

Water Quality – Issues, Challenges and Opportunities

Scrutiny Briefing Report – November 2023



EXECUTIVE SUMMARY

Plymouth City vision is to be ‘One of Europe’s most vibrant waterfront cities, where an outstanding quality of life is enjoyed by everyone.’ Plymouth Sound is also the UK’s first National Marine Park (NMP), where more people will be getting in, on, under and next to the water. It is therefore very important for the City and its citizens as well as the nature of the Sound that water quality is excellent.

In June 2023 the Growth and Infrastructure Overview and Scrutiny discussed the water quality challenges in Plymouth. The Committee agreed to ‘add an item on Water Quality with contributions from South West Water and to look at micro plastics in industry run-off’.

This paper sets out the issues, challenges and opportunities related to water quality in Plymouth Sound NMP. Issues include sewage discharge, agricultural run-off, urban run-off, misconnections, and microplastics. In addition to these issues, the paper sets out how the unavoidable impacts of climate change is and will continue to exacerbate some of the challenges around water quality.

There is however work already progressing to meet these challenges and opportunities for innovative and creative ways to improve water quality in the future. The NMP ambition is to be a pioneer in developing new relationships between people and the sea that can be replicated elsewhere in the country. There is therefore nowhere better to trial new approaches and seek solutions to the issues facing water quality and the impact that this is having on people’s enjoyment of the water.

The paper sets out recommendations for further work to progress improvements in water quality.

WATER QUALITY - ISSUES, CHALLENGES AND OPPORTUNITIES

The UK’s first National Marine Park (NMP) values the environment, heritage and economy of Plymouth Sound and its estuaries. It is where people and planet will come together to realise a new, sustainable relationship with the sea.

It will create opportunities for residents and visitors to reconnect with and explore the ocean in exciting new ways. Working alongside residents and the wider community is key to changing the way a city interacts with its environment; to care for, protect it and use it in different ways to develop a

healthier and more harmonious relationship with the ocean. The NMP will encourage more people to get in, on, under and next to the water so the quality of the water needs to be excellent.

Water quality is important for people and wildlife and as the NMP will encourage more people to get in, on and under and next to the water and enhance the wildlife of the Sound ensuring clean and healthy water is essential.

There are also a number of statutory designations that require good standards of water quality.

Designated Bathing Waters

The UK has over 600 designated Bathing Waters – sites that are popular for swimming and paddling and have been designated under the Bathing Water Regulations 2013. They have been designated under the EU Bathing Waters Directive that was first introduced in 1976.

Currently there are 3 sites within the Plymouth Sound NMP that are formally designated as Bathing Waters:

- Plymouth Hoe West (Designated 1988)
- Plymouth Hoe East (Designated 1988)
- Plymouth Firestone Bay (Designated 2023)

At each of the three designated sites the Environment Agency (EA) monitors bathing water quality, weekly from 15 May to 30 September, from an identified sampling point at the site. Their role is to investigate any sources of pollution and recommend measures to improve water quality.

At the three designated sites Plymouth City Council must, during the bathing season put up signs that show the current water quality and any advice against bathing.

Bathing waters are given an annual classification of 'excellent', 'good', 'sufficient' or 'poor' by the EA. Plymouth Hoe East and West are both classified as 'excellent', Firestone Bay is a new bathing water and will receive its classification next year.

Short Term Pollution Events

The Bathing Waters are at time subject to short term pollution events. At these times PCC must put up signs advising against bathing. The EA makes a daily pollution risk forecast based on the effects of rain and wind on bathing water quality. These factors affect the levels of bacteria that get washed into the sea from livestock, sewage and urban drainage via rivers and streams and how they disperse.

At times these factors combine to make short term pollution likely, and the EA issues a pollution risk warning on this website and PCC will display a sign. After a short-term pollution event, levels of bacteria typically return to normal after a day or so but it's possible to have several warning days in a row. Below are the pollution risk warnings for 2022:

- Plymouth Hoe East - 2022 7 pollution risk warnings were issued.
- Plymouth Hoe West – 2022 4 pollution risk warnings were issued.

Natural Environment Designations

Plymouth Sound contains many designations for nature as follows:

- Plymouth Sound & Estuaries Special Area of Conservation (SAC)
- Tamar Estuaries Complex Special Protection Area (SPA)
- Tamar Estuaries Site Marine Conservation Zone (MCZ)

The need for 'clean' water underpins the estuaries' ecological functions and therefore it is important that water quality is improved for the nature of the Sound.

In addition to these statutory designations, the quality of water bodies in and around Plymouth are subject to the requirements of the Water Framework Directive Regulations. The WFD Regs require the production of a River Basin Management Plan (RBMP). Locally the requirements of the RBMP are delivered through the Tamar Catchment Partnership. The WFD is designed to deliver holistic approaches to the improvement of water bodies, but water quality is a key driver.

Shell Fisheries

Within Plymouth City Council's (PCC) Port Health District has responsibility for monitoring classified shell fisheries. The commercial production and sale of live bivalve molluscs, e.g., clams, cockles, mussels, oysters, scallops etc. is strictly controlled, as they have the potential to cause serious illness due to the way in which they feed. PCC carries out sampling of harvesting areas within the Plymouth Port Boundary. The results are used by the Food Standards Agency to classify these areas according to the E. coli levels in the shellfish sampled. The classification determines the areas where shellfish can be collected, and how the shellfish have to be treated after harvesting to ensure they are safe to eat.

Within the PCC Port Health District there are two shellfish beds in the River Yealm which were recently declassified. There is a proposal for re-classification, however this is being hampered by concerns about historical chemical contamination and remediation plans. Once classified, these beds are accessible only by boat and must be sampled monthly as part of the national biotoxin programme

and also for maintaining classification. The water quality of the shellfish beds has been deteriorating and this impacts on Plymouth City Council as increased sampling is required when quality fails.

Water Quality - Issues and Challenges

The Bathing Water classification for the two sites within Plymouth NMP have been assessed as 'Excellent' but there remains a number of current issues impacting the standard of water quality in Plymouth Sound, which are detailed below. There are also future challenges that need to be addressed.

Issues

Combined Sewer Overflows

CSO are built into the sewerage network and may operate automatically during heavy rainfall to protect properties from flooding. During a storm event, heavy or prolonged rainfall can rapidly increase the flow in the combined sewer and may cause it to be overwhelmed. Storm overflows are designed to act as a safety valve by releasing excess storm water automatically into the sea or a river when this happens. At times of increased rainfall there isn't always enough capacity to contain the volumes. If storm overflows didn't exist within the currently designed network storm water wouldn't have anywhere to go, which would result in homes, businesses and streets being flooded.

CSO use has received a lot of attention and SWW have committed to reduce spills from storm overflows to an average of 20 per year by 2025 across the region. There are CSO's that function within Plymouth Sound.

Misconnections

Wrongly connected domestic waste-water pipes can affect the bathing water quality. Modern sewerage systems have two separate systems, one takes foul sewage to sewage treatment, the other takes rainwater runoff through surface water drains to rivers and the sea. Misconnections occur when waste water pipes are plumbed into surface water drains instead of the foul water sewerage system. This can give rise to pollution when the waste water is discharged directly to the environment through the surface water drain. This often happens when a washing machine or toilet is incorrectly plumbed so that it discharges to the surface drain rather than the foul sewage drain. The EA, South West Water and the Council continue to work together to identify and rectify any problems when they arise.

Urban Run-Off

In Plymouth's built-up areas pollutants can accumulate on hard surfaces such as roads and car parks which can then be washed into the sewer network during rainfall. At times this 'urban run-off' enters surface water drainage systems, and the pollutants are then discharged directly into watercourses and Plymouth Sound untreated. This can cause issues for water quality.

Agricultural Run-Off

Agricultural run-off can impact water quality and the catchments that surround Plymouth have many agricultural uses. The use of fertilisers and pesticides from some farming practices can contribute to poor water quality. Rainfall run-off from farmland carries chemicals and faecal matter into streams and rivers. As soil is eroded, it deposits silt and the phosphates and nitrates contained within it into watercourses.

Microplastics

Microplastics are very small particles of plastic debris with a diameter of less than five millimetres. These microplastics come from a number of sources including from the breakdown of larger items of plastic litter in the environment, such as plastic packaging and water bottles and particles resulting from the breakdown of tyres. It is estimated that there are now trillions of microplastic particles in the marine environment.

Microplastics are an issue as they pose a risk to nature. They can be eaten by a wide range of animals and studies have shown the potential for this to lead to harmful effects. Scientists have estimated that unless things change there will be wide scale and potentially irreversible effects.

Industrial Discharges

Any industrial waste water discharges will now require a permit from the Environment Agency. This could be from industrial processes, waste operations or mining activities. Although current discharges are required to comply with stringent environmental standards historic discharges can continue to cause water quality issues.

Everyone Playing Their Part

The incorrect disposal of fats oils and greases, and plastic cleaning wipes and other sanitary products flushed into foul water drains is congealing into blockages that cost companies and customers in the

region of £100 million a year. This incorrect disposal of materials is adding pressures to the sewerage system that cause sewer overflows to spill more frequently.

Unavoidable Climate Change

The anticipated impacts of unavoidable climate change are likely to result in changing weather patterns that will continue to exacerbate water quality issues. Impacts on water quality of changes in rainfall amounts and intensity are already being seen. Changes are predicted to include:

- Milder, wetter winters with an increase in rainfall intensity and frequency
- Rising sea levels and increased coastal erosion
- Increase in the intensity and frequency of storms.

There is a clear link between flood risk and water quality issues in the urban environment of Plymouth and therefore increased rainfall and the intensity of that rainfall needs to be taken into account when designing solution to improve water quality.

Complexity of Water Quality Improvements

The ownership of surface water drainage features is fragmented across a range of both public and private parties, including local authorities, highway authorities, water companies, and private individuals and businesses. DEFRA has acknowledged that the powers and duties to manage drainage features are often less than clear cut and the regulation, duties and responsibilities are split across government agencies and local authorities. This makes developing solutions to complex issues more challenging.

Work to Date

Partnership Work

The Environment Agency, South West Water and the Council have been working together to seek solutions to water quality and flooding in a joined up and collaborative manner. Through the alignment of capital programmes, the partnership has been delivering work to add capacity to the infrastructure systems and planning longer term solutions.

In addition to the alignment of work programmes the Council has been working with South West Water to look at the delivery of nature-based solutions (NBS) as part of the wider programme of work to improve water quality and reduce flood risk. The NBS work is fully aligned to the NMP by seeking 'green' solutions, capturing the services nature provides, to solve water quality issues that could impact the Sound. A Memorandum of Agreement is being developed around the NBS work to drive the partnership forward.

Waterfit

WaterFit is a South West Water programme. It states it is the next stage of its environment strategy and *'will be going further and faster to protect and enhance the South West's waters for future generations, with a £330m of investment over three years and focused on protecting our 860' miles of coastline and rivers.* Waterfit has 6 pledges including nurturing healthy rivers and seas. In Plymouth the investment is set to help reduce the risk of environmental impact from the sewerage network, and to contribute towards improving bathing water quality at Plymouth Hoe. SWW have earmarked circa £20,000,000 of investment up to March 2025.

INNOVATION OPPORTUNITIES

In addition to the work already progressing the Council is working with partners to look at new ways to solve water quality challenges.

Water Breakthrough Challenge 4: Catalyst Stream

The purpose of the Catalyst Stream is to encourage new ways of working that go beyond business-as-usual innovation practices in the water sector, in particular, increasing and improving collaboration and building partnerships from within and outside the water sector. Individual entries to the Catalyst Stream can bid for funding from £150,000 to £2 million. The Council is working with South West Water and other partners to develop a bid to the catalyst stream. It will focus on nature-based solutions and new investment streams building on new natural capital investment markets.

Natural Flood Management (NFM)

In September 2023 the Environment Agency and Defra announced £25 million funding for improving flood resilience through a new NFM programme. The aim of the programme is to reduce flood risk with NFM methods in a manner which also delivers wider benefits including water quality. The Council and partners are currently developing a bid to this fund to pilot approaches in an urban environment.

SUMMARY

The importance of a high-quality natural environment with excellent water quality is essential in meeting the City vision and delivering the UK's first National Marine Park. However, the issues and challenges facing water quality are diverse and complex. To resolve all these issues will require a collaborative and innovative approach, which not only addresses current issues but also addresses future challenges.

There are however great opportunities to improve water quality alongside, reducing flood risk, enhancing places for people and nature. This paper sets out a summary of all the points, but it is a complicated and complex area of work. This is reflected in the recommendations below.

RECOMMENDATIONS

- **Recommendation**

The Growth and Infrastructure Overview and Scrutiny Committee note the content of the Water Quality Briefing Note.

- **Reason**

To note the complex nature of the challenges, issues and opportunities with improving the water quality of Plymouth Sound and the number of stakeholders engaged with this area of work.

- **Recommendation**

To establish a Select Committee in 2024 focused solely on Water Quality, inviting key stakeholders and user groups to provide evidence for consideration and review.

- **Reason**

Recognising the complexities but also the importance of improving the water quality there is a need to have a dedicated Select Committee to enable key stakeholders to present evidence and for the issues and opportunities to be thoroughly reviewed.