Storm Overflows Improvement Plan

2023 update

Wessex Water

April 2023

Wessex Water
YTL GROUP

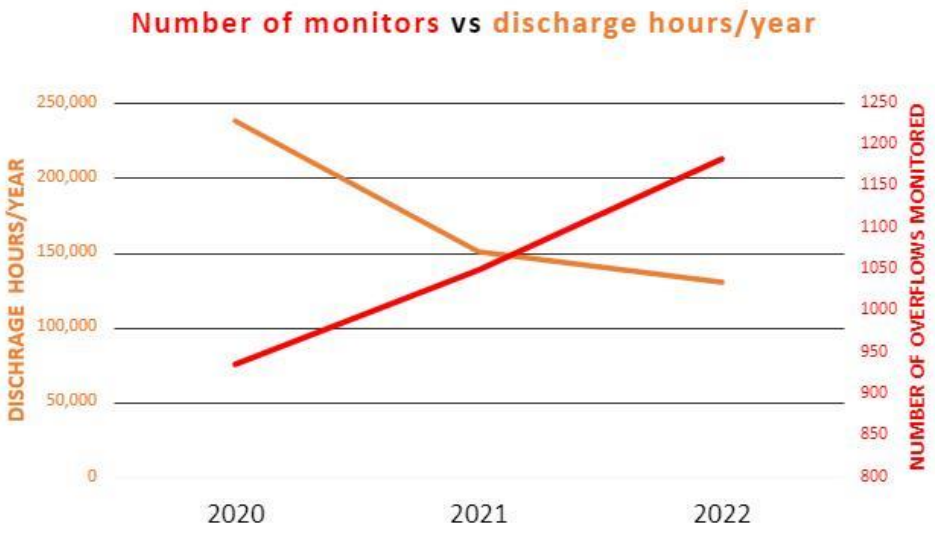
Executive summary

This document reports on our progress with addressing storm overflows and outlines our future investigation and investment plans.

This is an update to our published Storm Overflows Improvement Plan 2022-25.

In April 2022 we committed to reducing storm overflow discharge hours by 25% (from a baseline of 2020) by 2025. By the end of 2022, discharge hours had reduced by 45% despite monitoring coverage increasing by 27% from 935 to 1182 monitors.

On a like-for-like comparison with 2020 data (based on 935 monitors), discharge hours reduced by 56%.



The average number of discharges per overflow has also decreased from 30.9 times/year to 18.5.

The majority of the region served by Wessex Water experienced normal total annual rainfall for the year[1], however lower than average groundwater levels (due to low rainfall from November 2021 and spanning the 21/22 year end) and the long dry summer meant that discharge numbers were notably down.

We now have around 90 projects completed, ongoing or planned to be delivered by April 2025 that are contributing towards our ambition for reducing discharges and harm from storm overflows. Details of these projects are covered in section 2 of the report.

We have also developed near-real time bacteriological measurement app using AI tools to help people understand the likely public health risks associated with wild swimming. Our work on event duration and water quality monitoring is covered in section 3 of the report.

We have pulled together ambitious plans for addressing storm overflows beyond 2025 and cover these in section 4 of the report. This includes a plan to invest c£500 million between 2025 and 2030 – up from £150m between 2020 and 2025. Planned investment dates are shown on our Storm Overflow Improvement Map.

[1] Water situation report for England December 2022 (publishing.service.gov.uk)

Summary table

Storm Overflows	2020	2022
Number of overflows monitored	935	1182
Percentage of overflows monitored	71.9%	90.9%
Total discharge hours from overflows monitored in 2020	238,049	104,762
Total discharge hours from overflows monitored in 2022	-	129,957
% of Discharge hours reduction (from 2020)	-	56%
% of Discharge hours reduction (from 2020 with additional monitored overflows included)	-	45%
Nr of reasons for not achieving Good Ecological Status associated with storm overflows	18	9
% of total reasons for not achieving Good Ecological Status associated with storm overflows	1.4% (Aug 2020)	0.8% (March 2023)
Projects planned to be completed between 2020 and 2025	51	93
Storm Overflow investigations completed		39
Storm Overflow improvements completed in the year		9

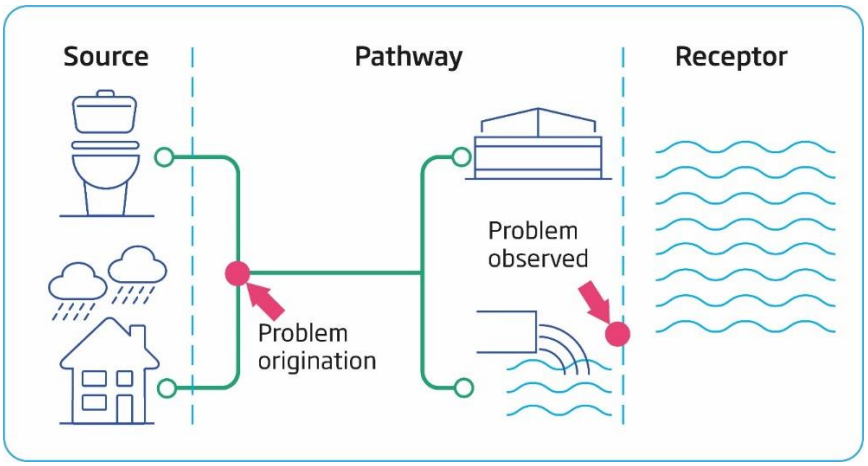
If you have any questions about this plan, please feel free to contact us. There are numerous ways to do this which can be found on our website here or via email at overflows@wessexwater.co.uk.

Contents

1. Introduction

1.1 Where and how to solve the problem

Whilst the discharge from storm overflows occurs at watercourses or the sea, the root cause of the problem is upstream and is caused by the number of connections to the sewer that contribute rainwater from impermeable areas such as roofs and roads.

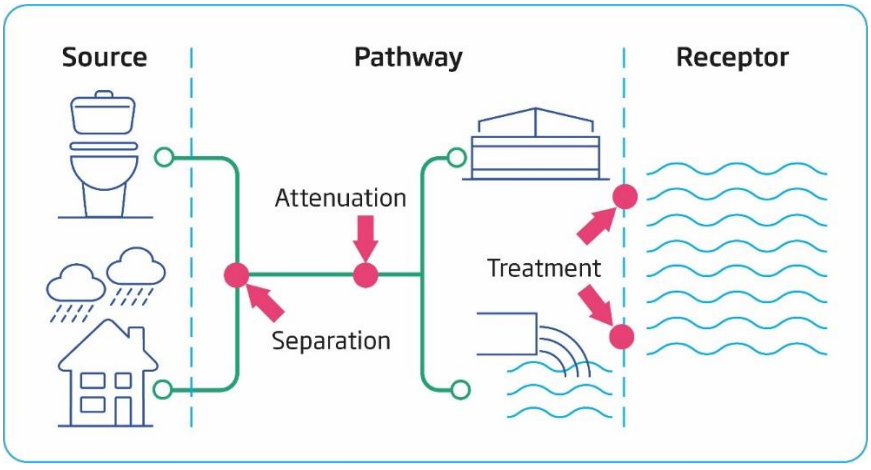


A single average-sized property roof can generate as much flow in a sewer in a typical heavy rainfall event as over 100 properties where only foul flows e.g. from toilets, sinks and showers, are connected. The point where rainwater and foul water combine most often occurs at an individual property level on privately owned pipes.

The options for solutions to address storm overflows are fourfold:

1. Reduce the discharges from the overflow by removing the rainwater from the sewer: known as **separation** solutions
2. Reduce the discharges from the overflow by storing combined sewage (rainwater and foul water) and then treating it after the rainfall has stopped: known as **attenuation** (or storage) solutions
3. Increasing the **treatment** of the intermittent discharge at the overflow (this reduces harm rather than discharges) or
4. Increasing the **treatment** capacity at the WRC so less flow reaches the overflow in the first place

The diagram below illustrates where these 4 basic types of solution can be implemented:



1.2 Pros and cons of different solution approaches

Not all solution approaches can be applied at every overflow and some approaches have more benefits than others.

The table below illustrates this by providing a relative benefits assessment between solution approaches:

Outcome	Solution	Largest constraining factors	Relative Benefits Assessment				
			Water efficiency	Bio-diversity	Customer bills	Embodied Carbon	Operational Carbon
Reduction in discharges	Separation (property level)	Land permeability Permission	✓	✓	✓	✓	✓
	Separation (community level)	Land availability Land permeability	✗	✓	✗	✓	✓
	Attenuation	Land availability	✗	✗	✗	✗	✗
	Increased WRC treatment capacity	Biological flexibility	✗	✗	✗	✗	✗
Reduction in harm	Overflow treatment: nature-based solutions	Land availability Biological flexibility	✗	✓	✗	✓	✓
	Overflow treatment: grey solutions (e.g. UV)	Land availability	✗	✗	✗	✗	✗

2. Current (2023-25) investment programme

2.1 Separation solutions

SiteID	Project Nr	Site name	Completion	What are we doing
15648	C00491	Portland Bill, Portland	Complete	We have removed c8,000m2 of impermeable area from the combined sewer as well as constructed 18m3 of new storage to reduce the storm overflow discharge from over 60/year to c4/year.

2.2 Attenuation solutions

SiteID	Project Nr	Site name	Completion	What are we doing
13100	D14196	Doynton WRC	24/03/2023	A new 27m3 stormwater storage tank will be constructed.
17543	C00499	Lambridge, Bath	28/09/2023	An additional 125m3 of stormwater storage will be contructed to reduce discharges from 46/year to c13/year.
13255	D14185	Ringwood WRC	08/12/2023	Total storm storage will be increased to 1,454m3 (existing is 986m3) by constructing a new 470m3 stormwater tank.
13274	D14269	Shoscombe WRC	08/01/2024	Total storm storage will be increased to 165m3 (existing is 48m3) by converting a redundant settlement tank into a stormwater storage tank.
16897	C00429	Culver Street, Bradford on Avon	29/01/2024	A stormwater storage tank with a capacity of 100m3 and a new mechanical screen will be constructed which will reduce discharges from 64/year to c15/year.
16462	C00497	Beechwood Avenue, Bristol	13/02/2024	An additional 50m3 of storage will be constructed plus modifications to the weir level and fine screen which will reduce discharges from 60/year to 13 events/year.
13132	D14198	Gillingham WRC	04/03/2024	A new 613m3 stormwater storage tank wil be constructed increasing total storage to 1,194m3.
13142	D14200	Hardington Manderville WRC	04/03/2024	Storm storage volume will be increased by 27m3.
13178	D14268	Leigh-on-Mendip WRC	04/03/2024	An additional 28m3 of storm storage will be constructed via a new in-line storm tank
16556	C00447	St Peters Church, Frampton Cotterell	06/06/2024	An additional c225m3 of new storage will be constructed to reduce discharges from 70/year to c13/year.
16759	C00443	Ostling Lane, Bathford	12/06/2024	An additional c100m3 of storage will be constructed in Bathford to reduce discharges to the river Avon from 66/year to c9/year.
13349	D14213	Wimborne WRC	28/06/2024	Total storm storage on site will be increased to 2,213m3 by constructing a new stormwater storage tank
16562	C00435	Nightingales Bridge, Frampton Cotterell	06/08/2024	An additional 150m3 storage tank will be constructed to reduce discharges from 61/year to c12/year.
16092	C00539	Fox Hill, Bath	09/08/2024	A 65m3 storm storage tank will be constructed
14431	C00437	Bishop Sutton, Chew Valley	14/08/2024	An additional 100m3 of stormwater storage will be constructed to reduce discharges from 82/year to c13/year.
13366	D14058	Yeovil Penn Mill WRC	06/09/2024	Total storm storage volume on site will be increased to 5,503 m3 by constructing new primary settlement tanks to improve treatment resilience then converting existing primary tanks into stormwater storage tanks.
13152	D14050	Holdenhurst WRC, Bournemouth	17/09/2024	9,000m3 of additional storm storage (total volume of 29,800m3) will be constructed to reduce discharges to 2 per Bathing Season
16914	C00449	Weymouth St, Warminster	18/09/2024	An additional 300m3 of new storage will be constructed and a flow control device to reduce discharges from 55/year to c12/year.
16582	C00293	Long Close, Chippenham	09/10/2024	A new 500m3 storm storage tank will be constructed enabling a Storm Overflow to be closed
13214	D14204	Milverton WRC	17/10/2024	Total storm storage will be increased to 168m3 by converting a redundant settlement tank into a stormwater storage tank.
13223	D9580	North Petherton WRC	24/10/2024	Total storage will be increased by 400m3 by constructing a new stormwater tank.
13316	D14270	Toller Porcorum WRC	31/12/2024	A new 27m3 stormwater storage tank will be constructed.
16561	C00439	Watleys End, Winterbourne	12/02/2025	An additional 440m3 storage tank will reduce discharges from 93/year to c20/year.
16762	C00541	Saltford Hill, Saltford	25/03/2025	A 50m3 storm storage tank will be constructed
13331	D14272	Wellow WRC	31/03/2025	An additional 35m3 worth of storage will be constructed by provision of a new inline storm tank
16605	C00445	Valens Terrace and Recreation Ground, Box	10/03/2026	Construction of 450m3 of storage and a new pumping station with a directional drill under the By Brook and mainline railway directly to Box WRC.
13022	D14048	Bishops Lydeard WRC	Complete	Storm storage was increased to 228m3
13094	D14170	Ditcheat WRC	Complete	Storm storage was increased to 52m3.
13039	D14195	Bruton WRC	Complete	130m3 of additional storm water storage was constructed to increase total storm storage to 295m3.
13199	D9869	Marnhull WRC	Complete	An additional 478m3 of storm storage was constructed, involving conversion of the one of the existing old sludge tanks.
13268	D9875	Sherborne WRC	Complete	Total storm storage was increased to 482m3 by constructing a new 175m3 stormwater tank.

2.3 Treatment of intermittent discharges and infiltration sealing of groundwater

SiteID	Project Nr	Site name	Completion	What are we doing
14220	C00273	Bulbury Lane, Lychett Matravers	11/12/2023	9 in-series wetland ponds will be constructed
14116	C00686	Gurney Slade SPS	31/03/2025	Reed bed treatment is under design
19035	C00702	Kingsbury Episcopi WRC	31/03/2025	A new reed bed will be used for additional treatment of the settled storm overflow
14047	C00706	Coate, Spaniels Bridge	31/12/2024	A new reed bed will be used for additional treatment of the storm overflow
13275	D17997	Shrewton WRC	31/03/2025	Existing reed beds will be used for additional treatment of the settled storm overflow
13032	D18047	Bradford on Tone WRC	31/03/2025	Reed bed treatment is under design
13145	D18048	Hatch Beauchamp WRC	31/03/2025	Reed bed treatment is under design
13192	D18049	Maiden Newton WRC	31/03/2025	Reed bed treatment is under design
13358	D18050	Wooley WRC	31/03/2025	Reed bed treatment is under design
13015	D18062	Barford St Martin Burcombe WRC	31/03/2025	A new reed bed will be used for additional treatment of the settled storm overflow
13057	D18063	Cheddar WRC	31/03/2025	Reed bed treatment is under design
13129	D18065	Fovant WRC	31/03/2025	A new reed bed will be used for additional treatment of the settled storm overflow
13136	D18067	Great Badminton WRC	31/03/2025	Reed bed treatment is under design
13353	D18069	Wishford WRC	31/03/2025	A new reed bed will be used for additional treatment of the settled storm overflow
13157	D18071	Hullavington WRC	31/03/2025	Reed bed treatment is under design
13158	D18073	Hurdcott WRC	31/03/2025	A new reed bed will be used for additional treatment of the settled storm overflow
13201	D18075	Martock WRC	31/03/2025	A new reed bed will be used for additional treatment of the settled storm overflow
13221	D18077	North Cadbury WRC	31/03/2025	Reed bed treatment is under design
13303	D18079	Sydling St Nicholas	31/03/2025	Reed bed treatment is under design
13319	D18081	Ubley WRC	31/03/2025	Reed bed treatment is under design
13058	D18082	Chew Stoke WRC	31/03/2025	Reed bed treatment is under design
14328	NbS-02	Hanging Langford	Complete	Reed beds have been contructed
13163	NbS-03	Iwerne Minster WRC	Complete	Existing reed beds will be used for additional treatment of the settled storm overflow
13282	NbS-04	Sparkford WRC	Complete	Existing reed beds will be used for additional treatment of the settled storm overflow
13212	NbS-05	Milborne St Andrew WRC	Complete	Existing reed beds will be used for additional treatment of the settled storm overflow
13346	NbS-06	Wick St Lawrence	Complete	Existing reed beds will be used for additional treatment of the settled storm overflow
13042	NbS-07	Butcome WRC	Complete	Existing reed beds will be used for additional treatment of the settled storm overflow
13280	NbS-08	South Perrott WRC	Complete	Existing reed beds will be used for additional treatment of the settled storm overflow
13036	NbS-09	Broadmayne WRC	Complete	Existing reed beds will be used for additional treatment of the settled storm overflow
13021	NbS-10	Bishops Caundle WRC	Complete	Existing reed beds will be used for additional treatment of the settled storm overflow

2.4 Infiltration sealing of groundwater

SiteID	Project Nr	Site name	Completion	What are we doing
14302	DQ0121	Idmiston SPS	31/03/2024	We are sealing sewer pipes in Idmiston to prevent groundwater entering the system.
13158	DQ0121	Hurdcott WRC	31/03/2024	We are sealing sewer pipes in Hurdcott to prevent groundwater entering the system.
14374	CR0056	Highbridge SPS	31/03/2024	We are sealing sewer pipes in Berrow to prevent groundwater entering the system.
15573	CR0057	Bleadon, Purn SPS	31/03/2024	We are sealing sewer pipes in Bleadon to prevent groundwater entering the system.
13303	CR0061	Sydling St. Nicholas WRC	31/03/2024	We are sealing sewer pipes in Sydling St. Nicholas to prevent groundwater entering the system.
13212	CR0060	Milborne St. Andrew WRC	31/03/2024	We are sealing sewer pipes in Milborne St. Andrew to prevent groundwater entering the system.
17637	CR0069	Piddletrenthide	31/03/2024	We are sealing sewer pipes throughout the Piddle valley to prevent groundwater entering the system.
17638	CR0069	Piddletrenthide	31/03/2024	We are sealing sewer pipes throughout the Piddle valley to prevent groundwater entering the system.
15497	Inf-01	Martinstown SPS	31/03/2024	We are sealing sewer pipes in Martinstown to prevent groundwater entering the system.
13275	CQ0335	Shrewton WRC	31/03/2024	We are sealing sewer pipes in Shrewton to prevent groundwater entering the system.
15167	CR0045	Cromhall Jubilee Lane SPS	31/03/2024	We are sealing sewer pipes in Cromhall to prevent groundwater entering the system.
15334	CR0062	Charlton Adam SPS	31/03/2024	We are sealing sewer pipes in Charlton Adam and Keinton Mandeville to prevent groundwater entering the system.
14047	CR0067	Coate, Spaniels Bridge SPS	31/03/2024	We are sealing sewer pipes in Coate to prevent groundwater entering the system.
14058	CR0067	Horton Farm SPS	31/03/2024	We are sealing sewer pipes in Horton to prevent groundwater entering the system.
13258	CR0068	Salisbury WRC	31/03/2024	We are sealing sewer pipes in Alderbury to prevent groundwater entering the system.
13353	CR0064	Great Wishford WRC	31/03/2025	We are sealing sewer pipes in Overstreet to prevent groundwater entering the system.
13192	CR0059	Maiden Newton WRC	31/03/2025	We are sealing sewer pipes in Maiden Newton to prevent groundwater entering the system.
13066	CR0070	Christchurch WRC	31/03/2025	We are sealing sewer pipes in Sopley to prevent groundwater entering the system.
14585	Inf-02	Edington, Broadmead Lane SPS	31/03/2025	We are sealing sewer pipes in Edington to prevent groundwater entering the system.
13265	Inf-02	Shapwick (West) SPS	31/03/2025	We are sealing sewer pipes in Shapwick to prevent groundwater entering the system.
17002	Inf-03	Watchet, Old Cleeve, Bye Farm	31/03/2025	We are sealing sewer pipes in Roadwater to prevent groundwater entering the system.
15084	Inf-04	Verwood, Potterne Way SPS	31/03/2025	We are sealing sewer pipes in Verwood to prevent groundwater entering the system.
15164	Inf-05	Tytherington, Stidcott SPS	31/03/2025	We are sealing sewer pipes in Tytherington to prevent groundwater entering the system.

2.5 Treatment capacity at Water Recycling Centres or increasing pass forward flow to treatment

SiteID	Project Nr	Site name	Completion	What are we doing
13013	D14162	Avonmouth	31/03/2028	The treatment capacity will be increased from 3,472 litres/second to 5,700 litres/second. Construction will be part completed by 2025 and we expect full commissioning by the end of 2027.
13048	D14165	Castle Cary	31/03/2025	The treatment capacity will be increased by a third from 25.5l/s to 34l/s by adding primary, biological, and final settlement tanks to accommodate additional flows.
13027	D14168	Bourton	31/03/2025	The treatment capacity will be increased from 6.8l/s to 13l/s by investing in additional biological treatment capacity.
13094	D14170	Ditcheat	24/08/2022	The treatment capacity will be increased by over 35% from 4.8l/s to 6.5l/s.
13140	D14199	Halstock	25/11/2024	The treatment capacity will be more than doubled from 2.3l/s to 4.8/s. This will require a new inlet pumping station and new primary and humus settlement tanks.
13271	D14207	Shillingstone	27/01/2025	The treatment capacity at Shillingstone WRC will be increased by about 40% from 19.5l/s to 27.5l/s.
13173	D14267	Lacock	31/03/2024	The treatment capacity at Lacock WRC will be more than doubled from 4.8l/s to 9.8l/s.
13274	D14269	Shoscombe	31/03/2024	The treatment capacity will be increased by 60% from 10l/s to 16l/s.
13256	D18004	Rode	07/11/2023	The treatment capacity of Rode WRC will be increased by over 30%.
13016	D9863	Bath (Saltford)	31/12/2026	The treatment capacity of the WRC at Saltford (which serves the city of Bath) will beincreased from 580l/s to 802l/s by constructing two new primary settlement tanks, a new activated sludge plant to provide biological treatment capacity and two new final settlement tanks.
13057	D9866	Cheddar WRC	31/03/2023	The treatment capacity of works will be increased from 83.5l/s to 94l/s.
13075	D9882	Compton Bassett	06/04/2023	The treatment capacity will beincreased by nearly 200% (from 17.5l/s to 49l/s). This will require new inlet pumping station and new treatment assets to treat the additional flow.

SiteID	Project Nr	Site name	Completion	What are we doing
15486	C00441	West Bexington, Swyre	01/06/2023	The pumping rate at West Bexington sewage pumping station to Gorselands sewage pumping station will be increased. Both pumping stations will have upgraded pumps and pumping mains. The investment will reduce discharges from 79/year to <20/year.
14219	C00017	Sandy Lane pumping station	17/05/2024	The pumping station will be upgraded and the pumping main replaced which will allow an increase in the pass forward flow to Lytchett Minster WRC.
13319	D14281	Ubley	12/09/2024	A new pumping station and transfer pipeline will replace the existing WRC at Ubley and reduce the number of storm overflow discharges. Flows will be redirected to Blagdon WRC for treatment to reduce storm discharges into Blagdon Lake.
16507	CL297	Westway Centre, Frome	Complete	Pipes were upsized and new flow controls installed to reduce discharges to the river Frome from 43/year to c14/year.

3. Monitoring

3.1 Event Duration Monitor installation

We appreciate that the operation of storm overflows is a growing concern for the general public, which is why we are working to ensure that information about them is readily available, and easily searchable.

Event Duration Monitors typically record the depth of sewage in the sewer at storm overflow locations. When it rains or when groundwater tables are high, the depth of sewage increases. The monitor sends out an alarm when the sewage overtops the weir and records for how long the discharge occurs.

By April 2023 we will have monitors in place at 95% of storm overflows.

By December 2023 100% of storm overflows will have Event Duration Monitors installed

3.2 Real-time data from event monitors

We currently report this data live for sites where the overflow discharge might influence bathing or amenity water quality. This is on our Coast and RiversWatch website here and has been live all-year round since 2012.

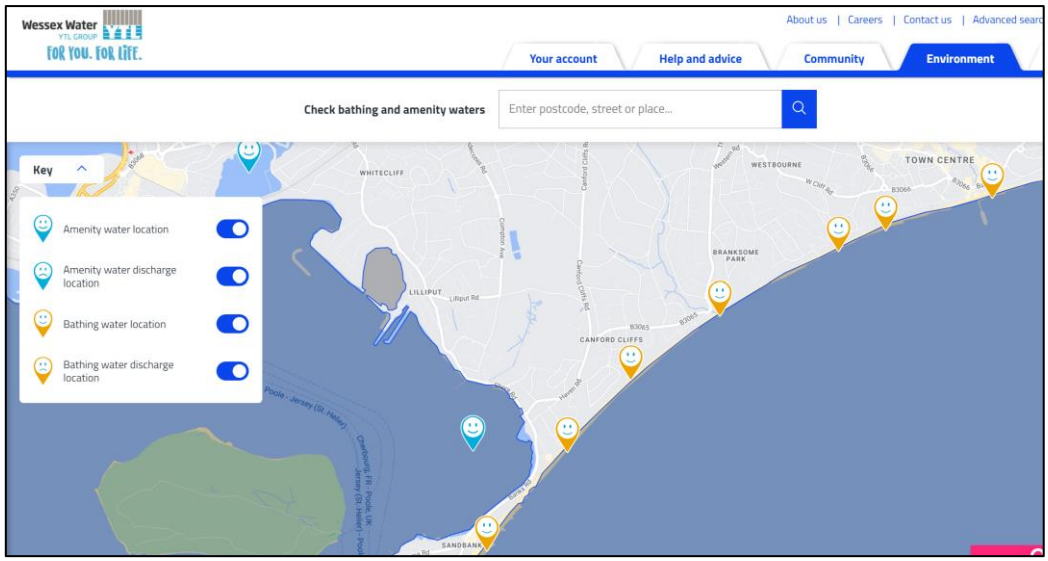


Figure 3-1 Screenshot from the Coast and Riverswatch internet page showing live storm overflow operation

We also provide this information to Surfers Against Sewage for them to broadcast on their Safer Seas and Rivers App.

We will provide this data live for **all** storm overflows in our area in a new and enhanced interactive data platform by the end of 2023.

This new platform will offer users greater information, context and insight specifically where each storm overflow is, the location of the discharge, the impermeable area upstream that causes the overflow to operate and any downstream water quality data available to show what impact it has.

3.3 Environmental monitoring

3.3.1 Reasons rivers do not achieve good ecological status

In March 2022, the Environment Agency identified the number of reasons why waterbodies in Wessex Water's area did not meet Water Framework Directive ecological standards due to storm overflows was 12 out of 1080. This data was updated in March 2023.

The Environment Agency have indicated that there are 7 (out of 444) river waterbodies in the Wessex Water area which do not achieve Good Ecological Status that have been confirmed or suspected to be as a result of storm overflow operation.

These 9 reasons (such as low dissolved oxygen or high nutrients) linked to storm overflow operation and these affect the 7 waterbodies mentioned above. The data can be found on the Catchment Data Explorer here. A summary of all 1074 reasons is presented below:

Row Labels	Count of Category
⊞ **Agriculture and rural land management**	**528**
⊞ **Domestic General Public**	**22**
⊞ **Industry**	**26**
⊞ **Local and Central Government**	**39**
⊞ **Mining and quarrying**	**12**
⊞ **Other**	**56**
⊞ **Recreation**	**8**
⊞ **Sector under investigation**	**14**
⊞ **Urban and transport**	**83**
⊞ **Waste treatment and disposal**	**14**
⊟ **Water Industry**	**272**
Barriers - ecological discontinuity	3
Groundwater	2
Groundwater abstraction	15
Incidents	2
Misconnections	2
Other (not in list, must add details in comments)	9
Regulating Reservoir Flow Regime	2
Sewage discharge (continuous)	222
Sewage discharge (intermittent)	9
Surface water abstraction	5
Trade/Industry discharge	1
Grand Total	**1074**

Figure 3-2 Environmental monitoring data showing that 9 reasons for not achieving good ecological status are associated with storm overflows [sewage discharge(intermittent)]

We are aware of the problems the Environment Agency faces around collecting sufficient monitoring evidence to accurately determine WFD status. We will be installing additional environmental monitoring from 2025 as part of the requirements of the Environment Act 2021 to measure dissolved oxygen and ammonia levels downstream of storm overflows to further assess local adverse ecological impact.

3.4 Public health monitoring

3.4.1 Background

With the increasing awareness of the existence and operation of storm overflows and the increase in popularity of wild swimming, there has become a greater desire to understand what risk river water quality poses to recreational users.

Public health risk metrics are different from metrics used to assess protection of the environment. This is because human beings have a much lower tolerance to microbiological

activity than wild animals. The key parameters that are used to measure public health risk are faecal indicator organisms (FIOs) – these are types of bacteria found in mammal intestines that are both common, easy to cultivate and survive well outside of their natural environment.

There are various sources of FIOs, and it is important to note that storm overflows are just one of these sources. River water quality can still be poor from a public health perspective even when no storm overflows exist or operate.

Sources of FIOs include:

- Treated sewage from WRCs – treated sewage does not normally have a treatment process that kills bacteria. Additional disinfection processes are required.
- Wildlife – bacteria from faecal matter from ducks, swans, seagulls, otters, rats etc
- Storm overflow discharges
- Agricultural run-off – faecal matter from cattle, sheep, poultry, piggeries etc.

The two types of faecal indicator organism that are measured are Escherichia Coli and Intestinal Enterococci. The UK's Bathing Water Regulations sets standards for these to limit the probability of illness for people who accidentally ingest the untreated water.

It is important to note that even if water meets Excellent Bathing Water standards (which is the highest classification), it does not make the water drinkable and there is still a risk of gastroenteritis or infections for water users.

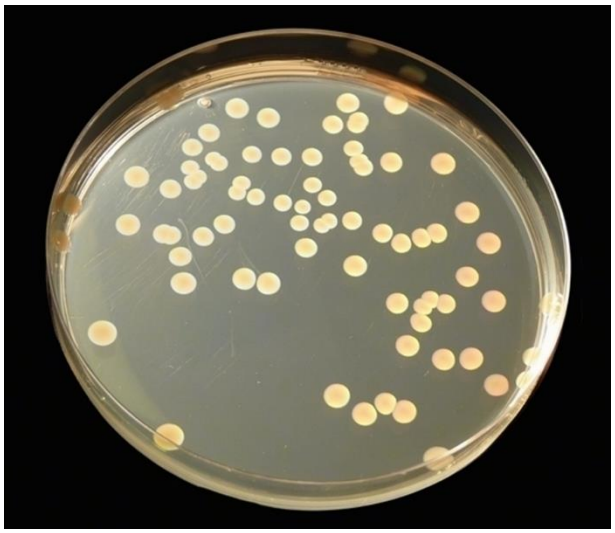


Figure 3-3 Bacterial colony forming units grown on a petri-dish

One of the biggest problems facing users is that measurement of such bacteria requires samples to be cultivated and grown in a laboratory on petri dishes and in incubators. The results can take 24-36 hours to be obtained – which does not enable real-time water quality (against these parameters) to be calculated. So there is poor understanding or what risks are 'now'. The Bathing Water regulations inform users what the 4-year history of water quality has been like rather than "what is the water quality like today?".

You can view the historical data for every bathing water by visiting the Bathing Water profile using this link.

3.4.2 Public health monitoring plans

We are working with various swimming and water sports groups to improve both the knowledge of water quality and provide better real-time information, to help users make risk-based decisions about using the water as well as to help inform investment decisions to improve water quality. Where improvements are required, identifying both the source of the problem and the solutions are key outputs from the monitoring.

Warleigh Weir (near Bath) investigation

At Warleigh Weir near Bath, we are carrying out an investigation to determine the sources of bacteria in the river that increase the risk to public health. We have set up a dedicated webpage to keep customers informed of the investigation work we are doing and what information is being gathered. You can access this information here.

Key findings so far include the poor relationship between bacteria levels and upstream storm overflow operation, meaning resolving storm overflows will not mean the location will meet Bathing Water standards.

Whilst there is some correlation between storm overflow discharges and bacteria levels, it is notable that of the samples that exceeded the indicative 'Good' standard (for E.coli and enterococci) **c80% had had no upstream storm overflow discharge in the previous 48 hours**

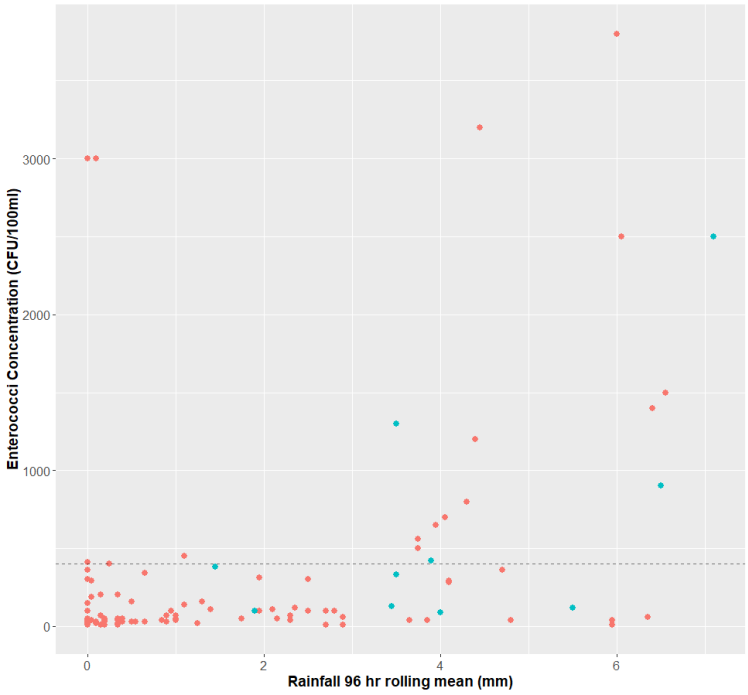


Figure 3-4 Relationship between Enterococci concentrations and rainfall, with incidents of upstream storm overflow operation within the previous 48 hours of the sample identified in blue

The investigation into the source of FIOs continues in an attempt to identify what would need to be done to reduce the levels of bacteria to meet bathing water standards. This work will consist of eDNA analysis to better understand where different sources of FIOs, such as agriculture and wildlife, might also be impacting standards.

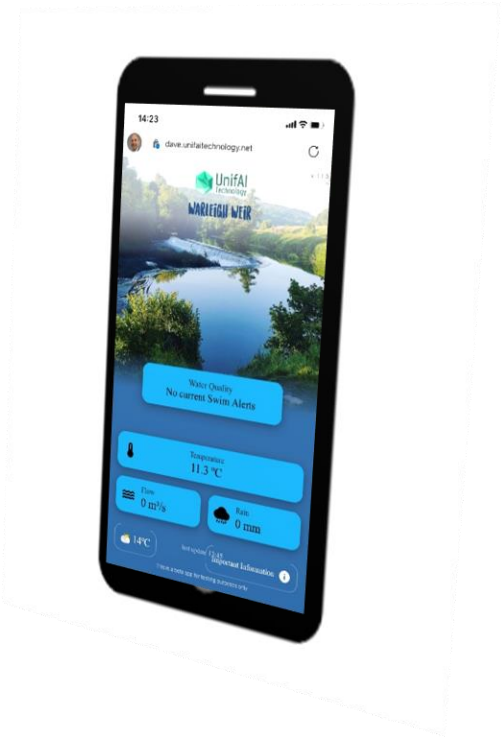
Real-time information

As water quality is affected by various sources and users just want to know what the quality of the water is, we have been developing an Artificial Intelligence (AI)-led app which predicts bacteria levels using parameters that are easy to obtain (such as pH, conductivity, turbidity and temperature) and building the relationship with laboratory measured FIOs.

The AI tool now has a greater than 90% accurate prediction rate as to whether a spot sample would pass Good bathing water standard or not. This information, along with river

temperature and flow rate, is now updated on the App every 30 minutes to provide near-real time public health and safety information.

A QR code and screenshot for the App is below



4. Longer term investment programme

4.1 2025-2030

The period 2025-2030 will require a significant uplift in investment to meet the new targets for storm overflows.

We have submitted a proposal in the draft Water Industry National Environment Programme to address 147 storm overflows between 2025-2030 out of approximately 700 that need addressing to meet Government targets by 2050. This programme will be confirmed in December 2024.

These have been prioritised in line with the Government's prioritisation approach as detailed in the Storm Overflows Discharge Reduction Plan and are shown on our Storm Overflow Improvement Map.

4.2 2030 onwards

Our long-term ambition is to eliminate the need for storm overflows and our draft Drainage and Wastewater Management Plan sets out options for this. The final DWMP will be published in May 2023 which will outline plans for the next 25 years.

5. Conclusion

Addressing storm overflows and the impact they have will require a long-term multi-billion pound investment plan.

Our aim is to address the problem of storm overflows by prioritising investment based on impact, deliver solutions at an affordable pace to our customers and in a way that has a low operational and embedded carbon footprint and maximises a multitude of benefits.

We fully support the governing principles of rainwater management set out by Government, namely:

- that rainwater should be treated as a resource to be valued for the benefit of people and the environment, not mixed with sewage or other contaminants
- that rainwater should be discharged back to the environment as close as possible to where it lands or channelled to a close watercourse.

In the majority of cases, attenuation solutions are not the best solution as they do not meet these principles. They tend to be high carbon, low capital cost solutions that will not stand the test of time against a changing climate and the gradual and unregulated impermeabilisation of permeable ground.

This is a societal problem that needs Government, regulators, sewerage companies, highways authorities, local authorities, businesses and private property owners all to play their part towards unwinding decades of how infrastructure used to be built to manage rainwater and transform our nation's drainage infrastructure to meet the principles above.

We remain committed to a long-term aim of elimating storm overflows, starting with those that have the greatest impact and those that discharge most frequently.

We are also committed to lobbying for changes to legislation and regulation that enable and encourage solutions that fulfil the rainwater management principles above.

Document control

No	Details	Authorised by	Date
1	Website publication	Matt Wheeldon Director of Infrastructure Development	24 April 2023
2			
3			