

Our Pollution Incident Reduction Plan 2020-2025

March 2020



YorkshireWater

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1. Introduction

Our pollution incident reduction plan explains how we will reduce pollutions incidents across our asset base. Pollution can arise from any of our assets: our water treatment works, our wastewater treatment works, our water distribution system and our sewerage system. Pollution arises from asset failures such as burst pipes, from the impacts of severe weather such as flooding, or the handling and storage of chemicals used in treatment processes. For this reason, our pollution incident reduction plan covers all assets with an emphasis on our sewerage network as it accounts for most of our pollution incidents.

Our pollution reduction plan is founded on three themes:

Theme 1: Operational Excellence

Enhanced operational maintenance, and an industry leading response to pollution risk and management.

Theme 2: Data and Technology

Data driven risk assessment and planning.

Theme 3: TOTEX Investment

Totex investment is about choosing the optimal balance of operational activities and capital investment initiatives in a prioritised format to drive the most effective sustainable outcomes.

Our pollution incident reduction plan meets the Environment Agency request for companies to develop and implement a pollution incident reduction plan. An Environment Agency information letter dated the 29th of November 2019, attached as appendix 1, set out their requirements.

Our plan is aspirational and will be dynamic as it evolves to meet the scale of the challenge and develop and deploy the most cost-effective solutions. We will review our plan quarterly with the Environment Agency.

Our board signed off our pollution incident reduction plan and we have published our plan on our web site as part of our drive for transparency and accountability to our customers and our regulators. Our Director of Wastewater Services is accountable for the delivery and review of our plan.

2. Our regulator

The Environment Agency is part of the government's Department for Environment, Food and Rural Affairs (DEFRA). The Agency's overall responsibility is the protection and enhancement of the environment. The Environment Agency publish pollution data as well as prosecuting those responsible for pollution incidents.

The Environment Agency expects water companies to prevent serious pollution incidents and require us to have effective pollution reduction plans.

Our pollution incident reduction plan for 2020-2025 has been submitted for Environment Agency review. The Environment Agency will report on our plans and our progress as part of their annual water company performance reporting.

The Environment Agency assess pollution incidents into three categories:

Category 1 incidents have a serious, extensive or persistent impact on the environment, people or property and may, for example, result in a large number of fish deaths.

Category 2 incidents have a lesser, yet significant, impact.

Category 3 incidents have a minor or minimal impact on the environment, people or property with only a limited or localised effect on water quality.

Environment Agency Expectations

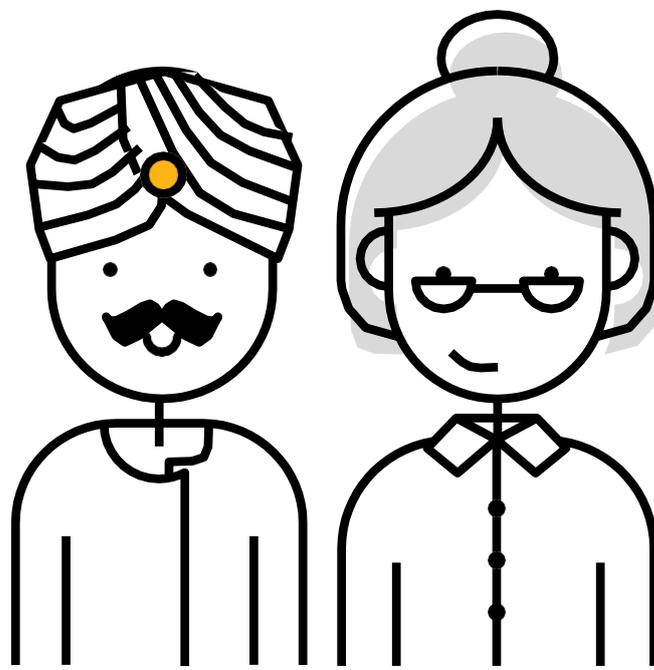
In October 2017 the Environment Agency and Natural England outlined the obligations and expectations for the water industry for our 2020-2025 business plan within 'Water industry strategic environmental requirements (WISER) Strategic steer to water companies on the environment, resilience and flood risk for business planning purposes'. The WISER document described a broad range of environmental enhancements and improvements to resilience and excellent performance.

The WISER document set an expectation of excellent performance including pollution performance as follows:

- Serious pollution incidents (category 1 and 2) must continue to trend towards zero by 2020 with at least a 50% reduction compared to numbers of serious incidents recorded in 2012.
- Trend to minimise all pollution incidents (category 1-3) by 2025. There should be at least a 40% reduction compared to numbers of incidents recorded in 2016.
- Minimise all category 3 incidents.
- High levels of self-reporting of pollution incidents with at least 80% of incidents self-reported by 2025 and more than 90% of incidents self-reported for wastewater treatment works and pumping stations.

The Environment Agency's annual summary of water and sewerage companies' environmental performance includes pollution performance and other indicators to compare performance between water

companies and across years. The Environment Agency have noted a concern that the industry's improving trend in pollution performance has plateaued recently, and the introduction of the new pollution incident reduction plans will help drive further improvements in performance.



3. Our pollution incident reduction plan

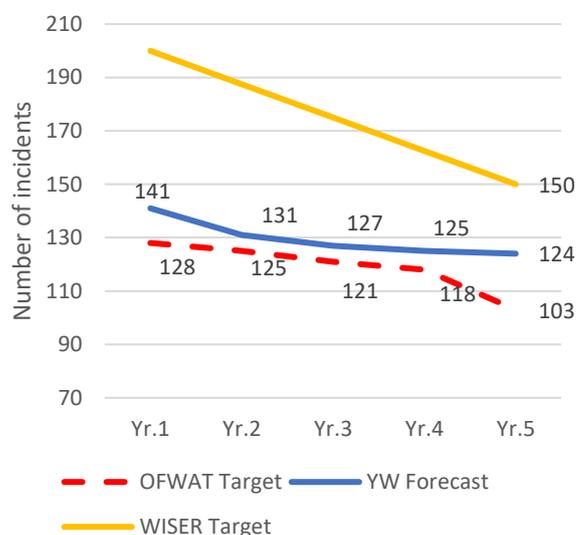
3.1 Our Commitment

Our pollution incident reduction plan objective is to meet the Environment Agency’s Water Industry Strategic Environmental Requirements (WISER) expectations for pollution.

The figure 1 below demonstrates our current plan and forecast performance we will deliver through our business plan for 2020-2025. The plan will meet the Environment Agency’s WISER expectation of at least a 40% reduction in total pollutions against 2016 reference levels with a 44% reduction forecast for 2020. We also forecast a further reduction by 2025. The yellow line shows the WISER target and the blue line our current forecast of performance.

We are also economically regulated by the water services regulation authority, or Ofwat. Ofwat set a series of financial and performance targets within a 5-year business plan. Ofwat is stimulating stretching performance improvement targets, including pollution, in the 2020-2025 period based upon the best performers in the industry. The targets are based on companies achieving the best 25% performance, known as upper quartile targets. Ofwat set financial penalties or rewards for performance against the targets. We have set ourselves a business plan forecast to ensure that we meet the reduction requirements of WISER and follow a glide path towards upper quartile targets set by Ofwat, shown by the red line.

Figure 1 – Yorkshire Water Pollution incident reduction plan forecast performance 2020-2025



3.2 Our Approach

Our plan is based upon three main themes to drive resilient and sustainable reduction in pollution incidents by investing in our assets, our people, deploying innovative use of data and working in collaboration across the sector.

Theme 1 Operational Excellence

Enhanced operational maintenance, and an industry leading response to pollution risk and management.

Theme 2 Data and Technology

Data driven risk assessment and planning.

Theme 3 TOTEX Investment

Totex investment is about choosing the optimal balance of operational activities and capital investment initiatives in a prioritised format to drive the most effective sustainable outcomes.

3.3 Theme 1 Operational Excellence

Operational excellence is key to delivering our ambitions. It simply means maintaining and operating our assets well, developing a highly skilled workforce, using data analytics to inform risk assessment and investment and drive innovation. It is a focus on our customers' and environmental needs, and continually improving our activities and services.

Our major initiative is to develop our capability and capacity of operational teams.

Phase 1 of the transformation is now complete with a significant increase to our capacity and capability within our teams.

The insourcing of network activity associated with sewer jetting and proactive maintenance activity is a critical enabler for our 2020-2025 business plan, including capital investment of £18.4m in new vehicle fleet and a 67% increase in additional operational teams.

Phase 2 of the transformation is about maximising the benefit of this investment focusing on the following areas, to drive visibility and control of our activities and service to prevent incidents occurring in the first place.

Competence and training

We have developed competency frameworks for all frontline roles and an accompanying programme of coaching and performance assessment.

Planning & Scheduling

New ways of working to ensure we deploy the right person, at the right time with the right resources.

Technical Control & Support Desk

We are expanding our operational central technical team to reach out to provide advice and support to onsite teams.

Fast Track Civils

Improved business process to reduce the risk of repeats incidents by speeding up time to resolution.

Working Patterns

New working patterns to increase productivity of our fleet vehicles.

Culture

Drive a consistent way of operating and delivering services by training and equipping our teams to achieve ever higher competency levels.

Organisational Change

Pollution Manager

The appointment of the pollution manager role and team is to create a centre of excellence to work across all Directorates in Yorkshire Water. The Pollution Manager will also work externally to develop best practice to help drive learning across the sector. The role will be Yorkshire Water's primary point of contact with the Environment Agency to discuss performance, consistent regulation, industry guidance and to maintain an effective working relationship. The post will ensure that pollution risk awareness, performance and management are embedded in our core operational day to day practices by driving a culture of operational excellence.

Environmental Incident Review Board

We have introduced a senior cross business review board, the Environmental Incident Review Board (EIRB) to drive greater understanding of each incident to ensure we address the root cause and learn from each incident to help drive continuous improvement in our actions and processes. The EIRB is chaired by our Director of Health, Safety and Environment and the Directors of both operational units and Asset Management are members. The learning from the EIRB is implemented by a Wastewater Programme Board. The Wastewater Programme Board is chaired by the Director of Wastewater Services and manages the portfolio of initiatives to drive improvement. We also use the Wastewater Programme Board to share learning and best practice both within the company and the sector.

3.4 Theme 2 Data and Technology

Cutting edge analytics underpin our plan and provide a data driven approach to risk assessment and effective targeting and prioritisation of interventions. Analytics is the discovery, interpretation, and communication of meaningful patterns in data by the application of statistics, computer programming and operations research to quantify performance and turn data into insight for making better decisions.

Our Data Science team apply analytical and modelling techniques to inform where resources and investments can deliver maximum benefit to drive improvement. We have processes in place to forecast and track outcomes. Our focus is to predict and intervene to prevent pollution and avoid repeat incidents. We will only achieve our pollution reduction ambition with proactive intervention. The case study in 3.5.2 demonstrates our modelling and analytic techniques.

Figure 2 shows pollution incidents arising from different asset types for 2018/19 and shows the range of assets causing pollution and their relative proportion and scale. This information has allowed us to baseline our activities and has allowed us to tailor our plans to asset type and use analytics to focus interventions where most benefit can be achieved, Figure 3 demonstrates where some improvements have been made and also where we have higher at risk asset groups.

Figure 2 category 1-3 2018 & 2019 pollution incidents - % distribution by asset type

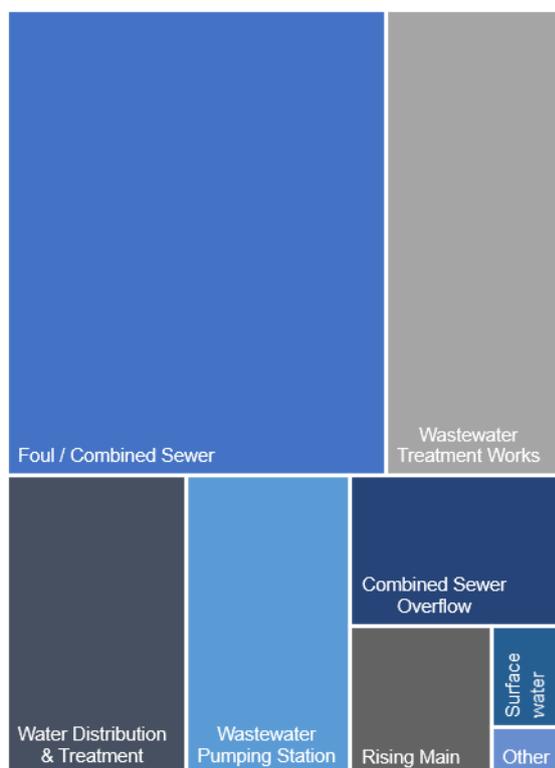


Figure 3 – Pollution incidents by asset type 2018 and 2019

Asset type	% incidents attributed to each asset group	
	2018	2019
Foul/Combined Sewer	38	46
Wastewater Treatment Works	21	18
Wastewater Pumping Station	13	10
Combined Sewer Overflow	7	8
Rising Main	6	4
Surface Water	2	1
Water Distribution	12	12
Water treatment Works	1	0
Other	0	1

3.5 How we are utilising data

3.5.1 Identify 'hot spots'

We use our data and analytics to ensure our proactive pollution prevention programme is underpinned by:

- Effective targeting by asset type to control dominant causal factors.
- Innovative clustering techniques to identify hot spots for intervention and resolution.
- Robust analytical approaches to determine benefit potential and benefit realised to deliver maximum value from investment.

In practice, this is a continual, plan, do, review approach with learning and feedback implemented through the regular updating of our plan. Initiatives are tailored to address specific geographic hot spots and specific causal issues and cover a wide range of intervention techniques including proactive cleaning, defect resolution, condition-based assessments, monitoring, remote intervention and process improvements.

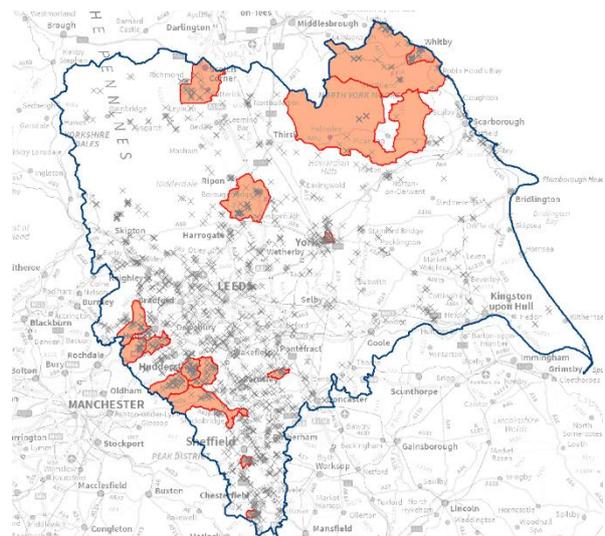
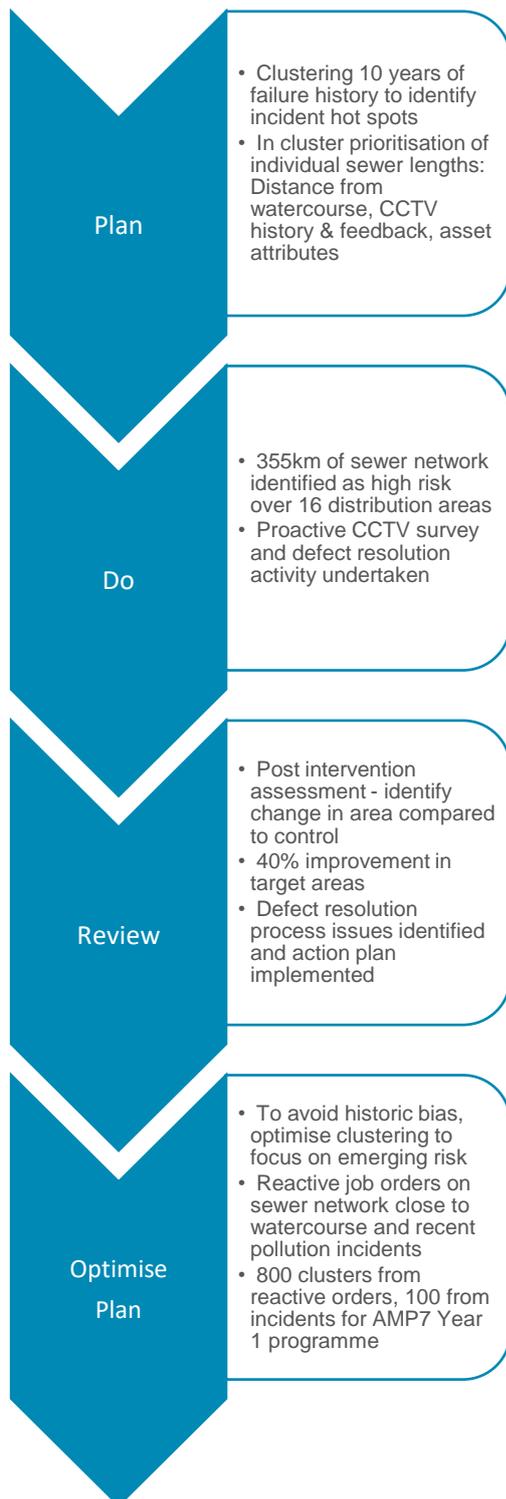
Across the portfolio of projects planned for 2020-2025, benefit appraisal and validation activity has been undertaken by Data Science for over 80% of the forecast benefit.

3.5.2 Case Study

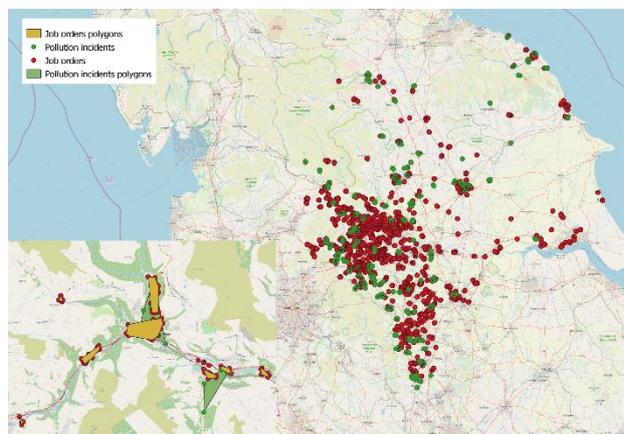
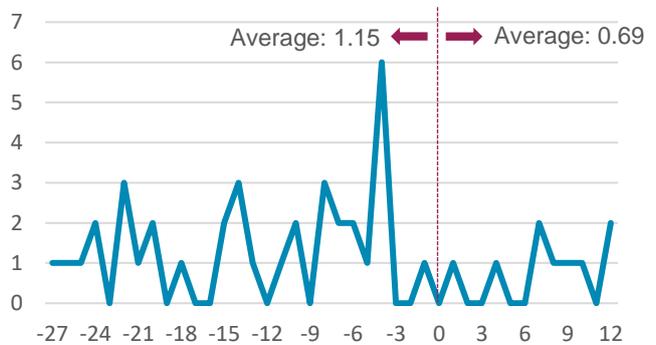
Proactive CCTV and repair programme to prevent pollution arising from sewers.

The following case study below demonstrates the application of the data analytics process we have adopted.

Figure 4 - Case Study Proactive CCTV and repair programme to prevent pollution arising from sewers



Category 3 incidents - Pre/post CCTV in distribution areas



3.5.3 Enhance Telemetry

Through 2018-2020 we focused on our readiness to deliver our 2020-2025 business plan, including substantial investment in enhancing telemetry at pollution high risk sites. Telemetry enables real time visibility of emerging risk to predict and prevent incidents or respond more rapidly should they occur. Activities have included:

- Installation of 1000 sewer network loggers.
- Installation of rising main pressure monitors.
- Installation of remote intervention and pump reversal technologies at sewage pumping stations.
- Installation of additional sewage treatment works telemetry, specific to pollution risks on site.

The additional data has also given us additional insight to develop 'neural networks' to predict combined sewer overflow spill and pollution risk and to develop decision trees to understand the impacts of rainfall generated alarms in our central Control Room. This will help ensure the right resource levels are available to effectively validate alarms and implement response activity to support our theme of operational excellence.

3.5.4 Data Gathering and Evidence Capture

We are currently testing a new mobile software application designed to run on a mobile device to allow us to consistently record pollution incidents from our asset network that could have an impact on the environment. It is called our 'Escapes App'. The application will allow more accurate

data collection and analysis to drive immediate response and longer-term continuous learning and improvements through prompt and consistent feedback. The 'Escapes App' will also help drive and improve our self-reporting of pollution to the Environment Agency.

Overall, good data will improve the real time picture of the situation on site, allow us to make the right interventions and provide information in a consistent format to help categorise incidents, allowing clearer data on performance to be established in a timely manner.

3.6 Working with the Environment Agency

3.6.1 Sharing and delivering industry best practice

We recognise that our relationships with the Environment Agency and other water companies are essential. The relationships will help us develop best practice to respond to climate change, which provides uncertainty over future weather patterns and growing population of Yorkshire. Both will place further pressures upon sewerage infrastructure in Yorkshire. Climate change and population growth are a major focus for our pollution prevention and reduction plans.

Our close working relationship with the Environment Agency will support the delivery of our pollution incident reduction plan. This includes playing an active role within the Yorkshire Bathing Water Partnership led by the Environment Agency. We will review the terms of reference we share with the Environment Agency to make sure that we have a common purpose and

goals to help drive our pollution incident reduction plan and meet the Environment Agency's WISER requirements.

We will use benchmarking and seek industry wide collaboration to make sure we both share and seek best practice to drive and improve performance across the sector. We have already hosted the first collaborative cross sector pollution workshop attended by all water and sewerage companies which was facilitated by the Environment Agency. Encouragingly this has already led to a series of improvement projects, such as projects improving guidance, procedures, impact assessment and incident management with the Environment Agency.

3.7 Theme 3 Totex Investment

3.7.1 Introduction

The totex theme of the pollution incident reduction plan is to allow operational activities to be brought alongside the capital investment initiatives to choose the optimal balance to drive the most effective sustainable outcomes.

Our 2020-2025 totex investment plan has been designed to drive pollution improvement from year 1 of the plan and it is the largest investment we have ever planned to deliver in a single year.

The totex plan is made up of projects started in 2018-2020, projects with a proven track record for delivering benefits and new innovative approaches that will achieve a step change in our pollution performance. Our projects target risk across a range of assets types, but a particular focus has been given to driving improvement

in our sewer network, which remains our biggest source of pollution.

Data has played a huge part in the development of our plan. All projects have undergone rigorous cost/benefit analysis. Data has been used to make sure that projects are scaled and targeted at the right locations to remove pollution risks.

Our Analytics team forecast that our current totex plan of capital and operational interventions will achieve 80% of the reduction required to meet our regulatory performance commitment in 2021 and 75% of the required reduction by 2025.

3.7.2 Pollution Incident Reduction on Water and Wastewater Treatment works

Our totex theme also focuses on our treatment works:

On water treatment works we are:

- training staff to increase awareness and how to prevent, mitigate and report pollution
- updating site drainage plans where pollution risks have been identified
- improving pollution prevention equipment provision and maintenance.

On our wastewater treatment works we are:

- installing additional instrumentation on sites to alert to potential overflows on inlet works and sludge tanks
- mapping site drainage to ensure pathways to the environment are completely understood
- implementing additional cleaning activities on inlet works to prevent blockages

- focusing on increasing reliability and return to service of inlet screens
- targeting totex investment at sites with poor historic performance
- increasing trade effluent control activities to reduce impacts from traders
- improving UV disinfection awareness and response to prevent failures
- purchasing dedicated vehicles to improve the efficiency and increase the remit of cleaning activities.

3.7.3 Pollution Reduction 2020-2025

Our current pollution incident reduction plan for 2020-25 is made up of a portfolio of projects. We have summarised the projects which can be found on our Pollution webpage at <https://www.yorkshirewater.com/pollution/>.

4. Governance and assurance of the pollution incident reduction plan

In 2018 we put a new company governance, assurance and reporting procedures and structures in place to deliver the performance step change required to meet our ambition for water industry upper quartile performance across many service measures. The pollution incident reduction plan is one part of this overall plan for improving service performance.

The Environmental Incident Review Board and Wastewater Programme Board are part of the company governance, assurance and reporting.

The portfolio of projects associated with the pollution incident reduction plan is governed and assured on a monthly basis by the Wastewater Programme Board chaired by the Director of Wastewater Services.

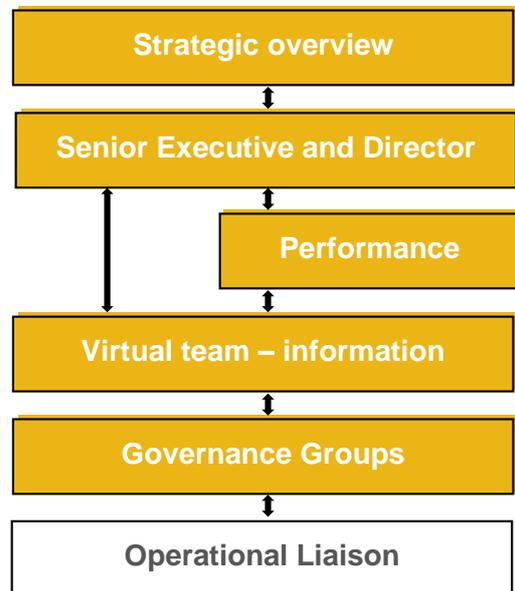
The initiatives and projects included in the portfolio programme are made up of business as usual projects and initiatives to deliver the step change in pollution incident reduction.

Each business as usual, project and initiative have a clear definition and business owner. The forecast and actual benefit are evaluated, resource requirements and financial aspects are reported on a monthly basis to the Wastewater Programme Board and included in the company report at Yorkshire Water Board level.

The governance and assurance also involves the Environment Agency to ensure the activities within our pollution incident reduction plan are delivered, the benefits are achieved, and innovation elements evaluated.

Our joint governance structure with the Environment Agency is shown in Figure 5.

Figure 5 – Liaison and Governance Structure



The governance, assurance, reporting and liaison structures are well established to allow challenge and scrutiny of our pollution incident reduction plan. Our plan will evolve and develop as an agile and dynamic plan focused on achieving the reduction in pollution incidents.

5. Conclusion and summary

Our pollution incident reduction plan is focused on delivering consistently excellent environmental performance. It is also fundamental to helping drive resilience in our overall asset base to avoid harm to the environment and provide great service to our customers and the people of Yorkshire.

The plan will be a living document. It needs to be dynamic and will evolve with experience and as we develop and deploy best practice and innovation, as well as meet the challenges of climate change and the growing Yorkshire population. We will review our plan quarterly with the Environment Agency.

We want to play an active role in helping everyone in Yorkshire work together to look after our precious water environment. Our customers rely on us to provide safe water, take away and recycle wastewater, work smart to minimise the amount lost through leaks and reduce pollution and flood risk.

Our pollution incident reduction plan also contributes to and follows our approach to resilience, to help maintain and enhance resilience in all areas of our business and services.

Resilience is the ability to cope with, and recover from disruption, and anticipate trends and variability in order to maintain services for people and protect the natural environment, now and in the future.

Figure 6 - The five qualities of our resilience framework



In its 2011 guidance, 'Keeping the country running', the Cabinet Office shared a model of the four components of effective infrastructure resilience. We embedded this model in our planning approach and our resilience framework has built on this approach by further developing this best practice model with a fifth quality of resilience, called Reflection. This addition recognises and supports the importance of ongoing review and learning.

Our pollution incident reduction plan can be found on our pollution webpage: <https://www.yorkshirewater.com/pollution/>.

The plan will be updated quarterly though our updates to the Environment Agency. We look forward to continuing to drive our improvement programme and further develop the programme for pollution reduction with our customers, regulators and stakeholders.

**Appendix 1.
Environment
Agency
information letter**

Information Letter: EA/11/2019

Date: 29th November 2019

To: Regulatory Contacts in Water and Sewage Companies in England

Pollution Incident Reduction Plans

Dear Sir/Madam

This summer saw unfavourable headlines for the water industry as we published our annual water company performance report for the water and sewerage companies.

In our report we expressed our disappointment and concern that the number of serious pollution incidents (category 1 and 2 incidents) instead of dropping increased in 2018 for the first time since 2013. We consider that concerted action is needed by the industry to reduce the number of pollution incidents. We are therefore requesting that each water and sewerage company develop and implement a Pollution Incident Reduction Plan (PIRP) to deliver the much needed reduction in pollution incidents to achieve at least a 40% reduction in category 1 to 3 incidents by the end of AMP7 as outlined in our WISER document.

We had originally intended to include this in our performance expectations letter for PR19 which will be issued shortly but I understand from our account managers that some water companies are already progressing the development of PIRPs so I am setting out the requirements in this letter.

We will not be prescriptive in what these plans should contain as we consider the ownership should be with you as the operator. However, there are guiding principles we want the PIRPs to follow:

- The plans should be signed off and monitored at board level within each company.
- Governance should be set up to ensure active engagement, updates and liaison with EA staff on an agreed timeframe but as a minimum we would expect written progress updates to be provided on a quarterly basis.
- The PIRPs should be published on the water company website.
- Based on the PR19 business plan and the commitments in WISER for pollution incidents a glide path with appropriate milestones and targets should be established to reduce serious pollution incidents (category 1 and 2) down to zero and the 40% reduction in category 1 to 3s by 2025.

- The PIRPs should contain the following:
 - A robust root cause analysis to help identify the underlying causes across different assets types.
 - Hot spot mapping to assist in identifying those areas of the sewer network or sites where priority interventions are needed.
 - Identification of the appropriate interventions for the different asset types along with an assessment of technical feasibility and cost benefit.
 - Prioritisation of appropriate interventions for high risk sites and assets
 - Assessment of the effectiveness of different interventions with subsequent refinement of the plan as necessary.
 - The appropriate management systems and procedures in response to an incident.
 - Any cultural changes required.
 - Best practice shared across the industry.
- The Environment Agency will review the PIRPs against these principles to ensure they have been met and have been consistently applied across companies.
- The timescale for the production of the PIRPs should be agreed with our account management team. The plans should be in place no later than that the start of the 2020/2021 year.

We will be reporting on these plans and their progress as part of our published water company performance reporting.

Copies of this letter are being sent to Kirstin Green and Sophie Broadfield at Defra, Bart Schoonbaert at Ofwat, Stuart Colville at water UK and Ceri Davies at natural resources Wales.

If you have any queries regarding this methodology please contact Keith Davis, Water Quality Regulatory Development Manager, Environment and Business, Keith.davis@environment-agency.gov.uk or Tel 07769 934832.

This letter is being sent electronically to Regulatory Contacts and hard copies of the letter will not be sent. Please can you confirm receipt by e-mail to Kath.Peirce@environment-agency.gov.uk.

Yours sincerely



A handwritten signature in black ink, appearing to read 'H Wakeham', is written over a light grey rectangular background.

Helen Wakeham
Deputy Director - Water Quality, Groundwater and Land Contamination

yorkshirewater.com

Yorkshire Water Services Limited, Western
House, Halifax Road, Bradford, BD6 2SZ.
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