

SEWAGE AND OTHER POLLUTING DISCHARGES TO SOLENT HARBOUR

By

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Waste Water Treatment Works (WwTWs) surround Langstone, Chichester and Pagham Harbours. All are connected to the Eastern Solent. A similar configuration also envelops the Western Solent. As well as the outfall pipes from the WwTWs, there are Combined Sewer Outfalls (CSOs) and tertiary outlets. CSOs come into operation when WwTWs are threatened with being overwhelmed. This most commonly occurs during periods of prolonged rainfall, causing groundwater pressure to ingress sewer pipes and overload the system. Tertiary systems are often not fully charted and are historically not connected into the regulated waste water catchments.

The system was largely built between the Edwardian Period and the 1930s, when the area experienced significant growth on the back of improved rail and road connections to other regions. A detailed historical account of the construction of one catchment, Bosham, may be found at the Bosham Association website.¹

The actual WwTW have undergone numerous upgrades, including the addition of nitrate filtering, other processes and in some cases to protect water quality in designated protected zones even UV treatment. Nonetheless effluent remains a concern for bathing waters and areas covered by various protective designations.

The impact of effluent on harbour waters has been known since the tragic events of 1902 when four people lost their lives from typhoid following a Winchester banquet where contaminated Emsworth oysters were served. The ensuing scandal obliterated the lucrative oyster trade of Chichester Harbour. Efforts to recover this resource have been frustratingly elusive.²

This event, 119 years ago serves as a prequel to the current drama of anthropogenic degradation of the natural habitat. In 1989 the water utilities were privatised. It seems that investment has simply not matched the increasing demands on the sewerage system. It is not the task here to apportion responsibility between a failure of regulatory standards, a failure of investment or a combination. However, it would seem to be a *prima facie* case of market failure. Why?

The Environment Agency (EA) is charged with responsibility for regulating the water companies' discharges. OFWAT look after their consumers. It goes without saying that the development of housing and other water consuming land uses will increase demands upon the waste water treatment systems. The more connections made to the system, the more income is generated by the water companies. Investment is based upon a number of assumptions. The average use per household, around 150 litres per day, is obviously very important, but also consideration must also be given as to the separation of rainwater run-off from grey water, the integrity of the connecting pipes and the headroom of the WwTW themselves. The experience of people living in the catchments run by Southern Water has caused concern over the last 5 years or so, leading to a fine by Ofwat and more recently to a letter to Rachel Fletcher, head of Ofwat on 7th December 2020, from Chichester leaders. It reminded Ofwat of its duties under law namely to:

- secure that water companies (meaning water and sewerage undertakers) properly carry out their statutory functions;
- secure that water companies can (in particular through obtaining reasonable returns on their capital) finance the proper carrying out of their statutory functions;

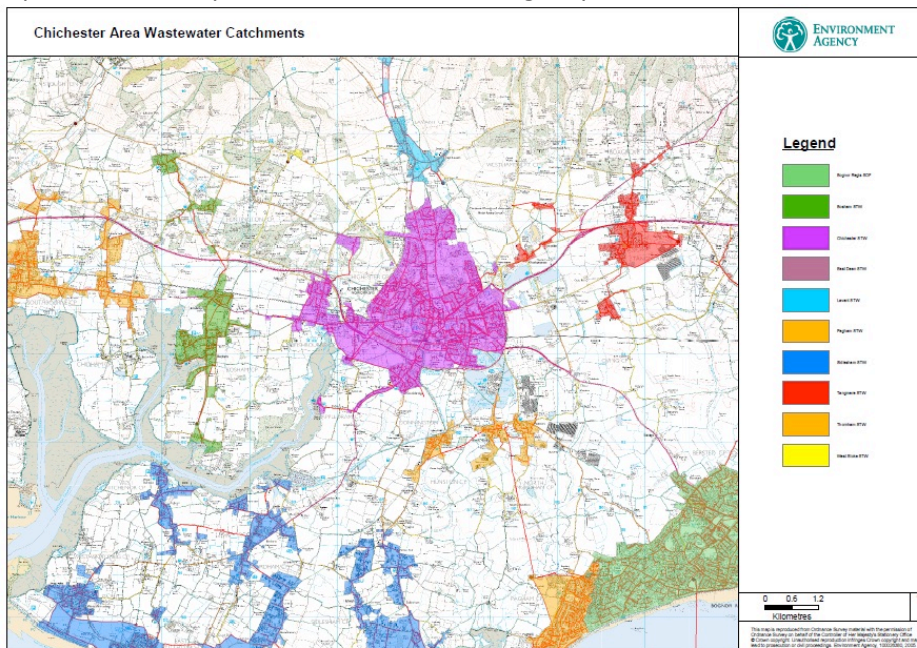
¹ <https://www.boshamassociation.org.uk/DocumentStore/C20th%20pumping%20stations.pdf>.

² <https://nefconsulting.com/wp-content/uploads/2018/03/Chichester-Shellfish-Valuation-Report-2018.pdf>

- further the resilience objective to secure the long-term resilience of water companies' water supply and wastewater systems; and to secure that they take steps to enable them, in the long term, to meet the need for water supplies and wastewater services.

It is clear to the leader of CDC that Southern Water is saying that they have the capacity, whilst it is a matter of record that they do not. This is being born out in planning applications which are on-going. The vulnerability of the coastal WwTWs to climate change/sea level rises is also noted in the letter. We have elsewhere drawn attention to this particular risk exposure, providing the evidence collated by Joseph W Lockwood.³

To give an idea of the variety in size and shape of the WwTW in a part of the sub-region, we reproduce the map from the Environment Agency.



Since this map was created there have been extensions to the various catchments and concomitant reduction in the headroom capacity of the WwTWs; for example over 100 houses have now been connected to the Bosham system in Smugglers Lane and Bosham Hoe on 3rd October 2011 and further developments since this 2005 map would have reduced the headroom of the Bosham WwTW from 400 households to virtually none. Any further developments could not and should not be accommodated in this catchment.

More detailed maps of the catchments in the Chichester District are available.⁴ Those in the Manhood peninsula (Siddlesham, Hunston and Mundham) also take the flow from the seasonal holiday homes which, whilst not in full-time occupation, may double the size of the population in summer. These units are used for increasing periods of the year and are no longer constrained by six-month occupancy restraints.

The 'headroom' (spare capacity at the various WwTW appears not to have been re-calculated for several years, yet we know that planning consents for a range of developments and many 'windfall' sites have been given in the meantime. The most recent document that we could find is 'Adopted

³ https://5d0e6579-f20c-40a0-acbf-8c4ac274613b.filesusr.com/ugd/dae4df_bc46d604a4ae4965a574ea0054fd1582.pdf

⁴ <https://chichester.moderngov.co.uk/documents/s4557/Appendix%20to%20appendix%20%20-%20Wastewater%20Treatment%20Works%20Catchment%20Map.pdf>

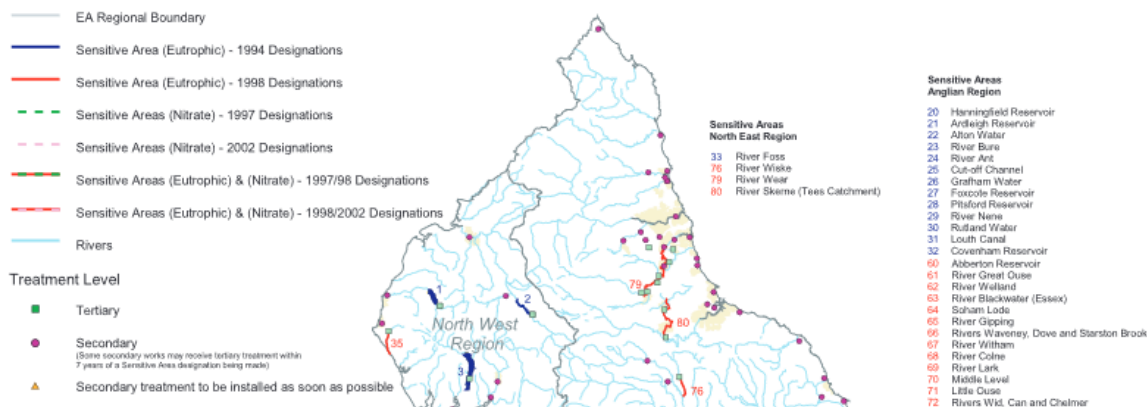
Surface Water and Foul Drainage Supplementary Planning Document 20th September 2016' which certainly did not take into account windfall site developments of the previous few years, as well as the Bosham Hoe connections.⁵ An added challenge for the capacity of the WwTW system is the mixing of storm and waste water from historically inherited and more recent unlawful connections. Limited progress has been achieved on this but in Bosham and Hambrook for example, we know of combined rainwater/grey and black water system, which at times of heavy and prolonged rainfall will not help the current situation.

We have written elsewhere on the issue of the other main cause for concern – Nutrient pollution of coastal waters.⁶ Whilst phosphates may be a powerful factor for eutrophication on inland/freshwater courses, it is nitrates that produce greater eutrophication on harbour/saltwater locations.

The EA has been acutely aware of the nitrate-sensitivity issue and its maps from 2001 and 2004 and have charted both eutrophic alerts and nitrate sensitivity. Strikingly, Chichester Harbour features prominently. Whilst other Solent-surrounding Local Planning Authorities have tried to develop nitrate neutrality policies for development proposals, Chichester District Council has deferred to the Solent-wide policies of Natural England.⁷

The sensitivity of the Solent and its adjoining harbours has been charted for some time.⁸ Charts published in 2012 show the entire Solent to be nitrate sensitive. The first chart from 2004 shows the legend, whilst the second gives an idea of the issues in the Southern Region.

Urban Waste Water Treatment Directive: Implementation of Secondary Treatment as at 31-12-2001 and Tertiary Treatment in Place or Planned by 31-12-2004 England and Wales



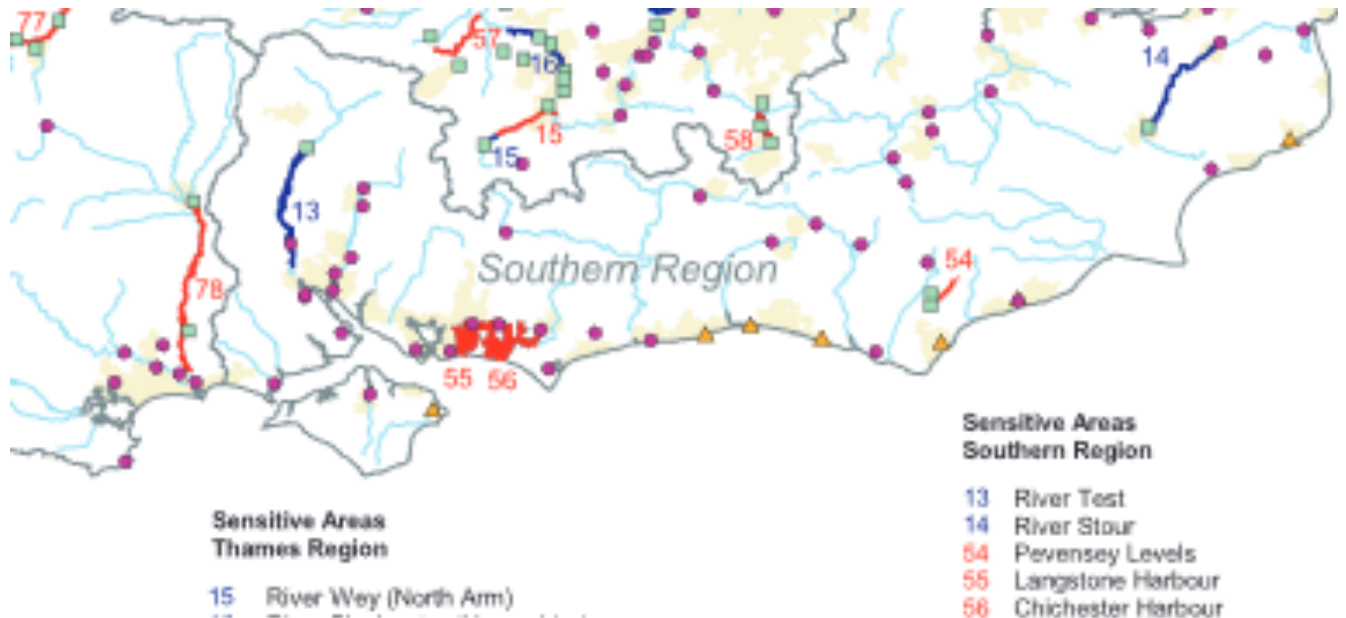
⁵ <http://www.chichester.gov.uk/CHttpHandler.ashx?id=27842>

⁶ [https://5d0e6579-f20c-40a0-acbf-](https://5d0e6579-f20c-40a0-acbf-8c4ac274613b.filesusr.com/ugd/dae4df_4e50c308b6b1463dba41ab92f21b547e.pdf)

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⁷ <https://www.chichester.gov.uk/nutrientneutrality>

⁸ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69592/pb13811-waste-water-2012.pdf



Source: ⁹

Numerous coastal WwTWs debouch to marine environments with a variety of protective designations. Such an example are those at Apuldram and Bosham (Harts Farm). The protections and the explanation are set out simply in the Bosham Village Design Statement.¹⁰

It states:

“The mudflats, saltmarsh, grasslands, dune and shingle support substantial populations of overwintering waders, wildfowl and breeding seabirds, and other flora and fauna. For this reason, Chichester Harbour carries a number of international, European and national designations. At the national level the intertidal area and some of the land is designated as a Site of Special Scientific Interest (SSSI) which is designated under the Wildlife and Countryside Act 1981 as a national network of areas with the greatest value to wildlife or geological conservation.” (page 15).

Chichester Harbour is most fortunate in that both port authority (navigation etc) and environmental management is vested in a single body, that of the Chichester Harbour Conservancy (CHC). This body takes a keen interest in water quality.¹¹

The latest readings of water quality (E.coli and enterococci) show that at three locations; Dell Quay, Dell Quay north channel and Emsworth Quay all failed the EU Bathing Water Directive on 13th January 2021. This is a matter of organic pollution causing risk to human health. These measurements were completed by CHC. They kindly measure regularly monthly in winter and bi weekly in summer. That there are no measurements in between and that there is no coordinated measurement with known discharges remains a concern for knowledgeable water users.

Water users in Chichester Harbour are particularly concerned that Southern Water is unable to deliver warnings of untreated discharges in a timely manner and there has been extensive

⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69582/pb6655-uk-sewage-treatment-020424.pdf

¹⁰ https://www.chichester.gov.uk/media/14707/Bosham-Village-Design-Statement/pdf/BVDS_17.4.12_low_res_2.pdf

¹¹ <https://conservancy.co.uk/page/water-quality>

correspondence between Sir James Humphrys at the Environment Agency and some of their representatives. The problems focus upon the inadequacy of the BeachBouy notification system to which water users can register. However, to date SOSCA has not been informed of any infections arising from exposure.¹² The CHC and local sailing/rowing/paddling clubs have all noted the increased use of the harbour by immersive users, yet the harbour itself is not designated as a bathing water area, whilst main beaches at West Wittering and Hayling Island are so designated. The Environment Agency requires bathing waters prone to pollution should under the following circumstances trigger public warnings:

1. Heavy rain or tides washing pollution into the water that flows into a bathing water from the surrounding catchment. At sites where this is known to occur, this risk is assessed by daily Pollution Risk Forecasts (PRF) and if an increased risk is forecast, a pollution risk warning is issued along with advice against bathing and
2. On rare occasions pollution incidents can occur which may affect water quality. If a pollution incident occurs that may affect bathing water quality *we will issue advice against bathing.*¹³

This does not appear to be happening with the frequency stipulated according to regular local water users namely year-round swimmers and water sports enthusiasts.

We have no information on the take-up of the notification but it seems to be very patchy and the doubts about its efficacy, i.e. timeliness and accuracy, may have caused clubs and user groups to hold back from endorsement as a reliable source.

Below are two examples of the notification in January 2021.

names and comments from meeting.

Beachbuoy was first launched for the 2018 bathing season. Since then, we've used feedback from users to make some significant improvements. We launched the second version in September 2020.

The screenshot shows the Southern Water website interface. At the top, there are navigation links for 'Household', 'Developing', and 'Retailers', along with 'Accessibility', 'About us', and 'Contact us'. The main header features the 'WATER for LIFE from Southern Water' logo, 'Account', 'Help & Advice', 'Water For Life', a search icon, and 'Register/Log in'. Below this is a map of the South Coast of England with several orange circular icons indicating pollution risk. To the right of the map is a table of forecasts:

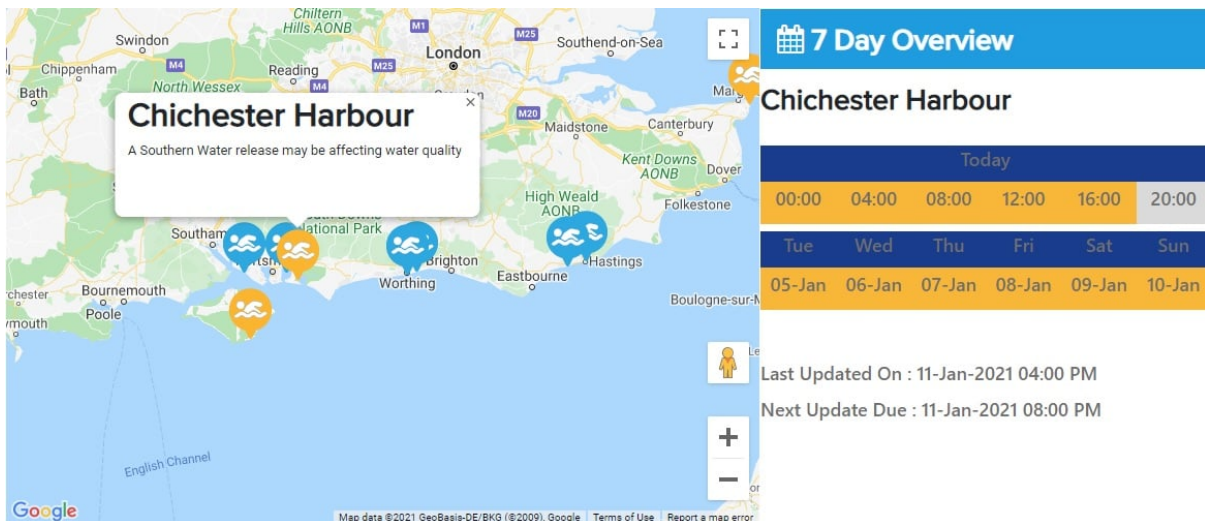
	00:00	04:00	08:00	12:00	16:00	20:00
	Mon	Tue	Wed	Thu	Fri	Sat
	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan

Below the table, it states: 'Last Updated On : 24-Jan-2021 08:00 AM' and 'Next Update Due : 24-Jan-2021 12:00 PM'.

Another day in January 2021 reported even more prolonged releases, but many water users had not received adequate warning, even although there had been prolonged downpour.

¹² <https://www.southernwater.co.uk/water-for-life/our-bathing-waters/beachbuoy>

¹³ <https://environment.data.gov.uk/bwg/profiles/help-understanding-data.html>



The letter to Rachel Fletcher, head of Ofwat on 2nd December 2020, from Chichester leaders noted that the Wastewater Treatment Works discharged sewage into Chichester Harbour during 2020 for the following periods: Chichester = 107.2 Days. Thornham = 19.7 Days, Bosham = 41.8 Days and Information received from other combined sewer overflows together add another 10.1 days.

However, of equal concern is the chemical threat to the natural habitat (SSSIs) and the body charged with monitoring the quality of water from this perspective is Natural England.¹⁴

The latest assessments (28/02/20) for the intertidal littoral (the mud flats) show a worsening situation caused by nutrient enrichment.¹⁵

The causes of this are listed as “FRESHWATER POLLUTION - WATER POLLUTION - AGRICULTURE/RUN OFF, FRESHWATER POLLUTION - WATER POLLUTION - DISCHARGE,”

We have set out elsewhere our concerns for the nutrient enrichment contributed through waste water discharge.¹⁶

In response to these changes, some local planning authorities have set out their own policies and these are largely those in Hampshire. Chichester District Council has decided to derogate policy reference to Natural England.¹⁷

As well as environmental and health implications of the poorly performing regulatory systems and supply of water services, there are also further down the line, economic implications. The CHC commissioned a study of the economic benefit of the high reputation of the Chichester Harbour environment.

Chichester Harbour was first valued in 2002 and this was updated in 2009. It was concluded that “the total value of Chichester Harbour has been estimated to be at least £2.78 billion. This

¹⁴<file:///C:/Users/user/AppData/Local/Temp/SSSI%20Monitoring%20assessment%20and%20Reporting%20Standard%20v1-0%20May19%20FINAL%20signe....pdf>

¹⁵<https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S1003245&ReportTitle=Chichester%20Harbour%20SSSI>

¹⁶https://5d0e6579-f20c-40a0-acbf-8c4ac274613b.filesusr.com/ugd/dae4df_4e50c308b6b1463dba41ab92f21b547e.pdf

¹⁷<https://www.chichester.gov.uk/nutrientneutrality>

And https://www.chichester.gov.uk/media/33596/Solent-Nutrients-Non-Technical-Summary-V2/pdf/SolentNutrientAdvice_-_Non-Technical_Summary_v2.pdf

cumulative figure is made up of individual valuation information from maritime businesses (£524M), residential property (£2,151M), tourism (£44M), land values (£52M) and recreation (£1.2M).¹⁸

Whilst water quality was not mentioned in the report, it is quite clear that it has a bearing on both the intangible and tangible assets that the Harbour possesses. It also follows that a deterioration of the assets makes the area poorer not richer. Two obvious features are the attractiveness of the water sports and the landscape value of the Spartina/salt marsh. The first is adversely affected by the presence of E.coli and enterococci and nutrients (nitrates and phosphorus). We have noted elsewhere that The Environment Agency's work on climate change impacts on Chichester Harbour in 2005 revealed that there had been a 50% loss of salt-marsh coverage since 1946. The dominant species of saltmarsh is *spartina anglica*, but also some small cord grass.¹⁹

The loss of the sea grasses that fringe the harbour would have a major impact on attractiveness just as much as the loss of woodland and copses on land. The eutrophication engendered by nutrient enrichment also impacts boaters, paddle boarders and windsurfers whose craft get caught in the super-abundant algae and other plant life that form as a result. Sailors will recall the massive efforts made by the Chinese Government to clear their sailing area designated for the Olympic Games. It is not unimaginable that the problem could become as severe in our harbours. Deteriorating environmental conditions deter smart investment in enterprises, jobs, homes and social infrastructure. It can be so easy to tip into an unvirtuous spiral.

Can the Chichester District properly accommodate the number of houses currently being proposed in the local plan review and be sure that the water quality in our harbours can be maintained, let alone improved? It could if the water utilities could guarantee the investment necessary ahead of any development. This was a significant feature of the Conservative Party Manifesto 2019 which declared a government formed would "ensure infrastructure is in place before homes are delivered."²⁰

Much is laid at the door of Southern Water and the letter from Chichester District leaders to Ofwat has underlined this. So, who is Southern Water? It should be said that while this public utility has a monopoly position on sewerage and waste water through the south coast from Hampshire, the Isle of Wight, West Sussex, East Sussex to Kent, the supplier of fresh water in the west of this region is Portsmouth Water.²¹

Southern Water is regulated under the Water Industry Act 1991 and since 2007 has been owned by Greensands Holdings Limited, a consortium of investors representing infrastructure investment funds, pension funds and private equity. Currently the largest shareholders are JP Morgan Asset Management (40%), UBS Asset Management (22%), Hermes Infrastructure Funds (21%) and Whitehelm Capital (8%).²²

The company website shows their efforts at environmental compliance and is a convincing account of the company meeting their legal duties.²³ However, the experience of living in the area served by the company is that, whilst with the exceptions that caused the multiple fines on the company by Ofwat, the company meets the legal requirements, they go little further and will struggle if greater

¹⁸ <http://www.chichester.gov.uk/CHttpHandler.ashx?id=7890&p=0>

¹⁹ [https://5d0e6579-f20c-40a0-acbf-](https://5d0e6579-f20c-40a0-acbf-8c4ac274613b.filesusr.com/ugd/dae4df_4e50c308b6b1463dba41ab92f21b547e.pdf)

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²⁰ <https://www.instituteforgovernment.org.uk/manifesto-tracker#housing>

²¹ https://en.wikipedia.org/wiki/Portsmouth_Water

²² https://en.wikipedia.org/wiki/Southern_Water

²³ <https://beta.southernwater.co.uk/our-performance/environmental-performance>

consumer demands are place upon it. Wikipedia list the fines imposed on Southern Water between 2007 and 2019.²⁴

Do the shareholders feel comfortable with such lamentable performance? They appear to be between a rock and a hard place. They are required to provide a service for all new development, yet the capacity of their current catchments has been found to be severely stressed frequently as is evidenced by the proven breaches of the regulations that resulted in fines and by the frequent resort to the full extent of their licences to discharge untreated waste to our harbours. The stream of investment funds from the receipts from Community Infrastructure Levy appear to lag far behind the requirement for such improvements that would meet and exceed minimum standards.

The issue for governance seems to be, can it sign off on developments unsure of the consequences for water quality on their doorsteps? The issue for the water utility must be, is it meeting its corporate social responsibility? The issue for the regulators is, are they doing their job?

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²⁴ https://en.wikipedia.org/wiki/Southern_Water#cite_note-3