Wastewater Services

# Our catchment plan.

## Providing safe and reliable wastewater services in Aldershot.

Thames Water

2018

Wastewater Services

# Contents.

# Introduction.

## About our plan

We want to tell you about our plan to improve our sewerage network in the Aldershot catchment, so it can cope with current and future demands. We're doing this because some of our customers have experienced flooding, and pollution has affected local rivers.

Both flooding and pollution are unacceptable, that's why we treat all instances with the highest priority. If one of our sewers causes a problem, we'll do everything we can to put this right as soon as possible. We're committed to addressing these issues across our region and we'll continue to work with our customers and other drainage stakeholders to do so.

Our plan explains:

- the sewer problems some of our customers are experiencing, and their causes
- what we're doing to address these issues, and who else is involved
- our recommendations for continuing to provide safe and reliable wastewater services in the catchment now, and in the future.

**At the back of this document you'll also find definitions for some of the words and phrases we use in our plan.**

## The Aldershot catchment

Every day, our sewerage network in Aldershot serves almost 40,000 customers. The River Blackwater rises in the west of the catchment, and forms the southern and eastern boundary of Aldershot town. The catchment is served by Aldershot Sewage Treatment Works (STW), which is located to the east of the town.

Our sewerage network consists of:

- foul sewers - these take water from showers, toilets, sinks and appliances to Aldershot STW, where it's cleaned
- surface water sewers - these collect rainwater that falls on properties, roads and other paved areas, and drain it into local rivers.

Our network has been vastly improved and extended since it was constructed, yet it remains under increasing pressure from an increasing population, the paving over of green areas and climate change.


**The Aldershot catchment***

* Source: Contains Ordnance Survey data © Crown copyright and database right (2015) https://www.ordnancesurvey.co.uk

# Sewer flooding and pollution

Sewer flooding and pollution is caused by a number of factors including:

- more intense rainfall events
- population growth
- loss of green spaces that previously provided natural drainage
- pipework misconnections and blockages.

Combined, these can result in unwanted flow from the sewerage network into:

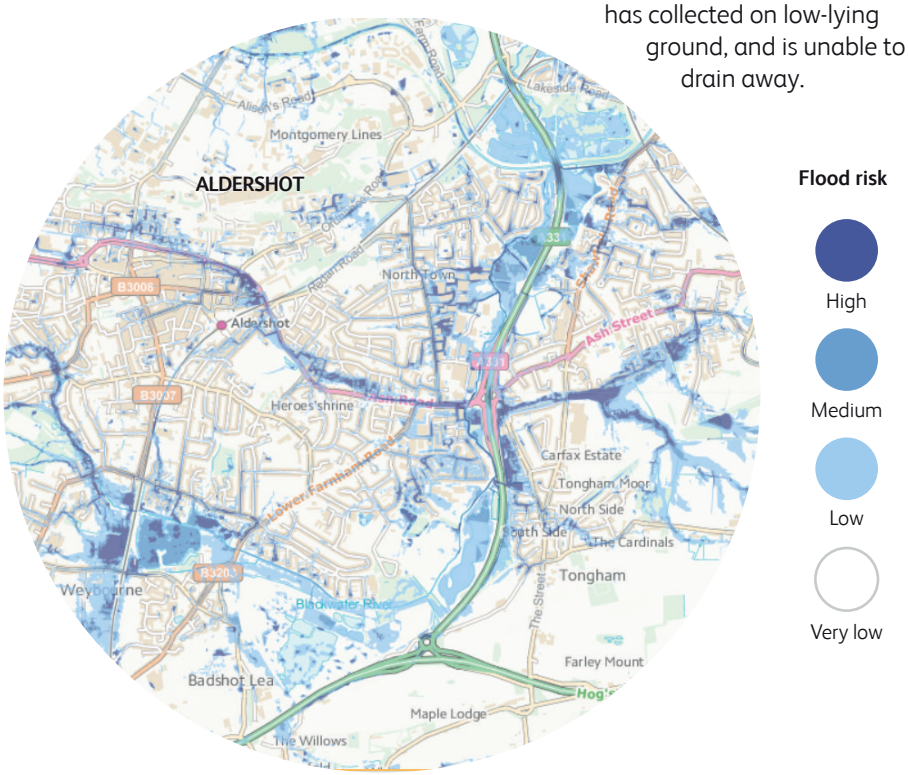
- customer homes and businesses, causing sewer flooding
- our neighbouring natural environments, causing pollution
- roads, causing congestion and closures.

During heavy rainfall the Aldershot sewerage network can become overwhelmed in some locations. It's currently dealing with flows from more properties, roads and other paved areas than it was originally built to cope with.

The development of the catchment has also put pressure on other drainage systems, which are the responsibility of other stakeholders. For example, the Environment Agency is responsible for managing the main rivers in the catchment, some of which have become overloaded during heavy rainfall. Flooding has also occurred when surface water runoff from roads and green spaces has collected on low-lying ground, and is unable to drain away.

Flooding of this kind falls under the responsibility of Rushmoor Borough Council, Hampshire County Council and land owners in the catchment.

In the future, the catchment's population is estimated to continue to rise, and also we predict that rainfall events will continue to get more intense. We need to improve our sewerage network to address sewer flooding and pollution, so it can cope with the current and future demands of the Aldershot catchment.




Aldershot catchment - Flood risk from surface water map
Source: Environment Agency

# Our catchment plan.

## What we're doing

We've already consulted with some of our customers and stakeholders, to support the creation of our plan. We've also initiated work to improve drainage and alleviate sewer flooding, pollution and growth-related issues in a sustainable way. We'll continue to share our plans to make sure that the work we do is affordable for our customers, and meets their needs.

We've adopted the good practice Drainage Strategy Framework*, commissioned by the Environment Agency and Ofwat, the water industry regulators. We're also using this framework to make plans for other catchments, so that we're consistent in our approach to addressing issues across our region.

Our catchment plan has followed the 4-stage process shown in the diagram. We've summarised below the work undertaken at each stage of this process. We'll keep consulting with our customers and stakeholders as we complete Stage 3 and commence Stage 4.


* www.ofwat.gov.uk/publication/drainage-strategy-framework-for-water-and-sewerage-companies-to-prepare-drainage-strategies/.

** The estimated delivery timeline is dependent on factors including weather conditions, risks and costs, and is, therefore, open to change.

**Drainage Strategy Framework stages and timescales**

- **Stage 1 - Initialise / prepare**
  We gathered all the information that helps us to produce our plan. We surveyed the sewers and rivers, and collected data on pollution and flooding incidents. We also modelled the performance of the existing drainage systems in the catchment.
- **Stage 2 - Risk assessment**
  We investigated and analysed the information, to identify the risks in the catchment in the catchment and to understand the causes of the problems we found.
- **Stage 3 - Option appraisal**
  We developed a number of options to address the catchment risks and tested them using our models. We assessed the costs and benefits of each option and chose the ones we want to implement.
- **Stage 4 - Intervention**
  This is when we implement our chosen options. We'll need to work with our customers and other stakeholders to gain their help and support, for the work we propose.

# Our completed investigations

We've completed detailed research within the Aldershot catchment to identify the root causes of sewer flooding and pollution. Our investigations have included:

- physical inspection and CCTV surveys of sewers and manholes
- using our survey findings to evaluate the health and capacity of the catchment's sewers and manholes
- integrated catchment modelling - combining our own models, with river model data from the Environment Agency. The combined model contains over 2,900 manholes, 110 kilometres of sewers, 12 kilometres of rivers and over 20 structures such as bridges and culverts. It's helped us to understand and test the causes of flooding and to develop ways to address them.
- analysis of over 200 customer questionnaires about sewer flooding
- flow and depth monitors to assess the performance of our network and test the accuracy of our modelling work
- surveys to identify the source of surface water flows into the foul system
- predicting the level of flooding and pollution risk present across the catchment

# Our catchment findings

## Current issues

There are a broad range of flooding and pollution issues within the Aldershot catchment, and many root causes which include:

- heavier and more intense rainfall events happening more often
- population growth, high-density urban development and paving-over of gardens, creating a large combined watertight area
- property misconnections, leading to many homes and businesses discharging to the wrong sewer; as illustrated in the image on the next page
- the clay soil mainly found in the catchment restricts rainfall from soaking into the ground. This allows more water to enter our sewerage network from fields and grassy areas.

## What we've found

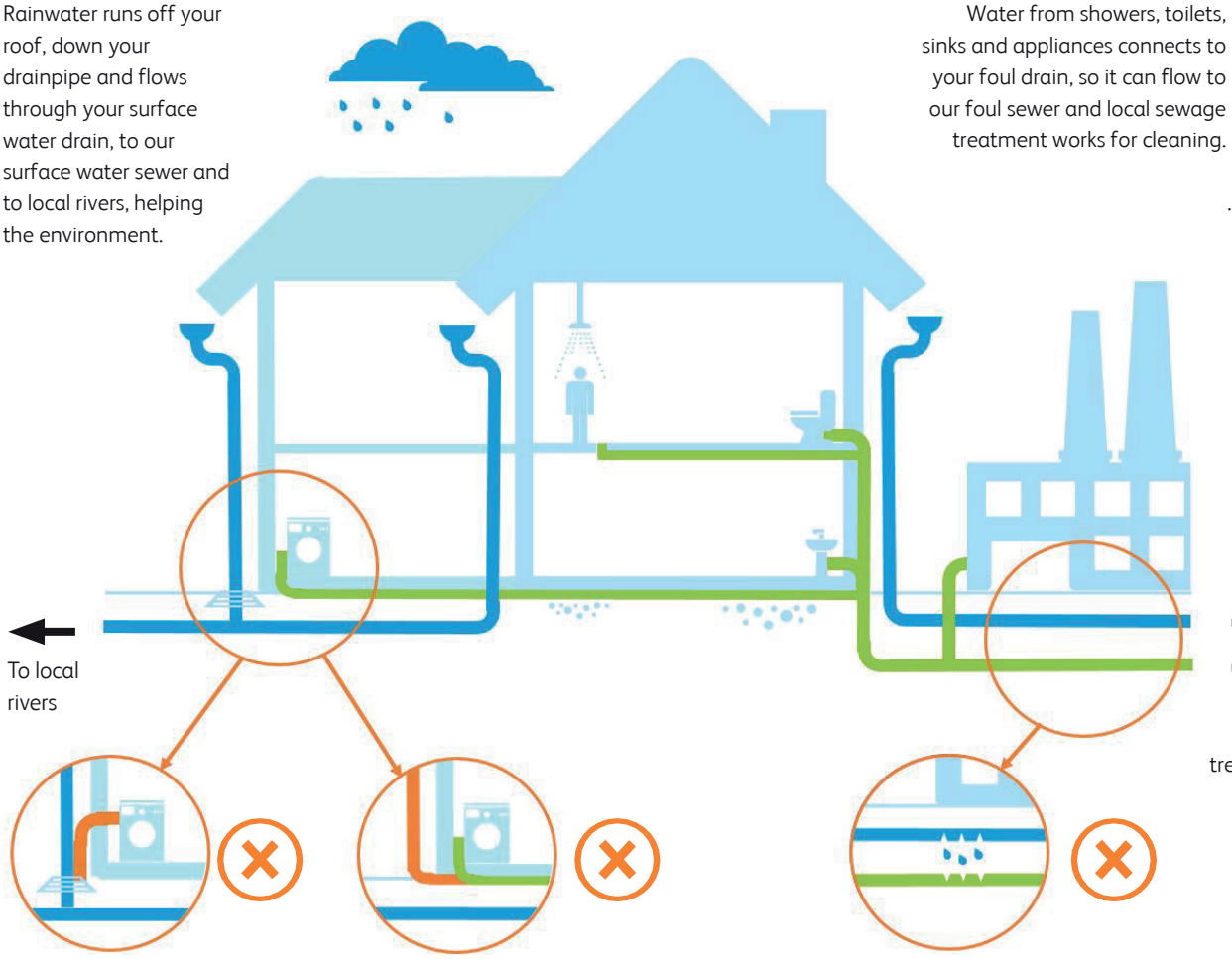
Overall our catchment findings tell us that:

- our surface water sewers have become overloaded as our network has to deal with flows from more properties, roads and other paved areas, than it was originally built for
- flooding from our surface water sewers has also occurred as a result of high river levels
- our foul sewers have become overloaded in storm events, as property misconnections have allowed surface water to drain into them. Our foul sewers were not designed to cope with surface water
- groundwater has entered some of our sewerage network, creating further capacity issues in those sewers
- during prolonged and extreme wet weather conditions Aldershot STW is unable to manage the large volumes of surface water entering the foul sewerage network. This results in more frequent spills from the storm tanks into the River Blackwater, which affects water quality
- in some areas, the sewers have been laid with relatively shallow gradients. This has increased the likelihood of debris and blockages forming during low flow conditions.

## Property misconnection problems

Rainwater runs off your roof, down your drainpipe and flows through your surface water drain, to our surface water sewer and to local rivers, helping the environment.

Water from showers, toilets, sinks and appliances connects to your foul drain, so it can flow to our foul sewer and local sewage treatment works for cleaning.




Appliances should never be plumbed into your drainpipe. This sends waste into the local river killing wildlife.

Drainpipes should never be connected to your foul drain. This sends rainwater to our foul sewer, overloading it and causing sewer flooding.

Poor condition sewers can sometimes let flows transfer between them, causing flooding or pollution. Where we find this happening, and it's our responsibility, we'll fix them.

## Future risks

To make sure our work is effective and sustainable we're also addressing within our plan the future challenges facing the catchment, which include:

- urban creep - loss of green space increasing the strain on our sewerage network when it rains heavily
  Our modelling suggests urban creep rates in Aldershot are slightly higher than the regional average
- climate change - some recent analysis suggests rainfall could become 20% more intensive by the 2050s*, increasing the potential for flooding.
- wetter winters may also mean groundwater levels could be higher more often, with more flow getting into our sewers
- population growth - there are significant areas of new development proposed in Ash Village and Tongham Village, the MOD site to the north of the catchment, and at brownfield sites within Aldershot town centre
- changes in customer behaviour - property misconnections are present in the catchment and flushing or pouring the wrong items into sewers has led to blockage-related flooding and pollution.

Addressing the current issues and future risks will be complex. We'll also need to work in partnership with all stakeholders responsible for drainage in the catchment. We'll also need to gain customer support for the work we propose.

* UK Climate Change Risk Assessment 2017: Evidence Report: Flood Risk, Appendix C – Climate Change Projections October 2015.

# Who can help?

There are a number of stakeholders who, like us, have important drainage responsibilities. They also play an essential role in addressing flooding and pollution in our catchment, and include:

**Local Authorities:** In some locations flooding occurs from multiple sources. We need Rushmoor Borough Council and Hampshire County Council (with Environment Agency funding), to address fluvial and surface water flooding. This will complement the work we're doing to help our network perform efficiently.

- we're developing sustainable schemes to reduce the risk of flooding in the Aldershot catchment. We'll continue to liaise with Rushmoor Borough Council and Hampshire County Council to make sure our schemes can be implemented and offer maximum benefits to our customers.

**Customers:** Our customers have an important role to play in ensuring that their properties, including any future improvements, are correctly connected. They can also ease the pressure on our sewerage network by reducing the runoff from the roofs and driveways of their properties, and through supporting our campaign to 'Bin it, don't block it!'. Our customers can also help us by reporting any internal flooding or overflow from manholes.

**Environment Agency:** Is the principal flood risk management operating authority in England. It has operational responsibility for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea. The Environment Agency is an important stakeholder as it provides partnership working support and funding to other flood risk management authorities, through their local regional flood and coastal committees.

- our surface water sewers in Aldershot connect into the River Blackwater It's important that we work with the Environment Agency to make sure that the river channel is maintained to allow our surface water sewers to discharge water efficiently.

We're seeking to work in partnership with all stakeholders to make sure that together, we deliver and maintain the most sustainable sewer flooding and pollution interventions.


**Stakeholders with drainage responsibilities**

Just as our drainage responsibilities are focussed on removing and treating wastewater, and draining the surface water from our customers' properties, other stakeholders' responsibilities include:

- managing local flood risk on riverbanks
- groundwater
- land and highways
- maintaining private drains.

We take full responsibility for addressing the drainage and sewer flooding issues in our control. Outside of this, we'll fully support other stakeholders to deliver their responsibilities, including working in partnership with them to tackle issues that need a joint approach.

# Our current actions

As we work to address sewer flooding and pollution across our region, we'll continue to:

- regularly talk to our customers and make contact with them through meetings, other communications and surveys
- collaborate with regional drainage stakeholders to agree ongoing activities and joint-working
- publish our catchment plans as they develop, and ask for feedback from our customers and stakeholders to shape our ongoing activities
- repair our sewerage network when our investigations identify problems
- trial new technology and approaches that are innovative within our industry, to achieve the best possible drainage outcomes for our customers and their local environment
- lead and participate in industry forums, both in the UK and worldwide, to share and expand our learning with the overall aim of improving services for our customers.

# Our recommendations

Our Aldershot catchment plan is currently at Stage 3, the Options Appraisal stage, of the Drainage Strategy Framework. We've used industry best practice, and our latest work on drainage innovation, to develop a number of options to address the sewer flooding and pollution happening in this area, and to prevent them in the future.

We've tested these options using our models and have selected those that have the greatest benefit to our customers, for the lowest cost to implement. We're recommending an intervention that has three phases:

### 1 Short-term activities

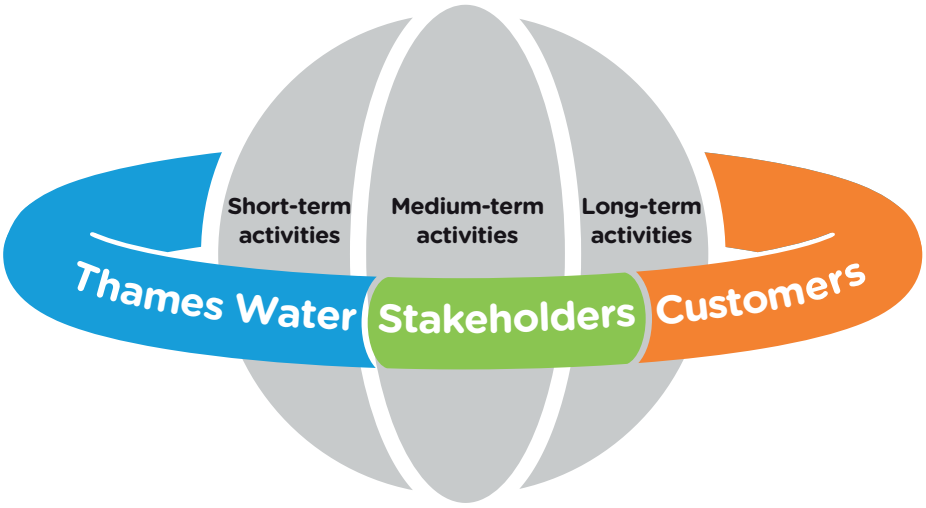
This will include all of our ongoing work to improve the operation of our sewerage network and our response to problems as they occur. We'll implement solutions at critical locations across the catchment to reduce pollution and flooding. We'll also provide advice to customers on how to avoid property misconnections and flushing or pouring the wrong items into sewers.

### 2 Medium-term activities

This will include the refurbishment of our local sewer network to reduce pollution and foul sewer flooding. We'll work with catchment stakeholders to undertake the widespread management and reduction of runoff from roads, roofs and parking areas at commercial, street and property level. This will reduce surface water flooding in this area.

### 3 Long-term activities

We'll review and refine our catchment approach based on the experience gained, and outcomes achieved, from our medium and short-term interventions. We'll continue to refurbish our sewerage network and work with catchment stakeholders to manage property misconnections, surface water and flooding.




**Aldershot catchment recommended option**

# Next steps

Our next step is to move our catchment plan to the final stage of the good practice Drainage Strategy Framework, Stage 4, Intervention. This is when we'll implement the recommended interventions for the Aldershot catchment.

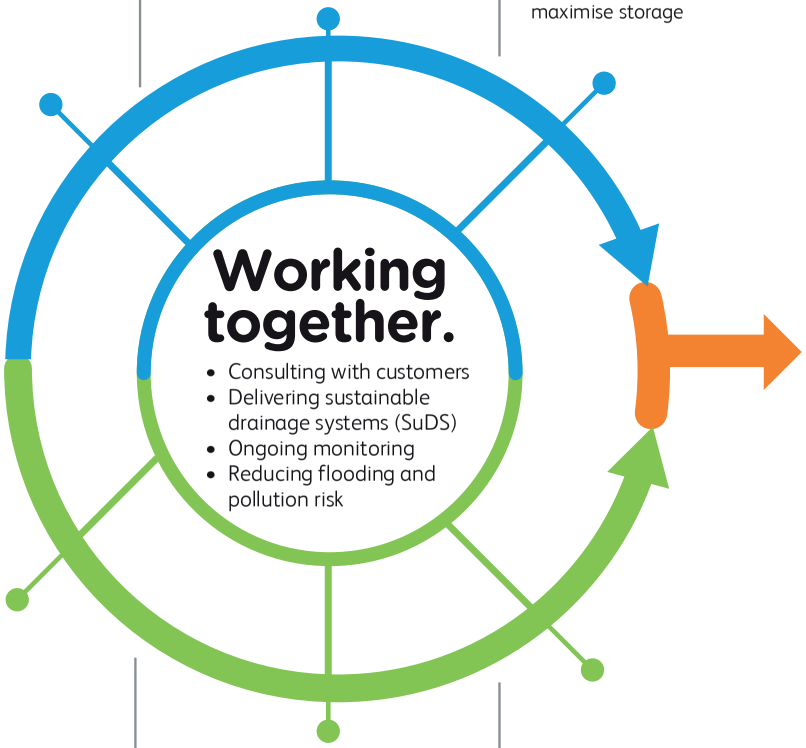
Implementing our plan successfully and sustainably requires us to:

- deliver all of the activities within our control
- gain agreement from stakeholders outside of our organisation, and our customers, to deliver the activities within their control
- work in partnership with stakeholders on activities that need a joint approach.

We understand that each stakeholder has different drivers, funding criteria and approaches. So, we'll be supportive, and work in partnership with them, to make sure agreed interventions are implemented and their benefits delivered for our customers.

# Stage 4 Intervention* >>> 2018 onwards**

| Activities | Short-term | Medium-term | Long-term |
|---|---|---|---|
| **What we need to do** | • Continue to develop SuDS schemes to alleviate flooding in areas currently at risk<br>• Regularly cleanse the sewerage network, where sediment is known to collect | • Implement SuDS schemes to reduce the risk of flooding in key areas of the catchment<br>• Work with customers and property developers to reduce runoff from buildings, properties and highways<br>• Continue to identify and rectify property misconnections<br>• Undertake sewer rehabilitation, where infiltration occurs | • Surface water management to offset flows from new developments<br>• Additional targeted implementation of SuDS<br>• Ongoing monitoring and customer consultation, leading to refinement and enhancement of our activities<br>• Live monitoring of weather conditions and sewer flows to maximise storage |
| **What other stakeholders need to do** | • Support Thames Water in delivering their activities<br>• Work with property developers to support Thames Water's services | • Shared responsibility for the ownership and maintenance of sustainable drainage features<br>• Continue to work with customers to resolve and avoid property misconnections | • Ongoing support for Thames Water in the delivery of their activities<br>• Ongoing monitoring and customer consultation, leading to refinement and enhancement of activities |




## Potential benefits

- Integrated and efficient partnership working with stakeholders
- Reduction in private property misconnections and associated flooding and pollution
- Reduction in flooding across the catchment
- Improved water quality in the River Blackwater
- Catchment-wide benefits including:
  - o enhanced natural environment
  - o increased natural habitats for local wildlife
- Sustainable long-term strategy

* www.ofwat.gov.uk/publication/drainage-strategy-framework-for-water-and-sewerage-companies-to-prepare-drainage-strategies/.
** The estimated delivery timeline is dependent on factors including weather conditions, risks and costs, and is, therefore, open to change.

# Frequently asked questions.

# Your questions answered

We're committed to listening to, consulting and collaborating with our customer and stakeholders on our sewerage network activities and plans. We've addressed key feedback and questions raised by customers and stakeholders in the Aldershot catchment, and by customers affected by flooding throughout our region, in this section. We've also included customer and stakeholder feedback into our detailed catchment plan, as far as possible, and is relevant to the Drainage Strategy Framework.

# General questions

## Q1 Will following the 4-stage drainage strategy process delay essential work in our area?

### Answer

Essential work will continue in the Aldershot area throughout our catchment plan investigations. We'll also continue to carry out repair works on our sewerage network if, through our investigations, we identify issues that increase the risk of flooding or pollution.

The 4-stage drainage strategy process has been commissioned and recommended as good practice by the Environment Agency and Ofwat, our industry regulators. It's allowed us to better understand the root causes of the sewer flooding and pollution in the catchment, and to predict future issues. It's very important for us to complete the process, to help us to focus our work and investments. Following this process is important to make sure we're implementing the most effective and sustainable drainage intervention for the Aldershot catchment.

## Q2 Why are costs a consideration when making plans to address sewer flooding and pollution?

### Answer

Every day we serve 15 million customers across London and the Thames Valley. Providing the essential service, and getting it right, is our focus every day and we never forget it's paid for by our customers.

We prioritise investment across our sewerage network to meet our customers' needs. Every five years we agree with Ofwat, our economic regulator, the amount we can charge all of our customers to deliver service improvements, including reducing the risk of sewer flooding and pollution. We calculate this amount by talking to our customers to find out how much they would be willing to pay for service improvements, and how they feel they should be prioritised.

We also estimate the customer benefits from these improvements, and those from other major projects, before we start any work, to make sure they always outweigh the costs to our customers.

# Drainage work questions

## Q1 What drainage-related work are you carrying out in our area, and when is it happening?

### Answer

We've developed our catchment plan for Aldershot and have outlined our next steps. The following actions have already been undertaken, or are underway, in the catchment:

- physical inspection and CCTV surveys of sewers and manholes
- using our survey findings to evaluate the health and capacity of the catchment's sewers and manholes
- integrated catchment modelling - combining our own models, with river model data from the Environment Agency. The combined model covers over 2,900 manholes, 110 kilometres of sewers, 12 kilometres of rivers and over 20 structures such as bridges and culverts. It's helped us to understand and test the causes of flooding and to develop ways to address them.
- analysis of over 200 customer questionnaires about sewer flooding
- flow and depth monitors to assess the performance of our network and test the accuracy of our modelling work
- surveys to identify the source of surface water flows into the foul system
- predicting the level of flooding and pollution risk present across the catchment
- innovative solution analysis, including sustainable drainage systems (SuDS), and approaches to maximise the capacity of our sewerage network.

## Q2 Are you renovating the sewers in our area?

### Answer

We'll renovate catchment sewers which we find to have been damaged through age, or as a result of other activities. We'll continue to target and repair these problems over the coming months, prioritising those that have the greatest impact on the service provided to our customers.

## Q3 What are you doing about defective private drainage and surface water connections?

### Answer

Our investigations have identifed misconnected private property drainage within the catchment. This means that a number of homes and businesses are discharging to the wrong sewer. By connecting a surface water drain to a foul sewer, these properties are contributing to the current sewer flooding issues. To address this problem we'll target misconnected private properties and raise repair requirements with the responsible stakeholder.

# Drainage work questions

## Q4
## Are you working with the Highway Authority to resolve blocked gullies, drains and ditches, and with landowners to reduce field runoff, as both affect drainage and our sewers?

### Answer

There are other stakeholders who, like us, have important drainage responsibilities and therefore, play an essential role in resolving sewer flooding issues in this catchment area. Highways maintenance activities and land maintenance practices sit outside of our responsibilities. We'll continue to work with the responsible stakeholders to highlight these issues, where there is a major impact on our sewerage network.

We'll also maintain our ongoing work with Rushmoor Borough Council and Hampshire County Council and the Highway Authority. This helps us to understand the extent to which flood waters may be escaping from highway or land drainage systems, and impacting the sewerage network.

## Q5
## What are the improvement plans for Aldershot Sewage Treatment Works to manage capacity?

### Answer

Based on the estimated population figures for Aldershot up to 2026, the Aldershot Sewage Treatment Works (STW), has sufficient capability to treat flows from the catchment, now and in the future.

However, at times, during heavy and prolonged storms, when large volumes of surface water flow into the sewerage network, the treatment works has struggled to cope. Therefore, our long-term plan, working with other responsible stakeholders, is to reduce the storm flows into our sewerage network and arriving at our treatment works. We'll reduce flows through actions including disconnecting properties that have been misconnected, and paved areas identified as contributing to the additional flow to the works. We'll also improve the structural condition of our network, which will limit the volume of groundwater entering the system through sewer cracks and holes.

As well as targeting capacity issues at Aldershot STW, we've also developed a range of upgrades to reduce odour.

# River question

## Q1
## What are you doing to address pollution in the River Blackwater?

### Answer

The Aldershot sewerage network is currently dealing with flows from more properties, roads and other paved areas, than it was originally built to cope with. During heavy and prolonged rainfall, Aldershot STW can become overwhelmed by the large volumes of surface water flow in the foul network.This leads to the storm tanks, which normally deal with an average overflow, spilling more regularly into the River Blackwater, affecting its water quality.

We're addressing this problem, working with other responsible stakeholers, through our long-term plan and activities to reduce surface water in Aldershot's foul sewerage network. By working together, our actions will reduce the existing pressure on the catchment's STW, limit spilling from its storm tanks and improve the water quality in the River Blackwater.

# Future risk questions

## Q1 Does urban creep affect this catchment?

### Answer

Our definition of urban creep is the transformation of a catchment by the paving-over or development of previously absorbent areas. When absorbent areas such as grass, are replaced with properties, extensions and driveways, this prevents surface water from soaking into the ground when it rains heavily. Instead, this water flows into our sewerage network, causing it to surcharge and flood in some instances.

The historical urban creep rate for the Aldershot catchment is slightly above the average rate across our Thames area. However, urban creep is linked to misconnected pipework and changes in land use, which are having a significant impact on sewer flooding locally. Implementing our long-term activities across the catchment will increase the capacity of our network, addressing the problems caused by urban creep.

We're also monitoring planning and development applications in and around the catchment to support our drainage activities and plans.

## Q2 How are you planning for population growth and future development in the catchment?

### Answer

We define a catchment's growth as the increase in the number of new properties developed, and the rise in the number of individuals living there. The population growth rate for the Aldershot catchment is fairly average compared to the Thames Water region, yet relatively small increases in population and new developments, can be influential on our operations and sewer flows.

As part of our drainage work in the catchment we're:

- closely monitoring development applications and assessing their likely impact on the capacity of our operations in the future
- working with property developers to make sure we can serve their new developments and avoid any problems for our existing customers.

We'll continue to work with all involved stakeholders to monitor local plans and planning applications. We'll incorporate current and projected developments into our business planning cycle. This way we'll be able to make sure our service is maintained for customers throughout the catchment's development.

## Q3 Why are you collecting climate change data rather than 'climate proofing' assets?

### Answer

Our business is sensitive to weather. Every day we manage the challenges that changing weather conditions has on the services we provide to our customers, including those problems created by severe weather.

We're concerned about the future impact of changing weather on our business, commonly referred to as climate change, and are responding to it by:

- understanding and assessing where we can respond to these unavoidable potential impacts on our services to customers
- lowering our greenhouse gas emissions.

Since 2010 we've been improving our understanding of how climate change could impact our ability to deliver services to our customers. In 2015/16 we published a detailed review of the potential risks and impacts on our business, and how we could manage them to protect our services to our customers.

We're lowering our greenhouse gas emissions in support of the Climate Change Act 2008. We've set ourselves a voluntary and challenging goal of achieving a 34% reduction in emissions, compared to 1990, for our scope 1 and 2 emissions* by 2020.

* Scope 1 emissions refer to greenhouse gas emissions associated with the operation of our assets. Scope 2 emissions are emissions associated with the use of grid electricity.

# Words we use.

## Definitions

### Foul sewers
These take water from showers, toilets, sinks and appliances to treatment works, where it's cleaned.

### Misconnection
This occurs when pipework is connected to the wrong sewer.

### Pollution
This occurs when wastewater flows from the sewerage network and contaminates neighbouring natural environments.

### Sewer flooding
This occurs when water flows from the sewerage network into customers homes and gardens, businesses, highways and open areas.

### Sewerage network
This consists of all of our foul and surface water sewers and manholes.

### Stakeholders
These are individuals, organisations or groups that are affected by our catchment plan.

### Surface water sewers
These collect rainwater that falls on properties, roads and other paved areas, and then drain the water into local rivers.

### Urban creep
This is the transformation of a catchment by the paving-over or development of previously absorbent areas.

### Wastewater
This is water that is drained by both foul and surface water sewers.