Joint Water Cycle Scoping Study

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This report describes work commissioned by Blaby District Council, by an instruction dated 04 October 2023. The Client's representative for the contract was Martin Needham of Blaby district Council. Lucy Briscoe, Alex Garratt, James Fitton and Richard Pardoe of JBA Consulting carried out this work.

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Abbreviations

ALS	Abstraction Licensing Strategy
AMP	Assessment Management Plan
AW	Anglian Water
BDC	Blaby District Council
BNG	Biodiversity Net Gain
BOD	Biological Oxygen Demand
BRAVA	Baseline Risk and Vulnerability Assessment
BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Methodology
CAMS	Catchment Abstraction Management Strategy
CIL	Community Infrastructure Levy
CIRIA	Company providing research and training in the construction industry
CSO	Combined Sewer Overflow
DCG	Design and Construction Guidance
DEFRA	Department of the Environment, Food and Rural Affairs (formerly MAFF)
DFW	Dry Weather Flow
DWMP	Drainage and Wastewater Management Plan
EA	Environment Agency
EIP	Environment Improvement Plan
EP	Environmental Permit
EU	European Union
FWMA	Flood Water and Management Act
GEP	Good Ecological Potential
GES	Good Ecological Status
GIS	Geographical Information Systems
GwH	Greywater Harvesting
HBBC	Hinckley and Bosworth Borough Council
HDC	Harborough District Council
HOF	Hands Off Flow
HOL	Hands Off Level
ICW	Integrated Constructed Wetland
JNCC	Joint Nature Conservation Committee
LLFA	Lead Local Flood Authority

LPA	Local Planning Authority
l/p/d	litres per person per day
NAV	New Appointment and Variations
NE	Natural England
NFM	Natural Flood Management
NH4	Ammonia
NPPF	National Planning Policy Framework
OEP	Office for Environmental Protection
Ofwat	Water Services Regulation Authority
OWBC	Oadby and Wigston Borough Council
P	Phosphorous
PPG	Planning Practice Guidance
PTP	Package Treatment Plant
Ramsar	The intergovernmental Convention on Wetlands, signed in Ramsar, Iran, in 1971
RMBP	River Basin Management Plans
RwH	Rainwater Harvesting
SAB	SuDS Approval Body
SAC	Special Area of Conservation, protected under the EU Habitats Directive
SFRA	Strategic Flood Risk Assessment
SPA	Special Protection Area
SPZ	Source Protection Zones
SS	Suspended Solids
SSD	Small Sewage Discharges
SSSI	Site of Special Scientific Interest
STW	Severn Trent Water
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
UK	United Kingdom
uPBT	Ubiquitous, Persistent, Bioaccumulative and Toxic
WCS	Water Cycle Study
WFD	Water Framework Directive
WINEP	Water Industry National Environment Programme
WRMP	Water Resource Management Plan
WRW	Water Resources West

WRZ	Water Resource Zone
WwTW	Wastewater Treatment Work

Executive Summary

JBA Consulting was commissioned by Blaby District Council (BDC), to undertake a joint Water Cycle Study (WCS) for Blaby District Council, Harborough District Council (HDC), Hinckley and Bosworth Borough Council (HBBC), and Oadby and Wigston Borough Council (OWBC) (referred to in this report collectively as the "Combined Councils"). This is to be carried out in two stages to inform their local plans. The purpose of the WCS is to update the previous WCS published in 2017 and should provide sufficient information to assist the Councils in selecting and developing sustainable developments.

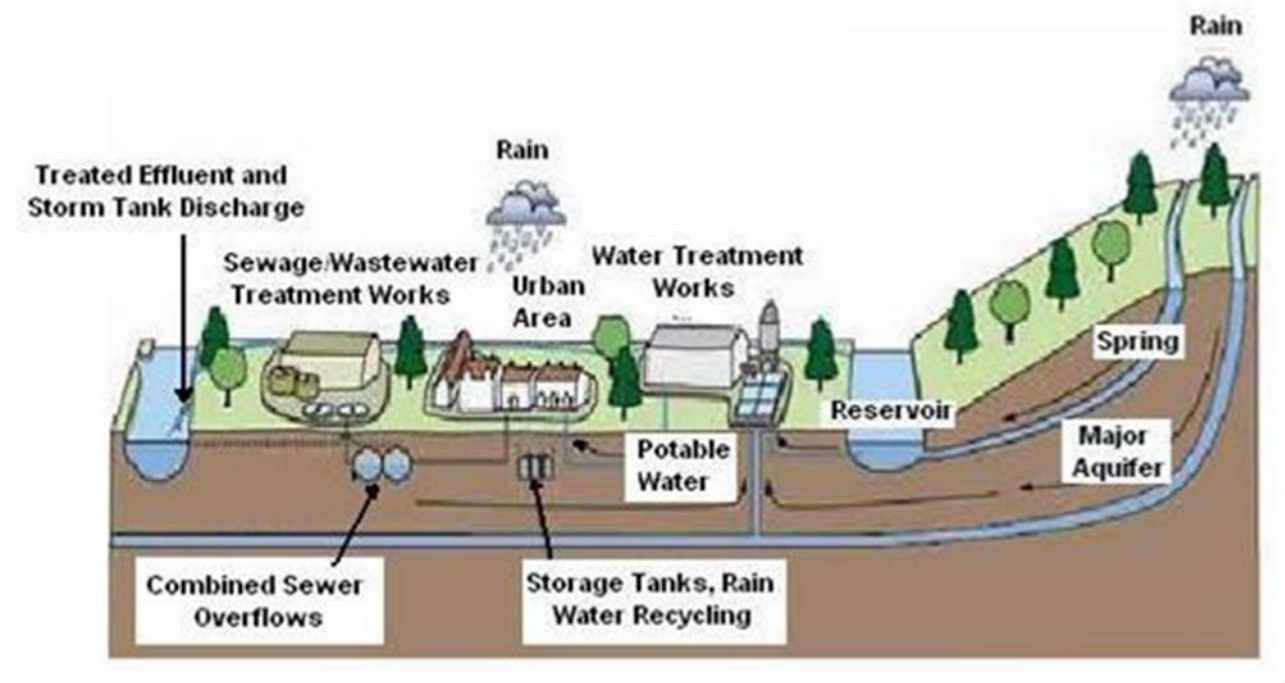
Unmitigated future development and climate change can adversely affect the environment and water infrastructure capability. A WCS will provide the required evidence, together with an agreed strategy to ensure that planned growth occurs within environmental constraints, with the appropriate infrastructure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

This study assesses the potential issues relating to future development within the whole of the study area and the impacts on water supply, wastewater collection and treatment and water quality. The Water Cycle Study is required to assess the constraints and requirements that will arise from potential growth on the water infrastructure.

New homes require the provision of clean water, safe disposal of wastewater and protection from flooding. The allocation of large numbers of new homes requires careful planning to ensure there are sufficient water resources, and available capacity in the water supply and wastewater network, protecting existing customers and the environment.

In addition to increased housing demand, future climate change presents further challenges to the existing water infrastructure network, including increased intensive rainfall events and a higher frequency of drought events. Sustainable planning for water must now take this into account. The water cycle can be seen in the figure below and shows how the natural and man-made processes and systems interact to collect, store or transport water in the environment.

The Water Cycle



Source: Environment Agency – Water Cycle Study Guidance

This study will assist LPAs within the study area to select and develop sustainable development allocations where there is 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, the requirements of the environment and by recommending potential solutions to these conflicts.

All four LPAs provided information about planned growth in their areas. Potential Local Plan allocations have not been decided at the time of writing and will be assessed in a Stage 2 WCS. Available information was collated on water policy and legislation, water resources, water quality, and environmental designations within the study area. Growth already planned in the study area, and data provided by Severn Trent Water and Anglian Water was used to indicate the current capacity in wastewater treatment infrastructure.

The objective of the study is to provide evidence to guide development towards the most sustainable locations.

Water resources and supply

Most of the study area receives its water from Severn Trent Water from their Strategic Grid WRZ (and a small area from their Rutland WRZ) with an area to the east of Harborough served by Anglian Water (from their Ruthamford North WRZ).

A comparison was made between predicted growth contained in STW's rdWRMP24 and the housing needs of the LPAs. Across the Strategic Grid, a 19% increase in the number of properties is predicted by STW. This is in line with the lower growth estimates (based on

the Standard Method), for Harborough and Hinckley and Bosworth, but is significantly less than the housing need for Blaby, Harborough and Oadby and Wigston and the higher growth scenarios for Hinckley and Bosworth. This should be investigated further in a Stage 2 WCS once the final WRMP24 has been published.

The Water Industry National Environment Programme (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. Several 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 the Combined Councils have an opportunity to contribute to these actions indirectly by pursuing policies that promote water efficiency in new development.

Water resources in the UK are under considerable pressure. The Environment Agency 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."

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

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 Environmental Improvement Plan 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 three credits in the assessment category WAT01 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.

The impact of potential allocations on the water supply network will be assessed in the Stage 2 study.

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, Severn Trent Water and Anglian Water is required, and further modelling of the network may be required in the Stage 2 WCS and 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 201 storm overflows in recorded in the study area, 161 on the network, and 40 at WwTWs.

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. 13 of the storm overflows were operating above this threshold between 2021 and 2023. The Storm Overflow Reduction Plan which was 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 60 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**,** when development sites are on previously developed land**,** 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 councils involved and Leicestershire County Council, and Severn Trent Water and Anglian Water is recommended to allow time for the strategic infrastructure required to serve these developments to be planned.

Wastewater treatment

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 the study area.

Evaluation of the STW and AW Drainage and Wastewater Management Plans indicated a lack of capacity at many WwTWs expected to serve growth in the study area. AW plans had less detail available at the time of writing, however they identified Market Harborough and Tilton on the Hill as requiring increased capacity in the future.

The JBA headroom assessment identified 22 WwTWs that are expected to be close to or exceeding their permit during the Local Plan period. An increase in the permit limit, and upgrades to treatment capacity may be required at these WwTW to accommodate further growth.

Seven AW WwTW had no mention of capacity upgrades. All 13 of the STW WwTW within this group of 22 had comments related to capacity, these were either; Monitoring of

headroom, capacity headroom limited. Investment options to be investigated or scheme planned or in progress to accommodate future growth.

Consideration should be given where possible to using capacity in existing permits as this provides a lower carbon cost than upgrading capacity at existing WwTW or building new treatment works. This may however not always be feasible due to other Local Plan considerations.

There are several poorly performing storm tank overflows at WwTWs in the study area. Growth within these catchments could result in an increase in the operations of these 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.

Water quality

The EA "reasons for not achieving good" (RNAG) dataset indicates that the water industry (sewage discharges) and agriculture and rural land management (livestock and arable) 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 WwTWs in the study area. There is a potential for this to cause a deterioration in water quality in the receiving watercourses and this must be carefully considered. A significant deterioration in water quality is not acceptable under the Water Framework Directive, and large-scale investment in treating effluent to higher standards may therefore be required.

The sensitivity analysis suggests that watercourses within the study area may be sensitive to increases in the discharge of treated wastewater. Further modelling should be undertaken in the Stage 2 WCS.

Nutrient management

Across England, 42 LPAs, including Hinckley and Bosworth, are required to demonstrate nutrient neutrality in at least part of their area when permitting new developments. Nutrient neutrality is a means of ensuring that a plan or project does not add to existing nutrient burdens so there is no overall increase in nutrients. Nutrient neutrality needs to be demonstrated before the plan or project in question is carried out. This affects a small area in the northwest of Hinckley and Bosworth and covers all overnight accommodation, including new homes, student accommodation, care homes, tourism attractions and tourist accommodation and permitted development which gives rise to new overnight accommodation.

NE has also published standing advice for the River Mease SAC in January 2022 to help LPAs with planning applications within the Mease catchment (NWLDC, 2022). This should be consulted by LPAs and developers' pre-development of sites within the River Mease catchment.

Environmental opportunities

The potential impact of development on several protected sites such as SAC and SSSIs within, or downstream of the study area should be carefully considered in future plan making.

Water quality modelling should be undertaken in a Stage 2 WCS to identify potential deterioration in water quality in waterbodies adjacent to protected sites.

The growth forecasts of the Combined Councils are higher than the percentage growth predicted within STW's Strategic Grid WRZ. It is therefore recommended that the difference between the rdWRMP24 and the growth plans is investigated in a Stage 2 WCS to ensure that delivery of the Combined Council's growth plans is within the growth expectations of STW and does not lead to an unsustainable increase in abstraction.

There is one Groundwater Source Protection Zone in the study area (North West edge of Hinckley and Bosworth District). The impact of future development on groundwater should be investigated in Stage 2 once potential allocations are available.

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.

The Combined Councils should be consulted at an early stage of development to ensure that SuDS are designed and implemented in response to site characteristics and policy factors.

In the wider area, opportunities exist to implement natural flood management techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

1 Introduction

1.1 Terms of reference

JBA Consulting was commissioned by Blaby District Council (BDC), to undertake a joint scoping Water Cycle Study (WCS) for Blaby District Council, Harborough District Council (HDC), Hinckley and Bosworth Borough Council (HBBC), and Oadby and Wigston Borough Council (OWBC) referred to in this report as the "Combined Councils") to inform their local plans. The purpose of the WCS is to provide a more geographically focused and updated document to the Leicester and Leicestershire Strategic WCS published in 2017, and should provide sufficient information to assist the Councils in selecting and developing sustainable developments.

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.

1.2 Structure of Report

The requirements and objectives of the WCS are set out in the section below. Planned growth in the Combined Councils and neighbouring authorities 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 assessments. The report is then divided into sections assessing the impact of growth on each topic in the water cycle study.

1.3 The Water Cycle

Planning Practice Guidance (PPG) on Water Supply, Wastewater and Water Quality (Gov.UK a, 2019) describes a water cycle study 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 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 guidance on WCS 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. The scoping study will identify:

- The area and amount of proposed development
- The existing evidence
- Main partners to work with
- 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.

As a WCS is not a mandatory document, Local Planning Authorities are advised to prioritise the stages of the WCS to integrate with their Local Plan programme. Figure 1.1 below shows the main elements that compromise 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.

Further information can be found on the Government website (GOV.UK).

Figure 1.1 below shows the main elements that compromise the Water Cycle and shows how the natural and man-made processes and systems interact to collect, store or transport water in the environment.

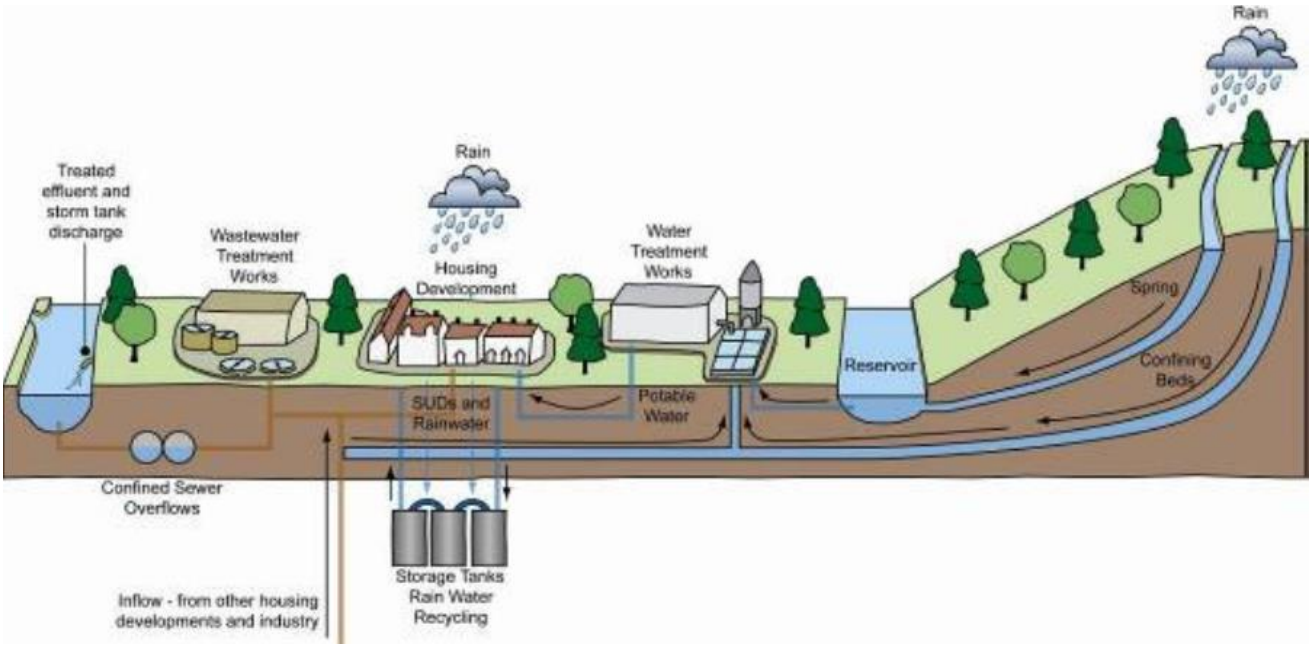


Figure 1.1 The Water Cycle

1.4 Impacts of Development on the Water Cycle

New homes require the provision of clean water, safe disposal of wastewater and protection from flooding. 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.

1.4.1 Objectives

This Stage 1 scoping report is written to support the Blaby District Council (BDC), Harborough District Council (HDC), Hinckley and Bosworth Borough Council (HBBC), and Oadby and Wigston Borough Council (OWBC) emerging Local Plans and to serve as an update to the previous iterations outlined in Table 1.1.

Table 1.1 Adopted/current local plans for the four councils

Council name	Name of current/adopted local plan
BDC	Core Strategy (2013) Delivery DPD 2019
HDC	Harborough Local Plan (2019)
HBBC	Core Strategy (2006-2026), adopted 2009 Site Allocations and Development Management Policies DPD (adopted 2016) Hinckley Town Centre AAP (adopted 2011) Earl Shilton and Barwell Area Action Plan (2014) Adopted local plan
OWBC	Local plan (2019)

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

1.5 Study Area

Blaby District Council, Harborough District Council, Hinckley and Bosworth Borough Council, and Oadby and Wigston District Council (the Combined Councils) are in the

surrounding areas to the south, east and west of the city of Leicester, in Central England (Figure 1.2). The boundary includes towns such as Market Harborough and Lutterworth including some of the outer suburbs of Leicester.

The combined area of the councils is approximately 1,046 km^2, and has several waterbodies, with the main named waterbodies including: the Rivers Avon, Sence, Soar, Swift, and Welland, the Grand Union Canal, and the Thurlaston and Eye Brooks. The area is predominantly served by Severn Trent Water (STW) with Anglian Water (AW) serving part of the southeast of the study area for water supply and sewerage. The largest wastewater treatment works is Wanlip (WRW) to the north of the study area, which serves a population of circa 650,000 including much of Leicester City.

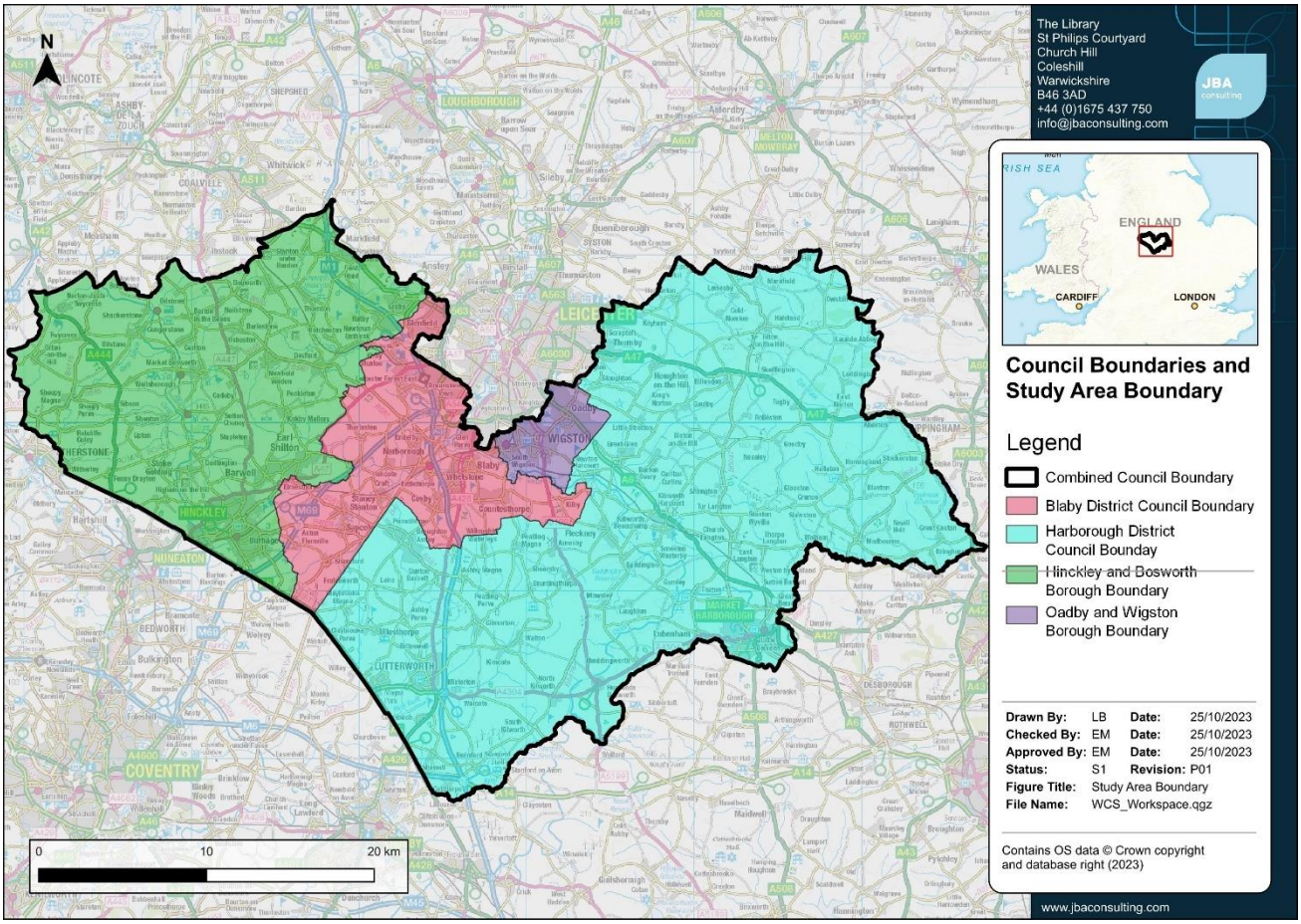


Figure 1.2 The combined councils study area

1.6 Authorities Responsible for Water Resource and Wastewater Management

Within the Combined Councils boundary, there are several authorities and regulators that are responsible or involved in supplying, managing, and overseeing the water supply, wastewater, and the environment. Table 1.2 explains the responsibilities of various bodies within the boundary presented.

Table 1.2 Responsibilities of authorities within the Combined Council Area

Authority Name	Key Responsibilities of Different Authorities
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.
Severn Trent and Anglian Water	Severn Trent and Anglian Water are the sewerage undertaker for the districts and boroughs in this study. Sewerage undertakers have a duty under the Water Industry Act to provide, improve and extend a system of public sewers (for both domestic and trade flows) to cleanse and maintain those sewers (and any lateral drain) to ensure that the area that they serve is effectually drained. There is also a duty to make provision for the emptying of those sewers, normally through sewage treatment works or where appropriate through discharges direct to watercourses.
New Appointment and Variations (NAV) suppliers	Limited companies providing water and/or wastewater services, primarily to new developments. The "wholesale supplier" remains the local supplier of water and/or wastewater services in that area. NAVs were introduced with the intention of providing competition in the monopolistic water market. Whilst OfWAT maintains a register of NAV appointments there is no national map available to identify if any NAVs exist within the study area.
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.

1.7 Record of Engagement

Preparation of a WCS requires significant engagement with stakeholders, within the Local Planning Authority area, with water and wastewater utilities, with the Environment Agency, and where there may be cross-boundary issues, with neighbouring local authorities. This section forms a record of engagement for the WCS. Further engagement will take place, if necessary, as the WCS progresses.

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

Inception Meeting

Engaged Parties	Details
BDC, HDC, HBBC and OWBC	Scope of works and data collection requirements.

Neighbouring Authorities

Engaged Parties	Details
Charnwood Borough Council, Leicester City Council, Rutland Council, West Northamptonshire Council, Rugby Borough Council, Nuneaton and Bedworth Borough Council, North Warwickshire Borough Council	Request for water cycle studies conducted in their area, and housing growth that would be served by WwTW within or shared with the four councils

Collaboration with Water Companies

Engaged Parties	Details
STW AW	Request for data including the location of wastewater treatment works catchments, and flow data. Water company assessments of water and wastewater infrastructure and capacity constraints.

2 Future Growth in the Combined Councils

2.1 Growth in the Combined Councils

The four councils are in the process of developing their Local Plans that will cover the plan periods set out in Table 2.1. The plans will direct future growth and associated infrastructure across the area and will include new housing and employment requirements for the study area.

Table 2.1 Local development scheme information for the combined councils

Council	Plan period
BDC	2023- 2041
HDC	2020 - 2041
HBBC	2020 - 2041
OWBC	2020 - 2041

In a Stage 1 WCS the focus is on existing capacity, and so a forecast has been put together for planned growth provided by the LPAs. This included:

- Allocations (not yet built out) from adopted Local Plans
- Residential and employment commitments
- Recent completions
- Windfall

Spatial growth options for some of the councils have not been finalised or defined. Once available they will form an updated growth forecast for use in a Stage 2 WCS. The housing need up to 2041 is contained in Table 2.2.

Table 2.2 Housing requirement across the study area

Local Planning Authority	Housing requirement
Blaby District Council	12,366 +10% buffer (2023-2041)
Harborough District Council	13,182 (2020-2041)
Hinckley and Bosworth Borough Council	9,093 - standard method (2023 affordability ratio) 12,054 – standard method (2023 affordability ratio) + 102 dpa 13,839 – standard method (Statement of Common Ground) + 187 13,862 – Policy SP02 Local Plan Consultation Draft (Regulation 18)
Oadby and Wigston Borough Council	5,040 (2020-2041)
Total dwellings	40,918 – 45,687

2.2 Development within the Combined Councils

2.2.1 Planned Development

The four councils have provided their commitments for the study area as at 31 March 2023, and completion data for the year 2022/23. The housing numbers and employment sites have been summarised for each council in Table 2.3 and Table 2.4 below.

Table 2.3: Residential commitments and completions for the combined councils (number of dwellings)

Council	Commitments as at 31 March 2023	Completions 2022/23
BDC	4,939	289
HDC	7,462	929
HBBC	3,960	NA
OWBC	1,393	340

Table 2.4: Employment commitments and completions for the combined councils

Council	Commitments as at 31 March 2023 (sqm)	Completions 2022/23 (sqm)
BDC	188,516	4,074
HDC	501,639	201,812
HBBC	293,806	NA
OWBC	50,650	NA

2.2.2 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). For the Stage 1 report, windfall sites were distributed between WwTWs based on the proportion of the commitments at each WwTW. This may be revised in Stage 2. The number of dwellings by council area is shown in Table 2.5.

Table 2.5 Windfall dwellings by council area

Council	Number of dwellings 2023-41
HDC	450
HBBC	87
OWBC	252
BDC	510

2.3 Development outside of the Combined Councils area

Where growth within a neighbouring Local Planning Authority (LPA) area may be served by infrastructure within or shared with the four councils, the LPAs 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 WwTW which serve part of their council area and the study area.

The neighbouring authorities where infrastructure is shared across the study area boundary were identified, and are shown in Figure 2.1. Melton Borough Council and North Northamptonshire Council also share a boundary with the study areas however there is no overlap in wastewater infrastructure.

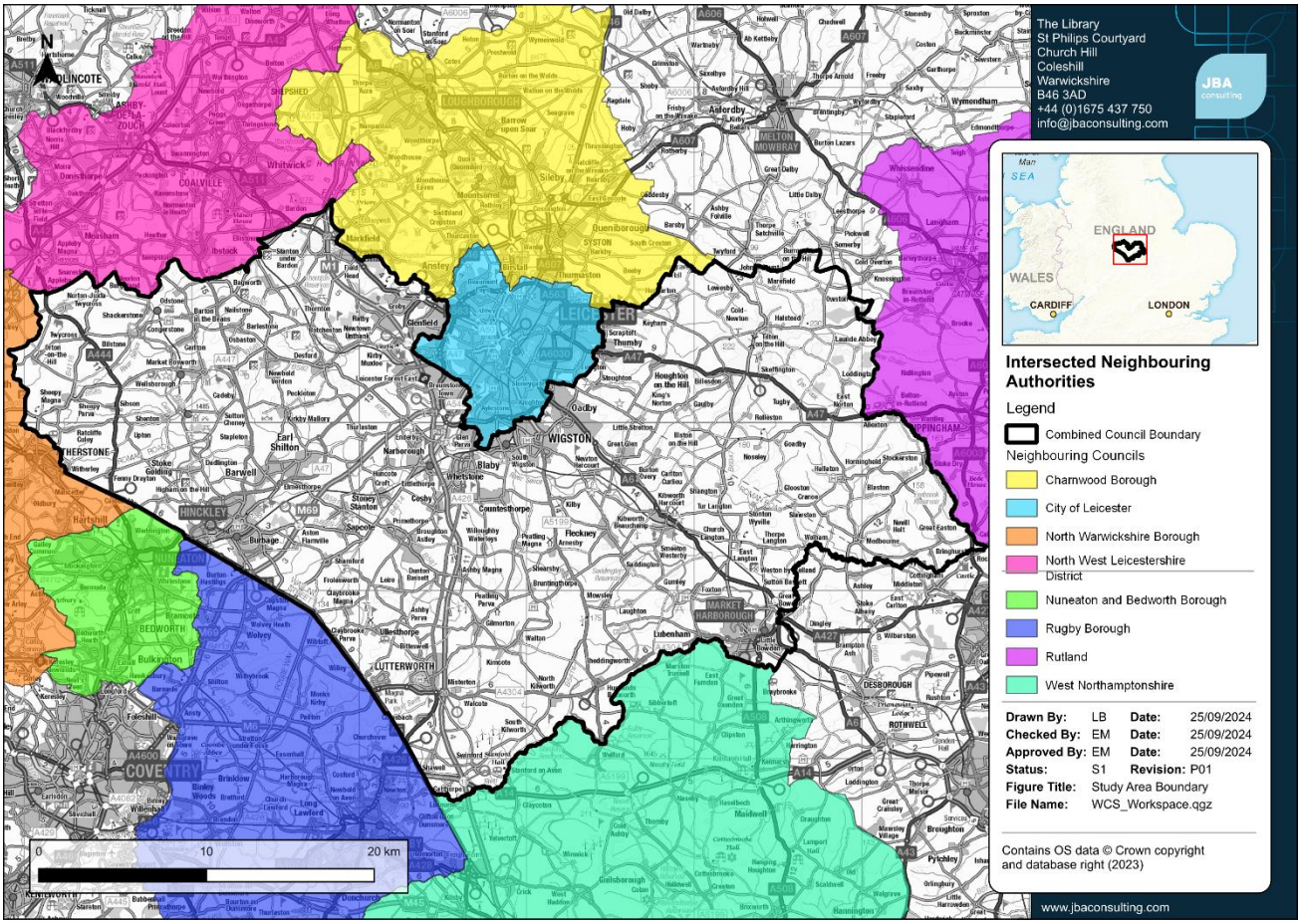


Figure 2.1: Neighbouring authorities with overlapping treatment works

2.3.1 Neighbouring authorities' growth figures

The neighbouring authorities provided information on growth within their areas during the Combined Council's Local Plan period, or growth information was taken from their WCS. This represents all known growth during the period 2023 to 2041, however this is subject to change as their own Local Plan's evolve. This was compared with wastewater catchments to determine if those sites would impact infrastructure shared with the study area. This has

been considered in the wastewater treatment capacity assessment in section 7. The neighbouring authority forecast is summarised in in Table 2.6.

Table 2.6 Neighbouring authority growth likely to share wastewater infrastructure

Council	Number of dwellings	Employment
Charnwood Borough Council (Wanlip WwTW)	10,752	142,000m^2
Leicester City Council (Wanlip WwTW)	41,704	Estimated 7,373 FTE jobs
North Warwickshire Borough Council (Nuneaton-Hartshill WwTW and Atherstone WwTW)	3,166	Estimated 5,423 FTE jobs
North West Leicestershire District Council (Ibstock WwTW)	487	None identified
Nuneaton and Bedworth Borough Council (Nuneaton-Hartshill WwTW)	15,967	Estimated 42,266 FTE jobs
Rugby Borough Council (Rugby Newbold WwTW)	12,375	Estimated 8,940 FTE jobs
West Northamptonshire Borough Council (Rugby Newbold (WwTW)	None identified	1,200,000m^2 B8

3 Legislative and Policy Framework

3.1 Introduction

The following sections introduce several national, regional, and local policies that must be considered by the Local Planning Authority (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 National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, 2023) 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. Local Plans must be prepared by Local Planning Authorities (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.
- 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."

Under the Localism Act (HM Government, 2011) 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, Local Planning Authorities are required to provide technical advice and support to communities.

3.3 Water and the Planning System

3.3.1 National Planning Policy Framework and Water

The NPPF 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 34: “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 153: "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 174: "…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, considering relevant information such as river basin management plans".

3.3.2 Planning Practice Guidance Overview

Planning Practice Guidance (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 (HM Government, 2019)
- Housing - Optional Technical Standards (HM Government, 2015a)

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:

- "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 ground water, 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 (Para 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 (Para 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., SuDS schemes) can be used to address water quality in addition to flood risk.

Plan-making considerations - Wastewater (Para 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 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 (Para 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 (Para 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, River Basin Management Plan (RBMP), Water Cycle Study, 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, local planning authorities 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 to consider the impact of setting this optional standard on housing viability.

The evidence for adopting the optimal requirements is outlined in section 4.6, and viability is reviewed in section 4.6.11.

3.4 Water and Design

3.4.1 Building Regulations

The Building Regulations (2010) Part G 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 (HM Government, 2015b) (see 3.3.4).

The Environmental Improvement Plan (discussed in 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 (BRE, 2023a), and commercial, leisure, educational facilities and mixed-use buildings by the Building Research Establishment Environmental Assessment Methodology (BREEAM) UK New Construction Standard (BRE, BREEAM, 2018b).

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 Homes Quality Mark, 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, the Council has the opportunity to seek BREEAM or HQM status for all new, residential, and non-residential buildings.

3.4.3 Energy and Water

17% of the UK’s domestic energy usage is for water heating (Eurostat 2017). 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. Whilst 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 (EC Harris, 2014).

- The Committee on Climate Change report - UK Housing: Fit for the Future - 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." (Committee on Climate Change, 2019)
- Heating Water accounts for 18% of energy used in the home (Department for Energy Security and Net Zero, 2022) This would cost a 2-3 person, 3-bed household an average of £352 per year in energy at 2023 costs (British Gas, 2023). 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 (JBA Consulting, 2022) 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 Sewerage Companies (WaSCs) and six '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 can obtain water and/or wastewater services from alternative suppliers - known as inset agreements.

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

- Non-domestic customers will be able to switch their water supplier and/or sewerage undertaker (from April 2017);
- new businesses will be 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 Environment Agency 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:** Finally, 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 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 Environment Agency.

Ofwat assesses and compares the plans with the objective of ensuring 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 (202-2025), and the price of water for this period was set by Ofwat late in 2019 in a processed referred to as Price Review 19 (PR19). The new price came into effect in April 2020. 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 Water Framework regulations. 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.

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, they set out 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, ensuring that sufficient water continues to be available for growth and that the supply systems are flexible enough to adapt to climate change.

Both Severn Trent Water and Anglian Water have published and consulted on their draft WRMPs for 2024 (dWRMP). Final plans are expected to be published later in 2024.

3.5.3.1 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 bans 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
  - 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
    - 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.

3.5.3.2 Regional water resource planning

Water resource planning is taking an increasingly regional focus, recognising the need for collaboration between water companies and sectors 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 West group (WRW) which covers the Blaby, Harborough, Hinckley and Bosworth, and Oadby and Wigston councils. An advisory group consisting of their regulators (Environment Agency and Ofwat) and Defra regularly attend meetings of WRW.

A small area of Harborough is also within the Water Resources East (WRE) area, however due to the insignificant size, only the WRW plan will be reviewed in the Stage 1 study.

WRW has published a thought piece on the next cycle of regional water resource plans, which in turn will inform the next round of company WRMPs to be published in 2029. 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

3.5.4.1 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.

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 UK, 2018) 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.

3.5.4.2 Drainage and Wastewater Management Plans (DWMPs)

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 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.

Both Severn Trent Water and Anglian Water published their final DWMPs in 2023. These are reviewed in detail in section 7.2.

3.5.5 Developer Contributions and Connection Changes

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, 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 sewerage undertaker. 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, the water industry's economic regulator, published revised rules covering how water and wastewater companies may charge customers for new connections (OfWAT, 2020). 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 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.

Severn Trent Water publish their charging arrangements annually, which include incentives to encourage good design by developers which are as follows:

- Sustainable Drainage Incentive - where offered, a reduction in infrastructure charges to a Developer Customer where they evidence that a Development will or does meet a stipulated threshold for use of a sustainable drainage solution. As defined in the Water Company's Charging Arrangements and/or specific environmental policies
- Water Efficiency Incentive - where offered, a reduction in infrastructure charged to a Developer Customer where they evidence that a Development will or does meet a stipulated threshold for reduced water consumption, as defined in the Water Company's Charging Arrangements and/or specific environmental policies.

Similarly Anglian Water publish their charging arrangements annually, which include incentives to encourage good design by developers which are as follows:

- "Where a previous surface water connection to a foul or combined sewer is confirmed, we propose to reduce the 2023-2024 sewerage infrastructure charge by 50% if a sustainable surface water discharge method is used as an alternative."

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.

3.6 Flood Risk and Surface Water

3.6.1 Flood and Water Management Act (2010)

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

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 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 Act has not been enacted in England, but this is expected to be implemented in 2024. The enactment of schedule 3 will have the following implications for the planning process:

- Designation of local authorities as SuDS Approval Bodies (SAB) which have a duty to adopt new drainage systems.
- The cessation of the automatic right for new developments to connect to the existing sewer system.
- Developers must ensure that drainage systems are built as per the approved drainage plan that complied with mandatory national standards as outlined in the NPPF and the PPG.

3.6.2 Strategic Flood Risk Assessments (SFRA)

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.

Blaby District Council published a joint SFRA with Hinckley and Bosworth Borough Council, and Oadby and Wigston Borough Council in year 2014. However, Hinckley and Bosworth Borough Council published an SFRA in 2019, and Harborough District Council published an update to their SFRA in 2017 (as part of Leicestershire and Leicester Strategic Growth Plan SFRA) and a new Level 1 SFRA is currently in preparation.

3.6.3 Surface Water Management Plans

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.

Currently, neither Blaby District Council, Harborough District Council, Hinckley and Bosworth Borough Council, or Oadby and Wigston Borough Council have published SWMPs. While the councils fall under the LLFA of Leicestershire County Council, the LLFA has not published a SWMP that covers a district area. However, according to the recently published Leicestershire County Council Local Flood Risk Management Strategy, the LLFA will maintain and coordinate the Market Harborough SWMP.

3.6.4 Previous Water Cycle Studies

The Leicester City and Leicestershire Water Cycle Study was published in 2017 and covers the County of Leicestershire and the City of Leicester. It was produced to support the production of the Strategic Growth Plan which aims to set out the partners aspirations for growth, development and environmental matters over the long term. The Water Cycle Study focused on the potential growth areas identified during the production of the emerging Leicester and Leicestershire Strategic Growth Plan to assess if largescale development within these areas would be viable and sustainable in terms of their impacts on the water cycle.

Leicester City Council commissioned a separate WCS to support their Local Plan in 2020, with an updated WCS published in 2023.

3.6.5 Sustainable Drainage Systems

From April 2015, Local Planning Authorities (LPA) 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 National Planning Policy Framework, which requires that development in areas already at risk of flooding should give priority to sustainable drainage systems.
- The House of Commons written statement (Pickles, 2014) setting out government's 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 now incorporated in the 2019 update of the NPPF (paragraph 165). In practice, this has been implemented by making Lead Local Flood Authorities (LLFAs) statutory consultees on the drainage arrangements of major developments.
- The Defra non-statutory technical standards for sustainable drainage systems (HM Government, 2015c). 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.

Leicestershire County Council is the LLFA that governs the study area and play 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 from Leicestershire County Council on surface water drainage can be found here.

An updated version of the 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 here.

CIRIA also publish “Guidance on the Construction of SuDS” (C768), which contains detailed guidance on all aspects of SuDS construction, with specific information on each SuDS component available as a downloadable chapter. The downloadable chapter is available here.

Furthermore Anglian Water provides guidance for SuDS, and applications for projects should be made through The Anglian Water and Severn Trent Water sites.

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 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 Sewers for Adoption 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 (HM Government, 2021) 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 newly created Office for Environmental Protection (OEP, more information available here).

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 Environmental Improvement Plan (EIP) is the first revision of the 25-year environment plan (25YEP) published in 2018. It contains ten goals which are shown in Figure 3.1. The full text of the EIP can be found here. 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.

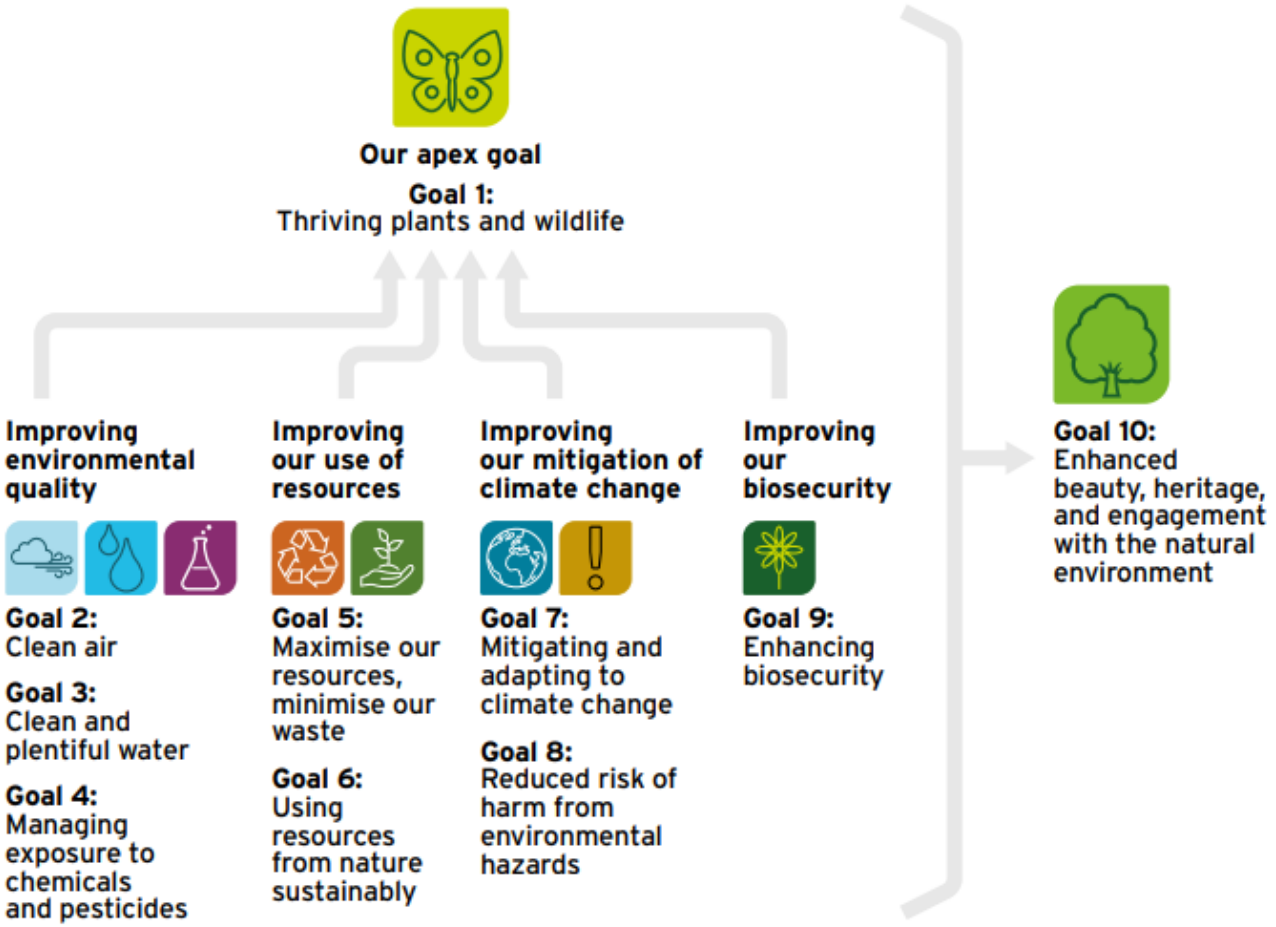


Figure 3.1 The 10 Environmental Improvement Plan goals

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 (Department for Environment, Food & Rural Affairs, 2023) 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 sustainable drainage systems (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 January 2024. This was required on small sites from April 2024.

3.7.5 Storm Overflow Reduction Plan

The Environment Act placed a legal duty on water companies to progressively reduce the adverse impacts of discharges from storm overflows. The storm overflow reduction plan (Department for Environment, Food & Rural Affairs, 2023) 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.

3.7.6 The Water Framework Directive (WFD) and Water Environment Regulations

3.7.6.1 Introduction

The European Union Water Framework Directive (WFD) 2000 is currently transposed into English and Welsh law by the Water Environment Regulations (HM Government, 2017). 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 (Figure 3.2). UK policy remains to meet GES or GEP for all waterbodies by 2027.

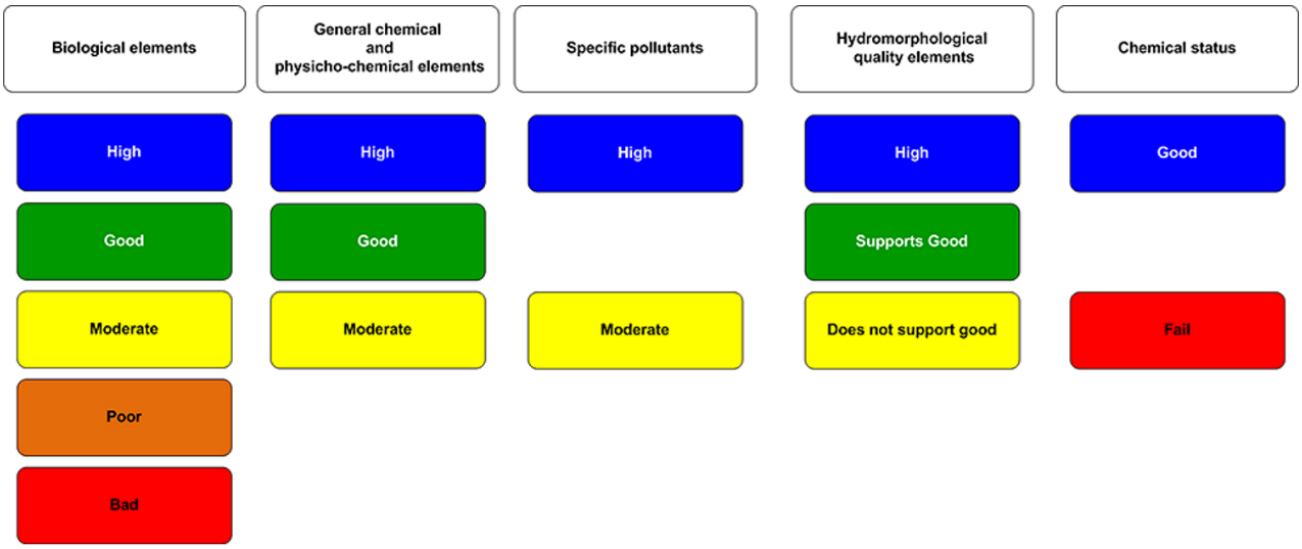


Figure 3.2: Status classification for surface water (Environment Agency, 2023a)

Chemical Status is separately assessed. The Water Framework Directive (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, PFOS, and PBDE are the most ubiquitous causes of all failures. Due to the persistent nature of these chemicals, the date for getting all waterbodies to Good Chemical Statis is set for 2063.

3.7.6.2 River Basin Management Plans

River Basin Management Plans (RBMP) 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. Blaby, Hinckley and Bosworth, and Oadby and Wigston are within the Humber River Basin District (RBD). Harborough is within three RBDs, with the south in the Severn RBD, the east within the Anglian RBD and the west within the Humber RBD. The third cycle RBMPs were published on the Government website (GOV.UK) 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 their respective River Basin Management Plans. Another equally important objective requires all water bodies to achieve good ecological status. 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.
- Local Planning Authorities (LPAs) must have regard to the Water Framework Directive 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 Agency, 2023a) and map viewer (Environment Agency, 2023b).

3.7.6.3 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
- 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

3.7.7 Conservation of Habitats and Species Regulations 2017 (as amened)

The Conservation of Habitats and Species Regulations 2010 (commonly referred to as the Habitats Regulations) consolidated the Conservation (Natural Habitats, &c.) Regulations 1994, 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.

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).
- A site of Community Importance.
- 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).
- A potential SPA.

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 rules 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 has had particular significant implications in two areas related to water and planning:

- Nutrient Neutrality. Natural England (NE) has identified several catchment areas where Habitats Sites are in unfavourable condition due to eutrophication (an excess of the nutrients phosphorous 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. Within the study area, a small area in the northwest of the Hinckley and Bosworth District, around the

village of Norton-Juxta-Twycross, lies within the River Mease catchment (Figure 3.3), designated as a nutrient neutrality area in 2022. The Mease was one of the first catchments in England to develop a nutrient management plan in 2011, with a well-established Mease Catchment Partnership working on nutrient reduction and catchment restoration.

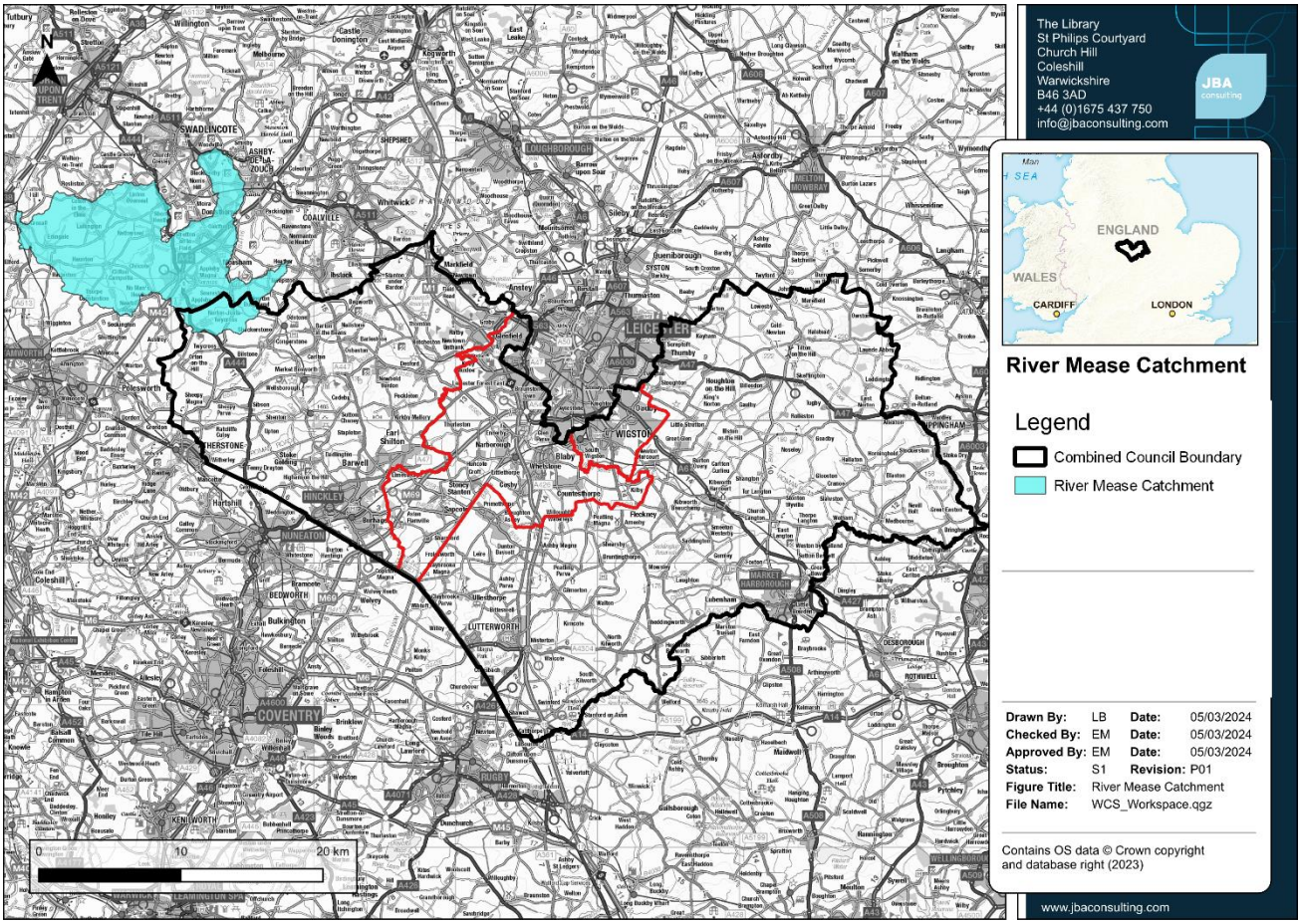


Figure 3.3: River Mease catchment and encroachment into the study area.

- 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. The concept of water neutrality is introduced in Section 4.6.7.

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

3.7.8 Wildlife and Countryside Act

Sites of Special Scientific Interest (SSSI) are designated and legally protected under the Wildlife and Countryside Act 1981, Section 28G 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." (HM Government, 1981).

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, Local Authorities 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).

3.7.9 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 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". (Ramsar Convention Secretariat, 2010)
- 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 that Ramsar sites should be given the same protection in the planning process as sites designated under the EU Habitats Directive.

3.7.10 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 Environment Agency 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, 32 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, including a requirement for at least 100 bathers per day during the season (Department for the Environment, Food and Rural Affairs, 2023). There are no officially designated bathing waters in the study area.

3.7.11 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 (HM Government, 2016) were introduced 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 relevance to this study are the regulations for permitting sewage effluent discharges to surface waters and groundwaters, known as water discharge activities (Environment Agency, 2022).

- The regulations are used to permit discharges from water company and private wastewater treatment works, and for sewer overflows.
- The Environment Agency 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.

3.7.12 Groundwater Protection

Under the regulations, the EA have published a set of position statements on protecting groundwater from various activities (Environment Agency, 2018). The position 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 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 Environment Agency 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 Policies 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. As changes to the planning system emerge, this chapter may need to be updated as part of a Stage 2 study.
- At the time of writing a new draft NPPF was under consultation.
- Schedule 3 of the Flood and Water Management Act is expected to be enacted in England in 2024. This will designate Lead Local Flood Authorities as SuDS Approval Bodies (SABs) with a duty to adopt new SuDS and removing the automatic right to connect to public sewers.
- 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% net-gain in biodiversity.
- 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. Within the study

area, this impacts the small area of Hinckley and Bosworth District that lies within the River Mease catchment area

- 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 and Water Supply

4.1 Introduction

4.1.1 Objectives

The aim of the water resources assessment is to ensure there is sufficient water available to abstract in the region for the level of proposed growth without impacting the environment, over both the local plan time frame and the future. The assessment characterises the study area, identifying key surface and ground water bodies and the geology of the region studied, and highlights pressures on water resources, existing constraints on abstraction, and evidence for adopting tighter water efficiency targets.

4.1.2 Water resources in the UK

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

The Environment Agency (Environment Agency, 2024) have published a summary of the revised draft regional and Water Resources Management Plans 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 Environmental Improvement Plan 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 Water

Within the study area, there are multiple main statutory watercourses and ordinary watercourses, with the main statutory rivers being: The Rivers Avon, Sence, Soar, Swift, and Welland, the Grand Union Canal, and the Thurlaston and Eye Brooks, each with their own associated tributaries (Figure 4.1).

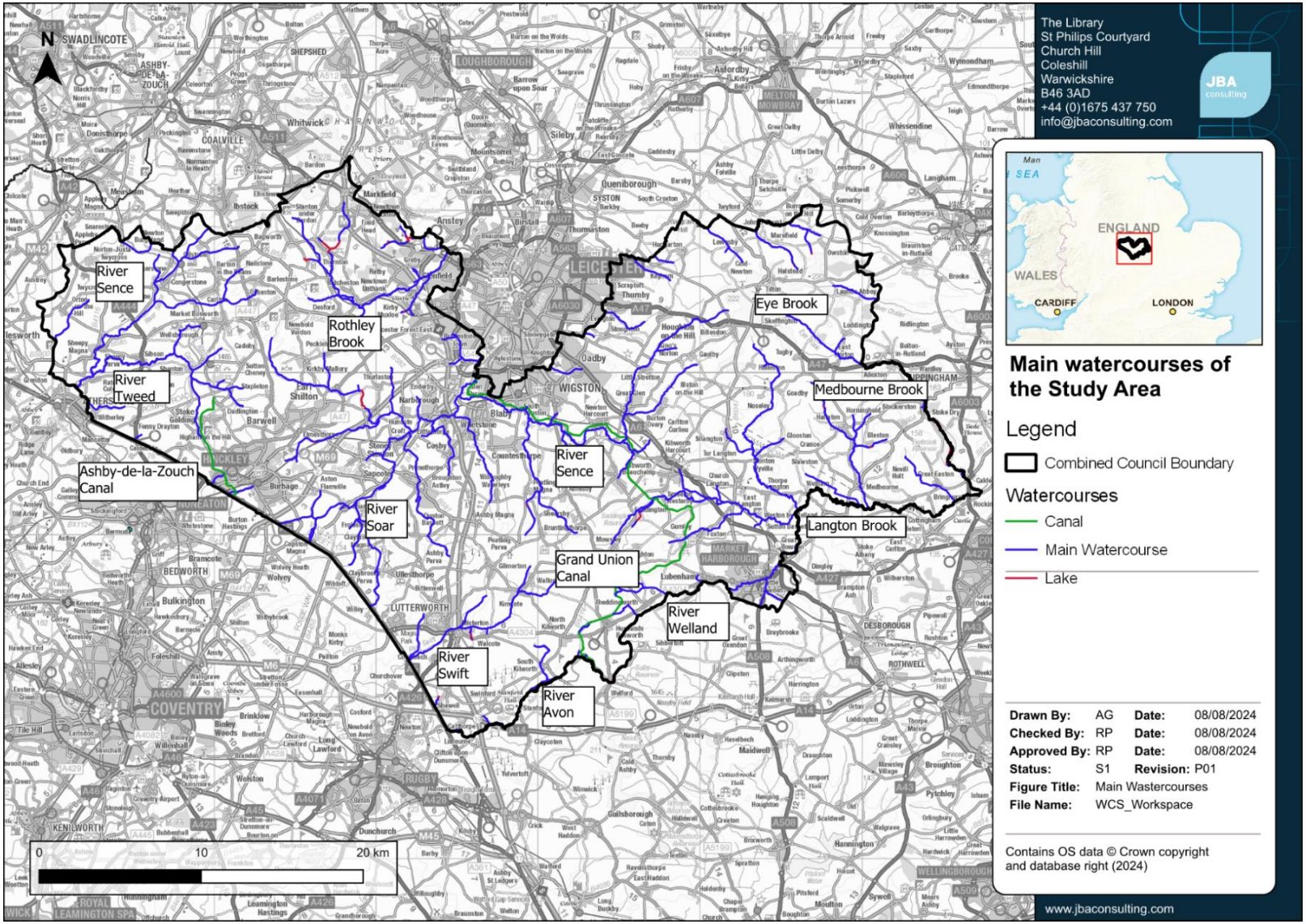


Figure 4.1 Main water courses within the study area

4.2.2 Geology

The geology of catchments is an influencing factor in water runoff from the ground surface, and how appropriate the type of SuDS is for a development due to the variations in the permeability of surface material and bedrock stratigraphy.

Figure 4.2 shows the bedrock geology over the study area. Oadby and Wigston's bedrock is of the Lias Group, a combination of mudstone, siltstone, limestone and sandstone sedimentary rock (late Triassic to early Jurassic). Harborough's bedrock is predominantly that of the Lias Group, with undifferentiated Triassic rock to the west, with Inferior Oolite Group (Jurassic sedimentary rock) to the east. Blaby's bedrock is predominantly undifferentiated Triassic rock, with Lias Group to the east, and through the centre of the borough are unnamed igneous intrusions (Ordovician to Silurian). Hinckley and Bosworth's bedrock is bedrock is predominantly undifferentiated Triassic rock, with undifferentiated Cambrian Rock and unnamed igneous intrusions (Neoproterozoic) to the north of the borough.

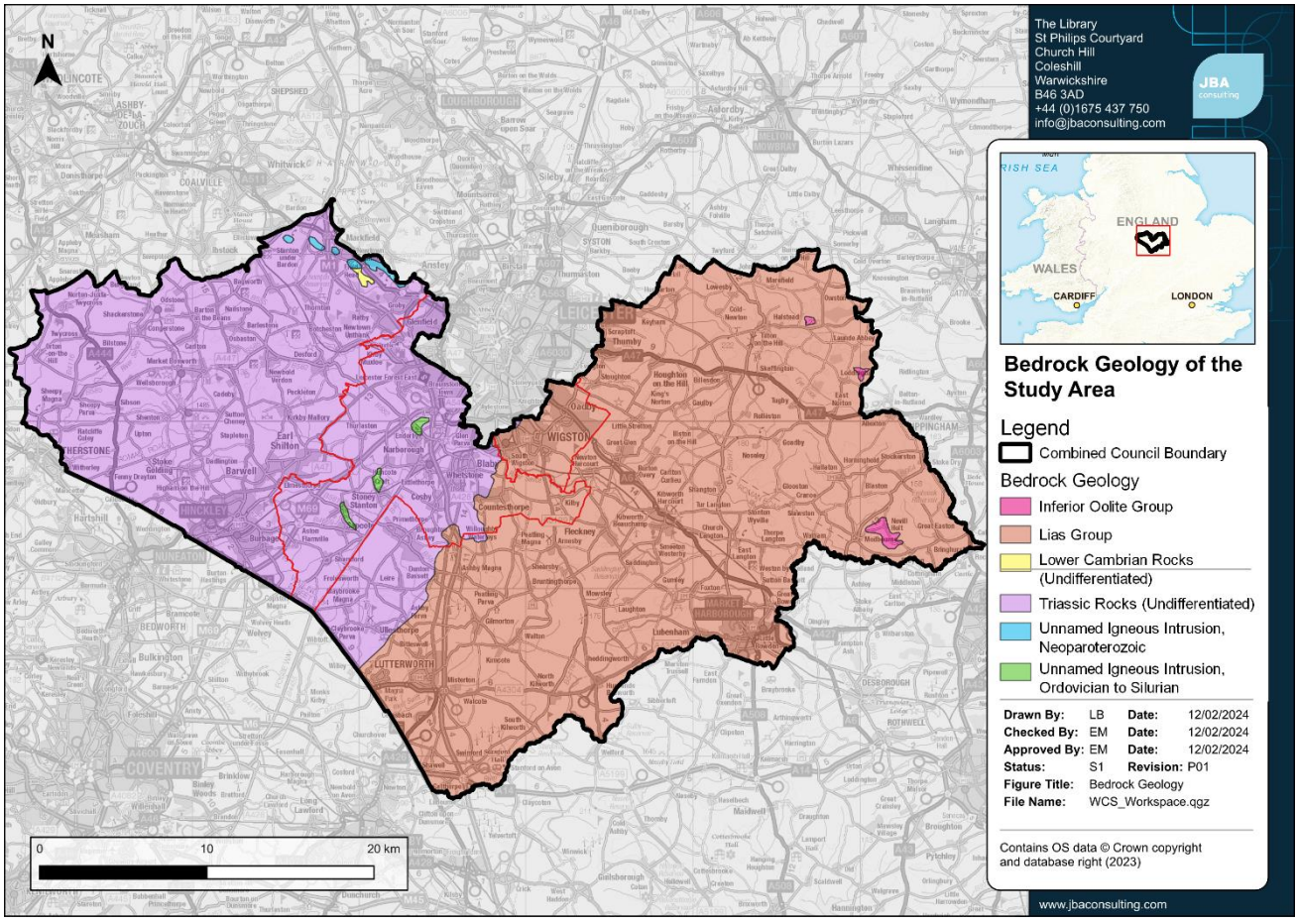


Figure 4.2 Bedrock geology of the study area

Figure 4.3 shows the superficial (surface) geology of the study area. Oadby and Wigston, is predominantly till with some alluvium in the central area. Harborough is predominantly till, with glacial sand and gravel deposits and alluvium dispersed throughout the district, and undifferentiated river terrace deposits to the east. Blaby

is predominantly till, with alluvium dispersed throughout the borough, undifferentiated river terrace deposits in the central area and glacial sand and gravel deposits to the west. Hinckley and Bosworth are predominantly till and glacial sand and gravel deposits, with alluvium dispersed throughout, and undifferentiated river terrace deposits to the west of the borough.

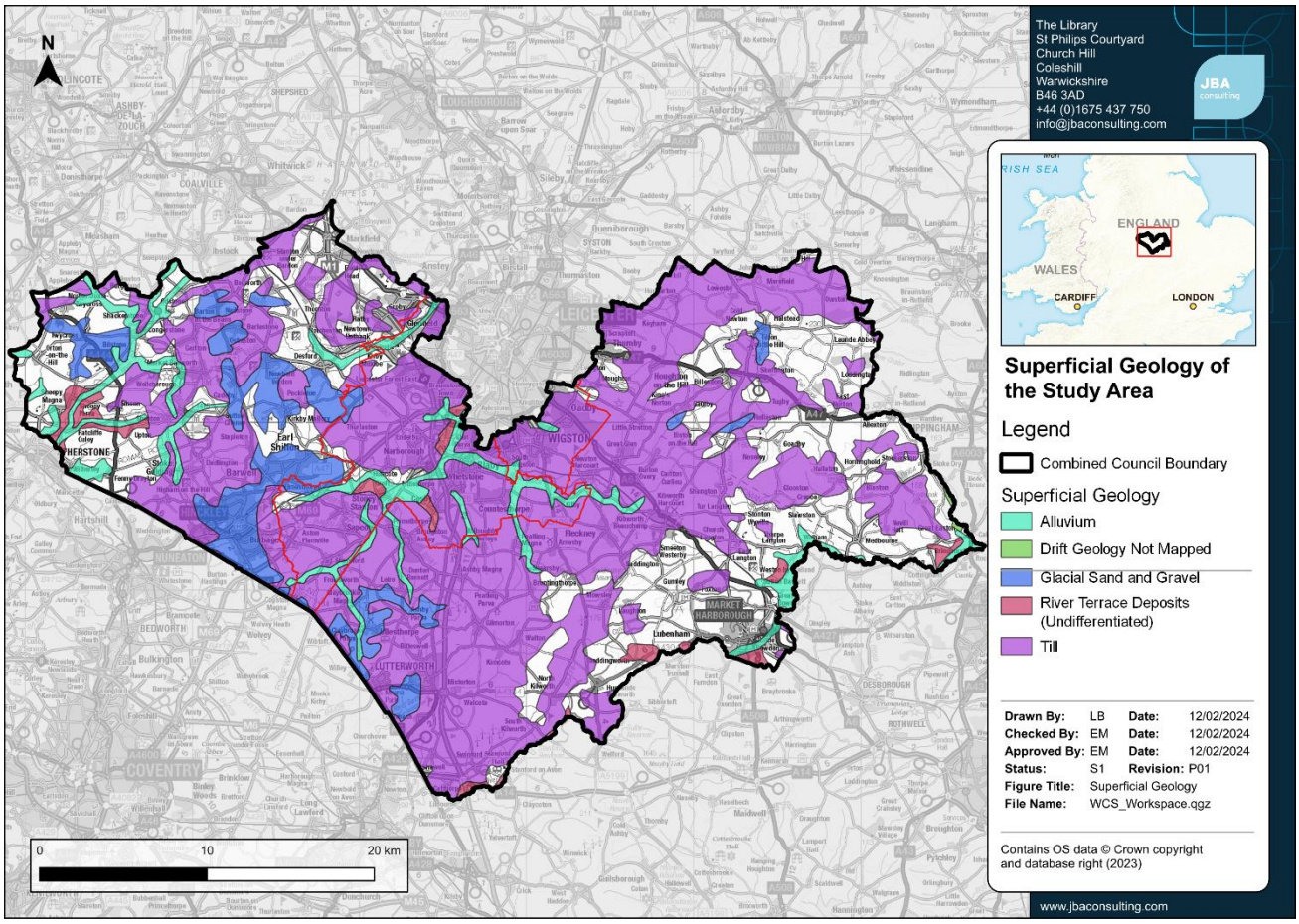


Figure 4.3 Superficial geology of the study area

4.2.3 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 four groundwater bodies within the study area which are shown in Figure 4.4, their corresponding WFD classification is summarised in Table 4.1 below.

The Soar- Secondary Combined groundwater body covers most of the study area, with the Warwickshire Avon- Secondary Mudrocks, Tame Anker Mease- Secondary Combined and Welland Lower Jurassic Unit covering the rest. The Tame Anker Mease- PT Sandstone Burton has 'poor' overall status because of industry being a Significant Water Management Issues (SWMI). This includes pollution from towns, cities and transport.

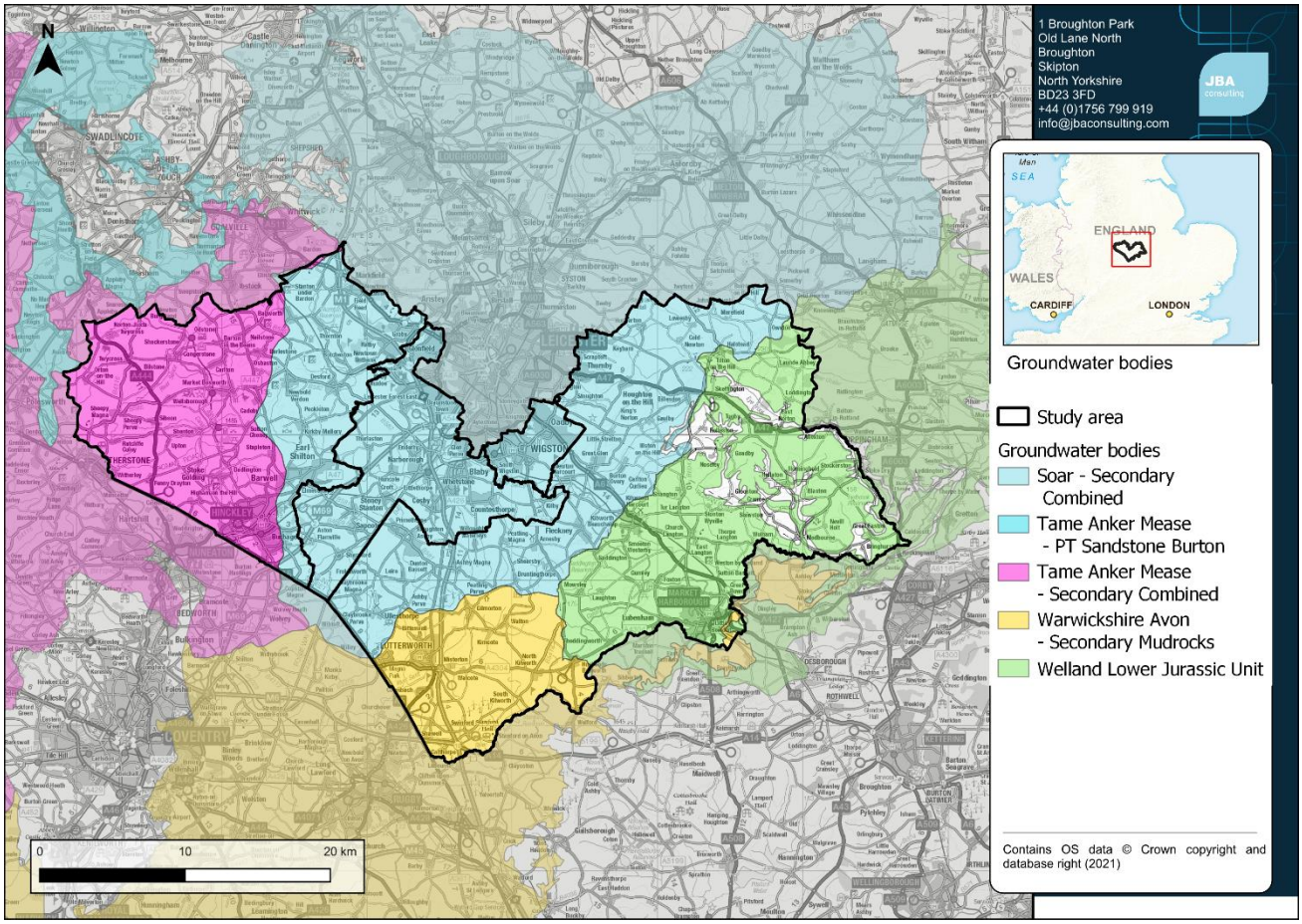


Figure 4.4 Groundwater bodies that cover the study area

Table 4.1 WFD Groundwater body classifications

Groundwater body name	Groundwater body ID	Overall Status
Soar- Secondary combined	GB40402G990600	Good
Tame Anker Mease- PT Sandstone Burton	GB40401G301200	Poor
Tame Anker Mease- Secondary combined	GB40402G990800	Good
Warwickshire Avon- Secondary Mudrocks	GB40902G990900	Good
Welland Lower Jurassic Unit	GB40502G304000	Good

4.3 Availability of Water Resources

4.3.1 Abstraction Licencing Strategy

The Environment Agency working through the Catchment Abstraction Management Strategy (CAMS) process, prepare an Abstraction Licensing Strategy (ALS) for each

sub-catchment in a river basin. The strategy sets out how water resources are managed within England and contributes to the implementation of the WFD. The ALS report provides information on the resources available and what conditions might apply to new licences. The licences require abstractions to stop or reduce when a flow or water level falls below a specific threshold, as a restriction to protect the environment and manage the balance between supply and demand for water users.

All new licences, and some existing licences are time limited, allowing for periodic review of the area as circumstances may have changed since the licence was first issued. The duration is generally twelve years, but shorter licences may be granted if they are based on resource assessment and environmental sustainability grounds. In some cases, future plans or changes may mean that the EA will grant a shorter time limited licence, so it can be re-assessed following the change. If a licence is only required for a short time, it can be granted either as a temporary licence or with a short time limit. If a licence is considered to pose a risk to the environment it may be granted with a short time limit while monitoring is carried out. The licences are then replaced with a changed licence, revoked or renewed near to the expiry date.

The ALS are important in terms of the Water Resource Management Plan (WRMP) as this helps to determine the current and future pressures on water resources and how the supply and demand will be managed by the relevant water companies. An abstraction license is needed from Natural Resources Wales or the Environment Agency if abstraction is above 20m^3/ day (4,400 gallons) a day from:

- rivers or streams
- reservoirs, lake or pond
- canal
- spring or
- an underground source

The license is granted depending on the amount of water available. The Combined Councils are covered by the Tame, Anker, and Mease ALS, Warwickshire Avon ALS, the Soar ALS, and the Welland and Nene ALS.

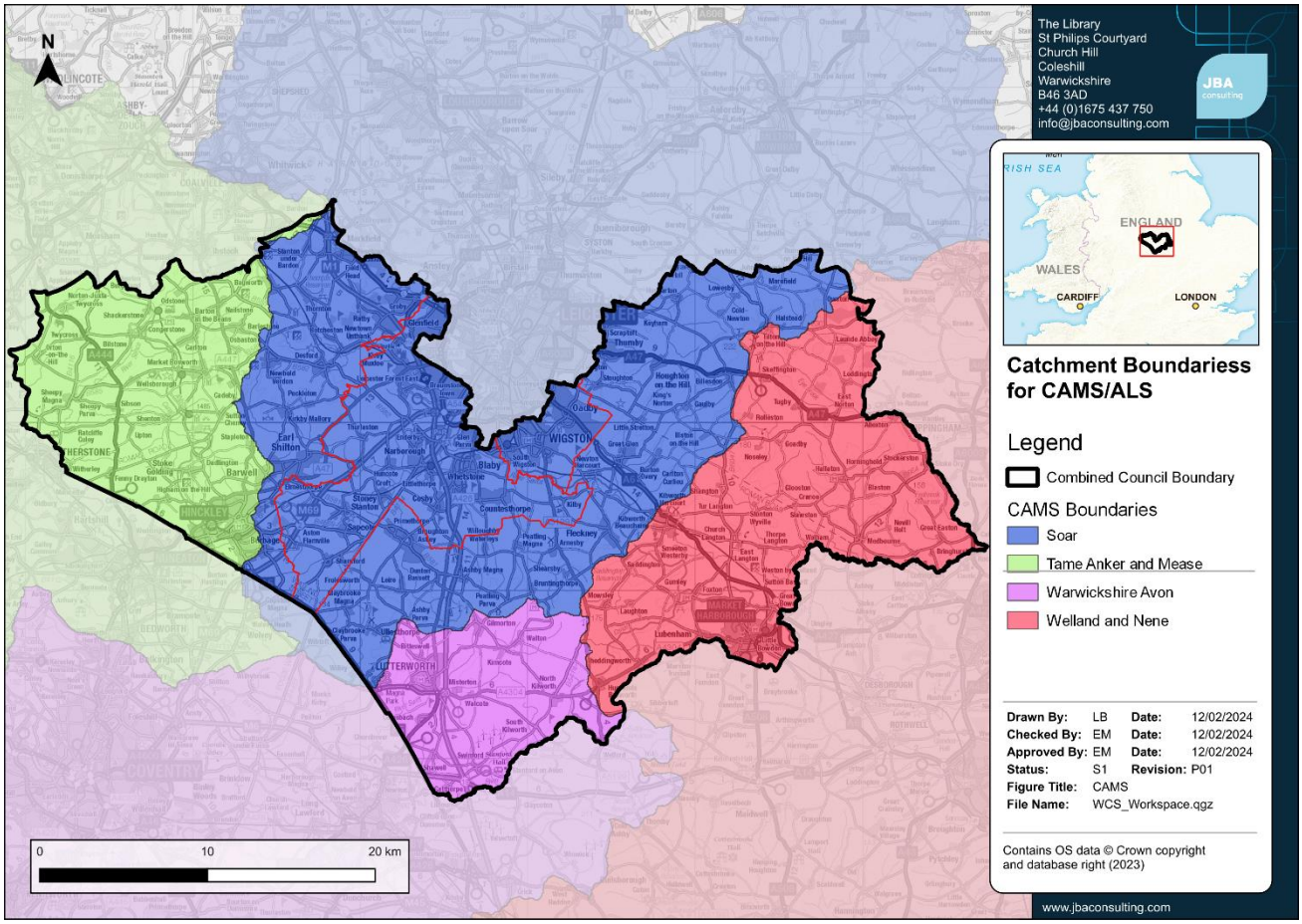


Figure 4.5 CAMS boundaries

4.3.2 Resource Availability Assessment

To abstract surface water, it is important to understand what water resources are available within a catchment and where abstraction for consumptive purposes will not pose a risk to resources or the environment. The Environment Agency 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
- 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.

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 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 Good Ecological Status. No further licences will be granted. Water may be available via licence trading.
Grey - Heavily Modified Water Bodies (HMWBs) (and/or discharge rich waterbodies)	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

The resource availability for the four ALS's is shown in Figure 4.6 to Figure 4.9.

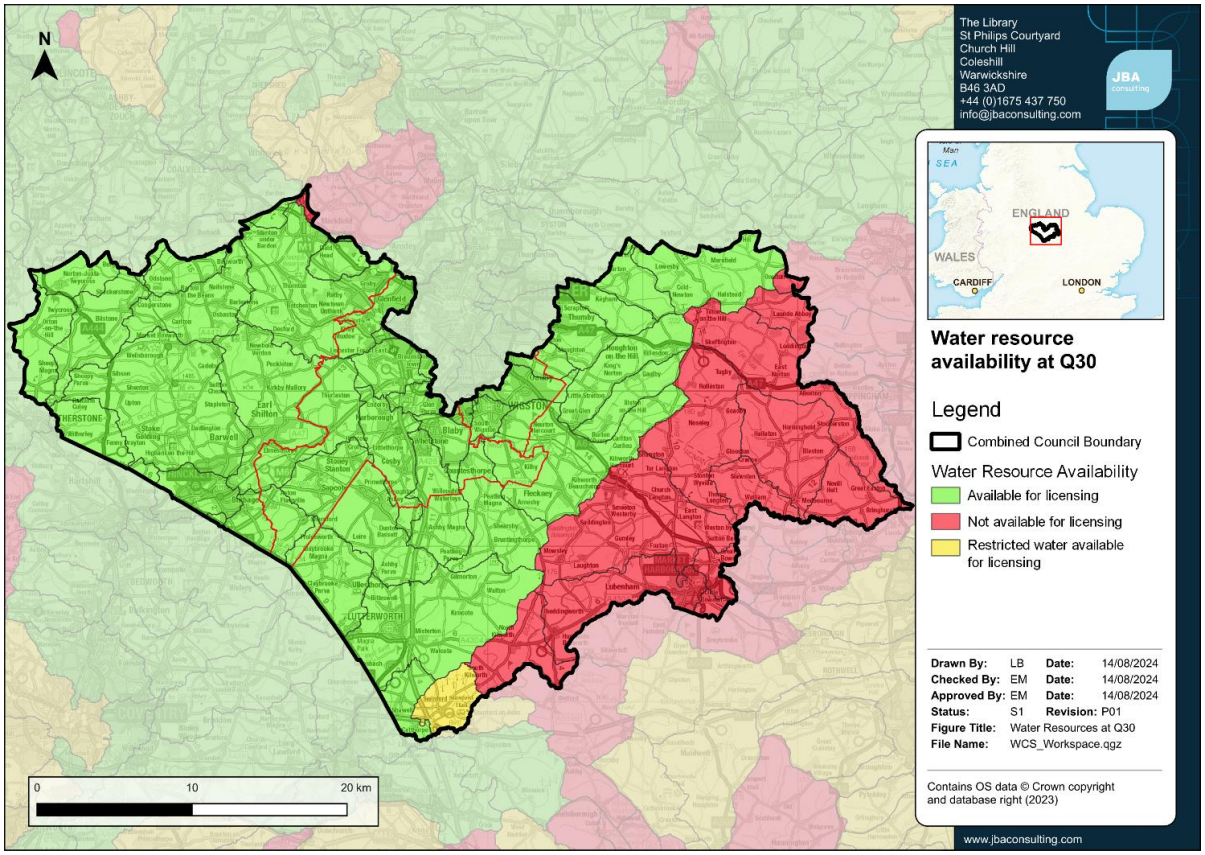


Figure 4.6 Water resource availability at Q30

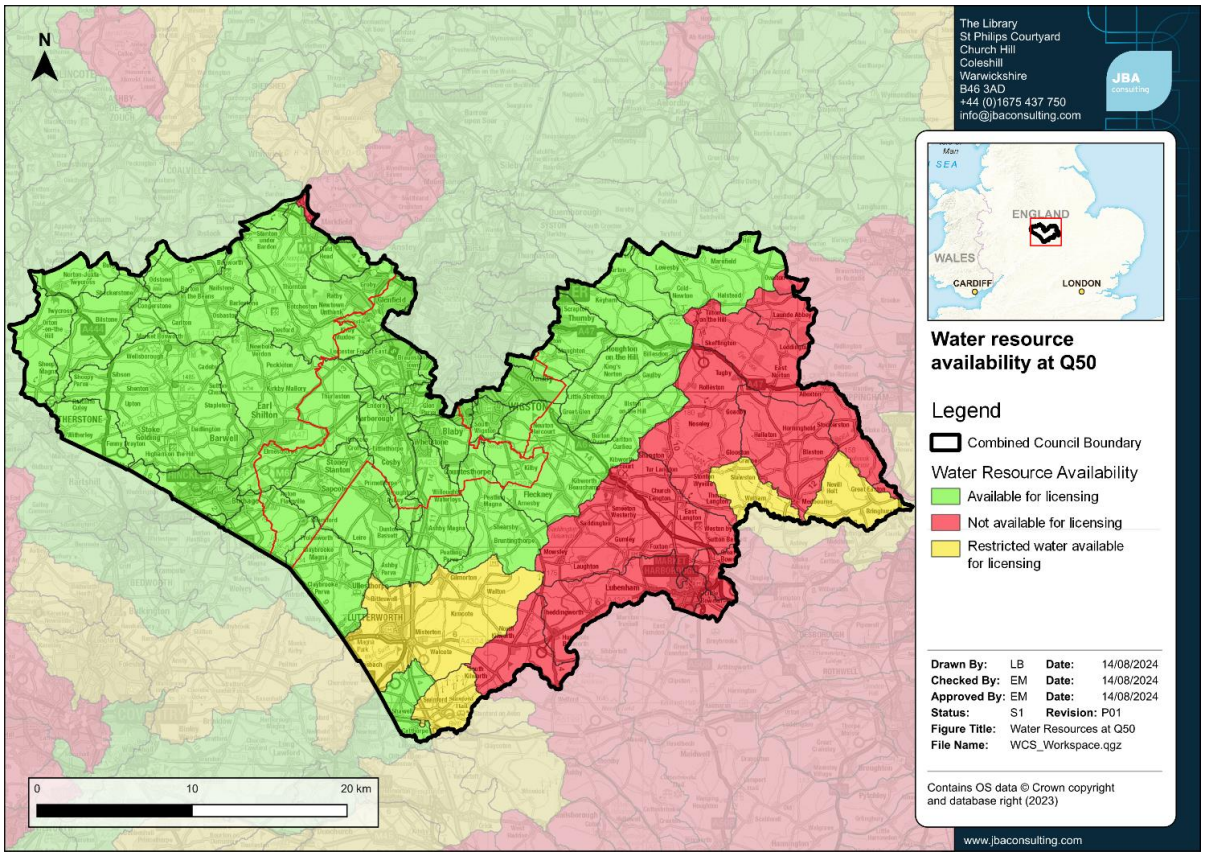


Figure 4.7 Water resource availability at Q50

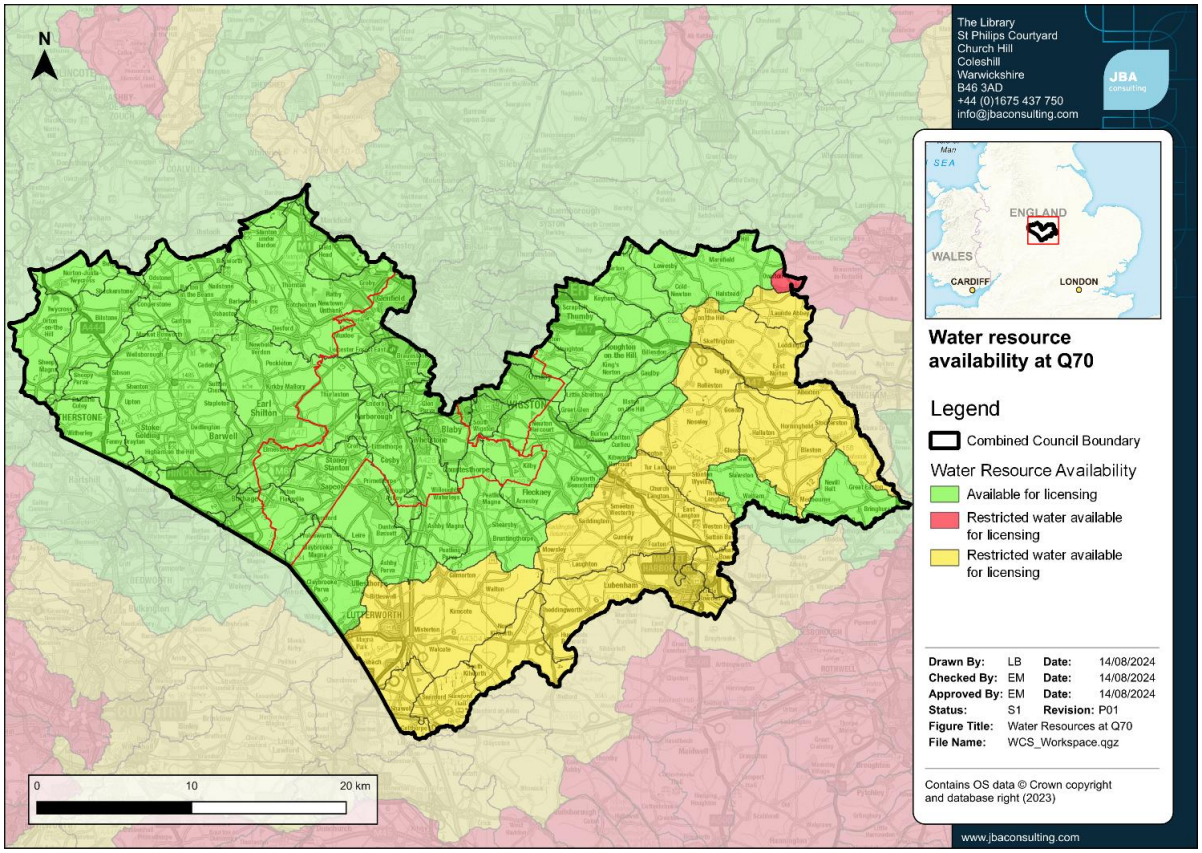


Figure 4.8 Water resource availability at Q70

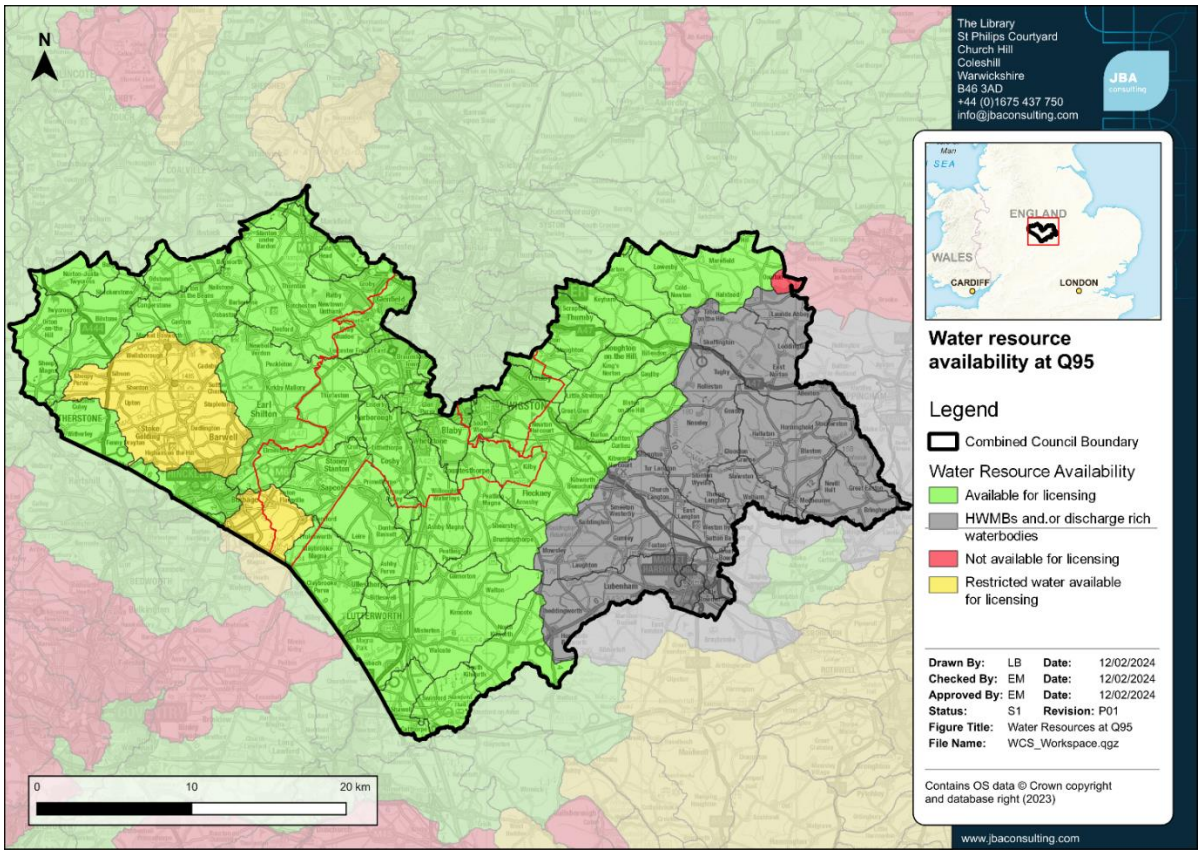


Figure 4.9 Water resource availability at Q95

In some catchments this assessment may show that there is limited or no water available for abstraction at Q50 or Q70 but show that there is water available at lower flows. This is likely to be because most abstraction licences are limited using a 'Hands off Flow' or 'Hands off Level', therefore within the catchment less water is being abstracted at very low flows and there is water available. This may not be the case across all catchments and, particularly in heavily modified catchments, there may be other artificial influences impacting on catchment flows. For example, if there are many discharges within the catchment or the flow is artificially augmented then this would artificially elevate flow particularly at lower flows. In some cases, the EA doesn't include this water in the amount available for licensing because it isn't guaranteed, but more flow can potentially be available.

4.3.3 Soar ALS

The Soar ALS covers licences for the Soar catchment. The Soar catchment covers ~1,380 km^2 covering part of the East Midlands in England. Surface water is the main source of abstraction within the Soar Catchment with few water resource pressures within the catchment as majority of public water is important, with some public water supply reservoirs in the west of the catchment. These reservoirs tend to be SSSIs and there are very little strategically important groundwater licences. The Soar catchment has several SSSIs, as such the protection of water courses is important to maintain the health of each of these protected sites.

Resource availability is calculated at four different flows Q95 (lowest), Q70, Q50 and Q30 (highest) at points along the river called Assessment Points (APs). The Soar has 8 assessment points, and at all these assessment points the number of days per year abstraction may be available is 329 and there is also a HoF restriction of 34.0 Ml/d at Q90. In addition, new licences are given a common end date, next of which is the 31 March 2037

At Q30, Q50, and Q70, majority of the catchment has water available for abstraction, however at Q95 there is limited water availability.

4.3.4 Tame Anker and Mease ALS

The Tame Anker and Mease ALS covers the catchments of the aforementioned rivers, with the Rivers Rea, Cole, Blythe covered within the strategy. The ALS span an area of ~3,136 km^2, covering much of the West Midlands and of West Leicestershire. The area has 2 SACs and 24 SSSIs, some of which are water bodies, as such the protection of water courses is important to maintain the health of each of these protected sites.

The catchment area has 10 assessment points, with a HoF of 2,650 Ml/d across the catchment area. New licences have a common end date of 31 March 2038, and a time limit for the 31 March 2026 for new abstractions or increases to existing licensed abstractions in the River Mease Catchment.

At Q30 most of the area has water available for abstraction, however there are two instances no water available, and three instances of limited water availability. At Q50 the number of areas of limited availability increases. At Q70 most of the area has water available with an increased area with no water available and limited availability. At Q95, water availability either has limited water availability or no water available.

Within 2050 climate change projections, low flows are to be 65% over but peak river flows to be 30% with drier summers and wetter winters.

4.3.5 Warwickshire Avon ALS

The Warwickshire Avon ALS catchment area covers the river Avon with notable tributaries such as the Rivers Swift, Stour, and Arrow. The area spans ~2,900 km^2, covering the midlands of England. The area has 24 SSSIs, some of which are water bodies, as such the protection of water courses is important to maintain the health of each of these protected sites. The water within the catchment area is primarily abstracted from surface and ground water for industry, agriculture and public water supply and restricted by HoF.

The catchment area has 14 assessment points, with a HoF of 2,568 Ml/d across the catchment area, and new licences have a common end date of 31 March 2037, with shorter time limits where there are risks to catchment sustainability.

At Q30 most of the area has water available for abstraction, the remaining areas have no water available. At Q50 most of the area has water available with a spilt between areas of limited water availability and no water availability. At Q70, is similar to Q50 with the exception of an increase in areas with limited water availability. At Q95, water availability either has limited water availability or no water available.

Within 2050 climate change projections, low flows are to be 65% over but peak river flows to be 30% with drier summers and wetter winters.

4.3.6 Welland and Nene ALS

The Welland and Nene ALS catchment area covers the aforementioned rivers and the major tributaries of the Rivers Glen, Gwash, and Chater, with the Welland discharging into The Wash. The area spans ~3,970 km2, covering the East Midlands and East of England. The Wash is the only mentioned SSSI, SPA and Ramsar within the SPA, however there are more within the catchment are that are not specified within the ALS. Due to The Wash, and other SSSIs being waterbodies the protection of water courses is important to maintain the health of each of these protected sites.

The catchment area has 20 assessment points with their own specific HoF. The ALS specifies two common end dates, the first being 31 March 2026, the second the 31 March 2038, operating in 12-year cycles.

At Q30, the catchment area is split between no water availability to the west of the area and limited water availability to the east. For Q50, Q70, and Q95, the full catchment area has no water availability.

4.4 Water Resource Management Plans

4.4.1 Introduction

Water Resource Management Plans (WRMPs) are 50-year strategies that water companies are required to prepare, with full updates every five years. 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, they set out 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 next 50 years.
- 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, ensuring that sufficient water continues to be available for growth and that the supply systems are flexible enough to adapt to climate change.

When new development within a Local Planning Authority 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 emerging Local Plan, with the demand accounted for by Severn Trent Water within their Water Resource Management Plan.

The water resources assessment has been carried out by reviewing the Water Resource Management Plans (WRMPs) of Severn Trent Water and Anglian Water.

The Water Resource Zones (WRZs) that cover the combined council area are shown in Figure 4.10. Most of the study area is served by the STW's Strategic Grid WRZ, with a small are in the east of Harborough served by Rutland WRZ (STW) and Ruthamford North (AW).

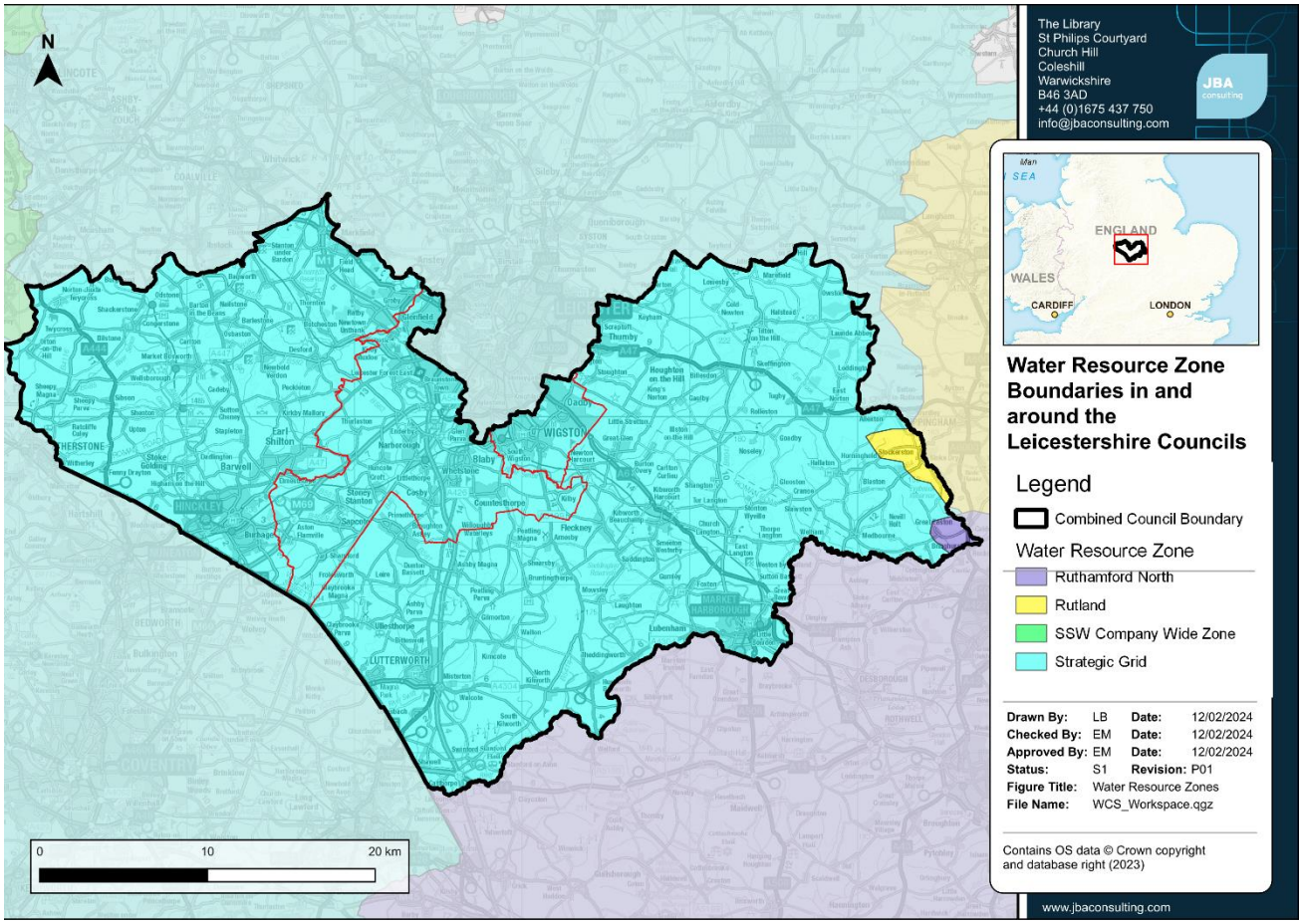


Figure 4.10 Water Resource Zones covering study area, South Staffordshire Water (SSW) is a water supply only company to the west of the combined council area.

4.4.2 Methodology

The spatial boundaries for each water company's water resource zones were used to overlay the local authority boundaries. Severn Trent Water and Anglian Water Water Resources Management Plans 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.

4.4.3 STW WRMP

Severn Trent's water comes from 40% reservoirs, 32% rivers and 28% groundwater. Challenges identified in the WRMP are:

- Growing population
- Leakages
- Sustainable abstraction
- Delivering the best value to customers

The draft for the Severn Trent 2024 WRMP was published in 2022 (Severn Trent, 2022).

In STW's WRMP24 revised draft, a focus on demand management, leakage reduction, value for customers and climate change. Demand reduction activities include smart metering, home efficiency checks, school pop-up sessions and a target to reduce per capita consumption to a mean of 110 l/p/d throughout their WRZ by 2050. Severn Trent are currently surpassing leakage targets and are predicting they will achieve a 50% reduction by 2045. There is also a focus on sustainable abstraction and ensuring the environment is protected.

The revised DWRMP24 contains an adaptive plan where if population is growing faster than expected an alternative pathway could be triggered and a different suite of options delivered. This will be explored further in the Stage 2 WCS once the final WRMP24 has been published.

The Strategic Grid Zone WRZ that covers part of the study area supplies most of Severn Trent's customers. Severn Trent's baseline supply and demand projections show Strategic Grid Zone WRZ is predicted to be in a deficit from 2029 to the end of the projections in 2085.

To meet the deficit, supply schemes are developed as part of the WRMP process alongside demand reduction. From AMP8 (2025-2030) the largest two schemes planned are transfers out of the Strategic Grid WRZ to support other WRZs (which therefore do not benefit the Strategic Grid WRZ). This is supported by an expansion of multiple Water Treatment Works (WTWs) alongside an increase in output of others. Programmes of leakage reduction and water efficiency are also planned aimed at reducing demand for future growth in STW's supply zone.

Table 4.3 Severn Trent Water preferred water resource programmes in AMP8

Scheme name	Benefit (million litres per day)
Transfer from Strategic Grid to Notts	30
Carsington to Tittesworth transfer	30
United Utilities Vyrnwy release to River Severn	25
Expand Strensham Water Treatment Works	15
Expand Draycote Reservoir (Rugby)	9.5
Increase output from Little Eaton Water Treatment Works	5

STW's WRMP also presents longer term Strategic Resource Options (SROs). Several of them are interconnected and rely on infrastructure or water resources from other water companies to be successful.

STW have presented a Strategic Resource Options (SROs) to increase water availability for abstraction within their WRZs, in Table 4.4.

Table 4.4 Strategic Resource Option

Strategic Resource Option (SRO)	Details
Upper Derwent Valley Reservoir Expansion	This reservoir expansion is working with Yorkshire Water to expand STWs current reservoir capacity (Severn Trent Water a, 2023).

4.4.4 AW WRMP

Anglian Water abstracts from pumped storage reservoirs, two natural catchment reservoirs, and eight raw water reservoirs, making up 50% of the water supply. The other 50% is abstracted from groundwater sources. The following challenges are identified within the WRMP:

- Population growth
- Climate change
- Environmental Needs
- Drought resilience

Anglian Water's WRMP was published in 2019, covering the period 2020-2045 (Anglian Water c, 2023). Anglian Water are in the process of developing their WRMP24 for the period 2025-2050, and the revised draft WRMP (rdWRMP) has been reviewed within the Stage 1 WCS. It should therefore be noted that information presented from the revised draft WRMP may be subject to change upon finalisation.

The rdWRMP reports that by 2050 therefore will be 38% less water to supply customers driven by the implementation of abstraction licence capping across the region, reducing the volume of water taken from sensitive catchments, achieving enhanced resilience to drought and adaptation to climate change. During the same period, water demand is expected to increase as the population is forecast to increase by 18% by 2050. In the baseline scenario, Anglian Water predicts a shortfall of 593 megalitres of water a day by 2050 if no action is taken.

The WRMP outlines how a supply-demand balance is achieved across each zone with the main measures outlined including:

- Demand management.
- Progression of strategic resource options (SROs).
- Increasing resilience of the public water supply against climate change, especially drought.

The demand management measures include:

- Continue the investment into smart metering across the region, reaching the maximum feasible meter penetration by 2030, achieving a demand saving of 25 Ml/d.
- Investigate how to pursue a compulsory metering strategy to be implemented by 2030.
- Promotion of water efficiency to homes by providing smart devices to monitor shower duration and volume.
- Continuous engagement with customers and community to embed behavioural changes within homes, with targeted communication during times of drought and peak summer demand.
- Implementing a "Water Demand Reduction Discovery Fund" to increase understanding of customer behaviours and explore future water efficiency initiatives.

Two Strategic Resource Options (SROs) are being progressed - the Fens and Lincolnshire reservoirs. Both are raw water storage reservoirs taking surplus water when available in the environment. Both are classed as Nationally Significant Infrastructure Projects and will require a Development Consent Order (DCO), expected to be applied for in 2026.

According to Anglian Water, both SROs will supply 43% of the water needed to maintain a supply-demand balance. The benefits of these reservoirs will not be felt until at least the mid-2030s.

Other water supply options included in the rdWRMP, although not within WRZs supplying the study area are a water reuse scheme at Colchester WRC (treated effluent from a WRC is discharged to a reservoir where it is subsequently abstracted and treated to drinking water standards) and desalination (abstraction of seawater and removal of salt).

Within the newest iteration of AW's rdWRMP there is an increased focus on the non-household sectors water usage. A portfolio of non-household options which are expected to save 10 Ml/d of water by 2029/30 and 50 Ml/d by 2049/50. The portfolio represents AWs most extensive programme of water efficiency including, but not limited to, smart metering and smart home device retrofitting (Anglian Water h, 2023).

Non-household demand management options are also presented in the newest iteration of the dWRMP. These options are laid out in Table 4.5 from the rdWRMP below

Table 4.5 Non-household water efficiency options. Table adapted from Anglian Water's dWRMP24 September 2023 iteration.

Type of visit	Size of customer (consumption)	Expected no. properties impacted per year (based upon AWs customer base)	Expected saving (per property per day)
Delivery of smart meter targeted water saving efficiency packages, similar to household drop20 campaigns. This will be undertaken on a scaled basis (dependent on the size of water consumption).	Low consumption	3,000	86 litres per water efficiency package
Specialist water efficiency audits, with find and fix for consumers using approximately 25,000 litres per property per day.	Medium consumption	79	2,127 litres per property

Type of visit	Size of customer (consumption)	Expected no. properties impacted per year (based upon AWs customer base)	Expected saving (per property per day)
Specialist water efficiency audits with find and fix for larger consumers (approx. 500,000 litres per property per day).	High consumption	10	43,775 litres per property
Retailer incentives for plumbing loss reduction A £100 incentive to retailers to reduce plumbing losses.	All users	3,000	59 litres per property
Smart meter identified plumbing loss fix non-household plumbing loss repairs for properties identified, through smart metering, to have continuous flow. These visits will be aligned with water efficiency visits.	All users	3,000	240
Smart meter identified customer supply pipe leakage (CSPL) fix. Non-household repairs for properties identified, through smart metering, to have continuous flow. These visits will be aligned with water efficiency visits.	All users	3,000	9 litres per property

4.4.5 Population and household growth

Table 4.6 shows the household growth forecasts for the WRZs which serve growth within the four LPAs areas. It is difficult to make direct comparisons between the four LPAs and the Strategic Grid due to their differing geographies. Across the Strategic Grid, a 19% increase in the number of properties is predicted by STW. This is in line with the lower growth estimates (based on the Standard Method), for Hinckley and Bosworth, but is significantly less than the housing need for Blaby, Harborough and Oadby and Wigston and the higher growth scenarios for Hinckley and Bosworth.

A Stage 2 WCS should examine the difference in growth between the WRMP and housing need to ensure that a sufficient level of growth has been factored into water company plans.

The 2020 baseline household forecast is taken from the ONS Household Projections dataset (2018). The STW forecast is taken from the rdWRMP24 planning tables. Rutland WRZ and Ruthamford North WRZ only cover a small area of Harborough so have not been considered in this analysis.

Please note that changes proposed in the draft NPPF (being consulted on at the time of writing) may result in significant changes to the housing needs. This comparison may need to be revisited in Stage 2.

Table 4.6 Comparison of household growth forecasts

Forecast	2020	2041	% increase
Blaby District Council	43,393	+12,366	28%
Harborough District Council	39,434	+13,182	33%
Hinckley and Bosworth Borough Council - standard method (2023 affordability ratio)	50,925	+9,093	18%
Hinckley and Bosworth Borough Council - standard method (2023 affordability ratio) + 102 dpa	50,925	+12,054	24%
Hinckley and Bosworth Borough Council - standard method (Statement of Common Ground) + 187	50,925	+13,839	27%
Hinckley and Bosworth Borough Council - Policy SP02 Local Plan Consultation Draft (Regulation 18)	50,925	+13,862	27%
Oadby and Wigston Borough Council	21,003	+5,040	24%
Severn Trent Water - Strategic Grid WRZ	2,389,310	2,841,110	19%

4.4.6 Water Resource West regional plan

The Combined Councils are within the Water Resources West (WRW) regional water resources planning group. WRW have published and consulted on their Emerging Regional Plan for the West of England which covers 2025-2085 (Water Resources West a, 2022). WRW relies on several major rivers such as the Severn, Dee, Trent, and Wye to supply 18 million people as well as agriculture and businesses. WRW aim for a 50% reduction of leakage by 2050 and deliver net environmental and biodiversity gain.

Figure 4.11 has been taken from the WRW website to illustrate the future demand for water within the area.

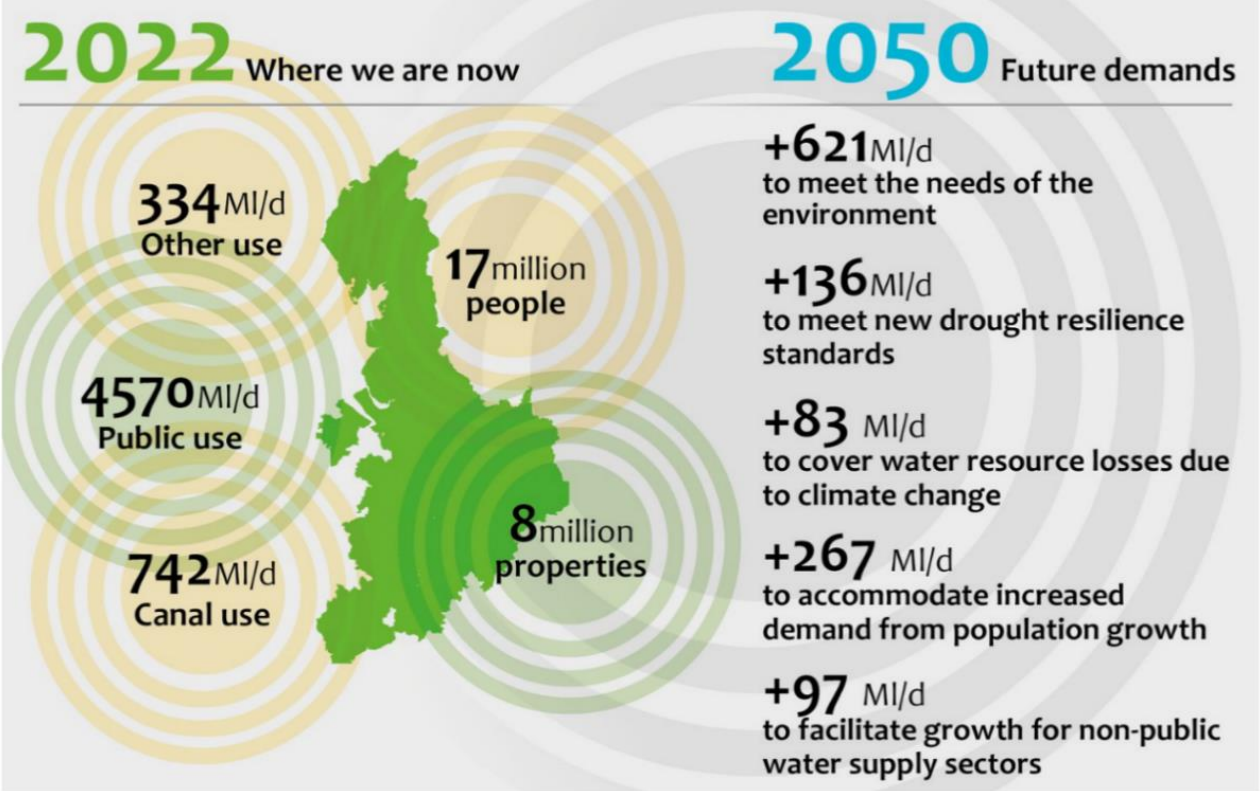


Figure 4.11 Future demands within the Water Resources West demand zone

(Water Resource West b, 2022).

The report outlines their needs for the future, and a recent report published in April 2023 (Water Resources West c, 2023) further lay out their plans for managing drivers for change within the report. These drivers are:

- Growth and an increased need in services
- Climate change
- Environmental needs such as low flow and water quality (including drinking water quality)
- Flood (high flows)

Proposed actions are laid out within the report.

Within the emerging regional plan some of the biggest non-public uses in the area are chemicals, agriculture, and power. In addition, interregional water transfers create a demand of energy. Issues such as over abstraction, pollution, and degradation of habitats make it difficult for some watercourses in the area to achieve 'good ecological status' under the WFD. WFD status is discussed further in Section 8.

As it currently stands at the time of writing, the draft best value plan is:

- Reduce daily water demand, including water labelling to help raise consumers awareness of how much water they are using. Water labelling is where a label is put on certain products such as washing machines and dishwashers saying how much water is used per use.

- Diversification water supply options to offset abstraction reduction.
- Developing new water resources to support water transfers.
- Upgrading networks in South-East Wales.
- Improving water quality and the natural environment.

Factors that will increase pressure on the water supply and demand to 2050 in the WRW region are:

- Climate change
- Drought resilience
- Environmental needs
- Demand growth

The area that WRW covers experiences more extensive drought and severe drought. This creates more pressure on water resources. Baseline forecasts for the Strategic Grid WRZ show that in a 1 in 500-year drought scenario there will be a large deficit (Water Resources West d, 2021). WRW have a goal of reducing household per capita consumption to 110 l/p/h/d by 2050 and a leakage reduction of 50% to try to manage the lack of water resources in the future. Drought measures, new supply and transfers between regions are also goals to help increase water resource availability in the future.

4.5 Domestic and Sectoral Water Use

In 2021/2022 the amount of water used per person in England and Wales (Per Capita Consumption) was, on average, 145 litres per day. However, this does not account for the total water use based on all the water required for day-to-day activities and products bought.

Water is abstracted under licences from the EA, issued on the basis of the reasonable needs of the public, industry and agriculture and availability of supplies. The total water use for the Water Resources West region is 5,645 Ml/d, of which water companies in the region abstract, treat and distribute 4,570 Ml/D (81%). The next largest abstractor is the Canal and Rivers Trust at 742 Ml/d (13%). The remaining 6% is made up of important but smaller abstractors, including power and agriculture.

4.6 Water Industry National Environment Programme measures

The Water Industry National Environment Programme (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. Actions may include investigations or actual measures, examples could be reductions in abstraction in a particular river to maintain flow to support WFD objectives, or a reduction in phosphate pollution in a catchment through upgrades to a WwTW.

WINEP will provide a baseline for the Local Nature Recovery Strategies required by March 2025. As set out in the recently enacted Environment Act, new Local Plans will need to have regard to LNRSs when being developed.

Table 4.7 shows WINEP actions relating to water resources in surface and groundwater waterbodies in the study area in AMP 7 (2020-2025). Actions relating to water quality are presented in Section 8 (Water Quality).

Development and population growth can increase abstraction, and so the Councils have an opportunity to contribute to these actions indirectly by pursuing policies that promote water efficiency in new development

Table 4.7 WINEP actions relating to water resources

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
Tame Anker Mease - PT Sandstone Burton	WMD00121	CHILCOTE P.S. - BOREHOLES 1,2,3	Investigation and Options Appraisal Groundwater No deterioration investigation relating to water resource	31/03/2022
Avon (Warks) - source to Clay Coton-Yelvertoft Brook	WMD00360	Stanford Reservoir (Leicestershire / Northamptonshire	Adaptive Management Action to Improve hydrological regime to meet WFD objectives	22/12/2024

4.7 Water Demand Management

4.7.1 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 several 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 Environment Agency classification of water stress.
  - Water resource management plans produced by water companies.
  - River Basin Management Plans 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 good ecological status, due to low flows or reduced water availability.
- Consultations with the local water and sewerage company, the Environment Agency and catchment partnerships.
- Consideration of the impact on viability and housing supply of such a requirement.

The following sections will set out the available evidence, and provide a recommendation for a water efficiency target for the study area.

4.7.2 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 Environment Agency 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 Environment Agency assessment, the Severn Trent and Anglian Water supply regions were classified as being areas of serious water stress.

4.7.3 River Basement Management Plans

One of the challenges identified in the River Basin Management Plan (RBMP) for the Humber Basin are alterations to "natural flow levels of water". The management recommendations from both RBMP's are listed below:

- Government and agencies (Environment Agency) give constraint or refusal to applications for renewals to time limited licences, changes licences necessary to protect the environment, implementing Restoring Sustainable Abstraction programme and bringing previously exempt abstractions under regulation.

- 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.

4.7.4 National Water Resources Framework

A National Framework for Water Resources was published by the Government in March 2020. This outlines the water resources challenges facing England 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. A water efficiency target higher than 110 l/p/d would make the overall target for the UK harder to achieve.

4.7.5 Water Resources West

At a regional level demand management has been planned by Water Resources West through their draft regional plan published in 2022. They have a target of reaching 110l/p/d by 2050; to reach this, they outline various objectives in their plan:

- Government to introduce water labelling
- Targeted water efficiency campaigns
- Significant roll out of water meters using enhanced/smart technology
- Reach 50% reduction in leakage by 2050 – including pressure control
- Household water audit
- Retrofitting indoor water efficiency devices

4.7.6 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 Environment Agency is:

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

It is useful to also refer to the refined definition developed by Ashton:

“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” (V Ashton, 2014)

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, water resource zones, or water abstraction boundaries depending on what is appropriate for that 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 several 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

Suggestions for water-efficiency measures are listed in Table 4.8.

4.7.7 Water positive development

As outlined in Section 3.7.2 and 3.7.3 the Government's EIP contained a commitment to develop guidance on "water positive" development. This goes further than water neutrality, giving back more to water sources than is taken, conserving and protecting while also replenishing. As with water neutrality, it involves actions such as rainwater harvesting, and greywater recycling as well demand management and offsetting.

This approach is being piloted in Greater Cambridge (Defra, 2024) by:

- reducing water use in new buildings
- reusing more water; and
- offsetting water use.

The offsetting part of this involve a "water credit" system where developers can offset their development through the purchase and sale of water credits to ensure they have a neutral impact on water scarcity in Cambridge.

An investment of £4.5 million of central Government money is also being made to deliver retrofitting of water efficient devices such as efficient sensor taps and boundary flow regulators in homes, schools and leisure centres.

4.7.8 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 homeowners are aware of their role in improving water efficiency. Table 4.8 shows water efficiency measures that can be made by consumers.

Table 4.8: Consumer water efficiency measures

Measure	Implementation
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
Rainwater harvesting and water reuse	Large-scale rainwater harvesting Small-scale rainwater 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
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).

Measure	Implementation
	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

4.7.9 Rainwater and Greywater Recycling

4.7.9.1 Rainwater harvesting

Rainwater recycling or rainwater harvesting (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.

4.7.9.2 Benefits of Rainwater Harvesting

- 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 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.

4.7.9.3 Challenges of RwH

- Dependency on rainfall can limit availability of harvested rainwater during drought and hot weather events.
- Increased capital (construction) costs to build rainwater harvesting infrastructure into new housing (equipment costs averaging between £2500 - £3000 plus installation fees upwards of £3000).
- Payback periods are long as the cost of water is low so there is little incentive for homeowners to invest. Further information can be found in the Housing Standards Review from the Department for Communities and Local Government.

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.

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

4.7.10 Energy and Water Use

According to EU statistics (Eurostat 2023), 14.5% of the UK's domestic energy usage is for water heating, a reduction from years prior but still a significant percentage. 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 is 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. However, the Future Homes Standard is to be updated and implemented by 2025, and as such usage may change to reflect the updates.

4.7.11 Impact on Viability

With the evidence outlined in Section 3.4.4, the cost of installing water-efficient fittings to target a per capita consumption of 110l/p/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[1] indicated that a target of 100l/p/d could be achieved with "minimal additional cost". Research undertaken for the devolved Scottish and Welsh

1 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: 12/12/2023

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 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[2] 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.

4.7.12 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 because 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. Both STW and AW offer discounts on their infrastructure charges if developers demonstrate they are building new homes that would use 100 l/p/d or less.

For water neutrality to be achieved, policy shifts may be required 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

2 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: 12/12/2023

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

4.7.13 Water efficiency target for the study area

Currently, Building Regulations provide for a water efficiency target of 125l/p/d or 110l/p/d in water stressed areas. Based on the EA classification of water stress and the information contained in the RBMPs alongside the national objective to achieve a water efficiency target of 110l/p/d across the UK by 2050, there is clear evidence to support the 110l/p/d as a minimum.

However, this figure is under review and is expected to change. The Future Homes Hub have proposed a roadmap to achieve the 110l/p/d national target that includes a target of 100l/p/d in water stressed areas from 2025. This figure reduces to 90l/p/d by 2030.

The WCS therefore recommends that the Councils adopt a policy requiring a water efficiency target of 100l/p/d in their respective Local Plans and allow for a reduction in this target to 90l/p/d from 2030.

This residential target should be supported by an equivalent non-household target.

In other areas of the UK. some LPAs are now going further than building regulations and adopting Local Plan policies requiring tighter water efficiency standards where there is a clear local need, including:

- Southern Water have committed in their Water Resource Management Plan to a water efficiency policy that aims to achieve a PCC of 100 l/p/d across the whole of their supply area by 2040. Southern Water advises Councils that a target of 100 l/p/d should be adopted in policy for new build properties, and 80l/p/d for strategic developments where master planning and community level schemes can provide greater benefits.
- Concerns over the impact of abstraction on an SAC and Ramsar site have led to the Sussex North WRZ being designated as a water neutrality area and a target of 85l/p/d across all residential development in the WRZ has been recommended (JBA Consulting, 2022). This has been successfully adopted in Crawley Borough Council's Local Plan.
- Within Greater Cambridge, the Environment Agency are objecting to planning applications due to concerns over future water resource availability. A target of 80l/p/d. is being explored by the planning authority.

4.8 Conclusions

- Most of the study area receives its water from Severn Trent Water from their Strategic Grid WRZ (and a small area from their Rutland WRZ) with an area to the east of Harborough served by Anglian Water (from their Ruthamford North WRZ).

- A comparison was made between predicted growth contained in STW's rdWRMP24 and the housing needs of the LPAs. Across the Strategic Grid, a 19% increase in the number of properties is predicted by STW. This is in line with the lower growth estimates (based on the Standard Method), for Hinckley and Bosworth, but is significantly less than the housing need for Blaby, Harborough and Oadby and Wigston and the higher growth scenarios for Hinckley and Bosworth. This should be investigated further in a Stage 2 WCS once the final WRMP24 has been published.
- The Water Industry National Environment Programme (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. Several 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 the Combined Councils 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 several 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 Environment Agency 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 Environmental Improvement Plan 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 three credits in the assessment category WAT01 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.

4.9 Recommendations

Table 4.9 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 Local Planning Authorities.	STW and AW	Ongoing
Provide yearly profiles of projected housing growth to water companies to inform the WRMP update.	BDC, HDC, HBBC, OWBC	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. target.	BDC, HDC, HBBC, OWBC	In Council specific LPs
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.	BDC, HDC, HBBC, OWBC	In Council specific LP
The concept of water neutrality or water positive development 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 Environment Agency how the Council's planning and climate change policies can encourage this	BDC. HDC, HBBC, OWBC, STW, AW and EA	In LP and Climate Change Action Plan

Action	Responsibility	Timescale
approach. This approach could have application in strategic sites and new settlements		
Larger residential developments (including new settlements), and commercial developments should consider incorporating greywater recycling and/or rainwater harvesting into development at the master planning stage to reduce water demand.	BDC, HDC, HBBC, OWBC, STW and AW	In Council specific LP
Water companies should advise the Councils of any strategic water resource infrastructure developments within the study, where these may require safeguarding of land to prevent other type of development occurring.	BDC, HDC, HBBC, OWBC, STW and AW	Part of Councils LP process
Review this section of the WCS following publication of Severn Trent and Anglian Waters final Water Resource Management Plan 2024.	BDC, HDC, HBBC, OWBC	Stage 2 WCS

5 Water Supply Infrastructure

5.1 Introduction

An increase in water demand adds pressure to 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 scoping study is focused on the supply infrastructure. It is expected that developers should 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 (Waterwise, 2009). This is particularly feasible within property owned or managed by the local authorities, such as social housing.

5.2 Methodology

Once potential allocations are available, these will be shared with the water companies who will be asked to assess the impact of each site on the water supply network. A red / amber / green score will be assigned to each site based on the presence of any significant constraints and the nature of any upgrades or new infrastructure required to accommodate them.

5.3 Recommendations

Table 5.1 Recommendations for water supply

Action	Responsibility	Timescale
The Councils and Developers should engage early with water	BDC, HDC, HBBC, OWBC, AW, STW, developers	Ongoing

Action	Responsibility	Timescale
companies to ensure supply infrastructure is in place prior to occupation.		
Developers should engage early with water companies to ensure that the capacity of distribution systems is adequate prior to development coming forward	AW, STW, developers	Ongoing

6 Wastewater Collection

6.1 Sewerage Undertakers

Severn Trent Water and Anglian Water are the Sewerage Undertaker (SU) for the study area. The role of sewerage undertaker includes the collection and treatment of wastewater from domestic and commercial premises, and 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 overflow (often referred to as Combined Sewer Overflows or CSOs).

Likewise, headroom at Wastewater Treatment Works (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 Environment Agency as the environmental regulator, may tighten consented 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.

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. 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 sustainable drainage systems (SuDS) to groundwater, watercourses, or surface water sewers. The WwTW catchments can be seen in Figure 6.1.

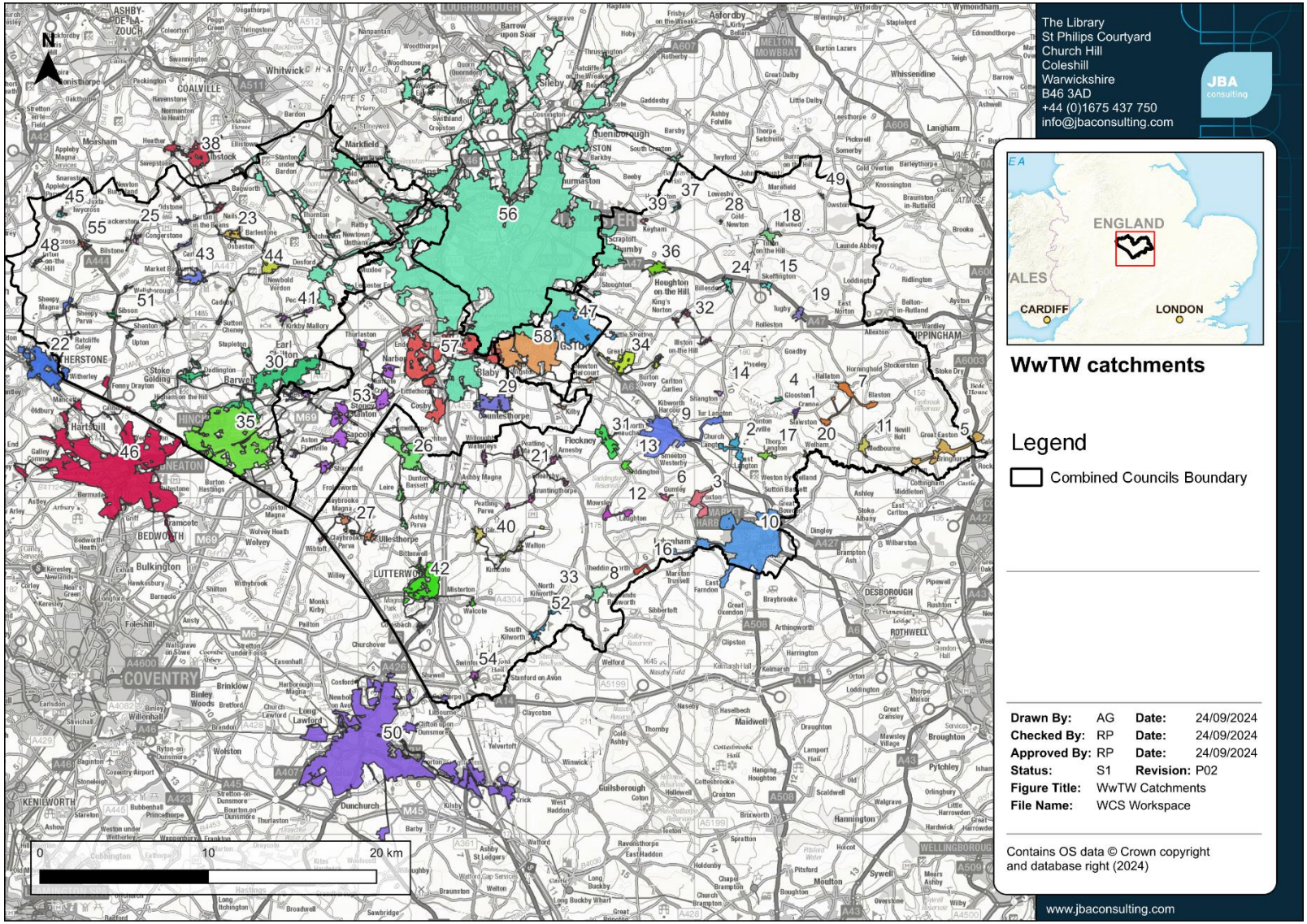


Figure 6.1 WwTW catchments serving the combined councils area, numbers refer to table 6-1 below.

Table 6.1 WwTW catchment name, JBA given number and water company they are operated by

WwTW name	WwTW number (Figure 6.1)	Water Company
ARNESBY	21	STW
ATHERSTONE	22	STW
BARLESTONE	23	STW
BILLESDON	24	STW
BILSTONE	25	STW
BROUGHTON ASTLEY	26	STW
CLAYBROOKE MAGNA	27	STW
COLD NEWTON	28	STW
COUNTESTHORPE	29	STW
CRANOE	1	AW
EARL SHILTON	30	STW
EAST LANGTON	2	AW
FLECKNEY	31	STW
FOXTON	3	AW
GAULBY	32	STW
GLOOSTON	4	AW
GRANGE FARM	33	STW
GREAT EASTON	5	AW
GREAT GLEN	34	STW
GUMLEY	6	AW
HALLATON	7	AW
HINCKLEY	35	STW
HOUGHTON ON THE HILL	36	STW
HUNGARTON	37	STW
HUSBANDS BOSWORTH	8	AW
IBSTOCK	38	STW
KEYHAM	39	STW
KIBWORTH	9	AW
KIMCOTE	40	STW
KIRKBY MALLORY	41	STW
LUTTERWORTH	42	STW
MAGNA PARK	n/a	STW
MARKET BOSWORTH	43	STW
MARKET HARBOROUGH	10	AW

WwTW name	WwTW number (Figure 6.1)	Water Company
MEDBOURNE	11	AW
MOWSLEY	12	AW
NEWBOLD VERDON	44	STW
NORTON JUXTA	45	STW
NUNEATON-HARTSHILL	46	STW
OADBY	47	STW
ORTON ON THE HILL	48	STW
OWSTON	49	STW
RUGBY NEWBOLD	50	STW
SADDINGTON	13	AW
SHANGTON	14	AW
SIBSON	51	STW
SOUTH KILWORTH	52	STW
STONEY STANTON	53	STW
SWINFORD	54	STW
THEDDINGWORTH	16	AW
THORPE LANGTON	17	AW
TITLTON ON THE HILL	18	AW
TUGBY	19	AW
TWYCROSS	55	STW
WANLIP	56	STW
WELHAM	20	AW
WHETSTONE	57	STW
WIGSTON	58	STW

6.2 Assessment of the Drainage and Wastewater Management Plans

6.2.1 Severn Trent Water DWMP

Severn Trent Water's DWMP (Severn Trent c, 2023) lays out eight key ambitions:

- Guarantee future water supply.
- Ensure water is used wisely.
- Deliver a high quality, affordable service.
- Lower the risk of flooding and pollution.
- Protect and enhance our environment.
- Support a more circular economy.

- Make a positive social difference.
- Maintain a safe, inclusive, and fair workplace.

There are 2,647 storm overflows in the Severn Trent Water region, and by 2050, 1097 of them are predicted to be classed as high priority activating higher than 10 times per year, which is above the national annual allowance. By 2030 STW aim to align to the Storm Overflow Discharge Reduction Plan by addressing 39% of high priority storm overflows causing harm and 26% of all overflows activating more than 10 times a year. Reducing storm overflow operation can be achieved by upgrading WwTWs or the sewer network ensuring that storm overflows only operate in unusually heavy rainfall.

An assessment has been carried out using a Baseline Risk and Vulnerability Assessment (BRAVA) for a 1 in 50-year storm with various climate change scenarios taken into consideration (no temperature change, 2°C increase and 4°C increase). The scenarios looked at how many properties would be at risk of internal sewer flooding. Currently there are 112,000 properties at risk of internal flooding which amounts to 2.58% of connected properties in the Severn Trent region. If no upgrades of WwTW occur, by 2050 this percentage is expected to rise to 39% (155,998 properties), assuming a 2°C increase in temperature.

The DWMP moves on to option development and appraisal. It identifies 'investment opportunities' to alleviate internal sewer flooding and spills from storm overflows. These investments would incorporate separation to remove surface water from combined sewers. Further investment is identified to reduce harm from storm overflows including improving screening for pollutants and addressing high priority storm overflows.

Maximising blue-green nature-based solutions was focussed on to work towards a more sustainable approach to reducing the inflow of surface water in the sewer network. The main solution for this was using SuDS.

Overall, there is a focus on reduction of storm overflow operations, upgrading WwTW and creating more sustainable water management options, such as SuDS.

6.2.2 Anglian Water DWMP

Anglian Water's DWMP for 2025-2050 lays out four main ambitions:

- Make the East of England resilient to the risks of drought and flooding
- Enable sustainable economic and housing growth in the UK's fastest growing region
- Be a carbon neutral business by 2030
- Work with others to achieve significant improvement in ecological quality across the catchments

1,500 storm overflows have been identified in the DWMP (as Level 3 Catchments - catchments of a water recycling centre), with a modelled uplift of 36% increase in spills by 2050 and an aim (at time of writing) to have all overflows to have an event duration monitor by the end of 2023. The DWMP then outlines assessment criteria for storm overflows, from

trigger points for prioritisation, assessing the spill frequency, identifying the high priority list, investigations and investments.

An assessment has been carried out using a Baseline Risk and Vulnerability Assessment (BRAVA) for a 1 in 50-year storm, using the 36% uplift, assessed against the following objectives:

- Escape from Sewers
  - Storm overflow performance
  - External/internal sewer flooding risk and pollution risk
  - Risk of flooding from the 1 in 50-year storm
  - Sewer collapse
- WRC compliance
  - WRC quality
  - WRC DWF compliance
- Environment and well being
  - Access to amenity areas
  - Green infrastructure
- Extended BRAVA assessment to review some sites sensitivity to growth

In these assessments, Market Harborough had been identified to be at a DWF compliance risk, with mitigations consisting of increasing the capacity of the water recycling centres, increasing the attenuation and capacity of networks and a 10% removal of surface water.

The DWMP primarily focuses on storm flow reduction, increased use of sustainable management options, and increased performance of infrastructure.

6.3 Storm Overflows

Storm overflows are an essential component in the sewer network – however when they operate frequently, 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 all this flow passed through the sewer network and is treated at a wastewater treatment works.

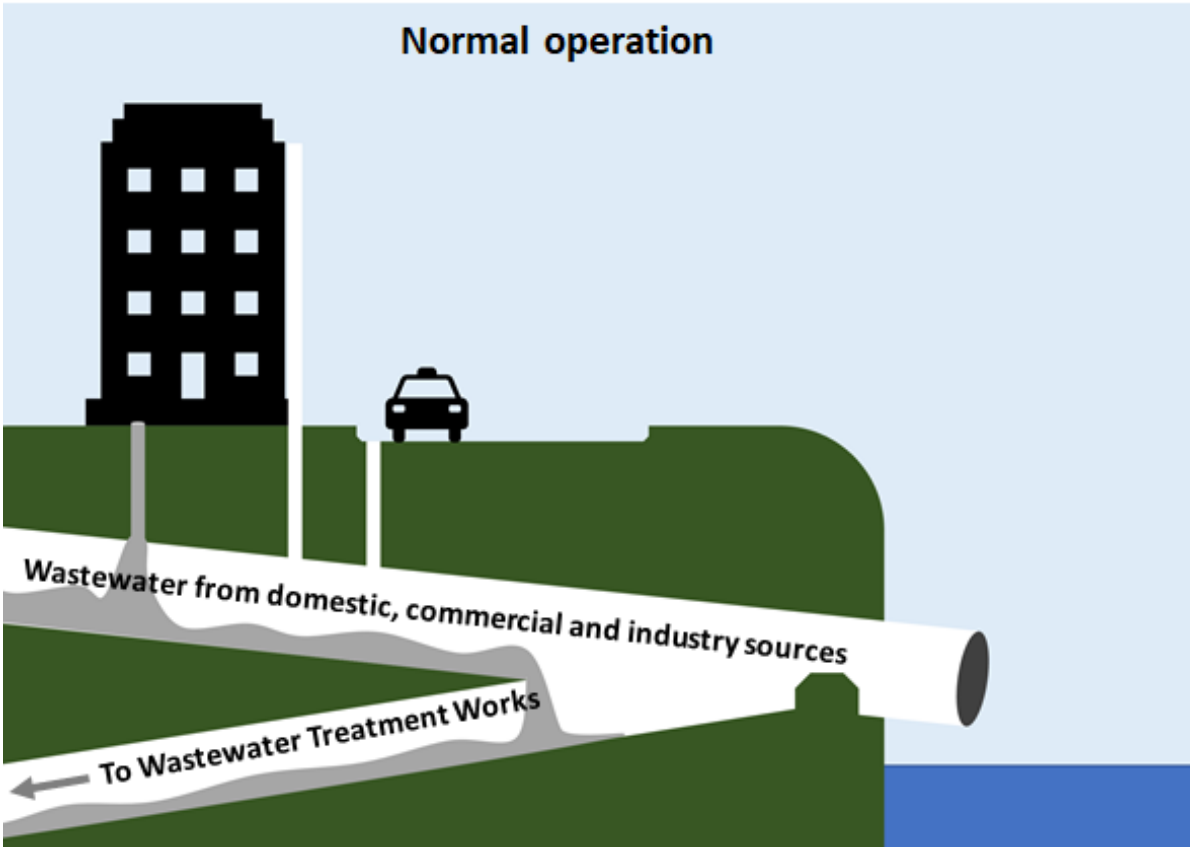


Figure 6.2 Storm overflow operation in normal conditions

In periods of exceptional rainfall, 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.

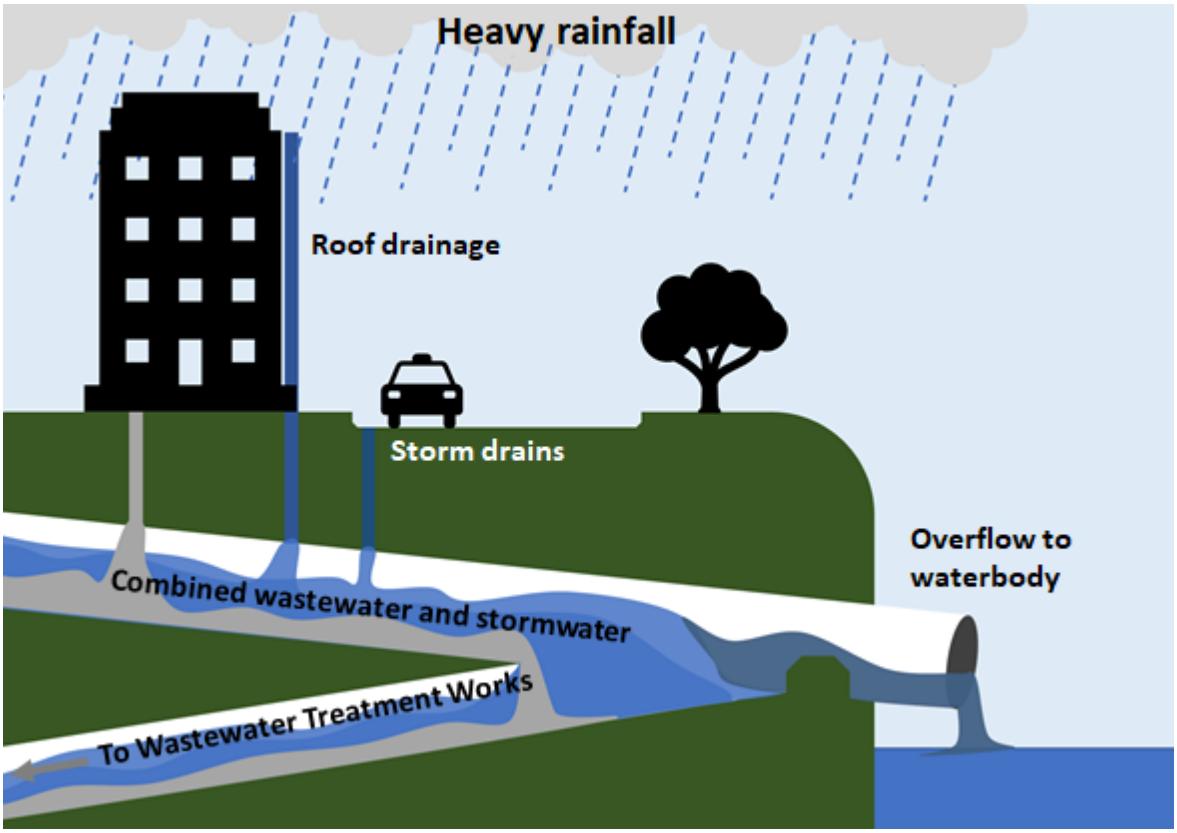


Figure 6.3 Storm overflow operation in exceptional rainfall

6.4 Methodology

6.4.1 Sewerage System Capacity Assessments

New residential developments 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 must 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.

Sewerage Undertakers 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 Asset Management Plan (AMP) period. Typically, investment is committed to provide new or upgraded sewerage capacity to support allocated growth with a high certainty of being delivered. 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.

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.

The Storm Overflow Taskforce 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, and a target was set to monitor the frequency and duration of operation at all storm overflows by 2023. This is called Event Duration Monitoring (EDM). The EDM dataset (which contains performance data on the 16,639 storm overflows monitored in 2021) has been used to provide information on storm overflows in the Combined Councils area. The EA have set thresholds above which a storm overflow should be investigated. Where there is one year of EDM data this should be if there are over 60 operations per year, over 50 operations for two years of data and 40 operations for three years of data. We have included a maximum of three years of data in our assessment, where less years were available, we have applied the above corresponding threshold. Storm overflows assessed either exist within the study area or part of the sewerage catchment that crosses the study area boundary.

Table 6.2: Definition of RAG scoring applied

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.

The results of the storm overflow assessment can be seen in Figure 6.6, with the overflows scored as "red" summarised in Table 6.2. The full data set can be viewed in Appendix A.

A total of 161 storm overflows across the study area were assessed and within that number a total of 13 overflows were rated as "Red". A red rating means that an investigation should be carried out. A further 60 storm overflows are classed as amber, as they are not meeting the long-term goal of ten spills or less per year.

According to Water UK, there are 175 storm overflows in the study area (Water UK, 2024) (which includes overflows on the network and at WwTW). Analysis in this report shows 201, which may be because there are additional overflows now monitored since the Water UK data was published. Of these, 108 have improvements planned aimed at reducing the number of spills.

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

The current plan is expected to prevent 2,232 spills by 2030 and 3,504 spills by 2050, a 48% and 75% 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 6.4 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 6.5 shows the corresponding number of spills as improvements are made.

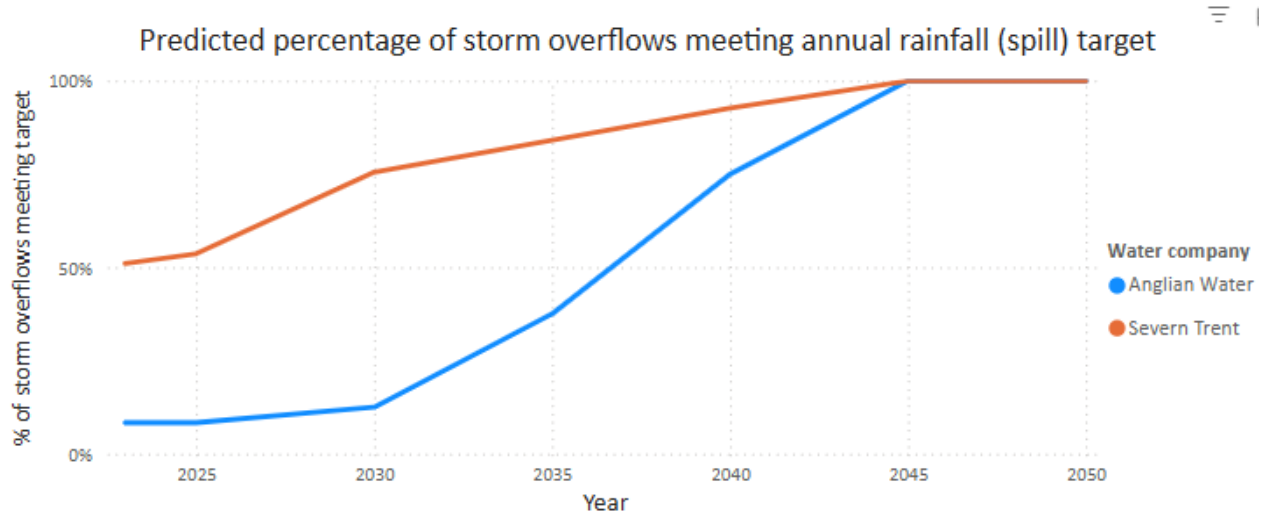


Figure 6.4 Percentage of storm overflows in study area meeting annual spill targets

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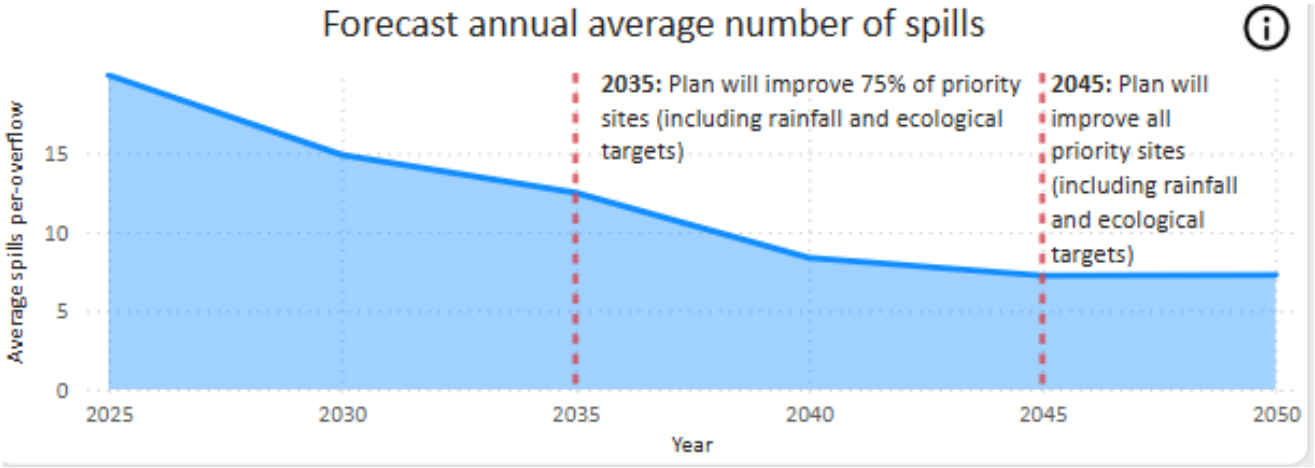


Figure 6.5 Forecast number of spills

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.

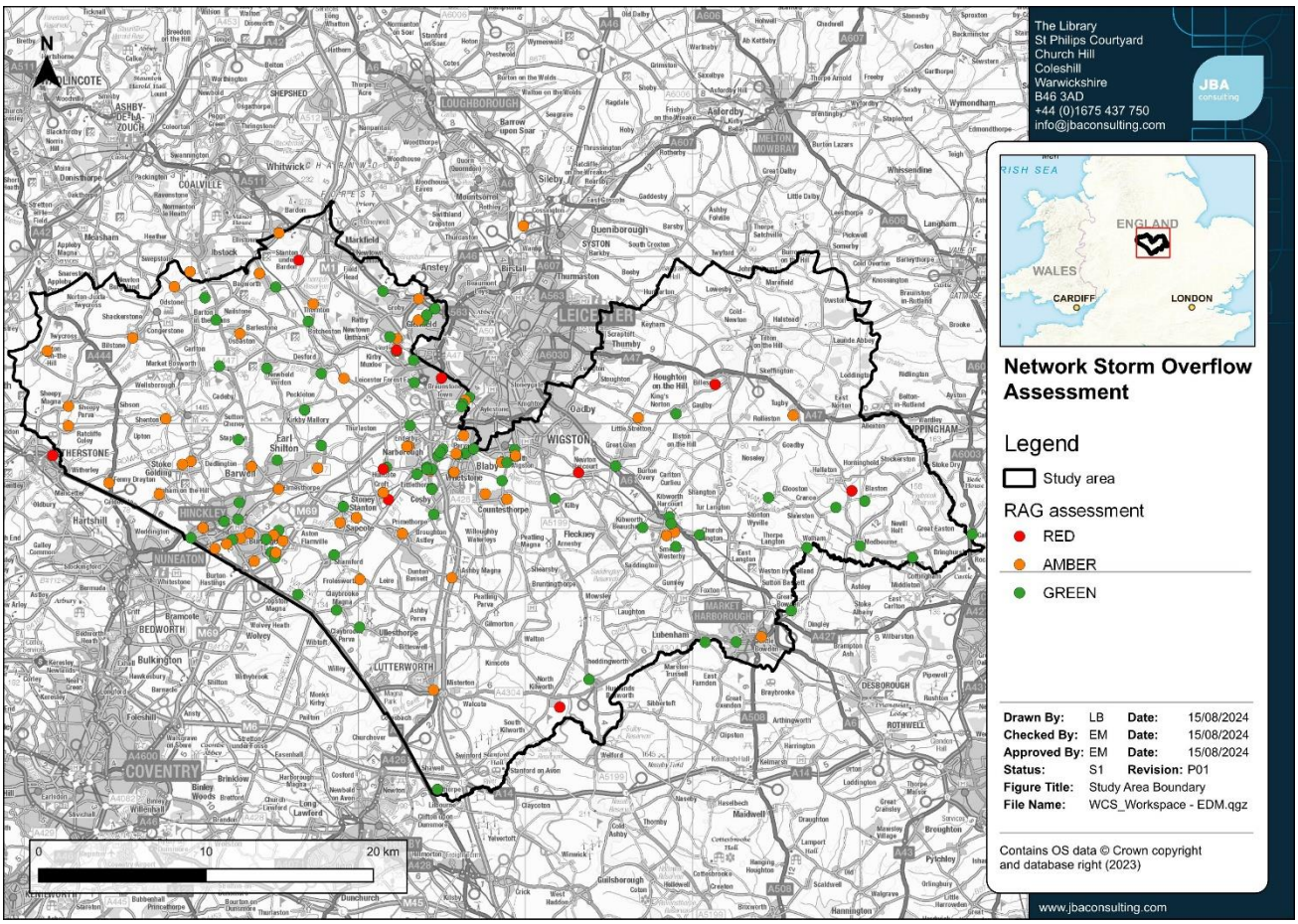


Figure 6.6 Results of the storm overflow assessment (network)

Table 6.3: Storm overflows with a red rating that are in or serving growth in the study area

Site name and Permit Ref	Permit Reference	Number of Spills 2021	Number of Spills 2022	Number of Spills 2023	Average Number of Spills	RAG Rating
ARBOR ROAD CSO	T/50/12388/O	55	48	50	51	RED
ATHERSTONE SEWAGE TREATMENT WORKS	T/19/35541/R	80	60	83	74	RED
ATHERSTONE SEWAGE TREATMENT WORKS	T/19/35541/R	112	76	110	99	RED
BILLESDON STW	T/51/45517/R	259	123	83	155	RED
FOREST ROAD CSO	T/50/40087/O	54	56	79	63	RED
GLENFIELD/KIRBY MUXLOE PS/STM/SWS	T/56/02605/O	61	47	107	72	RED
HALLATON STW	AWNNF1287	103	113	162	126	RED
NEWTON HARCOURT PUMPING STATION	T/51/40031/O	0	47	80	42	RED
NORTH KILWORTH - CRANMER LANE (SSO)	TBC	46	23	53	41	RED
STANTON UNDER BARDON SPS	T/56/40256/O	77	40	90	69	RED
VARIOUS PS'S & CSOS-STONEY STANTON	T/50/03632/O	45	33	58	45	RED
WESTOVER ROAD CSO	T/52/00990/O	41	42	60	48	RED
WIGSTON - BLABY RD (CSO)	TB3798VK	42	37	50	43	RED

6.5 Conclusions

- 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, Severn Trent Water and Anglian Water is required, and further modelling of the network may be required in the Stage 2 WCS and 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 201 storm overflows in recorded in the study area, 161 on the network, and 40 at WwTWs.
- 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. 13 of the storm overflows were operating above this threshold between 2021 and 2023. The Storm Overflow Reduction Plan which was 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 60 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 when development sites are on previously developed land, 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 councils involved and Leicestershire County Council, and Severn Trent Water and Anglian Water is recommended to allow time for the strategic infrastructure required to serve these developments to be planned.

6.6 Recommendations

Table 6.4: Recommendations from wastewater network assessment

Action	Responsibility	Timescale
Early engagement between the involved councils, Severn Trent Water, and Anglian Water is required to ensure that where strategic infrastructure is required, it can be planned in by Severn Trent Water and Anglian Water and will not lead to any increase in discharges from sewer overflows.	BDC, HDC, HBBC, OWBC, STW, AW	Ongoing

Action	Responsibility	Timescale
Consider wastewater infrastructure constraints in phasing development in partnership with the sewerage undertaker.	BDC, HDC, HBBC, OWBC, STW, AW	Ongoing
Developers will be expected to work with the sewerage undertaker 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.	BDC, HDC, HBBC, OWBC, STW, AW and developers	Ongoing
Developers will be expected to demonstrate to the Lead Local Flood Authority (LLFA) that surface water from a site will be disposed using a sustainable drainage system (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, STW and AW.	Leicestershire County Council as LLFA, and developers	Ongoing

7 Wastewater Treatment

7.1 Wastewater Treatment Works in the Combined Councils area

The Environment Agency 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 7.1 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 Wastewater Treatment Works (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, freeing their capacity for the next rainfall event.

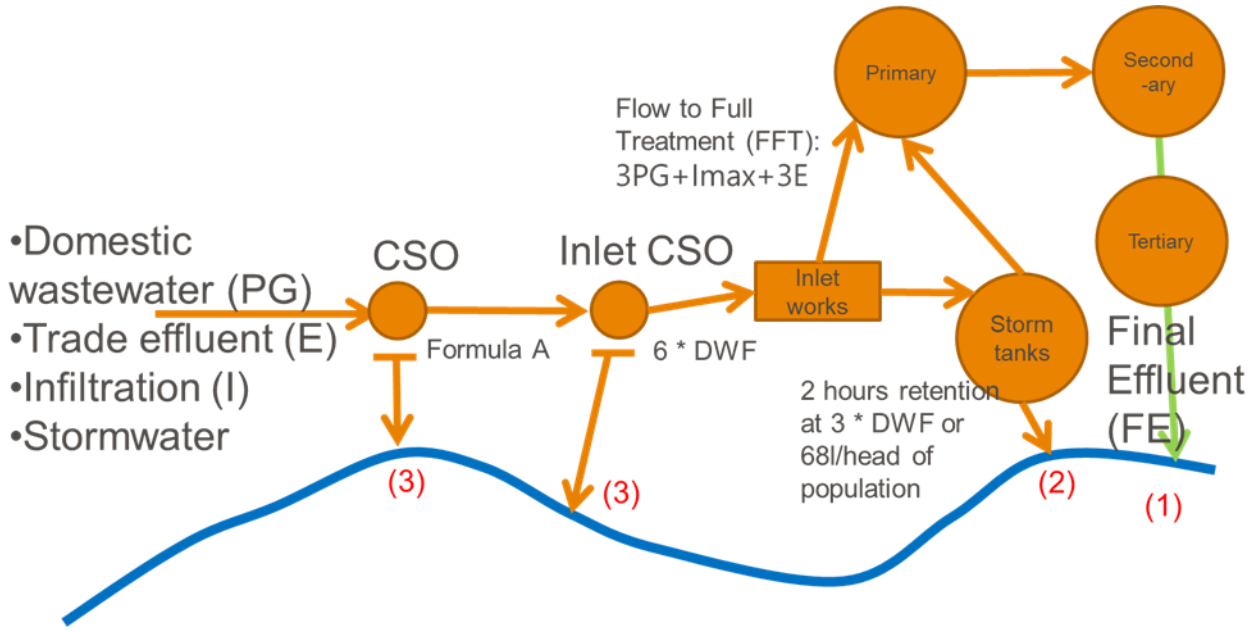


Figure 7.1 Overview of a typical combined sewerage system and WwTW discharges

Environmental permits are used alongside water quality standard as a means of controlling the pollutant load discharged from a water recycling centre to a receiving watercourse. Sewage flow rates must be monitored for all WwTWs 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 at which discharges to storm tanks will be permitted by the permit (Flow to Full Treatment, FFT).

WwTW Environmental Permits also consent for maximum concentrations of pollutants, in most cases Suspended Solids (SS), Biochemical Oxygen Demand (BOD) and Ammonia (NH4). Some works (usually the larger works) also have permits for Phosphorous (P). These are determined by the Environment Agency 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 Water Framework Directive (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.

7.2 Assessment of treatment capacity in the DWMPs

7.2.1 Severn Trent Water

The DWMP provides details of the WwTW capacity assessment from the baseline risk and vulnerability assessment (BRAVA). STW outline the priority level for capacity at each works over five-year periods up to 2050. These priority levels are; short term (ST), medium term (MT) and long term (LT). In addition, ST provided their Level 1 WwTW Assessment which categorises works by the amount of spare capacity and watercourse constraints (usually the receiving water quality), Table 7.1. A 'very high' capacity rating describes the level of priority of the works, indicating a potential issue with low capacity in future, and vice versa for 'low' ratings. ST provided comments on the status and if any improvements are planned.

Those works which ST indicate have limited capacity are; Billesdon - with investment options being investigated, Kimcote and Market Bosworth - both with ongoing capacity monitoring, Nuneaton Hartshill - AMP7 scheme underway, Sibson - AMP7 scheme underway, South Kilworth - AMP8 scheme planned, Swinford - ongoing capacity monitoring and Wanlip - with AM7 & 8 schemes underway and planned respectively. ST indicate a large proportion of the receiving watercourses have 'high' or 'very high' water quality constraints for their works serving growth from the combined councils.

Table 7.1 DWMP WwTW capacity assessment and STW Level 1 assessment for works receiving growth in the plan period

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
ARNESBY	LT	LT	LT	LT	LT	Medium	Low	AMP7 quality scheme in progress which will address likely growth in the catchment
ATHERSTONE	LT	LT	LT	LT	LT	Medium	High	AMP7 quality scheme in progress which will address likely growth in the catchment
BARLESTONE	LT	LT	LT	LT	LT	Low	High	AMP7 scheme underway for works expansion to accommodate anticipated growth within the catchment

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
BILLESDON	LT	LT	ST	ST	ST	High	Medium	Capacity headroom limited. Investment options to be investigated.
BILSTONE	N/A	N/A	N/A	N/A	N/A	Low	Low	Sufficient spare capacity to accommodate anticipated growth
BROUGHTON ASTLEY	ST	ST	ST	ST	ST	Medium	High	Sufficient spare capacity to accommodate anticipated growth
CLAYBROOKE MAGNA	LT	LT	LT	LT	LT	Low	High	Sufficient spare capacity to accommodate

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
								anticipated growth
COLD NEWTON	N/A	N/A	N/A	N/A	N/A	Low	Non-Numeric	No risk identified
COUNTESTHORPE	LT	LT	LT	LT	LT	Medium	Low	Final Effluent will be transferred to Wigston at the end of AMP7
EARL SHILTON	ST	ST	ST	ST	ST	Low	Very High	Sufficient spare capacity to accommodate anticipated growth.
FLECKNEY	LT	LT	LT	LT	LT	Medium	High	AMP7 quality scheme in progress which will address likely growth in the catchment

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
GAULBY	LT	LT	LT	LT	LT	Low	Low	Sufficient spare capacity to accommodate anticipated growth
GRANGE FARM	N/A	N/A	N/A	N/A	N/A	Low	Non-Numeric	No risk identified
GREAT GLEN	ST	ST	ST	ST	ST	Low	High	Sufficient spare capacity to accommodate anticipated growth
HINCKLEY	LT	LT	LT	LT	MT	Low	Very High	Site closing at the end of AMP7 and its flows will be transferred to Nuneaton-Hartshill

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
HOUGHTON ON THE HILL	LT	LT	LT	LT	LT	Low	High	AMP8 quality scheme planned the scope of which will contribute towards environmental compliance
HUNGARTON	N/A	N/A	N/A	N/A	N/A	Low	High	Sufficient spare capacity to accommodate anticipated growth
IBSTOCK	LT	LT	LT	LT	LT	Low	High	AMP7 quality scheme in progress which will also address likely growth in the catchment

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
KEYHAM	N/A	N/A	N/A	N/A	N/A	Low	High	Sufficient spare capacity to accommodate anticipated growth
KIMCOTE	LT	LT	ST	ST	ST	High	Medium	Capacity headroom being monitored
KIRKBY MALLORY	LT	LT	LT	LT	LT	Low	Low	Sufficient spare capacity to accommodate anticipated growth
LUTTERWORTH	ST	ST	ST	ST	ST	Medium	High	AMP8 scheme planned to address anticipated growth in the catchment

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
MARKET BOSWORTH	LT	LT	LT	LT	MT	High	High	Capacity headroom being monitored
NEWBOLD VERDON	N/A	N/A	N/A	N/A	N/A	Medium	High	Investment before 2030 unlikely, headroom being monitored
NORTON JUXTA	N/A	N/A	N/A	N/A	N/A	Very High	Medium	Site closing at the end of AMP7 and its flows will be transferred to Snarestone

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
NUNEATON-HARTSHILL	LT	LT	LT	LT	LT	Very High	High	AMP7 scheme underway with quality drivers but also to accommodate flows from Hinckley and future forecast growth
OADBY	LT	LT	LT	LT	LT	Low	Very High	AMP7 quality scheme in progress which will also address likely growth in the catchment
ORTON ON THE HILL	N/A	N/A	N/A	N/A	N/A	Low	Non-Numeric	No risk identified
OWSTON	LT	LT	LT	LT	LT	Low	Low	Sufficient spare capacity to accommodate

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
								anticipated growth
RUGBY NEWBOLD	LT	LT	LT	LT	MT	Medium	High	AMP8 scheme planned to address anticipated growth in the catchment
SIBSON	N/A	N/A	N/A	N/A	N/A	Very High	High	AMP7 quality scheme in progress which will address likely growth in the catchment

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
SOUTH KILWORTH	ST	ST	ST	ST	ST	Very High	Medium	AMP8 quality scheme planned the scope of which will address likely growth in the catchment and contribute towards environmental compliance
STONEY STANTON	LT	LT	LT	LT	LT	Low	Low	Sufficient spare capacity to accommodate anticipated growth
SWINFORD	ST	ST	ST	ST	ST	Very High	High	Capacity headroom being monitored

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
TWYCROSS	N/A	N/A	N/A	N/A	N/A	Medium	Low	Capacity headroom limited. Investment options to be investigated.
WANLIP	ST	ST	ST	ST	ST	Very High	Very High	AMP7 enhancement scheme underway. AMP8 schemes planned with quality and growth drivers to contribute towards treatment capacity enhancement and environmental compliance

WwTW	2021	2025	2030	2035	2050	Estimated Spare Capacity (RAG)	Watercourse Constraints	Any other Comments
WHETSTONE	LT	LT	LT	MT	MT	Low	High	AMP7 quality scheme in progress which will also address likely growth to the catchment
WIGSTON	LT	LT	LT	LT	LT	Low	High	AMP7 scheme underway with quality drivers but also to accommodate flows from Countesthorpe.

7.2.2 Anglian Water

Anglian Water's risk-based catchment screening had no triggers for WwTW flow or quality compliance in the study area. However, the level 3 (WwTW catchment level) DWMP technical report identifies some improvement plans at the medium term and long term (2050), Table 7.2. Kibworth, Tilton on the Hill and Market Harborough works have plans for capacity increase in the medium term. This indicates Anglian foresee capacity issues with these works within the planning periods of the combined councils.

Table 7.2 WwTW catchment screening (trigger) and DWMP strategies at catchment level (3), for works receiving growth in the plan period

	DWMP Risk-based Catchment Screening	DWMP Risk-based Catchment Screening	DWMP Technical report - catchment level (3)	DWMP Technical report - catchment level (3)
WwTW	WwTW quality compliance	WwTW flow compliance	Medium term strategy	2050 Strategy at 2050
Cranoe	No	No	None	None
East Langton	No	No	None	No risk identified
Foxton	No	No	Wait and see	Wait and see
Glooston	No	No	None	None
Great Easton	No	No	None	Infiltration reduction
Gumley	No	No	None	None
Hallaton	No	No	Infiltration reduction	Wait and see
Husbands Bosworth	No	No	None	None
Kibworth	No	No	WwTW - increase capacity	Wait and see
Market Harborough	No	No	WwTW - increase capacity	10% surface water removal
Medbourne	No	No	WwTW - Process optimisation	None
Mowsley	No	No	None	None
Saddington	No	No	None	None
Shangton	No	No	None	None

	DWMP Risk-based Catchment Screening	DWMP Risk-based Catchment Screening	DWMP Technical report - catchment level (3)	DWMP Technical report - catchment level (3)
Theddingworth	No	No	None	None
Thorpe Langton	No	No	None	None
Tilton On the Hill	No	No	WwTW - increase capacity	Infiltration reduction
Tugby	No	No	None	No risk identified
Welham	No	No	None	None

7.3 JBA Headroom Assessment Methodology

An assessment of WwTW capacity was carried out by JBA using measured flow data supplied by STW and AW. The process was as follows:

- STW provided their calculated 80th percentile exceedance flow statistic for each WwTW.
- AW provided their daily flow data, the 80th percentile exceedance flow was calculated using years 2021-23, the same years that STW used.
- Adopted allocations, commitments, completions and an allowance for windfall, were assigned to a WwTW using the sewerage drainage area boundaries provided by STW and AW to assess headroom at each WwTW. 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.
- For each site, the future DWF was calculated using the occupancy rates and per-capita consumption values obtained from the Water Resource Management Plans (Table 7.3) 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.

Table 7.3 Water resource zone demand statistics

Water Supply Company	Water Resource Zone	Per capita domestic consumption (m^3/person/day)	Average occupancy (persons per household)
Severn Trent Water	Rutland	0.175	2.2
Anglian Water	Ruthamford North	0.171	2
Severn Trent Water	Strategic Grid	0.195	2.1

7.4 JBA headroom assessment results

STW have commented in their level 1 assessment that three WwTWs will stop operating at the end of AMP7 (2030). The flows currently entering these works will be diverted to others nearby, these are:

- Norton Juxta - will be transferred to Snarestone
- Countesthorpe - will be transferred to Wigston
- Hinckley - will be transferred to Nuneaton Hartshill

Our headroom assessment results shown in Figure 7.2 and Table 7.4 indicate the future available headroom as equivalent numbers of dwellings. The flow to the three works closing in AMP7 has been added to the receiving works future headroom figures. There are 12 works in the present day which have higher DWF than their permit (based on 80th exceedance percentile - the EA measure permit compliance on the 90th percentile), increasing to 22 by 2041. The works which have headroom in the present day and not in future are listed below, with the percentage capacity deficit predicted in future:

- Atherstone - minus 2,605
- East Langton - minus 46
- Fleckney - minus 982
- Hallaton - minus 47
- Market Bosworth - minus 275
- Medbourne - minus 94
- Newbold Verdon - minus 79
- Rugby Newbold - minus 30,524
- Tugby - minus 58
- Twycross - minus 21

The capacity assessment at Wanlip WwTW indicated that the WwTW is operating at or exceeding its flow permit based on the 80th exceedance percentile. Permit compliance is assessed by the Environment Agency using the 90th percentile statistic which results in a lower value than the 80th percentile - used in this assessment. Compliance of Wanlip WwTW is not within the scope of the WCS and the assessment below should not be used to infer non-compliance. JBA carried out a Stage 2 WCS for Leicester City in 2023 in which capacity at Wanlip WwTW was also highlighted. In STW's response to the Leicester City WCS, they rated Wanlip WwTW as a "very high risk" for flow status and commented that several phases of investment are planned over the next five to ten years to provide adequate treatment capacity. This includes an enhancement scheme in AMP7 (2020-25) and further upgrades in AMP8 (2025-30) to increase treatment capacity and environmental compliance. However, the data suggests that there is a risk of WwTW capacity being exceeded without careful consideration of the trajectory of development by LPAs with areas served by Wanlip WwTW.

The Magna Park business park contains a private package treatment works providing wastewater treatment to the businesses in the park. Flow data for this WwTW is therefore not held by the water companies so it was not possible to assess the available headroom. Should allocations be planned within the catchment for this WwTW, further investigation of

the capacity may be required in a Stage 2 WCS. There is currently a substantial additional wastewater demand predicted based on committed employment sites.

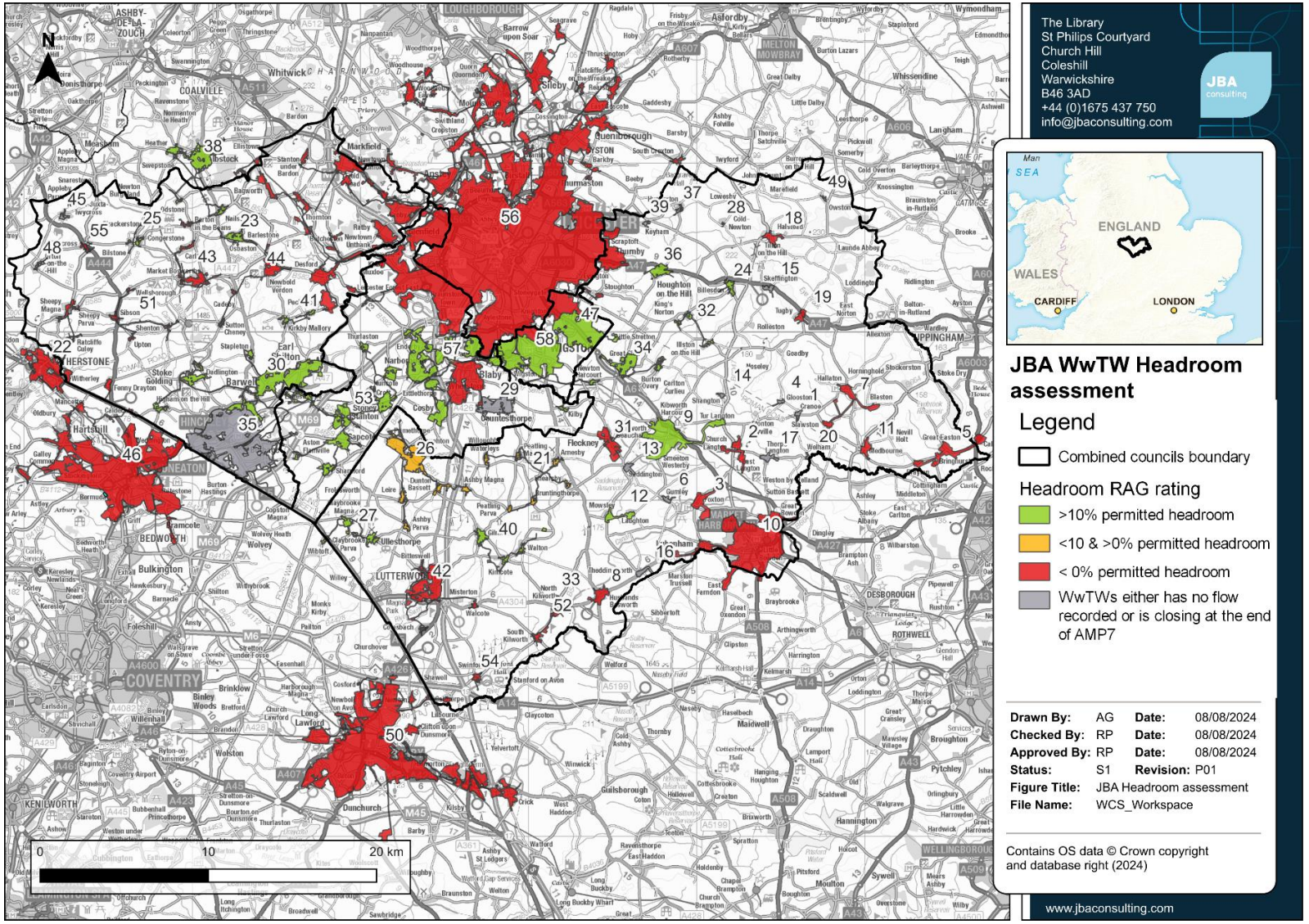


Figure 7.2 WwTWs catchment labels correspond to the number column in Table 7.4

Table 7.4 WwTW headroom assessment for works receiving wastewater from growth in the plan periods of councils. Future headroom incorporates all the growth proposed by the councils, including commitments and employment adopted allocations (at least to 2041.)

WwTW name	WwTW number (Figure 7.1)	Water Company	Committed housing growth over Local plan period	Committed employment growth over plan period (m^2)	Approximate remaining headroom (no. dwellings) following planned growth	Is DWF forecast to exceed permitted flow over local plan period
ARNESBY	21	STW	18	0	164	No
ATHERSTONE	22	STW	2,192	0	-2,605	Yes
BARLESTONE	23	STW	128	0	607	No
BILLESDON	24	STW	74	6,067	-265	Yes
BILSTONE	25	STW	7	957	356	No
BROUGHTON ASTLEY	26	STW	195	17,930	992	No
CLAYBROOKE MAGNA	27	STW	24	0	345	No
COLD NEWTON	28	STW	1	0	n/a	n/a
COUNTESTHORPE	29	STW	n/a	n/a	n/a	n/a
CRANOE	1	AW	9	0	n/a	n/a
EARL SHILTON	30	STW	840	16,937	6,188	No
EAST LANGTON	2	AW	44	0	-46	Yes
FLECKNEY	31	STW	610	4,851	-982	Yes

WwTW name	WwTW number (Figure 7.1)	Water Company	Committed housing growth over Local plan period	Committed employment growth over plan period (m^2)	Approximate remaining headroom (no. dwellings) following planned growth	Is DWF forecast to exceed permitted flow over local plan period
FOXTON	3	AW	16	0	-37	Yes
GAULBY	32	STW	1	0	112	No
GLOOSTON	4	AW	1	0	n/a	n/a
GRANGE FARM	33	STW	5	0	n/a	n/a
GREAT EASTON	5	AW	25	0	-79	Yes
GREAT GLEN	34	STW	126	0	2,356	No
GUMLEY	6	AW	3	0	n/a	n/a
HALLATON	7	AW	34	0	-47	Yes
HINCKLEY	35	STW	n/a	n/a	n/a	n/a
HOUGHTON ON THE HILL	36	STW	0	0	223	No
HUNGARTON	37	STW	7	0	n/a	n/a
HUSBANDS BOSWORTH	8	AW	67	0	-214	Yes
IBSTOCK	38	STW	497	499	1,780	No
KEYHAM	39	STW	1	0	n/a	n/a

WwTW name	WwTW number (Figure 7.1)	Water Company	Committed housing growth over Local plan period	Committed employment growth over plan period (m^2)	Approximate remaining headroom (no. dwellings) following planned growth	Is DWF forecast to exceed permitted flow over local plan period
KIBWORTH	9	AW	93	13,288	989	No
KIMCOTE	40	STW	35	672	271	No
KIRKBY MALLORY	41	STW	2	0	206	No
LUTTERWORTH	42	STW	3,197	95,569	-7,773	Yes
MAGNA PARK	n/a	STW	0	473,174	n/a	n/a
MARKET BOSWORTH	43	STW	196	0	-275	Yes
MARKET HARBOROUGH	10	AW	2,514	89,813	-7,473	Yes
MEDBOURNE	11	AW	85	0	-94	Yes
MOWSLEY	12	AW	6	0	208	No
NEWBOLD VERDON	44	STW	132	0	-79	Yes
NORTON JUXTA	45	STW	n/a	n/a	n/a	n/a
NUNEATON-HARTSHILL	46	STW	18,811	61,190	-57,582	Yes
OADBY	47	STW	392	0	5,995	No
ORTON ON THE HILL	48	STW	3	0	n/a	n/a

WwTW name	WwTW number (Figure 7.1)	Water Company	Committed housing growth over Local plan period	Committed employment growth over plan period (m^2)	Approximate remaining headroom (no. dwellings) following planned growth	Is DWF forecast to exceed permitted flow over local plan period
OWSTON	49	STW	1	0	n/a	n/a
RUGBY NEWBOLD	50	STW	12,376	1,200,000	-30,524	Yes
SADDINGTON	13	AW	6	0	n/a	n/a
SHANGTON	14	AW	12	515	n/a	n/a
SIBSON	51	STW	6	501	-38	Yes
SOUTH KILWORTH	52	STW	58	1,097	-236	Yes
STONEY STANTON	53	STW	47	4,956	4,180	No
SWINFORD	54	STW	47	0	-120	Yes
THEDDINGWORTH	16	AW	3	0	n/a	n/a
THORPE LANGTON	17	AW	2	0	n/a	n/a
TITLTON ON THE HILL	18	AW	18	0	-68	Yes
TUGBY	19	AW	18	668	-58	Yes
TWYCROSS	55	STW	16	2,018	-21	Yes
WANLIP	56	STW	60,283	295,271	-168,575	Yes

WwTW name	WwTW number (Figure 7.1)	Water Company	Committed housing growth over Local plan period	Committed employment growth over plan period (m^2)	Approximate remaining headroom (no. dwellings) following planned growth	Is DWF forecast to exceed permitted flow over local plan period
WELHAM	20	AW	4	0	n/a	n/a
WHETSTONE	57	STW	335	118,496	5,611	No
WIGSTON	58	STW	1,287	50,650	18,170	No

7.5 Storm Tank Overflows

The EDM data for the WwTW storm overflows was available for 1, 2 or 3 years (2021-23) depending on the discharges. An average was calculated where 2 or 3 years were available. 24 of the overflows meet the EA threshold for investigation (rated red), and nine are rated as amber. It is important that growth in these catchments does not lead to an increase in storm overflow operation. Figure 7.3 shows the results of the storm overflow assessment. The storm overflows assessed as "red" are summarised in Table 7.5. The full list of overflows at WwTWs can be found in Appendix A.

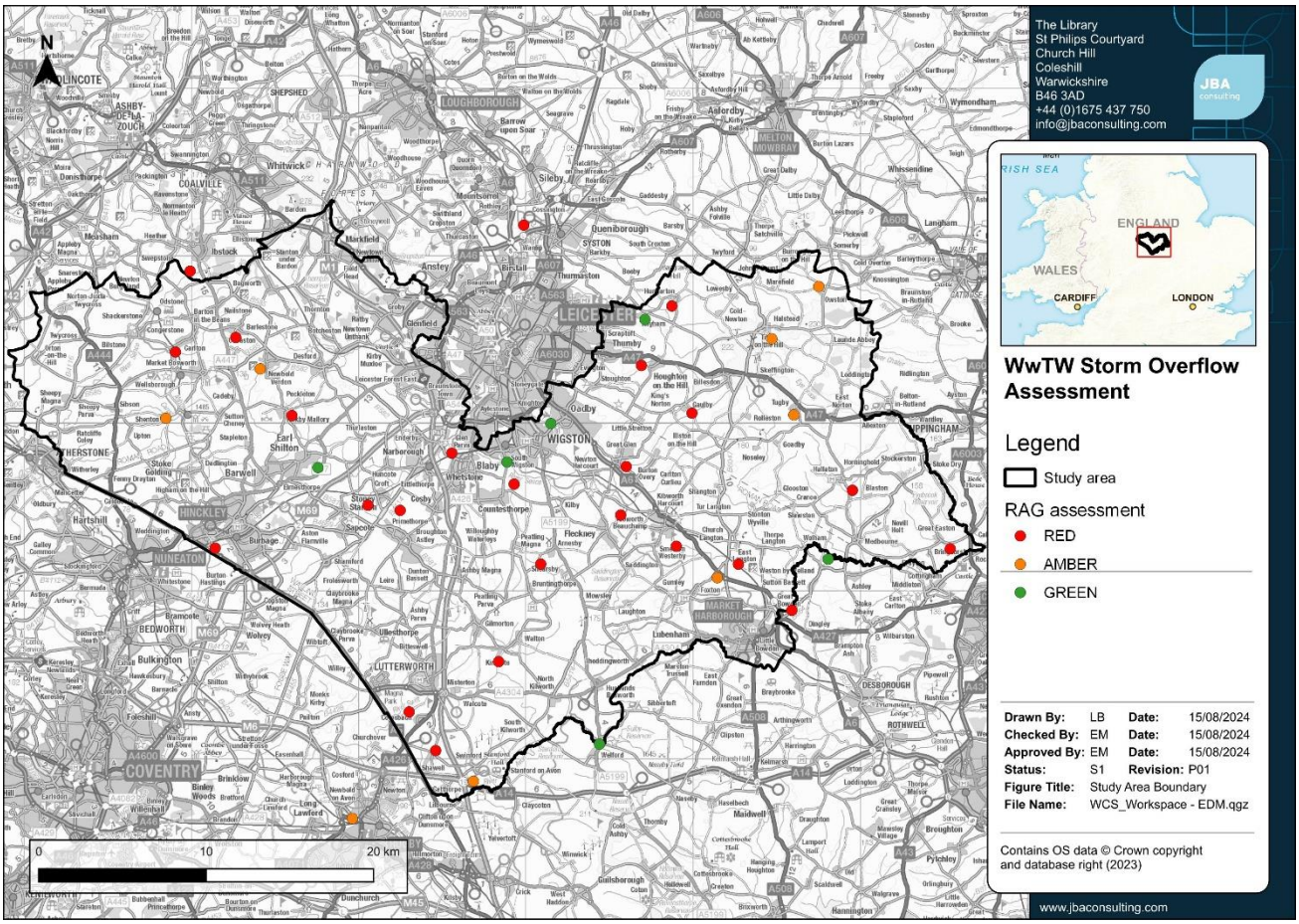


Figure 7.3 Results of the storm overflow assessment (at WwTWs)

Table 7.5 WwTW Storm Tank Overflows with a red rating that are in or surround the study area

Site name	Permit Reference	Number of Spills 2021	Number of Spills 2022	Number of Spills 2023	Average Number of Spills	RAG Rating
ARNESBY SEWAGE TREATMENT WORKS	T/51/45648/R	255	73	94	141	RED
BARLESTONE STW	T/20/35726/R	52	42	71	55	RED
BROUGHTON ASTLEY STW	T/50/45321/R	44	39	59	47	RED
COUNTESTHORPE STW	T/51/45760/R	106	64	107	92	RED
EAST LANGTON STW	AW5NF5216	79	50	133	87	RED
FLECKNEY SEWAGE TREATMENT WORKS	T/51/45576/R	52	30	64	49	RED
GAULBY STW	T/51/45532/R	99	65	177	114	RED
GREAT EASTON(LEICS) STW	AW5NF768	143	81	99	108	RED
GREAT GLEN SEWAGE TREATMENT WORKS	T/51/45910/R	68	66	114	83	RED
HALLATON STW	AWNNF1287	103	113	62	93	RED
HINCKLEY SEWAGE TREATMENT WORKS	T/19/36495/R	189	47	77	104	RED
HOUGHTON ON THE HILL STW	T/53/12089/R	71	53	102	75	RED
HUNGARTON STW	T/55/45462/R	39	55	55	50	RED
IBSTOCK SEWAGE TREATMENT WORKS	T/20/36246/R	40	56	77	58	RED
KIBWORTH STW	AW5NF803	0	24	101	42	RED
KIMCOTE SEWAGE TREATMENT WORKS	S/10/26413/R	135	113	205	151	RED

Site name	Permit Reference	Number of Spills 2021	Number of Spills 2022	Number of Spills 2023	Average Number of Spills	RAG Rating
KIRKBY MALLORY STW	T/50/46001/R	16	27	79	41	RED
LUTTERWORTH SEWAGE TREATMENT WORKS	S/10/26704/R	64	77	85	75	RED
MARKET BOSWORTH STW	T/20/35543/R	80	50	74	68	RED
MARKET HARBOROUGH-RIVERSIDE ROAD	AW5NF739A	70	50	76	65	RED
SHAWELL SEWAGE TREAMENT WORKS	S/10/26120/R	91	84	8	61	RED
STONEY STANTON STW	T/50/46146/R	56	48	83	62	RED
WANLIP SEWAGE TREATMENT WORKS	T/53/46354/R	56	35	64	52	RED
WHETSTONE WASTEWATER TREATMENT WRKS	T/50/45829/R	48	29	55	44	RED

7.6 Conclusions

- 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 the study area.
- Evaluation of the STW and AW Drainage and Wastewater Management Plans indicated a lack of capacity at many WwTWs expected to serve growth in the study area. AW plans had less detail available at the time of writing, however they identified Market Harborough and Tilton on the Hill as requiring increased capacity in the future.
- The JBA headroom assessment identified 22 WwTWs that are expected to be close to or exceeding their permit during the Local Plan period. An increase in the permit limit, and upgrades to treatment capacity may be required at these WwTW to accommodate further growth.
- Seven AW WwTW had no mention of capacity upgrades. All 13 of the STW WwTW within this group of 22 had comments related to capacity, these were either; Monitoring of headroom, capacity headroom limited. Investment options to be investigated or scheme planned or in progress to accommodate future growth.
- Consideration should be given where possible to using capacity in existing permits as this provides a lower carbon cost than upgrading capacity at existing WwTW or building new treatment works. This may however not always be feasible due to other Local Plan considerations.
- There are several poorly performing storm tank overflows at WwTWs in the study area. Growth within these catchments could result in an increase in the operations of these 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.

7.7 Recommendations

Table 7.6 Recommendations for wastewater treatment

Action	Responsibility	Timescale
Provide Annual Monitoring Reports to STW & AW detailing projected housing growth.	HDC, BDC, HBBC, OWBC	Ongoing
Early engagement with STW and AW (ideally within a stage 2 WCS) is required to ensure that provision of WwTW capacity is aligned with delivery of development.	HDC, BDC, HBBC, OWBC, STW, AW	Ongoing / During a stage 2 WCS
STW & AW to assess growth demands as part of their wastewater asset planning activities and feedback to the Council if concerns arise – ideally within the timeframe of the stage 2 WCS.	STW & AW	When this stage 1 WCS is published

8 Water Quality

8.1 Introduction

An increase in the discharge of effluent from Wastewater Treatment Works (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 Environment Agency (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.

The Environment Agency operational instructions on water quality planning and no-deterioration are currently being reviewed. Previous operational instructions[3] (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"[4] 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. The Environment Agency's operational instructions on water quality planning and no-deterioration[5] (now withdrawn but with no published replacement) set out a

3 Water Quality Planning: no deterioration and the Water Framework Directive, Environment Agency (2012). Accessed online at: http://www.fwr.org/WQreg/Appendices/No_deterioration_and_the_WFD_50_12.pdf on: 10/02/2023.

4 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: 10/02/2023.

5 Water Quality Planning: no deterioration and the Water Framework Directive, Environment Agency (2012). Accessed online at:

hierarchy for how the no-deterioration requirements of the WFD should be implemented on inland waters.

8.2 The Combined Council area in the Wider Catchment

This section provides an understanding of how the Combined Councils area fits into the wider catchment. By knowing the current Combined Councils position, shown in Figure 8.1, it can help in understanding where changes need to be made.

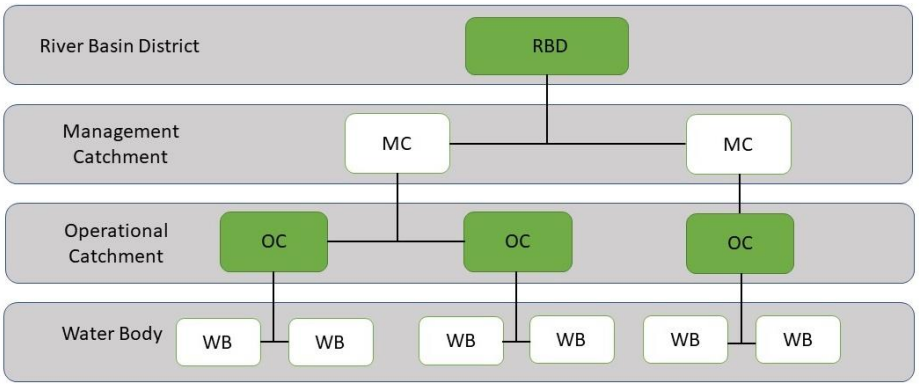


Figure 8.1 Catchment hierarchy (adapted from EA diagram)

The Humber River Basin District (RBD), with 18 management catchments (MC), where the Soar MC, with the Soar River and Wreake River Operation Catchments (OC) and Tame Anker and Mease MC, with the Sence Anker and Bourne Rivers and Lakes OC coving most of the study area. The rest of the study area is in a different district, Anglian. In the Anglian RBD, the study area is covered by the Welland MC, with the Welland Upper OC.

A qualitative assessment was conducted using available data on WFD Cycle 3 status for the receiving watercourse, forecast growth for each WwTW and existing water quality assessments conducted on each WwTW where available.

8.3 Methodology

8.3.1 General approach

In the Stage 1 WCS, a sensitivity analysis was undertaken of the water bodies in the Combined Councils area, to changes in the volume of treated effluent. It is proposed that a detailed modelling study form part of the Stage 2 WCS.

8.3.2 Water quality sensitivity assessment

SIMCAT is used by the Environment Agency 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

http://www.fwr.org/WQreg/Appendices/No_deterioration_and_the_WFD_50_12.pdf on: 10/02/2023.

deterioration will be reduced. SIMCAT is a 1-Dimensional model which represents inputs from both point-source effluent discharges (i.e. the point at which the WwTW discharges into the watercourse) and diffuse sources (for example pollution from runoff which enters the river over a length of the river), 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.

The study area is covered by the Severn, Trent, and Wash SIMCAT models.

Within SIMCAT, the determinands examined in this study were Biochemical Oxygen Demand (BOD), Ammonia (NH_4) and Phosphate (P). In fresh waterbodies, Phosphorus is usually the limiting nutrient for algal growth.

The following methodology was used:

- Run SIMCAT with current flow data and extract water quality outputs for ammonia, biochemical oxygen demand (BOD) and phosphate.
- Increase effluent flows at WwTWs by 20% to account for potential future development.
- Re-run SIMCAT with higher effluent flows and extract relevant river water quality data.
- Compare the two model runs for all three water quality indicators and categorise the percentage change.

Where water quality downstream of a WwTW in any given determinand deteriorates by 10% or more in response to a 20% increase in effluent flow, the sewer catchment can be said to be “more sensitive” to changes in effluent flow, and therefore growth. It should be noted that this assessment takes the existing SIMCAT model based on 2014-2020 data and increases flow by a consistent figure across the whole model. In some cases, a WwTW may be able to accommodate a higher flow, in other cases, a 20% increase may not be likely or feasible. This assessment therefore just highlights the relative risk of deterioration.

This analysis also does not consider planned changes in permits at WwTWs beyond 2025 that would have the effect of improving water quality.

8.4 Results

8.4.1 Water Framework Directive Overview

The Water Framework Directive (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 River Basin Management Plans (RBMPs). At the time of writing, the WFD Cycle 3 has been conducted but results not fully published, thus Cycle 2 has been used.

Figure 8.2 shows the overall WFD Status of the waterbodies in and around the Combined Councils area and Table 8.1 shows the number of waterbodies for each status that exist in the study are or border it. This is usually assessed in WCSs for each of the waterbodies that are predicted to receive additional effluent from growth during the plan period. Several of the WwTWs discharge to small watercourses which do not have a WFD classifications.

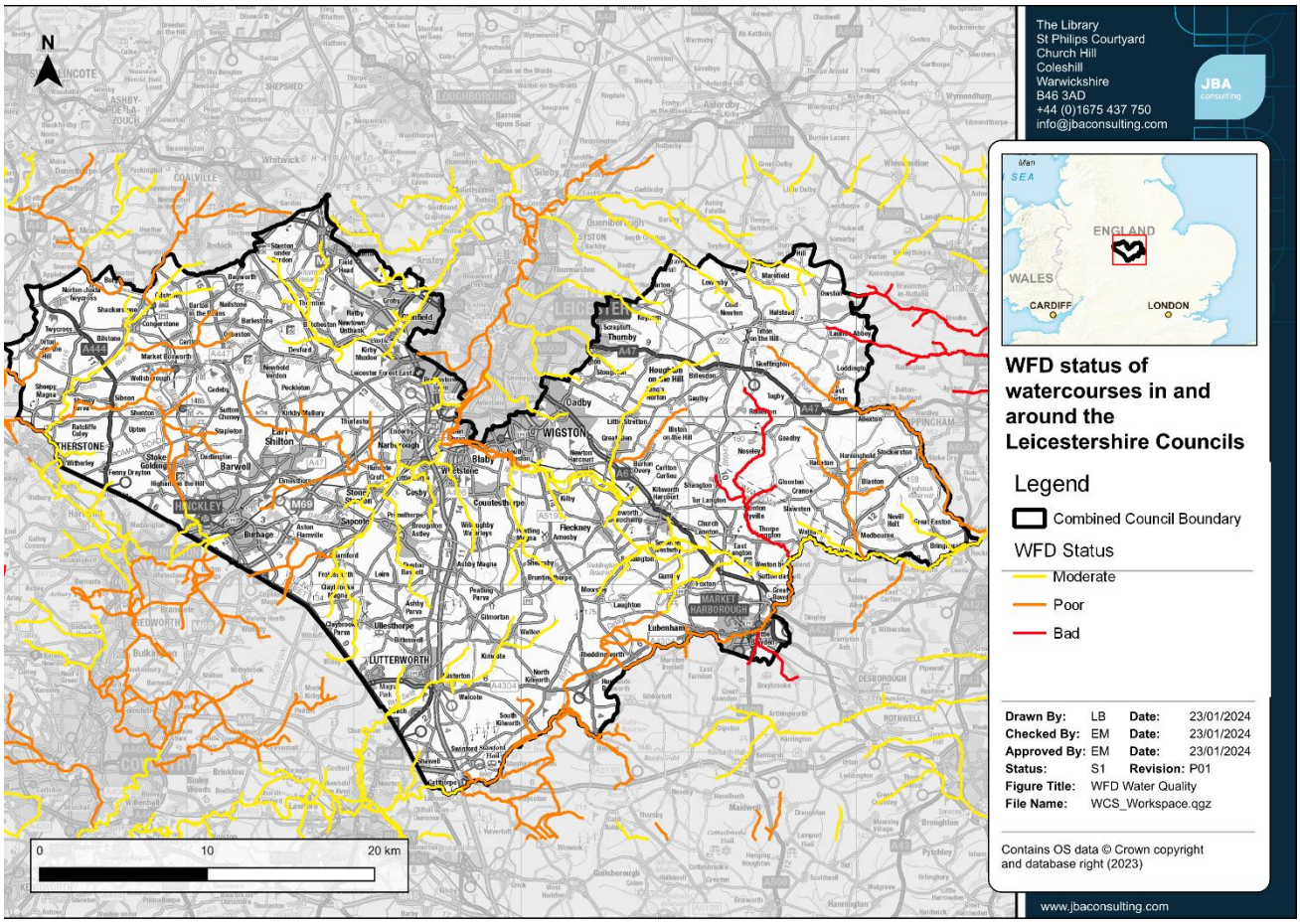


Figure 8.2 Overall WFD status of watercourses in the study area

Table 8.1 Overall WFD status of watercourses in the study area

Status	Bad	Poor	Moderate	Good	High
Number of waterbodies	6	23	38	0	0

All waterbodies are natural rivers, canals, and surface water transfers, and fail the chemical status for surface water under the WFD classification. Figure 8.3 and Table 8.2 shows an overview of the catchment's ecological status, Figure 8.4 shows an overview of the WFD status of fish, and Figure 8.5 shows the WFD status of invertebrates.

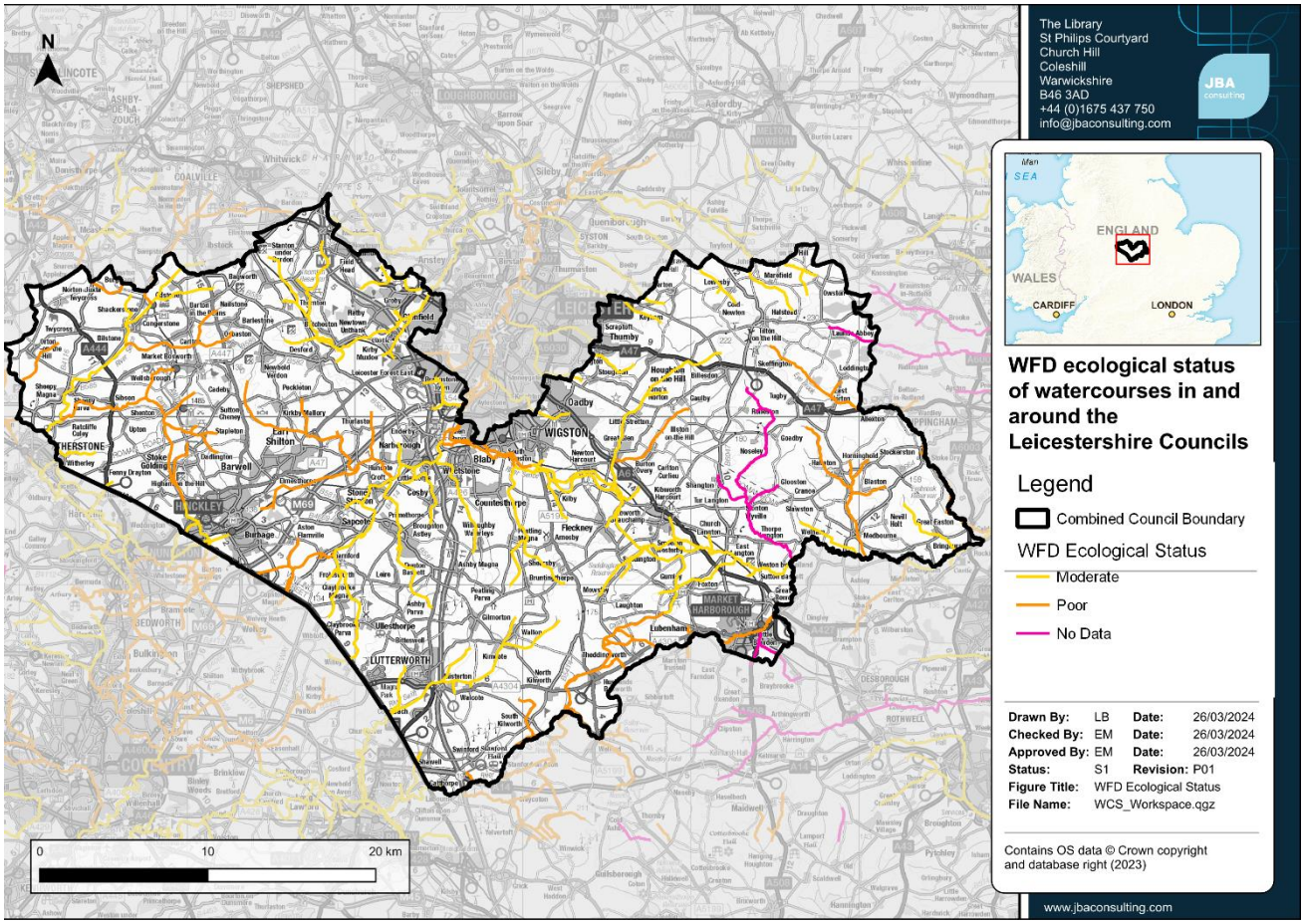


Figure 8.3 WFD ecological status of watercourses in the study area

Table 8.2 WFD ecological status for watercourses in the study area

Ecological status or potential	Bad	Poor	Moderate	Good	High
Number of waterbodies	6	23	37	1	0

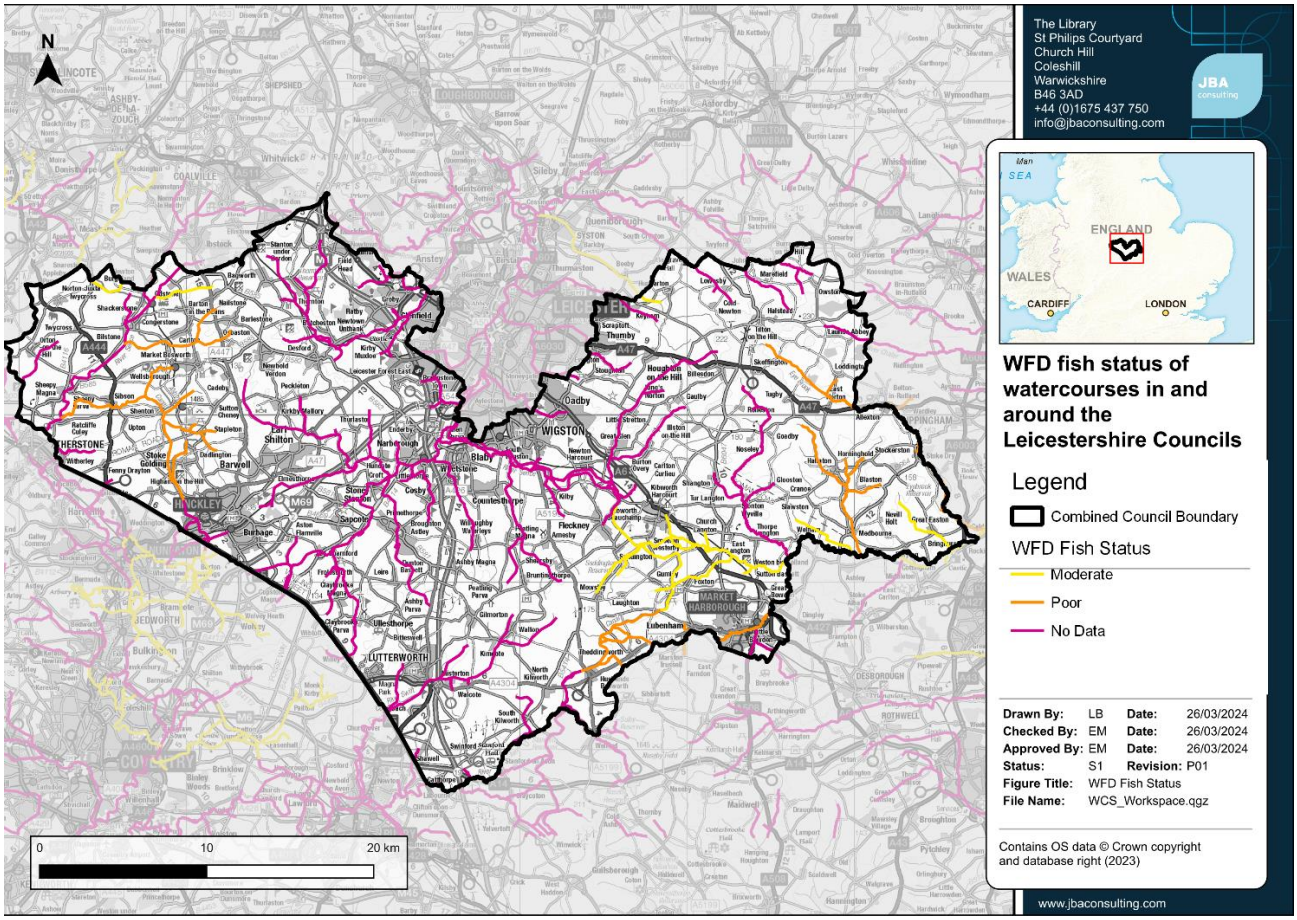


Figure 8.4 WFD fish status for watercourses in the study area

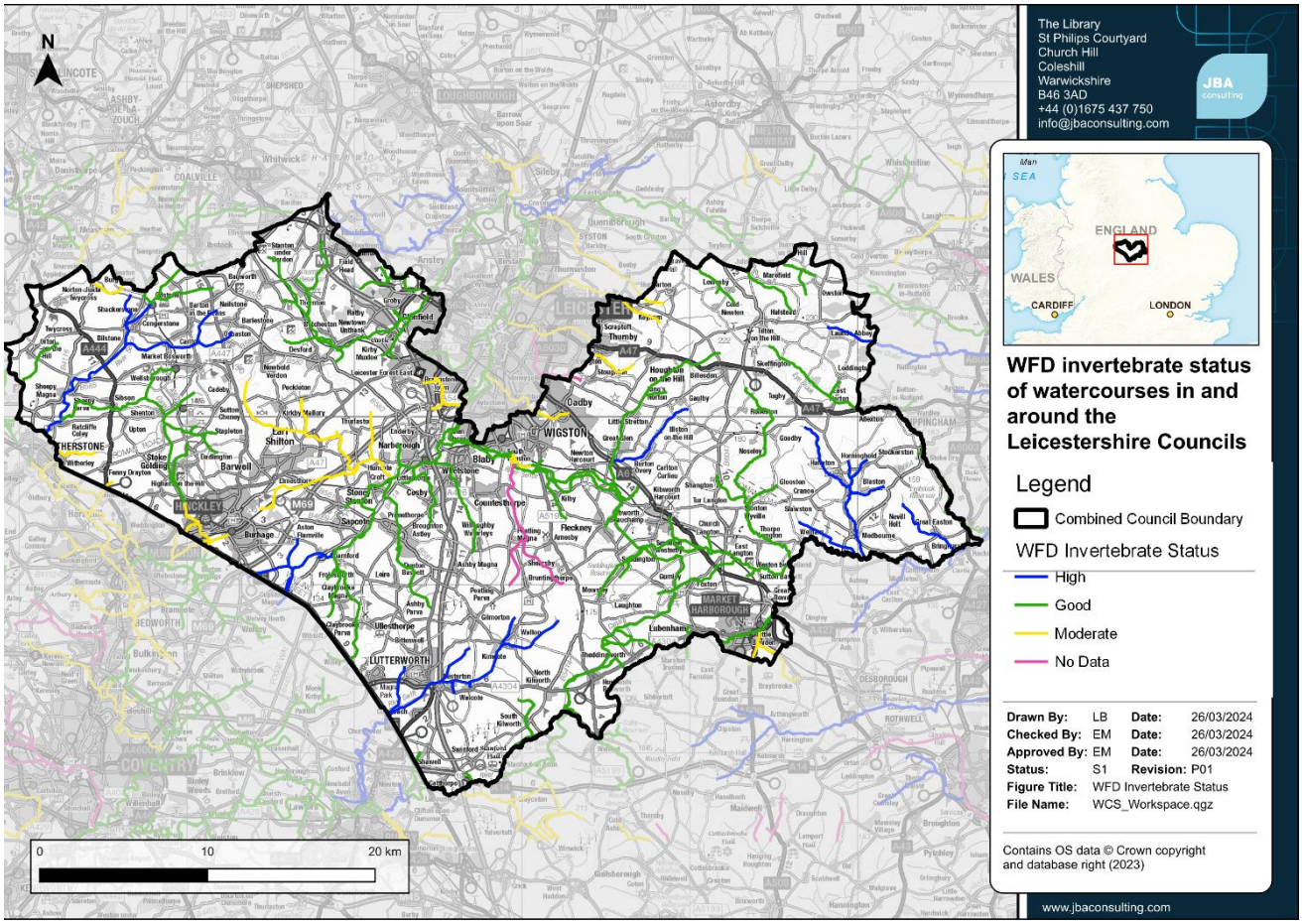


Figure 8.5 WFD invertebrate status for watercourses in the study area

When considering chemical status in Cycle 3 from the EAs assessment of English waterbodies, all waterbodies have the status of 'does not require assessment'. This is because reflecting on the Cycle 3, 2019 data collected for chemical status all waterbodies in England failed because of a high level of four groups of global pollutants, also known as ubiquitous, persistent, bio-accumulative, and toxic substances (uPBTs). The four groups are:

- Polybrominated diphenyl ethers (PBDEs- a group of brominated flame retardants)
- Mercury
- Certain Polycyclic aromatic hydrocarbons (PAHs)
- Per- and polyfluoroalkyl substances (PFAs)

Within the EAs Catchment Data Explorer, there is a map available showing the chemical status of waterbodies without the uPBTs being assessed. Within the Councils study area, all waterbodies pass chemical status with the omission of the uPBTs, apart from Yazor Brook which also fails on Nickel (Environment Agency m, 2022).

8.4.2 Reasons for not achieving Good (RNAG)

The 2019 WFD assessment data shows that most watercourses in the Combined Councils area have “moderate” and "poor" status, and six watercourses (The River Chatter, River Jordan and an unnamed main watercourse and its tributaries (flows north to south through

Harborough into the Langton Brook) have a classification of "bad". The EA reasons for not achieving good (RNAG) dataset indicates that the main reasons for the failure are:

- Pollution from wastewater from continuous discharge (Water industry)
- Pollution from towns, cities, and transport (Mixed drainage, defuse sewerage discharge, and trading/industrial estate)
- Pollution from livestock and arable runoff (Agriculture and rural land management)

Additional reasons for not achieving good for specific WFD status include:

- Inclusions of barriers that prevent fish migration
- Water body bank poaching
- Other reasons (unlisted by the EA)

8.4.3 SIMCAT Results

The sensitivity analysis was conducted using the EA's SIMCAT models and full results are presented in Appendix C. The modelling results suggest changes in the volume of treated wastewater in the Combined Councils area cause a significant response in the concentration of Ammonia, BOD, and Phosphate.

For ammonia, most waterbodies are highly sensitive with a greater than 10% deterioration in response to a 20% increase in the discharged volume of treated effluent, with higher sensitivity concentrated across the centre and south of the study area. Generally, sensitivity of ammonia across the waterbodies in the Combined Councils area is greater than 10%. A deterioration of greater than 3% is observed at five WwTWs which are at "Bad" WFD status for ammonia. These are Kibworth, Norton Juxta, Billesdon, Fleckney, and Earl Shilton. A deterioration in class is predicted at seven WwTWs. These are Goadby, and Market Harborough (Good to Moderate), and East Langton, South Kilworth, Market Bosworth, Thorpe Langton, and Arnesby & Shearsby (High to Good).

For BOD, most waterbodies are moderately sensitive with a 0% to 10% deterioration. A deterioration of greater than 3% is predicted at Kibworth which is already at "Bad" WFD status for BOD. A deterioration in class is predicted at three WwTWs. These are Kibworth (Poor to Bad), and Norton Juxta, and Fleckney (Good to Moderate).

For phosphate, most waterbodies are moderately sensitive with a less than 10% predicted deterioration, with higher sensitivity concentrated at the edges of the study area. A deterioration of greater than 3% is observed at six WwTWs which are at "Bad" WFD status for Phosphate. These are Oadby, Gaulby, Great Glen, Fleckney, Newbold Verdon, and Houghton-on-the-Hill. A deterioration in class is predicted at Owston (Moderate to Poor).

The waterbodies downstream of the following WwTWs are predicted to deteriorate by greater than 10% as a result of a 20% increase in flow.

Table 8.3: WwTWs with a significant downstream deterioration (>10%)

WwTW	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration
ARNESBY & SHEARSBY STW	15%	N/A	13%
BARLESTONE STW	12%	N/A	N/A
BELTON STW	10%	N/A	N/A
BILSTONE STW	10%	N/A	11%
CLAYBROOKE MAGNA STW	11%	N/A	N/A
COUNTESTHORPE STW	12%	N/A	N/A
CRANOE	11%	N/A	N/A
EAST LANGTON STW	17%	N/A	N/A
FOXTON(LEICS) STW	15%	N/A	N/A
GLOOSTON	14%	N/A	N/A
GOADBY STW	18%	N/A	N/A
GRANGE FARM	13%	N/A	16%
GREAT EASTON (LEICS)	11%	N/A	N/A
HALLATON STW	15%	N/A	16%
HORNINGHOLD	15%	N/A	16%
HOUGHTON ON THE HILL	12%	N/A	12%
IBSTOCK STW	10%	N/A	N/A
KIBWORTH STW	N/A	10%	N/A
KIMCOTE & WALTON STW	N/A	N/A	13%
KIRKBY MALLORY STW	14%	N/A	11%
LITTLE STRET	15%	N/A	N/A
MARKET BOSWORTH STW	12%	N/A	N/A
MEDBOURNE STW	14%	N/A	17%
NORTON JUXTA	14%	N/A	N/A
ORTON ON THE HILL STW	N/A	N/A	10%
OWSTON STW	10%	N/A	11%
ROCKINGHAM	13%	N/A	N/A
SHAWELL (WRW)	N/A	N/A	13%
SIBSON & SHENTON STW	10%	N/A	N/A
SKEFFINGTON	16%	N/A	12%
SOUTH KILWORTH STW	17%	N/A	16%
STONEY STANTON STW	15%	N/A	N/A
SWINFORD STW	14%	N/A	16%
THORPE LANGTON STW	14%	N/A	N/A
TILTON ON THE HILL STW	14%	N/A	12%

WwTW	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration
TUGBY STW FE	18%	N/A	N/A
TWYCROSS STW	N/A	N/A	10%
Welham	11%	N/A	N/A
WHETSTONE STW	10%	N/A	N/A
WIGSTON STW	10%	N/A	N/A
WISTOW (WRW)	15%	N/A	N/A

The waterbodies downstream of the following WwTWs are presently at Bad WFD status and deteriorate by greater than 3% as a result of a 20% increase in flow.

Table 8.4: WwTWs discharging to watercourse at 'Bad' status with >3% deterioration

WwTW	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration
KIBWORTH STW	9%	10%	N/A
BILLESDON STW	8%	N/A	N/A
EARL SHILTON STW	5%	N/A	N/A
FLECKNEY STW	10%	N/A	4%
GAULBY STW	N/A	N/A	5%
GREAT GLEN STW	N/A	N/A	9%
HOUGHTONONTHEHILL	12%	N/A	12%
NEWBOLD VERDON STW	10%	N/A	9%
NORTONJUXTA	14%	N/A	N/A
OADBY STW	N/A	N/A	3%

8.4.4 Priority Substances

As well as the physico-chemical water quality elements (BOD, Ammonia, Phosphate etc.) addressed above, a watercourse can fail to achieve Good Ecological Status due to exceeding permissible concentrations of hazardous substances. Currently 33 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 EU and 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.

Consideration should be given to how the planning system might be used to manage priority substances:

- Industrial sources – whilst this report covers potential employment sites, it doesn't consider the type of industry and therefore likely sources of priority substances are unknown. It is recommended that developers should 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 sewerage undertaker.
- 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 would manage these sources by using SuDS that provide water quality treatment, designed following the CIRIA SuDS Manual. This is covered in more detail in section 10.5.4.
- Domestic wastewater sources - some priority substances are found in domestic wastewater because 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 will be undertaken as part of this study.

8.5 WINEP

The actions from the Water Industry National Environment Programme that relate to water quality are set out in Appendix D and show that most WwTWs 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 many, a permit condition to limit the concentration of phosphorus and ammonia in the treated effluent is being applied to improve downstream water quality.

8.6 Conclusions

- The EA "reasons for not achieving good" (RNAG) dataset indicates that the water industry (sewage discharges) and agriculture and rural land management (livestock and arable) 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 WwTWs in the study area. There is a potential for this to cause a deterioration in water quality in the receiving watercourses and this must be

carefully considered. A significant deterioration in water quality is not acceptable under the Water Framework Directive, and large-scale investment in treating effluent to higher standards may therefore be required.

- The sensitivity analysis suggests that watercourses within the study area may be sensitive to increases in the discharge of treated wastewater. Further modelling should be undertaken in the Stage 2 WCS.

8.7 Recommendations

Table 8.5 Recommendations for water quality

Action	Responsibility	Timescale
Provide annual monitoring reports to STW and AW detailing projected housing growth in the Local Authority	Combined Councils	Ongoing
When preferred options for growth are identified, undertake water quality impact modelling as part of a Stage 2 WCS.	Combined Councils	Ongoing
Consider the full volume of growth (from the councils and neighbouring authorities) within the catchment when considering WINEP schemes or upgrades at WwTW	STW and AW	Ongoing

9 Nutrient Management

9.1 Nutrient Neutrality in the Mease Overview

In March 2022 Natural England (NE) wrote to 42 Local Planning Authorities (LPAs) advising them "as the Competent Authority under the Habitats Regulations, to carefully consider the nutrients impacts of any new plans and projects (including new development proposals) on habitats sites and whether those impacts may have an adverse effect on the integrity of a habitats site that requires mitigation, including through nutrient neutrality."

Catchments containing a designated site such as a Special Area of Conservation (SAC), Special Protection Area (SPA) or Ramsar site, where an adverse impact from additional nutrients (from growth) cannot be ruled out have been defined by NE (Natural England b, Natural England, 2023).

The guidance covers all overnight accommodation, including new homes, student accommodation, care homes, tourism attractions and tourist accommodation and permitted development which gives rise to new overnight accommodation.

Across England, 42 LPAs, including Hinckley and Bosworth, are required to demonstrate nutrient neutrality in at least part of their area when permitting new developments. Nutrient neutrality is a means of ensuring that a plan or project does not add to existing nutrient burdens so there is no overall increase in nutrients. Nutrient neutrality needs to be demonstrated before the plan or project in question is carried out.

The River Mease is protected because it is a meandering lowland river with an array of wildlife such as Spined loach (Cobitis taenia) and Bullhead (Cottus gobio). Both species have a restricted distribution in England, which is why the River Mease has been designated a SSSI and SAC (River Mease Partnership, 2023). As such, nutrient management throughout the catchment is critical to maintain the health and quality of the River Mease.

NE and Ricardo have developed a nutrient budget calculator for the river Mease catchment to assess the relationship between new developments and additional nutrients. The Mease catchment calculator comes in the form of Excel spreadsheets and can be accessed online. The calculator looks at the current land use, WwTW phosphate discharge, and proposed land use in addition to other factors that impact drainage, such as soil and rainfall.

In the case of the River Mease, phosphate is the nutrient that is considered the greatest risk to protected site health. The total phosphate that needs to be mitigated can be found through a catchment specific calculator.

NE has also published standing advice for the River Mease SAC in January 2022 to help LPAs with planning applications within the Mease catchment (NWLDC, 2022). This should be consulted by LPAs and developers' pre-development of sites within the River Mease catchment.

A small area of Hinckley and Bosworth overlaps with the catchment of an SAC and SSSI site, the River Mease, in the western area the study area, shown in Figure 9.1. Subsequently, mitigation of additional nutrients will need to take place if any proposed developments fall within the river catchment.

In January 2024, the Secretary of State for the Environment, Food and Rural Affairs designated "16 sensitive catchments, including the River Mease catchment, in which water companies are required to upgrade wastewater treatment works before April 1 2030. Further information can be found on the Government website (GOV.UK).

None of the development sites so far assessed in this report (which in Stage 1 only includes adopted allocations and commitments) fall within the River Mease catchment. In the Stage 2 WCS, the impact on proposed allocations will be examined.

All development sites (that fall under the guidance) within the catchment must achieve nutrient neutrality. However, this is also a situation where a development may be outside of the catchment but be served by a wastewater treatment works (WwTW) inside the catchment. Conversely, there may also be a situation where a development site is within the catchment but served by a WwTW outside, reducing its potential impact on the River Mease SAC.

Advice contained in the FAQs of the Planning Advisory Service website confirms that where development is within the catchment but drains to a WwTW outside the catchment, only the surface water component should be considered. Where a development site is outside the catchment but is served by a WwTW discharging within the catchment, "…a habitats regulations assessment will be required. This also applies to surface water drainage." We have interpreted this as meaning that the assessment must address the nutrient load from wastewater generated by the development, but that phosphates from surface water runoff from the site would not need to be offset if the assessment can demonstrate that they won't be discharged or otherwise enter the designated catchments.

Figure 9.1 shows the wastewater catchments within and overlapping the River Mease catchment. Development in a small part of North of Hinckley and Bosworth would need to consider the nutrient impact of surface water drainage. There is one WwTW present that serves an area in Hinckley and Bosworth and discharges within the River Mease catchment (Norton Juxta WwTW). As noted in 7.4, flow from this WwTW is due to be transferred to Snarestone WwTW to the north. This WwTW still discharges within the nutrient neutrality area.

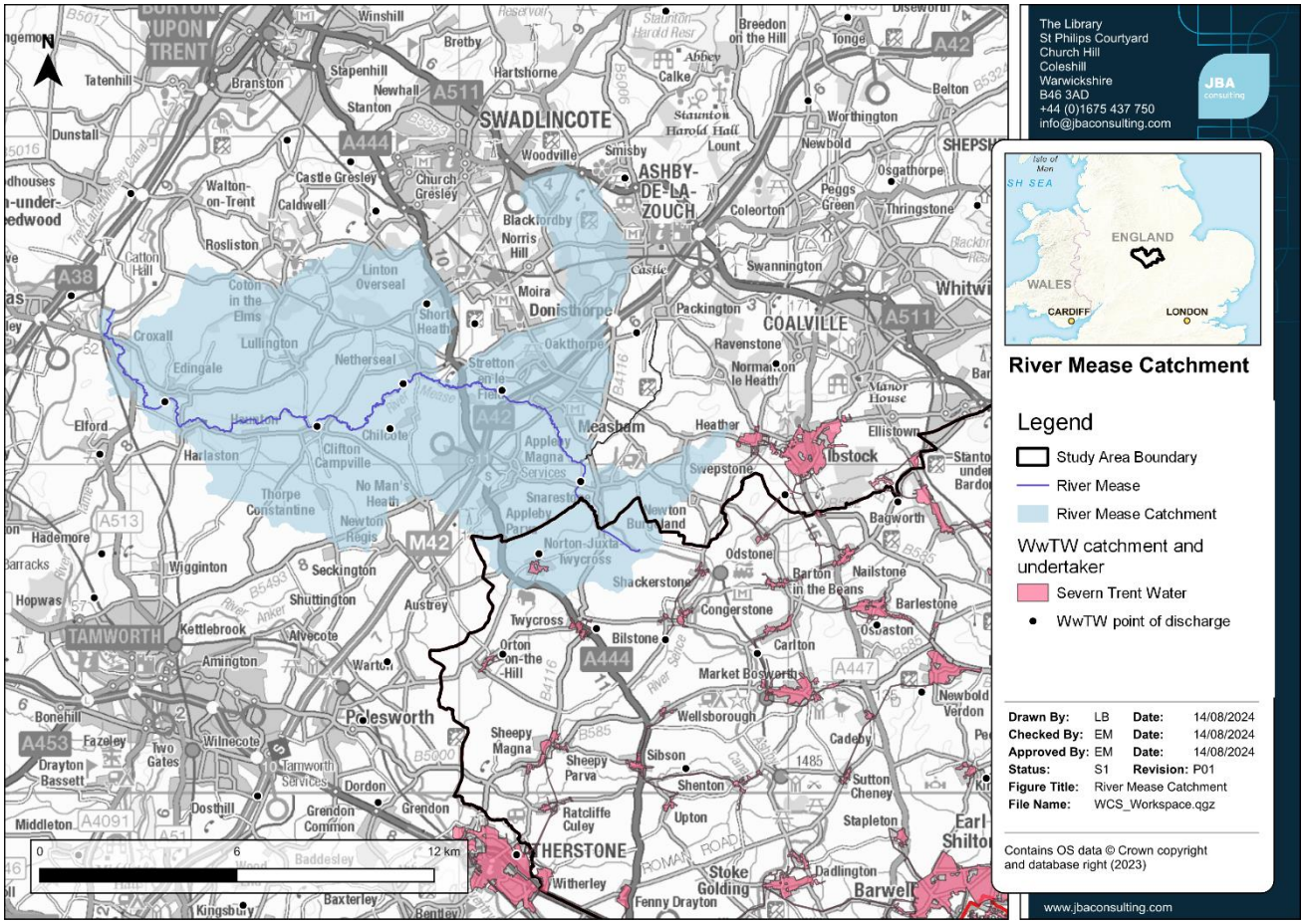


Figure 9.1: Mease Catchment within the study area

9.2 Farm Nutrient Management

The River Mease Partnership is a group of farmers, agencies and local authorities which are working together to conserve the River Mease which is a SSSI and a SAC. One of the actions used to help conserve the river is the reduction of nutrients.

Project like Catchment Sensitive Farming, and schemes such as Rural Payment Schemes can help landowners fund and work towards managing their nutrient management. Although this is not in the power of the local plan, it is beneficial to be aware of to advise landowners in the sub-region.

9.3 Nutrient Trading

The Mease Developer Contribution Scheme (DCS) is mentioned as an action to help reduce the nutrients in the catchment. DCS is where a monetary contribution is made from developers or landowners to ensure that where planning permission is granted for proposed developments, any impact on the environment is in line with appropriate regulatory obligations such as nutrient neutrality. This could include funding for land mitigation measures or phosphate credits. DCS has previously had two rounds: DCS1 and DCS2.

A third DCS is being developed collaboratively by the Trent Rivers Trust, South Derbyshire District Council (SDDC) and North West Leicestershire District Council (NWLDC). Until this

scheme is in place, developments will only be permitted if there is an appropriate bespoke mitigation solution integrated into the application.

10 Environmental Opportunities and Constraints

10.1 Introduction

Development has the potential to cause an adverse impact on the environment through several routes, such as worsening of air quality, pollution to the aquatic environment or disturbance to wildlife. In the context of a Water Cycle Study, the impact of development on the aquatic environment is assessed.

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

10.2 Impact of abstraction

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, for example Trout require a clean gravel bed to lay their eggs. 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.

Chalk stream catchments are particularly sensitive to changes in groundwater levels.

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. Rather there is a general risk to all designated sites sensitive to changes in water levels or flow that are within groundwater bodies containing abstraction points or surface water bodies with abstraction upstream.

The impact of water company abstraction has been taken into account in the Strategic Environmental Assessment (SEA) within the WRMP24, which is been reviewed and approved by the EA, NE, Defra and Ofwat. This plan contains a forecast of growth, resulting in a water demand, and how this will be met while meeting the water company's environmental objectives, including reductions in certain abstractions for sustainability.

Section 4.4.5 showed that the growth plans of Blaby, Harborough and Oadby and Wigston and the higher growth scenarios for Hinckley and Bosworth are above the predicted percentage increase in the number of households for STW's Strategic Grid WRZ outlined in their rdWRMP24. It is therefore recommended that the difference between the rdWRMP24 and the growth plans is investigated in a Stage 2 WCS to ensure that delivery of the

Combined Council's growth plans is within the growth expectations of STW and does not lead to an unsustainable increase in abstraction.

10.3 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.”

Examples of diffuse sources of water pollution include:

- Contaminated runoff from roads – this can include metals and chemicals
- Drainage from housing estates
- Misconnected sewers (foul drains to surface water drains)
- Accidental chemical/oil spills from commercial sites
- Surplus nutrients, pesticides and eroded soils from farmland
- Septic tanks and non-mains sewer systems

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, several 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 sections 10.5.4 through to 10.5.6. Potential impacts on receiving surface waters include the blanketing of riverbeds with sediment, a reduction in light penetration from suspended solids, and a reduction in natural oxygen levels, all of which can lead to a loss in biodiversity.

10.4 Pathways

Pollutants can take several 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.

10.5 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 receptors.

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

A description of these, and the relevant legislation that defines and protects them, can be found in Section 3.7.

To identify protected sites that may be at risk, Flood Zone 2 from the Risk of Flooding from Rivers and the Sea mapping was used to define an area that was either adjacent to a river or could be reasonably expected to receive surface water from a river. Where a WwTW was present in the catchment upstream of the protected site, it was considered that there was a risk of deterioration in water quality due to growth during the local plan period, all upstream WwTWs must also be considered in future analysis. Where there were no WwTWs serving growth upstream, risk of deterioration is considered to be low, and would not be shown by water quality modelling. 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.

Priority Habitats are available to view on the DEFRA Magic Map website, which can be accessed on the Defra website (GOV.UK).

Multiple watercourses run through and around the study area, and a number play host to SSSIs or other protected sites. The statutory watercourses that have SSSIs are: the Rivers Soar, Swift, and Avon, the Thurlaston Brook, Eye Brook, Laughton brook, and the Grand Union Canal. There are 50 SSSIs that are close to rivers within or downstream of the study area that have a WwTWs serving growth within the study area. SSSIs within or close to the study are shown in Figure 10.1. These sites are listed in Appendix B. There are no SACs within the Combined Council boundaries, however the River Mease SAC is to the north of the study area and is significant from a nutrient neutrality perspective (shown in Figure 10.2). The Humber Estuary, Severn Estuary and the Wash are all classified as SACs, SPAs and Ramsar sites and are downstream of the study area.

Natural England publish Impact Risk Zones (IRZs) for SSSIs. This is a tool development by NE to make a rapid initial assessment of the potential risks to terrestrial SSSIs posed by development proposals. They define zones around each SSSI which reflect the sensitivities of the features for which the site is notified and indicates the types of development which could potentially have adverse impacts and need further consideration. In certain locations they also include NE's statutory advice for certain development types. The SSSI IRZs also cover the interest features and sensitivities of those European Sites (habitats sites) that are underpinned by a terrestrial SSSI designation and include a number of "Compensation Sites", which have been secured as compensation for impacts on European Sites (habitats sites).

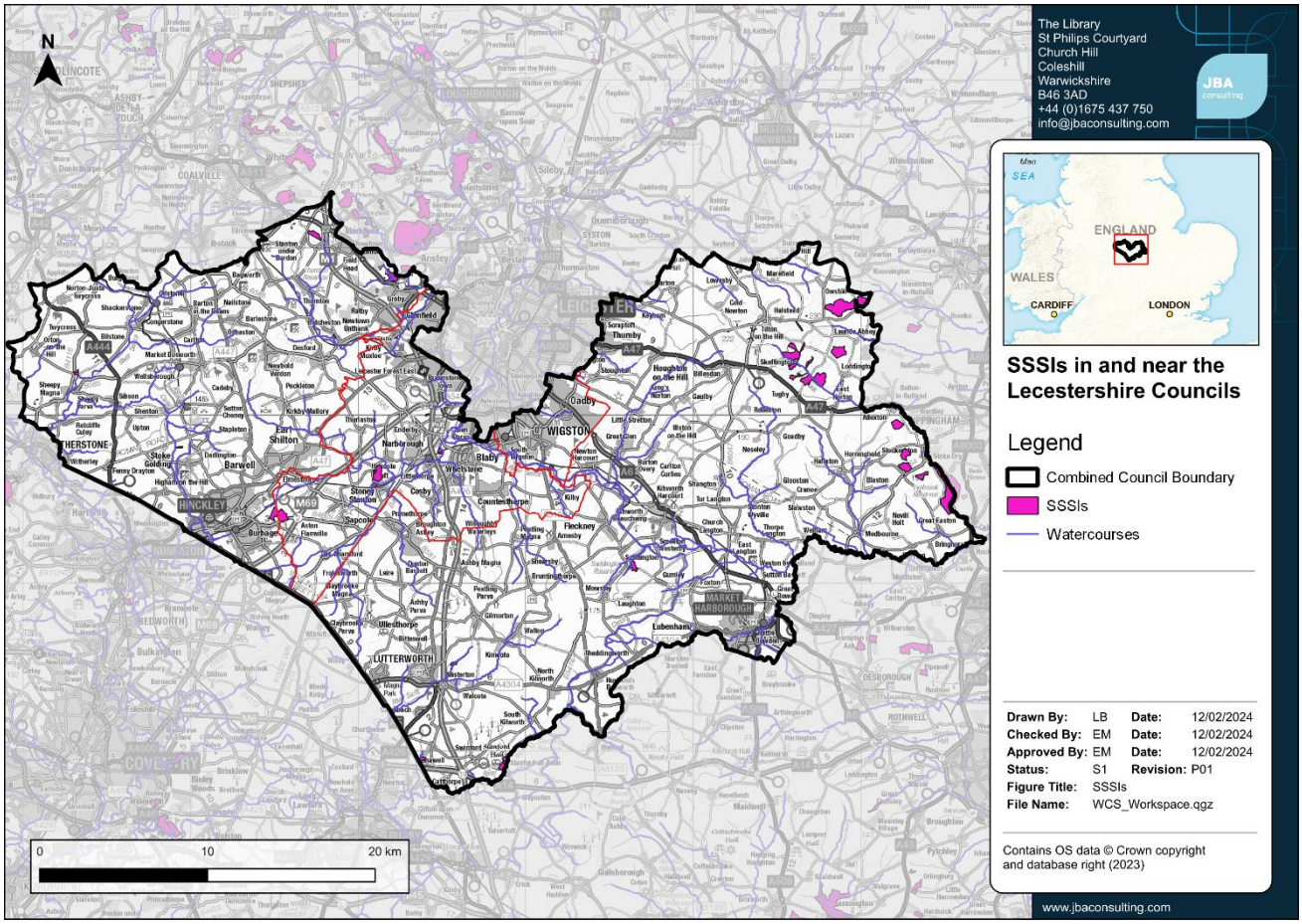


Figure 10.1: SSSIs in Combined Council area

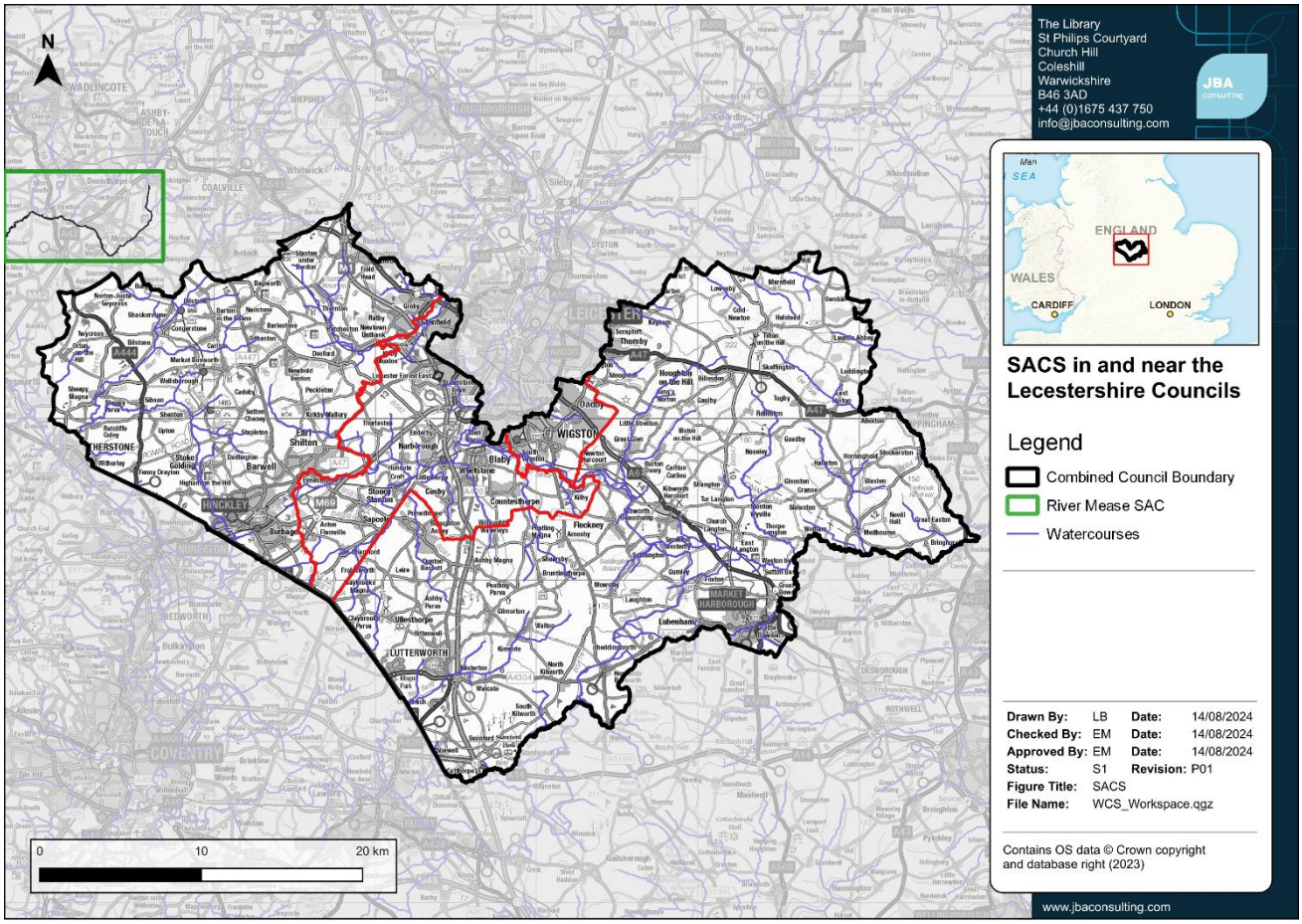


Figure 10.2: SAC close to the combined council area

10.6 Protection and Mitigation

10.6.1 Agriculture Management

The Environment Agency's 'Reason for Not Achieving Good' database indicates that one of the reasons for some of the watercourses in the study 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 exist to help with this (ADAS, 2023). Once a scheme is implemented it relies on the landowner to continue to maintain it to maintain the mitigation benefit.

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

10.6.1.1 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.

“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.”

Ruth Barden, Director of Environmental Strategy, Wessex Water

10.6.2 Diffuse Sources of Water Pollution

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. Sites within the Combined Councils area that could be considered as sources of additional runoff, and receptors in the form of sites with environmental designations are summarised in Appendix B. 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. A probable impact score of low, medium or high was applied to each site to provide an indication of the likely impact prior to any mitigation being applied. It should be noted that this is a desk-based assessment to

highlight risk and should not replace the appropriate level assessment on a site-by-site basis. Other development sites not identified in the table, may still contribute to a cumulative impact within the catchment and so management of water quality of surface runoff from these sites should still be considered.

10.6.3 Groundwater Protection

Groundwater is an important source of water in England and Wales.

The Environment Agency 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 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 Environment Agency 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 which includes direct discharges to groundwater, discharges of effluents to ground and surface water runoff. This is of relevance to this water cycle study where a development may manage surface water through SuDS.

10.6.3.1 Sewerage and Trade Effluent

Discharge of treated sewage of 2m^3 per day or less to ground are called small sewage discharges (SSDs). Most SSDs do not require an environmental permit 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 environmental permit. 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 Environment Agency 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 sustainable drainage systems and discharges from sewage treatment works operated by sewerage undertakers 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.

10.6.3.2 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 sustainable drainage systems – these should be used in conjunction with the NPPF and PPG
- 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.

10.6.3.3 Source Protection Zones within the Study Area

Source protection zones (SPZs) form a key part of the Environment Agency’s approach to controlling the risk to groundwater supplies from potentially polluting activities and accidental releases of pollutants.

The SPZ present in the Combined Councils area are shown in Figure 10.3.There is a small area of one Groundwater Source Protection Zone 3 on the North West edge of Hinckley and Bosworth District. The impact of future development on groundwater should be investigated in Stage 2 once potential allocations are available.

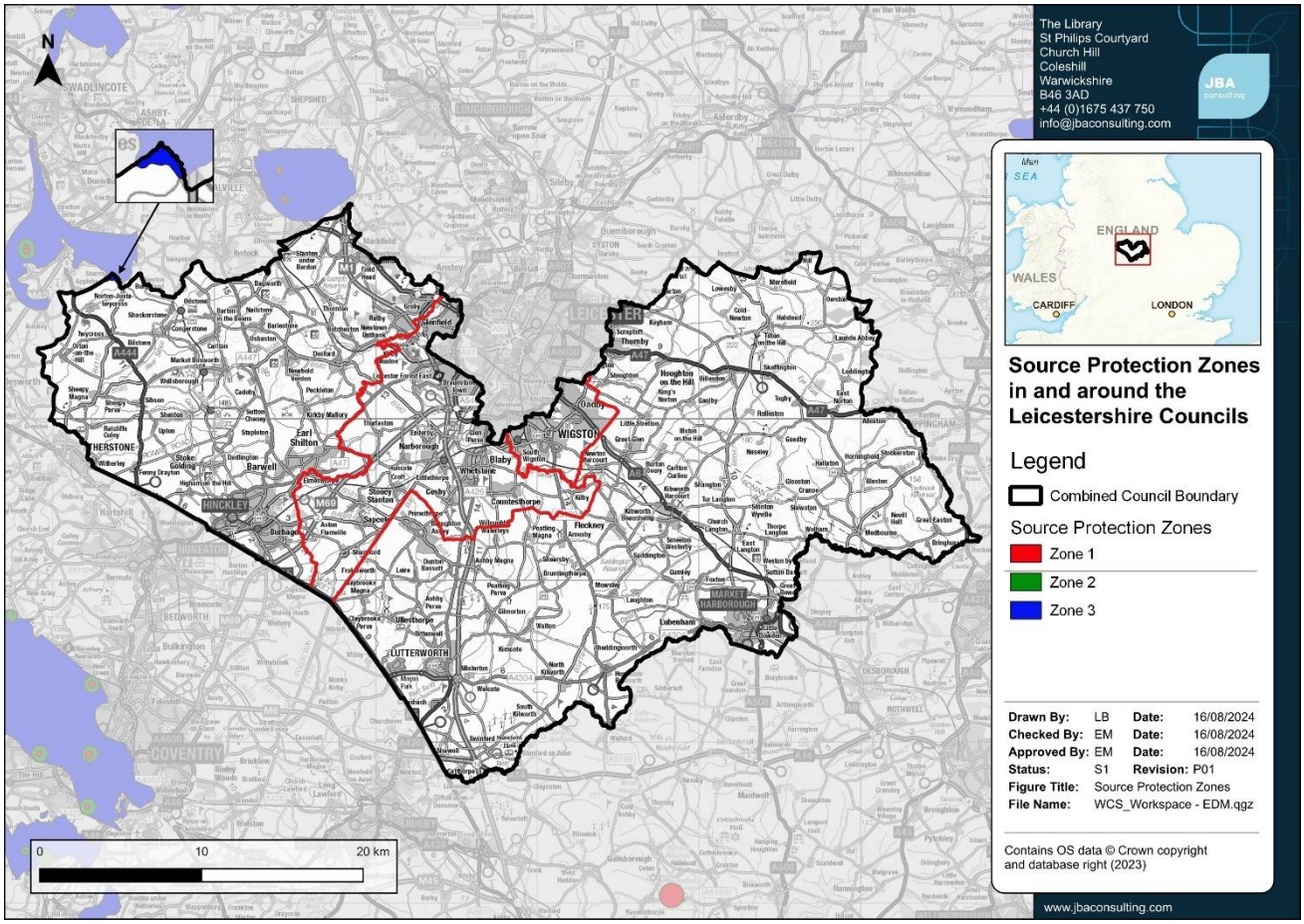


Figure 10.3: Source Protection Zones

Note - inset box shows edge of a zone 3 which slightly overlaps the combined councils' area.

The Environment Agency's approach to groundwater protection is a position statement which sets out a tiered, risk-based approach to protecting groundwater.

Proposed development locations within or close to Source Protection Zones, should be assessed in relation to the Environment Agency guidance, which identifies some forms of development that they will object to within specific SPZs. For residential development, this specifically relates to:

- Sewage effluent discharges inside SPZ1 (not likely to be an issue in the Combined Council boundary where all development is likely to be served by the public sewerage systems and a small area within a SPZ).
- Infiltration SuDS in SPZ1 (except where these serve only roof water).
- For employment sites the specific guidance related to proposed uses should be followed.

There are no adopted allocations that fall within an SPZ in the combined Councils area.

10.6.4 Surface Water Drainage and SuDS

Since April 2015, management of the rate and volume of surface water has been a requirement for all major development sites, through the use of Sustainable Drainage Systems (SuDS).

Lead Local Flood Authorities (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 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 Standards for Sustainable Drainage Systems. The CIRIA C753 SuDS Manual The CIRIA C753 SuDS Manual and Guidance for the Construction of SuDS provide the industry best practice guidance for design and management of SuDS.

Local guidance, provided by the Lead Local Flood Authorities covering the study area, is detailed below:

- Leicestershire County Council is the Lead Local Flood Authority providing the necessary advice for the council areas.

10.6.5 Benefits of SuDS

10.6.5.1 Flood Risk

The Strategic Flood Risk Assessments for the individual councils contains recommendations for SuDS to manage surface water on development sites, with the primary aim of reducing flood risk.

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

10.6.5.2 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 rainwater harvesting, 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.

10.6.5.3 Climate Resilience

Climate projections for the UK suggest that winters may become milder and wetter and summers may become warmer, but with more frequent higher intensity rainfall events, particularly in the southeast. This would be expected to increase the volume of runoff, and therefore the risk of flooding from surface water, and diffuse pollution, and reduce water availability.

SuDS offer a more adaptable way of draining surfaces, controlling the rate and volume of runoff leaving urban areas during high intensity rainfall, and 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, which allows the recharge of the watercourses and underlying aquifers. This is particularly important where water resource availability is limited, and likely to become increasingly scarce under future drier climates.

10.6.5.4 Biodiversity

The water within a SuDS component is an essential resource for the growth and development of plants and animals, and 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.

10.6.5.5 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, provide habitat for flora and fauna and act a resource for local environmental education programmes and working groups and directly influence the sense of community in an area.

10.6.6 Suitable SuDS Techniques

The hydraulic and geological characteristics of each property development site across the Combined Councils 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 10.1. 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 10.1: summary of SuDS categories

SuDS Type	Technique
Source Controls	Green roofs, rainwater harvesting, pervious pavements, rain gardens
Infiltration	Infiltration trench, infiltration basin, soakaway
Detention	Ponds, wetlands, subsurface storage, shallow wetlands, pocket wetlands, submerged gravel wetlands, wetland channels, detention basins
Filtration	Surface sand filters, subsurface sand filters, perimeter sand filters, bioretention, filter strips, filter trenches
Conveyance	Dry swales, under-drained swales, wet swales

10.6.7 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 to store or slow down flood waters before they can damage flood risk receptors (e.g., people, property, infrastructure, etc.). NFM involves taking action to manage flood and coastal erosion risk by protecting, restoring, and emulating the natural regulating functions of catchments, rivers, floodplains, and coasts. Techniques and measures, which could be applied in Birmingham include:

- 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
- Creation of rural and urban SuDS

In 2017, the Environment Agency published on online evidence base to support the implementation of NFM and with JBA produced maps showing locations with the potential for NFM measures. 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.

10.6.8 Multiple Benefits of NFM

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 can 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.)

10.6.9 Integrated Constructed Wetland Management

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

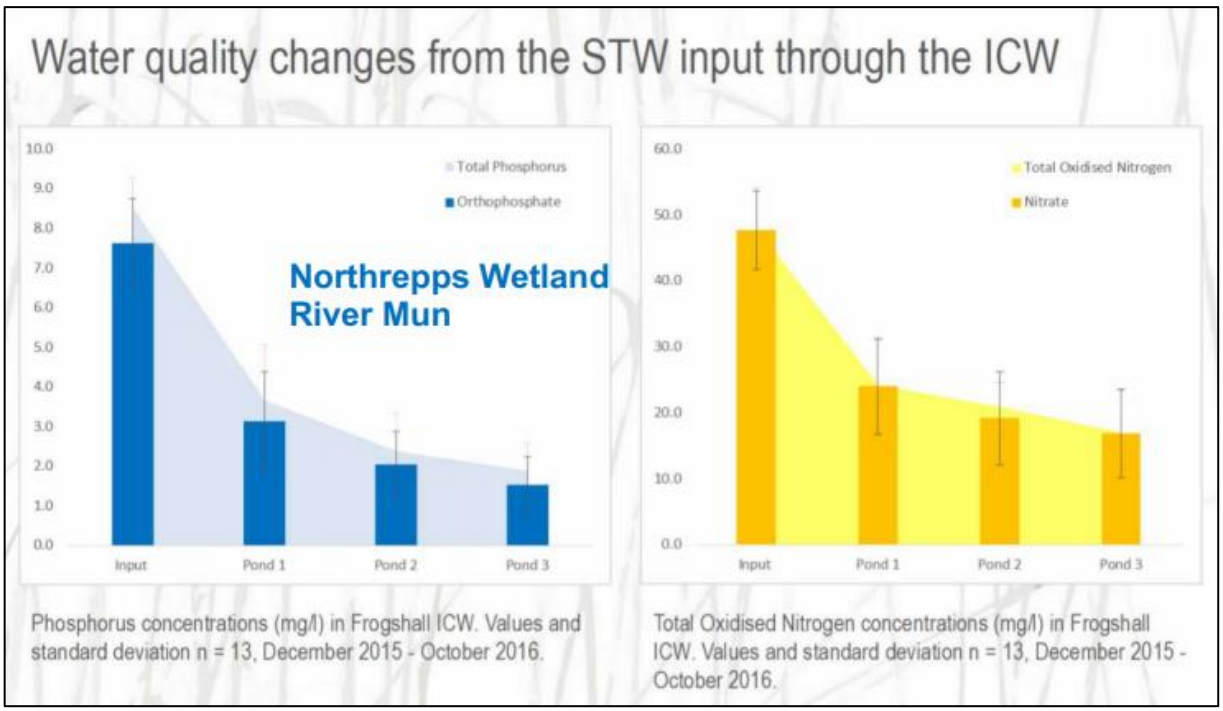
Defra carried out a systematic review of the effectiveness of various wetland types, including ICWs for mitigating agricultural pollution such as phosphate and nitrate. The overall conclusion was that all wetland types are very effective at reducing major nutrients and suspended sediments, except for 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%.

10.6.9.1 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 Sewage Treatment Works 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.



Reproduced from “Stripping the Phosphate” a presentation by the Norfolk Rivers Trust (2018) (Norfolk Rivers Trust, 2018).

10.6.10 Barriers

Whilst there are many benefits to implementing NFM and constructed wetlands, 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.

10.7 Conclusions

- The potential impact of development on several protected sites such as SAC and SSSIs within, or downstream of the study area should be carefully considered in future plan making.
- Water quality modelling should be undertaken in a Stage 2 WCS to identify potential deterioration in water quality in waterbodies adjacent to protected sites.
- The growth forecasts of the Combined Councils are higher than the percentage growth predicted within STW's Strategic Grid WRZ. It is therefore recommended that the difference between the rdWRMP24 and the growth plans is investigated in a Stage 2 WCS to ensure that delivery of the Combined Council's growth plans is within the growth expectations of STW and does not lead to an unsustainable increase in abstraction.
- There is one Groundwater Source Protection Zone in the study area (North West edge of Hinckley and Bosworth District). The impact of future development on

groundwater should be investigated in Stage 2 once potential allocations are available.

- 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.
- The Combined Councils 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 natural flood management techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

10.8 Recommendations

Action	Responsibility	Timescale
Consider the environmental impact of development on protected sites downstream of receiving wastewater treatment works in the Habitats Regulations Assessment	HDC, BDC, HBBC, OWBC	Local Plan Development
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).	HDC, BDC, HBBC, OWBC	Ongoing
The Local Plan should include policies that require development sites to adopt SuDS to manage water quality of surface runoff.	HDC, BDC, HBBC, OWBC	Ongoing
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.	HDC, BDC, HBBC, OWBC, EA, STW, AW	Ongoing

Action	Responsibility	Timescale
Developers should include the design of SuDS at an early stage to maximise the benefits of the scheme.	Developers	Ongoing
Opportunities for Natural Flood Management that include schemes aimed at reducing / managing runoff should be considered to reduce nutrient and sediment pollution within the Combined Councils area.	HDC, BDC, HBBC, OWBC, EA, NE	Ongoing

11 Summary and Overall Conclusions

11.1 Conclusions

Assessment	Conclusion
Water resources	• Most of the study area receives its water from Severn Trent Water from their Strategic Grid WRZ (and a small area from their Rutland WRZ) with an area in the east of Harborough served by Anglian Water (from their Ruthamford North WRZ). • A comparison was made between predicted growth contained in STW's rdWRMP24 and the housing needs of the LPAs. Across the Strategic Grid, a 19% increase in the number of properties is predicted by STW. This is in line with the lower growth estimates (based on the Standard Method), for Hinckley and Bosworth, but is significantly less than the housing need for Blaby, Harborough and Oadby and Wigston and the higher growth scenarios for Hinckley and Bosworth. This should be investigated further in a Stage 2 WCS once the final WRMP24 has been published. • The Water Industry National Environment Programme (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. Several 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 the Combined Councils 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 several 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 Environment Agency 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."

Assessment	Conclusion
	• 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 Environmental Improvement Plan 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 three credits in the assessment category WAT01 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.

Assessment	Conclusion
Wastewater network	• 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, Severn Trent Water and Anglian Water is required, and further modelling of the network may be required in the Stage 2 WCS and 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 201 storm overflows in recorded in the study area, 161 on the network, and 40 at WwTWs. • 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. 13 of the storm overflows were operating above this threshold between 2021 and 2023. The Storm Overflow Reduction Plan which was 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 60 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, when development sites are on previously developed land, 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 councils involved and Leicestershire County Council, and Severn Trent Water and Anglian Water is recommended to allow time for the strategic infrastructure required to serve these developments to be planned.
Wastewater treatment	• 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

Assessment	Conclusion
	estimate of the spare capacity in wastewater treatment infrastructure in the study area. • Evaluation of the STW and AW Drainage and Wastewater Management Plans indicated a lack of capacity at many WwTWs expected to serve growth in the study area. AW plans had less detail available at the time of writing, however they identified Market Harborough and Tilton on the Hill as requiring increased capacity in the future. • The JBA headroom assessment identified 22 WwTWs that are expected to be close to or exceeding their permit during the Local Plan period. An increase in the permit limit, and upgrades to treatment capacity may be required at these WwTW to accommodate further growth. • Seven AW WwTW had no mention of capacity upgrades. All 13 of the STW WwTW within this group of 22 had comments related to capacity, these were either; Monitoring of headroom, capacity headroom limited. Investment options to be investigated or scheme planned or in progress to accommodate future growth. • Consideration should be given where possible to using capacity in existing permits as this provides a lower carbon cost than upgrading capacity at existing WwTW or building new treatment works. This may however not always be feasible due to other Local Plan considerations. • There are several poorly performing storm tank overflows at WwTWs in the study area. Growth within these catchments could result in an increase in the operations of these 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.

Assessment	Conclusion
Water quality	• The EA "reasons for not achieving good" (RNAG) dataset indicates that the water industry (sewage discharges) and agriculture and rural land management (livestock and arable) 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 WwTWs in the study area. There is a potential for this to cause a deterioration in water quality in the receiving watercourses and this must be carefully considered. A significant deterioration in water quality is not acceptable under the Water Framework Directive, and large-scale investment in treating effluent to higher standards may therefore be required. • The sensitivity analysis suggests that watercourses within the study area may be sensitive to increases in the discharge of treated wastewater. Further modelling should be undertaken in the Stage 2 WCS.
Environmental impact	• The potential impact of development on several protected sites such as SAC and SSSIs within, or downstream of the study area should be carefully considered in future plan making. • Water quality modelling should be undertaken in a Stage 2 WCS to identify potential deterioration in water quality in waterbodies adjacent to protected sites. • The growth forecasts of the Combined Councils are higher than the percentage growth predicted within STW's Strategic Grid WRZ. It is therefore recommended that the difference between the rdWRMP24 and the growth plans is investigated in a Stage 2 WCS to ensure that delivery of the Combined Council's growth plans is within the growth expectations of STW and does not lead to an unsustainable increase in abstraction. • There is one Groundwater Source Protection Zone in the study area (North West edge of Hinckley and Bosworth District). The impact of future development on groundwater should be investigated in Stage 2 once potential allocations are available. • 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

Assessment	Conclusion
	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. • The Combined Councils 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 natural flood management techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

11.2 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 Local Planning Authorities.	STW and AW	Ongoing
Water resources	Provide yearly profiles of projected housing growth to water companies to inform the WRMP update.	BDC, HDC, HBBC, OWBC	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. target.	BDC, HDC, HBBC, OWBC	In Council specific LPs
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.	BDC, HDC, HBBC, OWBC	In Council specific LP
Water resources	The concept of water neutrality or water positive development 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 Environment Agency how the Council's planning and climate change policies can encourage this approach. This approach could have application in strategic sites and new settlements	BDC. HDC, HBBC, OWBC, STW, AW and EA	In LP and Climate Change Action Plan

Aspect	Action	Responsibility	Timescale
Water resources	Larger residential developments (including new settlements), and commercial developments should consider incorporating greywater recycling and/or rainwater harvesting into development at the master planning stage to reduce water demand.	BDC, HDC, HBBC, OWBC, STW and AW	In Council specific LP
Water resources	Water companies should advise the Councils of any strategic water resource infrastructure developments within the study, where these may require safeguarding of land to prevent other type of development occurring.	BDC, HDC, HBBC, OWBC, STW and AW	Part of Councils LP process
Water resources	Review this section of the WCS following publication of Severn Trent and Anglian Waters final Water Resource Management Plan 2024.	BDC, HDC, HBBC, OWBC	Stage 2 WCS
Water supply	The Councils and Developers should engage early with water companies to ensure supply infrastructure is in place prior to occupation.	BDC, HDC, HBBC, OWBC, AW, STW, developers	Ongoing
Water supply	Developers should engage early with water companies to ensure that the capacity of distribution systems is adequate prior to development coming forward	AW, STW, developers	Ongoing
Wastewater collection	Early engagement between the involved councils, Severn Trent Water, and Anglian Water is required to ensure that where strategic infrastructure is required, it can be planned in by Severn Trent Water and Anglian Water and will not lead to any increase in discharges from sewer overflows.	BDC, HDC, HBBC, OWBC, STW, AW	Ongoing
Wastewater collection	Consider wastewater infrastructure constraints in phasing development in partnership with the sewerage undertaker.	BDC, HDC, HBBC, OWBC, STW, AW	Ongoing

Aspect	Action	Responsibility	Timescale
Wastewater collection	Developers will be expected to work with the sewerage undertaker 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.	BDC, HDC, HBBC, OWBC, STW, AW and developers	Ongoing
Wastewater collection	Developers will be expected to demonstrate to the Lead Local Flood Authority (LLFA) that surface water from a site will be disposed using a sustainable drainage system (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, STW and AW.	Leicestershire County Council as LLFA, and developers	Ongoing
Wastewater treatment	Provide Annual Monitoring Reports to STW & AW detailing projected housing growth.	HDC, BDC, HBBC, OWBC	Ongoing
Wastewater treatment	Early engagement with STW and AW (ideally within a stage 2 WCS) is required to ensure that provision of WwTW capacity is aligned with delivery of development.	HDC, BDC, HBBC, OWBC, STW, AW	Ongoing / During a stage 2 WCS
Wastewater treatment	STW & AW to assess growth demands as part of their wastewater asset planning activities and feedback to the Council if concerns arise – ideally within the timeframe of the stage 2 WCS.	STW & AW	When this stage 1 WCS is published
Water quality	Provide annual monitoring reports to STW and AW detailing projected housing growth in the Local Authority	Combined Councils	Ongoing
Water quality	When preferred options for growth are identified, undertake water	Combined Councils	Ongoing

Aspect	Action	Responsibility	Timescale
	quality impact modelling as part of a Stage 2 WCS.		
Water quality	Consider the full volume of growth (from the councils and neighbouring authorities) within the catchment when considering WINEP schemes or upgrades at WwTW	STW and AW	Ongoing
Environmental impact	Consider the environmental impact of development on protected sites downstream of receiving wastewater treatment works in the Habitats Regulations Assessment	HDC, BDC, HBBC, OWBC	Local Plan Developme nt
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).	HDC, BDC, HBBC, OWBC	Ongoing
Environmental impact	The Local Plan should include policies that require development sites to adopt SuDS to manage water quality of surface runoff.	HDC, BDC, HBBC, OWBC	Ongoing
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.	HDC, BDC, HBBC, OWBC, EA, STW, AW	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	Opportunities for Natural Flood Management that include schemes aimed at reducing / managing runoff should be considered to reduce nutrient and sediment pollution within the Combined Councils area.	HDC, BDC, HBBC, OWBC, EA, NE	Ongoing

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13 Appendices

A Appendix A - Storm overflow assessment results

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
ALBERT ROAD	TBC	0	ND	ND	0	GREEN
AMY STREET 14 BRAUNSTONE CSO	T/52/01648/O	4	1	6	4	GREEN
AMY STREET PS /STORM SETT TANKS	T/52/00460/O	10	7	43	20	AMBER
ARBOR ROAD CSO	T/50/12388/O	55	48	50	51	RED
ASHBY MAGNA PS - STM & EMERG O/F	T/50/00802/O	16	21	31	23	AMBER
SAPCOTE-ASTON FIRS PUMPING STATION	T/50/40071/O	2	4	2	3	GREEN
ATHERSTONE SEWAGE TREATMENT WORKS	T/19/35541/R	80	60	83	74	RED
ATHERSTONE SEWAGE TREATMENT WORKS	T/19/35541/R	112	76	110	99	RED
AUBURN ROAD COMBINED SEWER OVERFLOW	EPRKB3592NQ	16	14	28	19	AMBER
BAGWORTH	TBC	0	ND	ND	0	GREEN
BAGWORTH MAIN SPS	NPSWQD006539	0	24	27	17	AMBER
BANKY MEADOW CSO	T/50/12279/O	10	3	6	6	GREEN
BARWELL - FARM ROAD (SSO)	EPRJB3997AL	3	0	12	5	GREEN
BARWELL - THE COMMON PUMPING STN	T/50/03182/O	33	38	34	35	AMBER
BATTLEFLAT - WEST LANE SPS	T/20/01553/O	18	10	14	14	AMBER
BEECHWOOD AVENUE PUMPING STATION	T/52/40157/O	1	0	0	0	GREEN
BELL LANE	DT/8041	1	2	5	3	GREEN

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
BELL LANE SSO	AW5NF1866	0	0	0	0	GREEN
BILLESDON STW	T/51/45517/R	259	123	83	155	RED
BLABY - SYCAMORE STREET (CSO)	EPR/HB3993WE	2	1	2	2	GREEN
BLABY - WEST STREET STORM TANKS (CSO)	TBC	0	0	0	0	GREEN
BOSWORTH PARK SPS	T/20/03106/O	5	2	5	4	GREEN
BRANTING HILL CSO	T/56/45416/O	14	9	11	11	AMBER
BRAUNSTONE - COLBERT DRIVE (SSO)	TBC	2	3	12	6	GREEN
BRODICK ROAD CSO	T/19/30299/O	19	27	23	23	AMBER
BROOKSIDE CSO	T/20/35410/O	9	8	16	11	AMBER
BROOKSIDE HINCKLEY CSO	T/19/09205/O	13	15	4	11	AMBER
BULLFURLONG LANE CSO	T/50/45424/O	12	8	11	10	AMBER
BURBAGE - HORSEPOOL (CSO)	TBC	1	0	0	0	GREEN
BURBAGE - LYCHGATE LANE (2) (CSO)	EPRJB3599AQ	7	6	7	7	GREEN
BURBAGE - LYCHGATE LANE SPS	T/50/09330/O	4	14	8	9	GREEN
BURBAGE - LYCHGATE/WOODSTOCK CL CSO	T/50/08892/O	21	29	26	25	AMBER
BURBAGE - SAPCOTE ROAD CSO	T/50/40061/O	27	37	47	37	AMBER
BURBAGE - WOODLAND AVE (CSO)	TBC	6	0	0	2	GREEN
CALDECOTT SPS	AW5NF1792	0	0	9	3	GREEN
CAPTAINS LANE SCO	T/56/45446/O	19	27	36	27	AMBER
CATTHORPE SEWAGE PUMPING STATION	S/10/25578/O	2	0	3	2	GREEN

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
CLAYBROOKE MAGNA - HIGH CROSS ROAD (SSO)	TBC	0	0	3	1	GREEN
CLAYBROOKE ROAD - STORM OVERFLOW	T/50/08859/O	8	6	0	5	GREEN
CONDOR CLOSE CSO	T/50/07567/O	19	5	8	11	AMBER
CONGERSTONE PUMPING STATION	T/20/30033/O	18	3	21	14	AMBER
COSBY ROAD SPS CSO	T/50/01009/O	41	7	13	20	AMBER
COURT CLOSE CSO	T/56/03828/O	6	3	4	4	GREEN
COVENTRY ROAD	DT/8039	0	0	0	0	GREEN
COVENTRY ROAD - NUTTS LANE CSO	T/19/35416/O	23	35	10	23	AMBER
CROFT - BROUGHTON ROAD (CSO)	TBC	1	2	0	1	GREEN
CSO AT LITTLE GLEN ROAD SPS	T/52/03045/O	24	15	0	13	AMBER
CSO AT STAPLETON SPS	T/20/30311/O	3	3	15	7	GREEN
DESFORD - LEICESTER LANE (SSO)	TBC	22	14	16	17	AMBER
DESFORD ROAD - STORM OVERFLOW	T/50/02176/O	0	0	0	0	GREEN
DRAYTON	AW5NF2117	0	0	7	2	GREEN
EARL SHILTON SEWAGE TREATMENT WORKS	T/50/45319/R	68	25	0	31	AMBER
EJECTOR STATION	DT/8054	28	11	0	13	AMBER
ENDERBY - BLABY ROAD CSO	DT/8037	0	4	8	4	GREEN
FENNY DRAYTON SEWAGE PS	T/19/12086/O	47	20	30	32	AMBER
FOREST ROAD CSO	T/19/30143/O	14	41	61	39	AMBER
FOREST ROAD CSO	T/50/40087/O	54	56	79	63	RED

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
FROLESWORTH SEWAGE TREATMENT WORKS	T/50/45550/R	10	12	35	19	AMBER
GLEN PARVA - SOUTHFIELD CLOSE (SSO)	EPR/KB3596VE	ND	ND	19	19	AMBER
GLENFIELD/KIRBY MUXLOE PS/STM/SWS	EPR/KB3595ED	ND	ND	1	1	GREEN
GLENFIELD/KIRBY MUXLOE PS/STM/SWS	EPR/KB3595VZ	ND	ND	5	5	GREEN
GLENFIELD/KIRBY MUXLOE PS/STM/SWS	EPR/KB3595WN	ND	ND	27	27	AMBER
GLENFIELD/KIRBY MUXLOE PS/STM/SWS	EPR/KB3596AA	ND	ND	40	40	AMBER
GLENFIELD/KIRBY MUXLOE PS/STM/SWS	EPR/KB3596NG	ND	ND	1	1	GREEN
GLENFIELD/KIRBY MUXLOE PS/STM/SWS	EPR/KB3596RF	ND	ND	4	4	GREEN
GLENFIELD/KIRBY MUXLOE PS/STM/SWS	T/56/02605/O	61	47	107	72	RED
GLOOSTON WATER RECYCLING CENTRE	AW5NF425	0	0	14	5	GREEN
GREAT GLEN - THE NOOK TPS	T/51/01368/O	0	2	17	6	GREEN
HALLATON STW	AWNNF1287	103	113	162	126	RED
HAWLEY ROAD / SOUTHFIELD ROAD CSO	T/19/00793/O	13	1	1	5	GREEN
HIGHAM-ON-THE-HILL PUMPING	T/20/30310/O	14	6	15	12	AMBER

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
STATION						
HINCKLEY - HARROWBROOK ROAD CSO	T/19/35414/O	19	0	2	7	GREEN
HINCKLEY - HAWLEY RD/STATION RD (CSO)	TBC	12	0	1	4	GREEN
HINCKLEY - HOLLYCROFT/STANLEY RD (CSO)	EPRJB3399DJ	0	2	2	1	GREEN
HINCKLEY SEWAGE TREATMENT WORKS	T/19/36495/R	38	27	46	37	AMBER
HUNCOTE	DT/8047	0	0	0	0	GREEN
IBSTOCK SEWAGE TREATMENT WORKS	T/20/36246/R	33	36	46	38	AMBER
KIBWORTH HARBOROUGH ROAD CSO	AWNNF13411	0	0	1	0	GREEN
KIBWORTH STW	AW5NF803	0	0	2	1	GREEN
KILBY PUMPING STATION	T/51/40041/O	3	1	7	4	GREEN
KINGS NORTON SPS & GAULBY STW	T/51/03218/O	3	0	10	4	GREEN
KINGSWAY COMBINED SEWER OVERFLOW	T/52/21090/O	3	0	8	4	GREEN
LEICESTER FOREST EAST - SOMERFIELD WAY (CSO)	TBC	0	0	0	0	GREEN
LEICESTER ROAD	T/50/21104/O	3	1	1	2	GREEN
LEICESTER ROAD PS - STM/EMEG O/F	T/51/03504/O	ND	0	1	1	GREEN
LITTLE GLEN ROAD SPS	EPRKB3596WV	0	ND	ND	0	GREEN
LITTLE STRETTON STW	T/51/46383/R	38	14	1	18	AMBER
LITTLETHORPE	DT/8043	8	2	19	10	GREEN

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
LITTLETHORPE-NARBOROUGH ROAD (CSO)	TBC	3	1	13	6	GREEN
LUBENHAM SPS	AW5NF1773	0	0	9	3	GREEN
LUTTERWORTH - FOX INN CSO	S/10/26166/O	26	7	3	12	AMBER
MARKET HARBOROUGH SOUTH CSO	EPRRB3094WT	10	24	31	22	AMBER
MARKET HARBOROUGH-RIVERSIDE ROAD	AW5NF1798	4	7	10	7	GREEN
MARKFIELD ROAD PUMPING STATION	T/56/40158/O	15	0	4	6	GREEN
MARSH AVENUE SSO	AW5NF1871	0	0	0	0	GREEN
MEADOWBROOK ROAD SSO	AW5NF1870	0	0	0	0	GREEN
MEDBOURNE STW	AW5NF416	0	0	3	1	GREEN
MERRY LEES PUMPING STATION	TBC	0	ND	ND	0	GREEN
MIDLAND COTTAGES CSO	T/51/40058/O	10	2	11	8	GREEN
NAILSTONE TERMINAL PUMPING STATION	T/20/30309/O	3	2	23	9	GREEN
NARBOROUGH COVENTRY ROAD MELAS SPS	T/50/01625/O	0	0	0	0	GREEN
NARBOROUGH ROAD	DT/8044	0	0	1	0	GREEN
NARBORUGH - STEWART AVENUE CSO	DT/8038	30	44	45	40	AMBER
NEWBOLD VERNON 2 CSO	T/50/45425/O	8	8	0	5	GREEN
NEWTON HARCOURT PUMPING STATION	T/51/40031/O	0	47	80	42	RED

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
NOCK VERGES PS - STORM & EMERG O/F	TBC	0	ND	ND	0	GREEN
NORTH KILWORTH - CRANMER LANE (SSO)	TBC	46	23	53	41	RED
ODSTONE SEWAGE PUMPING STATION	T/20/00916/O	40	7	2	16	AMBER
ORTON-ON-THE-HILL STW	T/21/35938/R	20	9	19	16	AMBER
OSBASTON HOLLOW PUMPING STATION	T/20/02941/O	0	ND	ND	0	GREEN
PECKLETON	T/50/01060/O	4	0	3	2	GREEN
PECKLETON LANE PUMPING STATION	T/56/03521/O	1	0	2	1	GREEN
PS AND CSO - COUNTESTHORPE	T/51/02170/O	11	9	10	10	AMBER
PS AND CSO - COUNTESTHORPE	T/51/02170/O	0	0	8	3	GREEN
PS AND CSO - COUNTESTHORPE	TSC38	2	0	1	1	GREEN
RAILWAY BRIDGE COMBINED SEWER OVERF	AW5NF1869	12	9	33	18	AMBER
RATBY PS & VILLAGE/STM/EMG/SWS	T/56/02657/O	4	1	0	2	GREEN
RATCLIFFE CULEY - MAIN ROAD CSO	T/20/21463/O	19	9	16	15	AMBER
ROSEWAY STREET CSO	T/20/03817/O	40	40	22	34	AMBER
SAPCOTE ROAD CSO	EPR/HB3991RX	1	1	1	1	GREEN
SAPCOTE ROAD CSO	EPR/HB3991VH	29	2	2	11	AMBER
SAPCOTE ROAD CSO	T/50/07734/O	2	23	16	14	AMBER
SHARNFORD - LEICESTER ROAD (SSO)	TBC	0	0	4	1	GREEN
SHEEPY PUMPING STATION	T/20/00779/O	19	18	34	24	AMBER

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
SHENTON SEWAGE PUMPING STATION	T/20/02399/O	36	15	59	37	AMBER
SLAWSTON SEWAGE PUMPING STATION	AW5NF1775	0	0	8	3	GREEN
SOUTHFIELD ROAD STORM OVERFLOW	T/19/22033/O	40	35	35	37	AMBER
SPRINGFIELD CRESCENT SSO	AW5NF1872	0	18	72	30	AMBER
SSO COVENTRY RD	AW5NF1820	0	0	0	0	GREEN
ST GILES CHURCH SSO	AW5NF1839	0	0	1	0	GREEN
STANTON UNDER BARDON SPS	T/56/40256/O	77	40	90	69	RED
STAPLETON LANE SEWAGE PUMPING ST.	T/20/35907/O	12	15	24	17	AMBER
STATION ROAD	DT/8040	10	6	10	9	GREEN
STOKE GOLDING SEWAGE PUMPING STN	T/20/03180/O	28	12	28	23	AMBER
STOKE ROAD HINKLEY	TBC	0	ND	ND	0	GREEN
SUNNYSIDE CSO 1	T/20/02145/O	10	9	5	8	GREEN
THORNHILL SPS	T/50/07064/O	13	2	52	22	AMBER
THORNHILL SPS & FOXHUNTER CSO	T/50/07645/O	0	4	0	1	GREEN
TUGBY STW	AW5NF762	8	46	66	40	AMBER
TUR LANGTON SPS	AWNNF354	0	0	14	5	GREEN
VARIOUS PS'S & CSOS-STONEY STANTON	T/50/03632/O	18	27	24	23	AMBER
VARIOUS PS'S & CSOS-STONEY STANTON	T/50/03632/O	13	9	15	12	AMBER

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
VARIOUS PS'S & CSOS-STONEY STANTON	T/50/03632/O	8	9	14	10	AMBER
VARIOUS PS'S & CSOS-STONEY STANTON	T/50/03632/O	45	33	58	45	RED
VICARAGE LANE PUMPING STATION	T/51/40070/O	0	ND	ND	0	GREEN
WANLIP SEWAGE TREATMENT WORKS	T/53/46354/R	28	23	46	32	AMBER
WELHAM	AW5NF2033	0	0	0	0	GREEN
WEST STREET PS - STORM OVERFLOW	T/56/07427/O	0	0	2	1	GREEN
WESTFIELD AVENUE CSO	T/51/40060/O	11	11	17	13	AMBER
WESTOVER ROAD CSO	T/52/00990/O	41	42	60	48	RED
WESTRAY DRIVE CSO	T/19/20313/O	3	0	2	2	GREEN
WESTSIDE SSO	AW5NF1873	1	2	0	1	GREEN
WHETSTONE - THE DICKEN (SSO)	2171V-3	8	77	11	32	AMBER
WIGSTON - BLABY RD (CSO)	TB3798VK	42	37	50	43	RED
WIGSTON - COUNTESTHORPE ROAD CSO	HB3993RH	25	25	27	26	AMBER
WIGSTON - COUNTESTHORPE ROAD CSO	T/83/02690/O	3	1	3	2	GREEN
WIGSTON - CROW MILLS PS (CSO)	T/51/12328/R	4	0	0	1	GREEN
WIGSTON FIELDS CSO	T/83/01666/O	3	0	2	2	GREEN
WIGSTON GAS LANE CSO	EPRQB3395EJ	31	34	47	37	AMBER
WIGSTON PARVA STW	T/50/45544/R	8	0	0	3	GREEN
WOODYARD LANE CSO	T/51/21105/O	10	10	14	11	AMBER

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
ARNESBY SEWAGE TREATMENT WORKS	T/51/45648/R	255	73	94	141	RED
BARLESTONE STW	T/20/35726/R	52	42	71	55	RED
BROUGHTON ASTLEY STW	T/50/45321/R	44	39	59	47	RED
COUNTESTHORPE STW	T/51/45760/R	106	64	107	92	RED
EARL SHILTON SEWAGE TREATMENT WORKS	T/50/45319/R	4	4	0	3	GREEN
EAST LANGTON STW	AW5NF5216	79	50	133	87	RED
FLECKNEY SEWAGE TREATMENT WORKS	T/51/45576/R	52	30	64	49	RED
FOXTON(LEICS) STW	AW5NF758	0	25	79	35	AMBER
GAULBY STW	T/51/45532/R	99	65	177	114	RED
GREAT EASTON(LEICS) STW	AW5NF768	143	81	99	108	RED
GREAT GLEN SEWAGE TREATMENT WORKS	T/51/45910/R	68	66	114	83	RED
HALLATON STW	AWNNF1287	103	113	62	93	RED
HINCKLEY SEWAGE TREATMENT WORKS	T/19/36495/R	189	47	77	104	RED
HOUGHTON ON THE HILL STW	T/53/12089/R	71	53	102	75	RED
HUNGARTON STW	T/55/45462/R	39	55	55	50	RED
IBSTOCK SEWAGE TREATMENT WORKS	T/20/36246/R	40	56	77	58	RED

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
KEYHAM STW	T/53/45549/R	ND	3	0	2	GREEN
KIBWORTH STW	AW5NF803	0	24	101	42	RED
KIMCOTE SEWAGE TREATMENT WORKS	S/10/26413/R	135	113	205	151	RED
KIRKBY MALLORY STW	T/50/46001/R	16	27	79	41	RED
LUTTERWORTH SEWAGE TREATMENT WORKS	S/10/26704/R	64	77	85	75	RED
MARKET BOSWORTH STW	T/20/35543/R	80	50	74	68	RED
MARKET HARBOROUGH-RIVERSIDE ROAD	AW5NF739A	70	50	76	65	RED
NEWBOLD VERDON STW	T/50/45372/R	0	25	61	29	AMBER
OADBY STW	T/52/45772/R	14	12	0	9	GREEN
OWSTON STW	T/55/45843/R	ND	56	0	28	AMBER
RUGBY NEWBOLD STW	S/10/26528/R	3	1	10	5	GREEN
RUGBY NEWBOLD STW	S/10/26528/R	24	8	21	18	AMBER
SHAWELL SEWAGE TREAMENT WORKS	S/10/26120/R	91	84	8	61	RED
SHENTON SEWAGE PUMPING STATION	T/20/02399/O	32	1	3	12	AMBER
STONEY STANTON STW	T/50/46146/R	56	48	83	62	RED
SWINFORD STW	S/10/26596/R	ND	80	0	40	AMBER
TILTON ON THE HILL STW	AW5NF5249	1	9	40	17	AMBER
TUGBY STW	AW5NF762	8	46		27	AMBER

Overflow Name	Permit Reference	2021	2022	2023	Mean	RAG
WANLIP SEWAGE TREATMENT WORKS	T/53/46354/R	56	35	64	52	RED
WANLIP SEWAGE TREATMENT WORKS	T/53/46354/R	43	26	50	40	AMBER
WELFORD SEWAGE TREATMENT WORKS	S/10/26433/R	9	3	6	6	GREEN
WESTON BY WELLAND STW	AW5NF5224	7	ND	ND	7	GREEN
WHETSTONE WASTEWATER TREATMENT WRKS	T/50/45829/R	48	29	55	44	RED
WIGSTON CROW MILLS SPS	T/51/12328/O	4	0	13	6	GREEN

B Appendix B: Study area protected sites

Protected sites have been screened in when they are downstream of a WwTW in the study area and overlap flood zone 2. The rivers have been examined as far as the coast.

B.1 Sites of special scientific interest

SSSI_NAME	REFERENCE
Alvecote Pools	SK255044
Attenborough Gravel Pits	SK521342
Besthorpe Meadows	SK817642
Birches Barn Meadows	SK281020
Bosworth Mill Meadow	SP628822
Brandon Marsh	SP386754
Cotes Grassland	SK553208
Cowbit Wash	TF240191
Coombe Hill Canal	SO867268
Croft Pasture	SP509958
Crowle Borrow Pits	SE790106
Kilby - Foxton Canal	SP652959
Deeping Gravel Pits	TF178081
Eye Brook Reservoir	SP852955
Upham Meadow and Summer Leasow	SO915375
Barrow Gravel Pits	SK568166
Saddington Reservoir	SP663910
Ashby Canal	SK364073
River Mease	SK264113
Innsworth Meadow	SO850215
Laughton Common	SK837967
Wainlode Cliff	SO845257
Lea Marsh	SK817869
Holme Pit	SK536345
Leighfield Forest	SK773021
Besthorpe Warren	SK829654
Lockington Marshes	SK489299
Mother Drain, Misterton	SK776952
Narborough Bog	SP549978
Chaceley Meadow	SO857305

SSSI_NAME	REFERENCE
Eastoft Meadow	SE786142
Racecourse Meadow	SP185536
Severn Ham, Tewkesbury	SO885325
Old River Severn, Upper Lode	SO880330
Guy's Cliffe	SP293667
Garden Cliff	SO718127
Stanford Park	SP586792
Spalford Warren	SK832680
Welford Field	SP139528
Seaton Meadows	SP915979
Tuetoes Hills	SE844014
Tiddesley Wood	SO929452
Sheepy Fields	SK332025
Humber Estuary	TA232155
Rectory Farm Meadows	SO921382
Ashleworth Ham	SO832262
Loughborough Meadows	SK538216
Hatfield Chase Ditches	SE766103
Severn Estuary	ST529870
Upper Severn Estuary	SO716063

B.2 Special Areas of Conservation (SAC)

SAC NAME	REFERENCE
Humber Estuary	UK0030170
River Mease	UK0030258
Severn Estuary	UK0013030
The Wash and North Norfolk Coast	UK0017075

B.3 Special Protection Area (SPA)

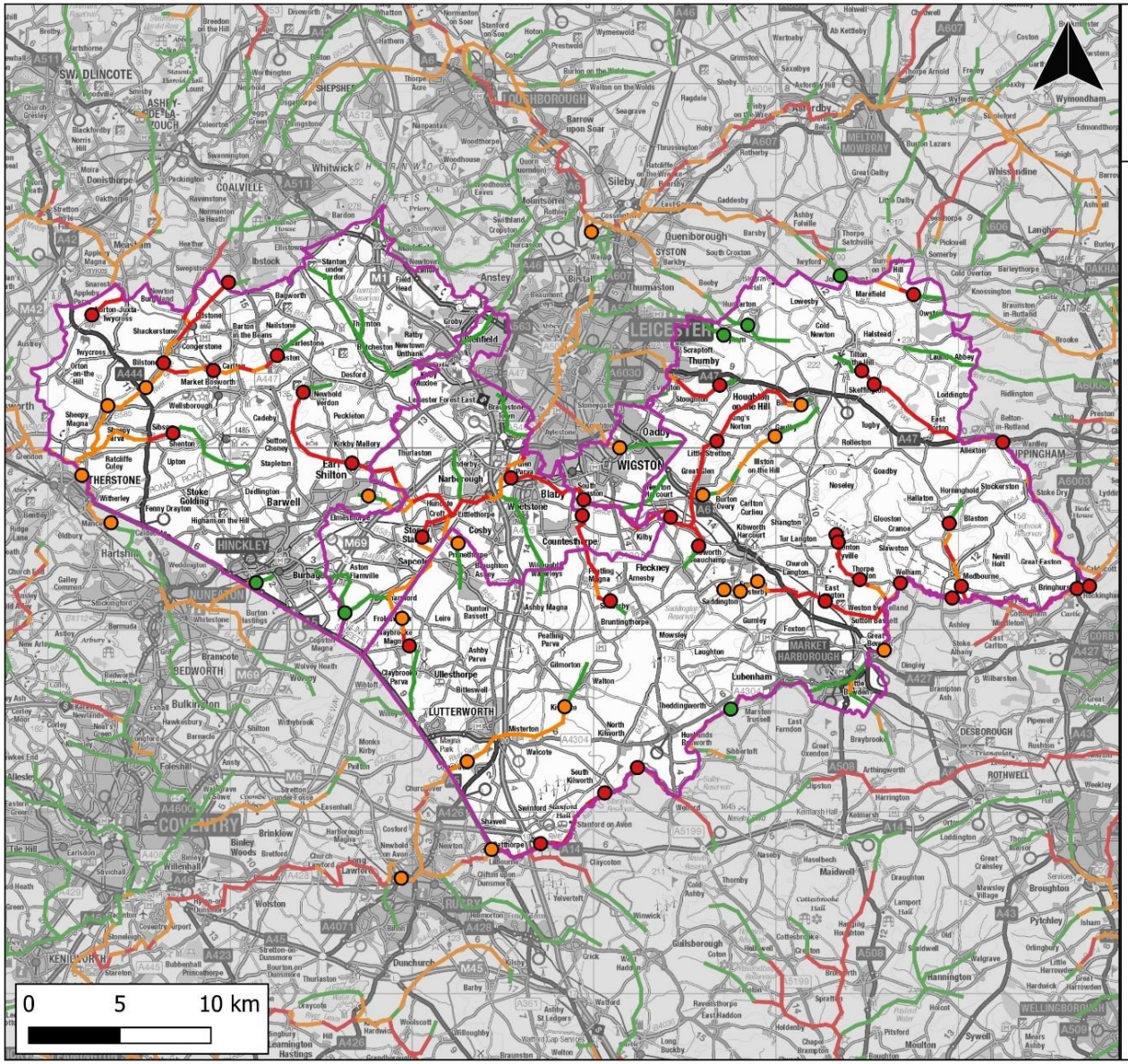
SPA NAME	REFERENCE
Humber Estuary	UK9006111
Severn Estuary	UK9015022
Greater Wash	UK9020329

B.4 Ramsar sites

Ramsar NAME	REFERENCE
Humber Estuary	UK11031
Severn Estuary	UK11081
The Wash	UK11072

C Appendix C: Water quality modelling

C.1 Water Quality Mapping



Ammonia
Deterioration

Study Area

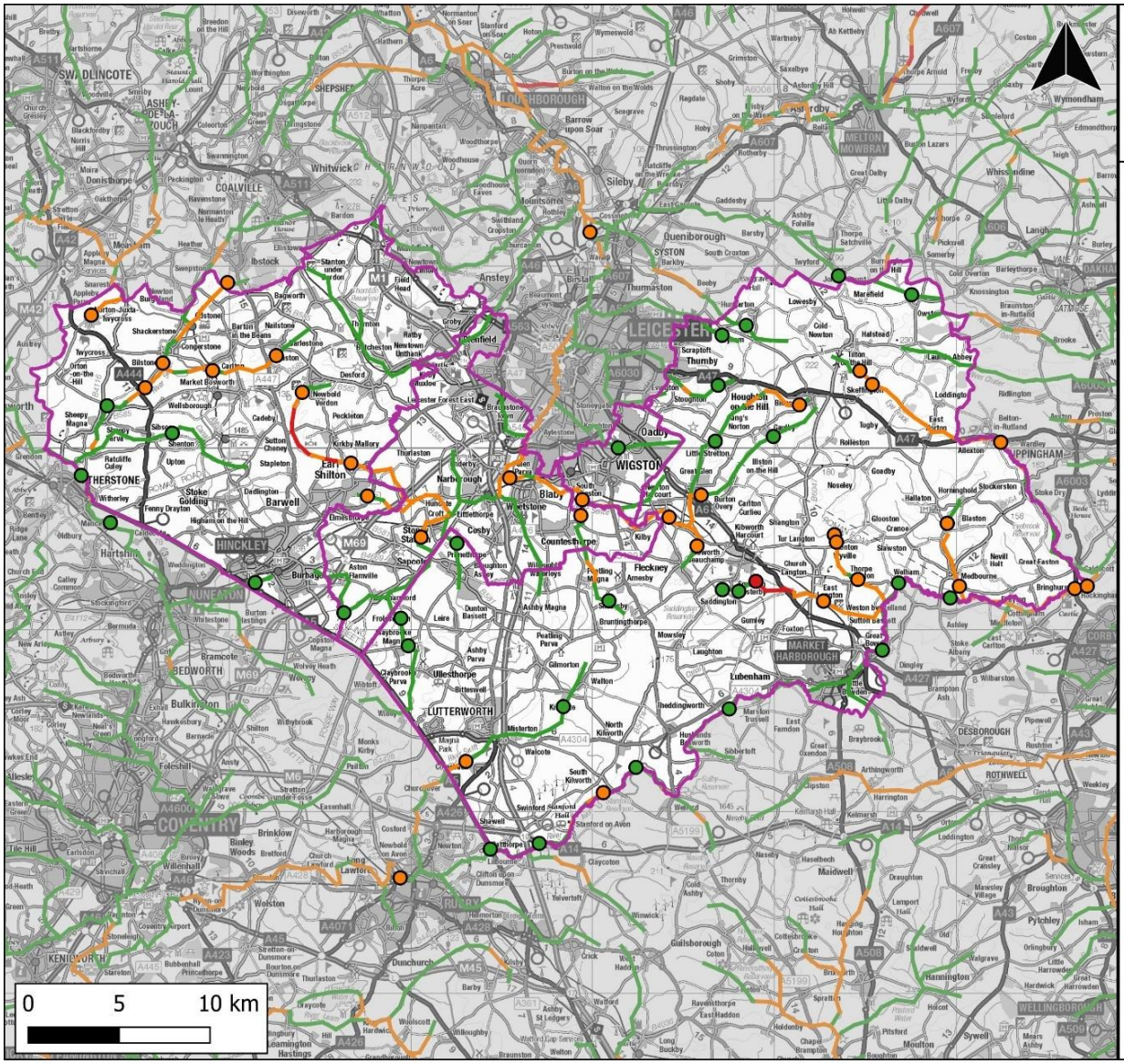
Deterioration at WwTW Outfall

- No Deterioration
- Deterioration <10%
- Deterioration >10%

Deterioration in Watercourse

- No Deterioration
- Deterioration <10%
- Deterioration >10%

Source:
LKD-JBAU-XX-XX-MX-EN-0001-S0-P01
Ammonia_Deterioration
Date Created: 15.07.2024



BOD
Deterioration

Study Area

Deterioration at WwTW Outfall
- No Deterioration
- Deterioration <10%
- Deterioration >10%

Deterioration in Watercourse
- No Deterioration
- Deterioration <10%
- Deterioration >10%

Source:
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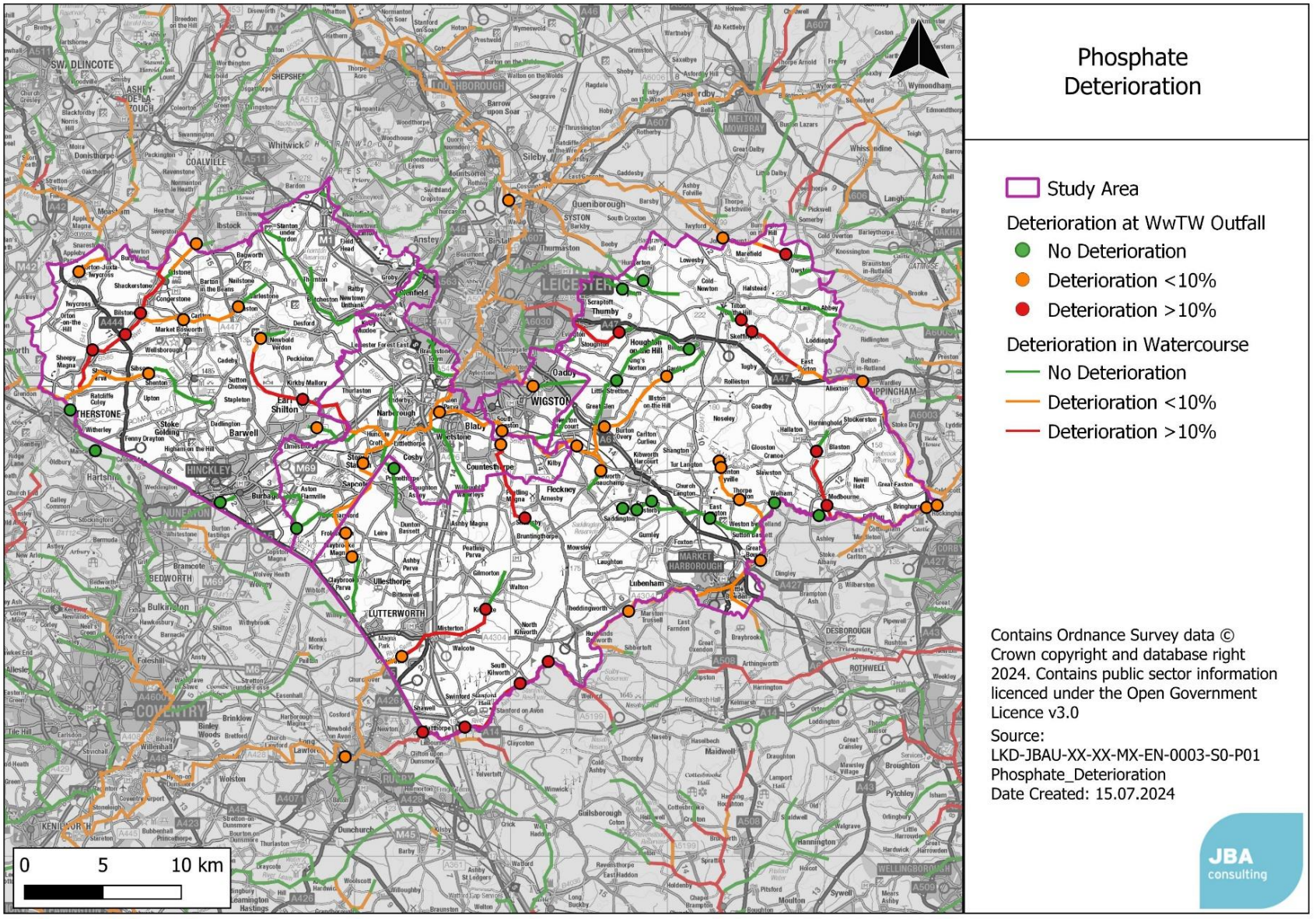
BOD_Deterioration
Date Created: 15.07.2024


Phosphate Deterioration
Study Area
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2024. Contains public sector information licenced under the Open Government Licence v3.0
Source:
LKD-JBAU-XX-XX-MX-EN-0003-S0-P01
Phosphate_Deterioration
Date Created: 15.07.2024
0
5
10 km

C.2 WwTW Deterioration

C.2.1 Ammonia

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
ARNESBY & SHEARSBY S	0.2640	0.3033	15%	HIGH	GOOD
ATHERSTONE STW	0.3845	0.4000	4%	GOOD	GOOD
BARLESTONE STW	0.3845	0.4309	12%	GOOD	GOOD
BELTON STW	0.0751	0.0829	10%	HIGH	HIGH
BILLESDON STW	4.5764	4.9323	8%	BAD	BAD
BILSTONE STW	0.0730	0.0801	10%	HIGH	HIGH
BROUGHTON ASTLEY STW	0.6686	0.6848	2%	MODERATE	MODERATE
CLAYBROOKE MAGNA STW	0.1251	0.1388	11%	HIGH	HIGH
COUNTESTHORPE STW	1.6694	1.8643	12%	POOR	POOR
Cranoe	0.1452	0.1608	11%	HIGH	HIGH
EARL SHILTON STW	2.7763	2.9168	5%	BAD	BAD
EAST LANGTON STW	0.2817	0.3283	17%	HIGH	GOOD
FLECKNEY STW	2.7750	3.0493	10%	BAD	BAD
FOXTON(LEICS) STW	0.4257	0.4890	15%	GOOD	GOOD
FROLESWORTH	0.1189	0.1244	5%	HIGH	HIGH

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
GAULBY STW	0.2217	0.2383	7%	HIGH	HIGH
Glooston	0.4396	0.5014	14%	GOOD	GOOD
GOADBY STW	0.5625	0.6635	18%	GOOD	MODERATE
GRANGE FARM	0.0943	0.1061	13%	HIGH	HIGH
GREAT EASTON(LEICS)	0.1103	0.1224	11%	HIGH	HIGH
GREAT GLEN STW	0.3747	0.4063	8%	GOOD	GOOD
Gumley	0.0605	0.0638	5%	HIGH	HIGH
HALLATON STW	0.3439	0.3968	15%	GOOD	GOOD
HINCKLEY (STW)	0.9166	0.9184	0%	MODERATE	MODERATE
Horninghold	0.3466	0.4000	15%	GOOD	GOOD
HOUGHTONONTHEHIL L	0.2019	0.2269	12%	HIGH	HIGH
HUNGARTON (W	0.3575	0.3575	0%	GOOD	GOOD
IBSTOCK STW	0.6120	0.6737	10%	MODERATE	MODERATE
KEYHAM (WRW)	0.2373	0.2373	0%	HIGH	HIGH
KIBWORTH STW	3.8914	4.2502	9%	BAD	BAD
KIMCOTE & WALTON STW	0.2613	0.2801	7%	HIGH	HIGH
KIRKBY MALLORY STW	0.0607	0.0695	14%	HIGH	HIGH
LITTLE STRET	0.2145	0.2464	15%	HIGH	HIGH
LOWESBY (STW	0.0963	0.0963	0%	HIGH	HIGH
LUTTERWORTH STW	0.3771	0.4014	6%	GOOD	GOOD

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
MARKET BOSWORTH STW	0.2919	0.3257	12%	HIGH	GOOD
MARKET HARBOROUGH ST	0.5722	0.6169	8%	GOOD	MODERATE
MEDBOURNE STW	0.2219	0.2538	14%	HIGH	HIGH
MOWSLEY STW	0.0962	0.1017	6%	HIGH	HIGH
NEWBOLD VERDON STW	1.7086	1.8755	10%	POOR	POOR
NORTONJUXTA	6.5405	7.4806	14%	BAD	BAD
NUNEATON (HARTSHILL)	0.5734	0.5999	5%	GOOD	GOOD
OADBY STW	0.7899	0.8366	6%	MODERATE	MODERATE
ORTON ON THE HILL STW	0.1520	0.1571	3%	HIGH	HIGH
OWSTON STW	0.1198	0.1322	10%	HIGH	HIGH
Rockingham	0.1043	0.1180	13%	HIGH	HIGH
RUGBY NEWBOLD STW	0.5061	0.5500	9%	GOOD	GOOD
Saddingtom	0.0675	0.0678	1%	HIGH	HIGH
Shangton	0.1854	0.1856	0%	HIGH	HIGH
SHAWELL (WRW	0.0772	0.0840	9%	HIGH	HIGH
SIBSON & SHENTON STW	0.1081	0.1192	10%	HIGH	HIGH

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
Skeffington	0.4529	0.5251	16%	GOOD	GOOD
SOUTH KILWORTH STW	0.2940	0.3437	17%	HIGH	GOOD
STONEY STANTON STW	0.6313	0.7283	15%	MODERATE	MODERATE
SWINFORD STW	0.1294	0.1475	14%	HIGH	HIGH
Theddingworth	0.1269	0.1272	0%	HIGH	HIGH
THORPE LANGTON STW	0.2655	0.3023	14%	HIGH	GOOD
TILTON ON THE HILL S	0.7952	0.9056	14%	MODERATE	MODERATE
TUGBY STW FE	0.4466	0.5253	18%	GOOD	GOOD
TWYCROSS STW	0.1052	0.1119	6%	HIGH	HIGH
WANLIP STW	1.5030	1.6216	8%	POOR	POOR
Welham	0.1980	0.2193	11%	HIGH	HIGH
WHETSTONE STW	0.3376	0.3718	10%	GOOD	GOOD
WIGSTON PARV	0.0605	0.0605	0%	HIGH	HIGH
WIGSTON STW	0.4373	0.4819	10%	GOOD	GOOD
WISTOW (WRW)	0.3054	0.3525	15%	GOOD	GOOD

C.2.2 BOD

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
ARNESBY & SHEARSBY S	3.6293	3.6090	-1%	HIGH	HIGH
ATHERSTONE STW	2.6080	2.5818	-1%	HIGH	HIGH
BARLESTONE STW	4.3500	4.4089	1%	GOOD	GOOD
BELTON STW	2.0841	2.1093	1%	HIGH	HIGH
BILLESDON STW	4.0874	4.2687	4%	GOOD	GOOD
BILSTONE STW	2.6691	2.7052	1%	HIGH	HIGH
BROUGHTON ASTLEY STW	4.6362	4.6573	0%	GOOD	GOOD
CLAYBROOKE MAGNA STW	1.6110	1.6072	0%	HIGH	HIGH
COUNTESTHORPE STW	4.3972	4.7755	9%	GOOD	GOOD
Cranoe	2.7635	2.7565	0%	HIGH	HIGH
EARL SHILTON STW	5.3935	5.4835	2%	MODERATE	MODERATE
EAST LANGTON STW	3.5799	3.6855	3%	HIGH	HIGH
FLECKNEY STW	4.6797	5.0188	7%	GOOD	MODERATE
FOXTON(LEICS) STW	3.6296	3.7027	2%	HIGH	HIGH
FROLESWORTH	1.6182	1.6143	0%	HIGH	HIGH
GAULBY STW	2.7518	2.7275	-1%	HIGH	HIGH
Glooston	1.7605	1.8066	3%	HIGH	HIGH
GOADBY STW	1.8567	1.9071	3%	HIGH	HIGH

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
GRANGE FARM	2.5434	2.5459	0%	HIGH	HIGH
GREAT EASTON(LEICS)	2.4533	2.4861	1%	HIGH	HIGH
GREAT GLEN STW	3.4833	3.6568	5%	HIGH	HIGH
Gumley	2.3165	2.3174	0%	HIGH	HIGH
HALLATON STW	1.5197	1.5952	5%	HIGH	HIGH
HINCKLEY (STW)	5.3511	5.1853	-3%	MODERATE	MODERATE
Horninghold	1.5221	1.5969	5%	HIGH	HIGH
HOUGHTONONTHEHILL	2.4275	2.3621	-3%	HIGH	HIGH
HUNGARTON (W	3.8787	3.8787	0%	HIGH	HIGH
IBSTOCK STW	4.0679	4.3881	8%	GOOD	GOOD
KEYHAM (WRW)	2.3795	2.3795	0%	HIGH	HIGH
KIBWORTH STW	8.8281	9.7006	10%	POOR	BAD
KIMCOTE & WALTON STW	2.2526	2.2497	0%	HIGH	HIGH
KIRKBY MALLORY STW	1.3153	1.4051	7%	HIGH	HIGH
LITTLE STRET	2.5585	2.5556	0%	HIGH	HIGH
LOWESBY (STW	2.0673	2.0656	0%	HIGH	HIGH
LUTTERWORTH STW	2.2730	2.3809	5%	HIGH	HIGH
MARKET BOSWORTH STW	3.4337	3.4595	1%	HIGH	HIGH
MARKET	3.4525	3.4420	0%	HIGH	HIGH

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
HARBOROUGH ST					
MEDBOURNE STW	1.5369	1.6565	8%	HIGH	HIGH
MOWSLEY STW	2.6382	2.6385	0%	HIGH	HIGH
NEWBOLD VERDON STW	4.0960	4.3998	7%	GOOD	GOOD
NORTONJUXTA	4.9130	5.0080	2%	GOOD	MODERATE
NUNEATON (HARTSHILL)	2.3562	2.3474	0%	HIGH	HIGH
OADBY STW	6.6365	6.6543	0%	POOR	POOR
ORTON ON THE HILL STW	2.5896	2.5881	0%	HIGH	HIGH
OWSTON STW	2.7636	2.7633	0%	HIGH	HIGH
Rockingham	2.4373	2.4695	1%	HIGH	HIGH
RUGBY NEWBOLD STW	3.0825	3.1176	1%	HIGH	HIGH
Saddingtom	2.6333	2.6341	0%	HIGH	HIGH
Shangton	1.6540	1.6542	0%	HIGH	HIGH
SHAWELL (WRW	2.1382	2.1387	0%	HIGH	HIGH
SIBSON & SHENTON STW	3.8079	3.8039	0%	HIGH	HIGH
Skeffington	3.0357	3.0818	2%	HIGH	HIGH
SOUTH KILWORTH STW	2.4748	2.5046	1%	HIGH	HIGH

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
STONEY STANTON STW	2.7104	2.8667	6%	HIGH	HIGH
SWINFORD STW	2.2427	2.2419	0%	HIGH	HIGH
Theddingworth	5.1867	5.1773	0%	MODERATE	MODERATE
THORPE LANGTON STW	1.5747	1.6086	2%	HIGH	HIGH
TILTON ON THE HILL S	3.3988	3.5453	4%	HIGH	HIGH
TUGBY STW FE	1.7312	1.7418	1%	HIGH	HIGH
TWYCROSS STW	2.6588	2.6771	1%	HIGH	HIGH
WANLIP STW	4.1669	4.2871	3%	GOOD	GOOD
Welham	2.7840	2.7861	0%	HIGH	HIGH
WHETSTONE STW	3.3643	3.4312	2%	HIGH	HIGH
WIGSTON PARV	3.8731	3.8731	0%	HIGH	HIGH
WIGSTON STW	2.6104	2.7650	6%	HIGH	HIGH
WISTOW (WRW)	2.5694	2.6460	3%	HIGH	HIGH

C.2.3 Phosphate

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
ARNESBY & SHEARSBY S	0.8495	0.9591	13%	POOR	POOR
ATHERSTONE STW	0.2401	0.2361	-2%	POOR	POOR
BARLESTONE STW	0.1508	0.1540	2%	MODERATE	MODERATE
BELTON STW	0.1653	0.1782	8%	MODERATE	MODERATE
BILLESDON STW	0.6886	0.6538	-5%	POOR	POOR
BILSTONE STW	0.2023	0.2240	11%	POOR	POOR
BROUGHTON ASTLEY STW	0.8088	0.7986	-1%	POOR	POOR
CLAYBROOKE MAGNA STW	0.9308	0.9915	7%	POOR	POOR
COUNTESTHORPE STW	0.3945	0.4315	9%	POOR	POOR
Cranoe	0.5095	0.5072	0%	MODERATE	MODERATE
EARL SHILTON STW	0.7662	0.7730	1%	POOR	POOR
EAST LANGTON STW	1.5396	1.4553	-5%	POOR	POOR
FLECKNEY STW	3.6665	3.8019	4%	BAD	BAD
FOXTON(LEICS) STW	1.6855	1.6341	-3%	POOR	POOR
FROLESWORTH	0.8628	0.9110	6%	POOR	POOR
GAULBY STW	1.2382	1.2983	5%	BAD	BAD
Glooston	0.4640	0.4759	3%	MODERATE	MODERATE
GOADBY STW	0.5330	0.5451	2%	MODERATE	MODERATE

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
GRANGE FARM	0.2344	0.2723	16%	POOR	POOR
GREAT EASTON(LEICS)	0.3979	0.4110	3%	MODERATE	MODERATE
GREAT GLEN STW	1.8441	2.0059	9%	BAD	BAD
Gumley	1.3678	1.3688	0%	POOR	POOR
HALLATON STW	0.4657	0.5401	16%	MODERATE	MODERATE
HINCKLEY (STW)	0.1083	0.1072	-1%	MODERATE	MODERATE
Horninghold	0.4662	0.5408	16%	MODERATE	MODERATE
HOUGHTONONTHEHILL	2.0551	2.3114	12%	BAD	BAD
HUNGARTON (W	0.2142	0.2142	0%	POOR	POOR
IBSTOCK STW	0.2357	0.2394	2%	POOR	POOR
KEYHAM (WRW)	0.2950	0.2950	0%	POOR	POOR
KIBWORTH STW	0.4896	0.4585	-6%	MODERATE	MODERATE
KIMCOTE & WALTON STW	0.7352	0.8286	13%	POOR	POOR
KIRKBY MALLORY STW	0.8196	0.9087	11%	POOR	POOR
LITTLE STRET	1.3075	1.2780	-2%	BAD	BAD
LOWESBY (STW	0.2306	0.2382	3%	POOR	POOR
LUTTERWORTH STW	0.3657	0.3960	8%	POOR	POOR
MARKET BOSWORTH STW	0.2226	0.2380	7%	POOR	POOR
MARKET HARBOROUGH ST	0.2245	0.2265	1%	MODERATE	MODERATE

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
MEDBOURNE STW	0.3204	0.3744	17%	MODERATE	MODERATE
MOWSLEY STW	1.9635	1.9648	0%	POOR	POOR
NEWBOLD VERDON STW	2.3394	2.5585	9%	BAD	BAD
NORTONJUXTA	0.3674	0.3761	2%	POOR	POOR
NUNEATON (HARTSHILL)	0.2222	0.2178	-2%	POOR	POOR
OADBY STW	3.2338	3.3346	3%	BAD	BAD
ORTON ON THE HILL STW	0.1888	0.2078	10%	POOR	POOR
OWSTON STW	0.1645	0.1834	11%	MODERATE	POOR
Rockingham	0.3897	0.4029	3%	MODERATE	MODERATE
RUGBY NEWBOLD STW	0.3181	0.3273	3%	POOR	POOR
Saddingtom	1.9594	1.9595	0%	POOR	POOR
Shangton	0.4717	0.4718	0%	MODERATE	MODERATE
SHAWELL (WRW	0.1928	0.2183	13%	POOR	POOR
SIBSON & SHENTON STW	0.1525	0.1563	2%	MODERATE	MODERATE
Skeffington	0.6028	0.6752	12%	MODERATE	MODERATE
SOUTH KILWORTH STW	0.2774	0.3223	16%	POOR	POOR

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	Baseline Class	Future Class
STONEY STANTON STW	0.3887	0.4177	7%	POOR	POOR
SWINFORD STW	0.1910	0.2218	16%	POOR	POOR
Theddingworth	0.3769	0.3832	2%	MODERATE	MODERATE
THORPE LANGTON STW	0.3127	0.3257	4%	MODERATE	MODERATE
TILTON ON THE HILL S	0.8763	0.9848	12%	MODERATE	MODERATE
TUGBY STW FE	0.5181	0.5273	2%	MODERATE	MODERATE
TWYCROSS STW	0.2003	0.2205	10%	POOR	POOR
WANLIP STW	0.4154	0.4247	2%	POOR	POOR
Welham	0.6576	0.6454	-2%	MODERATE	MODERATE
WHETSTONE STW	0.6962	0.7022	1%	POOR	POOR
WIGSTON PARV	0.1714	0.1714	0%	MODERATE	MODERATE
WIGSTON STW	1.0090	1.0152	1%	POOR	POOR
WISTOW (WRW)	2.2105	2.2603	2%	BAD	BAD

D Appendix D WINEP Measures

The tables below contain many acronyms that are part of the original Environment Agency database. These have been retained for accuracy, but definitions are included in

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
Countesthorpe Brook from Source to Sence	EMD00250 EMD00413 EMD00575	ARNESBY (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with U_IMP5 - The WwTW FFT must be increased to 3PG + IMAX + 3E .	31/03/2025 31/03/2022 31/03/2023
Anker from Wem Brook to River Sence	WMD00591 WMD00849 WMD01112	ATHERSTONE (STW)	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	31/03/2022 31/03/2021 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			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. U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with U_IMP5 – The WwTW FFT must be increased to 3PG + IMAX + 3E .	
Carlton Brook from Source to River Sence	WMD00595 WMD00853 WMD01274	BARLESTONE (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where	31/03/2021 31/03/2022 22/12/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_IMPg – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measure to meet a Good standard for the element. There may also be situations where a WFD biological element fails its water body objective due ammonia and/or dissolved oxygen (i.e. reason for not achieving good status (RNAG) is confirmed as ammonia and/or dissolved oxygen), but the ammonia and/or dissolved oxygen element at the designated monitoring location achieved good status. This may be due to circumstances such as different monitoring sites used for chemistry and biology. There must be a confirmed link between the water company asset and the observed effect for measures to improve biology. A phosphorous permit of 0.25mg/l is proposed.	
Sence from Source to Burton Brook	EMD00261 EMD00424	BILLESDON (STW)	U_MON4 - Install MCERTS flow monitoring as close to the overflow as practicable to record FFT at WwTW where the existing DWF	31/03/2025 31/03/2022

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	
Soar from Soar Brook to Thurlaston Brook	EMD00269 EMD00432	BROUGHTON ASTLEY (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	31/03/2021 31/03/2022
Countesthorpe Brook from Source to Sence	EMD00282 EMD00445 EMD00794	COUNTESTHORPE (STW)	U_MON4 - Install MCERTS flow monitoring as close to the overflow as practicable to record	31/03/2021 31/03/2022 22/12/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_IMPm – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measures to meet a Moderate standard. A phosphorous permit of 0.8mg/l is proposed.	
Thurlaston Brook Catchment (trib of Soar)	EMD00290 EMD00453 EMD00951	EARL SHILTON (STW)	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 U_MON3 -	31/03/2021 31/03/2022 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_ND – Scheme to meet requirement s to prevent deterioration in BOD. A BOD permit of 12mg/l is proposed.	
Langton Brook	EAN01149 EAN01150	EAST LANGTON STW	U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with 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	31/03/2021 31/03/2022

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			neither can be MCERTS certified then a new inlet MCERTS flow monitor will be required under a PR24 driver.	
Sence from Burton Brook to Countesthorpe Brook	EMD00304 EMD00467 EMD00806 EMD00807	FLECKNEY (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_ND – Scheme to meet requirement s to prevent deterioration in ammonia. A ammonia permit of 6.5mg/l is proposed. WFD_IMPg – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measure to meet a Good standard for the element. There may also be situations where a WFD biological	31/03/2021 31/03/2022 31/03/2025 22/12/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			element fails its water body objective due ammonia and/or dissolved oxygen (i.e. reason for not achieving good status (RNAG) is confirmed as ammonia and/or dissolved oxygen), but the ammonia and/or dissolved oxygen element at the designated monitoring location achieved good status. This may be due to circumstances such as different monitoring sites used for chemistry and biology. There must be a confirmed link between the water company asset and the observed effect for measures to improve biology. A BOD permit of 10mg/l is proposed	
Langton Brook	EAN01231 EAN01232	FOXTON STW (LEICS)	U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with 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	31/03/2024 31/03/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
Burton Brook from Source to Sence	EMD00308 EMD00471	GAULBY (STW)	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. U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	31/03/2022 31/03/2021
Welland - conf Langton Bk to conf Gwash	EAN01310 EAN01311 EAN01313	GREAT EASTON STW (LEICS)	U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	31/03/2024 31/03/2024 31/03/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			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 U_IMP6 – The WwTW storm tank capacity must be increased to 68 litres/head or to 2 hours at max flow through the tanks.	
Burton Brook from Source to Sence	EMD00311 EMD00474 EMD00952	GREAT GLEN (STW)	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	31/03/2022 31/03/2021 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			required under a PR24 driver. U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_ND – Scheme to meet requirement s to prevent deterioration in BOD. A BOD permit of 20mg/l is proposed	
Medbourne Brook	EAN01372 EAN01373	HALLATON STW	U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with 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	31/03/2021 31/03/2022

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			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.	
Sketchley Brook from Source to River Anker	WMD00694 WMD00952 WMD01329 WMD01330 WMD01331 WMD01332	HINCKLEY (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_IMPg – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measure to meet a Good standard for the element. There may also be situations where a WFD biological element fails its water body objective due ammonia and/or dissolved oxygen (i.e. reason for not achieving good status	31/03/2021 31/03/2022 22/12/2024 22/12/2024 31/03/2025 22/12/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			(RNAG) is confirmed as ammonia and/or dissolved oxygen), but the ammonia and/or dissolved oxygen element at the designated monitoring location achieved good status. This may be due to circumstances such as different monitoring sites used for chemistry and biology. There must be a confirmed link between the water company asset and the observed effect for measures to improve biology. A phosphorous permit of 0.1mg/l is proposed. WFD_IMPg – As above, a ammonia permit of 1mg/l is proposed WFD_ND – Scheme to meet requirement s to prevent deterioration in ammonia. A ammonia permit of 2.4mg/l is proposed WFD_IMPg – As above, a BOD permit of 7.5mg/l is proposed	
Willow Brook Catchment (trib of Soar)	EMD00224 EMD00322 EMD00485	HOUGHTON ON THE HILL (STW)	U_IMP6 – The WwTW storm tank capacity must be increased to 68 litres/head or to 2 hours at max flow through the tanks. U_INV2 - Investigation to confirm if any existing front end flow monitor or the back end	31/03/2024 31/03/2022 31/03/2021

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			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. U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	
Ibstock Brook from Source to River Sence	WMD00703 WMD00961 WMD01345 WMD01539	IBSTOCK (STW)	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	31/03/2021 31/03/2022 22/12/2024 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_IMPm – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measures to meet a Moderate standard. A phosphorous permit of 0.3 is proposed. WFD_ND – Scheme to meet requirement s to prevent deterioration in ammonia. A ammonia permit of 6.5mg/l is proposed.	
Langton Brook	EAN01502 EAN01503 EAN01505 LNA00215 LNA00381	KIBWORTH STW	U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with 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	31/03/2024 31/03/2024 31/03/2024 22/12/2024 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			installed flow monitoring, cannot be readily used to confirm the permitted FFT setting is being complied with when the overflow to storm tanks operates U_IMP6 – The WwTW storm tank capacity must be increased to 68 litres/head or to 2 hours at max flow through the tanks. WFD_IMPm - Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measures to meet a Moderate standard. A phosphorous permit of 0.25mg/l is proposed. WFD_ND – Scheme to meet requirement s to prevent deterioration in phosphorous. A phosphorous permit of 4.8mg/l is proposed	
Swift source to conf Avon	WMD00710 WMD00968	KIMCOTE (STW)	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	31/03/2022 31/03/2021

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			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. U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	
Thurlaston Brook Catchment (trib of Soar)	EMD00333 EMD00496	KIRKBY MALLORY (STW)	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	31/03/2022 31/03/2021

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			neither can be MCERTS certified then a new inlet MCERTS flow monitor will be required under a PR24 driver. U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	
Swift source to conf Avon	WMD00727 WMD00985	LUTTERWORTH (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	31/03/2025 31/03/2022
Welland - conf Jordan to conf Langton Bk	EAN01632 EAN01633 EAN01634 LNA00219 LNA00382	MARKET HARBOROUGH STW	U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting	31/03/2022 31/03/2021 31/03/2025 22/12/2024 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			is being complied with 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 U_IMP6 – The WwTW storm tank capacity must be increased to 68 litres/head or to 2 hours at max flow through the tanks. WFD_IMPm – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measures to meet a Moderate standard. A phosphorous permit of 0.25mg/l is proposed. WFD_ND – Scheme to meet requirement s to prevent deterioration in phosphorous. A phosphorous permit of 0.8mg/l is proposed	
Stoke Golding Brook from Source to R Sence	WMD00732 WMD00990	MARKET BOSWORTH (STW)	U_MON4 - Install MCERTS flow monitoring as close	31/03/2021 31/03/2022

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
	WMD01369		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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_IMPg – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measure to meet a Good standard for the element. There may also be situations where a WFD biological element fails its water body objective due ammonia and/or dissolved oxygen (i.e. reason for not achieving good status (RNAG) is confirmed as ammonia and/or dissolved oxygen), but the ammonia and/or dissolved oxygen element at the designated monitoring location achieved good status. This may be due to circumstances such as different	22/12/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			monitoring sites used for chemistry and biology. There must be a confirmed link between the water company asset and the observed effect for measures to improve biology. A phosphorous permit of 0.3mg/l is proposed.	
Thurlaston Brook from Source to River Soar	EMD00351 EMD00514	NEWBOLD VERDON (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	31/03/2021 31/03/2022
Anker from Wem Brook to River Sence	WMD01393 WMD01548	NUNEATON-HARTSHILL (STW)	WFD_IMPm – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measures to meet a Moderate standard. A phosphorous permit of 0.2mg/l is proposed.	22/12/2024 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			WFD_ND – Scheme to meet requirement s to prevent deterioration in ammonia. A ammonia permit of 3mg/l is proposed	
Wash Brook Catchment (trib of Soar)	EMD00354 EMD00517 EMD00855 EMD00856	OADBY (STW)	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. U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_IMPm – Measures to reduce ammonia,	31/03/2022 31/03/2021 22/12/2024 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measures to meet a Moderate standard. A phosphorous permit of 0.2mg/l is proposed. WFD_ND – Scheme to meet requirement s to prevent deterioration in ammonia. A ammonia permit of 4mg/l is proposed	
Avon - Claycoton Yelvertoft Bk to conf R Sowe	WMD00775 WMD01033 WMD01558	RUGBY NEWBOLD (STW)	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. U_MON3 - Install EDM on WwTW overflows to	31/03/2022 31/03/2021 31/03/2025

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_ND – Scheme to meet requirement s to prevent deterioration in ammonia. A ammonia permit of 4mg/l is proposed	
Stoke Golding Brook from Source to R Sence	WMD01417	SIBSON (STW)	WFD_IMPg – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measure to meet a Good standard for the element. There may also be situations where a WFD biological element fails its water body objective due ammonia and/or dissolved oxygen (i.e. reason for not achieving good status (RNAG) is confirmed as ammonia and/or dissolved oxygen), but the ammonia and/or dissolved oxygen element at the designated monitoring location achieved good status. This may be due to circumstances such as different monitoring sites used for chemistry and biology. There must be a confirmed link between the water company asset and the observed effect for measures to	22/12/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			improve biology. A phosphorous permit of 1.3mg/l is proposed	
Soar from Soar Brook to Thurlaston Brook	EMD00379 EMD00542	STONEY STANTON (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	31/03/2021 31/03/2022
Eye Brook	EAN02121 EAN02122 EAN02123	TILTON ON THE HILL STW	U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with 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	31/03/2021 31/03/2022 31/03/2023

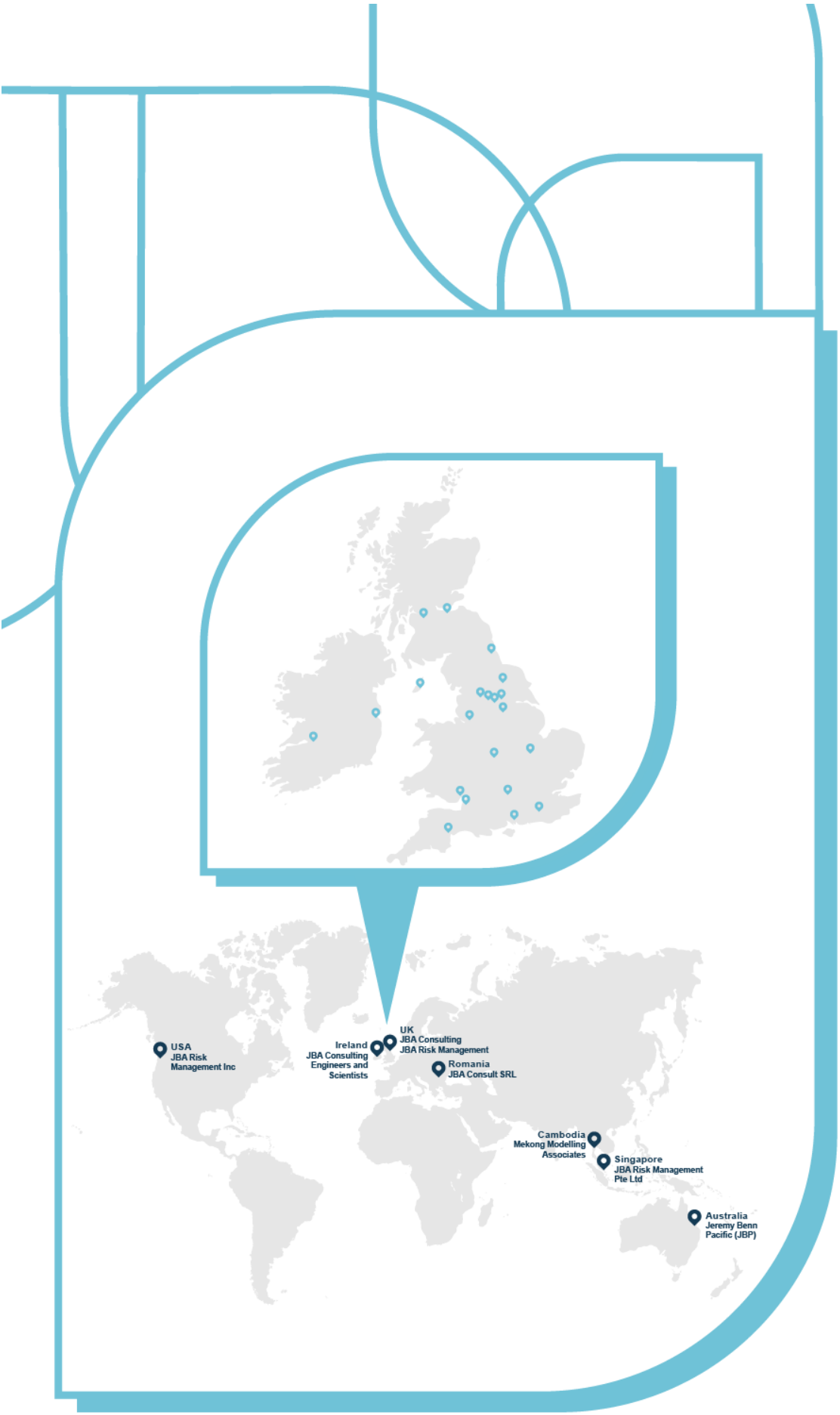
Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			be MCERTS certified to measure PFF they should be used to provide data within AMP7. Where there is no front end monitor or it cannot be MCERTS certified investigate whether the back end flow monitor can be MCERTS certified 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. U_IMP6 – The WwTW storm tank capacity must be increased to 68 litres/head or to 2 hours at max flow through the tanks.	
Stonton Brook	EAN02153 EAN02154	TUGBY STW	U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with 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	31/03/2021 31/03/2022

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			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.	
Soar from Sence to Rothley Brook	EMD00393 EMD00556	WANLIP (STW)	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. U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where	31/03/2022 31/03/2021

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			existing monitors cannot be used to be confident that the permitted FFT setting is being complied with	
Sence from Countesthorpe Brook to Soar	EMD00398 EMD00561 EMD00904 EMD00905	WHETSTONE (STW)	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 U_MON3 - Install EDM on WwTW overflows to storm tanks at those WwTW where existing monitors cannot be used to be confident that the permitted FFT setting is being complied with WFD_IMPm – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measures to meet a Moderate standard. A phosphorous permit of 0.3mg/l is proposed. WFD_IMPg – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in	31/03/2021 31/03/2022 22/12/2024 22/12/2024

Waterbody Name	WINEP ID	Scheme Name(s)	Type of scheme/notes	Completion date
			rivers, transitional or coastal waters. Measure to meet a Good standard for the element. There may also be situations where a WFD biological element fails its water body objective due ammonia and/or dissolved oxygen (i.e. reason for not achieving good status (RNAG) is confirmed as ammonia and/or dissolved oxygen), but the ammonia and/or dissolved oxygen element at the designated monitoring location achieved good status. This may be due to circumstances such as different monitoring sites used for chemistry and biology. There must be a confirmed link between the water company asset and the observed effect for measures to improve biology. A BOD permit of 15mg/l is proposed.	
Sence from Countesthorpe Brook to Soar	EMD00909	WIGSTON (STW)	WFD_IMPm – Measures to reduce ammonia, phosphorus, BOD or nitrogen at STWs in order to meet WFD standards in rivers, transitional or coastal waters. Measures to meet a Moderate standard. A phosphorous permit of 0.3mg/l is proposed.	22/12/2024

Abbreviation	Definition
MON i.e., U_MON3, U_MON4, U_MON5	Long-term monitoring
INV i.e., U_INV2	Investigation
IMP i.e., U_IMP6,	Action (to improve)
WFD_IMP i.e., WFD_IMPg and WFD_IMPm	Measure to reduce ammonia, phosphorus, BOD or nitrogen at WwTWs in order to meet WFD standards in rivers, transitional or coastal waters. The letters after 'WFD_IMP' correspond to indicate what target the measure is aimed at achieving: h- measure to meet High status for the element g- measure to meet Good status for the element p- measure to meet Poor status for the element m- measure to meet Moderate status for the element
WFD_NDLS_Chem2	Measures related to load standstill requirements for chemicals (below Environmental Quality Standards (EQS)). These are set where a wastewater treatment works is discharging significant concentrations of a chemical, but the EQS is not threatened. Targets are set to ensure that current effluent quality does not deteriorate.



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