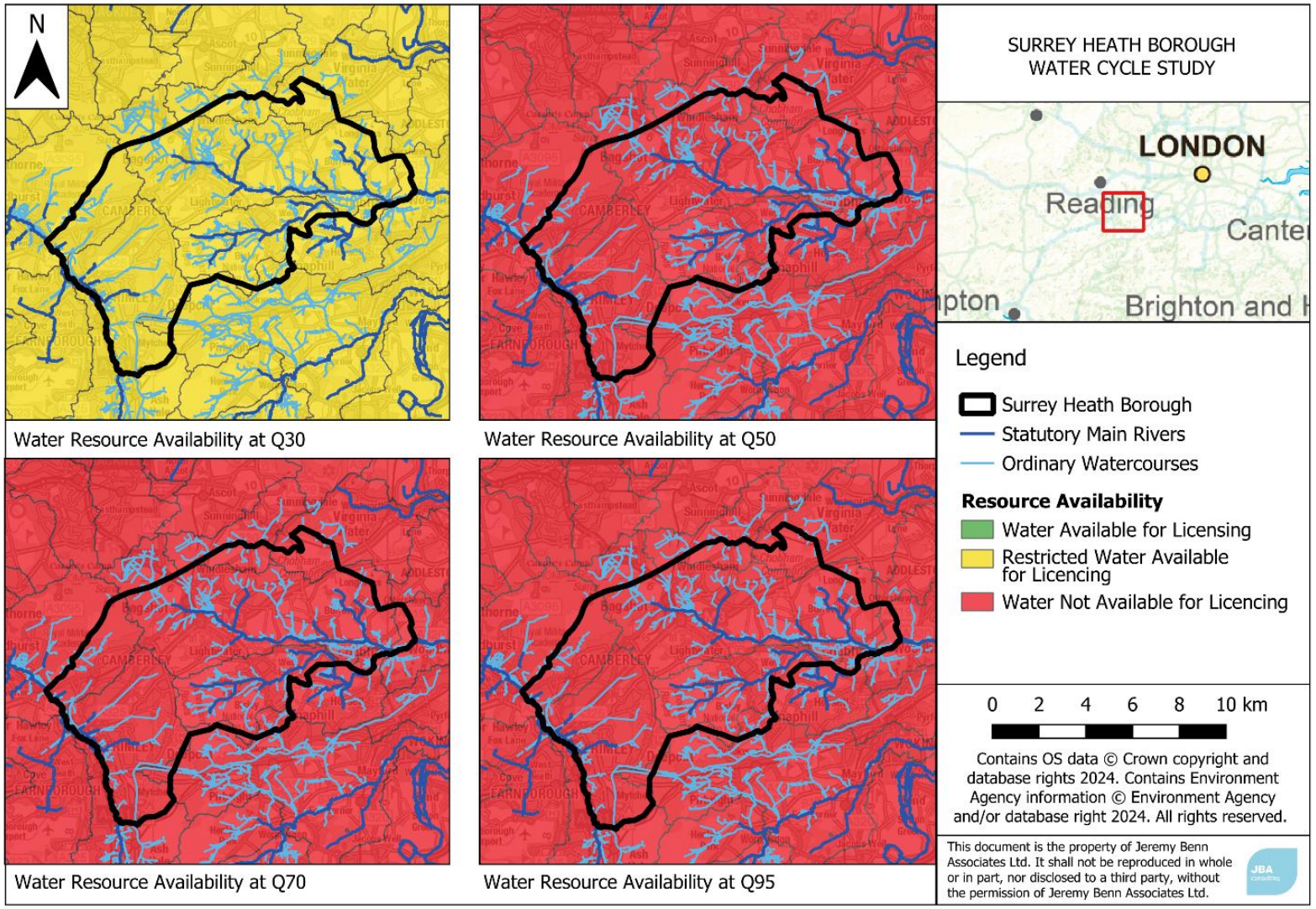


Figure 4-4: Water resource availability for Surrey Heath.

4.4 Water Resource Management Plans

4.4.1 Introduction

WRMPs are 50-year strategies that water companies are required to prepare, with full updates every five years (see Section 3.5.3 for further details).

When new development within an LPA is being planned, it is important to ensure that there are sufficient water resources in the area to cover the increase in demand without risk of shortages in the future or during periods of high demand, and without causing a negative impact on the waterbodies from which water is abstracted.

The aim of this assessment was to compare the future additional demand as a result of development proposed within the new Local Plan, with the demand accounted for by Affinity Water and South East Water within their WRMPs.

WRZs are defined by the EA as areas in which the management of supply and demand is largely self-contained and where the supply infrastructure is linked such that customers within the zone experience the same risk of supply failure. Within a WRZ a customer may receive their water from anywhere within the zone, and not necessarily from the nearest source. The WRZs covering Surrey Heath are shown in Figure 4-5.

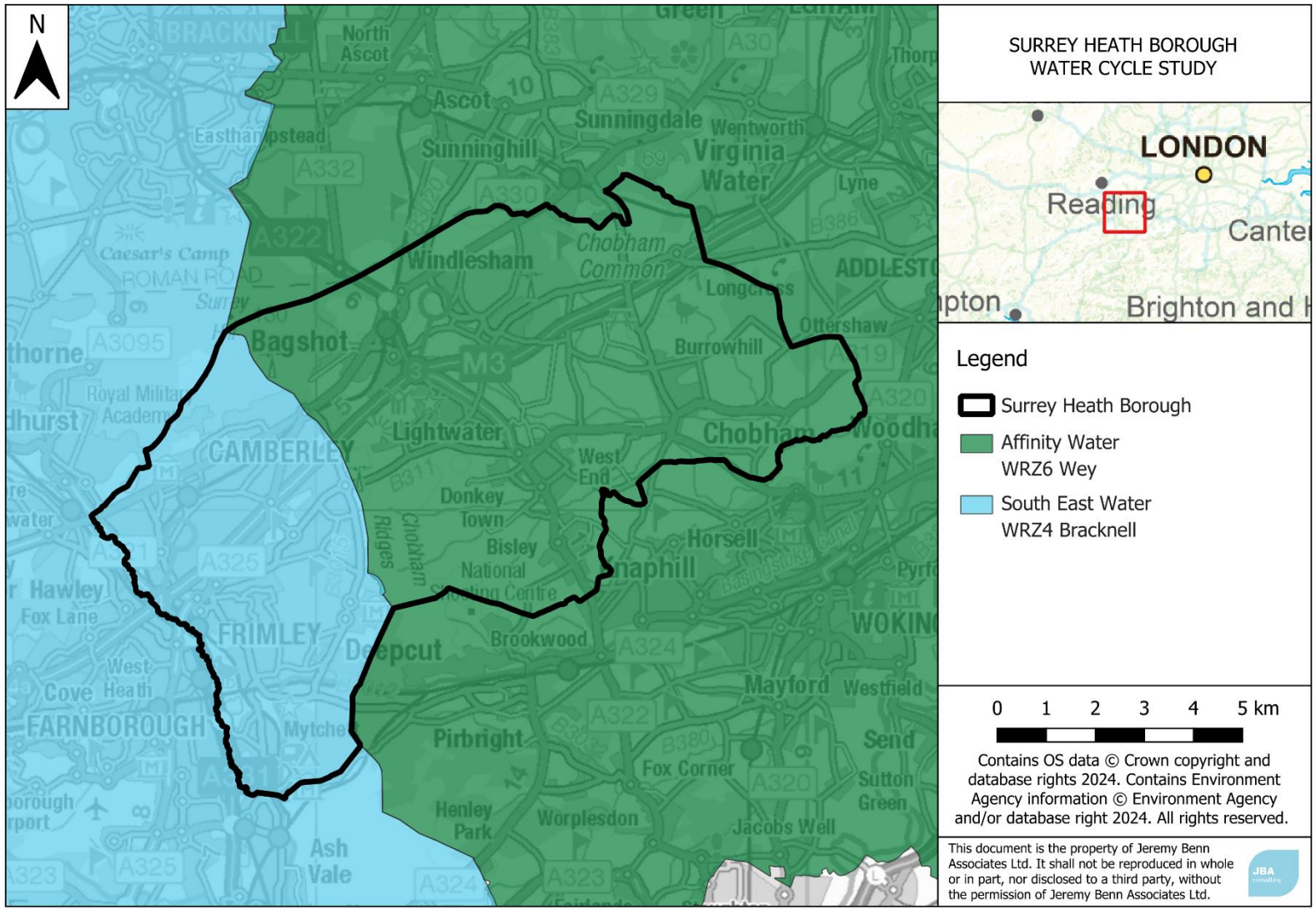


Figure 4-5: Water supply companies in Surrey Heath.

4.4.2 Methodology

The Water Resources Management Plans for the water companies supplying Surrey Heath were reviewed. Attention was mainly focussed upon:

- The available water resources and future pressures which may impact upon the supply element of the supply/demand balance.
- The allowance within those plans for housing and population growth and its impact upon the demand side of the supply/demand balance.

The Ministry for Housing, Communities and Local Government (MHCLG), (now Department for Levelling Up Housing and Communities (DLUHC)), 2018-based estimates of household growth up to 2041 has been used to estimate the present-day number of houses in Surrey Heath in this study.

4.4.3 South East Water

South East Water is a water-only company that supplies the western part of the borough (see Figure 4-5). The operational supply area for South East Water is divided into eight WRZs, and SHBC is within WRZ4 Bracknell. This WRZ covers around 64% of properties and encompasses the following areas: Camberley, Old Dean, Heatherside, Frimley, Frimley Green, Deepcut, and Mytchett.

The EA has designated the area as being under serious 'water stress' (see Section 4.6.2). The region is one of the driest nationally and there is already significant pressure on water resources. With climate change, predicted population growth and a reduction in the amount of water available for abstraction, the WRMP suggests a potential shortfall of 188 million litres per day in the South East Water's supply area by 2075. In WRZ4, Dry Year Annual Average (DYAA) Baseline projections indicate a supply demand balance deficit of -43.6 Ml/d by 2030, which increases to -72.1 Ml/d by 2050. The DYAA Final Plan scenario shows a surplus of 19.72 in 2030, which decreases to 10.47 by 2050.

To secure future drinking water supplies, the WRMP evaluates a number of supply side and demand side options to address the forecasted deficit, while also considering costs, natural capital, resilience, environment protection and customer acceptability.

Supply side options planned in the WRMP24 include:

- Investing £1.2 billion over the next 50 years to build large-scale infrastructure projects. This includes reservoirs, such as at Broad Oak in Kent in 2033, which can provide an additional 22 million litres of water a day.
- New pipelines to increase the amount of water moving between water companies and within South East Water's supply area.
- Desalination plants, removing the salt from seawater and brackish water creating drinking water. Several desalination plants are considered after 2036 in coastal and estuarine locations across Kent, including East Sussex and Reculver in 2044.

- Water recycling schemes, six to be completed by 2035 and an additional two by 2075, where highly treated wastewater is used to supplement natural water supplies.
- Increasing available supplies, such as through regional and inter-zonal water transfer schemes and water network improvements.
- Groundwater schemes aimed to deliver a net reduction in abstraction, using sources more efficiently and improving how water is stored.

Reducing demand was highlighted as being particularly necessary in the first 10 years of the plan, before new sources are developed and the level of environmental improvement from reduced abstraction has been assessed. Demand management proposals include:

- Minimising water usage through water-efficiency audits, the installation of smart meters, water efficiency devices, as well as community partnerships for households and other interventions such as new on-site storage facilities for non-households.
- Reducing leakage by 40% by 2040, based on 2017/18 levels, aided by technological advancements to detect small leaks, including the use of satellite technology.

4.4.4 Affinity Water

Affinity Water is a water-only company responsible for supplying the eastern part of the borough. The operational supply area for Affinity Water is divided into eight WRZs, and SHBC is in the central region within WRZ6 Wey. This WRZ covers a larger area of SHBC than South East Water, but as the east is more rural this equates to around 36% of properties. The region supplied includes: Lightwater, Bagshot, West End, Bisley, Windlesham, Valley End, and Chobham.

The EA has classed Affinity Water's supply areas as being under serious ‘water stress’ (see Section 4.6.2). The region has one of the lowest total annual average rainfalls per person in the UK, and climate change also increases the likelihood of prolonged periods with higher demand for water. A continued forecast of substantial population and housing growth, demand for water is predicted to rise by around 10% by 2050. DYAA Baseline projections for the WRZ6 indicate a supply demand balance surplus of 17.6 Ml/d by 2030, which decreases to 3 Ml/d by 2050. The DYAA Final Plan scenario shows a surplus of 0.5 in 2030, which increases to 7.9 in 2050.

The area also has a groundwater-dominated supply (around 65%), and abstraction needs to be minimised to prevent damage to ecologically sensitive areas in the region. For example, the area contains 10% of globally rare chalk streams. Affinity Water have set out a number of short and longer-term ambitions in the WRMP24 to sustainably address the water resourcing challenges.

A number of supply side options are proposed, with 2025-2030 focusing on maximising current sources and planning new ones, with the following decade delivering a number of strategic resource options (SROs). These supply side measures include:

- Transferring additional water from River Thames that is released by upstream abstraction reductions (2025-2030).
- Reducing existing export to WRZ6 Wey by 10 Ml/d, transferring the extra capacity north (2025-2030).
- Delivering the Grand Union Canal Transfer (100 Ml/d) and constructing the South East Strategic Reservoir (150Mm³) (2030-2040).
- Construction for the Thames to Affinity Transfer scheme (2030-2040).

With the aim of reducing water consumption to 110 litres per capita per day by 2050, key demand side measures from the WRMP24 include:

- Installing 400,000 smart meters for customer households and businesses between 2025-2030, and a further 1,055,000 between 2030-2040.
- Delivering a 50% leakage reduction by 2050, achieved 76% through actively identifying and repairing network leaks and 24% through mains replacement.
- Encouraging behavioural changes in water saving through Home Water Efficiency Checks (HWEC), which includes the provision of water-saving devices.
- For businesses between 2025-2030, reducing leakages through subsidised repairs and alterations and allow usage reductions through self-audits and retailer audits. Longer term, 2030-2040, encouraging water recycling and water efficiency actions.
- Government-led initiatives, including enhanced regulation for new properties, water efficiency labelling, and minimum standards for water using goods.

4.4.5 Population and household growth

Table 4-3 shows the household growth forecasts for the WRZs which serve growth within Surrey Heath from the Office for National Statistics (ONS) 2018 forecast, the new Local Plan, and the 2024 WRMPs. It is difficult to make direct comparisons between growth forecasts in Surrey Heath and the WRZs due to their differing geographies, but in general the growth forecasted by the water companies is slightly higher to that considered in the new Local Plan.

Table 4-3: Comparison of household growth forecasts.

Forecast	2024	2038	% increase
ONS 2018-based forecast – Surrey Heath	35,014	35,873	2.45%
Expected growth in Local Plan period*	38,364	42,381	10.47%
WRMP24 Forecast – Affinity Water WRZ6**	232,710	276,379	18.77%
WRMP24 Forecast – South East Water WRZ4**	287,422	333,687	16.10%

* Using baseline from the Surrey Heath Local Housing Needs Assessment 2024.

** These figures are based on the Water Resources Market Information tables published as part of final WRMP24 published in October 2024.

4.4.6 Summary

Surrey Heath is within Affinity Water Wey WRZ6 and South East Water WRZ4 Bracknell. Affinity Water and South East Water's WRMPs highlight a deficit between supply and demand forecast and defines the actions required to achieve a supply demand balance to prevent the risk of future environmental deterioration.

Although Affinity Water and South East Water have not relied on new homes being more water-efficient than existing metered homes, there is opportunity, through the planning system, to ensure that new homes do meet the higher standard of domestic water usage at no significant additional cost to the developer. This would be in line with general principals of sustainable development, and reducing energy consumed in the treatment and supply of water.

Growth during the Local Plan period is expected to be in the region of 10.5% between 2024 and 2038. This is lower than the percentage growth forecast in the Affinity Water and South East Water's WRZs, based on data published as part of the final WRMP24s. This indicates that the water company plans have sufficient allowance for the levels of growth proposed in the Local Plan.

4.5 Water Environment National Environment Programme Measures

There are no flow related WINEP actions on waterbodies Surrey Heath. Actions relating to water quality are presented in Section 8.6.

4.6 Water demand management

4.6.1 Water efficiency

Climate change is predicted to increase pressure on water resources, increasing the potential for a supply-demand deficit in the future, and making environmental damage from over abstraction of water resources more likely. Furthermore, the delivery of water and wastewater services and the heating of water in the home require high energy inputs, and therefore contribute directly to emissions of greenhouse gases. Water efficiency therefore reduces energy use and carbon emissions.

It is important therefore that new development does not result in an unsustainable increase in water abstraction. This can be done in a number of ways from reducing the water demand from new houses through to achieving water neutrality in a region by offsetting a new development's water demand by improving efficiency in existing buildings.

It is for Local Authorities to establish a clear need to adopt the tighter water efficiency target through the building regulations. This should be based on:

- Existing sources of evidence such as:
    - The EA classification of water stress;
    - WRMPs produced by water companies;

- RBMPs which describe the river basin district and the pressure that the water environment faces. These include information on where water resources are contributing to a water body being classified as ‘at risk’ or ‘probably at risk’ of failing to achieve GES, due to low flows or reduced water availability;
    - Defra Plan for Water.
- Consultations with the local water and sewerage company, the EA and catchment partnerships; and
- Consideration of the impact on viability and housing supply of such a requirement

This evidence is laid out below.

4.6.2 Water stress

Water stress is a measure of the level of demand for water (from domestic, business and agricultural users) compared to the available freshwater resources, whether surface or groundwater. Water stress causes deterioration of the water environment in both the quality and quantity of water, and consequently restricts the ability of a waterbody to achieve a 'Good' status under the WFD.

The EA has undertaken an assessment of water stress across the UK. This defines a water stressed area as where:

- the current household demand for water is a high proportion of the current effective rainfall which is available to meet that demand; or
- the future household demand for water is likely to be a high proportion of the effective rainfall available to meet that demand.

In the EA’s 2021 assessment of Water Stressed Areas (gov.uk) the Affinity Water and South East Water supply regions were classified as being an area of serious water stress.

4.6.3 River Basin Management Plans

The study area is located within the Thames RBD. The management recommendations from the RBMP are listed below:

- **Government and agencies (EA)** grant licences under the Water Resources Act 1991 to regulate how much water is taken from rivers, lakes estuaries and groundwater. The EA reviews the sustainability of time-limited abstraction licences as they expire, and the licence holders seek replacement licences.
- **All sectors** take up or encourage water efficiency measures, including water industry work on metering, leakage, audits, providing water efficient products, promoting water efficiency and education.
- **Local Government** sets out local plan policies requiring new homes to meet the tighter water efficiency standard of 110 litres per person per day as described in Part G of Schedule 1 to the Building Regulations 2010.
- **Industry manufacturing and other business** implement tighter levels of water efficiency, as proposed by changes to the Building Regulations.

- **Agriculture and rural land management** manage demand for water and use water more efficiently to have a sustainable water supply for the future.
- **Local government** commissions water cycle studies to inform spatial planning decisions around local water resources.

The RBMP goes on to state that 'dealing with unsustainable abstraction and implementing water efficiency measures is essential to prepare and be able to adapt to climate change and increased water demand in the future.'

4.6.4 Defra Plan for Water

Through their Plan for Water[5] Defra has signalled their intention to review the water efficiency standards for new homes, including consideration of a new national 105l/p/d standard and 100l/p/d where there is a clear local need.

The Future Homes Hub (futurehomes.org.uk) was established to 'facilitate the collaboration needed within and beyond the new homes sector to help meet the climate and environmental challenges ahead.' It consists of representatives from the building industry, regulators, water companies, and environmental groups. Defra asked them to support them in the creation of the roadmap towards greater water efficiency. They have proposed a road map for water efficient homes in England and sets out a framework for the homebuilding sector to work in partnership with other stakeholders such as the water sector, local authorities and regulators to deliver it. The proposed roadmap is shown in Figure 4-6 below and outlines a staged approach to reducing per capita consumption. It also allows for a tighter figure of 90l/p/d by 2025 in seriously water stressed areas to enable sustainable growth.

Figure 4-6: Future Homes Hub proposed water efficiency roadmap.

4.6.5 National Water Resources Framework

A new National Framework for Water Resources (gov.uk) was published by the Government in March 2020. This outlines the water resource challenges facing England

5 Plan for Water: our integrated plan for delivering clean and plentiful water, Defra (2023). Accessed online at: https://www.gov.uk/government/publications/plan-for-water-our-integrated-plan-for-delivering-clean-and-plentiful-water/plan-for-water-our-integrated-plan-for-delivering-clean-and-plentiful-water on: 06/11/2024.

and sets out the strategic direction for the work being carried out by regional water resource groups.

A range of options were explored, and the most ambitious scenarios rely on policy change to introduce mandatory labelling of water using fittings and associated standards. The Government is currently reviewing policy on water efficiency following a recent consultation. The framework proposes that regional groups plan to help customers reduce their water use to around 110 l/p/d. This is achievable without policy interventions.

This aligns with the tighter standard of 110 l/p/d per day as described in building regulations. However, in order to achieve an average of 110 l/p/d across the UK, including existing housing, a water efficiency target for new build housing of 110 l/p/d or higher would make this harder to achieve. New build housing should therefore be lower than 110 l/p/d.

4.6.6 Water-only company advice

- Affinity Water share a number of water saving tips on their website for customers, found here. Split into kitchen, bathroom, seasonal, and garden tips, this includes advice such as adding a duel flush button on the toilet, installing a water butt to collect rainwater, and only running dishwashers and washing machines when they are full.
- South East Water offers advice on saving water on their website, found here. This includes reporting leaks, having shorter showers, and to look out for ECO labelling when replacing washing machines and dishwashers in order to buy the most water efficient model.
- Both South East Water and Affinity Water also provide free water-saving devices and products to customers in their supply areas. This includes cistern bags, regulated shower heads, shower timers, and LeakyLoo strips to detect toilet leaks.

4.6.7 Impact on viability

As outlined in Section 4.7.2, the cost of installing water-efficient fittings to target a per capita consumption of 110l/d has been estimated as a one-off cost of £12 for a four-bedroom house. Engagement with developers and information from Defra that emerged as part of the Sussex North Water Neutrality Strategy[6] indicated that a target of 100l/p/d could be achieved with 'minimal additional cost'. Research undertaken for the devolved Scottish and Welsh governments indicated potential annual savings on water and energy bills for householders of £24-£64 per year as a result of such water efficiency measures. Water efficiency is therefore not only viable but of positive economic benefit to both

6 Sussex North Water Neutrality Study: Part C - Mitigation Strategy, JBA Consulting (2022). Accessed online at: https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley on: 06/11/2024

private homeowners and tenants. In addition, financial incentives are available from the water companies to developers to encourage water-efficient design.

Research published by BRE[7] on the delivery of sustainable buildings reports that the cost of achieving lover BREEAM ratings incurs little or no additional cost and targeting higher BREEAM ratings incurs a typical cost of less than 2% above the baseline. The same study reports that the cost of achieving 3 credits in WAT01 (a 40% reduction in water consumption for baseline) would be £13,361 and payback could be achieved between 1 and 2.5 years depending on the price of water.

4.6.8 Summary

There is sufficient evidence to recommend a standard beyond the optional 110 litres per person per day design standard allowed under Building Regulations. This should be supported by an equivalent non-household water efficiency target. The BREEAM New Construction Standard can be used for this, and it is recommended that non-household development achieves a minimum of 3 credits under the measure 'Wat01' which provides a 40% improvement in water consumption compared to the baseline for that type of building. Currently this approach is not adequately supported in building regulations and the NPPF and policies requiring water efficiency standards less than 100l/p/d may only be supported at Local Plan inspection in exceptional circumstances.

SHBC's current sustainable water use policy (Policy DH4), sets a water efficiency requirement for residential development of 110 l/p/d. However, given the evidence of pressures on the environment, and on public water supply, it is recommended that in a future review of the Local Plan SHBC considers a domestic water efficiency target of 100l/p/d for all new homes, in line with proposals in the Defra Plan for Water and works with the water suppliers to incentivise even lower consumption.

7 Delivering Sustainable Buildings: Savings and Payback, BRE (2018). Accessed online at: https://files.bregroup.com/breeam/briefingpapers/Delivering-Sustainable-Buildings-Savings-and-Payback-Office-Case-Study-BREEAM-NC-2018_BREEAM_BRE_115359_BriefingPaper.pdf on: 11/06/2024.

4.7 Water demand reduction

4.7.1 Water neutrality concept

Water neutrality is a relatively new concept for managing water resources, but one that is receiving increased interest as deficits in future water supply/demand are identified. The definition adopted by the Government and the EA[8] is:

'For every development, total water use in the wider area after the development must be equal to or less than total water use in the wider area before development.'

It is useful to also refer to the refined definition developed by Ashton (2014)[9]:

*'*For every new significant development, the predicted increase in total water demand in the region due to the development should be offset by reducing demand in the existing community, where practical to do so, and these water savings must be sustained over time.*'*

This definition states the need to sustain water saving measures over time, and the wording 'predicted increase in total water demand' reflects the need for water neutrality to be designed in at the planning stage.

Both definitions refer to water use in the region or 'wider area', and the extent of this area should be appropriate to local authority boundaries, WRZs, or water abstraction boundaries depending on what is appropriate for that particular location. For instance, if a development site is in an area of water stress relating to a particular abstraction source, offsetting water use in a neighbouring town that is served by a different water source will not help to achieve water neutrality.

In essence water neutrality is about accommodating growth in a region without increasing overall water demand.

Water neutrality can be achieved in a number of ways:

- Reducing leakage from the water supply networks.
- Making new developments more water-efficient.
- 'Offsetting' new demand by retrofitting existing homes with water-efficient devices.
- Encouraging existing commercial premises to use less water.
- Implementing metering and tariffs to encourage the wise use of water.
- Education and awareness-raising amongst individuals.

8 Water Neutrality: An improved and expanded water resources management definition (SC080033/SR1), Environment Agency (2009). Accessed online at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291675/scho1009bqzr-e-e.pdf on: 11/06/2024.

9 Ashton, V. (2014). 'Water Neutrality – An Overview', in Booth C.A. and Charlesworth, S.M (eds) Water Resources in the Built Environment: Management Issues and Solutions. Wiley: Chichester.

4.7.2 Consumer water efficiency measures

Many interventions are designed to reduce water use if operated in a particular way, and so rely on the user being aware and engaged with their water use. The educational aspect is therefore important to ensure that home occupiers are aware of their role in improving water efficiency. Table 4-4 shows water efficiency measures that can be made by consumers, which has been adapted from Booth and Charleswell's (2014) book on water resources in the built environment (onlinelibrary.wiley.com).

Suggestions for water-efficiency measures are listed in Table 4-4. Some of these approaches are currently subject to testing under a water neutrality innovation project (affinitywater.co.uk) being led by Affinity Water.

Table 4-4: Consumer water efficiency measures.

Type of measure	Examples
Education and promotional campaigns.	Encourage community establishments (e.g., schools, hospitals) to carry out self-audits on their water use. Deliver water conservation message to schools and provide visual material for schools. Building awareness with homeowners/tenants.
Water-efficient measures for toilets.	Cistern displacement devices to reduce volume of water in cistern. Retro-fit or replacement dual flush devices. Retro-fit interruptible flush devices. Replacement low-flush toilets.
Water-efficient measures for taps.	Tap inserts, such as aerators. Low flow restrictors. Push taps. Infrared taps.
Water-efficient measures for showers and baths.	Low-flow shower heads. Aerated shower heads. Low-flow restrictors. Shower timers. Reduced volume baths (e.g. 60 litres). Bath measures.
RwH and water reuse.	Large-scale RwH. Small-scale RwH harvesting for example with a water butt, or rainwater tank for toilet flushing. Grey water recycling.
Water-efficient measures addressing outdoor use.	Hosepipe flow restrictors. Hosepipe siphons. Hose guns (trigger hoses). Drip irrigation systems. Mulches and composting.

Type of measure	Examples
Commercial properties.	Commercial water audits. Rainwater recycling. Grey water recycling. Optimising processes. Provide water efficiency information to all newly metered businesses.
Metering.	Promote water companies free meter option. Compulsory metering (in water stressed areas). Smart metering (to engage customer with their consumption). Provide interactive websites that allow customers to estimate the savings associated with metering (environmental and financial). Innovative tariffs (seasonal, peak, rising block). Customer supply pipe leakage - supply pope repair and replacement.
Other.	Household water audits, including DIY or with help of plumber. Seek-and-fix internal leaks and/or dripping taps. Water efficient white goods included washing machines and dishwashers. Ask customers to spot and report leaks.

4.7.3 Rainwater and greywater recycling

Rainwater harvesting

Rainwater recycling or RwH is the capture of water falling on buildings, roads or pathways that would normally be drained via a surface water sewer, infiltrate into the ground or evaporate. In the UK this water cannot currently be used as a drinking water supply as there are strict guidelines on potable water, but it can be used in other systems within domestic or commercial premises.

Systems for collection of rainwater can be simple water butts attached to a drainpipe on a house, or it could be a complex underground storage system, with pumps to supply water for use in toilet flushing and washing machines. By utilising rainwater in this way there is a reduced dependence on mains water supply for a large proportion of the water use in a domestic property.

Benefits of RwH

- RwH reduces the dependence on mains water supply – reducing bills for homeowners and businesses.
- Less water needs to be abstracted from river, lakes, and groundwater.
- Stormwater is stored in a RwH system reducing the peak surface water runoff leaving a site providing a flood risk benefit (for smaller storms).

- By reducing surface water flow, RwH can reduce the first flush effect whereby polluted materials adhering to pavement surfaces during dry periods are removed by the first flush of water from a storm and can cause pollution in receiving watercourses.

Challenges of RwH

- Dependency on rainfall can limit availability of harvested rainwater during drought and hot weather events.
- Increased capital (construction) costs to build RwH infrastructure into new housing (£900 to £3,000 for a small-scale domestic system)[10].
- Payback periods are long as the cost of water is low so there is little incentive for homeowners to invest[11].

Greywater harvesting

Greywater refers to water that has been 'used' in the home in appliances such as washing machines, showers and hand basins. Greywater recycling or greywater harvesting (GwH) is the treatment and re-use of this water in other systems such as for toilet flushing. By their nature, GwH systems require more treatment and are more complex than RwH systems, and there are limited examples of their use in the UK.

Greywater re-use refers to systems where wastewater is taken from source and used without further treatment. An example of this would be water from a bath or shower being used on plants in the garden. This sort of system is easy to install and maintain, however, as mentioned above the lack of treatment to remove organic matter means the water cannot be stored for extended periods.

Greywater recycling refers to systems where wastewater undergoes some treatment before it is used again. These systems are complex and require a much higher level of maintenance than RwH or greywater re-use systems.

Domestic water demand can be significantly reduced by using GwH, and unlike with a RwH system where the availability of water is dependent on the weather, the source of water is usually constant (for instance if it is from bathing and showering). However, the payback period for a GwH system is usually long, as the initial outlay is large, and the cost of water relatively low.

Viability of greywater systems for domestic retrofit applications is therefore currently limited. However, communal systems may offer more opportunities where the cost can be

10 Independent review of the costs and benefits of rainwater harvesting and grey water recycling options in the UK, Waterwise (2020). Accessed online at: https://database.waterwise.org.uk/knowledge-base/independent-review-of-costs-and-benefits-of-rwh-and-gwr-options-in-the-uk/ on: 06/11/2024.

11 Housing Standards Review, UK Government (2014). Accessed online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/353387/021c_Cost_Report_11th_Sept_2014_FINAL.pdf on: 06/11/2024.

shared between multiple households particularly on larger new build developments, or in new settlements.

4.7.4 Energy and water use

18% of the UK's domestic energy usage is for water heating[2]. If less water was being used within the home, for instance through more water efficient showers, less water would need to be heated, and overall domestic energy usage would be reduced.

In 2020-2021 the Government consulted on a Future Homes Standard that will involve changes to Part L (conservation of fuel and power) of the Building Regulations for new dwellings[12]. Unfortunately, this fails to identify the role of water efficiency in the home in also reducing energy usage.

4.7.5 Funding for water efficiency

Water efficiency improvements or water neutrality is unlikely to be achieved by just one type of measure, and likewise it is unlikely to be achieved by just one funding source. Funding mechanisms that may be available could be divided into the following categories:

- Infrastructure-related funding (generally from developer payments).
- Fiscal incentives at a national or local level to influence buying decisions of households and businesses.
- Water company activities, either directly funded by the five-year price review or as a consequence of competition and individual company strategies.
- Joint funding through energy efficiency schemes (and possibly to integrate with the heat and energy saving strategy).

Currently in the UK, the main funding resource for the delivery of water efficiency measures is the water companies, with some discretionary spending by property owners or landlords. Affinity Water offers discounts on their infrastructure charges if developers demonstrate they are building homes to a tighter water efficiency standard. These are described in the section below. South East Water are developing their incentive scheme.

For water neutrality to be achieved, policy shifts may be required in order to increase investment in water efficiency. Possible measures could include:

- Further incentivisation of water companies to reduce leakage and work with customers to reduce demand.
- Require water efficient design in new development.
- Developer funding to contribute towards encouraging water efficiency measures.

12 The Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings, Ministry of Housing, Communities & Local Government (2019). Accessed online at: https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings on: 06/11/2024.

- Require water efficient design in refurbishments when a planning application is made.
- Tighter standards on water using fittings and appliances.

4.8 Water efficiency incentives

4.8.1 Affinity Water

Affinity Water offer a discount to infrastructure charges for new homes that evidence water efficiency design to a standard of <110lpppd. For 2024/2025, this is -£589 per infrastructure charge.

From April 2025, Affinity Water are also introducing an environmental incentive discount tier system to developers who meet specified water efficiency standards. The aim is to encourage the installation of water efficient fixtures and fittings in new developments.

The system is three-tiered and includes the increasing 'Basic', 'Enhanced', and 'Premium' water efficiency levels, where higher categories correspond to greater environmental incentive payments (see Figure 4-7). Affinity water also has a bespoke 'Water Neutral' category (see Section 4.7.1). This category represents the greatest commitment to the conservation of water resources. As such, it offers the highest environmental credit equal to the combined value of the standard tiers. No environmental incentive credit will be given to developments that do not meet the minimum water efficiency criteria.

Environmental Incentive Tier System			
Ofwat Tier	**Category**	**Environmental Incentive Credit**	**Water Efficiency Level**
	None	None	No water efficiency commitment
1	**Basic**	Small environmental credit	Low level of water efficiency
2	**Enhanced**	Medium environmental credit	Moderate level of water efficiency
3	**Premium**	Large environmental credit	High level of water efficiency
Bespoke	**Water Neutral**	Maximum environmental credit	Highest level of water efficiency

Figure 4-7: Affinity Water's Environmental Incentive Discount Tier System[13].

To fund the environmental incentive payments, a charge described as the environmental component will be applied to all properties once the connection is made. This is in addition to infrastructural charges currently paid by all developers. All properties will contribute the same amount. This funding mechanism is proposed by Ofwat14 and is illustrated in Figure 4-8.

13 Charging Consultation for 2025/2026, Affinity Water (2024). Accessed online at: https://www.affinitywater.co.uk/docs/developer/2024/Customer-Charging-Consultation-2025-26.pdf on 04/11/2024.https://www.affinitywater.co.uk/docs/developer/2024/Customer-Charging-Consultation-2025-26.pdf

14 Environmental incentives to support sustainable new homes, Ofwat (2023). Accessed online

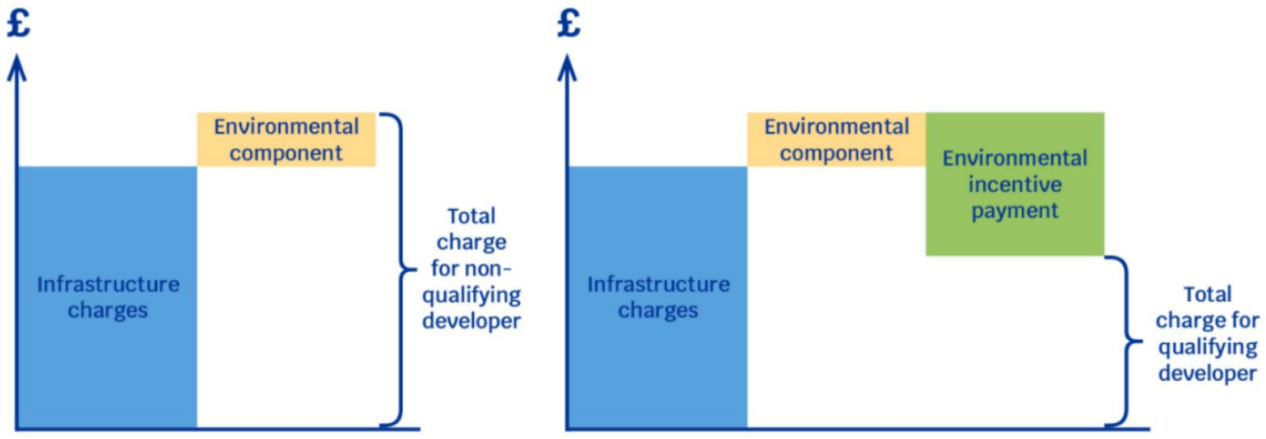


Figure 4-8: Ofwat's proposed environmental incentives funding mechanism for developers, from April 2025.

4.8.2 South East Water

South East Water are in the process of developing their water efficiency incentives for new developments. In their report on Charging Arrangements for New Connection Services 2024/2025 (cdn.southeastwater.co.uk), they explain that they planned on having a tiered scheme in place for 2024/25. However, they decided more research was required both into the incentives themselves and how to achieve consistency across the industry in the process of application, auditing and timing of payments.

4.9 Conclusions and recommendations

Surrey Heath receives its water from two water-only companies, Affinity Water and South East Water. Surrey Heath is split between WRZ4 Bracknell for South East Water and WRZ6 Wey for Affinity Water. In both WRZs, the forecast percentage growth in the WRMP is higher than the expected growth during the Local Plan period.

The WINEP is a set of actions that the EA have requested all 20 water companies operating in England to complete in a particular Asset Management Period (AMP) as part of their environmental commitments. A number of investigations are planned or underway to ensure that abstraction of water from both groundwater and rivers, is not leading to unsustainable reductions in flow. Development and population growth can increase abstraction, and so SHBC have an opportunity to contribute to these actions indirectly by pursuing policies that promote water efficiency in new development.

It is important that new development does not result in an unsustainable increase in water abstraction. This can be done in a number of ways from reducing the water demand from new houses through to achieving water neutrality in a region by offsetting a new developments water demand by improving efficiency in existing buildings.

Water resources in the UK are under considerable pressure. The EA have stated that 'the scale of the challenge we face increases with time, and, by 2050, we are looking at a shortfall

at: https://www.ofwat.gov.uk/wp-content/uploads/2023/06/Consultation-on-Environmental-incentives-to-Support-Sustainable-New-Homes.pdf on 05/11/2024.

of nearly 5 billion litres of water per day between the sustainable water supplied available and the expected demand.'

The National Water Resources Framework sets the objective to reduce the average per capita consumption in the UK to 110l/p/d by 2050. This is now part of the EIP and water companies' WRMPs. Within Defra's Plan for Water is the commitment to review Building Regulations and a target of 100l/p/d in water stress areas is suggested.

The Future Homes Hub, who are supporting Defra to produce a roadmap to greater water efficiency propose a stages reduction in PCC, with a target of 100l/p/d in water stressed areas in place from 2025, and a reduced target of 90l/p/d in place by 2030 (depending on market conditions and customer acceptance).

SHBC's submitted Local Plan sets the requirement for all new homes to meet a water efficiency standard of a maximum of 110 l/p/d, based on recommendations from the previous WCS (2017). This study recommends that as a minimum, the proposed new Building Regulations target of 100l/p/d outlined in Defra's Plan for Water be adopted across the study area. This should be achieved using a fittings-based approach. This should be supported by the requirement for non-household development to achieve at least three credits in the Wat01 measure for water of the BREEAM UK New Construction Standard.

- The Local Plan should allow for a future reduction in the Building Regulations target to 90l/p/d in 2030. This is supported by Affinity Water and South East Water's incentives for water efficient design in new builds, outlined in Section 4.8, offered to reduce design consumption below 100l/p/d.

The recommendations for water resources are provided in Table 4-5.

Table 4-5: Recommendations for water resources.

Action	Responsibility	Timescale
Continue to regularly review forecast and actual household growth across the supply region through WRMP Annual Update reports, and where significant change is predicted, engage with LPAs.	Affinity Water, South East Water	Ongoing
Provide yearly updates of projected housing growth to water companies to inform WRMP updates.	SHBC	Ongoing
The council should consider a domestic water efficiency target of 100l/p/d for all new homes, and work with water suppliers to incentivise even lower consumption. This should be achieved using a fittings-based approach.	SHBC	In a future review of Surrey Heath's Local Plan
Use planning policy to require new build non-residential development to achieve at least 3 credits in the Wat01 Measure for water in the BREEAM New Construction standard.	SHBC	In Surrey Heath's Local Plan

Action	Responsibility	Timescale
The concept of water neutrality has the potential to provide a benefit in improving resilience to climate change and enabling all waterbodies to be brought up to Good status. Explore further with the water companies and the EA how the Council's planning and climate change policies can encourage this approach. This approach could have particular application in strategic sites. This aligns with part 3 of Policy DH4 in SHBC's submitted Local Plan.	SHBC, EA, Affinity Water, South East Water	In Surrey Heath's Local Plan
Larger residential developments and commercial developments should consider incorporating greywater recycling and/or RwH into development at the master planning stage in order to reduce water demand.	SHBC, Affinity Water, South East Water	In Surrey Heath's Local Plan
Water companies should advise SHBC of any strategic water resource infrastructure developments within the study, where these may require safeguarding of land to prevent other type of development occurring.	SHBC, Affinity Water, South East Water	Part of Surrey Heath's Local Planning process

5 Water supply infrastructure

5.1 Introduction

An increase in water demand due to growth can exceed the hydraulic capacity of the existing supply infrastructure. This is likely to manifest itself as low pressure at times of high demand. An assessment is required to identify whether the existing infrastructure is adequate or whether upgrades will be required. The time required to plan, obtain funding and construct major pipeline works can be considerable and therefore water companies and planners need to work closely together to ensure that the infrastructure is able to meet growing demand.

Water supply companies make a distinction between supply infrastructure, the major pipelines, reservoirs and pumps that transfer water around a WRZ, and distribution systems, smaller scale assets which convey water around settlements to customers. This outline study is focused on the supply infrastructure. It is expected that developers should engage early with the Developer Services functions of the water and wastewater companies local to their site, and fund water company impact assessments and modelling of the distribution systems to determine requirements for local capacity upgrades to the distribution systems.

In addition to the work undertaken by water companies, there are opportunities for the local authority and other stakeholders to relieve pressure on the existing water supply system by increasing water efficiency in existing properties. This can contribute to reducing water consumption targets and help to deliver wider aims of achieving water neutrality.

A cost-effective solution can be for local authorities to co-ordinate with water supply companies and 'piggyback' on planned leakage or metering schemes, to survey and retrofit water efficient fittings into homes[15]. This is particularly feasible within property owned or managed by the local authorities, such as social housing.

5.2 Methodology

A list of allocations was provided to South East Water and Affinity Water as part of the Regulation 19 consultation in autumn 2024. This has been used to inform the Stage 2 assessment.

15 Water Efficiency Retrofitting: A Best Practice Guide, Waterwise (2009). Accessed online at: http://www.waterwise.org.uk/wp-content/uploads/2018/01/Waterwise-2009_Water-efficiency-Retrofitting_Best-practice.pdf on: 07/11/2024.

5.3 Results

5.3.1 Affinity Water's comments

Affinity Water provided the following comments on water supply:

'From the shapefile provided, it doesn't appear that any future proposed developments intersect our existing sites or assets. However, it is important to note that in general, where our mains apparatus do intersect sites for future development, or redevelopment of existing sites, no development will be permitted within a specified distance of these services. Where there is potential to impact the existing water network, we would expect these impacts to be fully considered and for developers to discuss these with us early on in the process. Please note that we have water mains within all town centre boundaries. For trunk and raw water trunk mains within or adjacent to sites and their boundaries, there will be no building, planting or other heavy earth works within a minimum of 4 metres of these mains. For our other mains there will be a minimum 2-3 metre no dig exclusion zone, unless the mains are to be diverted and the costs for this would need to be met by the developer.'

Affinity Water also added:

'Pressures at some of the critical points in the network due to the new developments are such that Local reinforcements in the network may be required, even given the relatively small scale of development proposed. This normally means new mains, pipelines and other assets. There will also be the requirement for some more localised, development specific reinforcements and connections.

All the proposed reinforcements will aim to recover the current level of service and the loss of capacity in the network due to the additional load imposed by all projected development.

Current capacity in the network may be used to absorb initial phases of growth. Some of the developments will require individual and global study to ensure correct supply in the area.

The overall scheme design and construction programme will depend on the location and phasing of developments and any early information concerning this will help our planning.'

5.3.2 South East Water's comments

South East Water provided the following comments, responding to Surrey Heath's draft Infrastructure Delivery Plan 2024:

'… we are confident that our plans accommodate a level of growth discussed with the Council in recent years (although final refinement may be required, based on our above review and checks [of housing and population growth]) to ensure that sufficient water is available within the local area to meet a supply-demand balance.'

They explained they will use a mix of new water supplies and demand management initiatives to meet this supply-demand balance. South East Water also added that:

'As applications are made through our developer enquiry process, we will work with local authorities and developers to carry out the appropriate detailed network modelling assessments, to ensure that any necessary infrastructure reinforcement is delivered (to move water to where is needed at a development level) ahead of the occupation of development.

Where there are infrastructure constraints, it is important not to underestimate the time required to deliver necessary infrastructure. We are therefore committed and willing to ensure engagement and communication at the earliest opportunity.'

5.4 Conclusions and recommendations

Affinity Water explain that none of the proposed developments that have been provided seem to overlap with their existing sites or assets. However, they explain that where mains apparatus does intersect sites for future development/redevelopment, then no development is allowed within a set distance, and local network reinforcements may also be needed due to pressure at critical points. South East Water's comments show that they are confident that their plans support the expected growth levels outlined in discussions with the Council, but that final adjustments may be necessary based on their review of housing and population growth projections. Water supply infrastructure recommendations are provided in Table 5-1.

Table 5-1: Recommendations for water supply infrastructure.

Action	Responsibility	Timescale
Undertake network modelling to ensure adequate provision of water supply is feasible.	Water companies, SHBC	Ahead of planning applications
SHBC and developers should engage early with water companies to ensure supply infrastructure is in place prior to occupation.	Water companies, SHBC, developers	Ongoing
Developers should engage early with water companies to ensure that the capacity of distribution systems is adequate prior to development coming forward.	Water companies, developers	Ongoing

6 Wastewater collection

6.1 Sewerage undertakers

Thames Water a water and wastewater company that serves as the SU for the study area. The role of the SU includes the collection and treatment of wastewater from domestic and commercial premises. In some areas, it also includes the drainage of surface water from building curtilages to combined or surface water sewers. It excludes, unless adopted by the SU, systems that do not connect directly to the wastewater network, e.g., SuDS or highway drainage.

Increased wastewater flows into collection systems due to growth in populations or per-capita consumption can lead to an overloading of the infrastructure, increasing the risk of sewer flooding and, where present, increasing the frequency of discharges from storm overflows. Seasonal and yearly variations in weather and infiltration can reduce headroom at WwTW.

Headroom at WwTW can be eroded by growth in population or per-capita consumption, requiring investment in additional treatment capacity. As the volumes of treated effluent rises, even if the effluent quality is maintained, the pollutant load discharged to the receiving watercourse will increase. In such circumstances the EA as the environmental regulator, may tighten effluent consents to achieve a 'load standstill', i.e., ensuring that as effluent volume increases, the pollutant discharged does not increase. Again, this would require investment by the water company to improve the quality of the treated effluent. Consents can also be tightened to prevent a deterioration in water quality due to growth, or to achieve environmental objectives.

In combined sewerage systems, or foul systems with surface water misconnections, there is potential to create headroom in the system, thus enabling additional growth, by the removal of surface water connections and reducing infiltration. This can most readily be achieved during the redevelopment of brownfield sites which have combined sewerage systems, where there is potential to discharge surface waters via SuDS to groundwater, watercourses or surface water sewers.

Thames Water supports the adoption of SuDS and its principles. According to their webpage on their Surface Water Management Programme (thameswater.co.uk), they are shifting towards SuDS after a historic reliance on engineering-based solutions.

6.2 Assessment of drainage and wastewater management plans

6.2.1 Thames Water drainage and wastewater management plan

Thames Water's DWMP (gov.uk) is a plan for 2025-2050, aiming 'To identify future catchment risks to our drainage and wastewater treatment systems and develop sustainable, efficient solutions to address them.' Alongside the common, national planning objectives, Thames Water sets out strategic outcomes that acknowledges capacity-related issues, including climate change and population growth. To achieve these targets, the DWMP aims to invest £31.9 billion over the next 25 years.

These strategic outcomes outline targets to help reach goals by 2050, including by 2030:

- Reduce storm discharges to no more than an average of 10 per overflow in a typical year at the most sensitive sites, and no more than three in a typical year at their designated bathing waters.
- Manage the rainwater falling on 99 hectares of land in London that drains into the sewer network, using SuDS.
- Reduce the number of properties at risk of internal and external sewer flooding in a 1 in 50-year storm by 5% in their Thames Valley region.
- Ongoing upgrades of 30 WwTW across the Thames Valley.
- Investigate options for a new WwTW in the London area to take pressure off the sewer network.

These targets are set out to help Thames Water achieve the following key goals by 2050:

- Reduce storm discharges to no more than an average of 10 per overflow in a typical year at all storm overflow locations, by 2045.
- Manage the rainwater falling on 6,851 hectares of land in London that drains into the sewer network, using SuDS.
- Eliminate the risk of sewer flooding at properties in a 1 in 50-year storm in our Thames Valley region where feasible.
- Upgrade two WwTW in London and two in the Thames Valley, and revisit 11 WwTW across our region for their next round of upgrades.

There were also nearly 8,000 storm overflow discharge events were reported by Thames Water in 2022, which was a year of low rainfall. Baseline Risk and Vulnerability (BRAVA) modelling shows that this has the potential to increase to 19,000 storm flow discharges in an average rainfall year by 2050, due to the effects of population growth and climate change. This means that Thames Water needs to address 13,000 discharges in order to meet the Defra Storm Overflows Discharge Reduction Plan (SODRP) target to reduce overflows to ≤10 events per year (average) per overflow by 2050. Reducing storm overflow operations can be achieved by upgrading WwTW or the sewer network ensuring that storm overflows only operate in unusually heavy rainfall.

The BRAVA modelling also suggests that the number of properties at risk of flooding in a 1:50 storm event will increase by over 50%, from 90,310 in 2025 to 138,821 by 2050[16]. Their sewer flooding plan adopts a 'SuDS-first' approach that builds on the 'sponge city'[17] model developed in China. By aiming to drain 7,598 hectares of impermeable land to SuDS, Thames Water suggests promoting SuDS at this scale makes it one of the most ambitious re-greening plans in the UK, and potentially globally.

The Thames Water DWMP follows a four-tier geographical structure, shown in Figure 6-1. As a part of Level 2, the DWMP is split into 13 planning areas, each having a Catchment Strategic Plan (CSP). SHBC falls within the Thames Regional Flood and Coastal Committee (TRFCC) area[18]. This area covers 1,502km^2, serves 941,000 customers, and contains 28 WwTW. Over the next 25 years, Thames Water's preferred plan for Surrey aims to invest: £1.7bn on managing the impact of surface water on the sewerage system, £312m on improvements to surface water management, £33m upgrading 20 WwTW, £24m on sewer lining, and £26m for individual property level protection.

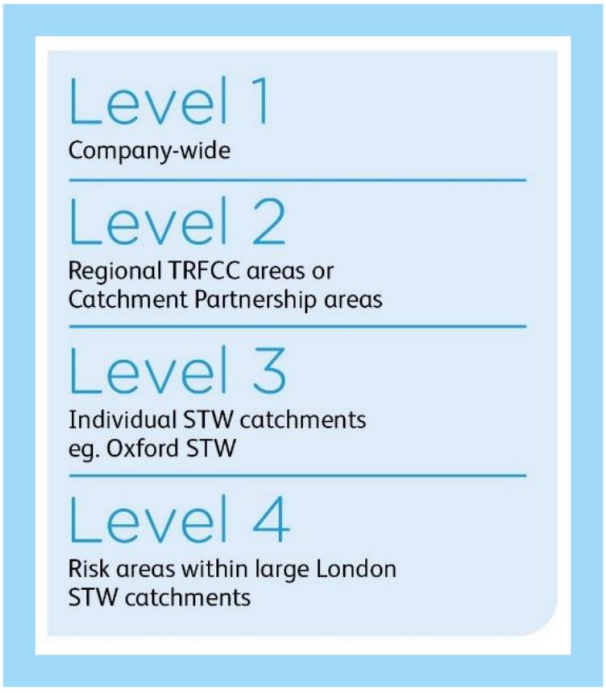


Figure 6-1: The four geographic levels in the Thames Water DWMP.

16 Our Drainage and Wastewater Management Plan 2025-2050: Technical Summary, Thames Water (2023). Accessed online at: https://www.thameswater.co.uk/media-library/home/about-us/regulation/drainage-and-wastewater/technical-summary.pdf on: 15/11/2024.

17 Sponge City Construction in China: A Survey of the Challenges and Opportunities, Li, H. et al. (2017). Water, 9(9):594. Accessed online at: https://doi.org/10.3390/w9090594 on 13/11/2024.

18 Co-creating resilient wastewater catchments: A long-term Strategic Plan for Surrey, Thames Water (2024). Accessed online at: https://www.thameswater.co.uk/media-library/home/about-us/regulation/drainage-and-wastewater/surrey-catchment-strategic-plan.pdf on: 15/11/2024

Level 3 involves catchment level tactical planning units, in which a wastewater network drains to a single WwTW. There are three Level 3 WwTW within Surrey Heath, and one just outside the border. Table 6-1 shows the increased modelled risk of hydraulic sewer flooding to properties in each WwTW catchment, comparing the 2025 baseline with the predicted performance in 2050 if the DWMP is not in place. Without the DWMP the risk increases in each WwTW catchment, but with the DWMP implemented the 2050 performance predicts no property flooding.

With the targets of reducing the number of customers at risk of internal and external hydraulic sewer flooding, reducing storm discharges, and maintaining 100% WwTW permit compliance, a number of catchment-level solutions are set out at different timescales.

Preferred solutions in the short term, 2025-2030:

- Ash Vale: Catchment-level planning mapping and modelling.
- Camberley STW: Catchment-level planning mapping and modelling.
- Chobham STW: Catchment-level planning mapping and modelling.
- Lightwater STW: Catchment-level planning mapping and modelling, and network improvements.

Preferred solutions in the medium term, 2030-2035:

- Ash Vale: Catchment-level planning mapping and modelling, network improvements, and treatment process technologies and protection from high river levels.
- Camberley STW: Catchment-level planning mapping and modelling, network improvements, treatment process technologies and protection from high river levels, and surface water management.
- Chobham STW: Catchment-level planning mapping and modelling.
- Lightwater STW: Catchment-level planning mapping and modelling.

Preferred solutions in the long term, 2035-2050:

- Ash Vale: Individual property level protection, network improvements, and surface water management.
- Camberley STW: Individual property level protection, network improvements, and surface water management.
- Chobham STW: Individual property level protection, network improvements, and surface water management.
- Lightwater STW: Individual property level protection, network improvements, treatment process technologies and protection from high river levels, and surface water management.

Overall, in the DWMP there is a focus on reduction of storm overflow operations, reducing sewer flooding, treatment works compliance, and using green engineering solutions in

conjunction with traditional green engineering to upgrade WwTW and create more sustainable water management options, such as SuDS and nature-based solutions.

Table 6-1: Hydraulic sewer flood risk*, 2025 modelled baseline compared to 2050 performance without the DWMP.

L3 WwTW Catchment	Internal Flooding 1 in 30-year (2025)	Internal Flooding 1 in 30-year (2050)	External Flooding 1 in 30-year (2025)	External Flooding 1 in 30-year (2050)	Resilience Flooding (internal) 1 in 50-year (2025)	Resilience Flooding (internal) 1 in 50-year (2050)
Ash Vale STW	14 properties (0.2%)	38 properties (0.5%)	64 properties (0.9%)	111 properties (1.6%)	119 properties (1.7%)	215 properties (3%)
Camberley STW	79 properties (0.1%)	136 properties (0.3%)	256 properties (0.5%)	424 properties (0.8%)	469 properties (0.9%)	839 properties (1.6%)
Chobham STW	8 properties (0.2%)	14 properties (0.3%)	33 properties (0.6%)	47 properties (0.9%)	50 properties (0.9%)	83 properties (1.6%)
Lightwater STW	49 properties (0.5%)	64 properties (0.7%)	55 properties (0.6%)	67 properties (0.7%)	146 properties (1.6%)	178 properties (2.0%)

*This table is adapted from the L3 STW catchment summary table in the Strategic Plan for Surrey, part of the Thames Water DWMP.

6.3 Storm overflows

Storm overflows are an essential component in the sewer network however when they operate, they can cause environmental damage. They occur on combined sewer systems where the sewer takes both foul flow (sewage from homes and offices) and rainwater runoff. In normal conditions (Figure 6-2) all of this flow passed through the sewer network and is treated at a wastewater treatment works.

In periods of exceptional rainfall (Figure 6-3), the capacity in a combined sewer may be used up by the additional flow from rooftops and storm drains. Once the capacity is exceeded, wastewater would back up into homes, businesses and on to roads. A storm overflow acts as a relief valve, preventing this from happening.

Storm overflows become problematic when they operate frequently in moderate or light rainfall, or for long periods as a result of groundwater infiltration in the sewerage system – possibly in breach of their permit.

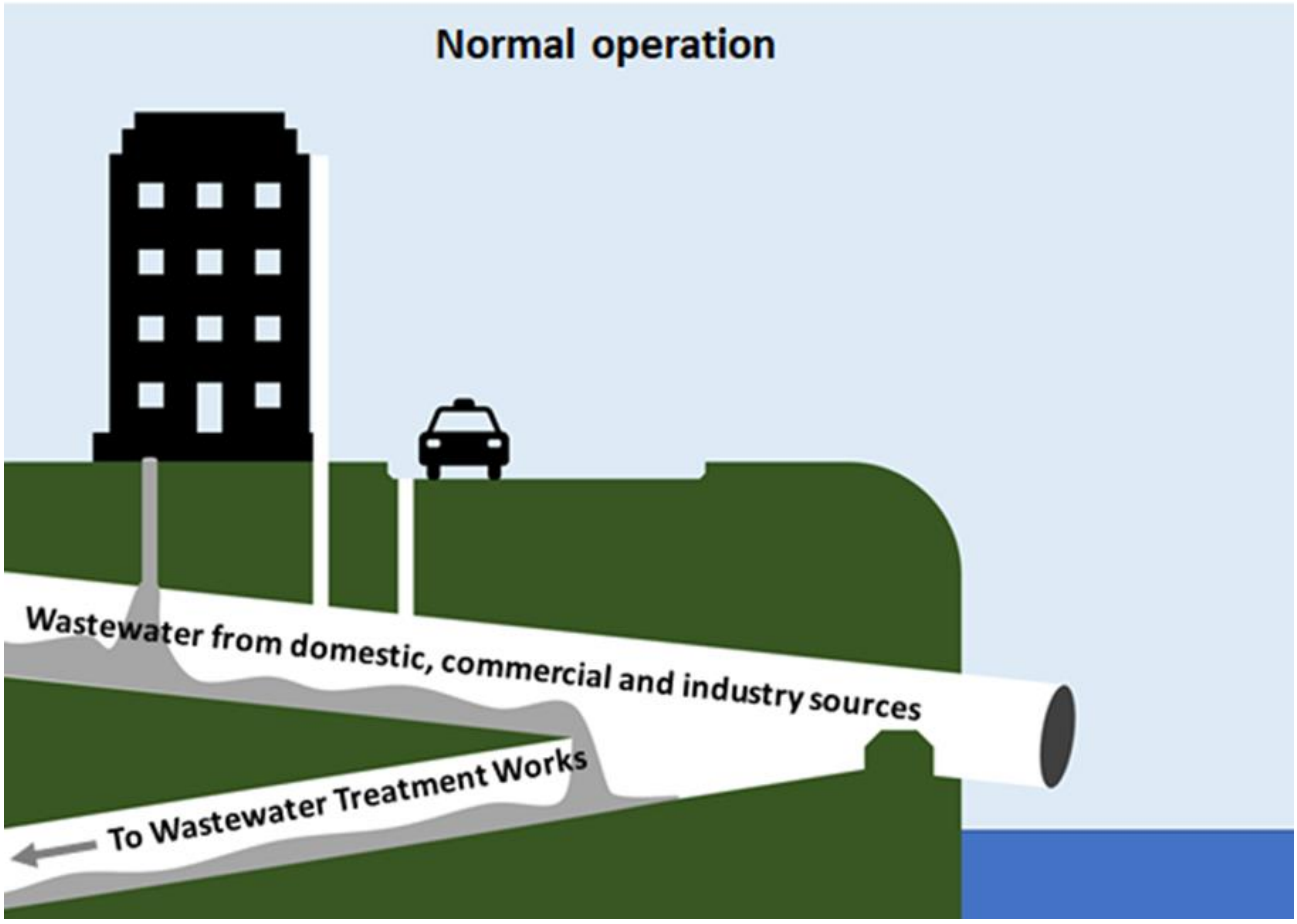


Figure 6-2: Storm overflow operation in normal conditions.

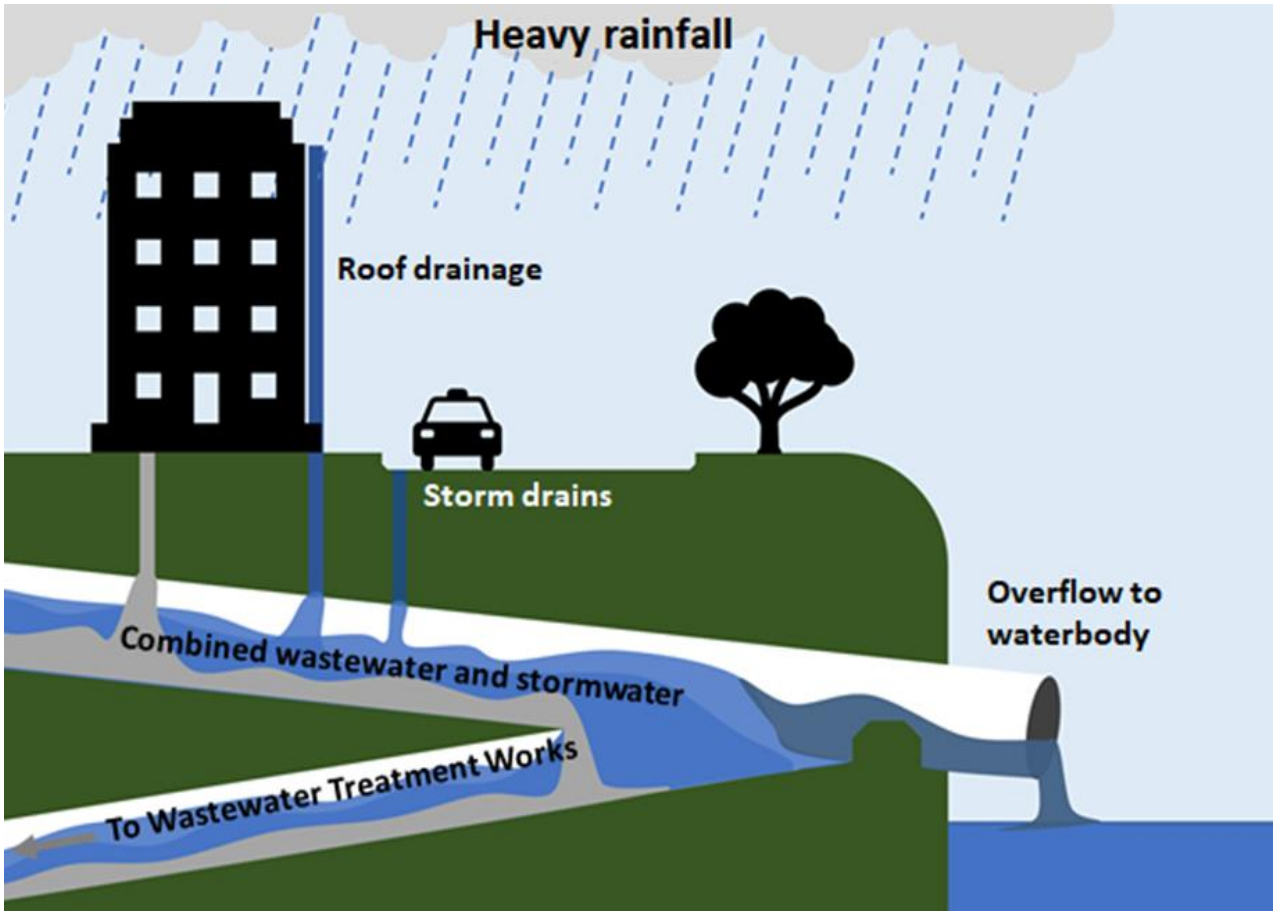


Figure 6-3: Storm overflow operation in exceptional rainfall.

6.4 Methodology

6.4.1 Sewerage system capacity assessment

New residential developments and new employment land add pressure to the existing sewerage systems. An assessment is required to identify the available capacity within the existing systems, and the potential to upgrade overloaded systems to accommodate future growth. The scale and cost of upgrading works may vary significantly depending upon the location of the development in relation to the network itself and the receiving WwTW.

It may be the case that an existing sewerage system is already working at its full capacity, and further investigations have to be carried out to define which solution is necessary to implement an increase in its capacity. New infrastructure may be required if, for example, a site is not served by an existing system. Such new infrastructure will normally be secured through private third-party agreements between the developer and utility provider.

SUs must consider the growth in demand for wastewater services when preparing their five-yearly Strategic Business Plans (SBPs) which set out investment for the next AMP period. Typically, investment is committed to provide new or upgraded sewerage capacity to support development only when planning permission has been granted, although

growth allocated in Local Plans is used to forward plan investment. Additional sewerage capacity to service windfall sites, smaller infill development or to connect a site to the sewerage network across third party land is normally funded via developer contributions, as third-party arrangements between the developer and utility provider.

Thames Water were provided details of the preferred allocations and asked to assess the impact of these sites on the wastewater network.

6.4.1.1 Results

Below, Table 6-2 shows three sites that are likely to require upgrades to the wastewater network, identified by Thames Water's sewer network assessments. Appendix A includes comments for all the sites, including the three sites identified as requiring upgrades and 27 sites with no anticipated infrastructural concerns regarding wastewater networks.

Thames Water added the following comments about each of the three sites:

'The scale of development/s is likely to require upgrades to the wastewater network. It is recommended that the Developer and the Local Planning Authority liaise with Thames Water at the earliest opportunity to agree a housing and infrastructure phasing plan. The plan should determine the magnitude of spare capacity currently available within the network and what phasing may be required to ensure development does not outpace delivery of essential network upgrades to accommodate future development/s. Failure to liaise with Thames Water will increase the risk of planning conditions being sought at the application stage to control the phasing of development in order to ensure that any necessary infrastructure upgrades are delivered ahead of the occupation of development. The developer can request information on network infrastructure by visiting the Thames Water website https://www.thameswater.co.uk/developers/larger-scale-developments/planning-your-development.'

'These comments are based on foul flows connecting to the public sewer by gravity (not pumped) and no surface water flows being discharged to the public sewer.'

To support SHBC's Pre-submission Local Plan, a SoCG was prepared with Thames Water (surreyheath.gov.uk) in July 2024, setting out duty to cooperate activities up to the point of Local Plan submission. The document also summarises engagement with Thames Water on Local Plan policies, leading to refinement policies.

Table 6-2: Surrey Heath Local Plan sites assessed by Thames Water as requiring sewerage network upgrades.

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste
907 - Sir William Siemens Square, 10 Chobham Road, Frimley, Camberley, Surrey	181764	2.1	170
HA2: London Road Block, Camberley Town Centre	588060	6.81	550
HA3: Land East of Knoll Road, Camberley Town Centre	363528	4.21	340

6.4.2 Storm overflow assessment

The Environment Act now requires water companies to report and monitor storm overflows as well as reduce the harm caused to the rivers they discharge to. In comparison to some urban areas or large cities, Surrey Heath only has a small number of storm overflows. There is one network storm overflow present in Surrey Heath, installed in 2023, and three WwTW storm tank overflows, installed in 2019. There is also one WwTW storm tank that is located outside of the borough boundary installed in 2018. It is included in the assessment, because growth within the borough could add additional pressure to the storm tank. The locations of these are shown in Figure 6-4.

The Storm Overflow Taskforce[19] has agreed a long-term goal to end the damaging pollution caused by the operation of storm overflows. An important component of this is the monitoring of overflows. According to a news story from the EA (gov.uk), 100% of storm overflows are now fitted with event duration monitoring devices, which was a target set by the government to be completed by 2023. This is called Event Duration Modelling (EDM). The EDM dataset (which contains performance data on the 16,710 storm overflows monitored in 2023) has been used to provide information on storm overflows in Surrey Heath. Thames Water have committed to reducing the use of storm overflows, with their assessments and interventions to do so outlined in their Storm Overflow Action Plan (thameswater.co.uk).

The Storm Overflow Assessment Framework (SOAF) set a threshold of 60 operations in a year based on 1 year of data (50 if based on 2 years data, and 40 if based on 3 years), above which a storm overflow should be investigated. The EA state that a revised SOAF methodology will be released to coincide with the Environment Act obligation on storm overflows, which will require all overflows to ensure that they are not causing adverse

19 Made up of Defra, the EA, Ofwat, Consumer Council for Water, Blueprint for Water and Water UK.

ecological harm. The assessment for storm overflows is presented using a Red/Amber/Green (RAG) rating system. The specific criteria for each rating are detailed in Table 6-3.

Table 6-3: Criteria used for RAG assessment for network and WwTW storm overflows.

Sewer Overflows RAG Score	Number of operations per year (average of available data)	Commentary
Green	0-10	Overflow is currently operating within the long-term (2050) target. Need to ensure that this is maintained in the long-term considering upstream development, climate change and urban creep.
Amber	11 - 39 (based on three years data) 11 - 49 (based on two years data) 11 - 59 (based on one year's data)	An investigation is not required at present, but improvements will need to be made in the network and/or catchment to meet the long-term target.
Red	40+ (based on three years data) 50+ (based on two years data) 60+ (based on one year's data)	The overflow may already be operating beyond the threshold which would trigger an investigation. Upstream development could further increase the discharge frequency, so mitigation should be required prior to significant development.

6.4.2.1 Results

The overflows identified in Surrey Heath were assessed on the long term average number of operations per year since monitoring began, with data in Table 6-4 and Table 6-5 also showing the frequency of operation and duration of storm overflows between 2021-2023. The results of the RAG assessment are mapped in Figure 6-4. There is only one network storm overflow in Surrey Heath, which is included in Table 6-4. As it was installed in May 2023, there is insufficient data to include it in the RAG assessment.

Table 6-5 presents performance of storm tanks at WwTW serving growth in the Surrey Heath Local Plan, including those located outside of the borough boundary. There is one storm tank overflow at Chobham STW that exceeded the 40 operations per year threshold averaged over 2021 to 2023, requiring investigation.

The Storm Overflow Reduction Plan (gov.uk), which was first published in August 2022, sets an objective that storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050. All of the monitored WwTW storm overflows are operating on average above 10 times per year, so may require action to meet the long-term target.

Unmitigated development within Surrey Heath could cause the frequency, or the duration, of the operation of storm overflows to increase. Where a storm tank overflow is operating in periods of moderate or light rainfall, or even in dry conditions it indicates either an infiltration problem within the network, the WwTW or its storm tanks are undersized for the population served, or that there are potential operational issues at the WwTW. Further development within a catchment that has a poorly performing storm tank overflow is likely to exacerbate the issue.

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits. SuDS can divert storm water away from the sewer network, reducing the volume that reaches the WwTW. This opportunity is greatest at brownfield sites connected to existing combined sewerage systems.

Table 6-4: Network storm overflow frequency of operation and duration in Surrey Heath.

Overflow	Number of operations in 2021	Duration of operation in 2021 (hours)	Number of operations in 2022	Duration of operation in 2022 (hours)	Number of operations in 2023	Duration of operation in 2023 (hours)	Long Term Average number of operations	Above threshold for investigation? (Y/N)
Knightsbridge Road, Camberley	No data - installed 2023	No data - installed 2023	No data - installed 2023	No data - installed 2023	2	1	No data - installed 2023	N/A

Table 6-5: WwTW storm overflow frequency of operation and duration in and near Surrey Heath.

WwTW	Number of operations in 2021	Duration of operation in 2021 (hours)	Number of operations in 2022	Duration of operation in 2022 (hours)	Number of operations in 2023	Duration of operation in 2023 (hours)	Long Term Average number of operations	Above threshold for investigation? (Y/N)
Camberley STW	17	90.0	16	82.2	26	139.8	20.2	N
Lightwater STW	23	82.2	6	35.2	12	57.8	17.4	N
Chobham STW	98	1139.9	48	394.6	45	315.8	65.4	Y
Ash Vale	9	78.1	2	10.8	15	137.3	10.2	N

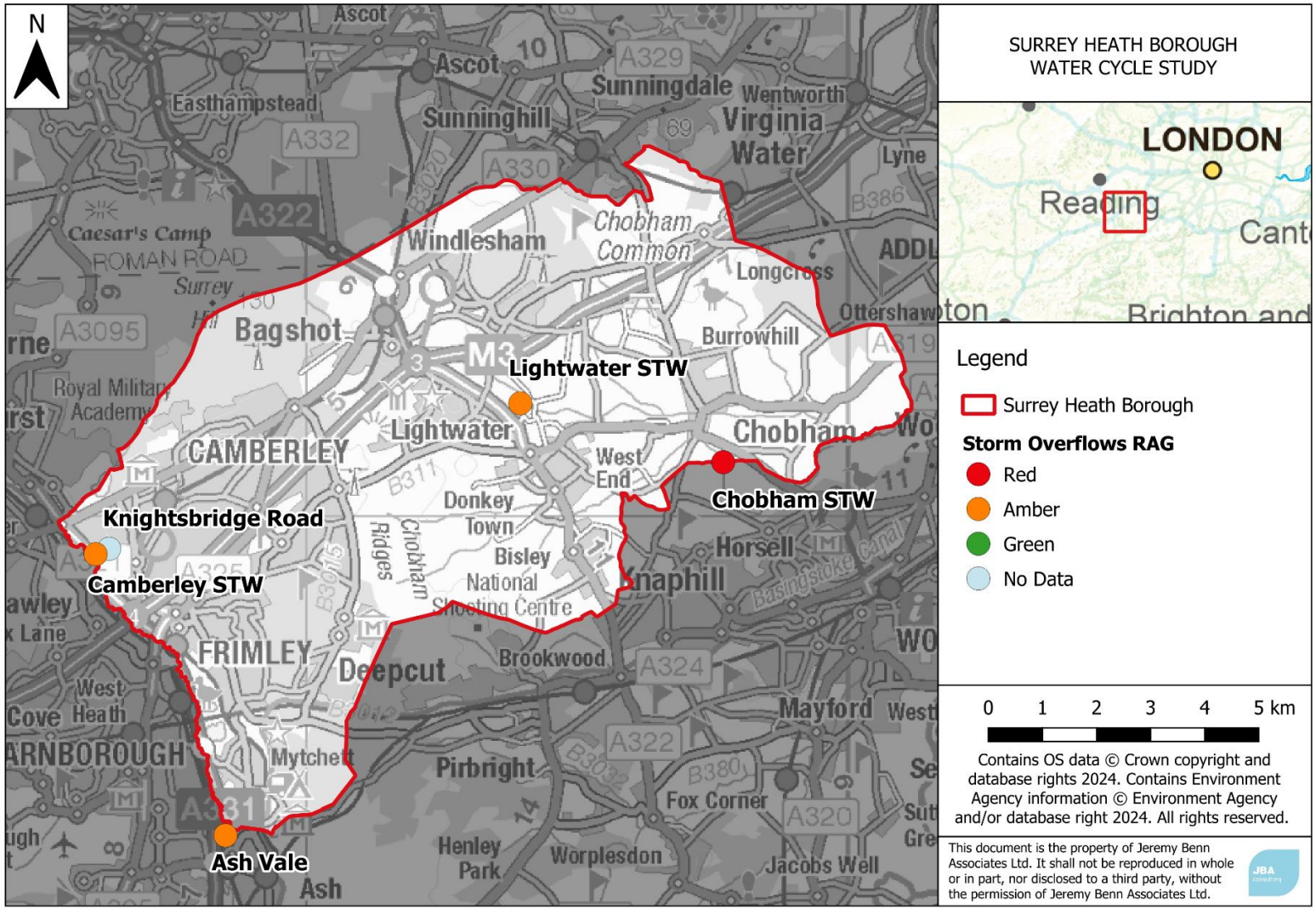


Figure 6-4: Network and WwTW Storm Overflow RAG Assessment.

6.4.3 Water UK assessment

According to the Water UK National Storm Overflow Assessment for England (water.org.uk), there are 4 storm overflows in the study area (which includes overflows on the network and at WwTW). Of these, all have improvements planned aimed at reducing the number of spills.

3 of the storm overflows in the area have the potential to be improved by a method involving nature-based solutions, which could include retrofitted SuDS and wetland treatment systems.

The current plan is expected to prevent 0 spills by 2030 and 108 spills by 2050, a 0% and 78% reduction respectively, relative to a 2020 baseline.

The new minimum requirement for all overflows is that they meet a 'rainfall target' of 10 spills per year. Figure 6-5 shows the percentage of storm overflows in the study area meeting this target now and (forecast) in the period up to 2050 as improvements are made. Other improvements may occur at the same time, as necessary, to further reduce spills. Present-day statistics are based on EDM coverage in 2022 when 90% of storm overflows had monitoring. Coverage by monitoring in 2022 varied by water company. At the end of 2023 there was 100% coverage. Figure 6-6 shows the corresponding number of spills as improvements are made.

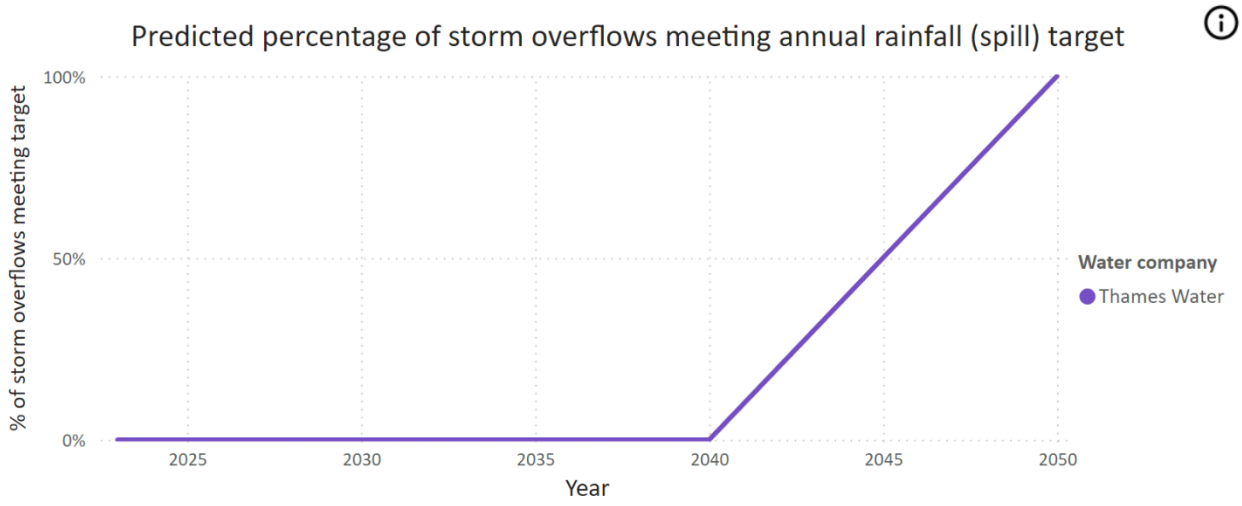


Figure 6-5. Percentage of storm overflows in study area meeting annual spill targets © Water UK.

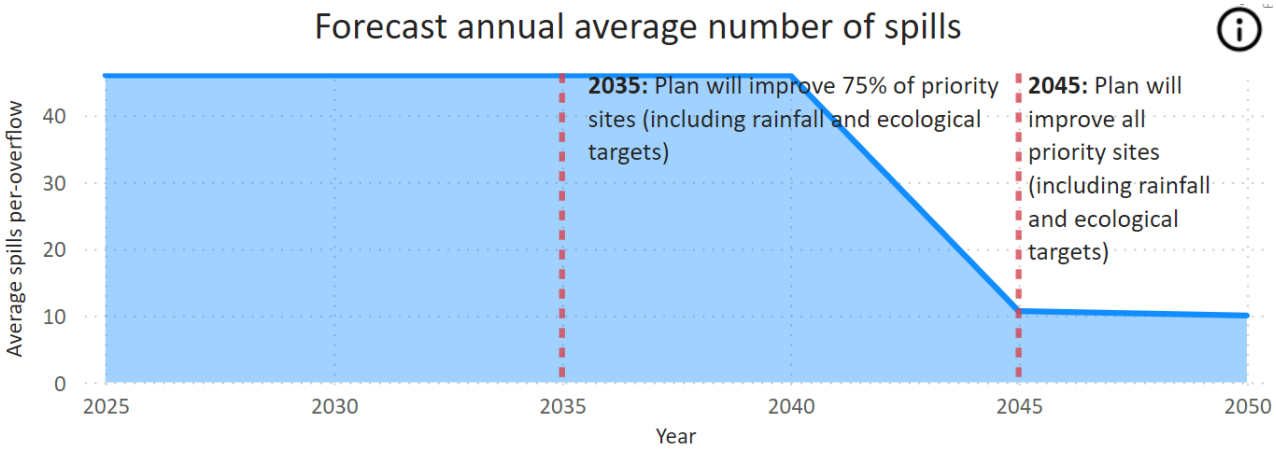


Figure 6-6: Forecast annual average number of spills per-overflow.

6.5 Conclusions and recommendations

Development in areas where there is limited wastewater network capacity will increase pressure on the network, increasing the risk of a detrimental impact on customers, and increasing the likelihood of storm overflow operation. Early engagement with developers and Thames Water is required, and further modelling of the network may be required at the planning application stage.

The Environment Act now requires water companies to report and monitor storm overflows as well as reduce the harm caused to the rivers they discharge to. There are 4 storm overflows recorded in the study area.

The SOAF set a threshold of 60 operations in a year (based on 1 years' data, 50 if based on 2 years data, and 40 if based on 3 years), above which a storm overflow should be investigated. 1 of the storm overflows was operating above this threshold between 2021 and 2023. The Storm Overflow Reduction Plan, which was first published in 2022, sets an objective that 'storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050'. A further 3 storm overflows are operating on average above 10 times per year so may require action to meet the long-term target.

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

Recommendations from the wastewater network assessment are provided in Table 6-6. Early engagement between developers, the council, and Thames Water is recommended to allow time for the strategic infrastructure required to serve these developments to be planned.

Table 6-6: Recommendations from wastewater network assessment.

Action	Responsibility	Timescale
Early engagement between SHBC and Thames Water is required to ensure that where strategic infrastructure is required, it can be planned in by Thames Water and will not lead to any increase in discharges from sewer overflows.	SHBC, Thames Water	Ongoing
Take into account wastewater infrastructure constraints in phasing development in partnership with the SU.	SHBC, Thames Water	Ongoing
Developers will be expected to work with the SU closely and early in the planning promotion process to develop an Outline Drainage Strategy for sites. The Outline Drainage strategy should demonstrate the wastewater assets required, their locations including points of connection to the public foul sewerage, whether the site drainage will be adopted by the water company and if any sewer requisitions will be required.	SHBC, Thames Water, developers	Ongoing
Developers will be expected to demonstrate to the LLFA that surface water from a site will be disposed using a SuDS with connection to surface water sewers seen as the last option. New connections for surface water to foul sewers will be resisted by the LLFA.	SHBC as the LLFA, developers	Ongoing

7 Wastewater treatment

7.1 Wastewater treatment works in Surrey Heath

Thames Water is a water and wastewater company that provides wastewater services for development in Surrey Heath. Thames Water refer to their wastewater processing plants as STW, however this report refers to them as WwTW. The location of the WwTW that serve Surrey Heath are shown in Figure 7-1 below.

Sites allocated in the Submitted Local Plan, or already in the planning system (commitments) as well as an allowance for windfall, were assigned to a WwTW using the sewerage drainage area boundaries provided by each SU to set a baseline for WwTW capacity. Actual connection of a development site to a particular WwTW may be different and will depend on the capacity of the receiving works, and the local sewer network.

Very small developments in rural areas may be suitable for on-site treatment and discharge, however the EA will not usually permit this where there is a public sewerage system within a distance calculated as 30m per dwelling. There is therefore a localised risk to water quality if all of these small developments were to be served by septic tanks, especially where there are clusters of small-scale new development. It needs to be noted that the EA have stated they 'would also object to a proposal which included septic tanks if they were within a 'sewered area''.

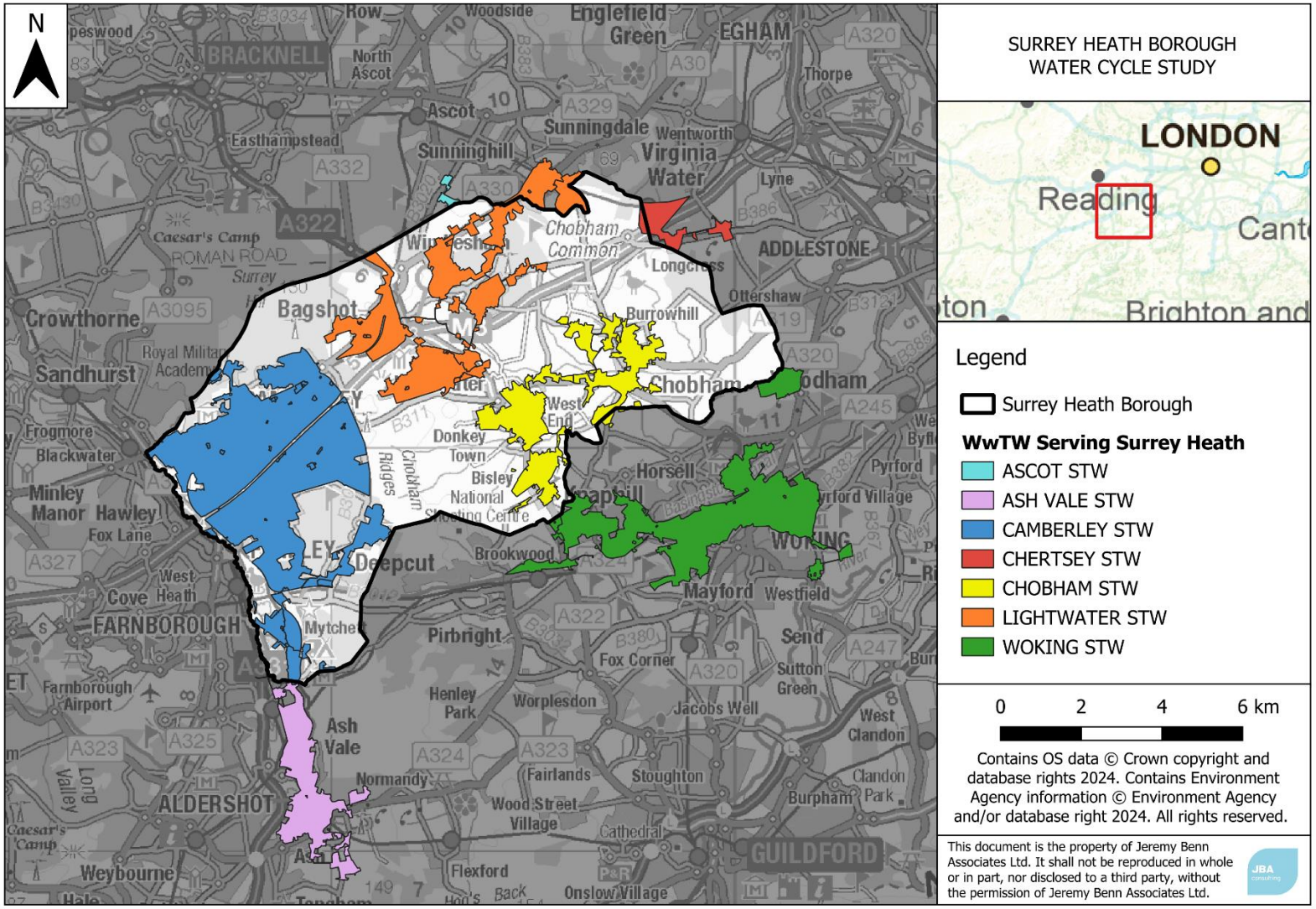


Figure 7-1: Thames Water WwTW serving Surrey Heath.

7.2 Wastewater treatment works flow permit assessment

7.2.1 Introduction

The EA is responsible for regulating sewage discharge releases via a system of Environmental Permits (EPs). Monitoring for compliance with these permits is the responsibility of both the EA and the plant operators.

Figure 7-2 summarises the different types of wastewater releases that might take place, although precise details vary from works to works depending on the design.

During dry weather, the final effluent from the WwTW should be the only discharge (1). With rainfall, the storm tanks fill and eventually start discharging to the watercourse (2) and Combined Sewer Overflows (CSOs) upstream of the storm tanks start to operate (3). The discharge of storm sewage from treatment works is allowed only under conditions of heavy rain or snow melt, and therefore the flow capacity of treatment systems is required to be sufficient to treat all flows arising in dry weather and the increased flow from smaller rainfall events. After rainfall, storm tanks should be emptied back to full treatment as soon as reasonably possible, freeing their capacity for the next rainfall event.

EPs are used alongside water quality limits as a means of controlling the pollutant load discharged from a WwTW to a receiving watercourse. Sewage flow rates must be monitored for all WwTW where the permitted discharge rate is greater than 50 m^3/day in dry weather.

Permitted discharges are based on a statistic known as the Dry Weather Flow (DWF). As well as being used in the setting and enforcement of effluent discharge permits, the DWF is used for WwTW design, as a means of estimating the ‘base flow’ in sewerage modelling and for determining the Flow to Full Treatment, (FFT), the minimum flow which must undergo full treatment, and above which additional flow is permitted to pass to the storm tanks (Figure 7-2).

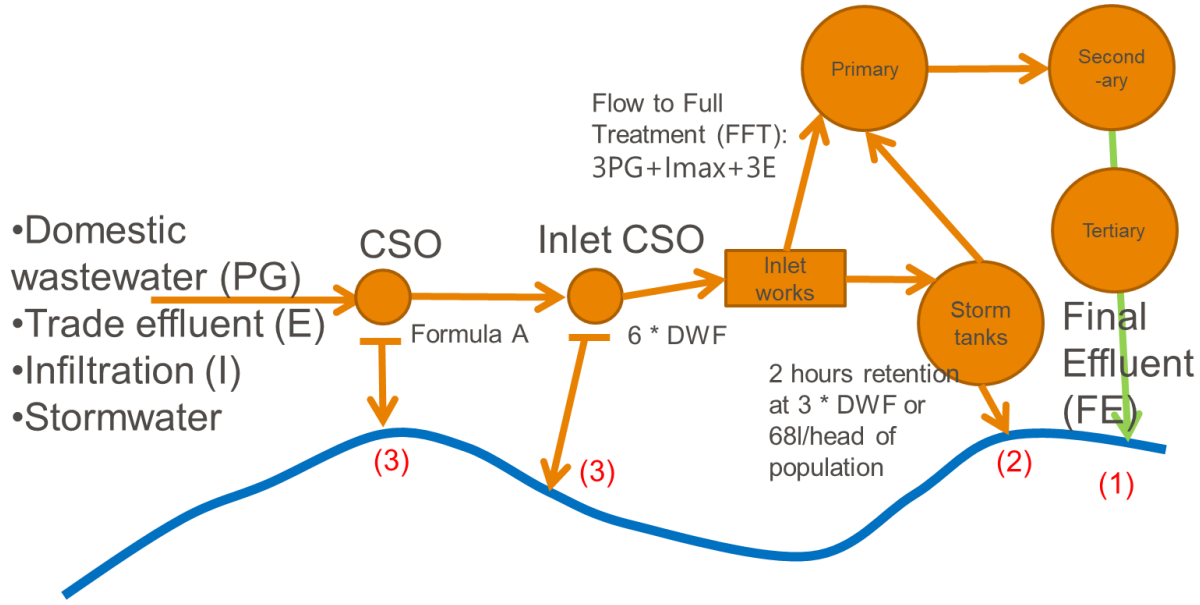


Figure 7-2: Overview of typical combined sewerage system and WwTW discharges.

WwTW EPs also consent for maximum concentrations of pollutants, in most cases Suspended Solids (SS), Biochemical Oxygen Demand (BOD) and ammonia. Some works (usually the larger works) also have permits for phosphorus. These are determined by the EA with the objective of ensuring that the receiving watercourse is not prevented from meeting its environmental objectives, with specific regard to the Chemical Status element of the WFD classification.

Increased domestic population and/or employment activity can lead to increased wastewater flows arriving at a WwTW. Where there is insufficient headroom at the works to treat these flows, this could lead to failures in flow consents.

In the case of failures in flow consents, it needs to be considered that even if there is sufficient headroom there could also be separate issues related to the capacity of the receiving watercourse to cope from an environmental point.

7.2.2 Methodology

An assessment of WwTW capacity was carried out by JBA using measured flow data supplied by the water companies. The process was as follows:

- Thames Water provided their calculated 80th percentile exceedance flow statistic for each WwTW.
- Development sites within the growth scenario including windfall and neighbouring authority growth were assigned to a WwTW using the sewerage drainage area boundaries.
- For each site, the future DWF was calculated using the occupancy rates and per-capita consumption values obtained from the WRMPs (Table 7-1), and the assumption that 95% of water used is returned to sewer. Permitted headroom

was used as a substitute for actual designed hydraulic capacity for each WwTW being assessed.

- For employment sites, wastewater demand was estimated based on the predicted number of new employees. Floor space, employment use types, and employment densities were used to estimate the number of employees.
- The current and estimated future flow was then compared to the permitted flow obtained from the EA Consented Discharges to Controlled Waters with Conditions (gov.uk) database.
- Headroom (expressed as the number of homes that could be accommodated before the permit is exceeded) was estimated by calculating the difference between the current and permitted flow and using the occupancy and per capita consumption for the WRZ the sewer catchment is in to provide an estimate for the number of houses.
- A RAG score was then assigned to each WwTW based on whether it was likely to exceed its permitted flow.
- The following RAG traffic light definition was used to score each WwTW:

GREEN Likely to be sufficient capacity to accommodate growth	AMBER Likely to be close to or exceed permit during plan period. Upgrades and / or a change to permit limit may be required. No significant constraints have been identified. (Based on less than 10% headroom remaining)	RED WwTW Capacity may be a constraint to growth (defined by Water Company)

Table 7-1: Per capita consumption values used in water demand calculations.

Water Company and Water Resource Zone	Average occupancy (persons per household)	Per capita domestic consumption (m^3/person/day)	Per capita employment consumption (m^3/person/day)
Affinity Water - Wey WRZ6	2.2	0.165	0.1
South East Water - Bracknell WRZ4	2	0.190	0.1

7.2.3 Results

In September 2024, the EA provided comments on the draft Surrey Heath Local Plan as a part of the Regulation 19 Consultation. These are presented in Table 7-2.

Table 7-2: EA comments on WwTW capacity.

WwTW Name	EA Comment
Lightwater WwTW	1) It is currently exceeding 100% of the permitted DWF for last three years 2) Records show no headroom left for new houses. Therefore, there is no infrastructure capacity now and it needs to be upgraded to support development 3) A WCS is required as evidence to support that additional development can be accommodated.
Camberley WwTW	1) Effluent discharge has exceeded 100% of the permitted DWF in last two years. 2) There may not be headroom available for new houses however an updated WCS is required as evidence to show that additional houses can be accommodated without exceeding the permitted DWF but detailed assessment such as a WCS is needed as evidence).
Chobham WwTW	1) Problematic spiller (Long term average spills>60) 2) It has AMP 7 ammonia ND driver (delivery date missed) 3) Reported compliance failure of ammonia permit exceedance 4) Compliance failure associated with problems in treatment units (inlet works, filter units, land treatment), so upgradation of STW is in progress (project delivery date is 2025).

Table 7-3 shows the results of the WwTW capacity assessment and also shows the JBA headroom assessment based on a comparison of current flow to the permit level.

Lightwater and Camberley WwTW are currently problematic and are likely to be close to or exceed their permit during the plan period. An increase in flow permit, and/or upgrades to treatment capacity will be required at these WwTW. The headroom assessment therefore shows a negative figure for the estimated capacity remaining at the end of plan period. This highlights the need for additional capacity equivalent to approximately that number of houses. Camberley WwTW and Lightwater WwTW both have upgrades planned to improve capacity to treat the incoming volume of sewage, with a scheme due to be completed in 2028 for Camberley, and 2027 for Lightwater. Information on these upgrades is available on Thames Water's website here. The capacity assessment is based on the 80th exceedance percentile. Permit compliance is assessed by the EA using the 90th percentile statistic which results in a lower value than the 80th percentile - used in this assessment. Compliance at WwTW is not within the scope of the WCS and the assessment below should not be used to infer non-compliance.

In the headroom assessment, Chobham WwTW is expected to have capacity for the growth planned throughout the plan period. However, as seen in the EA's comments in Table 7-2, a number of compliance issues have been noted, and upgrades are underway (with a project delivery date of March 2025). Early engagement with Thames Water is recommended in order to make sure that this additional capacity is in place to accommodate growth in Surrey Heath. Chobham WwTW does not have a DWF permit, instead it has a maximum daily discharge permit, therefore an estimated remaining capacity has not been calculated. Due to the relatively low volume of growth allocated to Chobham, WwTW flow data suggesting the maximum daily discharge permit is not currently being exceeded, and the current upgrades to address compliance issues, it is likely that Chobham WwTW will have capacity to accommodate planned growth.

Within Thames Water's PR24 Business Plan, Lightwater WwTW is identified in the Waste Asset Assurance Plan (WAAP) as one of sixty sites of planned investment to ensure compliance can be achieved when accounting for short term growth. Thames Water predict a 3.5% increase in population equivalent growth at Lightwater WwTW in AMP8, compared in line with the 2.9% growth identified in the WCS growth scenario. The additional capacity added by the upgrade scheme will accommodate a population equivalent of 1,209. Considering the average occupancy rate stated in Table 7-1, this equates to 550 households, covering the 266 households projected to be completed in AMP8 from the growth scenario. The predicted additional wastewater demand from 550 households is 0.19 Ml/d, while the predicted additional demand at Lightwater WwTW by the end of SHBC's Local Plan period is 0.2 Ml/d, suggesting the planned upgrade is in line with planned growth. Despite this planned upgrade, Lightwater WwTW has been assessed as "amber" as it is currently over capacity and further upgrades and/or permit changes may be required. Additionally, while this planned upgrade will deliver extra capacity associated with increased flow to treatment, it does not include a plan to increase the permitted DWF, therefore no gain in DWF headroom has been included in the capacity assessment.

Thames Water have confirmed that there are no definitive plans for DWF capacity upgrades to Camberley and Lightwater WwTWs during AMP8. While DWF is only one measure of WwTW capacity, and planned upgrades will improve other measures of capacity, Thames Water should secure funding for upgrades to accommodate growth at these sites.

Where a WwTW is likely to exceed its permit, the permit would be reviewed by the EA and if a higher flow consent was agreed, a tighter permit limit for substance concentrations is very likely to be required. In some cases, this may not be technically feasibly possible if that means concentrations tighter than the Technically Accepted Limit (TAL) which is 0.25 mg/l for phosphate for example.

Employment modelling data provided by SHBC identified where further employment growth in the borough may occur. While the exact volume and location of growth is not known, the modelling provided by SHBC highlights where 33,895 sqm of further employment growth could occur. The majority of sites identified for further growth would

be within the Camberley WwTW catchment, further highlighting the importance of upgrades at this location. At two sites identified for potential future employment growth, located on the boundary of Surrey Heath Borough, growth may be served by WwTW not assessed in this study such as Chertsey WwTW or Woking WwTW. Assessment of flow data at these WwTWs from the last three years indicate that both currently have spare capacity, however they will serve future growth primarily from outside of Surrey Heath.

Table 7-3: Results of the WwTW capacity assessment and JBA headroom assessment.

WwTW name	Predicted housing during LP period (no. dwellings)	Predicted employment during LP period (sqm)	Estimated remaining capacity at end of Local Plan period (dwellings)	Capacity assessment
Camberley WwTW	4190	9789.4	-24,766	RED - WwTW Capacity may be a constraint to growth. Upgrades/ a change in permit will be required.
Chobham WwTW	254	-844	Not assessed	AMBER – Max. daily discharge permit, daily flow data suggest this is not exceeded, though compliance issues have been noted by the EA.
Lightwater WwTW	586	7584	-2,745	AMBER - Likely to be close to or exceed permit during plan period. Upgrades and / or a change to permit limit may be required.

7.3 Wastewater treatment works odour assessment

7.3.1 Introduction

WwTW have a typical range where odour is experienced. Where developments encroach upon this range, there may become a cause for nuisance and complaints from residents. Managing odour at WwTW can add considerable capital and operational costs, particularly when retro fitted to existing WwTW. National Planning Policy Guidance recommends that plan makers consider whether new development is appropriate near to sites used (or proposed) for water and wastewater infrastructure, due to the risk of odour nuisance.

7.3.2 Methodology

SUs recommend that an odour assessment may be required if the site of a proposed development is close to a WwTW and is encroaching closer to the WwTW than existing urban areas.

A Geographic Information System (GIS) assessment was carried out to identify areas that the SU considers may be at risk from odour nuisance due to encroachment on an existing WwTW. For Thames Water, this is defined as development sites less than 800m from the WwTW and encroaching closer to the WwTW than existing urbanised areas. If there are no existing houses close to a WwTW it is more likely that an odour impact assessment is needed.

7.3.3 Results

There are two Local Plan allocations within 800m of a WwTW which have been given an amber RAG rating:

- 280 Gordon Avenue.
- Broadford, Castle Grove Road.

The location of these is shown in Figure 7-3. An odour assessment is recommended at these sites as part of the planning process (to be funded by the developer). Consideration should also be given to the layout of these sites where only part of the site boundary lies within the 800m buffer zone. In some cases, only part of a larger site may be at risk, in which case zoning of lower impact land uses (e.g., landscaping, amenity, parking) closer to sources of odour may be sufficient to address this risk.

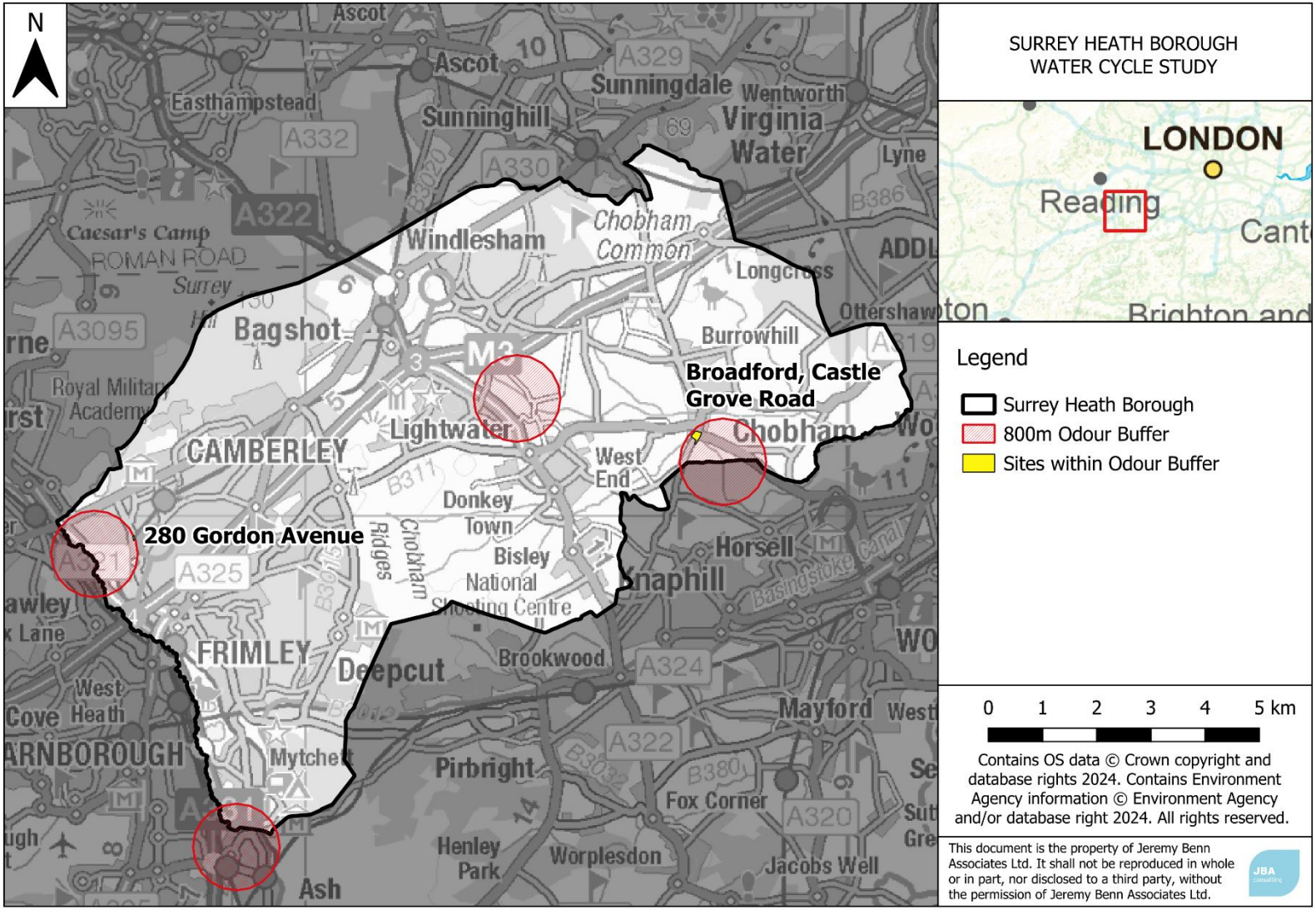


Figure 7-3: Thames Water 800m WwTW odour assessment buffer.

7.4 Conclusions and recommendations

A headroom assessment was carried out comparing the current flow from each WwTW, making allowance for growth already planned, within the permit limit. This provides an estimate of the spare capacity in wastewater treatment infrastructure in Surrey Heath.

Lightwater and Camberley WwTW are likely to be close to, or exceed, their permit during the plan period. An increase in flow permit, and/or upgrades to treatment capacity will be required at these WwTW. Due to the maximum daily discharge permit at Chobham WwTW, remaining capacity has not been calculated. Despite this, flow data from the past three full years suggest the maximum daily discharge is not currently exceeded, and the volume of planned growth is lower than the other WwTWs. However, as seen in the EA's comments in Table 7-2, a number of compliance issues have been noted, and upgradation is underway (with a project delivery date of March 2025). Upgrades are also planned for Camberley and Lightwater WwTWs, due to be completed in 2028 and 2027 respectively. However, these upgrades will not increase DWF capacity, so have not been included in this assessment.

Consideration should be given to using capacity in existing permits as this provides a lower carbon cost than upgrading capacity at existing WwTW or building new treatment works.

Where new infrastructure or upgrades to existing infrastructure may be required, engagement between SHBC and the water company is required to ensure that delivery of this infrastructure is aligned with delivery of development sites. Grampian conditions may be sought by the water company should development be in advance of the necessary infrastructure.

There is one poorly performing storm tank overflow at Chobham WwTW serving Surrey Heath. Growth within this catchment could result in an increase in the operations of this overflows contributing to a worsening of water quality in the area. Action should be taken by Thames Water to address this overflow prior to an increase in wastewater demand being generated by new development.

The odour screening assessment has identified the areas an odour impact assessment would be recommended if development is proposed within the buffered region. Odour impact assessments for sites subsequently indicated to be potentially at risk of experiencing odour nuisance, should be undertaken by site developers.

Recommendations from the odour assessment and headroom assessment are provided in Table 7-4.

Table 7-4: Recommendations for wastewater treatment.

Action	Responsibility	Timescale
Early engagement with Thames Water is required to ensure that provision of WwTW capacity is aligned with delivery of development.	SHBC	Ongoing

Action	Responsibility	Timescale
Provide Annual Monitoring Reports to Thames Water detailing projected housing growth.	SHBC	Ongoing
Thames Water to assess capacity demands as part of their wastewater asset planning activities and feed into PR29 business plan for AMP9 to secure funding for upgrades to Camberley and Lightwater WwTWsand feedback to the Council if concerns arise.	Thames Water	Ongoing
Carry out an odour impact assessment for sites which fall within the buffer zone of WwTW.	SHBC, Developers	Ongoing

8 Water quality

8.1 Introduction

An increase in the discharge of effluent from WwTW as a result of development and growth in the area in which they serve can lead to a negative impact on the quality of the receiving watercourse. Under the WFD, a watercourse is not allowed to deteriorate from its current WFD classification (either as an overall watercourse or for individual elements assessed).

It is EA policy to model the impact of increasing effluent volumes on the receiving watercourses. Where the scale of development is such that a deterioration is predicted, a variation to the EP may be required for the WwTW to improve the quality of the final effluent, so that the increased pollution load will not result in a deterioration in the water quality of the watercourse. This is known as 'no deterioration' or 'load standstill'. The need to meet river quality targets is also taken into consideration when setting or varying a permit.

The EA operational instructions on water quality planning and no-deterioration are currently being reviewed. Previous operational instructions (now withdrawn but with no published replacement) set out a hierarchy for how the no-deterioration requirements of the WFD should be implemented on inland waters. The potential impact of development should be assessed in relation to the following objectives:

- **Could the development cause a greater than 10% deterioration in water quality?** This objective is to ensure that all the environmental capacity is not taken up by one stage of development and there is sufficient capacity for future growth.
- **Could the development cause a deterioration in WFD class of any element assessed?** This is a requirement of the Water Framework Directive to prevent a deterioration in class of individual contaminants. The 'Weser Ruling'[20] by the European Court of Justice in 2015 specified that individual projects should not be permitted where they may cause a deterioration of the status of a water body. If a water body is already at the lowest status ('bad'), any impairment of a quality element was considered to be a deterioration. Emerging practice is that a 3% limit of deterioration is applied.
- **Could the development alone prevent the receiving watercourse from reaching Good Ecological Status (GES) or Potential?** Is GES possible with current technology or is GES technically possible after development with any potential WwTW upgrades.

20 PRESS RELEASE No 74/15, European Court of Justice (2015). Accessed online at: https://curia.europa.eu/jcms/upload/docs/application/pdf/2015-07/cp150074en.pdf on: 15/11/2024.

The overall WFD classification of a water body is based on a wide range of ecological and chemical classifications. This assessment focuses on three physio-chemical quality elements; Biochemical Oxygen Demand (BOD), ammonia, and phosphate which are key to WFD compliance.

BOD – Biochemical Oxygen Demand

BOD is a measure of how much organic material – sewage, sewage effluent or industrial effluent – is present in a river. It is defined as the amount of oxygen taken up by micro-organisms (principally bacteria) in decomposing the organic material in a water sample stored in darkness for 5 days at 20°C. Water with a high BOD has a low level of dissolved oxygen. A low oxygen content can have an adverse impact on aquatic life.

Ammonia

Nitrogen is an essential nutrient required by all plants and animals for the formation of amino acids. In its molecular form nitrogen cannot be used by most aquatic plants, and so it is converted into other forms. One such form is ammonia. This may then be oxidized by bacteria into nitrate (NO3) or nitrite (NO2). Ammonia may be present in water in either the unionized form NH3 or the ionized form NH4. Taken together these forms are called Total Ammonia Nitrogen.

Although ammonia is a nutrient, in high concentrations it can be toxic to aquatic life, in particular fish, affecting hatching and growth rates.

The main sources in rivers include agricultural sources, (fertilizer and livestock waste), residential sources (ammonia containing cleaning products and septic tank leakages), industrial processes, and WwTW.

Phosphate

Phosphorus is a plant nutrient and elevated concentrations in rivers can lead to accelerated plant growth of algae and other plants. Its impact on the composition and abundance of plant species can have adverse implications for other aspects of water quality, such as oxygen levels. These changes can cause undesirable disturbances to other aquatic life such as invertebrates and fish.

Phosphorus (P) occurs in rivers mainly as Phosphate (PO4), which are divided into Orthophosphates (reactive phosphates), and organic phosphates.

Orthophosphates are the main constituent in fertilizers used in agriculture and domestic gardens and provide a good estimation of the amount of phosphorus available for algae and plant growth and is the form of phosphorus that is most readily utilized by plants.

Organic phosphates are formed primarily by biological processes and enter sewage via human waste and food residues. Organic phosphates can be formed from orthophosphates in biological treatment processes or by receiving water biota.

Although it is phosphorus in the form of phosphates that is measured as a pollutant, the term phosphorus is often used in water quality work to represent the total phosphorus containing pollutants.

8.2 Water quality modelling

8.2.1 General approach

SIMCAT is used by the EA to model water bodies and identify where permit changes are needed to prevent deterioration or improve water quality as well as supporting decision making to guide development to locations where environmental deterioration will be reduced. SIMCAT is a 1D model which represents inputs from both point-source effluent discharges and diffuse sources, and the behaviour of solutes in the river.

SIMCAT can simulate inputs of discharge and water quality data and statistically distribute them from multiple effluent sources along the river reach. It uses the Monte Carlo method for distribution that randomly models up to 2,500 boundary conditions. The simulation calculates the resultant water quality as the calculations cascade further downstream.

Once the distribution results have been produced, an assessment can be undertaken on the predicted mean and ninetieth percentile concentrations or loads compared to the Environmental Quality Standards.

Within SIMCAT, the determinands modelled were Biochemical Oxygen Demand (BOD), ammonia) and phosphorus. In fresh waterbodies, phosphate is usually the limiting nutrient for algal growth. However, in marine environments, nitrogen is considered to be the limiting nutrient.

The methodology followed is summarised in Figure 8-1. In this flow chart, all of the questions in the top row must be answered.

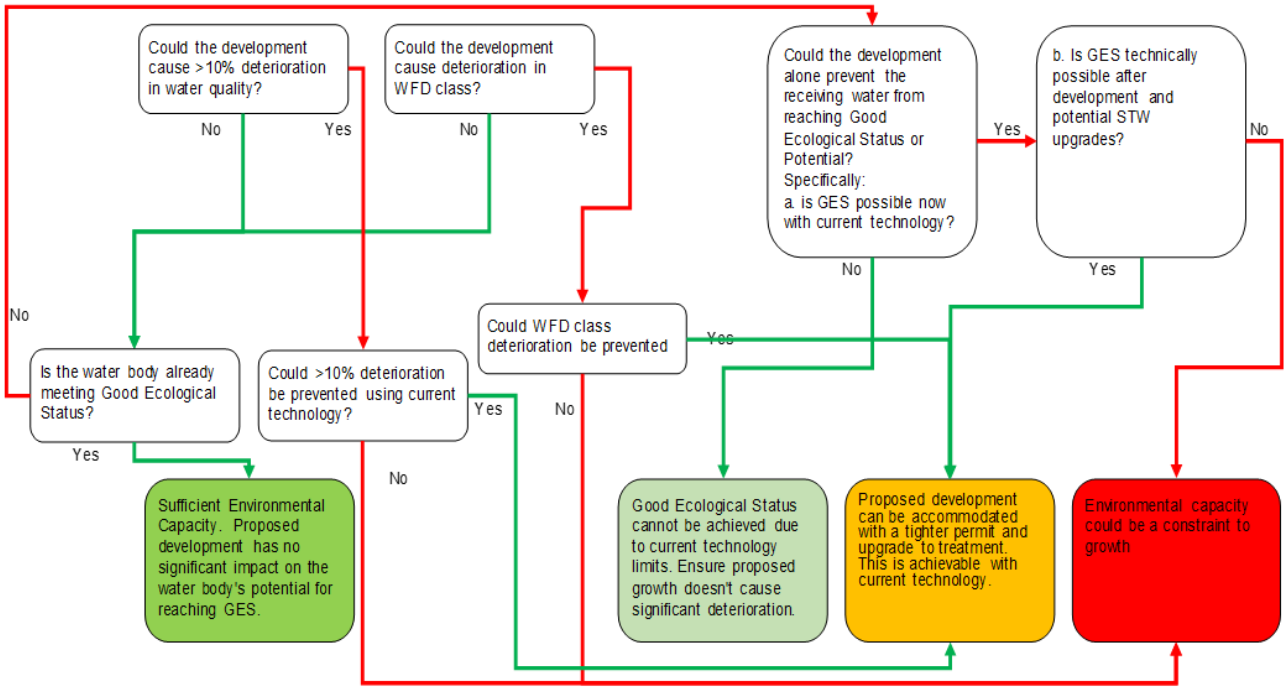


Figure 8-1: Water quality impact assessment following EA guidance.

Where modelling indicated growth may lead to a deterioration in the watercourse, or where the watercourse is not currently meeting at least a 'Good' class for each

determinant, the models were used to test whether this could be addressed by applying stricter discharge limits. In such cases, a Technically Achievable Limit (TAL) was considered.

The EA advised that the following permit values are achievable using treatment at TAL, and that these values should be used for modelling all WwTW potential capacity irrespective of the existing treatment technology and size of the works:

- Ammonia (90%ile): 1 mg/l.
- BOD (90%ile): 5 mg/l.
- Phosphorus (mean): 0.25 mg/l.

This assessment did not take into consideration whether it is feasible to upgrade each existing WwTW to TAL due to constraints of costs, timing, space, carbon costs etc.

8.2.2 Methodology

The study area is covered by the Thames SIMCAT model developed by the EA. The model has been largely based on observed flow and quality data for the period 2014-2020. A widespread update of the models, and the resultant recalibration were not within scope of this project. It was therefore agreed with the EA to update just the effluent flow at WwTW receiving growth in the study area. Consequently, the modelling work presented should be used to identify areas at risk of water quality deterioration, but not for permit setting.

Flow data from the last three years for each WwTW in the study area was supplied by Thames Water and used to update the model. Some of the WwTW in the study area already had upgrades completed in AMP6 or planned in AMP7, which would be expected to improve water quality at those locations. These were therefore factored into the model by applying the updated permit limit where it was less than the current discharge in the model. The model was then run in its updated form to set a 2024 baseline. Further upgrades defined in the AMP8 WINEP are scheduled for Camberley WwTW and Chobham WwTW including a tightening of the phosphorous permit to 0.25 mg/l, the TAL assessed in this water quality modelling.

Additional effluent flow from growth during the Local Plan period was added to current flow at WwTW receiving growth and the model re-run as a future scenario. This additional effluent flow includes growth from employment sites likely to be delivered, as identified in SHBC's employment modelling.

To address concerns raised by the EA around growth at WwTW upstream of Surrey Heath Borough, in the River Blackwater catchment, models were re-run with an 20% flow uplift applied to WwTWs upstream of Surrey Heath on the River Blackwater. A 20% uplift was applied as a conservative estimate of growth, greater than that estimated across Surrey Heath's Local Plan period.

No deterioration test

The results from the baseline and future versions of the model were compared to assess the predicted percentage deterioration for each of the modelled determinands. WFD

targets for each river reach were provided by the EA and used to determine if there was a risk of a class deterioration.

Where a deterioration of 10% or greater was predicted or a change in class (considered to be a significant deterioration under WFD) a further test was conducted to see if this deterioration could be prevented by upgrades to treatment processes. This used another version of the model with each WwTW set to operate at their TAL.

Good ecological status assessment

Where treatment at TAL and reductions in diffuse sources in the present day could improve water quality to achieve GES, it is important to understand whether this could be compromised as a result of future growth within the catchment.

Guidance from the EA suggests breaking this down into two questions:

a) Is GES possible now with current technology?

b) Is GES technically possible after development and any potential WwTW upgrades?

If the answer to questions a) and b) are both 'Yes' or both 'No' then the development can be assessed as having no significant impact on the water bodies potential for reaching GES, i.e., the development alone is not preventing GES from being achieved.

If the answer to a) is 'Yes' and the answer for b) is 'No' then development is having a significant impact, i.e., before development GES could be achieved with upstream improvements, and after growth the additional effluent from growth prevents GES being achieved.

The possible answers are summarised in Table 8-1.

Run type 9 within SIMCAT was used which assumes that upstream flow at each treatment works is at GES. This simulates improvements being made in upstream water quality. The water quality of the discharge from each WwTW in order to maintain GES is then calculated by the model.

Table 8-1: Possible GES assessment results.

Predicted to achieve GES after growth	Could achieve GES today with improvements in upstream water quality? (a)	Could achieve GES in the future with improvements in upstream water quality? (b)	Assessment Result
YES	N/A	N/A	GREEN - Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.

Predicted to achieve GES after growth	Could achieve GES today with improvements in upstream water quality? (a)	Could achieve GES in the future with improvements in upstream water quality? (b)	Assessment Result
NO	YES	YES	AMBER - Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology.
NO	NO	NO	YELLOW - GES cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration.
NO	YES	NO	RED - Environmental capacity could be a constraint to growth.

8.2.3 Results

The first test applied compares the future scenario to the baseline and assesses whether a significant deterioration in water quality occurs – either a 10% deterioration in water quality or a deterioration in WFD class. Where, a significant deterioration is predicted, the TAL scenario then assesses whether this deterioration could be prevented by improvements in treatment processes.

Table 8-2 below summarises the results of the water quality assessments. Where a 'green' score is given, deterioration was less than 10% for each determinand, and no change in WFD class is predicted. Where an 'amber' assessment is given, a 10% deterioration or change in WFD class is predicted, but this could be prevented by improvements in treatment technology. In these cases, upgrades may therefore be required at that WwTW or at WwTW upstream.

A 'red' assessment would be given where a significant deterioration in water quality is predicted, and it cannot be prevented by improvements in treatment processes.

All three WwTW serving growth during the plan period are predicted to experience a moderate deterioration, with a less than 10% deterioration in all determinands predicted. No changes in class are predicted as a result of the additional growth. The greatest deterioration is a 6% phosphate deterioration, predicted to occur at Camberley WwTW.

This is prevented in the TAL scenario when the phosphorous permit is tightened to 0.25 mg/l.

In this assessment, improvements in treatment processes have been modelled by assuming the WwTW is operating at TAL. It has not investigated the feasibility of upgrading individual WwTW. This should be performed by Thames Water who have the detailed knowledge of their assets, and the EA who are responsible for setting permit limits at WwTW. The following water quality schemes are being undertaken during this AMP period and are planned for future AMP periods.

- Camberley – An upgrade to this WwTW is planned which will improve ability to treat volumes of incoming sewage. The scheme is due to be completed in 2028.
- Chobham – AMP7 scheme to ensure higher quality effluent and improved ability to treat volumes of incoming sewage expected to be completed in 2025.
- Lightwater – A scheme is currently being designed to improve ability to treat the volume of incoming sewage due to be completed in 2027.

Appendix B maps the predicted deterioration in water quality visually for ammonia, BOD and phosphate in the future, and the predicted deterioration if WwTW were performing at the TAL.

The first set of maps in Appendix B.1 shows the modelled results if wastewater discharges increased by the volume predicted during the Local Plan period. They show a result at the point of mixing (i.e., where the WwTW discharges) and the results downstream in the river. These are colour coded based on whether deterioration is greater (red) or less than (amber) 10%. Areas where no deterioration is predicted are coloured green.

Table 8-3 summarises the results of the GES assessment outlined in Section 8.2.2.

The second set of maps in Appendix B.2 shows the modelled results in the TAL scenario, where each WwTW has been upgraded to the technically achievable limit. This shows areas where deterioration could not be prevented. In each case this is less than 10%.

The proposed growth and development stated in Table 8-1 includes recent completions and neighbouring authority growth as well as growth from within Surrey Heath.

Table 8-2: WFD assessment results.

WwTW	Could the development cause a greater than 10% deterioration in water quality for one or more of ammonia, BOD, or phosphate?	Could the development cause a deterioration in WFD class of any element?	Can a deterioration of >10% or in class be prevented by treatment at TAL
Camberley WwTW	No	No	Yes
Chobham WwTW	No	No	Yes

WwTW	Could the development cause a greater than 10% deterioration in water quality for one or more of ammonia, BOD, or phosphate?	Could the development cause a deterioration in WFD class of any element?	Can a deterioration of >10% or in class be prevented by treatment at TAL
Lightwater WwTW	No	No	Yes

Table 8-3: GES assessment results.

WwTW	Ammonia assessment	Biochemical Oxygen Demand (BOD) assessment	Phosphate assessment
Camberley WwTW	GREEN - Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN - Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	YELLOW - GES cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration.
Chobham WwTW	GREEN - Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN - Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	YELLOW - GES cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration.
Lightwater WwTW	YELLOW - GES cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration.	GREEN - Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for	YELLOW - GES cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration.

WwTW	Ammonia assessment	Biochemical Oxygen Demand (BOD) assessment	Phosphate assessment
		meeting GES.	

The results of the water quality modelling show that additional growth is unlikely to cause a significant deterioration in water quality or a change in WFD class at and downstream of the WwTW discharge locations. At all WwTW, the proposed growth does not prevent GES being achieved and is not a constraint to growth.

8.3 Water framework directive overview

The WFD aims to ensure 'no deterioration' in the environmental status of rivers and sets objectives to improve rivers to meet 'good' status. LPAs must have regard to the WFD and associated statutory objectives as implemented in the EA's RBMPs.

Figure 8-2 shows the ecological status WFD classification (2022) for waterbodies in Surrey Heath. This is broken down into the determinands usually assessed in WCSs for each of the waterbodies that are predicted to receive additional effluent from growth during the plan period.

Within Surrey Heath, the majority of the waterbodies have a 'moderate' ecological status. The only exception is the Chertsey Bourne (Sunningdale to Virginia Water), which has a classification of 'poor'. The overall WFD status is not available for Cycle 3, though it is made of Ecological and Chemical status, which are further broken down into sub-elements, the measurement of which is prioritised for each waterbody based on its characteristics and risk, hence not all elements are reported for each river.

Invertebrate and fish statuses are used within the WFD as indicators of the overall health of the aquatic ecology and water quality. The WFD classification for invertebrates shows a variation across the study area. The Addlestone Bourne (West End to Hale/Mill Bourne) is classed as 'high', which is the highest status possible. The Hale/Mill Bourne (Bagshot to Addlestone Bourne), and Blackwater (Hawley to Whitewater) have a 'good' Invertebrate Status, and Blackwater (Aldershot to Cove Brook), and Chertsey Bourne (Sunningdale to Virginia Water) are 'moderate'. The Fish Status classifications are also varied in the borough, ranging from 'good' to 'poor'.

Maps showing the WFD Fish Status and Invertebrates status of the waterbodies are also shown below in Figure 8-3 and Figure 8-4. Additionally, Figure 8-5 to Figure 8-7 show the WFD status for Ammonia, BOD and Phosphate, the determinands assessed in the water quality modelling set out in Section 8.2.

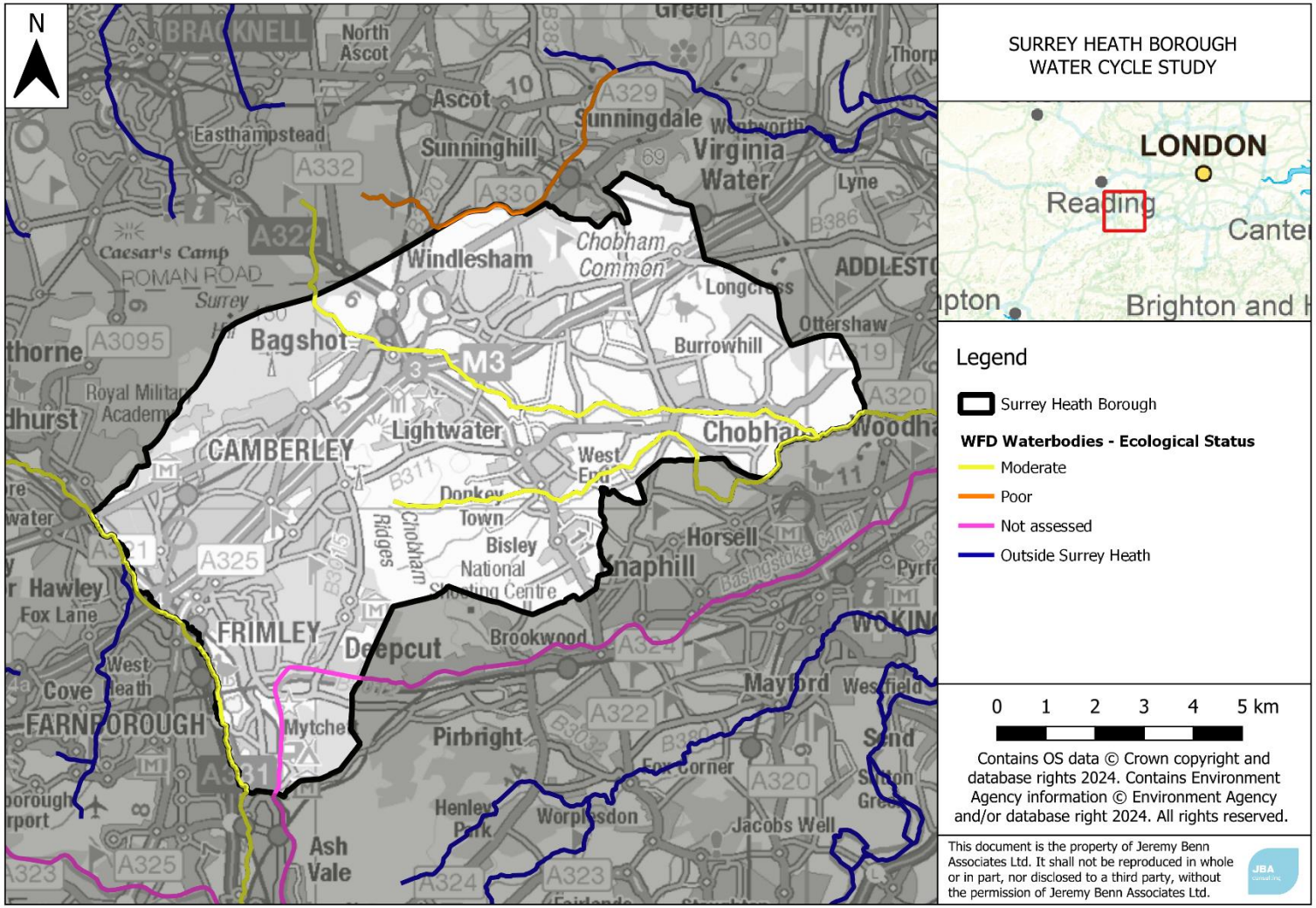


Figure 8-2: WFD Ecological status for waterbodies in Surrey Heath.

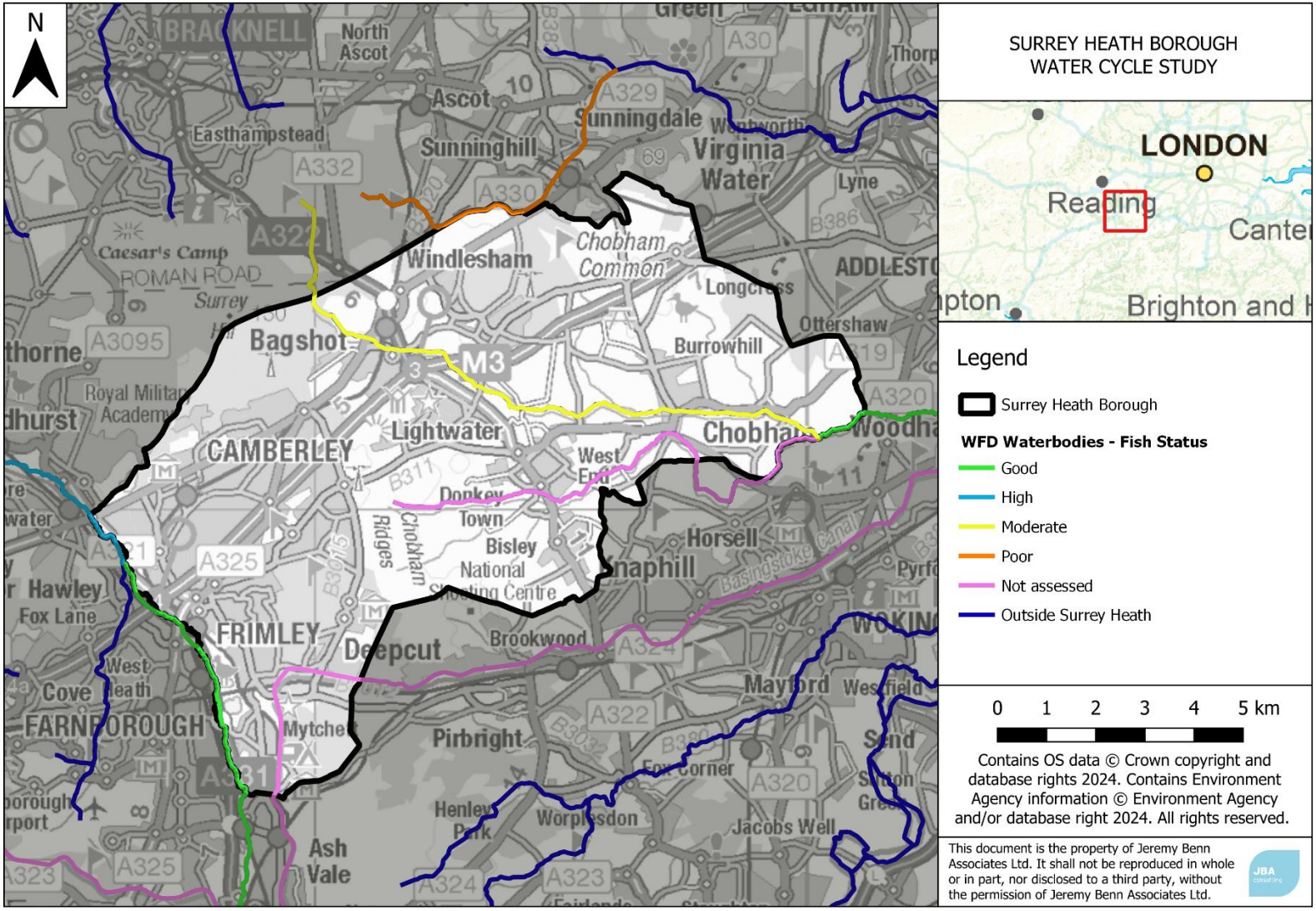


Figure 8-3: WFD Fish status for waterbodies in Surrey Heath.

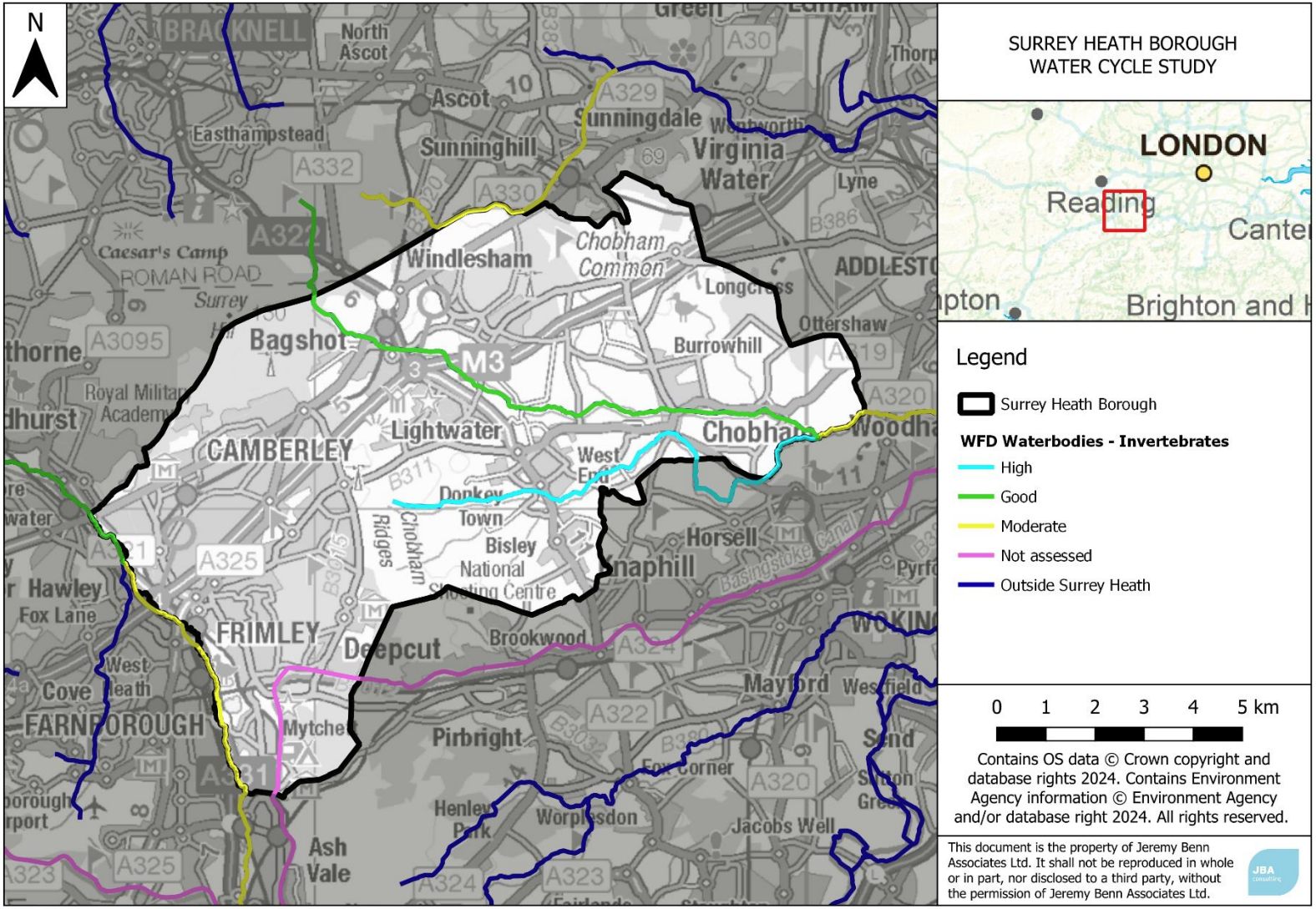


Figure 8-4: WFD Invertebrate status for waterbodies in Surrey Heath.

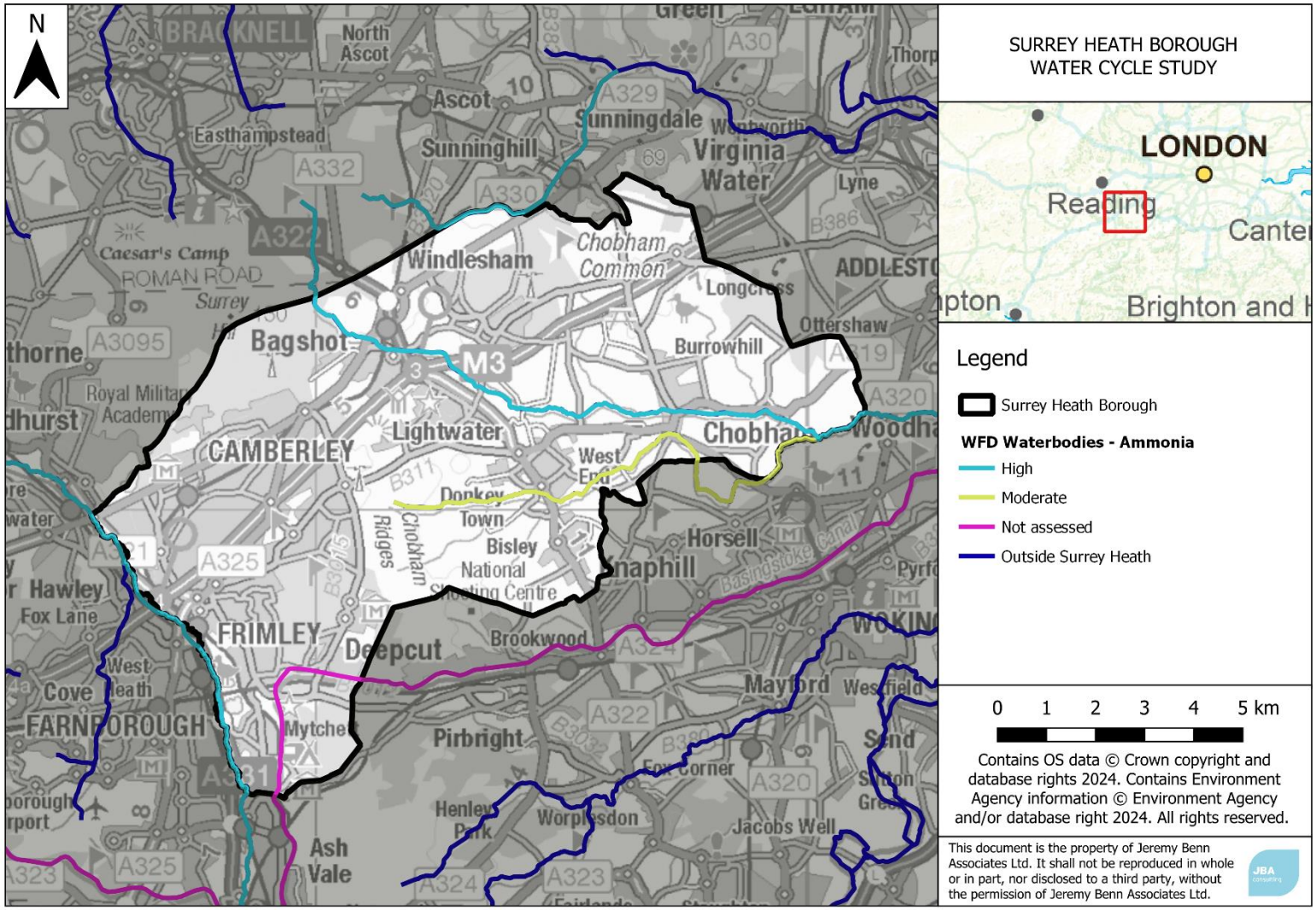


Figure 8-5: WFD Ammonia status for waterbodies in Surrey Heath.

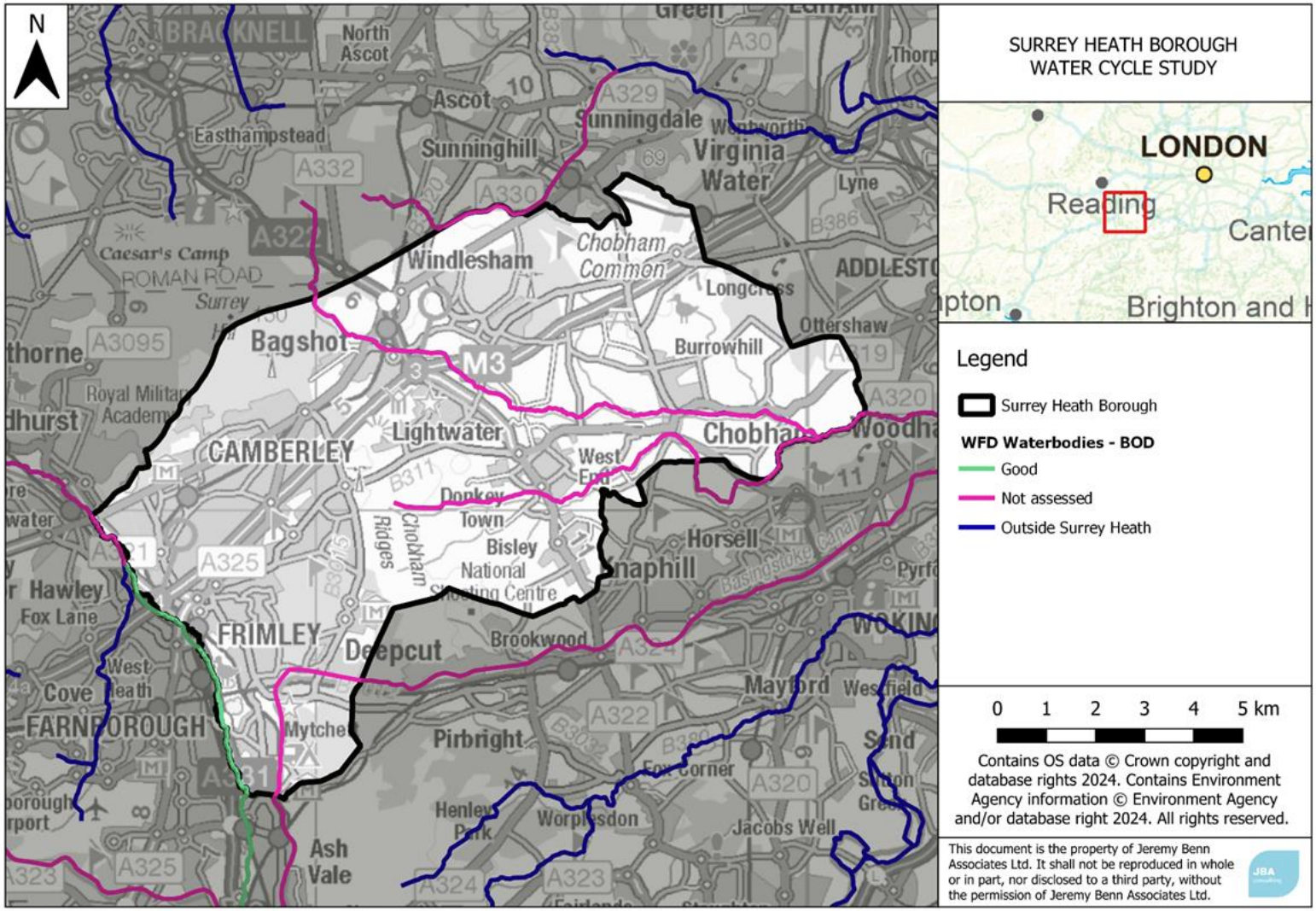


Figure 8-6: WFD BOD status for waterbodies in Surrey Heath.

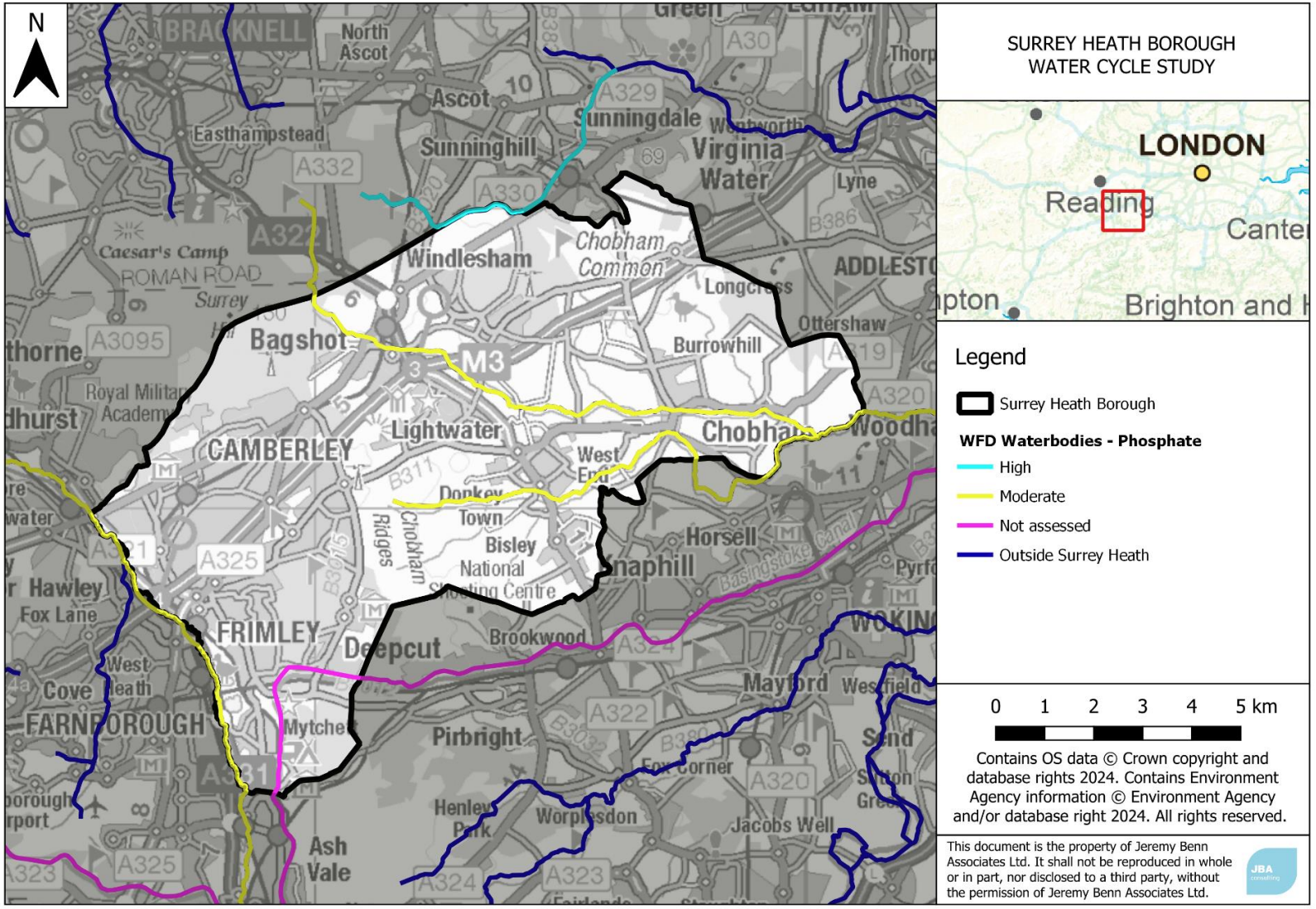


Figure 8-7: WFD BOD status for waterbodies in Surrey Heath.

8.4 Reasons for not achieving good

The latest WFD assessment data shows that the majority of watercourses in Surrey Heath have 'moderate' or 'poor' status. The EA's Reasons for Not Achieving Good (RNAG) dataset indicates that pollution and physical modifications from the water industry (sewage discharges), industry (industrial discharge) and the urban and transport sectors (contaminated land, drainage, urban development, transport) are the main reasons for watercourses not achieving good status in this area.

8.5 Priority substances

As well as the physico-chemical water quality elements (BOD, Ammonia, Phosphate etc.) addressed above, a watercourse can fail to achieve GES due to exceeding permissible concentrations of hazardous substances. Currently 73 substances are defined as hazardous or priority hazardous substances, with others under review. Such substances may pose risks both to humans (when contained in drinking water) and to aquatic life and animals feeding in aquatic life. These substances are managed by a range of different approaches, including international bans on manufacturing and use, targeted bans, selection of safer alternatives and end-of-pipe treatment solutions. There is considerable concern within the UK water industry that regulation of these substances by setting permit values which require their removal at wastewater treatment works will place a huge cost burden upon the industry and its customers, and that this approach would be out of keeping with the 'polluter pays' principle.

The following points consider how the planning system might be used to manage priority substances:

- **Industrial sources** – whilst this report covers potential employment sites, it does not consider the type of industry and therefore likely sources of priority substances are unknown. It is recommended that developers discuss potential uses which may be sources of priority substances from planned industrial facilities at an early stage with the EA and, where they are seeking a trade effluent consent, with the SU.
- **Agricultural sources** - there is limited scope for the planning system to change or regulate agricultural practices. UK water companies are involved in a range of 'Catchment-based Approach' schemes aimed at reducing diffuse sources of pollutants, including agricultural pesticides.
- **Surface water runoff sources** - some priority substances e.g., heavy metals, are present in urban surface water runoff. It is recommended that future developments manage these sources by using SuDS that provide water quality treatment, designed following the CIRIA SuDS Manual. This is covered in more detail in Sections 9.5.2 and 9.5.3. Retrofitting of SuDS to existing highways systems would also be recommended, where opportunity and funding allows, in

order to treat heavy metal, microplastic and hydrocarbon contaminants present in highways runoff.

- **Domestic wastewater sources** - some priority substances are found in domestic wastewater as a result of domestic cleaning chemicals, detergents, pharmaceuticals, pesticides, or materials used within the home. Whilst an increase in the population due to housing growth could increase the total volumes of such substances being discharged to the environment, it would be more appropriate to manage these substances through regulation at source, rather than through restricting housing growth through the planning system.

No further analysis of priority substances have been undertaken as part of this study.

8.6 Water industry national environment programme

The actions from the WINEP that relate to water quality are presented in Appendix G and show that most WwTW in the study area have an action against them. In most cases these include monitoring of storm overflows and the volume of sewage being treated. In one case, a permit condition to limit the concentration of ammonia in the treated effluent is being applied in order to improve downstream water quality. In AMP8 there are further actions to limit the concentration of phosphorous in treated effluent at Camberley and Chobham WwTWs. The AMP8 WINEP actions are available to download from the UK Government website here. Those that relate to water quality in Surrey Heath are presented in Appendix G.3.

8.7 Conclusions and recommendations

The EA RNAG dataset indicates that the water industry (sewage discharges) and urbanisation are the main reasons for watercourses not achieving good status in this area. Growth during the local plan period will also increase the discharge of treated wastewater from WwTW in Surrey Heath. There is a potential for this to cause a deterioration in water quality in the receiving watercourses and this must be carefully considered.

The modelling indicates the growth during the Local Plan period would not result in a significant deterioration (10% or over or deterioration in class) in water quality at any of the modelled WwTW. In most cases, this deterioration could be prevented by improvements in treatment.

Growth alone will not prevent GES being prevented in the future should improvements in upstream water quality be made.

Where a WwTW is shared with a neighbouring authority, coordination of growth plans in collaboration with Thames Water is essential to ensure that infrastructure is in place prior to development to prevent a breach of the EP. Recommendations for water quality are provided in Table 8-4.

Table 8-4: Recommendations for water quality.

Action	Responsibility	Timescale
Provide annual monitoring reports to TW detailing projected housing growth in the Local Authority	SHBC	Ongoing
Take into account the full volume of growth (From SHBC and neighbouring authorities) within the catchment	Thames Water	Ongoing

9 Environmental opportunities and constraints

9.1 Introduction

Development has the potential to cause an adverse impact on the environment through a number of routes, such as worsening of air quality, pollution to the aquatic environment or disturbance to wildlife. In the context of a WCS, the impact of development on the aquatic environment is assessed. This section considers the implications for both water quantity (impact of abstraction) and water quality (impact of wastewater discharge and runoff) on protected sites.

A source-pathway-receptor approach can be taken to investigate the risk and identify where further assessment or action is required.

A screening exercise has been conducted to identify protected sites (such as SSSIs) that could be impacted by changes in water quality. Further analysis builds on this and links it to the water quality results presented in Section 8, as well as identifying protected sites that could be impacted by increases in abstraction.

Sections 9.5.4 and 9.5.7 of the report also outline the benefits of SuDS and Natural Flood Management which offer opportunities to manage surface water to achieve multiple benefits.

9.2 Impact of abstraction

9.2.1 Overview

Abstraction of water within a catchment, either from groundwater or surface water sources, is necessary to provide a public water supply, for industrial processes and for agriculture. When the volume of water being abstracted becomes too high, it can cause environmental damage by reducing river flow or lowering the water table.

Changes in river flow can impact sensitive ecosystems. A reduction in river flow can cause sediment to build up, blocking the spaces the fish require to lay their eggs impacting their reproductive cycle. Changes in groundwater levels can also affect the flow regime in rivers and can cause drying of wetland sites.

The precise location of abstraction points for public water supply in England is not available for reasons of national security. Furthermore, water demand within a WRZ can be met by anywhere within that WRZ, or from a neighbouring WRZ if the transfer between WRZs is used to provide some of the water available for use. It is therefore not possible to trace an impact of an individual development site back to a particular water abstraction and therefore to an environmental impact. The assessments in this report therefore rely on information available in the public domain.

9.2.2 Methodology

Surrey Heath is served by Affinity Water via WRZ 6 Wey, and by South East Water via WRZ 4 Bracknell. Abstraction either from surface water sources or from groundwater sources can occur anywhere within these zones. However, the impact of the abstraction could be felt outside of the WRZ within the same groundwater body, or downstream in surface waterbodies. In both cases this could be outside the LPA boundary.

Within the study area and downstream are many sites with environmental designations such as:

- Special Areas of Conservation (SAC).
- Special Protection Areas (SPA).
- Sites of Special Scientific Interest (SSSI).
- Ramsar sites (Wetlands of International Importance).
- Priority Habitats and Priority Headwaters.

Groundwater dependent terrestrial ecosystems

Figure 9-1 shows a schematic of how Groundwater Dependent Terrestrial Ecosystems (GWDTEs) were identified. Scottish Forestry define GWDTEs in a briefing note (forestry.gov.scot) as a type of wetlands that are 'ecologically critically dependent on groundwater'. GWDTEs draw their water primarily from groundwater sources, rather than from rain or surface water, and these ecosystems are crucial for supporting botanically rich ground-flora communities.

The LPA boundary is within a WRZ. Water abstracted anywhere within that WRZ could be used to serve growth within the LPA. In Figure 9-1, there are two abstraction points. Abstraction 1 could impact an area outside of the both the LPA boundary and the WRZ. However, there are no protected sites within that groundwater body. Abstraction 2 also impacts an area both within and outside of the LPA boundary. Protected site A is within the WRZ but may not be impacted directly by an abstraction. Protected site B is outside of the WRZ and outside of the groundwater body containing an abstraction and is therefore unlikely to be impacted by growth. Protected site 3 is within a groundwater body containing an abstraction. There is a risk that an increase in abstraction could impact the protected site.

The location of abstraction points within the study area is not known, and so the approach must be taken that GWDTE anywhere within the combined extent of the WRZ and groundwater bodies overlapping the WRZ could be impacted by an increase in abstraction.

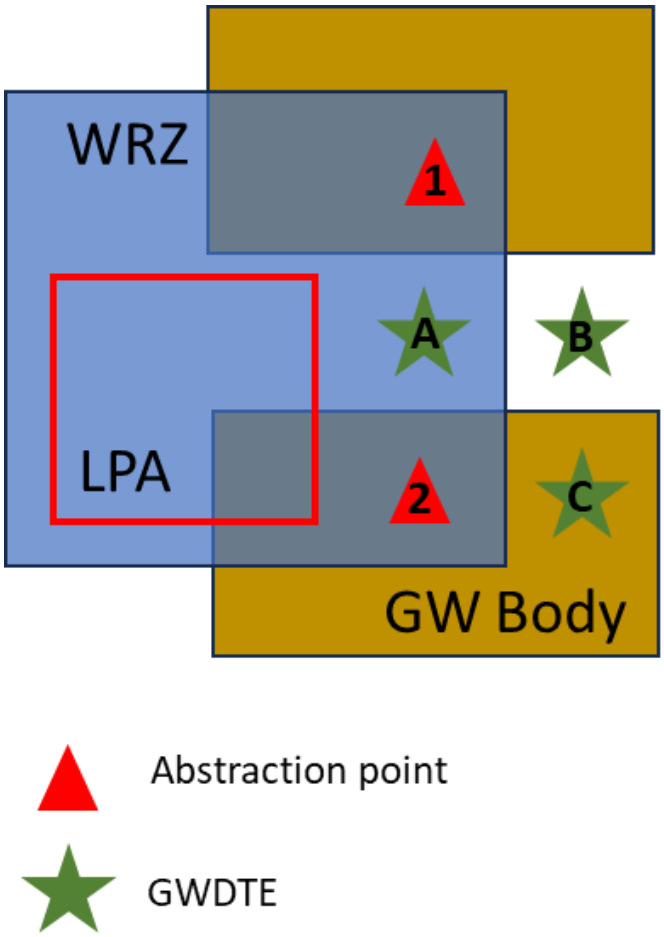


Figure 9-1: Definition of groundwater study area.

The following procedure was followed:

- Define study area for Surrey Heath - based on extent of WRZ and WFD Groundwater bodies that overlap with the WRZs.
- Identify GWDTEs within the study area using the EA's GWDTE dataset.
- Identify GWDTEs that are within groundwater bodies with flow identified as a Significant Water Management Issue (SWMI).

Surface water based ecosystems

Figure 9-2 shows a schematic of how protected sites on surface waterbodies were identified. As in the groundwater example, water could be abstracted from anywhere within the WRZ. Protected site A is downstream of an abstraction and so could be impacted by changes in river flow resulting from the abstraction. Protected site B whilst further downstream in the river basin, it is on a tributary not connected with the WRZ, abstraction is unlikely to have an impact. Protected site C is upstream of the abstraction so would not be impacted.

As with the groundwater abstractions, their location was not available as part of this study. The approach is therefore taken that any protected site directly on a waterbody that flows

through or is downstream of the WRZ could be impacted by abstraction. Protected sites upstream or on tributaries that have not flowed through the WRZ are ignored.

In order to identify protected sites that may be at risk, Flood Zone 2 from the EA's Flood Map for Planning (FMfP) was used to identify areas that are either adjacent to a river or are reasonably expected to experience flooding from a river overtopping.

The following procedure was followed:

- Define study area for Surrey Heath - based on extent of WRZs and WFD Surface water bodies that overlap with the WRZs.
- Identify protected sites within the study area.
- Filter these based on their proximity to waterbodies within the study area defined using EA Flood Zone 2 as a proxy.
- Identify the protected sites within a catchment where flow is recorded as a significant water management issue.

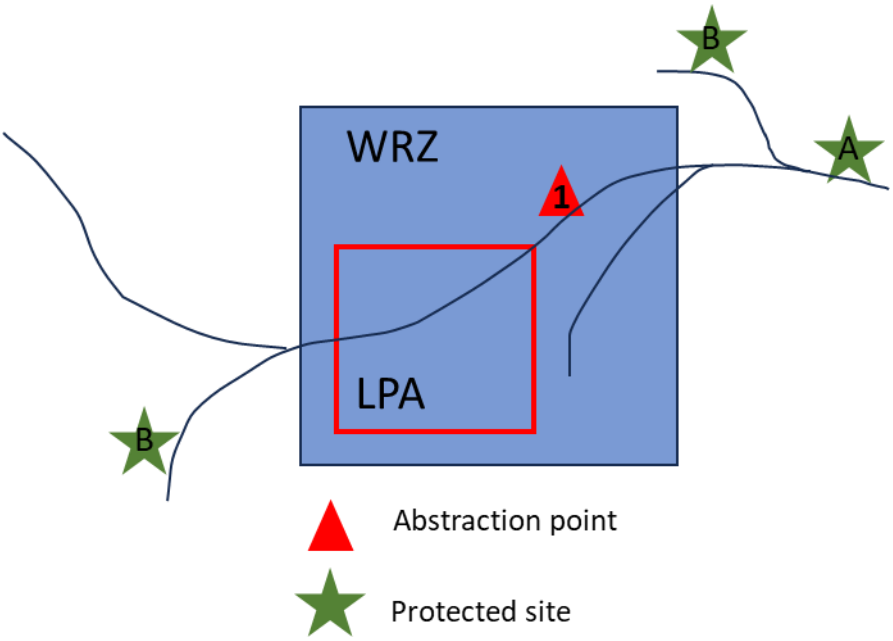


Figure 9-2: Definition of surface water study area.

9.2.3 Results

There are 83 GWTDEs that are within a groundwater body that overlaps with WRZs serving growth across SHBC's Local Plan period. These are shown in Figure 9-3 and presented in Appendix D. 40 of these are in groundwater bodies where flow is noted as a SWMI, either due to groundwater or surface water abstraction.

There are 124 SSSIs that are adjacent to waterbodies within the WRZs serving growth across the Local Plan period and downstream of Surrey Heath. There are also 37 SPA sites, 8 Ramsar sites, and 19 SACs. These are shown in Figure 9-4 and presented in Appendix E. 93 SSSIs, 30 SPAs, 17 SACs, and 7 Ramsar sites have flow abstraction (from surface water) identified as a significant water management issue.

Some of the SSSIs are also designated as Ramsar sites, SACs or SPAs and are included in Appendix E. This analysis demonstrates the potential for development within the study area to impact GWTDEs and waterbodies far beyond the boundaries of the study area. The primary process for managing or mitigating these impacts is through the WRMPs and their associated HRAs, however this analysis underlines that planning policies promoting water efficient development in Surrey Heath can contribute to improved water management across a much wider region.

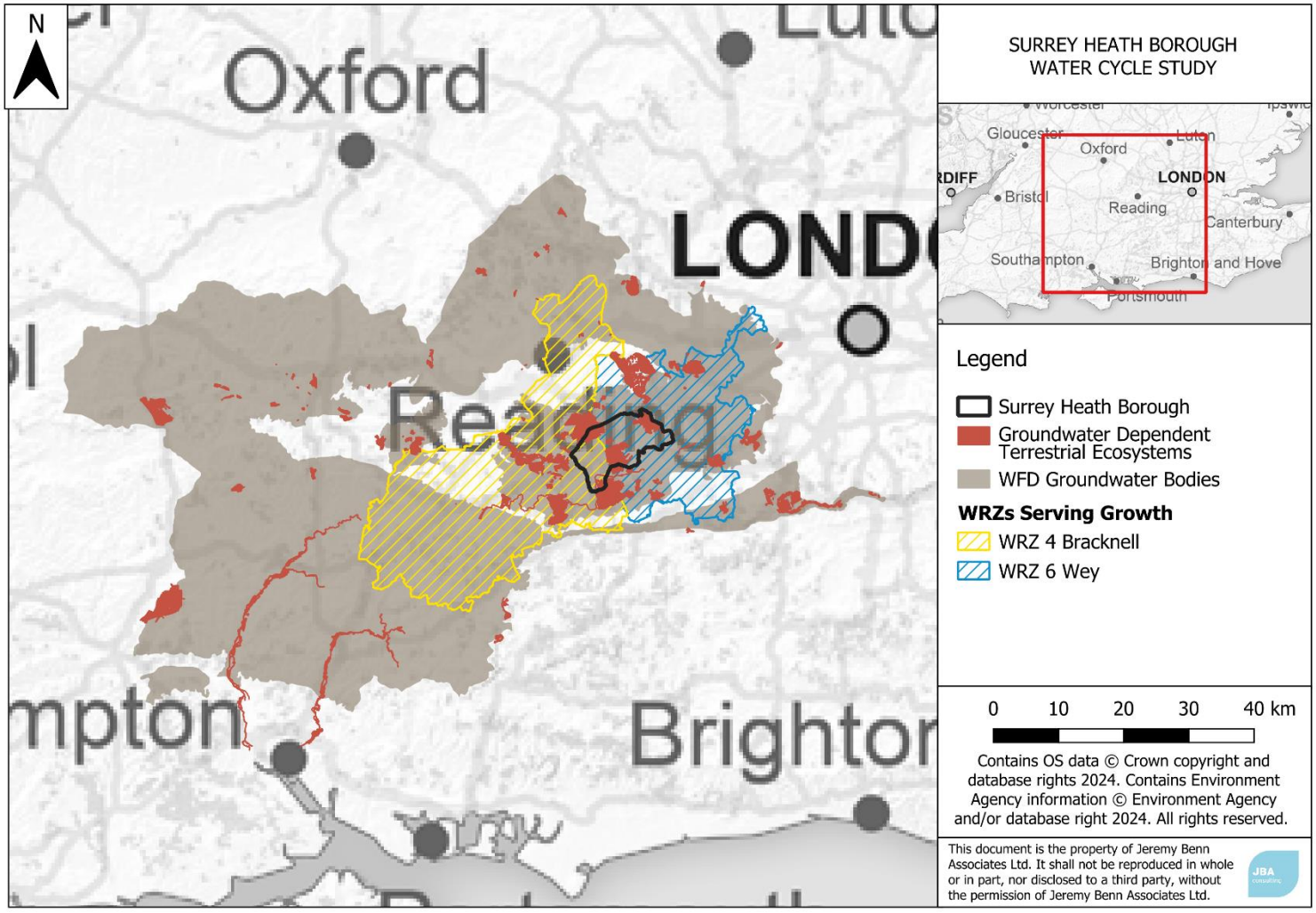


Figure 9-3: GWDTE within and downstream of WRZs serving growth in SHBC's Local Plan.

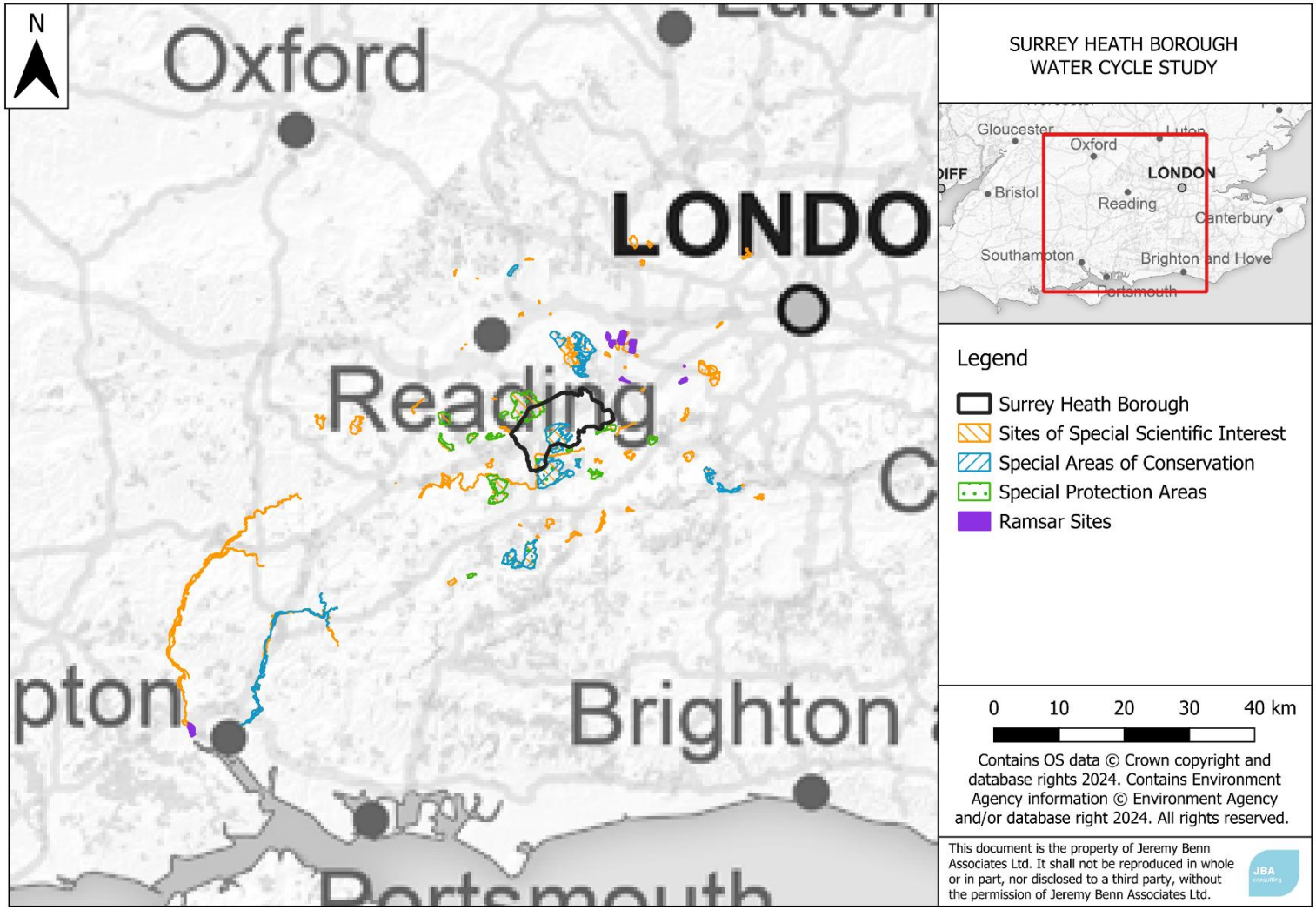


Figure 9-4: Protected areas within or downstream of WRZs serving growth in SHBC's Local Plan.

9.3 Water quality impact

9.3.1 Sources of pollution

Water pollution is usually categorised as either diffuse or point source. Point source sources come from a single well-defined point, an example being the discharge from a WwTW.

Diffuse pollution is defined as 'unplanned and unlicensed pollution from farming, old mine workings, homes and roads. It includes urban and rural activity and arises from industry, commerce, agriculture and civil functions and the way we live our lives.'

The most likely sources of diffuse pollution from new developments include drainage from housing estates, runoff from roads, and discharges from commercial and industrial premises. The pollution risk posed by a site will depend on the sensitivity of the receiving environment, the pathway between the source of the runoff and the receiving waters, and the level of dilution available. After or during heavy rainfall, the first flush of water carrying accumulated dust and dirt is often highly polluting.

Whilst the threat posed by an individual site may be low, a number of sites together may pose a cumulative impact within the catchment.

Runoff from development sites should be managed by a suitably designed SuDS scheme. More information on SuDS can be found in Section 9.5.2.

9.3.2 Pathways

Pollutants can take a number of different pathways from their source to a 'receptor' – a habitat or species that can be impacted. This could be overland via surface water flow paths, via the river system, or via groundwater or a combination of all three. For the purpose of this study, it should be assumed at any protected site has the potential to be impacted by surface runoff from adjacent development sites. Linkages between development sites and protected sites will be explored further in Section 9.4.

9.3.3 Receptors

A receptor in this case is a habitat or species that is adversely impacted by a pollutant. Both the rivers and groundwater as well as being pathways, can also be considered to be receptors. Groundwater bodies are also given a status under the WFD which is reported in Section 4.2.2 for the groundwater bodies across Surrey Heath.

A list of environmental designations is provided in Section 9.2.2, and protected sites within Surrey Heath can be seen in Section 9.2.3.

9.4 Assessment of point source risk

9.4.1 Methodology

In order to identify which of the protected sites may be at risk, Flood Zone 2 from the EA's FMfP was used to define an area that was either beside a river or could be reasonable expected to receive surface water from a river during times of flood. Where a WwTW serving growth in the plan period was present in the catchment upstream of the protected site, this site was taken forward for further assessment.

Where there were no WwTW serving growth upstream, these protected sites were discounted as no deterioration would be predicted in a water quality model, and the impact would be expected to be minimal. However, in these cases the overall catchment water quality should be considered where for example they are designated for migratory fish species that may spend part of their lifecycle elsewhere in the catchment.

Whilst deterioration in water quality may not always lead to a significant impact at a protected site such as a SSSI, modelled deterioration can be used to highlight areas of risk for further analysis in the HRA.

9.4.2 Results

There are no significant deteriorations in water quality (>10%) predicted at environmental sites downstream of WwTW serving growth from Surrey Heath. Phosphate deterioration of 6% is predicted at Castle Bottom to Yateley and Hawley Commons (SSSI), Thames Basin Heaths SPA, and Blackwater Valley (SSSI), while a 7% deterioration is predicted at Bramshill (SSSI). Each of these deteriorations are prevented in the TAL scenario.

A summary of the percentage deterioration in watercourses adjacent to environmental sites is presented in Appendix F.

9.5 Protection and mitigation

9.5.1 Groundwater protection

The EA is responsible for the protection of 'controlled waters' from pollution under the Water Resources Act 1991. These controlled waters include all watercourses and groundwater contained in underground strata.

The source protection zones are based on an estimate of the time it would take for a pollutant which enters the saturated zone of an aquifer to reach the source of abstraction or discharge point (Zone 1 = 50 days, Zone 2 = 400 days, Zone 3 is the total catchment area). The EA will use SPZs alongside other datasets such as the Drinking Water Protected Areas (DrWPAs) and aquifer designations as a screening tool to show:

- Areas where the EA would object in principle to certain potentially polluting activities, or other activities that could damage groundwater.

- Areas where additional controls or restrictions on activities may be needed to protect water intended for human consumption.
- How it prioritises responses to incidents.

The EA have published a position paper outlining its approach to groundwater protection (assets.publishing.services.gov.uk) which includes direct discharges to groundwater, discharges of effluents to ground and surface water runoff. This is of relevance to this WCS where a development may manage surface water through SuDS.

Sewage and Trade Effluent

Discharges of treated sewage of $2m^3$ per day or less to ground are called small sewage discharges (SSDs). The majority of SSDs do not require an EP if they comply with certain qualifying conditions. A permit will be required for all SSDs in Source Protection Zone 1 (SPZ1).

For treated sewage effluent discharges, the EA requires the use of shallow infiltration systems, which maximise the attenuation within the drainage blanket and the underlying unsaturated zone. Whilst some sewage effluent discharges may not pose a risk to groundwater quality individually, the cumulative risk of pollution from aggregations of discharges can be significant. Improvement or pre-operational conditions may be imposed before granting an EP. The EA will only agree to developments where the addition of new sewage effluent discharges to ground in an area of existing discharges is unlikely to lead to an unacceptable cumulative impact.

Generally, the EA will only agree to developments involving release of sewage effluent, trade effluent or other contaminated discharges to ground if it is satisfied that it is not reasonable to make a connection to the public foul sewer. The EA would normally expect to only permit new private discharges where the distance to connect to the nearest public sewer exceeds the number of dwellings multiplied by 30m. So, for example, a development of 100 dwellings would need to be more than 3km from a public sewer. The developer would have to provide evidence of why the proposed development cannot connect to the foul sewer in the planning application. This position will not normally apply to surface water run-off via SuDS and discharges from WwTW operated by SUs with appropriate treatment and discharge controls.

Deep infiltration systems (such as boreholes and shafts) are not generally accepted by the EA for discharge of sewage effluent as they bypass soil layers and reduce the opportunity for attenuation of pollutants.

Discharges of surface water run-off to ground at sites affected by land contamination, or from sites for the storage of potential pollutants are likely to require an EP. This could include sites such as garage forecourts and coach and lorry parks. These sites would be subject to a risk assessment with acceptable effluent treatment provided.

Discharge of Clean Water

'Clean water' discharges such as runoff from roofs or from roads, may not require a permit. However, they are still a potential source of groundwater pollution if they are not appropriately designed and maintained.

Where infiltration SuDS schemes are proposed to manage surface runoff they should:

- be suitably designed;
- meet government non-statutory technical standards for SuDS (gov.uk) – these should be used in conjunction with the NPPF and PPG; and
- use a SuDS management treatment train.

A hydrogeological risk assessment is required where infiltration SuDS is proposed for anything other than clean roof drainage in a SPZ1.

SPZs in Surrey Heath

SPZs form a key part of the EA's approach to controlling the risk to groundwater supplies from potentially polluting activities and accidental releases of pollutants.

The EA's groundwater SPZs production manual (gov.uk), details position statements which provide information about the EA's approach to managing and protecting groundwater.

There are no groundwater SPZs intersecting the borough. There are therefore also no proposed development locations within SPZs.

9.5.2 Surface water drainage

Since April 2015[21], management of the rate and volume of surface water has been a requirement for all major development sites, through the use of SuDS.

LLFAs are the statutory consultees to the planning system for surface water management within major development, which covers the following development scenarios:

- 10 or more dwellings.
- A site larger than 0.5 hectares, where the number of dwellings is unknown.
- A building greater than 1,000 square metres.
- A site larger than 1 hectare.

SuDS are drainage features which attempt to replicate natural drainage patterns, through capturing rainwater at source, and releasing it slowly into the ground or a water body. They can help to manage flooding through controlling the quantity of surface water generated by a development and improve water quality by treating urban runoff. SuDS

21 House of Commons: Written Statement (HCWS161), Pickles, the Secretary of State for Communities and Local Government, (2014). Accessed online at: https://www.parliament.uk/documents/commons-vote-office/December%202014/18%20December/6.%20DCLG-sustainable-drainage-systems.pdf on: 02/12/2024.

can also deliver multiple benefits, through creating habitats for wildlife and green spaces for the community. SuDS also have the advantage of providing effective blue and green infrastructure and ecological and public amenity benefits when designed and maintained properly.

National standards on the management of surface water are outlined within the Defra non-statutory technical standards for SuDS (gov.uk). The CIRIA SuDS manual (C753) (ciria.org) and guidance on the construction of SuDS (C768) (ciria.org) provide the industry best practice guidance for design and management of SuDS.

Surrey County Council is the LLFA and plays a key role in ensuring that the proposed drainage schemes for all new developments comply with technical standards and policies in relation to SuDS. The Surrey County Council's SuDS Design Guidance (surreycc.gov.uk) provides advice relating to surface water drainage, as well as outlining the minimum operating standards as specified in the NPPF.

Section 3.6.1 discusses Schedule 3 of the FWMA 2010 and the impact this would have on the implementation and management of SuDS.

9.5.3 Use of sustainable drainage systems in water quality management

SuDS allow the management of diffuse pollution generated by urban areas through the sequential treatment of surface water reducing the pollutants entering lakes and rivers, resulting in lower levels of water supply and wastewater treatment being required. This treatment of diffuse pollution at source can contribute to meeting WFD water quality targets, as well as national objectives for sustainable development.

This is usually facilitated via a SuDS Management Train of a number of components in series that provide a range of treatment processes delivering gradual improvement in water quality and providing an environmental buffer for accidental spills or unexpected high pollutant loadings from the site. Considerations for SuDS design for water quality are summarised in Table 9-1.

Table 9-1: Considerations for SuDS Design for Water Quality.

Action	Considerations
Manage surface water close to source	Where practicable, treatment systems should be designed to be close to source of runoff. It is easier to design effective treatment when the flow rate and pollutant loadings are relatively low. Treatment provided can be proportionate to pollutant loadings and sensitivity receptor. Accidental spills or other pollution events can be isolated more easily without affecting the downstream drainage system. Encourages ownership of pollution. Poor treatment performance or component damage/ failure can be dealt with more effectively without impacting on the whole site.
Treat surface	Where practicable, treatment systems should be designed to be on

Action	Considerations
Manage surface water close to source	Where practicable, treatment systems should be designed to be close to source of runoff. It is easier to design effective treatment when the flow rate and pollutant loadings are relatively low. Treatment provided can be proportionate to pollutant loadings and sensitivity receptor. Accidental spills or other pollution events can be isolated more easily without affecting the downstream drainage system. Encourages ownership of pollution. Poor treatment performance or component damage/ failure can be dealt with more effectively without impacting on the whole site.
water runoff on the surface	the surface Where sediments are exposed to UV light, photolysis and volatilisation processes can act to break down contaminants. If sediment is trapped in accessible parts of the SuDS, it can be removed more easily as part of maintenance. It enables use of evapotranspiration and some infiltration to the ground to reduce runoff volumes and associated total contamination loads (provided risk to groundwater is managed appropriately). It allows treatment to be delivered by vegetation. Sources of pollution can be easily identified. Accidental spills or misconnections are visible immediately and can be dealt with rapidly. Poor treatment performance can be easily identified during routine inspections, and remedial works can be planned efficiently.
Treat surface water runoff to remove a range of contaminants	SuDS design should consider the likely presence and significance of any contaminant that may pose a risk to the receiving environment. The SuDS component or combination of components selected should include treatment processes that, in combination, are likely to reduce this risk to acceptably low levels.
Minimise risk of sediment remobilisation	The SuDS design should consider and mitigate the risks of sediments (and other contaminants) being remobilised and washed into receiving surface waters during events greater than those which the component has been specifically designed for.
Minimise impacts from accidental spills	By using several components in series, SuDS can help ensure that accidental spills are trapped in/on upstream component surfaces, facilitating contamination management and removal. The selected SuDS components should deliver a robust treatment design that manages risks appropriately - considering the uncertainty and variability of pollution loadings, sensitivity of receptors and treatment processes.

Managing pollution close to its source can help keep pollutant levels and accumulation rates low, allowing natural processes to be more effective. Treatment can often be delivered within the same components that are delivering water quantity design criteria, requiring no additional cost or land-take.

SuDS designs should control the 'first flush' of pollutants (usually mobilised by the first 5mm of rainfall) at source, to ensure contaminants are not released from the site. Best practise is that no runoff should be discharged from the site to receiving watercourses or sewers for the majority of small (e.g., less than 5mm) rainfall events.

Infiltration techniques are likely to require consultation with the EA. Early consideration of SuDS within master planning will typically allow a more effective scheme to be designed.

Further guidance on designing SuDS to reduce phosphorus[22] and nitrogen[23] in surface water runoff can be found in the relevant CIRIA guidance documents.

9.5.4 Benefits of sustainable drainage systems

Flood Risk

The Surrey Heath Level 1 SFRA, due to be published early 2025, contains recommendations for SuDS to manage surface water on development sites, with the primary aim of reducing flood risk.

SuDS can be effective at reducing flood risk for relatively high intensity, short and medium duration events. They are particularly important in mitigating potential increases in surface water flooding, sewer flooding and flooding from small and medium sized watercourses resulting from development.

Water Resources

A central principle of SuDS is the use of surface water as a resource. Traditionally, surface water drainage involved the rapid disposal of rainwater, by conveying it directly into a sewer or wastewater treatment works.

SuDS techniques such as RwH, allow rainwater to be collected and re-used as non-potable water supply within homes and gardens, reducing the demand on water resources and supply infrastructure.

Climate Resilience

22 Using SuDS to reduce phosphorus in surface water runoff (C808F), CIRIA (2022). Accessed online at: https://www.ciria.org/ci/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=C808F on: 08/11/2024.

23 Using SuDS to reduce nitrogen in surface water runoff (C815F), CIRIA (2022). Accessed online at: https://www.ciria.org/CIRIA/News/CIRIA_news2/New%20guidance%20for%20Using%20SuDS%20to%20reduce%20nitrogen.aspx on: 08/11/2024.

Climate projections for the UK suggest that winters may become milder and wetter. Summers may become warmer, but with more frequent higher intensity rainfall events, particularly in the south east. This is expected to increase diffuse pollution, reduce water availability, and increase the volume of runoff, thereby increasing the risk of surface water flooding.

SuDS offer a more adaptable way of draining surfaces. They control the rate and volume of runoff leaving urban areas during high intensity rainfall, also reducing flood risk to downstream communities through storage and controlled release of rainwater from development sites.

Through allowing rainwater to soak into the ground, SuDS are effective at retaining soil moisture and groundwater levels. This allows for the recharge of the watercourses and underlying aquifers, which is particularly important in areas where water resource availability is limited and likely to become increasingly scarce under future drier climates.

Biodiversity

The water within a SuDS component is an essential resource for the growth and development of plants and animals. Biodiversity benefits can be delivered even by very small, isolated schemes. The greatest value can be achieved where SuDS are planned as part of a wider green landscape, providing important habitat, and wildlife connectivity. With careful design, SuDS can provide shelter, food, foraging, and breeding opportunities for a variety of species including plants, amphibians, invertebrates, birds, bats, and other animals.

Amenity

Designs using surface water management systems to help structure the urban landscape can enrich its aesthetic and recreational value, promoting health and well-being and supporting green infrastructure. Water managed on the surface rather than underground can help reduce summer temperatures and provide habitat for flora and fauna. It can also act a resource for local environmental education programmes and working groups, directly influencing the sense of community in an area. Although there are few comparative studies, the sites compared in available studies indicate that SuDS are more cost-effective than traditional drainage systems[24].

Kingsbrook, Aylesbury - SuDS Case Study

As part of the Kingsbrook new village outside Aylesbury, Barratt Homes and David Wilson Homes worked with the RSPB and the former Aylesbury Vale District Council to deliver a SuDS scheme which created habitats for wildlife, while improving the quality of life for the new community. The design included a network of swales to collect and convey surface water runoff along the ground surface, which then discharged into a series of storage

24 Comparisons of costs and benefits, Susdrain (2023). Available at: https://www.susdrain.org/delivering-suds/using-suds/the-costs-and-benefits-of-suds/comparison-of-costs-and-benefits.html accessed on: 08/11/2024.

ponds. It also included the creation of the wetland habitat of Oakfield Lake Nature reserve. Footpaths, benches and viewing platforms were designed to overlook the water features. The banks of the ponds were planted with native wildflowers, and less than one year after the first ponds were installed, the RSPB recorded egrets and several species of dragonfly[25].

Figure 9-5: Seating area and footpath overlooking water feature at Kingsbrook development site, Aylesbury (Credit: JBA).

Figure 9-6: Homes overlooking drainage feature in Kingsbrook, Aylesbury (Credit: JBA).

25 Ponds and streams: information for Kingsbrook residents. Accessed online at: https://www.kingsbrook-aylesbury.co.uk/wp-content/uploads/2018/12/4-suds-information-sheet-v4.pdf on: 08/11/2024.

9.5.5 Suitable sustainable drainage system techniques

The hydraulic and geological characteristics of each property development site across Surrey Heath should be assessed to identify the most appropriate forms of surface water management and any constraining factors to the utilisation of SuDS. These assessments are designed to inform the early-stage site planning process and should be followed up the site-specific detailed drainage assessments.

Appropriate SuDS techniques have been categorised into five main groups, as shown in Table 9-2, with further details provided on the Susdrain website (susdrain.org). Further site-specific investigation should be conducted to determine what SuDS techniques could be used on a particular development, informed by detailed ground investigations.

Table 9-2: Summary of SuDS Categories.

SuDS Type	Technique
Source Control	Green Roof, RwH, Pervious Pavements, Rain Gardens
Infiltration	Infiltration Trench, Infiltration Basin, Soakaway
Detention	Pond, Wetland, Subsurface Storage, Shallow Wetland, Extended Detention Wetland, Pocket Wetland, Submerged Gravel Wetland, Wetland Channel, Detention Basin
Filtration	Surface Sand filter, Sub-Surface Sand Filter, Perimeter Sand Filter, Bioretention, Filter Strip, Filter Trench
Conveyance	Dry Swale, Under-drained Swale, Wet Swale

9.5.6 Natural flood management

Natural Flood Management (NFM) is used to protect, restore, and re-naturalise the function of catchments and rivers to reduce flood risk. A wide range of techniques can be used that aim to reduce flooding by working with natural features and processes in order to store or slow down flood waters before they can damage flood risk receptors (e.g., people, property, infrastructure, etc.).

Techniques and measures, which could be applied in Surrey Heath include:

- Peatland and moorland restoration in upland catchments.
- Offline storage areas.
- Re-meandering streams.
- Targeted woodland planting.
- Reconnection and restoration of functional floodplains.
- Restoration of rivers and removal of redundant structures.
- Installation or retainment of large woody material in river channels.
- Improvements in management of soil and land use.
- Creation of rural and urban SuDS.

In 2017, the EA published an online evidence base on working with natural processes to reduce flood risk 2024 (gov.uk) to support the implementation of NFM and with JBA

produced maps showing locations with the potential for NFM measures[26]. These maps are intended to be used alongside the evidence directory to help practitioners think about the types of measure that may work in a catchment and the best places in which to locate them. There are limitations with the maps; however, it is a useful tool to help start dialogue with key partners.

9.5.7 Multiple benefits of natural flood management

In addition to flood risk benefits, there are also significant benefits in other areas such as habitat provision, air quality, climate regulation and water quality.

Many NFM measures have the ability to reduce nutrient and sediment sources by reducing surface runoff flows from higher ground, reducing soil erosion, trapping sediment at the edge of agricultural land, or encouraging deposition of sediments behind natural dams upstream in watercourses.

Suitable techniques may include:

- Leaky dams.
- Woodland planting.
- Buffer strips.
- Runoff retention ponds.
- Land management techniques (soil aeration, cover crops etc.).

Case Study - Black Brook Slow the Flow

Four engineered log dams, see Figure 9-7, were installed on Black Brook at an estimated cost of £2,000, funded by Natural England and the EA to restore Stanley Bank SSSI. The scheme aimed to improve habitat and reduce the risk of flooding. However, the scheme also resulted in reduced levels of phosphate and nitrate in Black Brook, with phosphate concentrations falling by 3.6mg/l. By 2035, it is predicted that 792m^3 of sediment will be stored in three ponds retained by the dams.

26 Mapping the potential for working with natural process, Environment Agency and JBA (2017). Accessed online at: https://www.arcgis.com/home/item.html?id=7315f943998847e2b3797a85665f5438 on: 08/11/2024.

Figure 9-7: Photograph of leaky dams at Black Brook.

Reproduced from Case Study 17. Black Brook Slow the Flow, St Helens, Norbury, Rogers and Brown, EA WwNP Evidence Base 2017. Photograph taken on 8 May 2015; courtesy of Matthew Catherall.

9.5.8 Integrated constructed wetlands

An integrated constructed wetland (ICW) is an artificial wetland created for the purpose of treating polluted water, whether this is municipal wastewater, grey water from residential properties, or agricultural runoff.

They are usually unlined, free surface flow wetlands, designed to contain and treat influents within emergent vegetated areas.

Defra carried out a systematic review of the effectiveness of various wetland types, including ICWs for mitigating agricultural pollution such as phosphate and nitrate. The overall conclusion was that all wetland types are very effective at reducing major nutrients and suspended sediments, with the exception of nitrite in ICWs. Nitrate is only reduced when passing through overland buffer strips and through constructed wetlands with vegetation, where the systematic review showed a mean reduction of 29% across the evidence included in the study. The mean reduction in Total Phosphorus across the evidence base was 78%. More information on this review can be accessed here.

It needs to be noted that in some cases where phosphorus is especially high the effectiveness of removal may be less certain. Although the reduction in total phosphorus is beneficial, stakeholders need to ensure the excess nutrients are dealt with at source, such as storm overflows and at a policy level.

Other techniques to manage nutrients are possible such as catchment nutrient balancing, where excess nutrients are managed at a catchment level, as well as catchment permitting. These techniques are recommended where environmental capacity is restrictive to growth. Thames Water is not eligible for this due to a low Environmental Performance Assessment (EPA) rating. The situation for South East Water and Affinity Water are unknown.

Case Study - Frogshall ICW

The Upper River Mun in Norfolk was experiencing chronic pollution, and a loss in biodiversity in the river. Investigation found that nutrients from a WwTW upstream were contributing to this issue.

A pilot ICW was created consisting of three shallow ponds, filled with 18,000 emergent aquatic plants, and the outfall from the treatment works was diverted to pass through the wetland.

Early monitoring has shown that 90% of the phosphate is being removed by the wetland, and a large increase in biodiversity downstream observed.

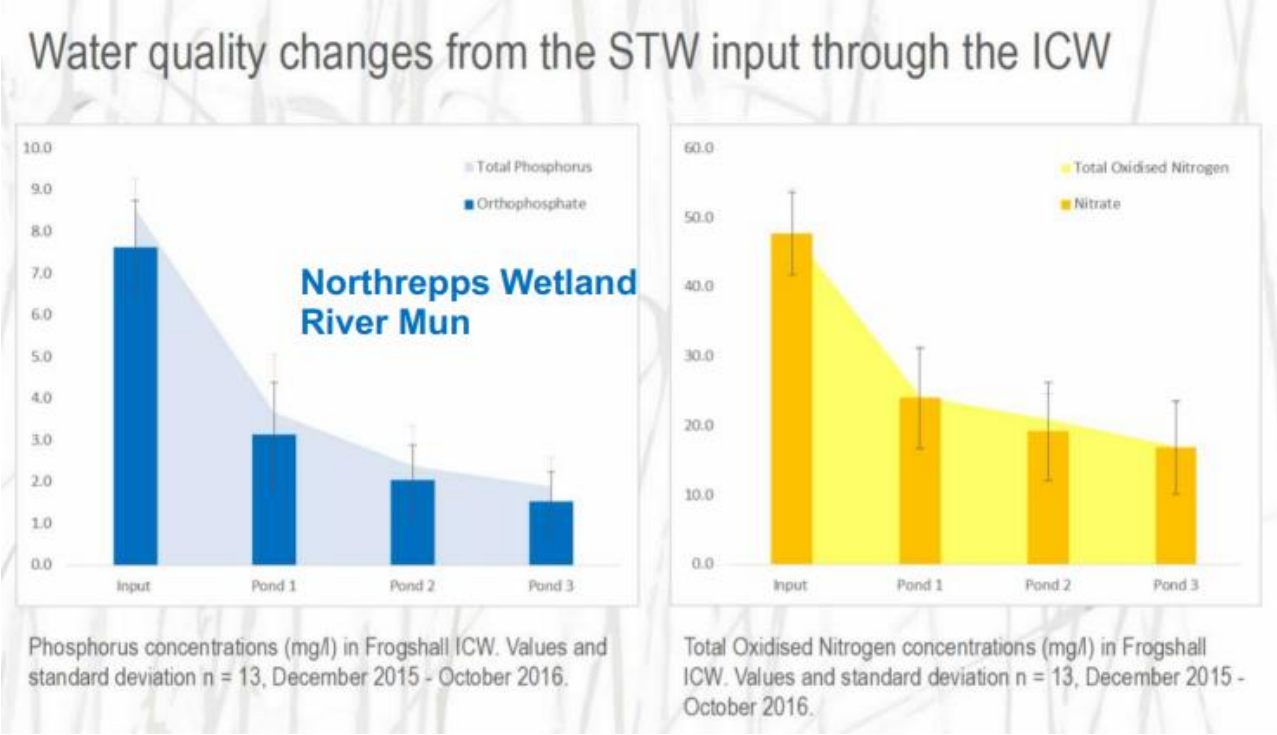


Figure 9-8: Graph of water quality changes, reproduced from 'Stripping the Phosphate' (theriverstrust.org), a presentation by the Norfolk Rivers Trust (2018).

9.5.9 Agricultural management

The EA's RNAG database indicates that one of the reasons for some of the watercourses in the area are not meeting 'Good' WFD standards can be related to agriculture and rural land use. The cause of this includes pollution from fertilisers, manures, pesticides and soils washing into streams when it rains or percolating into the groundwater. Other

pressures from agriculture include deepening, widening or re-routing of streams for land drainage, gravel removal and bankside erosion.

There is a big potential to improve water quality by interventions aimed at agricultural sources, especially considering the measures already taken by the water companies to reduce their contribution to phosphate load.

Potential schemes could include:

- Buffer strips.
- Cross slope tree planting.
- Runoff retention basins.
- Contour ploughing.
- Cover crops.

There is considerable overlap with NFM measures, and the challenges are also very similar. Exact impacts are difficult to measure, although modelling tools such as Farmscoper (adas.co.uk) exist to help with this. Once a scheme is implemented it relies on the landowner to continue to maintain it in order to maintain the mitigation benefit.

Funding for agricultural interventions could come from Catchment Sensitive Farming or a Payment for Ecosystem Services approach.

Case Study - Wessex Water - EnTrade

Wessex Water catchment team used EnTrade to invite farmers to bid to grow cover crops over winter to reduce the nitrogen leaching into the watercourse.

This avoided the need to upgrade Dorchester WwTW to provide the same nitrogen removal capacity.

A trial auction was held in 2015, and two further auctions have since taken place attracting 557 bids from 63 farmers to save 153 tonnes of nitrogen.

Ruth Barden, Director of Environmental Strategy, Wessex Water, stated that “'Using EnTrade to create a market in measures to deliver reductions in nitrogen has delivered a 30% saving for Wessex Water compared to traditional catchment approaches.”

9.5.10 Barriers

Whilst there are many benefits to implementing NFM and constructed wetlands, or modifying agricultural practises, the impact of these techniques is hard to quantify, and relies on ongoing maintenance to maintain that benefit. Where a potential scheme is not on a development site it will also require permission and support of the landowner. It may not be possible to influence this through planning policy.

9.5.11 Conclusions and recommendations

There are no groundwater SPZs within Surrey Heath. The potential impact of development on a number of protected sites such as SAC and SSSIs within, or downstream of the study area

should be carefully considered in future plan making. Development sites within the study area could be sources of diffuse pollution from surface runoff.

SuDS are required on all development sites. Their design should consider both water quantity and water quality and site level investigations should be undertaken to define the most appropriate SuDS types for each specific development. Opportunities exist for these SuDS schemes to offer multiple benefits of flood risk reduction, amenity value and biodiversity.

SHBC should be consulted at an early stage of development to ensure that SuDS are implemented and designed in response to site characteristics and policy factors. In the wider area, opportunities exist to implement NFM techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

Recommendations for environmental constraints and opportunities are provided in Table 9-3.

Table 9-3: Recommendations for environmental constraints and opportunities.

Action	Responsibility	Timescale
Consider the environmental impact of development on protected sites downstream of receiving wastewater treatment works in the HRA.	SHBC	Local Plan preparation
The Local Plan should include policies that require all development proposals with the potential to impact on areas with environmental designations to be considered in line with the relevant legislation and where stated, in consultation with Natural England (for national and international designations and priority habitats).	SHBC	In Surrey Heath's Local Plan
The Local Plan should include policies that require development sites to adopt SuDS to manage water quality of surface runoff.	SHBC	In Surrey Heath's Local Plan
In partnership, identify opportunities for incorporating SuDS into open spaces and green infrastructure, to deliver strategic flood risk management and meet WFD water quality targets.	SHBC, Thames Water, Affinity Water, and South East Water, EA	Ongoing
Developers should include the design of SuDS at an early stage to maximise the benefits of the scheme.	Developers	Ongoing
Work with developers to discourage connection of new developments into existing surface water and combined sewer networks. Prevent connections into the foul network, as this is a significant cause of sewer flooding.	SHBC, developers	Ongoing
Opportunities for NFM that include schemes aimed at reducing / managing runoff should be considered to reduce nutrient and sediment pollution within Surrey Heath.	SHBC, EA, Natural England	Ongoing

10 Summary and overall conclusions

10.1 Conclusions

10.1.1 Water resources

Surrey Heath receives its water from two water-only companies, Affinity Water and South East Water. Surrey Heath is split between WRZ4 Bracknell for South East Water and WRZ6 Wey for Affinity Water. In both WRZs, the forecast percentage growth in the WRMP is higher than the expected growth during the Local Plan period.

The WINEP is a set of actions that the EA have requested all 20 water companies operating in England to complete in a particular Asset Management Period (AMP) as part of their environmental commitments. A number of investigations are planned or underway to ensure that abstraction of water from both groundwater and rivers, is not leading to unsustainable reductions in flow. Development and population growth can increase abstraction, and so SHBC have an opportunity to contribute to these actions indirectly by pursuing policies that promote water efficiency in new development.

It is important that new development does not result in an unsustainable increase in water abstraction. This can be done in a number of ways from reducing the water demand from new houses through to achieving water neutrality in a region by offsetting a new developments water demand by improving efficiency in existing buildings.

Water resources in the UK are under considerable pressure. The EA have stated that 'the scale of the challenge we face increases with time, and, by 2050, we are looking at a shortfall of nearly 5 billion litres of water per day between the sustainable water supplied available and the expected demand.'

The National Water Resources Framework sets the objective to reduce the average per capita consumption in the UK to 110l/p/d by 2050. This is now part of the EIP and water companies' WRMPs. Within Defra's Plan for Water is the commitment to review Building Regulations and a target of 100l/p/d in water stress areas is suggested.

The Future Homes Hub, who are supporting Defra to produce a roadmap to greater water efficiency propose a stages reduction in PCC, with a target of 100l/p/d in water stressed areas in place from 2025, and a reduced target of 90l/p/d in place by 2030 (depending on market conditions and customer acceptance).

This study recommends that as a minimum the proposed new Building Regulations target of 100l/p/d outlined in Defra's Plan for Water be adopted across the study area. This should be achieved using a fittings-based approach.

This should be supported by the requirement for non-household development to achieve at least 3 credits in the Wat01 Measure for water in the BREEAM New Construction standard.

This is supported by Affinity Water and South East Water's incentives for water efficient design in new builds, outlined in Section 4.8, offered to reduce design consumption below 100l/p/d.

10.1.2 Wastewater collection

Development in areas where there is limited wastewater network capacity will increase pressure on the network, increasing the risk of a detrimental impact on customers, and increasing the likelihood of storm overflow operation. Early engagement with developers and Thames Water is required, and further modelling of the network may be required at the planning application stage.

The Environment Act now requires water companies to report and monitor storm overflows as well as reduce the harm caused to the rivers they discharge to. There are 4 storm overflows in recorded in the study area.

The SOAF set a threshold of 60 operations in a year (based on 1 years' data, 50 if based on 2 years data, and 40 if based on 3 years), above which a storm overflow should be investigated. 1 of the storm overflows were operating above this threshold between 2021 and 2023. The Storm Overflow Reduction Plan, which was first published in 2022, sets an objective that 'storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050'. A further 3 storm overflows are operating on average above 10 times per year so may require action to meet the long-term target.

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems, and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

Early engagement between developers, the council, and Thames Water is recommended to allow time for the strategic infrastructure required to serve these developments to be planned.

10.1.3 Wastewater treatment assessment

A headroom assessment was carried out comparing the current flow from each WwTW, making allowance for growth already planned, with the permit limit. This provides an estimate of the spare capacity in wastewater treatment infrastructure in Surrey Heath.

Lightwater and Camberley WwTW are likely to be close to, or exceed, their permit during the plan period. An increase in flow permit, and/or upgrades to treatment capacity will be required at these WwTW. Due to the maximum daily discharge permit at Chobham WwTW, remaining capacity has not been calculated. Despite this, flow data from the past three years suggest the maximum daily discharge is not currently exceeded, and the volume of planned growth is lower than the other WwTWs. However, the EA have identified a number of compliance issues with upgradation underway (with a project delivery date of Marach 2025). Upgrades are also planned for Camberley and Lightwater WwTWs, due to be completed in 2028 and

2027 respectively, though while this will improve flow to full treatment, the upgrades will not provide additional DWF headroom. Where new infrastructure or upgrades to existing infrastructure may be required, engagement between SHBC and the water company is required to ensure that delivery of this infrastructure is aligned with delivery of development sites. Grampian conditions may be sought by the water company should development be in advance of the necessary infrastructure.

There is one poorly performing storm tank overflows at Chobham WwTW serving Surrey Heath. Growth within this catchment could result in an increase in the operations of this overflows contributing to a worsening of water quality in the area. Action should be taken by the water companies to address these overflows prior to an increase in wastewater demand being generated by new development.

New development proposed within Thames Water's WwTW odour buffer zones are recommended to undergo an odour impact assessment.

10.1.4 Water quality

The EA RNAG dataset indicates that the water industry (sewage discharges) and urbanisation are the main reasons for watercourses not achieving good status in this area. Growth during the local plan period will also increase the discharge of treated wastewater from WwTW in Surrey Heath. There is a potential for this to cause a deterioration in water quality in the receiving watercourses and this must be carefully considered.

The modelling indicates the growth during the Local Plan period would not result in a significant deterioration (10% or over or deterioration in class) in water quality at any of the modelled WwTW. In most cases, this deterioration could be prevented by improvements in treatment. Some tightening of permit limits may already be planned in AMP8 but details have not yet been published.

Growth alone will not prevent GES being prevented in the future should improvements in upstream water quality be made. Where a WwTW is shared with a neighbouring authority, coordination of growth plans in collaboration with Thames Water is essential to ensure that infrastructure is in place prior to development to prevent a breach of the EP.

10.1.5 Environmental constraints and opportunities

The potential impact of development on a number of protected sites such as SAC and SSSIs within, or downstream of the study area should be carefully considered in future plan making.

There are no groundwater SPZs within Surrey Heath. Development sites within the study area could be sources of diffuse pollution from surface runoff.

SuDS are required on all development sites. Their design should consider both water quantity and water quality and site level investigations should be undertaken to define the most appropriate SuDS types for each specific development.

Opportunities exist for these SuDS schemes to offer multiple benefits of flood risk reduction, amenity value and biodiversity. SHBC should be consulted at an early stage of development to ensure that SuDS are implemented and designed in response to site characteristics and policy factors.

In the wider area, opportunities exist to implement NFM techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

10.2 Recommendations

The recommendations from each section in the report are shown in Table 10-1.

Table 10-1: Summary of report recommendations.

Aspect	Action	Responsibility	Timescale
Water resources	Continue to regularly review forecast and actual household growth across the supply region through WRMP Annual Update reports, and where significant change is predicted, engage with LPAs.	Affinity Water, South East Water	Ongoing
Water resources	Provide yearly updates of projected housing growth to water companies to inform WRMP updates.	SHBC	Ongoing
Water resources	The council should consider a domestic water efficiency target of 100l/p/d for all new homes, and work with water suppliers to incentivise even lower consumption. This should be achieved using a fittings-based approach.	SHBC	In a future review of Surrey Heath's Local Plan
Water resources	Use planning policy to require new build non-residential development to achieve at least 3 credits in the Wat01 Measure for water in the BREEAM New Construction standard or an equivalent status.	SHBC	In Surrey Heath's Local Plan
Water resources	The concept of water neutrality has the potential to provide a benefit in improving resilience to climate change and enabling all waterbodies to be brought up to Good status. Explore further with the water companies and the EA how the Council's planning and climate change policies can encourage this approach. This approach could have particular	SHBC, the EA, Affinity Water, South East Water	In Surrey Heath's Local Plan

Aspect	Action	Responsibility	Timescale
	application in strategic sites. This aligns with part 3 of Policy DH4 in SHBC's submitted Local Plan.		
Water resources	Larger residential developments and commercial developments should consider incorporating greywater recycling and/or RwH into development at the master planning stage in order to reduce water demand.	SHBC, Affinity Water, South East Water	In Surrey Heath's Local Plan
Water resources	Water companies should advise SHBC of any strategic water resource infrastructure developments within the study area, where these may require safeguarding of land to prevent other type of development occurring.	SHBC, Affinity Water, South East Water	Part of Surrey Heath's Local Planning process
Water supply	Undertake network modelling to ensure adequate provision of water supply is feasible.	Water companies, SHBC	Ahead of planning applications
Water Supply	SHBC and Developers should engage early with water companies to ensure supply infrastructure is in place prior to occupation.	Water companies, SHBC, developers	Ongoing
Wastewater network	Early engagement between SHBC and Thames Water is required to ensure that where strategic infrastructure is required, it can be planned in by Thames Water, and will not lead to any increase in discharges from sewer overflows.	SHBC, Thames Water	Ongoing
Wastewater network	Take into account wastewater infrastructure constraints in phasing development in partnership with the SU.	SHBC, Thames Water, developers	Ongoing

Aspect	Action	Responsibility	Timescale
Wastewater network	Developers will be expected to work with the SU closely and early in the planning promotion process to develop an Outline Drainage Strategy for sites. The Outline Drainage strategy should demonstrate the wastewater assets required, their locations including points of connection to the public foul sewerage, whether the site drainage will be adopted by the water company and if any sewer requisitions will be required.	SHBC, Thames Water, Developers	Ongoing
Wastewater network	Developers will be expected to demonstrate to the LLFA that surface water from a site will be disposed using a SuDS with connection to surface water sewers seen as the last option. New connections for surface water to foul sewers will be resisted by the LLFA.	SHBC as LLFA, developers	Ongoing
Wastewater treatment	Early engagement with Thames Water is required to ensure that provision of WwTW capacity is aligned with delivery of development.	SHBC, developers	Ongoing
Wastewater treatment	Provide Annual Monitoring Reports to Thames Water detailing projected housing growth.	SHBC	Ongoing
Wastewater treatment	Thames Water to assess capacity demands as part of their wastewater asset planning activities and feed into PR29 business plan for AMP9 to secure funding for upgrades to Camberley and Lightwater WwTWs and feedback to the Council if concerns arise.	Thames Water	Ongoing
Water quality	Provide annual monitoring reports to Affinity Water, Thames Water, and South East Water detailing projected housing growth in the Local Authority.	SHBC	Ongoing
Water quality	Take into account the full volume of growth (from Surrey Heath and neighbouring authorities within the catchment when considering WINEP schemes or upgrades at WwTW.	Thames Water	Ongoing

Aspect	Action	Responsibility	Timescale
Environmental impact	Consider the environmental impact of development on protected sites downstream of receiving wastewater treatment works in the HRA.	SHBC	Local Plan preparation
Environmental impact	The Local Plan should include policies that require all development proposals with the potential to impact on areas with environmental designations to be considered in line with the relevant legislation and where stated, in consultation with Natural England (for national and international designations and priority habitats).	SHBC	In Surrey Heath's Local Plan
Environmental impact	The Local Plan should include policies that require development sites to adopt SuDS to manage water quality of surface runoff.	SHBC	In Surrey Heath's Local Plan
Environmental impact	In partnership, identify opportunities for incorporating SuDS into open spaces and green infrastructure, to deliver strategic flood risk management and meet WFD water quality targets.	SHBC, Thames Water, Affinity Water, South East Water, EA	Ongoing
Environmental impact	Developers should include the design of SuDS at an early stage to maximise the benefits of the scheme.	Developers	Ongoing
Environmental impact	Work with developers to discourage connection of new developments into existing surface water and combined sewer networks. Prevent connections into the foul network, as this is a significant cause of sewer flooding.	SHBC, developers, Thames Water	Ongoing
Environmental impact	Opportunities for NFM that include schemes aimed at reducing / managing runoff should be considered to reduce nutrient and sediment pollution within Surrey Heath.	SHBC, EA, Natural England	Ongoing

Appendices

A Thames Water response to Local Plan Regulation 19 consultation

A.1 Key of responses from Thames Water

Response shortened	Full response
Response A - The scale of development/s is likely to require upgrades to the wastewater network.	The scale of development/s is likely to require upgrades to the wastewater network. It is recommended that the Developer and the Local Planning Authority liaise with Thames Water at the earliest opportunity to agree a housing and infrastructure phasing plan. The plan should determine the magnitude of spare capacity currently available within the network and what phasing may be required to ensure development does not outpace delivery of essential network upgrades to accommodate future development/s. Failure to liaise with Thames Water will increase the risk of planning conditions being sought at the application stage to control the phasing of development in order to ensure that any necessary infrastructure upgrades are delivered ahead of the occupation of development. The developer can request information on network infrastructure by visiting the Thames Water website https://www.thameswater.co.uk/developers/larger-scale-developments/planning-your-development.
Response B - On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s.	On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. It is recommended that the Developer and the Local Planning Authority liaise with Thames Water at the earliest opportunity to advise of the developments phasing. Please contact Thames Water Development Planning, either by email Devcon.team@thameswater.co.uk tel: 02035779998 or in writing Thames Water Utilities Ltd, Maple Lodge STW, Denham Way, Rickmansworth, Hertfordshire, WD3 9SQ.
Comment 1: Foul flows connecting to sewer by gravity, no surface	These comments are based on foul flows connecting to the public sewer by gravity (not pumped) and no surface water flows being discharged to the public sewer.

Response shortened	Full response
water discharged to sewer.	
Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy.	These comments are based on foul flows connecting to the public sewer by gravity (not pumped). Surface water should follow the surface water disposal hierarchy: Store Rainwater for later use > Use infiltration techniques, such as porous surfaces in non-clay areas > Attenuate rainwater in ponds or open water features for gradual release > Discharge rainwater direct to a watercourse.

A.2 Thames Water Regulation 19 Local Plan comments

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
907 - Sir William Siemens Square, 10 Chobham Road, Frimley, Camberley, Surrey	181764	2.1	170	Response A: The scale of development/s is likely to require upgrades to the wastewater network. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/01 - Bagshot Depot and Archaeology Centre, London Road, Bagshot GU19 5HN	53460	0.62	50	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy. For full response, see Section A.1.
HA1/02 - Camberley Centre, France Hill Drive, Camberley, GU15 3QG	37422	0.43	35	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
HA1/03 - Camberley Station, Station House, Pembroke Broadway, Camberley	160380	1.86	150	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/04 - York Town Car Park, Sullivan Road, Camberley	28868.4	0.33	27	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/06 - Chobham Rugby Club, Windsor Road, Chobham	97297.2	1.13	91	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy. For full response, see Section A.1.
HA1/07 - St James House, Knoll Road, Camberley	32076	0.37	30	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
				For full response, see Section A.1.	A.1.
HA1/08 - Land off Spencer Close, Frimley Green	64152	0.74	60	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/09 - Former Portesbery School, Portesbery Road, Camberley	38491.2	0.45	36	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/10 - Land rear of 192-210 London Road, Bagshot	21384	0.25	20	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy. For full response, see Section A.1.
HA1/11 - The Deans, Bridge Road, Bagshot	21384	0.25	20	Response B: On the information available to date we do not envisage infrastructure concerns	Comment 2: Foul flows connecting to sewer by gravity, surface water to

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
				regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	follow surface water disposal hierarchy. For full response, see Section A.1.
HA1/12 - 317 to 319 Guildford Road, Bisley	18176.4	0.21	17	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy. For full response, see Section A.1.
HA1/13 - 280 Gordon Avenue, Camberley	16038	0.19	15	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/14 - Burwood House Hotel, 15 London Road, Camberley	10692	0.12	10	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/15 - 439 - 445	16038	0.19	15	Response B: On the information	Comment 1: Foul flows

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
London Road, Camberley				available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/16 - Land Rear of 1 - 47 Sullivan Road, Camberley	14968.8	0.17	14	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/17 - Broadford, Castle Grove Road, Chobham	16038	0.19	15	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy. For full response, see Section A.1.

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
HA1/18 - Land North of Guildford Road, Deepcut,	22453.2	0.26	21	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/19 - Former Premier Site, Newfoundland Road, Deepcut	13899.6	0.16	13	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/20 - The Grange, St Catherines Road	18176.4	0.21	17	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/21 - 103 - 109 Guildford Road, Lightwater	22453.2	0.26	21	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s.	Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy. For full

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
				For full response, see Section A.1.	response, see Section A.1.
HA1/22 - Land adjacent to Sherrard Way	17107.2	0.2	16	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/23 - St Margarets Cottage and The Ferns, Woodlands Lane, Windlesham	17107.2	0.2	16	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy. For full response, see Section A.1.
HA1/24 - Land East of Benner Lane, West End	17107.2	0.2	16	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 2: Foul flows connecting to sewer by gravity, surface water to follow surface water disposal hierarchy. For full response, see Section A.1.
HA1/25 - Land at Chamness, Woodlands Lane,	21384	0.25	20	Response B: On the information available to date we do not envisage infrastructure concerns	Comment 2: Foul flows connecting to sewer by gravity, surface water to

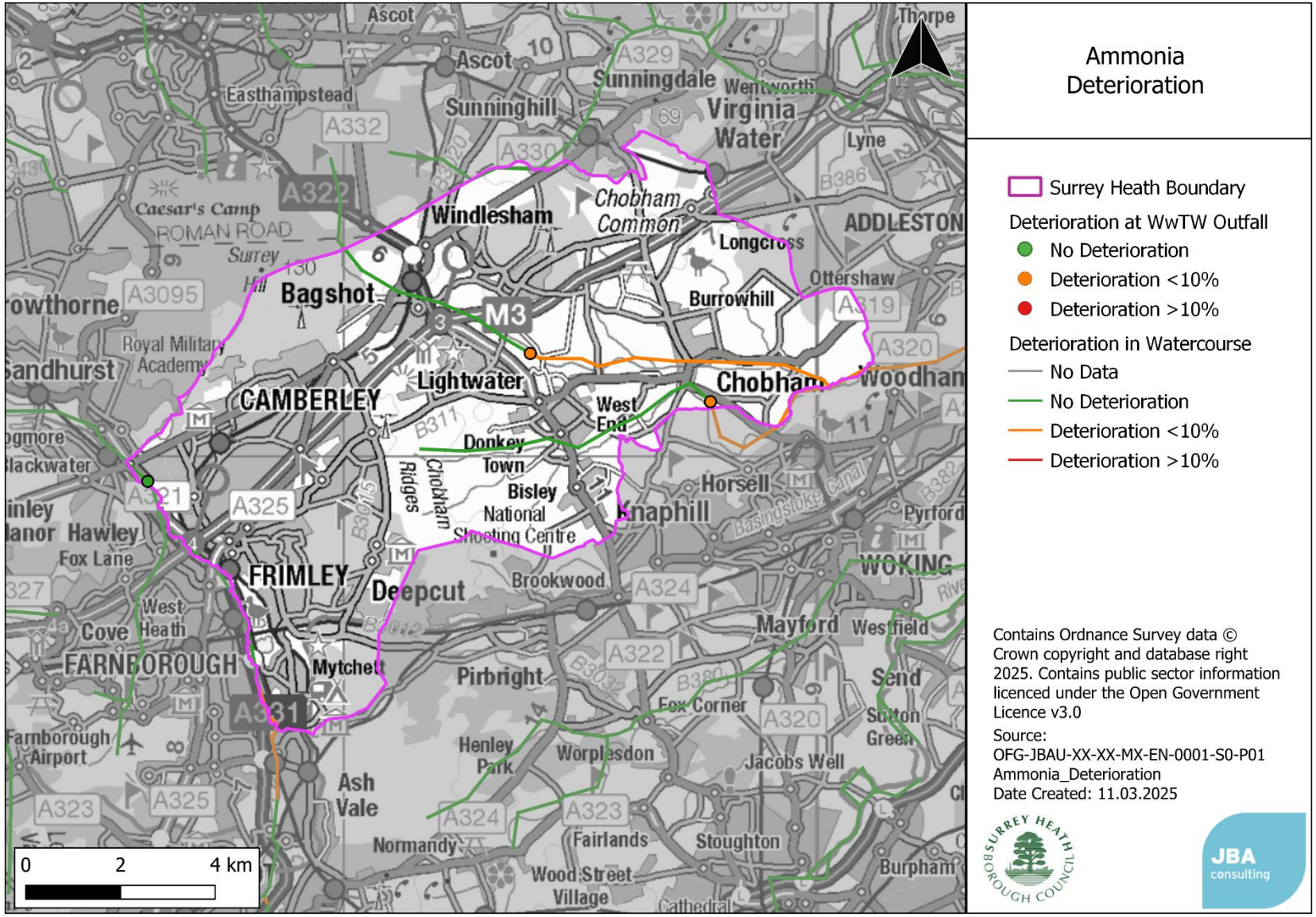
Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
Windlesham				regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	follow surface water disposal hierarchy. For full response, see Section A.1.
HA1/26 - Pinehurst, 141 Park Road, Camberley HA1/26 - Pinehurst, 141 Park Road, Camberley	34214.4	0.4	32	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/27 - Land at Loen, St Catherines Road, Deepcut	64152	0.74	60	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA1/28 - 61 - 63 London Road, Camberley	34214.4	0.4	32	Response B: On the information available to date we do not envisage infrastructure concerns regarding wastewater networks in relation to this development/s. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.

Site Name	Net Gain to System (l/day)	Net Foul Water Increase to System (l/s)	Net Property Equivalent Increase - Waste	Waste Response	Additional Comments
HA2: London Road Block, Camberley Town Centre	588060	6.81	550	Response A: The scale of development/s is likely to require upgrades to the wastewater network. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.
HA3: Land East of Knoll Road, Camberley Town Centre	363528	4.21	340	Response A: The scale of development/s is likely to require upgrades to the wastewater network. For full response, see Section A.1.	Comment 1: Foul flows connecting to sewer by gravity, no surface water discharged to sewer. For full response, see Section A.1.

B Water quality mapping

B.1 Future scenario

The set of maps below show the modelled results if wastewater discharges increased by the volume predicted during the Local Plan period. They show a result at the point of mixing (i.e., where the WwTW discharges) and the results downstream in the river. These are colour coded based on whether deterioration is greater (red) or less than (amber) 10%. Areas where no deterioration is predicted are coloured green.


Ammonia
Deterioration
Surrey Heath Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Data
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2025. Contains public sector information licenced under the Open Government Licence v3.0
Source:
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Ammonia_Deterioration
Date Created: 11.03.2025
0
2
4 km
Ascot
Sunninghill
Sunningdale
Virginia Water
Windlesham
Chobham Common
Longcross
ADDLESTON
Bagshot
M3
Burrowhill
Ottershaw
CAMBERLEY
Lightwater
Chobham
West End
Donkey Town
Bisley
National Shooting Centre
Horsell
Knaphill
FRIMLEY
Deepcut
Brookwood
WOKING
Mayford
Westfield
FARNBOROUGH
Mytchett
Pirbright
Fox Corner
Send
Farnborough Airport
Henley Park
Worplesdon
Jacobs Well
Ash Vale
Normandy
Fairlands
Stoughton
Wood Street Village
Burpham
Hawley
Fox Lane
West Heath
Cove
Easthampstead
Caesar's Camp
ROMAN ROAD
Royal Military Academy
Blackwater
Pyrford
Lyne
A322
A329
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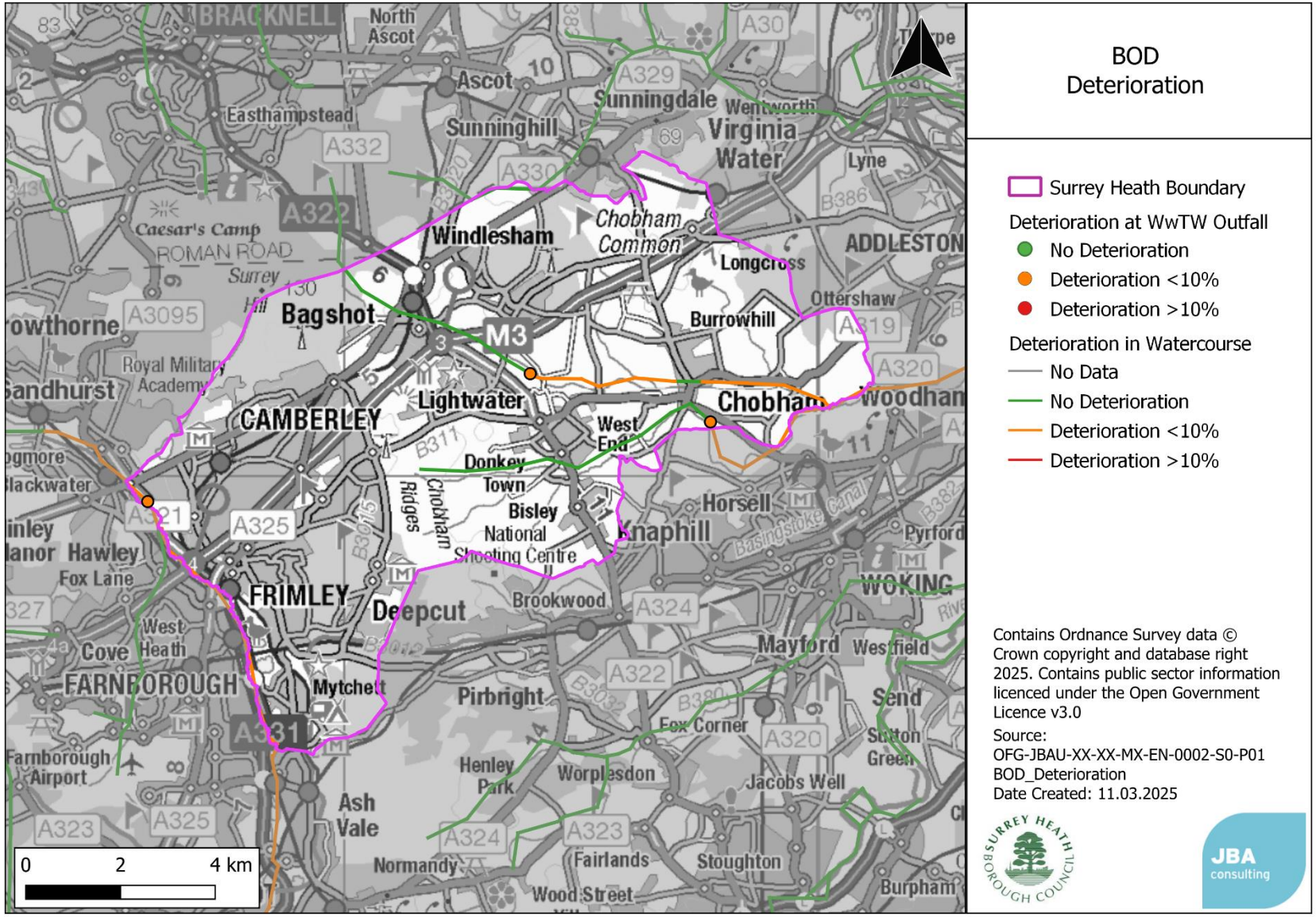
BOD
Deterioration
Surrey Heath Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Data
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2025. Contains public sector information licenced under the Open Government Licence v3.0
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4 km
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North Ascot
Ascot
Sunninghill
Sunningdale
Virginia Water
Easthampstead
Caesar's Camp
ROMAN ROAD
Windlesham
Chobham Common
Longcross
ADDLESTONE
Bagshot
Burrowhill
Ottershaw
Royal Military Academy
Lightwater
CAMBERLEY
West End
Chobham
Woodham
Donkey Town
Bisley
National Shooting Centre
Horsell
Knaphill
Pyrford
WOKING
Hawley
Fox Lane
FRIMLEY
Deepcut
Brookwood
West Heath
Cove
FARNBOROUGH
Mytchett
Pirbright
Mayford
Westfield
Send
Sutton Green
Fox Corner
Farnborough Airport
Henley Park
Worplesdon
Jacobs Well
Ash Vale
Normandy
Fairlands
Stoughton
Wood Street
Burpham
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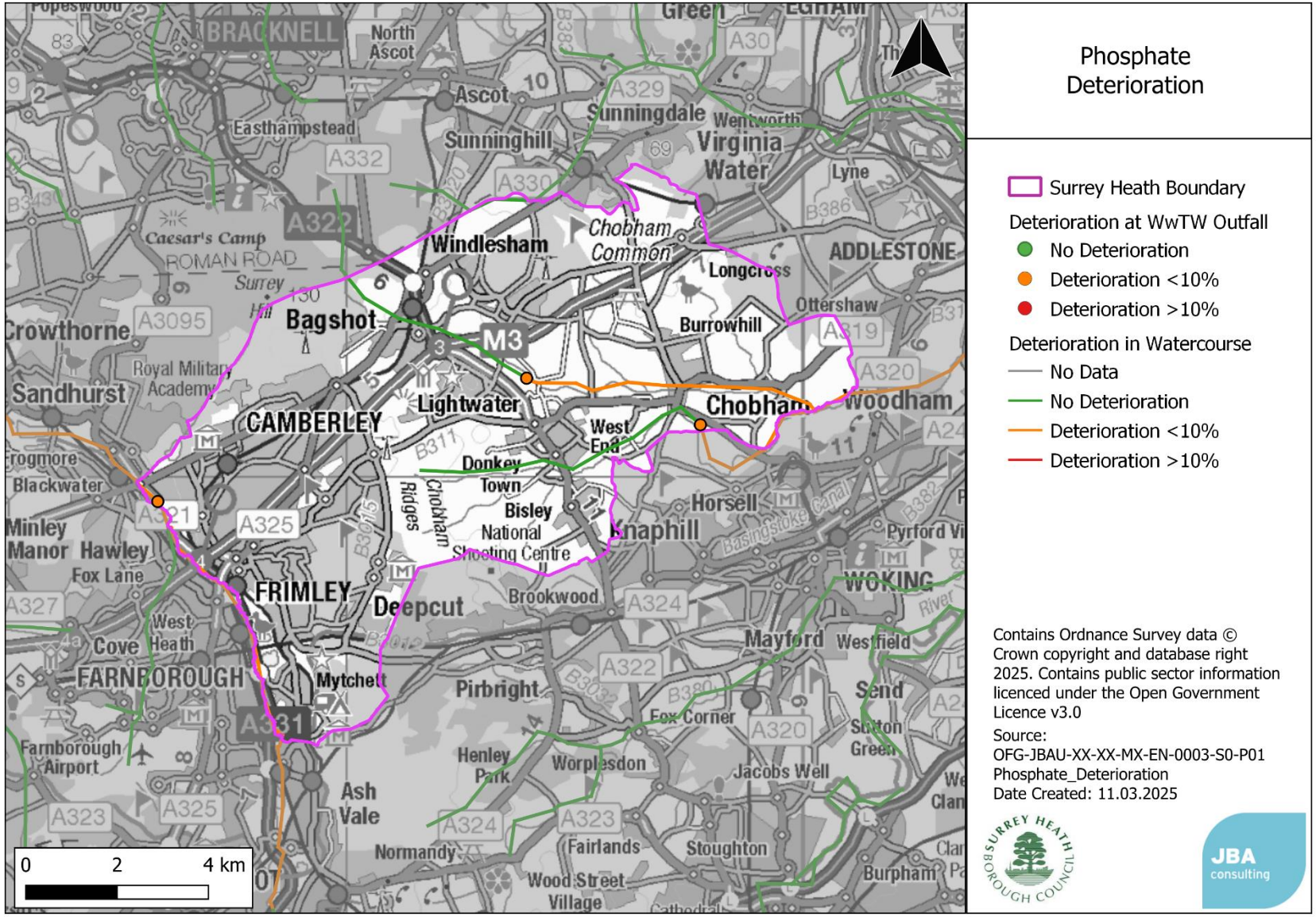
A322
A331


Phosphate Deterioration
Surrey Heath Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Data
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2025. Contains public sector information licenced under the Open Government Licence v3.0
Source: OFG-JBAU-XX-XX-MX-EN-0003-S0-P01 Phosphate_Deterioration
Date Created: 11.03.2025
0 2 4 km
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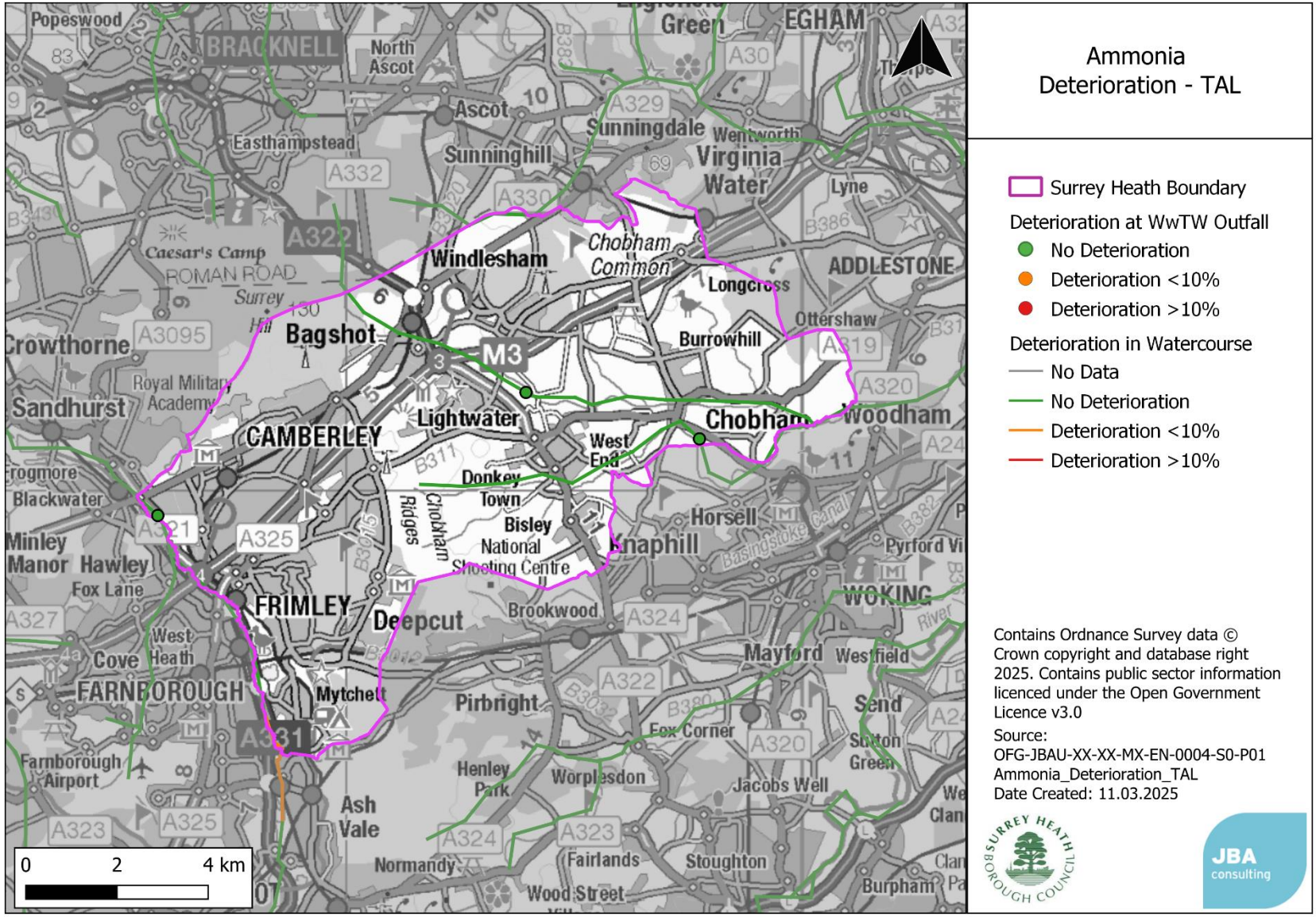
North Ascot
Ascot
Sunninghill
Sunningdale
Virginia Water
Easthampstead
Windlesham
Chobham Common
ADDLESTONE
Longcross
Ottershaw
Burrowhill
Bagshot
M3
Crowthorne
Sandhurst
Royal Military Academy
CAMBERLEY
Lightwater
Chobham
Woodham
West End
Donkey Town
Blackwater
Bisley
National Shooting Centre
Horsell
Knaphill
Minley Manor
Hawley
Fox Lane
FRIMLEY
Deepcut
Brookwood
WOKING
Mayford
Westfield
West Heath
Cove
FARNBOROUGH
Mytchett
Pirbright
Send
Fox Corner
Sutton Green
Farnborough Airport
Henley Park
Worplesdon
Jacobs Well
Ash Vale
Normandy
Fairlands
Stoughton
Wood Street Village
Burpham

B.2 TAL scenario

This second set of maps show the modelled results in the Technically Achievable Limit (TAL) scenario, where each WwTW has been upgraded to the TAL. This shows areas where deterioration could not be prevented. In each case this is less than 10%.


Ammonia
Deterioration - TAL
Surrey Heath Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Data
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2025. Contains public sector information licenced under the Open Government Licence v3.0
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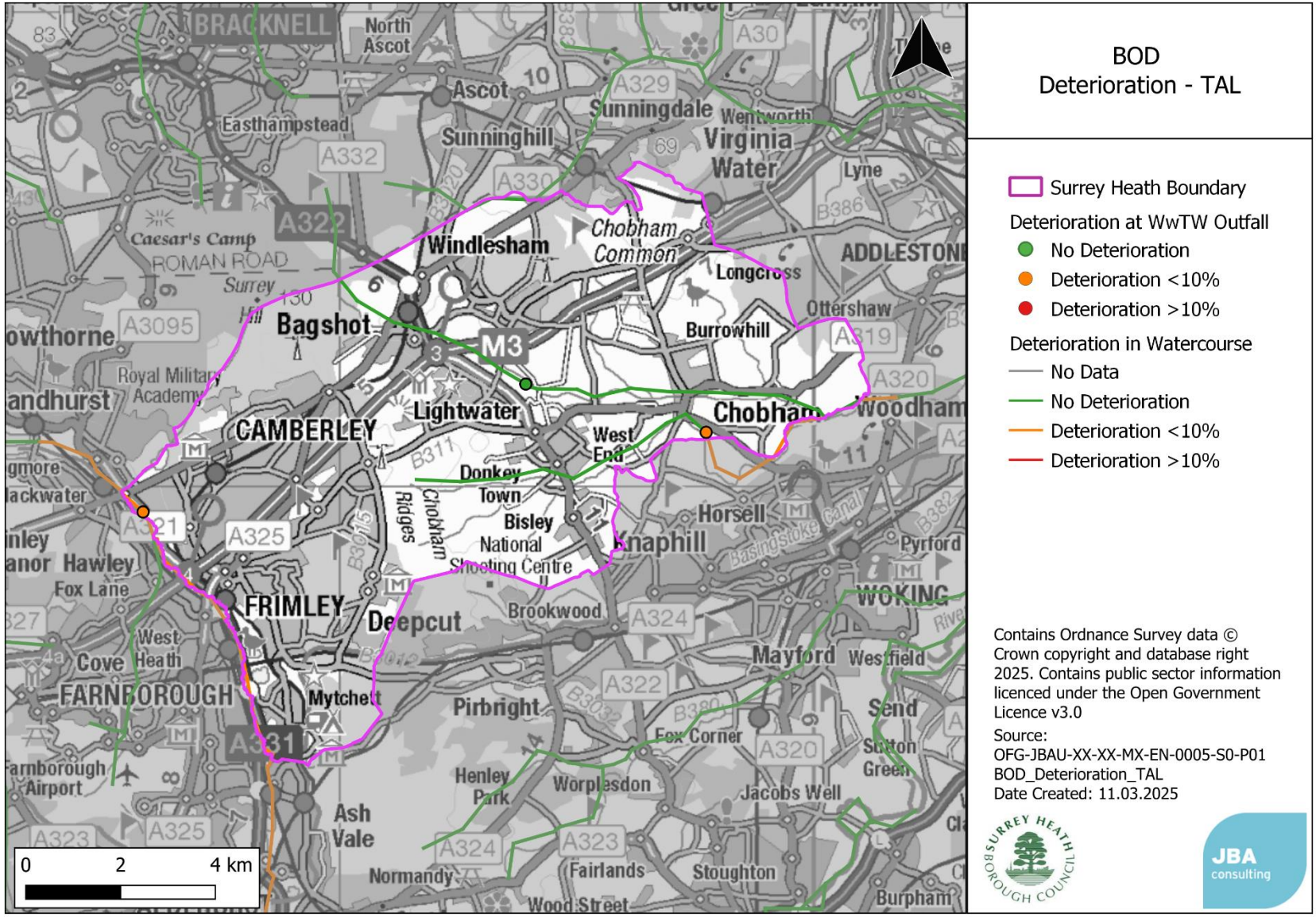
BRACKNELL
North Ascot
Ascot
Sunninghill
Sunningdale
Virginia Water
EGHAM
Easthampstead
Windlesham
Chobham Common
Longcross
ADDLESTONE
Ottershaw
Burrowhill
Bagshot
M3
Crowthorne
Royal Military Academy
Sandhurst
CAMBERLEY
Lightwater
Chobham
Woodham
West End
Donkey Town
Bisley
National Shooting Centre
Blackwater
Minley Manor
Hawley
Fox Lane
FRIMLEY
Deepcut
Brookwood
Horsell
Knaphill
WOKING
Pyrford
Mayford
Westfield
West Heath
Cove
FARNBOROUGH
Mytchett
Pirbright
Fox Corner
Send
Send Marsh/Burnt Common
Farnborough Airport
Henley Park
Worplesdon
Jacobs Well
Ash Vale
Normandy
Fairlands
Stoughton
Wood Street
Burpham


BOD
Deterioration - TAL
Surrey Heath Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Data
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2025. Contains public sector information licenced under the Open Government Licence v3.0
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BRACKNELL
North Ascot
Ascot
Sunninghill
Sunningdale
Virginia Water
Wentworth
Lyne
Easthampstead
Caesar's Camp
ROMAN ROAD
Windlesham
Chobham Common
Longcross
ADDLESTONE
Ottershaw
Burrowhill
Bagshot
M3
Royal Military Academy
Lightwater
CAMBERLEY
Chobham
Woodham
West End
Donkey Town
Bisley
National Shooting Centre
Chobham Ridges
Horsell
Knaphill
Pyrford
WOKING
Basingstoke Canal
Hawley
Fox Lane
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Send
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Jacobs Well
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Normandy
Fairlands
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Wood Street
Burpham
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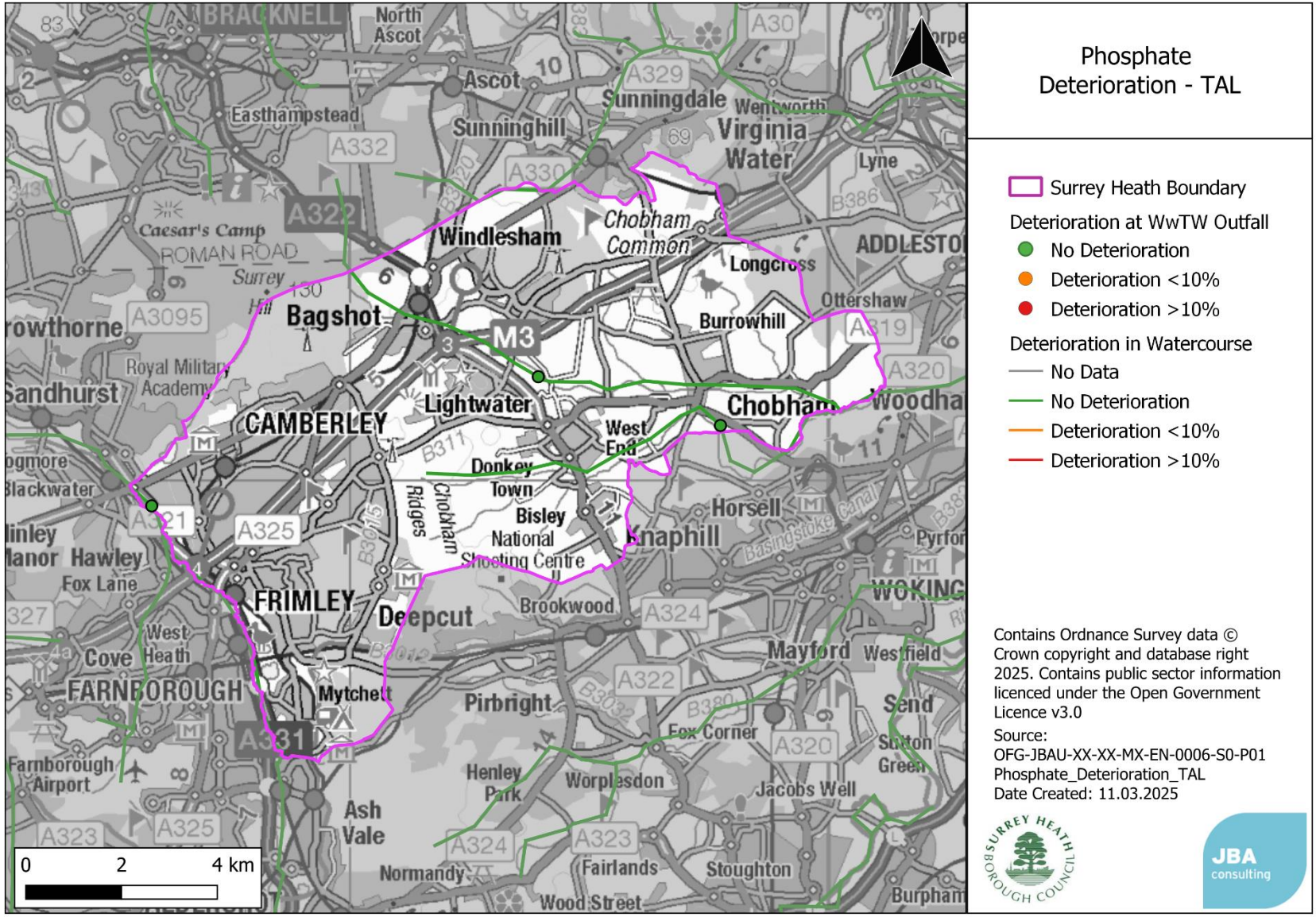
Phosphate
Deterioration - TAL
Surrey Heath Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Data
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2025. Contains public sector information licenced under the Open Government Licence v3.0
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4 km
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CAMBERLEY
FRIMLEY
Deepcut
FARNBOROUGH
Windlesham
Lightwater
Chobham
Horsell
Knaphill
Mytchett
Pirbright
Ash Vale
Normandy
Fairlands
Stoughton
Mayford
Send
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Chobham Common
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Chobham Ridges
Basingstoke Canal
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A319
A329
A30
A332
A330
A3095
B311
B386
B3015
B3032
B3380

C Wastewater treatment works deterioration

C.1 Ammonia

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class (WFD Cycle 3)	Baseline Class (model)	Future Class	TAL Class
Camberley STW	0.30	0.30	0%	0.30	0%	HIGH	GOOD	GOOD	GOOD
Chobham STW	1.02	1.03	1%	0.46	-55%	MODERATE	MODERATE	MODERATE	GOOD
Lightwater STW	1.90	1.93	2%	0.51	-73%	HIGH	POOR	POOR	GOOD

C.2 Biochemical oxygen demand

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class (WFD Cycle 3)	Baseline Class (model)	Future Class	TAL Class
Camberley STW	2.91	2.95	1%	2.94	1%	Not assessed	HIGH	HIGH	HIGH

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class (WFD Cycle 3)	Baseline Class (model)	Future Class	TAL Class
Chobham STW	2.04	2.04	0%	2.04	0%	Not assessed	HIGH	HIGH	HIGH
Lightwater STW	2.55	2.57	1%	2.51	-2%	Not assessed	HIGH	HIGH	HIGH

C.3 Phosphate

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class (WFD Cycle 3)	Baseline Class (model)	Future Class	TAL Class
Camberley STW	0.20	0.21	6%	0.18	-8%	MODERATE	POOR	POOR	POOR
Chobham STW	0.19	0.19	1%	0.12	-37%	MODERATE	POOR	POOR	MODERATE
Lightwater STW	0.40	0.41	2%	0.13	-68%	MODERATE	POOR	POOR	MODERATE

D Groundwater dependent terrestrial ecosystems

SSSI Code	SSSI Name	Groundwater Body	Significant Water Management Issue
1000031	West's Meadow, Aldermaston (SSSI)	Aldermaston Bagshot Beds	No
1002748	Pamber Forest & Silchester Common (SSSI)	Aldermaston Bagshot Beds	No
1004214	Ashford Hill Woods & Meadows (SSSI)	Aldermaston Bagshot Beds	No
1004254	Ron Ward's Meadow with Tadley Pastures (SSSI)	Aldermaston Bagshot Beds	No
1006377	Decoy Pit, Pools & Woods (SSSI)	Aldermaston Bagshot Beds	No
1003053	Noar Hill (SSSI)	Alton Chalk	No
1004170	Wick Wood & Worldham Hangers (SSSI)	Alton Chalk	No
1000282	Greywell Fen (SSSI)	Basingstoke Chalk	Yes
1001308	Mapledurwell Fen (SSSI)	Basingstoke Chalk	Yes
1001426	Freeman's Marsh (SSSI)	Berkshire Downs Chalk	Yes
1001463	Boxford Water Meadows (SSSI)	Berkshire Downs Chalk	Yes
1001972	Savernake Forest (SSSI)	Berkshire Downs Chalk	Yes
1002533	Chilton Foliat Meadows (SSSI)	Berkshire Downs Chalk	Yes

SSSI Code	SSSI Name	Groundwater Body	Significant Water Management Issue
1002628	Easton Farm Meadow (SSSI)	Berkshire Downs Chalk	Yes
1002762	Thatcham Reed Beds (SSSI)	Berkshire Downs Chalk	Yes
1003937	Sulham & Tidmarsh Woods & Meadows (SSSI)	Berkshire Downs Chalk	Yes
1004019	Snelsmore Common (SSSI)	Berkshire Downs Chalk	Yes
1004436	Burghclere Beacon (SSSI)	Berkshire Downs Chalk	Yes
2000109	Kennet & Lambourn Floodplain (SSSI)	Berkshire Downs Chalk	Yes
2000123	Kennet Valley Alderwoods (SSSI)	Berkshire Downs Chalk	Yes
1000780	Esher Commons (SSSI)	Chobham Bagshot Beds	No
1001052	Ockham & Wisley Commons (SSSI)	Chobham Bagshot Beds	No
1001865	Whitmoor Common (SSSI)	Chobham Bagshot Beds	No
1003051	Englemere Pond (SSSI)	Chobham Bagshot Beds	No
1004040	Swinley Park & Brick Pits (SSSI)	Chobham Bagshot Beds	No
1004110	Windsor Forest & Great Park (SSSI)	Chobham Bagshot Beds	No

SSSI Code	SSSI Name	Groundwater Body	Significant Water Management Issue
1004332	Chobham Common (SSSI)	Chobham Bagshot Beds	No
1006793	Smarts & Prey Heaths (SSSI)	Chobham Bagshot Beds	No
1007206	Dumsey Meadow (SSSI)	Chobham Bagshot Beds	No
1000977	Mole Gap to Reigate Escarpment (SSSI)	Dorking North Downs Chalk	Yes
1001091	Quarry Hangers (SSSI)	Dorking North Downs Chalk	Yes
1000009	Ash to Brookwood Heaths (SSSI)	Farnborough Bagshot Beds	No
1000117	Foxlease & Ancell's Meadows (SSSI)	Farnborough Bagshot Beds	No
1000162	Eelmoor Marsh (SSSI)	Farnborough Bagshot Beds	No
1001444	Wellington College Bog (SSSI)	Farnborough Bagshot Beds	No
1001502	Longmoor Bog (SSSI)	Farnborough Bagshot Beds	No
1001957	Colony Bog & Bagshot Heath (SSSI)	Farnborough Bagshot Beds	No
1002712	Fleet Pond (SSSI)	Farnborough Bagshot Beds	No
1002756	Odiham Common with Bagwell Green & Shaw (SSSI)	Farnborough Bagshot Beds	No

SSSI Code	SSSI Name	Groundwater Body	Significant Water Management Issue
1003263	Blackwater Valley (SSSI)	Farnborough Bagshot Beds	No
1003946	Bramshill (SSSI)	Farnborough Bagshot Beds	No
1004008	Sandhurst to Owlsmoor Bogs & Heaths (SSSI)	Farnborough Bagshot Beds	No
1004223	Broadmoor to Bagshot Woods & Heaths (SSSI)	Farnborough Bagshot Beds	No
1004262	West Minley Meadow (SSSI)	Farnborough Bagshot Beds	No
1006588	Basingstoke Canal (SSSI)	Farnborough Bagshot Beds	No
1006761	Bourley & Long Valley (SSSI)	Farnborough Bagshot Beds	No
1006836	Castle Bottom to Yateley and Hawley Commons (SSSI)	Farnborough Bagshot Beds	No
1000066	Colyers Hanger (SSSI)	Guildford Chalk	No
1001171	Sheepleas (SSSI)	Guildford Chalk	No
1000859	Thorpe Hay Meadow (SSSI)	Lower Thames Gravels	Yes
1000918	Langham Pond (SSSI)	Lower Thames Gravels	Yes
1001792	Staines Moor (SSSI)	Lower Thames Gravels	Yes
1002024	Fray's Farm Meadows (SSSI)	Lower Thames Gravels	Yes

SSSI Code	SSSI Name	Groundwater Body	Significant Water Management Issue
1004168	Wraysbury & Hythe End Gravel Pits (SSSI)	Lower Thames Gravels	Yes
1004281	Syon Park (SSSI)	Lower Thames Gravels	Yes
1006011	Bray Pennyroyal Field (SSSI)	Lower Thames Gravels	Yes
1003457	Alresford Pond (SSSI)	River Itchen Chalk	Yes
2000227	River Itchen (SSSI)	River Itchen Chalk	Yes
1000099	Chilbolton Common (SSSI)	River Test Chalk	Yes
1000182	Stockbridge Common Marsh (SSSI)	River Test Chalk	Yes
1000342	Stockbridge Fen (SSSI)	River Test Chalk	Yes
1002517	Bere Mill Meadows (SSSI)	River Test Chalk	Yes
1003140	Porton Down (SSSI)	River Test Chalk	Yes
1003152	East Aston Common (SSSI)	River Test Chalk	Yes
1003209	Rushmore & Conholt Downs (SSSI)	River Test Chalk	Yes
1003778	Bransbury Common (SSSI)	River Test Chalk	Yes
2000170	River Test (SSSI)	River Test Chalk	Yes
1001497	Moorend Common (SSSI)	South-West Chilterns Chalk	Yes

SSSI Code	SSSI Name	Groundwater Body	Significant Water Management Issue
1001558	Bix Bottom (SSSI)	South-West Chilterns Chalk	Yes
1001609	Rodbed Wood (SSSI)	South-West Chilterns Chalk	Yes
1002431	Widdenton Park Wood (SSSI)	South-West Chilterns Chalk	Yes
1002879	Naphill Common (SSSI)	South-West Chilterns Chalk	Yes
1003614	Frieth Meadows (SSSI)	South-West Chilterns Chalk	Yes
1005595	Temple Island Meadows (SSSI)	South-West Chilterns Chalk	Yes
1002602	Briff Lane Meadows (SSSI)	Thatcham Tertiaries	No
1002813	Avery's Pightle (SSSI)	Thatcham Tertiaries	No
1003103	Bowdown & Chamberhouse Woods (SSSI)	Thatcham Tertiaries	No
1003838	King's Copse (SSSI)	Thatcham Tertiaries	No
1000329	Great Thrift Wood (SSSI)	Twyford Tertiaries	No
1000513	Burnham Beeches (SSSI)	Twyford Tertiaries	No
1002741	Littleworth Common (SSSI)	Twyford Tertiaries	No
1003870	Lodge Wood & Sandford Mill (SSSI)	Twyford Tertiaries	No
2000299	Bray Meadows (SSSI)	Twyford Tertiaries	No

E Protected sites adjacent to rivers within WRZs serving Surrey Heath

E.1 Sites of special scientific interest

SSSI Code	SSSI Name	Catchment Name	Significant Water Management Issue
1006588	Horsell Common	Addlestone Bourne (Mill/Hale to Chertsey Bourne)	Yes
1000117	Horsell Common	Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge	Yes
1001308	Horsell Common	Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge	Yes
1002712	River Itchen	Arle	Yes
1003263	Ashford Hill Woods and Meadows	Baughurst Brook	No
1003946	Ashford Hill Woods and Meadows	Baughurst Brook	No
1004008	Ashford Hill Woods and Meadows	Baughurst Brook	No
1000009	Castle Bottom to Yateley and Hawley Commons	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
1000009	Castle Bottom to Yateley and Hawley Commons	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
1006761	Blackwater Valley	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
1006761	Bramshill	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
1006761	Sandhurst to Owlsmoor Bogs and Heaths	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes

SSSI Code	SSSI Name	Catchment Name	Significant Water Management Issue
1006761	Broadmoor to Bagshot Woods and Heaths	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
1006761	Castle Bottom to Yateley and Hawley Commons	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
1004223	Pamber Forest and Silchester Common	Bow Brook (Pamber End to Bramley)	No
1006836	Windsor Forest and Great Park	Chertsey Bourne (Sunningdale to Virginia Water)	No
1006836	Windsor Forest and Great Park	Chertsey Bourne (Sunningdale to Virginia Water)	No
1000009	Denham Lock Wood	Colne (Confluence with Chess to River Thames)	Yes
1001070	Staines Moor	Colne (Confluence with Chess to River Thames)	Yes
1001070	Wraysbury Reservoir	Colne (Confluence with Chess to River Thames)	Yes
1003046	Fray's Farm Meadows	Colne (Confluence with Chess to River Thames)	Yes
1004466	Mid Colne Valley	Colne (Confluence with Chess to River Thames)	Yes
1004466	Ruislip Woods	Colne (Confluence with Chess to River Thames)	Yes
1004466	Staines Moor	Colne (Confluence with Chess to River Thames)	Yes
1003463	Windsor Forest and Great Park	Cut (Ascot to Bull Brook confluence at Warfield)	Yes
1003463	Windsor Forest and Great Park	Cut (Ascot to Bull Brook confluence at Warfield)	Yes
1006836	Great Thrift Wood	Cut (Binfield to River Thames confluence) and Maidenhead Ditch	No
1001883	River Test	Dever	No
1002963	Bransbury Common	Dever	No

SSSI Code	SSSI Name	Catchment Name	Significant Water Management Issue
1002024	Papercourt	East Clandon Stream	No
1003463	Heath Lake	Emm Brook	Yes
1001792	Bourley and Long Valley	Fleet Brook	No
1001792	Bourley and Long Valley	Fleet Brook	No
1003469	Foxlease and Ancells Meadows	Fleet Brook	No
1003633	Fleet Pond	Fleet Brook	No
1003870	Bourley and Long Valley	Fleet Brook	No
1005507	Bourley and Long Valley	Fleet Brook	No
2000374	Bourley and Long Valley	Fleet Brook	No
1000926	Basingstoke Canal	Hart (Crondall to Elvetham)	No
1003870	Bourley and Long Valley	Hart (Crondall to Elvetham)	No
1003463	Hazeley Heath	Hart (Elvetham to Hartley Wintney)	Yes
1003463	Ash to Brookwood Heaths	Hoe Stream (Normandy to Pirbright)	Yes
1003463	Ash to Brookwood Heaths	Hoe Stream (Normandy to Pirbright)	Yes
1003463	Ash to Brookwood Heaths	Hoe Stream (Normandy to Pirbright)	Yes
1001027	Whitmoor Common	Hoe Stream (Pirbright to River Wey confluence at Woking)	Yes
1001027	Whitmoor Common	Hoe Stream (Pirbright to River Wey confluence at Woking)	Yes
1001609	Whitmoor Common	Hoe Stream (Pirbright to River Wey confluence at Woking)	Yes

SSSI Code	SSSI Name	Catchment Name	Significant Water Management Issue
1004371	Smart's and Prey Heaths	Hoe Stream (Pirbright to River Wey confluence at Woking)	Yes
1004371	Smart's and Prey Heaths	Hoe Stream (Pirbright to River Wey confluence at Woking)	Yes
1004110	Stanford End Mill and River Loddon	Loddon (Sherfield on Loddon to Swallowfield)	No
1004110	Lodge Wood & Sandford Mill	Loddon (Swallowfield to River Thames confluence)	No
2000385	Lodge Wood & Sandford Mill	Loddon (Swallowfield to River Thames confluence)	No
1002835	Syon Park	Lower Brent	Yes
1005595	Brent Reservoir	Lower Brent	Yes
1000870	Mapledurwell Fen	Lyde	No
1000066	Cock Marsh	Maidenhead Ditch	Yes
1006793	Bray Meadows	Maidenhead Ditch	Yes
1000918	Reigate Heath	Mole (Horley to Hersham)	Yes
1001865	Esher Commons	Mole (Horley to Hersham)	Yes
1001865	Mole Gap to Reigate Escarpment	Mole (Horley to Hersham)	Yes
1001865	Mole Gap to Reigate Escarpment	Mole (Horley to Hersham)	Yes
1002748	Mole Gap to Reigate Escarpment	Mole (Horley to Hersham)	Yes
1004168	Reigate Heath	Mole (Horley to Hersham)	Yes
1006011	Mole Gap to Reigate Escarpment	Mole (Horley to Hersham)	Yes
1006793	Bookham Commons	Mole (Horley to Hersham)	Yes
1007206	Moor Park	North Wey (Alton to Tilford)	Yes

SSSI Code	SSSI Name	Catchment Name	Significant Water Management Issue
2000381	Moor Park	North Wey (Alton to Tilford)	Yes
2000738	Kempton Park Reservoirs	Portlane Brook	Yes
1004110	Binswood	Slea (Kingsley to Sleaford)	No
1004110	Broxhead and Kingsley Commons	Slea (Kingsley to Sleaford)	No
2000738	Thursley, Hankley & Frensham Commons	South Wey (River Slea confluence to Tilford)	Yes
2000738	Thursley, Hankley & Frensham Commons	South Wey (River Slea confluence to Tilford)	Yes
2000383	Staines Moor	Surrey Ash	Yes
1002611	Stockbridge Fen	Test - conf Anton to conf Dun	No
1003634	Stockbridge Common Marsh	Test - conf Anton to conf Dun	No
1006588	Chilbolton Common	Test - conf Dever to conf Anton	Yes
1000859	River Test	Test (Lower)	No
1001037	Lower Test Valley	Test (Lower)	No
2000382	Bere Mill Meadows	Test (Upper)	No
1000870	Wraysbury & Hythe End Gravel Pits	Thames (Cookham to Egham)	Yes
1000870	Wraysbury No. 1 Gravel Pit	Thames (Cookham to Egham)	Yes
1001957	Bray Pennyroyal Field	Thames (Cookham to Egham)	Yes
1001957	Langham Pond	Thames (Cookham to Egham)	Yes
1002517	Bushy Park and Home Park	Thames (Egham to Teddington)	Yes

SSSI Code	SSSI Name	Catchment Name	Significant Water Management Issue
1003778	Dumsey Meadow	Thames (Egham to Teddington)	Yes
1004456	Knight & Bessborough Reservoirs	Thames (Egham to Teddington)	Yes
2000170	Bushy Park and Home Park	Thames (Egham to Teddington)	Yes
2000227	Bushy Park and Home Park	Thames (Egham to Teddington)	Yes
1000780	Rodbed Wood	Thames (Reading to Cookham)	Yes
1000977	Temple Island Meadows	Thames (Reading to Cookham)	Yes
1000977	Bisham Woods	Thames (Reading to Cookham)	Yes
1000977	Thorpe Hay Meadow	The Moat at Egham	Yes
1000977	Thorpe Park No. 1 Gravel Pit	The Moat at Egham	Yes
1006761	Colyers Hanger	Tillingbourne	No
1001037	Papercourt	Wey (Shalford to River Thames confluence at Weybridge)	Yes
1001037	Ockham and Wisley Commons	Wey (Shalford to River Thames confluence at Weybridge)	Yes
1001037	Wey Valley Meadows	Wey (Shalford to River Thames confluence at Weybridge)	Yes
1001052	Wey Valley Meadows	Wey (Shalford to River Thames confluence at Weybridge)	Yes
1001127	Papercourt	Wey (Shalford to River Thames confluence at Weybridge)	Yes
1001127	Papercourt	Wey (Shalford to River Thames confluence at Weybridge)	Yes

SSSI Code	SSSI Name	Catchment Name	Significant Water Management Issue
1003463	Wey Valley Meadows	Wey (Shalford to River Thames confluence at Weybridge)	Yes
1003463	Wey Valley Meadows	Wey (Shalford to River Thames confluence at Weybridge)	Yes
1000282	Wey Valley Meadows	Wey (Tilford to Shalford)	Yes
1000329	Wey Valley Meadows	Wey (Tilford to Shalford)	Yes
1000392	Wey Valley Meadows	Wey (Tilford to Shalford)	Yes
1000392	Wey Valley Meadows	Wey (Tilford to Shalford)	Yes
1001792	Wey Valley Meadows	Wey (Tilford to Shalford)	Yes
1002756	Puttenham & Crooksbury Commons	Wey (Tilford to Shalford)	Yes
1002979	Wey Valley Meadows	Wey (Tilford to Shalford)	Yes
1003322	Thursley, Hankley & Frensham Commons	Wey (Tilford to Shalford)	Yes
1003463	Charleshill	Wey (Tilford to Shalford)	Yes
1003463	Charterhouse to Eashing	Wey (Tilford to Shalford)	Yes
1004214	Charterhouse to Eashing	Wey (Tilford to Shalford)	Yes
1004214	Charterhouse to Eashing	Wey (Tilford to Shalford)	Yes
1004214	Puttenham & Crooksbury Commons	Wey (Tilford to Shalford)	Yes
1004281	Thursley, Hankley & Frensham Commons	Wey (Tilford to Shalford)	Yes
2000299	Wey Valley Meadows	Wey (Tilford to Shalford)	Yes
1000099	Colony Bog and Bagshot Heath	Wey Navigation (Pyrford reach)	Yes

SSSI Code	SSSI Name	Catchment Name	Significant Water Management Issue
1004371	Basingstoke Canal	Wey Navigation (Pyrford reach)	Yes
1004371	Colony Bog and Bagshot Heath	Wey Navigation (Pyrford reach)	Yes
1000182	Warnborough Green	Whitewater	Yes
1000342	Warnborough Green	Whitewater	Yes
1001282	Odiham Common with Bagwell Green and Shaw	Whitewater	Yes
2000170	Greywell Fen	Whitewater	Yes

E.2 Special areas of conservation

SAC Code	SAC Name	Catchment name	Significant Water Management Issue
UK0012599	River Itchen	Arle	Yes
UK0012586	Windsor Forest & Great Park	Chertsey Bourne (Sunningdale to Virginia Water)	No
UK0012586	Windsor Forest & Great Park	Chertsey Bourne (Sunningdale to Virginia Water)	No
UK0012586	Windsor Forest & Great Park	Cut (Ascot to Bull Brook confluence at Warfield)	Yes
UK0012793	Thursley, Ash, Pirbright & Chobham	Hoe Stream (Normandy to Pirbright)	Yes

SAC Code	SAC Name	Catchment name	Significant Water Management Issue
UK0012793	Thursley, Ash, Pirbright & Chobham	Hoe Stream (Normandy to Pirbright)	Yes
UK0012793	Thursley, Ash, Pirbright & Chobham	Hoe Stream (Normandy to Pirbright)	Yes
UK0012599	River Itchen	Itchen	Yes
UK0012804	Mole Gap to Reigate Escarpment	Mole (Horley to Hersham)	Yes
UK0012804	Mole Gap to Reigate Escarpment	Mole (Horley to Hersham)	Yes
UK0012804	Mole Gap to Reigate Escarpment	Mole (Horley to Hersham)	Yes
UK0012804	Mole Gap to Reigate Escarpment	Mole (Horley to Hersham)	Yes
UK0012793	Thursley, Ash, Pirbright & Chobham	South Wey (River Slea confluence to Tilford)	Yes
UK0012793	Thursley, Ash, Pirbright & Chobham	South Wey (River Slea confluence to Tilford)	Yes
UK0012586	Windsor Forest & Great Park	Thames (Cookham to Egham)	Yes
UK0012724	Chilterns Beechwoods	Thames (Reading to Cookham)	Yes
UK0012793	Thursley, Ash, Pirbright & Chobham	Wey (Tilford to Shalford)	Yes
UK0012793	Thursley, Ash, Pirbright & Chobham	Wey (Tilford to Shalford)	Yes
UK0012793	Thursley, Ash, Pirbright &	Wey Navigation (Pyrford reach)	Yes

SAC Code	SAC Name	Catchment name	Significant Water Management Issue
	Chobham		

E.3 Special protection areas

SPA Code	SPA Name	Catchment name	Significant Water Management Issue
UK9012141	Thames Basin Heaths	Addlestone Bourne (Mill/Hale to Chertsey Bourne)	Yes
UK9012141	Thames Basin Heaths	Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge)	Yes
UK9012141	Thames Basin Heaths	Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge)	Yes
UK9012141	Thames Basin Heaths	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
UK9012141	Thames Basin Heaths	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
UK9012141	Thames Basin Heaths	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
UK9012141	Thames Basin Heaths	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
UK9012141	Thames Basin Heaths	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes
UK9012141	Thames Basin Heaths	Blackwater (Hawley to Whitewater confluence at Bramshill)	Yes

SPA Code	SPA Name	Catchment name	Significant Water Management Issue
UK9012171	South West London Waterbodies	Colne (Confluence with Chess to River Thames)	Yes
UK9012171	South West London Waterbodies	Colne (Confluence with Chess to River Thames)	Yes
UK9012141	Thames Basin Heaths	Fleet Brook	No
UK9012141	Thames Basin Heaths	Fleet Brook	No
UK9012141	Thames Basin Heaths	Fleet Brook	No
UK9012141	Thames Basin Heaths	Fleet Brook	No
UK9012141	Thames Basin Heaths	Hart (Crondall to Elvetham)	No
UK9012141	Thames Basin Heaths	Hart (Elvetham to Hartley Wintney)	Yes
UK9012141	Thames Basin Heaths	Hoe Stream (Normandy to Pirbright)	Yes
UK9012141	Thames Basin Heaths	Hoe Stream (Normandy to Pirbright)	Yes
UK9012141	Thames Basin Heaths	Hoe Stream (Normandy to Pirbright)	Yes
UK9012141	Thames Basin Heaths	Hoe Stream (Pirbright to River Wey confluence at Woking)	Yes
UK9012141	Thames Basin Heaths	Hoe Stream (Pirbright to River Wey confluence at Woking)	Yes
UK9012141	Thames Basin Heaths	Hoe Stream (Pirbright to River Wey confluence at Woking)	Yes
UK9012171	South West London Waterbodies	Portlane Brook	Yes
UK9012132	Wealden Heaths Phase II	Slea (Kingsley to Sleaford)	No
UK9012131	Thursley, Hankley & Frensham Commons	South Wey (River Slea confluence to Tilford)	Yes

SPA Code	SPA Name	Catchment name	Significant Water Management Issue
UK9012131	Thursley, Hankley & Frensham Commons	South Wey (River Slea confluence to Tilford)	Yes
UK9011061	Solent & Southampton Water	Test (Lower)	No
UK9012171	South West London Waterbodies	Thames (Cookham to Egham)	Yes
UK9012171	South West London Waterbodies	Thames (Cookham to Egham)	Yes
UK9012171	South West London Waterbodies	Thames (Egham to Teddington)	Yes
UK9012171	South West London Waterbodies	The Moat at Egham	Yes
UK9012141	Thames Basin Heaths	Wey (Shalford to River Thames confluence at Weybridge)	Yes
UK9012131	Thursley, Hankley & Frensham Commons	Wey (Tilford to Shalford)	Yes
UK9012131	Thursley, Hankley & Frensham Commons	Wey (Tilford to Shalford)	Yes
UK9012141	Thames Basin Heaths	Wey Navigation (Pyrford reach)	Yes
UK9012141	Thames Basin Heaths	Wey Navigation (Pyrford reach)	Yes

E.4 Ramsar

Ramsar Code	Ramsar Name	Catchment name	Significant Water Management Issue
UK11065	South West London Waterbodies	Colne (Confluence with Chess to River Thames)	Yes
UK11065	South West London Waterbodies	Colne (Confluence with Chess to River Thames)	Yes
UK11065	South West London Waterbodies	Portlane Brook	Yes
UK11063	Solent & Southampton Water	Test (Lower)	No
UK11065	South West London Waterbodies	Thames (Cookham to Egham)	Yes
UK11065	South West London Waterbodies	Thames (Cookham to Egham)	Yes
UK11065	South West London Waterbodies	Thames (Egham to Teddington)	Yes
UK11065	South West London Waterbodies	The Moat at Egham	Yes

F Environmental sites water quality impact

Site name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Thames Basin Heaths (SPA)	SU878640	WQ PBNR0004	1%	0%	1%	-45%	0%	-32%
Thames Basin Heaths (SPA)	SU878640	Storm_EVERSLEY LOWER COMMON (NEW MILL "	-3%	1%	7%	-3%	-3%	-6%
Thames Basin Heaths (SPA)	SU878640	CSO 537	-2%	0%	6%	-1%	1%	-8%
Castle Bottom to Yateley and Hawley Commons (SSSI)	SU835579	CSO 537	-2%	0%	6%	-1%	1%	-12%

Site name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Horsell Common (SSSI)	TQ002606	WQ PBNR0004	1%	0%	1%	-45%	0%	-32%
Blackwater Valley (SSSI)	SU847605	CSO 537	-2%	0%	6%	-1%	1%	-8%
Bramshill (SSSI)	SU764606	Storm_EVERSLEY LOWER COMMON (NEW MILL "	-3%	1%	7%	-3%	-3%	-6%

G Water Industry National Environment Programme

G.1 Legend

- **U_MON2** – Urban pollution monitoring.
- **U_IMP5** – Flow to full treatment (FFT) = 3PG + Imax + 3E [Where: P = catchment population (number), G = per capita domestic flow (l/head/day), and E = trade effluent flow (l/d)].
- **FFT monitoring** – Monitoring of Flow to Full Treatment – the volume of wastewater that is treated.
- **EDM** – Event Duration Monitoring – monitoring of the operation of storm overflows.
- **WFD_IMP** – Measures to reduce ammonia, BOD and Phosphorous at STWs in order to meet WFD standards in rivers.
  (h) measures to meet High status, (g) measures to meet Good status, (m) measures to meet Moderate status, (p) measures to meet Poor status.
- **DrWPA_ND** – Catchment scheme actions and measures in Drinking Water Protected Areas (DrWPA) recommended by either previous investigations;
  or, actions for water companies identified in safeguard zone action plans to prevent WQ deterioration to avoid the need for additional treatment (WFD 'must do'):
  subject to cost effectiveness, sustainability and measurement of effectiveness.
- **HD_INV** – Investigation and/or options appraisal to determine impacts of Water Company activities,
  or permits or licence standards on the Natura 2000 or RAMSAR site or to determine the costs and technical feasibility of new targets.
- **U_IMP1** – Schemes to improve discharges that, through population growth, have crossed the population thresholds in the Urban Waste Water Treatment Regulations (UWWTR) and therefore must achieve more stringent UWWTR requirements. This includes newly qualifying discharges (from agglomerations >10,000pe) within existing sensitive areas.

G.2 AMP7 WINEP actions

Table 0-1: AMP7 WINEP actions relating to water quality.

Waterbody Name	WINEP ID	Unique ID	Scheme Name(s)	Type of scheme/notes	Completion date
Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge)	THM00156 THM00337 THM00657	7TW200318 7TW200499 7TW200819	CHOBHAM STW	**U_MON3** Install EDM on WwTW overflows to storm tanks at those WwTW where we can't use existing monitors to be confident that the permitted FFT setting is being complied with. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: EDM **U_INV2** Investigation to confirm if any existing front end flow monitor or the back end MCERTS flow monitor can be used to measure PFF to full treatment at a WwTW. Existing front end monitors must be considered first and where they can be MCERTS certified to measure PFF they should be used to provide data within AMP7. Where there is no front end monitor or it cannot be MCERTS certified investigate whether the back end flow monitor can be MCERTS certified to measure PFF. If it can, then use it to provide data within AMP7. If neither can be MCERTS certified then a new inlet MCERTS flow monitor will be required under a PR24 driver. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: FFT monitoring **WFD_ND** Scheme to meet requirements to prevent deterioration in ammonia. Measure Type: Continuous Discharge	31/03/2021 31/03/2022 31/03/2023

Waterbody Name	WINEP ID	Unique ID	Scheme Name(s)	Type of scheme/notes	Completion date
				Water Quality Detail: Population Equivalent for STWs: 11400 Current Permit Limit (mg/l): 5 Proposed Permit Limit (mg/l): 3 Current DWF (m3/d): 12600 (max permit) Proposed Permit Limit Other: Upper tier 12 mg/l Environmental Outcome, Quantitative Km River Length Improved or Protected: 2.7	
Blackwater (Aldershot to Cove Brook confluence at Hawley)	THM00112 THM00293 THM00118 THM00299	7TW200274 7TW200455 7TW200280 7TW200461	ALDERSHOT STW, ALDERSHOT, HANTS ASH VALE STW	**U_MON3** Install EDM on WwTW overflows to storm tanks at those WwTW where we can't use existing monitors to be confident that the permitted FFT setting is being complied with. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: EDM **U_MON4** Install MCERTS flow monitoring as close to the overflow as practicable to record FFT at WwTW where the existing DWF MCERTS flow monitoring, or other installed flow monitoring, cannot be readily used to confirm the permitted FFT setting is being complied with when the overflow to storm tanks operates. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: FFT monitoring **U_MON3** Install EDM on WwTW overflows to storm tanks at those WwTW where we can't use existing monitors to be confident that the permitted FFT setting is being complied with. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: EDM **U_INV2** Investigation to confirm if any existing front end flow monitor or the back end MCERTS flow monitor can be used to measure PFF to full treatment at a WwTW. Existing front end monitors must be considered first and where they can be MCERTS certified to measure PFF they should be used to provide data within AMP7. Where there is no front end monitor or it cannot be MCERTS certified investigate whether the back end flow monitor can be MCERTS certified to measure PFF. If it can, then use it to provide data within AMP7. If neither can be MCERTS certified then a new inlet MCERTS flow monitor will be required under a PR24 driver. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: FFT monitoring	31/03/2022 31/03/2022 31/03/2021 31/03/2022
Blackwater (Hawley to Whitewater confluence at Bramshill)	CHM00264 THM00141 THM00322 THM00180 THM00361	7TW300016 7TW200303 7TW200484 7TW200342 7TW200523	Camberley CAMBERLEY STW	**WFD_INV_CHEM11** Monitoring of chemical removal by installed technologies. Measure Type: Investigation Investigation Type: Tier 2 Investigation Scope: 18 months influent and effluent monitoring of mecana.	30/09/2021 31/03/2021 31/03/2022 31/03/2023 31/03/2021

Waterbody Name	WINEP ID	Unique ID	Scheme Name(s)	Type of scheme/notes	Completion date
	THM00246 THM00427	7TW200408 7TW200589	EVERSLEY LOWER COMMON STW SANDHURST STW	**U_MON3** Install EDM on WwTW overflows to storm tanks at those WwTW where we can't use existing monitors to be confident that the permitted FFT setting is being complied with. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: EDM **U_INV2** Investigation to confirm if any existing front end flow monitor or the back end MCERTS flow monitor can be used to measure PFF to full treatment at a WwTW. Existing front end monitors must be considered first and where they can be MCERTS certified to measure PFF they should be used to provide data within AMP7. Where there is no front end monitor or it cannot be MCERTS certified investigate whether the back end flow monitor can be MCERTS certified to measure PFF. If it can, then use it to provide data within AMP7. If neither can be MCERTS certified then a new inlet MCERTS flow monitor will be required under a PR24 driver. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: FFT monitoring **U_MON3** Install EDM on WwTW overflows to storm tanks at those WwTW where we can't use existing monitors to be confident that the permitted FFT setting is being complied with. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: EDM **U_MON4** Install MCERTS flow monitoring as close to the overflow as practicable to record FFT at WwTW where the existing DWF MCERTS flow monitoring, or other installed flow monitoring, cannot be readily used to confirm the permitted FFT setting is being complied with when the overflow to storm tanks operates. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: FFT monitoring **U_MON3** Install EDM on WwTW overflows to storm tanks at those WwTW where we can't use existing monitors to be confident that the permitted FFT setting is being complied with. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: EDM **U_INV2** Investigation to confirm if any existing front end flow monitor or the back end MCERTS flow monitor can be used to measure PFF to full treatment at a WwTW. Existing front end monitors must be considered first and where they can be MCERTS certified to measure PFF they should be used to provide data within AMP7. Where there is no front end monitor or it	31/03/2021 31/03/2022

Waterbody Name	WINEP ID	Unique ID	Scheme Name(s)	Type of scheme/notes	Completion date
				cannot be MCERTS certified investigate whether the back end flow monitor can be MCERTS certified to measure PFF. If it can, then use it to provide data within AMP7. If neither can be MCERTS certified then a new inlet MCERTS flow monitor will be required under a PR24 driver. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: FFT monitoring	
Hale/Mill Bourne (Bagshot to Addlestone Bourne confluence near Chobham)	THM00220 THM00401	7TW200382 7TW200563	LIGHTWATER STW	**U_MON3** Install EDM on WwTW overflows to storm tanks at those WwTW where we can't use existing monitors to be confident that the permitted FFT setting is being complied with. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: EDM **U_MON4** Install MCERTS flow monitoring as close to the overflow as practicable to record FFT at WwTW where the existing DWF MCERTS flow monitoring, or other installed flow monitoring, cannot be readily used to confirm the permitted FFT setting is being complied with when the overflow to storm tanks operates. Measure Type: Intermittent Discharge Water Quality Detail, Proposed Permit Limit Other: FFT monitoring	31/03/2024 31/03/2021

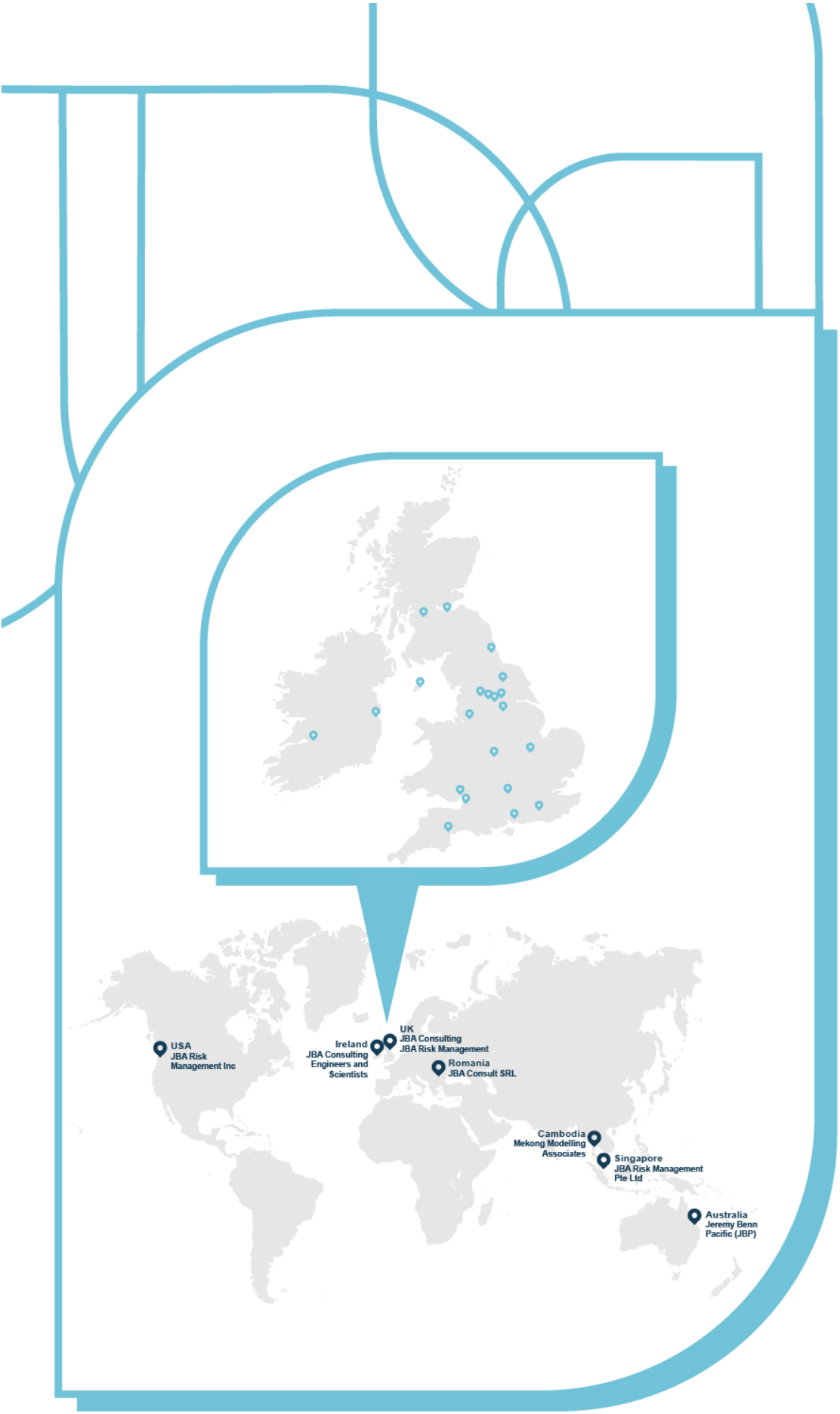
G.3 AMP8 WINEP actions

Table 0-2 AMP8 WINEP actions relating to water quality.

Waterbpdy Name	WINEP ID	Unique ID	Scheme Name(s)	Type of scheme/notes	Completion date
Addlestone Bourne (West End to Hale/Mill Bourne confluence at Mimbridge)	08TW100072 08TW101581 08TW100579 08TW101108	08TW100072a 08TW101581a 08TW100579a 08TW101108te	Reduce cypermethrin loading CHOBHAM STW CHOBHAM STW CHOBHAM (OLD) WWTW- Storm Overflows investigation	**WFD_NDLS_Chem2** Chobham STW, cypermethrin, 0.000515ug **U_MON4** Protect the environment from wastewater collection and discharges **U_MON3** MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) **EnvAct_INV4** Storm Overflows investigation	31/03/2027 31/12/2026 31/12/2025 30/04/2027

Waterbpdy Name	WINEP ID	Unique ID	Scheme Name(s)	Type of scheme/notes	Completion date
Blackwater (Aldershot to Cove Brook confluence at Hawley)	08TW100105 08TW100063 08TW100414 08TW100283 08TW100549 08TW100544 08TW100866 08TW100862 08TW101108	08TW100105a 08TW100063a 08TW100414a 08TW100283a 08TW100549a 08TW100544a 08TW100866a 08TW100862a 08TW101108uc	Reduce Nonylphenol loading Reduce cypermethrin loading ASH VALE STW ALDERSHOT STW, ALDERSHOT, HANTS ASH VALE STW ALDERSHOT STW, ALDERSHOT, HANTS Reduce Phosphorus Loadings at Ash Vale STW Reduce Phosphorus Loadings at Aldershot STW Aldershot CSO-Storm Overflows investigation	**WFD_NDLS_Chem2** Ash Vale STW, Nonylphenol, 0.94 ug **WFD_NDLS_Chem2** Ash Vale STW, cypermethrin, 0.000232ug **U_MON4** Protect the environment from wastewater collection and discharges **U_MON4** Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a) **U_MON3** MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) **U_MON3** MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) **EnvAct_IMP1** 0.25 mg/l Phosphorus permit with stretch target of 0.2 mg/l at Ash Vale STW **EnvAct_IMP1** 0.25 mg/l Phosphorus permit with stretch target of 0.2 mg/l at Aldershot STW **EnvAct_INV4** Storm Overflows investigation	31/03/2027 31/03/2027 31/12/2026 31/12/2026 31/12/2025 31/12/2025 31/03/2030 31/03/2030 30/04/2027
Blackwater (Hawley to Whitewater confluence at Bramshill)	08TW100133 08TW100115 08TW100094 08TW100069 08TW100473 08TW101605 08TW101578 08TW100331 08TW100656 08TW100599 08TW100568 08TW100929 08TW100881	08TW100133a 08TW100115a 08TW100094a 08TW100069a 08TW100473a 08TW101605a 08TW101578a 08TW100331a 08TW100656a 08TW100599a 08TW100568a 08TW100929a 08TW100881a	Reduce Nonylphenol loading Reduce Nonylphenol loading Reduce cypermethrin loading Reduce cypermethrin loading Reduce cypermethrin loading SANDHURST STW	**WFD_NDLS_Chem2** Sandhurst STW, Nonylphenol, 0.85 ug **WFD_NDLS_Chem2** Camberley STW, Nonylphenol, 0.88 ug **WFD_NDLS_Chem2** Sandhurst STW, cypermethrin, 0.000485ug **WFD_NDLS_Chem1** Camberley STW, cypermethrin, 0.0015827ug **WFD_ND_CHEM3** Camberley STW cypermethrin no det permit limit **U_MON4** Protect the environment from wastewater collection and discharges **U_MON4** Protect the environment from wastewater collection and discharges **U_MON4** Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)	31/03/2027 31/03/2027 31/03/2027 31/03/2027 31/03/2030 31/12/2026 31/12/2026 31/12/2026 31/12/2025 31/12/2025 31/12/2025 31/03/2030 31/03/2030

Waterbpdy Name	WINEP ID	Unique ID	Scheme Name(s)	Type of scheme/notes	Completion date
			CAMBERLEY STW EVERSLEY LOWER COMMON STW SANDHURST STW EVERSLEY LOWER COMMON STW CAMBERLEY STW Reduce Phosphorus Loadings at Great Rollright STW Reduce Phosphorus Loadings at Camberley STW	**U_MON3** MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) **U_MON3** MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) **U_MON3** MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) **EnvAct_IMP1** 0.35 mg/l Phosphorus permit at Great Rollright STW also known as Rollright STW **EnvAct_IMP1** 0.25 mg/l Phosphorus permit with stretch target of 0.2 mg/l at Camberley STW	
Hale/Mill Bourne (Bagshot to Addlestone Bourne confluence near Chobham)	08TW100103 08TW100358 08TW100636	08TW100103a 08TW100358a 08TW100636a	Reduce metal loading LIGHTWATER STW LIGHTWATER STW	**WFD_NDLS_Chem2** Lightwater STW, iron (total), 1667.7 **U_MON4** Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a) **U_MON3** MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)	31/03/2027 31/12/2026 31/12/2025



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