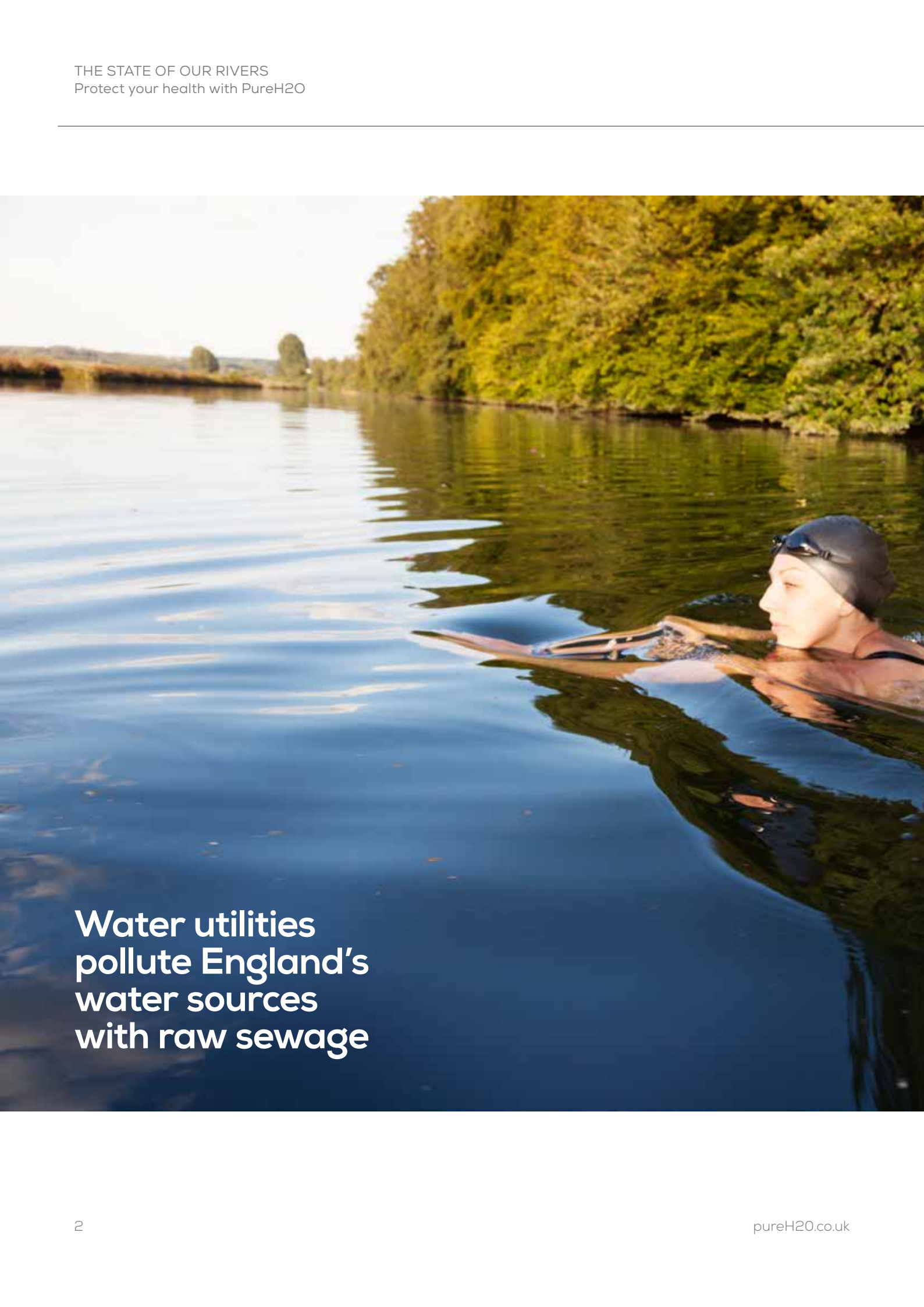


THE STATE OF OUR POLLUTED RIVERS

A woman wearing a black swim cap and goggles is swimming in a calm river. The water is dark blue and reflects the surrounding green trees on the right bank. In the distance, a bridge is visible across the river. The overall scene is peaceful and scenic.

Water utilities pollute England's water sources with raw sewage



ENGLAND'S WATER SOURCES POLLUTED BY INDUSTRY, AGRICULTURE, HOUSEHOLDS AND WATER FIRMS

Illegal raw sewage dumps into English rivers are widespread.

Release of untreated sewage through storm overflows into rivers and coastal waters should only happen after exceptional weather, and according to conditions and permits issued by the Environment Agency (EA). But an initial investigation by the EA suggests there may have been widespread and serious non-compliance with the law relating to sewage discharges into rivers and coastal waters by all 10 water firms in England. (1)

Deliberate (with or without discharge consents) or accidental release of sewage into our natural water courses on a daily basis is a long established practice that leads to the wholly unnecessary pollution of our rivers and widespread damage to the aquatic life and also to the water quality itself that is the life blood of the country.

► **"Since a child, I've always taken the opportunity to go swimming in rivers and lakes through the UK when the opportunity arose. But our rivers, the lifeblood of the country, have been used and abused by industrial and agricultural discharge and even the water industry itself for decades. And that's why, sadly, I'll not be taking a dip in the rivers and lakes of England again." – Roger Wiltshire, Managing Director PureH2O Ltd.**

WILDLIFE SUFFERS

Microorganisms use oxygen from the water course to decompose untreated sewage, which lead to reduced oxygen levels in the water, in turn leading to the death of natural aquatic life. According to the WWF's 'Flushed Away' 2017 report, 40% of rivers in the UK are polluted by sewage and 90% of sewer outflows discharge raw sewage into rivers. (1) But Water utilities have now been exposed to be breaching the regulations for sewage spillages over 1,000 times every day. (2)

But, before we lay the blame solely on the utilities, the problem is exacerbated by the population flushing away wet wipes, kitchen fats and sanitary products, which block sewers.

INVEST IN WATER INDUSTRY INFRASTRUCTURE

Such failings are the result of lack of investment in adequate infrastructure in favour of profit. This blatant disregard for our environment is unacceptable, especially in one of the most developed countries in the world with engineering capabilities to eliminate discharge completely.

The financial implications of cleaning up our water sources are huge. In 2021 Southern Water was fined £90 million for illegal raw sewage discharges into coastal waters. (3) And it cost £78 million to make just two rivers – the Teme and Leme – safe for bathers. (4)

Government is currently consulting on targets for water companies to reduce the frequency of raw sewage discharges into bathing waters by 70% by 2035, or significantly reduce harmful pathogens they contain. But a Rivers Trust spokesperson described this as too little, too late.



Nitrates in drinking water increase the risk of colorectal cancer



AGRICULTURAL POLLUTION AND HUMAN HEALTH

Even at rates below the current 'safe' levels set by the World Health Organisation (and followed by the UK Drinking Water Inspectorate), the presence of nitrates in drinking water increases the risk of developing a common form of cancer, a study finds.

Researchers at Aarhus University in Denmark carried out the largest epidemiological study of its kind (1) and found a positive correlation between long-term exposure to nitrates in drinking water and the development of colorectal cancer, one of the most common cancers in Denmark and the most frequently occurring, worldwide.

Nitrates are naturally present in soil and water at unproblematic levels – excessive levels are caused by the contamination of waterways by human activity including industrial and agricultural pollution. Nitrates are a component of agricultural fertilisers and the UK has guidelines for reducing fertiliser run-off into rivers and streams:

- ▶ **"farmers are supposed to avoid spreading on slopes, in wet weather and during winter". (2)**

But it's known that in some parts of the UK, even where river catchment areas have special conservation status:

- ▶ **"huge quantities of slurry and poultry manure are spread on farmland and... the rules and guidelines governing how this should be done are invariably broken". (3)**

Excessive levels of nitrates negatively impact the health of rivers and streams; they cause unchecked algae growth, which depletes the water of oxygen and

makes the reproduction and survival of fish, aquatic insects, wildlife and plants difficult or impossible. (4)

The risk to human health occurs because, once entering the body, excessive nitrate levels interact with normally occurring amines and amides and convert into carcinogenic N-nitroso compounds.

The World Health Organisation recommends nitrate levels of 50 mg per litre of drinking water, a standard that Denmark, EU countries and the UK authorities follow.

- ▶ **Problematically, the Aarhus study found that colorectal cancer risks are associated with "concentrations far below the current drinking water standard" (5); in people exposed to the highest concentrations found in the study (9.3 mg per litre water) a 15% greater risk of developing colorectal cancer was identified, compared to those exposed to the lowest concentrations found (1.3 mg per litre water).**

THE RESEARCHERS REPORT

- ▶ **"we found statistically significant increased risks at drinking water levels above 3.87 mg/L, well below the current drinking water standard of 50 mg/L". (6)**

As a result, Professor Torben Sigsgaard from the Department of Public Health at Aarhus University warns:

- ▶ **"the drinking water standard ought to be lower in order to protect against chronic health effects." (7)**



HOW TO PROTECT YOUR HEALTH

Clearly, current drinking water standards are not safe. But you don't need to wait for the World Health Organisation and UK water regulators to take action, you can protect your health today by installing a PureH2O tap water purifier in your home, workplace or hospitality venue.

Our technologically advanced reverse osmosis (RO) tap water purifiers remove up to 70% of nitrates and, when coupled with de-ionisation, our RODI water purification systems remove 99.99% of naturally occurring impurities and man-made contaminants including microplastics, hormones and medications, petrochemicals, lead and heavy metals.

Our RODI purifiers also remove 100% of disease-causing micro-organisms, pathogens and viruses or your complete peace of mind.

COCAINE IN RIVER THAMES HIGHLIGHTS WATER POLLUTION CONCERNS.

As Londoners' addiction to cocaine rises, water quality decreases and wildlife feels the effects. But what are the implications for human health?

A 2019 study from King's College London revealed that high concentrations of the class A drug cocaine contaminate the River Thames. Concentrations of the illicit drug in samples taken at a monitoring station near the Houses of Parliament were so high, they "lay outside of the quantifiable range", iNews reports. (1)

England and Wales have the highest drug consumption amongst young people in all of Europe. This study reveals that use of cocaine in the capital is now prevalent during the working week, whereas previously it was higher on weekends and lower during the week. In fact, iNews reports that roughly 80,000 lines of coke pollute the River Thames each day (2) and species that live in the river are paying a high price for Londoners' drug use. The research by King's College London revealed devastating effects to species in the river: "Cocaine-exposed eels appeared hyperactive... with evidence of serious injury including muscle breakdown and swelling." (3)

WHY IS COCAINE IN WATER?

Cocaine makes its way into waterways through a simple process: users urinate, flush and waste water is sent to water treatment plants. But

these plants fail to filter out cocaine and the result is widespread contamination of surface water. As our M.D. Roger Wiltshire, explains:

- ▶ **"Water utilities are failing to remove cocaine from waste water, which means our water courses are likely to see ever-increasing levels of drug residue. And, if cocaine isn't effectively removed, we can be sure that other drug residues will also be getting through."**

It's not just cocaine; anything humans ingest can make its way into our waterways, from cocaine and other illicit drugs, to prescribed medicines and hormonal treatments. Anything our washing machines flush out also makes its way there, including plastic fibres from clothing such as fleece. Human behaviour contaminates our most precious resource, water. Does this have implications for tap water? In a word, yes.

- ▶ **"Since our water supplies are in part recycled, processed water, then it follows that what goes around comes around."**
Roger Wiltshire, M.D PureH2O Ltd.

Sadly, we know that UK tap water contains a wide variety of pollutants resulting from human behaviour, as well as naturally occurring impurities. These include traces of cocaine as well as other drugs, medicines and hormones.

Plastic fibres are also present in tap water, thanks to single-use plastics pollution and the washing of man-made clothing. Pesticides and fertilisers used by the agricultural sector are also found in tap water, as well as chemicals from industry and a variety of micro-organisms including those associated with the development of Alzheimer's disease.

As Daniel Snow, the director of the Water Sciences Laboratory at the University of Nebraska, told National Geographic: "You can basically treat anything to any degree of purity, it's just about how much money you want to put into the treatment process." (4)

Just because water utilities aren't taking sufficient responsibility for removing drugs and other pollutants from our water sources – and from the drinking water that comes out of our taps – doesn't mean all these contaminants and impurities are a fait accompli you have to accept. Read on for the alternatives.

WATER FILTER OR WATER PURIFIER?

Water filters may spring to mind as your first line of defence. For limited budgets these may give a basic taste improvement. But for true water quality, a purifier is needed, as this infographic shows:



Above: comparison of tap, filtered, bottled and PureH2O pure water (total dissolved solids).

DON'T BOTHER WITH BOTTLED WATER, EITHER.

Think bottled is the answer to safe drinking water? Even if you could put to one side the devastating impact of single-use plastics production and pollution on the environment (which no-one ever should, let's face it), bottled water is a poor choice. It's even more contaminated with microplastics than tap water.

WATER PURITY IS POSSIBLE, WITH PUREH2O.

Yes, humans are having appalling effects on

the environment. Tap water and bottled water contains contaminants and impurities that may have a negative impact on human health. But safe, sustainable drinking water is not an impossible dream.

It's not even a technological conundrum. Here at PureH2O Ltd we know first hand from over 30 years' experience in the field of water purification that it is possible to remove drugs, medications, plastics, metals, pesticides, fertilisers and more from tap water. Roger Wiltshire, M.D. of PureH2O Ltd, reminds us that:

► **"For the perfect drinking water we all have the choice to treat our water at the point of use (in our homes, offices, in restaurants and hotels). No other process is as effective at removing all drug residues, and for that matter all other impurities, as the advanced patented reverse osmosis with de-ionisation (RODI) process within PureH2O RODI+ water purifiers."**

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