Anglian Water's Pollution Incident Reduction Plan 2020-2025

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Foreword

As a monopoly provider of water and water recycling services to almost seven million people across the east of England and Hartlepool, we have a clear-cut duty to safeguard - and indeed to enhance - our environment. One of the most important contributions we can make is to ensure that our activity does not contribute to environmental pollution. In words borrowed from the medical profession: first do no harm.

Caring for our environment is so fundamental to the way we operate at Anglian Water that we have built our commitment into the fabric of the company, in 2019 becoming the first major utility to change our Articles of Association to enshrine public interest for the long term.

So I want to be clear from the outset that we regard any pollution incident taking place in our region as one too many, and we are wholeheartedly committed to reaching zero pollutions. Customer expectations in this area are rightly high and we must rise to meet them.

Yet we acknowledge that elimination of all pollutions cannot be achieved overnight. First, we must address the challenges we face, which are recognised in our 25-year Strategic Direction Statement, and factored into our long-term plans for Anglian Water. Paramount among these are climate change and population growth, which both have an influence on pollution incidents. Our region is one of the fastest growing in the country, with rapid development leading to greater demand, and more water than ever passing through our recycling centres. The extremes of rainfall we are seeing as a result of climate change can cause huge and unpredictable volumes of excess water to enter our systems, while droughts can also impact water quality as waterbodies, and the biodiversity they support, become more sensitive when levels drop. The landscape of our region has a part to play too - low-lying, largely rural, and with slow-flowing rivers, meaning that any pollution that does occur can be slow to clear.

However, we recognise that external challenges are not the only causes of pollution in our region, and our plan addresses the role our people, our customers and of course our infrastructure assets can play in putting a stop to pollutions.

Preventing pollution, and tackling it where it occurs, forms part of the daily dialogue at operational meetings at all levels. When incidents do occur, root cause analysis takes place to ensure we learn the lessons from what has happened; I personally oversee the findings from all investigations into every single serious pollution.

For the first time, this plan sets out tangible and achievable steps to help us towards our goal of eradicating pollution incidents from our region, and gives us the tools we need to measure and track our progress. It's also a document designed to be shared with our customers and other interested parties, to show that we are being transparent both about the issues, and about what we are doing to address them.

It sets out how we will tackle pollutions via a nine-step model which includes a range of measures, from innovative early warning processes and preventative measures, through to customer education programmes and training for colleagues.

We are committed to sharing what we learn through carrying out the plan with our fellow water companies in a spirit of openness and transparency and, in return, to learning from examples of best practice elsewhere.

By working together we can drive real progress, protecting and enhancing our environment for current and future generations to enjoy.

Peter Simpson
CEO, Anglian Water

Executive summary

Every decision we make as a business considers the social and environmental impacts of our activities and we continuously seek to improve our performance and fulfil our commitment to our purpose.

Our Pollution Incident Reduction Plan for 2020-2025 (PIRP) sets out our strategy for sustainable improvements to our pollution performance and describes how we will deliver a significant reduction in the number of pollution incidents arising from our asset base, including those triggered at pumping stations, in sewers, through burst water mains and at treatment works.

In this document we first set out the particular challenges we face in our region (see page 5) before outlining the 10 outcomes, developed with our customers, which Anglian Water is committed to reaching (see page 6). These include our commitments to a flourishing environment, to delivering safe, clean water, and to delighting our customers - all integral to our pollution reduction strategy.

Next we outline our performance on pollution from 2015 to 2020, a period during which we have taken steps to address an upward trend in Category 1 and 2 pollutions.

We then set out the pollution reduction targets we have jointly agreed with the Environment Agency for 2020-2025, including zero serious pollution incidents and a minimum 40 per cent reduction in category 1 to 3 pollutions compared to 2016 levels. We are also striving to increase the percentage of incidents reported by our own colleagues, rather than our customers, targeting 80 per cent self-reporting across all incidents and an even higher percentage of self-reporting - 90 per cent - for incidents from water recycling centres and pumping stations.

But to prevent future incidents we must first understand the root causes which have led to historic pollutions - hence we began the delivery of this plan by identifying which asset bases are most at risk and the root causes behind the incidents we have experienced.

This has led us to a clear-cut plan with over 100 short, medium and long-term initiatives to reduce pollution, which we have grouped into a simple box model featuring nine key principles:

Pages 14-26 set out the details underpinning each element of the plan to give a clear understanding of the steps we are taking to reduce pollution incidents. Each element is weighted to enable us to anticipate and record the reduction in incidents proportionately.

Our five-year roadmap to achieving our targets is set out on page 27, while on page 28 we summarise how and in which forums performance against the targets will be tracked and measured.

We are fully committed to reaching - and exceeding, where we can - the targets set out in this Plan. As we do so we will continue to learn, evolving our knowledge and capability to protect the environment and region we serve.

Contents

Introduction and background

We are committed to enhancing our region for the wellbeing of all our customers, ensuring prosperity and the protection of the environments in which we live.

Population growth and climate change, however, present us with challenges due to the unique nature of our region. We experience record-breaking and long, hot, dry summers, extreme weather conditions and flooding in our low-lying part of the country, due to more intense rainfall and rising sea levels.

Pollution can occur when used water from customers' homes escapes, when storm water overwhelms our systems or where large volumes of water from a burst main are able to enter watercourses. We are committed to reducing the number of times this happens.

Our region's challenges:

- **Demand for water** will rise but available water won't
- **Population** is expected to rise – around **1 million** homes to be built in the next 25 years
- Our region is the **driest** in the UK – but warm weather leads to heavy downpours
- **28%** of our region is below sea level
- Our region has **1,200km** of coastline
- **25%** of the nation's cereal crop is grown here in East Anglia, and **75%** of the nation's shellfish industry is located on the East Coast
- As a **low-lying region**, lots of energy is needed to pump water around

We have implemented a range of initiatives to improve our pollutions performance during the five years from 2015 to 2020. As part of the 2019 Price Review we consulted with customers and stakeholders to develop our 2020-2025 Business Plan; this included measures to tackle pollution.

Our **Anglian Water Pollution Incident Reduction Plan 2020-2025,** created in response to the request from the Environment Agency to all water and sewage companies in England, builds on these measures to create a strategy for sustainable improvements to our performance.

We are committed to delivering the Environment Agency's target of a 40 per cent reduction in the number of pollution incidents by 2025. The plan describes how we can attain the targets we have set with sustained improvement for the benefit of the environments in which our communities live.

To ensure rigorous scrutiny, the plan will be reviewed regularly with the Environment Agency.

Our Love Every Drop strategy is guided by what our customers have told us is important to them.

We work towards 10 outcomes (right), developed with our customers around the areas they tell us are most important to them. Of these, 'Flourishing environment', 'Safe, clean water' and 'Delighted customers' are integral to our pollution reduction strategy. The outcomes were developed with customers in 2013 and refreshed in 2017 to stretch ourselves further.

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Performance

There are three measures which apply to pollution incidents. These are monitored by the Environment Agency (EA) through the Environmental Performance Assessment (EPA).

They are:

- **Pollution Incidents (Category 1-3)**
- **Serious Pollution Incidents (Category 1 and 2)**
- **Self-Reported Pollution Incidents**

Category 1 Pollution
Major, serious persistent and/or extensive impact or effect on the environment, people and/or property.

Category 2 Pollution
Significant impact or effect on the environment, people and/or property.

Category 3 Pollution
Minor or minimal impact or effect on the environment, people and/or property.

Self-reporting
A water company identifies a pollution incident and reports this to the EA. The sooner a pollution is identified and reported the sooner we stop the environmental impact.

Our performance

We have seen significant improvements in Category 3 incidents, measured from the last full year of our 2010-2015 and 2015-2020 Business Plans

2014
402 (of which **389** were in water recycling)

2019
280 (of which **254** were in water recycling)

Serious and significant pollutions are our greatest challenge

2014
1 in water, **8** in water recycling

2019
2 in water and **12** in water recycling

Self-reporting remains above 70%

2015
76%

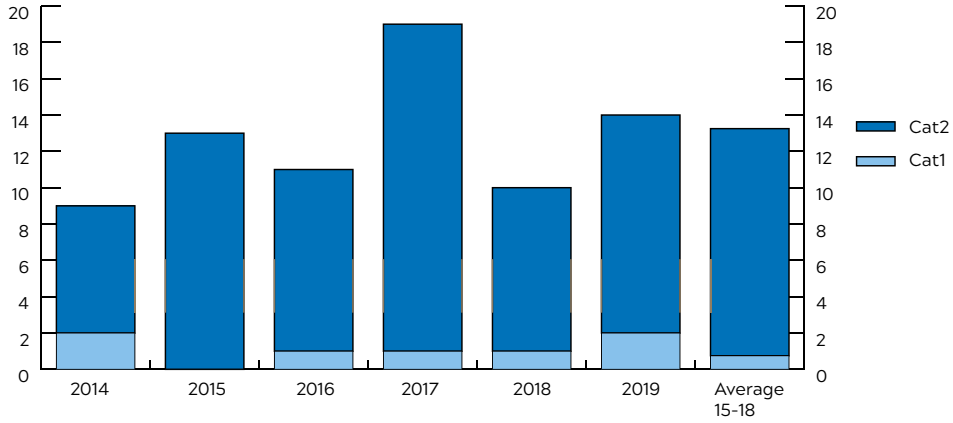
2019
71%

We are responsible for 76,355 kilometres of pipes, 1,000 water recycling works, and over 6750 pumping stations and we want to do more to minimise the escapes from our assets.

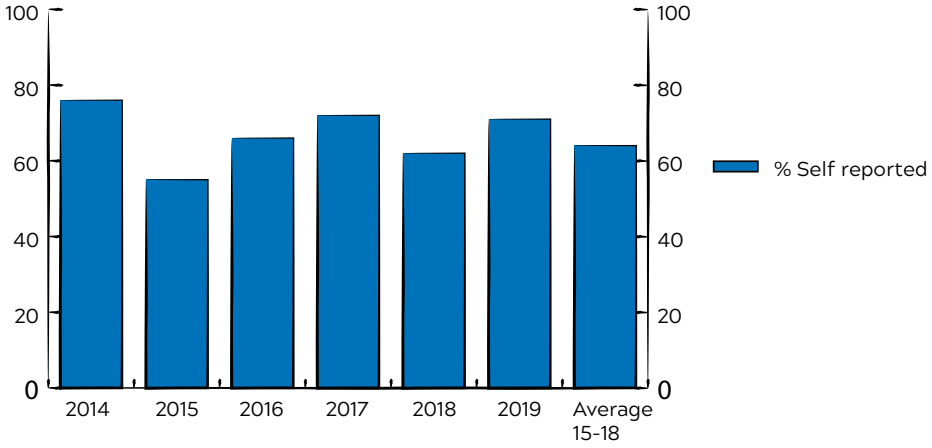
We identified an upward trend in Category 1 and 2 pollutions and have implemented initial phases of our pollution reduction strategy in 2018/19, investing in business systems and processes, advanced pressure monitoring technology, data modelling and artificial intelligence to identify and aid customer awareness and education.

The changes and investments have resulted in a decrease in the number of pollution incidents; however, we have to do more. This means a step change in our performance.

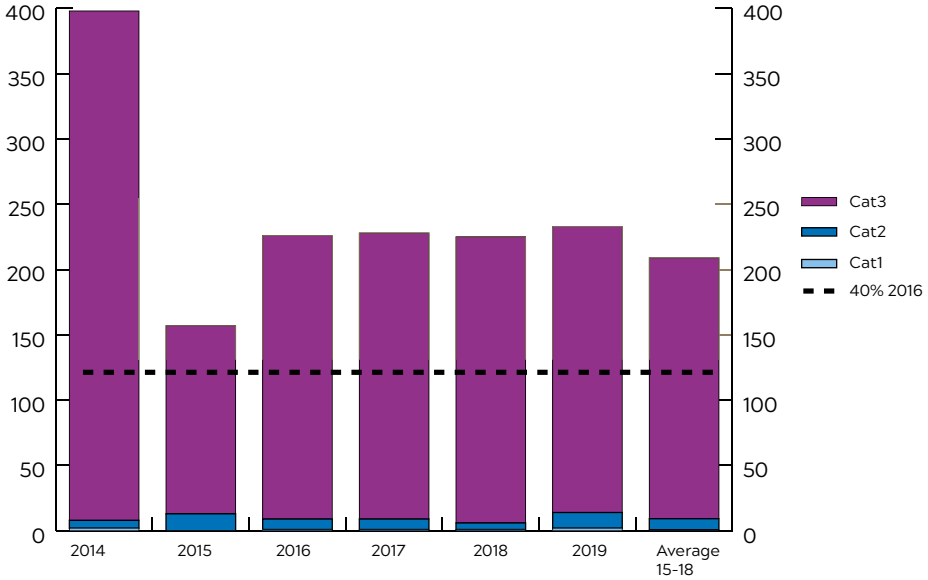
Graph: Cat 1-2 pollutions from water and water recycling assets



Graph: % Self reported from water and water recycling assets



Graph: Cat 1-3 pollutions from water recycling assets



Getting fit for 2020-2025

Our 2020-2025 Business Plan is based on extensive engagement with customers and stakeholders, with more than half a million interactions helping to develop the strategy. It sets out the investment required to facilitate housing and economic growth, ensure our region is resilient to the risks of drought and flooding while delivering our environmental obligations.

We placed our business in the best possible position as we approached 2020 by transforming the way we think and operate to face the challenges over the next five years. We have realigned our operating model around three key functions: water, water recycling and customer and wholesale services.

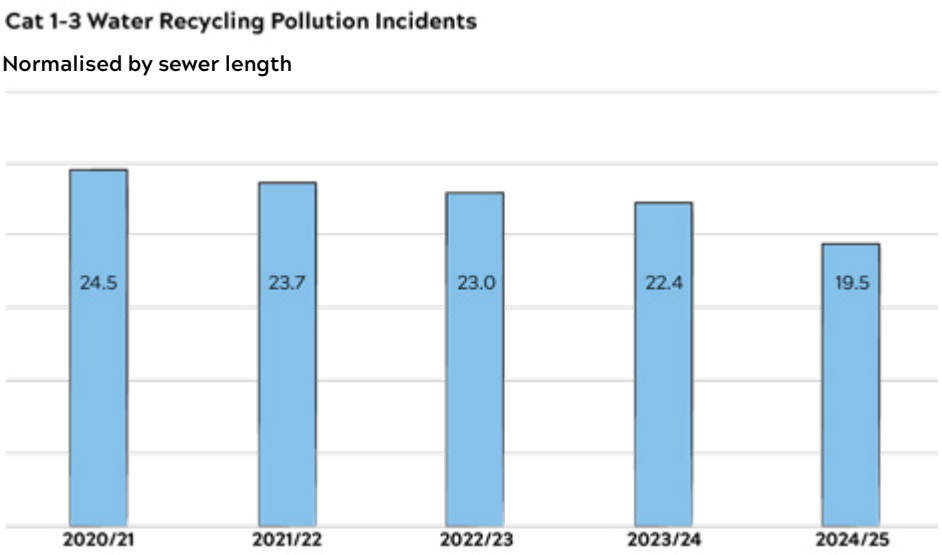
Our four key goals for 2020-2025 are set out on the right. The PIRP will contribute to delivering all four goals.

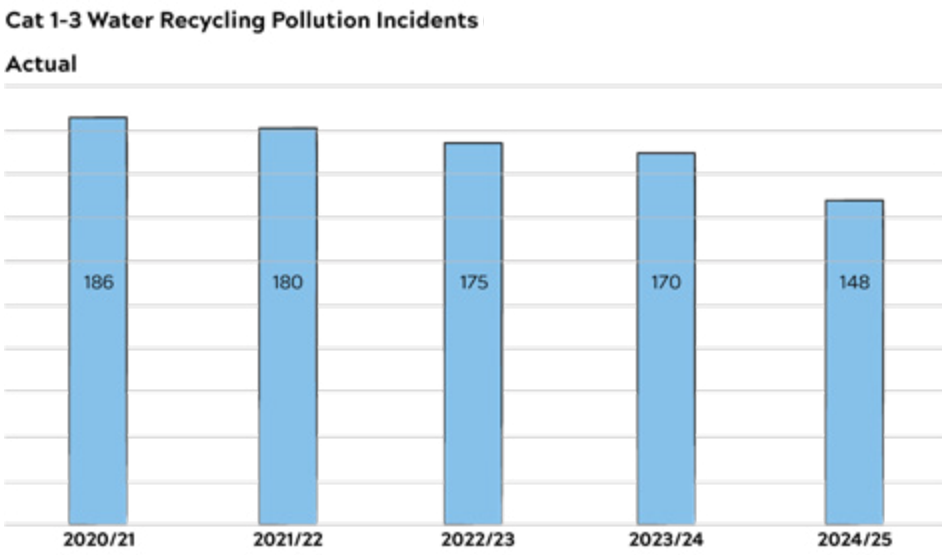
Our four key goals are:

- **To make life better for our customers every single day.**
- **To deliver our identified business priorities.**
- **To deliver our 2020-2025 Business Plan - the Final Determination.**
- **To create a sustainable future for our region.**

Targets

The 2020-2025 Business Plan includes targets for delivering reductions in the number of pollution incidents during this period. As many of the initiatives in the PIRP will need time to deliver their full benefits, a step change approach with tightening targets year on year has been agreed by the Environment Agency.





Environment Agency - Environmental Performance Assessment

Our performance across all pollution categories and self-reporting is assessed in the Environment Agency's Environmental Performance Assessment (EPA) 'star rating' which compares across the water industry. In 2019 we were a three star company.

Environment Agency - WISER (Water Industry Strategic Environmental Requirements)

Our enhanced and sustained goals for improvements to performance also need to meet the expectations and statutory obligations set out in the WISER document published by the EA and Natural England.

Ofwat - Performance Commitments

If we fail to deliver against the targets set out in the graphs, then financial penalties will be applied by Ofwat under the Outcome Delivery Incentive (ODI) framework.

There have been some important changes in the way our performance is measured:

- Measures now include all transferred assets *
- Serious Pollution Incidents now include our clean water assets such as drinking water pipe networks and water treatment works.

* Private sewers, lateral drains and pumping stations which connect to the public sewer network transferred to the ownership of the regulated local sewerage company.

	AW Pollution Incidents	Serious Pollution Incidents	Self-Reporting - All	Self-Reporting - WRC
WISER requirements	Trend to minimise **Cat 1 to 3** pollutions by 2025. At least a 40% reduction in category 1-3 incidents by the end of AMP7 based on 2016 baseline.	Serious pollution incidents must trend towards **zero**.	High levels of self-reporting with at least **80%** incidents self-reported by 2025.	More than **90%** of incidents self-reported from water recycling treatment centres (WRC) and pumping stations.
Our 2020-2025 Targets	We will continue our focus on minimising all pollution incidents and are targeting no more than [136] pollutions by 2025 (a reduction of 40% on 2016, in line with the Environment Agency's target).	We will continue our focus on all pollution minimising incidents targeting **zero** serious pollution incidents throughout the period.	We will continue to build on the previous five years' performance and improve self-reporting to at least **80%** by 2025.	We will target more than **90%** self-reported incidents from water recycling centres and pumping stations.

Stakeholder engagement

We are engaging with key stakeholders, including the Environment Agency and our customers, to ensure our plans continue to reflect their expectations and priorities.

A leap forward

We recognise that our current performance position, particularly in relation to serious incidents, is not where it should be or where we would want it to be. We need to make a significant leap forward in our pollution reduction performance and environmental protection if we are to achieve or out-perform the required level of performance in the next five years.
The remainder of this document sets out our Pollution Incident Reduction Plan highlighting continuing actions and proposed new initiatives.

What causes pollution in our region?

Our PIRP 2020-2025 has been shaped by extensive research of our historic and current pollution performance and assessment of best practice and techniques.

One of the encouraging developments we have promoted in the last five years has been the application of techniques to understand the root causes of pollution incidents. We now employ a consistent approach which is supported by the development of a management system for pollution incidents and post-incident analysis - the Pollution Control Centre (PCC).

This has enabled us to identify those elements of our asset base which are most likely to cause a pollution.

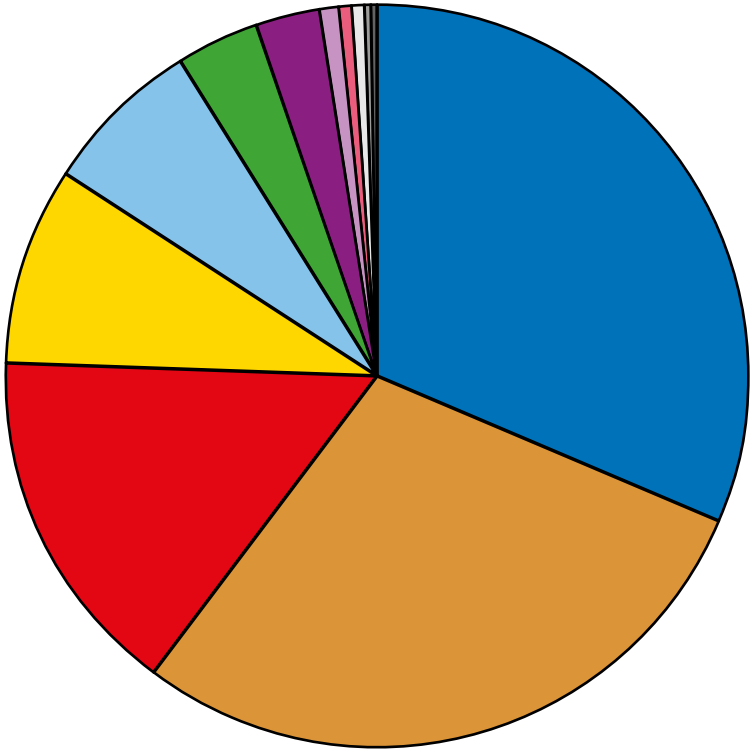


Chart: Percentage breakdown of causes of all blockages over the last five years

- Foul Sewer
- Pumping Station
- Water Recycling Centre
- Water Distribution System
- Rising Main
- Combined Sewer Overflow
- Surface Water Outfall
- Water Treatment Works
- Adopted Foul Sewer
- Other Industry Premises
- Storm Tank
- Adopted Pumping Station

The root causes of pollutions 2015-2020

The pie chart demonstrates the different categories and the proportion of pollution incidents caused by each. Our PIRP is focused in these areas to drive sustained improvement in pollution reduction performance.

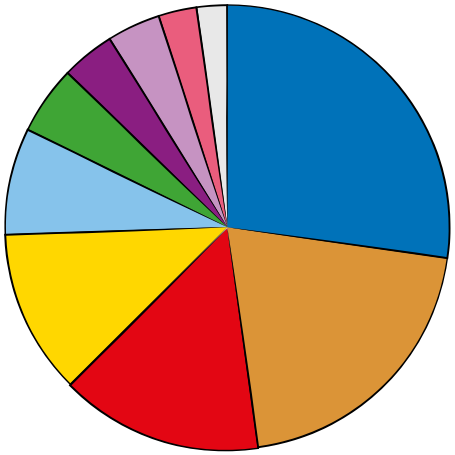


Chart: The root causes of pollutions 2015-2020

- Blockage
- Weather
- Third Party
- Asset Deterioration
- Asset Failure
- Behaviour
- Rising Main
- Power Supply
- Telemetry
- Unknown

Blockage

There are a number of reasons why a sewer can get blocked. Our data shows us that approximately 80 per cent of blockages are due to things customers may do every day without thinking: wipes and sanitary waste flushed down toilets which should be placed in the bin; or fat, oil, grease and food waste put down kitchen sinks, which should be binned or recycled. Other blockages include deterioration in the sewer causing its collapse or ingress from tree roots.

Weather

Extreme weather conditions can cause systems to become overwhelmed with storm water. In these circumstances the increased volume of water passing through the network, as well as an increase in groundwater infiltration, can cause hydraulic overload within the network. This leads to a flow rate into the pumping station higher than the pumps' movement can push through.
This could then lead to the network backing up and discharging from manholes or a pumping station discharging through an emergency overflow.
Such overflows are in place to prevent customer properties from flooding during storm events.

Asset deterioration

This is where an asset such as a pump or a pipe becomes degraded through wear and tear.

Asset failure

An example could be where a pump has failed due to a mechanical fault. In this case the flows would either reduce or stop moving out from the pumping station, leading to the network becoming backed up with possible discharges from manholes and emergency overflows.

Behaviour

Our asset base is run by people, and sometimes they make mistakes. Identifying this as a root cause enables us to understand if our people need additional training, or processes need reviewing.

Power supply

A power supply failure would occur if the mains power were to be interrupted. In this case pumps would not run and treatment works may not work as designed.

In such events discharges can occur or final effluent from treatment works may be outside of consented limits.

Telemetry

Telemetry failures such as a sensor or probe malfunction could lead to a pump not switching on when a well reaches a certain level. This would then cause the well to discharge either through the overflow or from manholes as the network becomes backed up.

Unknown

In rare cases the cause of an issue just isn't clear. However we don't leave these and continue to investigate.

Our Pollution Incident Reduction Plan

The plan includes over 100 short, medium and long-term water recycling and clean water pollution reduction initiatives. These are grouped into a simple box model featuring nine different principles.

The principles are aimed at reducing particular types of pollution depending on their root causes.

They are weighted in the accompanying pie chart by the contribution each root cause makes to the total number of pollution incidents.

This enables us to anticipate and record the reduction in the number of incidents proportionately when assessing successful delivery of the PIRP. We will monitor the efficacy of each initiative, flex and evolve our plan based on our successes and any failures we encounter as we develop innovative ways of working to reduce pollution risk.

The following sections set out the nine principles and give some examples of the initiatives within each.

Our Pollution Incident Reduction Plan

Asset Investment

Our investment strategies have focused on:

known-knowns where we have a previous history of pollution, which if not dealt with will continue to pollute; and

known-unknowns where we have a known pollution risk but we do not know when this risk could arise.

In the past, we have invested to reduce, remove or mitigate pollution risk in these areas. We have seen good results from this, delivering a reduction in so-called minor pollutions over the last five years.

However, we believe that we need to make a step change in the future. We want to ensure we tackle the more difficult, greater risk "unknown-unknowns" - where there are specific pollution risks we do not know about, and we don't know when they might occur.

Misconnections

We are investing in correcting misconnections, which will help to reduce pollutions to the local environment where drainage from a business, household or separate sewer has been connected to the wrong part of the sewer network.

'Misconnections' or 'wrong connections' are the terms applied when this happens, for example, when a washing machine or toilet in an extension has been wrongly connected to a surface water system instead of a used water (foul/combined) system which goes to our water recycling centres for treatment.

Surface systems are designed only to take rainwater from streets and roads, or run off from rooftops and drives, which is discharged directly to a river, stream or the sea. If there has been a misconnection sewage would get into these waterways and could cause a pollution.

A misconnection can also result when clean and uncontaminated rainwater enters the used (foul) sewer rather than discharging to surface or ground waters. With this type of misconnection there can be indirect pollution due to sewage overflows occurring from the reduced capacity of the network.

Risk profiling work

We use multiple data sources, including our analysis of root causes, to develop risk profiles of our key assets.

The understanding of risk across our network will help define the delivery of the PIRP initiatives and our investment programmes, ensuring we are investing in the right places at the right time.

We have already developed our pumping station risk profile and we are working on a profile of our water recycling centres and sewer network.

Network investment

We are tackling our 'known-unknowns' by focusing proactive investment on the asset types which have seen the highest frequency of past pollution incidents. These asset types include pumping stations close to watercourses and rising mains (which transport sewage under pressure along distances and up gradients). Our prioritisation process* has been amended to ensure pollution risk is at the forefront of colleagues' minds and is the most heavily weighted factor used to target in excess of £3.4 million proactive capital maintenance at pumping stations in 2020-21.

A rising main failure can result in a more significant pollution due to the pressure in the pipe needed to get the sewage to its destination for treatment. This asset group represents only 10 per cent of the total network length, but has accounted for 38 per cent of the most serious pollution incidents and 14 per cent of total pollution incidents since 2016.

In 2019-20 we replaced five rising mains. In 2020-21 we are planning to carry out capital maintenance on 10 rising mains, install pressure monitors on 26 and, additionally carry out mitigation activities on nine of them. We expect to protect five times more assets in the next five years than we have in the previous five years. We are looking to explore this philosophy across other assets over the next five years.

High rates of sample pressure monitoring data has meant we have been able to see the performance of rising mains like never before. This involves monitoring average pressure data every minute, which has given us a great opportunity to pick up information on bursts and poorly performing pumping assets. Using cloud operational technology, points are set within the cloud which send alerts directly to Anglian Water's telemetry platform. Since the introduction of this system 16 bursts have been identified. This significantly reduces the impact to the environment by being able to attend these alerts quicker than ever before.

Water recycling centre investment

Within our water recycling centre investment programme, we have enhanced the analysis and visibility of pollution risk, ensuring environmental protection remains at the forefront of our investment prioritisation decision-making process.

* We used all known historic incidents at sites over the previous five years along with other risk factors (such as high number of operational call outs, proximity to customers etc.) to rank every single one of our pumping stations. We then reviewed the top 100 of this list in a collaborative planning session alongside other known risks required for investment and progressed all the needs where 'pollution risk' was the primary driver for investment in year 1. For demand-driven needs that arise throughout the year we are also highlighting where pollution is flagged as the highest risk factor so that we can fund these before other risk types (i.e. flooding).

Clean water investment

For our water treatment works we are installing specialist de-chlorination equipment at 16 sites to prevent any future deterioration in discharge quality. We are also investigating those sites that have permitted low level iron discharges, with a view to invest to further enhance the quality of the discharge.

In the drinking water network, we have installed high frequency pressure loggers to detect pressure fluctuations that damage our assets and can lead to bursts. We will be increasing this coverage to 80% by 2025.

The data we collect from these sensors enables us to carry out pressure management activities, install surge protection where it is needed and replace other key assets such as air valves to calm the pressure in the network and reduce bursts. By having fewer bursts we reduce the chance of water making its way to a watercourse causing siltation and pollution, and where a burst does occur - our sensors can detect this and enable us to respond swiftly, minimising any pollution.

Another area of focus is proactive leak detection; we use a fleet of fixed noise logging devices to find small leaks that haven't yet been noticed by our technicians or the public. Finding these small leaks early and fixing them will help to prevent pollutions as the amount of water lost is minimal (for example, only a bit of wet soil) by the time we find it. The fixed noise logging programme also contributes significantly to our industry-leading performance on leakage.

We are at the forefront of the sector's efforts; sharing lessons learned and helping to drive performance improvements across the country. We have reduced leakage by a third since privatisation, and our leakage rate per kilometre of pipe is around half the national average. We have just beaten our regulatory leakage target for the ninth year running.

Our Pollution Incident Reduction Plan

Influencing Customer Behaviour

Keep It Clear

A major cause of pollution and flooding in our communities is avoidable blockages in pipes. Our award-winning and industry-leading behaviour change programme Keep It Clear is successfully inspiring people to fix the problem (behaviour) not the symptom (blocked sewer/flooding/pollution) through a range of engaging and motivational campaigns and strategies. Working with communities, local authority environmental health, waste and recycling teams, major environmental charities, schools and food premises, Keep It Clear has also been influential in driving change at a national level.

More than 80 per cent of the 40,000 blockages our crews deal with each year are caused by customer behaviour. Many people still do not realise that using the toilet and sink to incorrectly dispose of fat, oil, grease, food waste and items like wipes causes blockages which lead to flooding and pollution. Many of these unflushable products, like tampons, sanitary and incontinence pads, also contain hidden plastics which break down into tiny particles and cause harm to wildlife and the environment.

Keep It Clear

Nationally, Keep It Clear continues to drive change working with other water companies, organisations such as Business in the Community, major retailers and manufacturers.

Keep It Clear led on a trial of 3,500 teacher packs being distributed to initiate discussion about sanitary disposal methods and alternative reusable products. These period lessons, which reduce the likelihood of young people flushing conventional sanitary products, are now being delivered nationwide in schools, colleges and universities by the Women's Environmental Network. Our successful partnership work also continues with leading environmental charities such as The Marine Conservation Society and City to Sea.

Working with pubs, restaurants and cafés

We are also offering free advice on grease management to some of the region's 45,000-plus restaurants, cafés, pubs and other eating places. Latest estimates point to over a tonne, on average, of fats, oils and grease (FOG) being produced by each premise every year.
This waste cools and congeals in the pipes causing blockages and restricts the flow of sewage. A blockage can lead to sewage escaping from the network and causing flooding to properties and potentially damage to the environment. Around 80 per cent of our annual pollution incidents result from by blockages caused by inappropriate use of the sewer.

All food-serving establishments (FSEs) have a legal duty to ensure their used cooking oil is taken away by a registered waste carrier and that they do not allow fat and food scraps to cause a blockage. By liaising with head offices of some of the country's leading food chains, we have been encouraging the installation and maintenance of grease management systems at sites where there have been blockages. During 2019 we have trialled the use of a focused approach on grease management with FSEs. Our contractor ECAS works closely with these establishments, educating them on the risks and costs to their establishment of putting FOG and food waste in the sewer.

They provide information we have developed with the Chartered Institute of Environmental Health explaining good kitchen practice to avoid this, as well as support with the installation of appropriate grease management equipment.

Our nine-month trial focused on key areas in Cambridge city centre and Spalding. We made more than 261 inspections (with 940 individual contacts) and over 100 grease management plans were approved for installation.

In 2020, we will expand this work and move into three new high-risk catchment areas. We will monitor the programme and aim to expand by a further three new areas each year to 2025 with the goal of preventing more than 500 tonnes of FOG from entering our network.

Yorkshire puddings in an Ipswich sewer

Pollution Watch

In 2015 we launched our "Pollution Watch" campaign to raise awareness of sewage pollution, the causes of it, and what to do if you spot it. We worked with parish councils and local communities to help them understand the sewer network and its performance and what action to take if they spot a problem. We erected more than 6,000 signs on our key pumping stations, water recycling centres and outfalls, helping to prompt members of the public to call us if they spotted an issue and minimise the impact of a pollution on the environment.

We are revamping our approach in 2020 and relaunching a refreshed campaign and brand to support our self-reporting goals.

Our Pollution Incident Reduction Plan

Just in Time

Our root cause analysis has identified that serious pollution incidents have resulted from our network due to the amount of time between asset failure and intervention. Therefore, a key principle in our PIRP is our Just in Time initiative. We are taking data analysis and technology further to develop and implement systems and processes which will enable early-warning, allowing us to attend and resolve any issues BEFORE they have the potential to cause a pollution.

We are continually looking for ways to improve our performance and exploiting our operational technology to provide Just in Time notifications. One part of the operational technology toolkit is the telemetry system, with over 750,000 points monitoring our assets. By exploiting the telemetry and connecting data together we can move away from a system looking for faults to an operational technology system looking for performance deviation. This ensures we give the right priority to enhance our decision making.

We have implemented a programme to monitor flow at our water recycling treatment centres. Telemetry alarms have been added which trigger when low / no flow outside of normal flow patterns are detected. These alarms trigger an investigation response to understand and take appropriate action. This programme will improve our visibility of the performance of our assets and seek to minimise incidents.

We have also developed a model to proactively monitor pump performance across multiple operational sites. This model combines data captured via our telemetry monitoring system and is linked to other operational technology data to provide the insight into the operation of our water recycling pumping stations. Where this approach shows pump performance is out of the ordinary, we can deploy our operational teams to investigate earlier so that pump failure is avoided.

The key elements of Just in Time are:

Smart telemetry signals enhance our decision-making processes by looking for changes in asset performance.

Exploiting our telemetry monitoring system to enable implementation of smart signals to enhance the monitoring of our operational assets.

Smart alarms learn the normal behaviour of an asset and alert the operational control centre when the asset is behaving abnormally - indicating a problem which requires resolving. They form part of the continuing enhancement of the telemetry monitoring standards and data quality improvements, enabling us to consistently deliver smart signals where required to monitor assets for performance deviation.

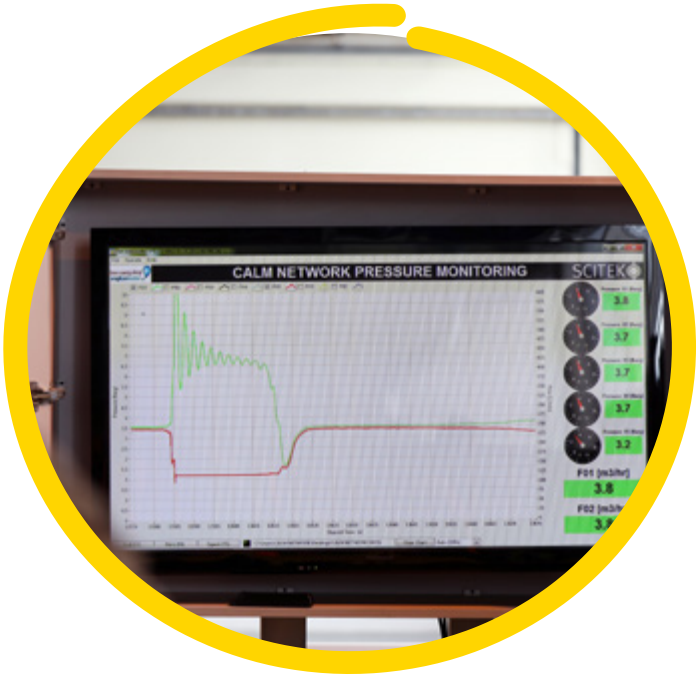
For example, a smart signal can monitor changes in flow of a site or a deviation in the running time of a pump, indicating a problem which could lead to failure of the system if not corrected.

Our drinking water systems are also heavily monitored. Flows, levels and asset activity are captured using our existing telemetry infrastructure, and bolstered by enhanced pressure monitoring of the network and condition monitoring of critical pumps.

All this data combines to give us really good information about how our systems are performing and allows us to spot both steady changes in performance or more rapid fluctuations indicative of harmful pressure waves with the power to cause bursts.

This valuable information can be used tactically, to alter operational activities and reduce the likelihood of a burst occurring - or it can feed our network calming work, whereby the causes of bursts are identified and removed.

Reducing the likelihood of bursts and removing their causes has a multitude of benefits, including reducing leaks, minimising interruptions and saving energy, but it also means that chlorinated water stays in our pipes where it should be - rather than flowing to the environment where it can cause pollutions.



Our Pollution Incident Reduction Plan

Flush to Treatment

Some assets such as pumped sewers (rising mains), specific lengths of sewer and non-return valves are designated as critical because of the risk posed by blockages on their performance. These assets require regular maintenance and we describe this as PPM (Planned Preventative Maintenance) which is carried out to a defined schedule. We also carry out high pressure water jetting of smaller pipes because our data tells us that they are at greatest risk of blocking, as well as high water jetting of our large trunk mains. PPM also extends to our pumping stations which can get blocked with build-up of fats, wipes and other sanitary waste.

We are currently trialling a new approach to PPM, looking at the risk across a full catchment area and planning methodical cleans and maintenance from the head of a catchment area (homes, offices, schools and industry discharge into the network) all the way to its destination pumping station or treatment works. We are calling this 'Flush (of the toilet) to Treatment'.

This approach will also give us the opportunity to inspect the entire length of the sewer, identify any unmapped pipes and update our pipe condition records. The associated improvements to our data will further reinforce our ability to create models for pollution prevention.

The Flush to Treatment approach is to target catchment areas we class as high risk so that we can provide mitigation and give assurance the network is fit for purpose and working within its design parameters.

Our Flush to Treatment trial is a collaborative project bringing together the key initiatives we perform on our asset base in one high risk area, and under a designed programme. Within the project trial team are representatives from the PPM team, the Keep It Clear team, our contractors working with FSEs, our asset investment team, the front-line operational team, the innovation team and the alarm and data team. Through this approach we will gain maximum benefit from our investment and initiatives and deliver enhanced pollution reduction.

Our Pollution Incident Reduction Plan

Clear Boundaries

In such a large organisation it is critical that our processes and hand-offs are joined up.

For pollution prevention this includes our planning and design teams working effectively with the operational teams. It also includes our operational control centre and work scheduling teams; ensuring they have a true understanding of the impact of their decisions and prioritisations and guaranteeing we are constantly balancing the needs of the customer and protecting the environment.

We are reviewing, amending and streamlining operational processes and putting frameworks in place to ensure consistent decision making and prioritisation of risk. We split our region into four areas to manage our work reacting to issues and maintaining our pipes, pumps and treatment works. These four areas are broken down further into 12 operational areas. Traditionally we have scheduled our work within these, but work volumes can vary depending on demand.

We are now looking at more cross-boundary working to shift resource. Our technicians meet the core demand and we also work with our contract partners to provide additional support daily. If a pollution incident occurs, we can also call on extra support as we have a contract in place with other companies who can provide further resources to help us.

Our Pollution Incident Reduction Plan

Zero Tolerance

Investment in our asset base and an efficient and rapid operational response to incidents are critical in reducing pollutions and the associated environmental impact. Equally important are the culture of our organisation and leadership focus on pollution prevention.

We are placing focus on our teams through the Doing the Basics Brilliantly initiative (see below). We are also redesigning the strategic management of our pollution prevention programme, putting a renewed focus on leadership and delivery.

We monitor our pollution performance regularly and report formally through defined governance groups. We have an established steering group of senior leaders which oversees the pollution strategy and PIRP. Our organisational restructure in 2019 has provided the opportunity to develop greater visibility of the delivery and impact of the initiatives under the PIRP and our Performance team are developing reporting tools to aid our understanding of successes and failures, ensuring our plan remains on track.

We continue to promote our pollution reduction ambitions at all levels of the organisation and using a variety of communication methods including newsletters, e-news, face-to-face briefings, videos and phone messages. We'll be using the expertise we have gained from internal behavioural change programmes to develop the concept of 'living in an incident-free environment' where we believe every pollution is avoidable and our decisions before and during an incident can make all the difference.

In the past year we've invested in training more than 2,000 water and water recycling employees in the importance of the effective management of incidents on our sites and the application of best practice. Training has included a new e-learning package as well as a hands-on, practical element on best techniques for monitoring, sampling and on-site testing and analysis.

Our Pollution Incident Reduction Plan

Ensuring Knowledge

Over the last five years we have fostered and promoted the application of techniques to understand the root causes of pollution incidents. We now employ a company-wide approach to root cause analysis which is supported by the development of a management system for pollution incidents and post-incident analysis: the Pollution Control Centre.

By robust study of our data and carrying out analysis on previous pollutions, we have been able to identify those elements of our asset base most at risk and more likely to cause a pollution. This increased knowledge is giving us the power to focus our investments and resources where we can make the biggest difference in reducing pollutions and minimising environmental impact.

Our Pollution Control Centre and Pollution App, together with the EA Portal, form an industry-leading suite of incident management and post-event analysis tools. The Pollution App enables our field resources people to capture real-time information about an incident and relay this to our operational control centre, ensuring an efficient and effective incident response. It also enables us to collect enhanced evidence about the specific scenario surrounding an incident and its impact so we can fully understand root cause and develop appropriate learning activities. We will continue to build on this enhanced knowledge and we are developing analytical skills and sharing of lessons learned across the business.

We place a lot of importance on the quality and visibility of pollution performance data and understand its value to our people in the decisions they make around investment and resource planning.

We are streamlining the pollution data and reports produced, and within the Pollution Control Centre, environment managers will be able to access a dashboard of information about performance in their area and to support asset and operational management processes.

Our Pollution Incident Reduction Plan

Right First Time

Blockages that could result in flooding and pollution are a source of concern for customers, as well as for us. We have recently begun to exploit local expertise to help resolve issues quickly and efficiently using a new triage process. This ensures we get it 'Right First Time'. We have called these local triage centres 'hubs'. The Norfolk hub opened in September 2019 with three more to follow during 2020.

The hub is a location where local field experts are rostered to spend time taking customer calls which are diverted from our Lincoln call centre. The field expert discusses the problem with the customer and, using their local and network expertise, diagnoses the issue and triggers a bespoke response with the right resource with the correct equipment to resolve the issue first time.

A key objective of the hubs is to target repeat blockages, with the aim of reducing occurrences through repair, mitigation and raising awareness to help to change customer behaviour.

Our Pollution Incident Reduction Plan

Doing the Basics Brilliantly

Our studies of root causes of pollution incidents have identified that we can make improvements by doing the basics brilliantly. This means refreshing our people on the basic tasks and routines and monitoring closely the areas we need to focus on.

We recognise the positive impact of sharing lessons learned, embedding this into the training and development of our teams. We actively encourage our people to continually develop their professional capacity and have several career-progression programmes, including the Registered Environmental Technician. During the next five years we will be actively promoting personal learning journeys for our field staff. Our training programmes will be continually reviewed to ensure learning from previous events and to reinforce how the contribution of each team member is vital.

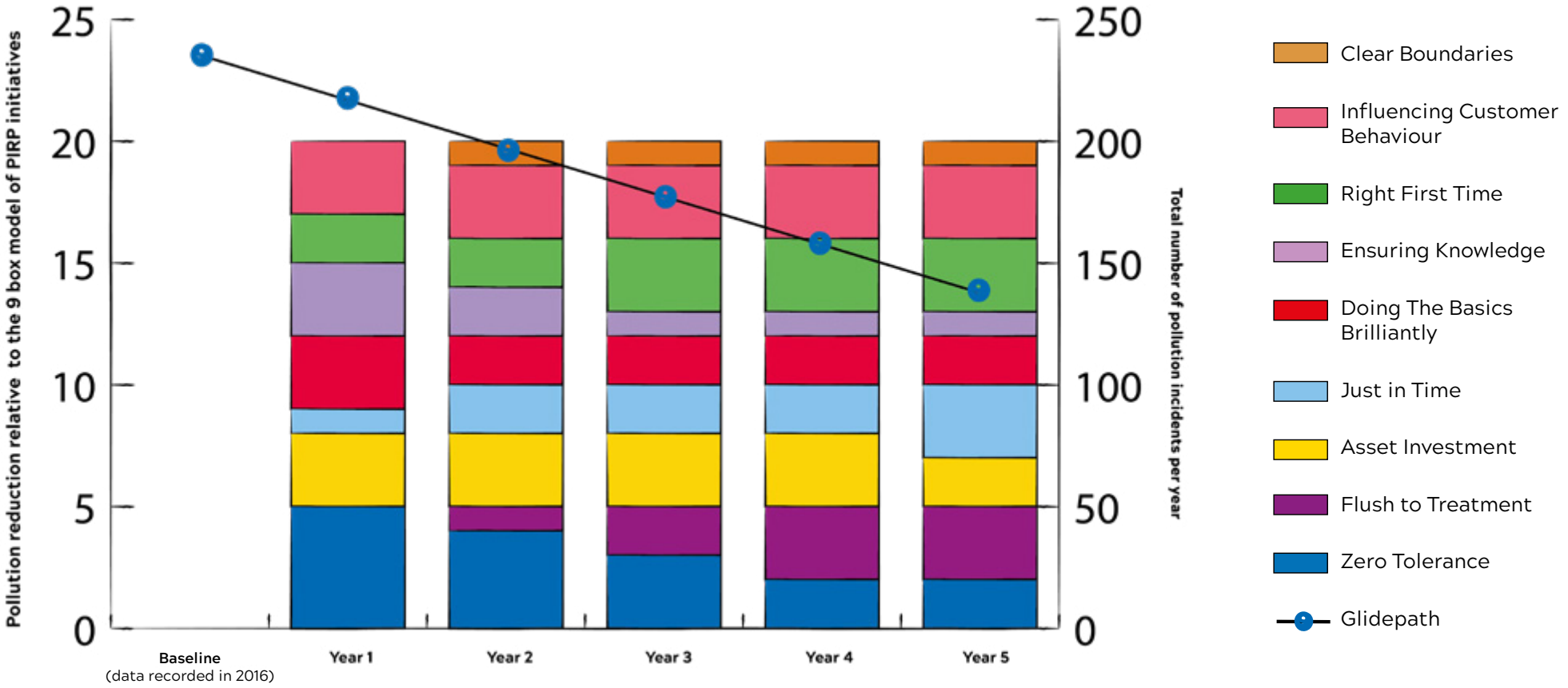
In July 2018 Anglian Water became the first UK water company to be awarded certification under the new Competent Operator Scheme (COS) for our Licence to Operate (LTO) scheme, and in January 2019 we became the only UK Water Company to date to attain ISO:17024 accreditation for this. The various schemes involve a detailed Training and Development Schedule of structured learning across a range of operational roles.

Another initiative is to improve our understanding and proactive response to risk by ensuring teams have the knowledge, confidence and ability to respond to emerging or changing situations. It is essential that everyone involved in managing and maintaining our assets can identify and understand when the risk of impact on the environment or our customers changes.

Anglian Water training platform

Our roadmap to achieving our targets

This is our map over the next five years to reduce our pollution incidents, in line with the EA target of a 40% reduction. We will monitor the efficacy of each of the initiatives within each area of the nine-box model to ensure we are on track to achieve the required reduction.



How will we know the plan is working?

The changes we have made to our way of working in preparation for the next five years support a more aligned and co-ordinated strategy.

This will give us enhanced insights into monitoring and ensuring continuous improvement and adjustment where required.

Key elements of our PIRP:

- The plan will evolve and flex based on our experiences, and as we develop innovative ways of working and reduce environmental risk.
- There are named owners for each area of the plan who will be responsible for the delivery of initiatives within it.
- Updates will be provided by the owners of each area against the targets and expectations set out in the PIRP.
- Our Performance Monitoring teams will report on the performance of each initiative.
- The delivery of the defined initiatives, their efficacy and our pollution performance will be monitored closely from Board level to front line team meetings, via internal forums including:

  - The Management Board
  - Water Quality and Environmental Compliance Group
  - Pollution Steering Group
  - Local team meetings

And we are not stopping here!

We will continue to seek out innovative approaches through research and development in-house and through benchmarking best practice.

We will continue to develop our root cause analysis to gain a greater depth of understanding about what causes pollutions in our region. And we will continue to develop and inspire our workforce, embedding a culture of zero tolerance to pollution.