Report on the Drinking Water Inspectorate's Investigation into the Cryptosporidium outbreak in the Brixham area in May 2024

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Foreword

This report sets out the investigation undertaken, the findings reached, and the resulting outcome of the prosecution brought by the Drinking Water Inspectorate (the Inspectorate) against South West Water Ltd ("the company"). The proceedings arise from the cryptosporidiosis outbreak in the Brixham area, notified to the Inspectorate on 14 May 2024, which impacted up to an estimated 39,000 residents and consumers.

The Inspectorate has powers to undertake investigations for the purpose of determining whether any duty imposed upon the water undertaker has contravened the relevant sections of the Water Industry Act 1991, and to make such reports of investigations to the Secretary of State.

Information contained in this report was provided in response to the duty of the water undertaker under Water Industry Act 1991 to provide all such information to the Inspectorate, and is further complemented by investigations by the Inspectorate on site and through correspondence and interviews with relevant persons, and information from other sources and organizations who were either directly or indirectly involved in the event.

Proceedings for an offence in relation to the quality of water supplied using a water undertaker's supply system, as specified in the Water Act 2003, are undertaken by the Chief Inspector of Drinking Water. Proceedings are governed by criminal law, including all the rights of the water undertaker as a defendant.

The assessment of information, the investigation, proceedings to the Magistrates' Court and the authorship of this report were undertaken by a small team of Inspectors appointed by the Chief Inspector under their powers. All the Inspectors involved in this investigation have worked in the water industry or allied industries and water quality regulation.

The obligations of the water undertaker under Water Industry Act 1991 are to provide water that is wholesome. This means that water must not contain any parasite at a concentration or value which would constitute a potential danger to human health. On 15 May 2024, South West Water advised consumers to boil their tap water before using it for drinking and food preparation in response to the detection of the protozoan parasite, *Cryptosporidium*, in water supplied from Hillhead and Boohay service reservoirs. This report identifies the potential routes of contamination and the conclusion that if the company had followed its own procedures this event could well have been avoided.

The decision to prosecute is taken by the Chief Inspector using the criteria outlined in the Enforcement Policy of the Drinking Water Inspectorate. The criteria being the

sufficiency of evidence and the public interest factors including the impact on consumers.

My conclusion is that there was sufficient evidence based upon clear physical evidence that the water supply was unwholesome and likely to be unfit due to the presence of a pathogenic parasite identified by analytical, epidemiological and clinical evidence as being the causative agent identified as the 'Brixham strain'. The physical and analytical evidence from the site identified by the Inspectors and the empirical evidence following changes to the network, directly linked to the source of contamination which returned the supply to normality. I further concluded that there was a high public interest due to the significant number of consumers who were reporting as ill in the community and were confirmed clinically to be suffering from cryptosporidiosis.

As both the criteria of the Enforcement Policy were met, I instructed my legal team to initiate court proceedings for the offence listed under section 70 of the Water Industry Act.

The company pleaded guilty to supplying water unfit for human consumption at Exeter Magistrates' Court on 4 March 2026. Judge Smith concluded at the sentencing hearing on 2 June 2026, that the case concerned a serious failure by South West Water Limited, the statutory water undertaker for this region, which resulted in the supply of water unfit for human consumption to thousands of people within the Littlehempston water supply zone (WSZ) during the spring of 2024. For many households, basic activities such as drinking, cooking, brushing teeth, preparing infant formula, washing salads, and bathing children became sources of anxiety. The boil water notice remained in place for up to eight weeks for some households.

This report is available to all water companies, interested parties and in the public domain for wider learning.

Dr Marcus Rink OBE

Chief Inspector of Drinking Water

22 June 2026

1. Introduction to the report

1.1 The Inspectorate was established to regulate drinking water quality in England and Wales following the privatisation of the water industry in England and Wales in 1989. The Chief Inspector of Drinking Water acts on behalf of the Secretary of State for the Department of the Environment, Food and Rural Affairs in England, and on behalf of Welsh Ministers in Wales.

1.2 In May 2024, a major drinking water quality event occurred in the Brixham area of Devon, affecting up to approximately 39,000 consumers. This was due to the detection of the protozoan parasite, *Cryptosporidium*, in water supplied in part of the Littlehempston WSZ, which resulted in boil water notices being issued to consumers.

1.3 *Cryptosporidium parvum* oocysts were identified at Hillhead and Boohay service reservoir outlets, within the distribution network from the service reservoirs and at consumer properties. Genetic profiling conducted by the Cryptosporidium Reference Unit demonstrated a consistent and unique 'Brixham strain', which was identified across; water samples, samples from soil taken in the vicinity of a damaged air valve and stool samples from infected consumers. The genetic consistency established a strong causal link between environmental contamination, the distribution network, and community illness.

1.4 On 4 March 2026 at Exeter Magistrates' Court, South West Water pled guilty to the charge of supplying water unfit for human consumption between 31 March 2024 and 1 June 2024, brought by the Chief Inspector of Drinking Water under section 70 of the Water Industry Act 1991.

1.5 This document is the report of the Inspectorate's investigation into this event. It covers only those aspects relating to drinking water quality that fall within the responsibilities of the Inspectorate as the independent regulator. It does not consider matters relating to performance commitments agreed with the economic regulator (Ofwat) or financial losses suffered by businesses and matters relating to financial compensation.

2. Executive summary

2.1 *Cryptosporidium parvum* oocysts were identified at Hillhead and Boohay service reservoir outlets, within the distribution network from the service reservoirs and at consumer properties. Genetic profiling conducted by the Cryptosporidium Reference Unit demonstrated a consistent and unique 'Brixham strain' identified across: water samples, samples from soil taken in the vicinity of an air valve located in agricultural land and stool samples from infected consumers. The genetic consistency established a strong causal link between environmental contamination, the distribution network, and community illness.

2.2 This was a serious and avoidable public health incident arising from systemic failures in asset inspection, governance, and risk management. The evidence demonstrates that:

- Contaminated water entered the supply via a compromised network asset.
- The company failed to implement known and documented control measures.
- The event had a significant impact on consumers and communities. There were confirmed and probable cases of cryptosporidiosis associated with the outbreak, widespread consumer concern, disruption to households, impacts on local businesses and effects on school attendance and education. The duration of the restrictions for some consumers materially increased the scale of that impact.
- The company failed to follow prior regulatory warnings on air valves and inspection of high-risk water users.

2.3 The Inspectorate, as regulator of drinking water quality in England and Wales, was notified of the event during the afternoon of 14 May 2024.

2.4 The company became aware of a number of reported cryptosporidiosis cases in the Brixham area on 13 May 2024 following contact from the UKHSA, at the same time a small number of consumers had also contacted the company from the area reporting illness. Following a social media post on the evening of 13 May 2024 there was an increase in consumers from the Brixham area contacting the company on 14 May 2024 reporting illness.

2.5 An Outbreak Control Team (OCT) was established on the afternoon of 14 May 2024, by the UKHSA. Teams reporting to the OCT included; the National Cryptosporidium Reference Unit, local authorities in Devon, medical centres in Devon and South West Water.

2.6 On 15 May 2024, following sampling and analysis, *Cryptosporidium* oocysts were detected in samples collected from a service reservoir and a consumer property in the Littlehempston WSZ.

2.7 On 15 May 2024, approximately 39,000 consumers resident in the Brixham area were advised by their water company, South West Water, to boil their tap water before

using it for drinking and food preparation. This was in response to the detection of the protozoan parasite, *Cryptosporidium*, in part of the Littlehempston WSZ, which serves these households.

2.8 As *Cryptosporidium* monitoring at Alston service reservoir had not detected any *Cryptosporidium* oocysts, the boil water notice for consumers served by Alston service reservoir was lifted on 18 May 2024. The boil water notice remained in place for 5,472 consumers fed from the Hillhead and Boohay service reservoirs.

2.9 The company undertook external and internal inspections of both Hillhead and Boohay service reservoirs in May 2024. The company also cleaned both service reservoirs. No issues were noted at either service reservoir.

2.10 The company flushed at 27 points on its mains and ice-pigged (which is to physically scrub) the full network fed off Hillhead and Boohay service reservoirs. This was completed on 3 July 2024. The company also installed ultra violet (UV) disinfection (which inactivates *Cryptosporidium*) and 1 µm filtration at the inlets to Hillhead and Boohay service reservoirs. Commissioning of the UV at both service reservoirs was completed by 11 June 2024 and the 1 µm filtration units at the service reservoirs were both commissioned by 1 June 2024. 1 µm filtration units were also installed within the network. This was a significant task for the company, which involved working at pace to procure, design and undertake the required engineering works to be able to return the network back to a state where it could confident that the water would remain wholesome and the restriction of use could be lifted.

2.11 As the work progressed, and contaminated water was removed from the distribution network, the boil water notice was lifted in phases, until 12 July 2024 when it was lifted for all consumers.

2.12 The Inspectorate's investigation involved scrutiny of a significant amount of data and information provided by the company to understand the cause of the event and an assessment of how the company managed the event, the actions taken by the company to restore wholesome supplies of water and actions taken by the company to prevent a recurrence. In accordance with the Inspectorate's duties, consideration was given to whether the company may have committed any offences under the Water Industry Act 1991 and The Water Supply (Water Quality) Regulations 2016 (as amended).

2.13 South West Water provided a number of reports and other relevant information relating to the event to the Inspectorate between May 2024 and June 2025, in accordance with its duties under the Water Industry Act 1991.

2.14 The Inspectorate concluded that the event was caused by contamination of the mains water supply with *Cryptosporidium*. The evidence gathered by the Inspectorate demonstrated serious weaknesses in preventive controls, asset protection and risk management.

2.15 The event had a significant impact on consumers and communities. There were confirmed and probable cases (gastric illness) of cryptosporidiosis associated with the outbreak, widespread consumer concern, disruption to households, impacts on local businesses and effects on school attendance and education. The duration of the restrictions for some consumers materially increased the scale of that impact, and the event has had a lasting impact on consumer confidence of the drinking water supply.

2.16 The Inspectorate's investigation found that *Cryptosporidium* from animal faeces entered the drinking water supply network on agricultural land likely via an exposed and faulty air valve covered in mud. A later inspection of the air valve following its removal identified a faulty internal rolling seal component. The rolling sealing assembly was torn which is the main connecting point between the sealing point and the air valve float.

2.17 Soil samples taken in the vicinity of the air valve contained *Cryptosporidium* oocysts whose DNA matched the 'Brixham strain' of the illness.

2.18 A second potential point of ingress was identified from a cross connection between a private water supply and the public mains supply, also on the main between Alston and Hillhead service reservoirs. Samples collected from the private water supply did not identify the presence of *Cryptosporidium*.

2.19 The Inspectorate considers that this event carries important lessons both for South West Water and for the wider water industry in England and Wales. In particular, it demonstrates the need for water suppliers to maintain a rigorous risk-based approach to the inspection and maintenance of network assets that could permit ingress, including air valves, and to exercise effective control over high-risk premises where backflow or cross connection may compromise public supplies. It also underlines the importance of having robust contingency arrangements that can be mobilised quickly to protect public health and minimise consumer harm when wholesome supplies are compromised.

3. Drinking water quality legislation in England and the role of the Inspectorate

3.1 The quality of drinking water in England and Wales is governed by the Water Supply (Water Quality) Regulations. At the time of the event the relevant legislation for public water supplies in England was The Water Supply (Water Quality) Regulations 2016[1] as amended (referred to throughout as the Regulations). The Inspectorate is responsible for enforcing the requirements of these Regulations in England.

3.2 Regulation 4 of the Regulations requires that water supplied to consumers for domestic purposes, which includes drinking, washing and food preparation, must be wholesome. This means that the water supply must not contain any micro-organism or parasite at a concentration or value that would constitute a potential danger to human health. Furthermore, the Regulations require that where a water company has reasonable grounds for believing that any organism or substance is present such that the water supply is likely to be unwholesome, the company must investigate the cause and extent of the failure.

3.3 Regulation 26 requires water companies to ensure that water supplied to consumers has been adequately treated and disinfected. Disinfection is a treatment process used to ensure that water supplies are safe to drink by rendering harmless any micro-organisms that may be present that could cause a risk to human health. The Regulations make it an offence if a water company does not comply with this requirement.

3.4 Water companies are required by regulation 27 to carry out a risk assessment of all their water supply systems and to identify any potential risks to health which require additional control measures, and take remedial action accordingly. A water company must report these risks to the Inspectorate, who has a duty under regulation 28 to serve a formal notice or notices to the company requiring it to take remedial action to address the identified risks.

3.5 Regulation 35 requires water companies to notify the Inspectorate of any event which gives rise, or is likely to give rise, to a significant risk to human health. The Inspectorate then has a duty to investigate the event and, amongst other things, to establish whether any offences may have been committed under either the Regulations and/or the Water Industry Act 1991. The Inspectorate also makes an assessment of the appropriateness of steps taken to protect public health, and, where necessary, uses its powers of enforcement to ensure that the company takes steps to prevent a recurrence. Companies are also required to notify health professionals in UKHSA and local authorities within the affected area.

[1] The Water Supply (Water Quality) Regulations 2016, SI 2016/614 – amended in 2016.

3.6 Section 70 of the Water Industry Act 1991[2] creates an offence of supplying water that is unfit for human consumption. Demonstration of due diligence to prevent the event or reduce the impact can be a defence for companies.

4. Cryptosporidium

4.1 *Cryptosporidium* is a type of protozoan parasite found in humans and many other species of animals, including cattle and sheep, other mammals, birds, fish and reptiles. Some species cause gastric illness, known as cryptosporidiosis, in humans. It occurs in the environment in the form of tiny resistant bodies called oocysts, which are excreted by infected humans and animals. In the United Kingdom, the first recorded outbreak of waterborne human cryptosporidiosis occurred in Ayrshire in 1988[3].

4.2 There is a background level of human illness in most communities associated with sources other than drinking water, for example, swimming pools and direct contact with farm animals. The incubation period may be anything from one to two days to three weeks[4].

4.3 Oocysts can be present in raw water used for drinking water supplies and water companies must have in place treatment processes designed to reduce the concentration to a sufficiently low level, and/or to inactivate them, so that they are not harmful to health.

4.4 Processes that are designed to remove particulate material from raw water are usually effective at reducing concentrations of oocysts to very low levels that are not a risk to human health.

4.5 In the UK, water is normally disinfected with chlorine before being supplied to consumers, to ensure that microbial pathogens are inactivated. Chlorine is not an effective disinfectant against *Cryptosporidium* and, in England and Wales, many water supplies are treated with ultra violet (UV) light as a safeguard against *Cryptosporidium*, since UV light is known to be effective for the inactivation of oocysts. UV light is effective for the inactivation of *Cryptosporidium* as it disrupts the genetic material and the organism cannot replicate in the host.

4.6 It is also possible for *Cryptosporidium* to enter the water supply after treatment through poorly maintained assets, such as service reservoirs and air valves.

4.7 Not all species of *Cryptosporidium* are pathogenic to humans. The most commonly found species that are known to be harmful to humans are *C.hominis*, *C.parvum* and *C.ubiquitum*. The last of these is not as virulent (infectious) in humans as the first two.

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[2] The Water Industry Act 1991 as amended by the Water Act 2003 and the Water Act 2014.

[3] An outbreak of waterborne cryptosporidiosis caused by post-treatment contamination, H. V. Smith et al, J of Epidemiology and Infection, vol. 103, 1989

[4] Cryptosporidium in Water Supplies, Report of the Group of Experts, Chairman Sir John Badenoch, July 1990.

5. Previous Cryptosporidium water quality events

5.1 *Cryptosporidium* has been associated with a number of waterborne outbreaks of human illness, and there have been a number of cases in England and Wales which have been investigated by the Inspectorate.

5.2 There is no recognised safe limit for the concentration of oocysts in water supplies and there is no regulatory limit for *Cryptosporidium* oocysts in drinking water. The following examples relate to separate *Cryptosporidium* events investigated by the Inspectorate:

- The Inspectorate prosecuted United Utilities Ltd under section 70 of the Water Industry Act 1991, for supplying water unfit for human consumption from Franklaw water treatment works[5] due to contamination by *Cryptosporidium* in 2015. 712,000 consumers were advised to boil their water following the detection of an unusual concentration of *Cryptosporidium* at the works. The boil water notice was in place for up to one month for some consumers. No definitive cause was found for the contamination. Public Health England reported that there were no identified cases of cryptosporidiosis illness in the community that were likely to be associated with the water supply. The Inspectorate concluded that the event was caused by a number of significant failings in the operation of Franklaw works and inadequate risk assessment of major operational changes that took place at Franklaw immediately before *Cryptosporidium* was detected in the supply. A number of recommendations were made by the Inspectorate following the event. The company pled guilty and were ordered to pay a penalty of £300,000 plus costs.

- The Inspectorate prosecuted Bournemouth Water under section 70 of the Water Industry Act 1991, for supplying water unfit for human consumption from Alderney water treatment works due to contamination by *Cryptosporidium* in 2013. In 2013, an outbreak of cryptosporidiosis in the community was linked to water supplies from Alderney works, near Bournemouth. There were 29 confirmed cases of cryptosporidiosis in a population of approximately 237,000 people served by this treatment works. *C.hominis* was detected in the water supplies. The company pled guilty and were fined £80,000 plus costs.

- Following the detection of *Cryptosporidium* in supplies to Northamptonshire from Pitsford works in 2008, there were 22 confirmed cases of cryptosporidiosis in a population served of approximately 258,000 consumers. *C.cuniculus* (not previously identified as a human pathogen in the UK as it is normally associated with rabbits) was identified in the water supplied to consumers. The

[5] Report of the Drinking Water Inspectorate's Investigation into the Cryptosporidium Contamination of Franklaw treatment works in August 2015.

concentration of oocysts observed in the water supply averaged around two oocysts per 10 litres (10 L) at the start of the event, with a maximum concentration of 17 oocysts per 10 L. The species of *Cryptosporidium* identified was not known to be a human pathogen, but these high concentrations caused cases of illness.

- The Inspectorate prosecuted Dŵr Cymru Welsh Water under section 70 of the Water Industry Act 1991, for supplying water unfit for human consumption from Cwellyn water treatment works due to contamination by *Cryptosporidium* in 2005. There were 218 confirmed cases of cryptosporidiosis due to *C. hominis*. 70,000 consumers were advised to boil their water. Some consumers remained on a boil water notice for approximately two months. The cause was found to be deterioration of the raw water quality of Llyn Cwellyn which supplied Cwellyn works and inadequate monitoring which led to the company not recognising the deterioration and the works not being capable of removing the *Cryptosporidium.* The company pled guilty and were fined £60,000 plus costs.

5.3 The variable levels of *Cryptosporidium* oocysts detected in the water supplies that caused these outbreaks of illness illustrate the difficulties involved with establishing a safe limit for *Cryptosporidium* in drinking water. Water companies have a duty to ensure that water supplied to consumers is wholesome at all times and, therefore, should ensure that the regulation 27 risk assessments for their supply systems are sufficiently thorough to identify all possible sources of *Cryptosporidium* in their supply systems, and to ensure that water treatment processes and protection of water supply assets from contamination are sufficient to effectively mitigate the risks to human health. Any unusual or unexpected occurrence of oocysts at any point in a supply system, whether it be in raw water, in water leaving a treatment works or water in the supply network, should prompt an immediate investigation by the water company with appropriate precautionary measures implemented to protect public health.

5.4 If *Cryptosporidium* is present in water supplies because of contamination or a breakdown in treatment, then alongside taking steps to restore wholesome water supplies as quickly as possible, a water company's emergency response is likely to include advising consumers to boil the water before using it for drinking and food preparation, because boiling is an effective means of inactivating oocysts.

5.5 To sample for *Cryptosporidium*, water is passed through a sampling apparatus that includes a specialised filter designed to capture *Cryptosporidium* oocysts, along with a meter to record the total volume of water that has passed through the filter. This approach enables continuous sampling rather than an instantaneous measurement, ensuring that a sufficiently large volume of water passes through the filter to obtain a representative sample. After the required sampling period or once the target volume has been reached, the filter is removed for analysis. The oocysts and any other trapped particulate matter are then eluted from the filter and concentrated into a pellet by centrifugation. The oocysts are then separated from the other particulate

matter using para-magnetic beads coated with specific antibodies which bind to the *Cryptosporidium* oocysts. The oocysts are then stained sequentially with stains specific for *Cryptosporidium* oocysts and examined microscopically. This method will detect the number of *Cryptosporidium* oocysts in a known volume of water but does not provide definitive information regarding the speciation or strain of the *Cryptosporidium* present. The method for the isolation, identification and enumeration of *Cryptosporidium* oocysts is a bluebook method and the bone fide method developed and produced by the Standing Committee of Analysts (SCA) and is United Kingdom Accreditation Services (UKAS) accredited[6].

5.6 There is no known reliable laboratory test for the viability of oocysts. This means that when oocysts are detected and speciated, experts are unable to say whether the oocysts are infective or not.

5.7 The standard laboratory method used to identify *Cryptosporidium* in water will indicate whether *Cryptosporidium* is present or absent. In order to identify the specific species of *Cryptosporidium* present, water companies must arrange for further tests to be carried out at a specialist laboratory. Therefore, until these additional tests are carried out, it is prudent for a water company to assume that any *Cryptosporidium* oocysts present might be pathogenic to humans and take appropriate precautionary measures to protect public health. Moreover, even where the species of *Cryptosporidium* identified is not subsequently identified to be a human pathogen, the presence of any *Cryptosporidium* oocysts could indicate a potential risk to health because in most circumstances the unidentified presence of a pathogenic species cannot be ruled out.

5.8 In addition, the Cryptosporidium Reference Unit can subtype *Cryptosporidium* species to provide a 'DNA fingerprint'. This fingerprint can then be utilised to link *Cryptosporidium* cases/samples, alongside epidemiological evidence and environmental inspections.

5.9 A common way to compare *Cryptosporidium* samples has been to look at a gene called *gp60*. This can help show whether cases may be linked in an outbreak. Although this method remains useful in outbreak investigations it does not always give sufficient detail. Therefore, the Cryptosporidium Reference Unit developed and uses a method based on multilocus variable number of tandem repeats analysis (MLVA) for *Cryptosporidium parvum*. MLVA compares several parts of an organism's DNA to build a more detailed profile of the sample. Using both methods the Cryptosporidium Reference Unit assess whether cases may be connected. If samples have the same MLVA profiles are compared and samples that have the same MLVA profile are called a MLVA cluster.

5.10 In 1989, a group of experts on *Cryptosporidium* in water supplies, chaired initially by Sir John Badenoch and later by Professor Ian Bouchier, was established in response to

[6] The Microbiology of Drinking Water (2016) - Part 14 - Methods for the isolation, identification and enumeration of Cryptosporidium oocysts and Giardia oocysts.

a waterborne outbreak of cryptosporidiosis in Swindon and Oxfordshire. This expert group published three reports in 1990[7], 1995[8]and 1998[9]. The purpose of these reports was to set out what is known about the organism, its occurrence in the environment and its importance as a human pathogen. These reports made recommendations covering water treatment, catchment protection, asset protection, management of outbreaks, responding to the presence of oocysts in water supplies, emergency planning, sampling and laboratory analysis. These recommendations remain the bench mark of good practice for managing risks associated with *Cryptosporidium* in water supplies, and since 1990 the water industry in England and Wales has invested heavily in improvements to water treatment works in response to recommendations made in these reports**.**

6. The Brixham *Cryptosporidium* Event

Summary of the detection of *Cryptosporidium* and the issuing of boil water notice in the Brixham area

This section of the report sets out the sequence of events involving South West Water advising up to 39,000 residents in the Brixham area to boil their tap water before consumption or using it for food preparation.

6.1 On 13 May 2024 at 15:47, South West Water was contacted by the UKHSA reporting eight confirmed cases of cryptosporidiosis in the Torbay area. In addition, between 10:42 and 16:08, five consumers from the TQ5 postcode area (Brixham, Torbay) contacted the company reporting illness.

6.2 At approximately 18:00 on 13 May 2024, as part of the company's investigation into the report from UKHSA regarding the cryptosporidiosis cases, a *Cryptosporidium* monitoring rig was fitted to the outlet sample point of Hillhead service reservoir.

6.3 A social media post was made at 20:43 on 13 May 2024 regarding the cryptosporidiosis/illness in the Brixham area. Following the post, seven further consumer contacts from the TQ5 area were received by the company, that evening, reporting illness.

6.4 On 14 May 2024, between 07:06 and 20:22, the company received further 126 consumer contacts relating to illness in the TQ5 and TQ4 areas.

6.5 At 13:00 on 14 May 2024, the company issued the following statement on its website in the 'In Your Area' section, '*We want to let our customers know that we are aware of posts on social media regarding the quality of drinking water in the Brixham and Paignton area. We would like to reassure you that you can continue to use your water*

[7] *Cryptosporidium* in Water Supplies, Chairman Sir John Badenoch, December 1990.

[8] *Cryptosporidium* in Water Supplies, Second Report of the Group of Experts, Chairman Sir John Badenoch, October 1995.

[9] *Cryptosporidium* in Water Supplies, Third Report of the Group of Experts, Chairman Professor Ian Bouchier, November 1998.

supply as normal. We always carefully monitor and test our drinking water supplies and all recent water samples and test results have come back clear.'

6.6 In the afternoon of the 14 May 2024, a *cryptosporidium* monitoring rig was also fitted to a consumer property in the Higher Brixham area.

6.7 On 15 May 2024, between 04:00 and 06:00, the South West Water laboratory manager reported a provisional positive *Cryptosporidium* result for the Hillhead service reservoir outlet sample and a provisional positive *Cryptosporidium* result for the sample from the property in the Higher Brixham area. The final results were reported as 0.0143 oocysts per litre (14 *Cryptosporidium* oocysts and 16 *Cryptosporidium*-like bodies) and 0.0322 oocysts per litre (seven *Cryptosporidium* oocysts and seven *Cryptosporidium*-like bodies), respectively. Filters are analysed at the company's laboratory where an extraction process is carried out in accordance with the standard published laboratory method.

6.8 On 15 May 2024, between 09:00 and 10:00, the company issued boil water notice for 16,221 properties (approximately 39,000 consumers) supplied from the Alston, Hillhead and Boohay service reservoirs.

6.9 *Cryptosporidium* samples taken from Alston service reservoir and the network fed from the service reservoir on 15, 16 and 17 May 2024 reported no *Cryptosporidium* oocyst detections. The boil water notice for consumers served by Alston service reservoir was lifted on 18 May 2024.

6.10 The boil water notice remained in place for 2,280 properties (approximately 5,472 consumers). The company sub-divided the remaining boil water notice area into zones. Following a number of interventions/actions by the company the boil water notice was lifted sequentially area by area. The last boil water notice was lifted, which was for four properties supplied from Hillhead service reservoir, on 12 July 2024.

6.11 The company set up the first bottled water station on 15 May 2024 at 20:00. A second bottled water station was in place by 10:00 on 16 May 2024. A third bottled water station was opened at 10:00 on 17 May 2024. The company commenced bottled water deliveries for vulnerable consumers on 15 May 2024. On 22 May 2024, the company started delivering bottled water to all properties that remained on boil water notice, following the lifting of the boil water advice to the Alston area.

6.12 There were 143 laboratory confirmed cryptosporidiosis cases reported for this event, of which 126 were the 'Brixham strain'. The reminder were confirmed cases but were not typed[10]. Additionally, there were also many consumers which were symptomatic of a gastrointestinal infection. 390 consumers contacted the company between 13 May 2024 and 12 June 2024 reporting illness.

[10] UKHSA – Cryptosporidium data 2015 to 2024, updated 26 June 2025

6.13 No taste and odour contacts were received by the company for the affected area in the two months prior to the first reports of illness.

6.14 UKHSA has undertaken an epidemiological study, and the supported conclusion will be scientifically peer reviewed prior to publication later this year.

7. South West Water's Investigation

Overview of the supply system

7.1 The Brixham area is located in the Littlehempston water supply zone (ZPL9). Littlehempston water treatment works pumps treated water to Alston service reservoir, from Alston service reservoir water is then pumped to Hillhead service reservoir and from Hillhead service reservoir water gravitates to Boohay service reservoir. Alston service reservoir supplies the Churston and Lower West Brixham area, Hillhead service reservoir supplies the Hillhead and Upper Brixham areas and Boohay service reservoir supplies the Kingswear area.

Water Treatment Works Review

7.2 The company undertook a review of the *Cryptosporidium monitoring* data and the raw water challenge for the supplying water treatment works, for the four weeks preceding the event. The review noted no *Cryptosporidium* oocysts in the treated water for the period 1 April to 31 May 2024 (27 samples) and indicated that the raw water challenge had been low across the same time period. Six raw water *Cryptosporidium* samples were taken between 1 April and 31 May 2024 noting that low levels of *Cryptosporidium* oocysts were detected on two of the samples and were reported as 0.1 oocysts per litre and 0.2 oocysts per litre for samples taken on the 10 and 21 May 2024, respectively. The company also reviewed through-works turbidity trends, which were reported to be satisfactory. On the basis of this review, the company concluded that the supplying treatment works was unlikely to have been the source of the *Cryptosporidium* contamination.

Network Review

7.3 The company reviewed network operations over the four-week period preceding the event and identified no burst mains, reactive repairs, or planned network interventions that could have affected hydraulic conditions or introduced a contamination risk within the distribution system.

7.4 South West Water reviewed microbiological water quality data collected from the network prior to the reports of illness which did not indicate any risk of contamination. Other microbiological indicators are susceptible to chlorine so the absence of these did not indicate the presence of *Cryptosporidium*.

7.5 South West Water also undertook enhanced sampling for microbiological parameters in the supply network, from service reservoirs and consumer properties. The company

noted three Enterococci on the outlet of Hillhead service reservoir on 16 May 2024 and 24 Enterococci on 29 May 2024 from a sample from a consumer property.

7.6 Following the initial detection of *Cryptosporidium* oocysts on 15 May 2024 from Hillhead service reservoir and a consumer property, South West Water initiated further sampling for *Cryptosporidium* at Hillhead service reservoir outlet and inlet, Boohay service reservoir outlet and inlet, Alston service reservoir and from within the network. South West Water regularly published the results on their website during the course of the event.

7.7 South West Water CCTV inspected part of the main between Alston and Hillhead service reservoirs, with no issues noted.

Air Valve

7.8 Air valves are hydromechanical devices which are designed to release trapped air during the filling of a pipe with water. Air valves will also ensure air is drawn in when a pipe is drained in order to prevent the pipe from collapsing due to negative pressure/vacuum formation.

7.9 The inlet main to Hillhead service reservoir receives a pumped supply from Alston service reservoir, therefore the main periodically will fill and drain when the pumps start/stop. There are four air valves located on this section of main, which were installed in 2009.

7.10 On 15 May 2024, South West Water undertook a survey of the air valves on the main between Alston and Hillhead service reservoirs. At 15:40, the company discovered that an air valve on the main was buried and also noted bubbling water. The company dug out the air valve and noted a suction sound. The metal cover, the metal frame for the cover and sections of the concrete chamber were noted to be missing. The company isolated the air valve from the main at 16:50. No issues were identified with the other air valves/chambers on the same main. The company also noted that cattle and sheep had been grazing in the field close to the buried air valve chamber (see figures1 – 4).

Figure 1 – Air valve chamber as found


Figure 2 – close up of air valve location

Figure 3 – Buried air valve

Figure 4 – Chamber dug out

7.11 South West Water could last demonstrate that the air valve had been inspected in 2011.

7.12 The three other air valves on the same section of main between Alston and Hillhead service reservoirs were found to be in good condition.

Private Water Supply - Cross Connection

7.13 A private supply cross-connection occurs when a private water source (for example borehole, well) is physically linked to a public mains supply, creating a potentially high-risk scenario for contamination, depending on the hydraulic conditions on each side of the supplies. For example, backflow can occur into the public mains network if there is a pressure deferential with the pressure greater on the private supply than in the public mains network.

7.14 On 29 May 2024, South West Water undertook a water fittings inspection at a farm located on the main between Alston and Hillhead service reservoirs and identified a cross connection between the farm's private water supply (borehole) and its mains water supply. The farmer was informed that this arrangement constituted a contravention of The Water Supply (Water Fittings) Regulations 1999 and a contravention notice was issued. The cross connection was disconnected the same day. On 2 June 2024, the company installed a double check valve at the mains connection to the farm. On 3 June 2024, a further cross connection between the farm's private water supply (borehole) and the farm's mains supply was identified. A further contravention notice was served, and the cross connection was disconnected the same day.

7.15 The private supply borehole has UV treatment. No *Cryptosporidium* was detected for large volume samples taken by South West Water pre and post UV treatment from the borehole supply.

7.16 The private supply at the farm also supplied a number of troughs and taps.

8. The Drinking Water Inspectorate's Investigation

The Drinking Water Inspectorate's main statutory duties

8.1 The Inspectorate was established by Parliament in 1990 to provide independent assurance that the privatised water industry in England and Wales delivered safe, clean drinking water to consumers. The two main strategic objectives of the Inspectorate are: that water suppliers deliver water that is safe and clean; and that consumers have confidence in their drinking water.

8.2 The regulatory framework for water supplies in England and Wales, including the powers and duties under which the Inspectorate operates and the duties of water suppliers, is established in legislation. The Chief Inspector of Drinking Water is appointed by the Secretary of State for Environment, Food and Rural Affairs, and Welsh Ministers, and acts on their behalf. Certain powers are also vested directly in the Chief Inspector which ensure clear independence in the Inspectorate's work. In addition to the Inspectorate's regulatory role, the Chief Inspector and his Inspectors are the appointed technical advisers to the Secretary of State and Welsh Ministers on all drinking water quality matters.

8.3 The primary legislation setting out our functions and duties is contained in the Water Industry Act 1991 (the Act) (as amended by the Water Act 2003 and the Water Act 2014)[2]. Water supply matters are also devolved to the Welsh Government by means of the Government of Wales Act 1998.

8.4 The Water Supply (Water Quality) Regulations 2016[3] (the Regulations) made under the Water Industry Act 1991 set out the regulatory requirements for the quality of public drinking water supplies in England.

8.5 The provisions in section 68 of the Act (concerning enforcement) have been formally delegated to the Chief Inspector by Ministers. The provisions in section 70 of the Act (concerning proceedings against undertakers and others who supply water unfit for human consumption) are vested directly in the Chief Inspector. Responsibility for supporting Ministers in some other requirements of the Act is shared between the Inspectorate and policy officials in the Welsh Government and Defra.

8.6 Companies are required under the provisions of regulation 35(6) to notify the Inspectorate of any event which is giving rise to, or is likely to give rise to, a significant risk to human health. The company must also notify every appropriate local authority and UK Health Protection Agency (UKHSA).

Actions taken by the Inspectorate

8.7 Inspectors are experienced professionals with strong technical, scientific or engineering backgrounds, most of whom have experience of working in the water industry or allied industries. The work requires a high level of expertise in all aspects of drinking water supply, the interpretation of law, fair and proportionate enforcement of legal requirements and the provision of informed advice and guidance to all levels of industry, stakeholders and government.

8.8 As required by Water Industry (Suppliers' Information) Direction 2024 which supplements the requirements of regulation 35, the company provided a number of written reports to the Inspectorate about the event including interim and final reports, the outcome of the company's investigations into the root cause, or causes, the steps the company has taken to prevent a recurrence in the Brixham area. The Inspectorate has investigated the event through reviewing data and information provided by the company, visiting the affected area and taking witness statements and collecting exhibits.

8.9 The company submitted a 3-day report (interim) on 17 May 2024 and a 20-day report (final) on 12 June 2024. On reviewing each report, the Inspectorate responded with a request for a substantial amount of additional information required to enable completion of the investigation. This process involved numerous exchanges of emails, and the provision of follow-up information by South West Water, which the company had a duty to provide under the powers granted to Inspectors under section 86(3) of the Water Industry Act 1991.

8.10 The Inspectorate was represented on, and participated in, meetings with the Operational Control Team (OCT).

8.11 The Inspectorate's communications team dealt with a significant number of enquiries from concerned members of the general public, press and media and liaised with Defra's press office and the Secretary of State's private office to ensure that media communications were consistent and appropriate. Written statements were issued from time to time in response to media requests for statements.

8.12 The Inspectorate's investigation involved scrutiny of a significant amount of data and information provided by the company to understand the cause of the event and an assessment of how the company managed the event, the actions taken by the company to restore wholesome supplies of water and actions taken by the company to prevent a recurrence. In accordance with the Inspectorate's duties, consideration was given to whether the company may have committed any offences under the Water Industry Act 1991 and the Water Supply (Water Quality) Regulations.

8.13 A Principal Inspector and an Inspector visited Hillhead service reservoir on 16, 17, 18 and 21 May 2024. As part of the visit the Inspectors inspected the air valve and chamber, took soil samples from the area around the air valve chamber, observed the

internal service reservoir inspections undertaken by the company at Hillhead service reservoirs and collected witness statements.

8.14 The soil samples taken from the area around the air valve chamber were sent to the Moredun Research Institute for processing to extract any *Cryptosporidium*. The extracted samples were then sent to the Cryptosporidium Reference Unit for analysis to genetically type the *Cryptosporidium*. The genetic typing was undertaken by Multiple-locus variable-number tandem repeat analysis (MLVA). This typing can then be utilised to link *Cryptosporidium* cases/samples, alongside epidemiological evidence and environmental inspections.

8.15 *Cryptosporidium* samples taken from the water supply and from consumer's stool samples were also sent to the Cryptosporidium Reference Unit for analysis to genetically type the *Cryptosporidium*.

8.16 The *Cryptosporidium* genetic typing identified a *Cryptosporidium* strain unique to this outbreak which was named the 'Brixham Strain'. The strain was found in one of the collected soil samples, water samples and consumer stool samples.

8.17 The Inspectorate sent the air valve to the manufacturer for inspection and testing. The internal rolling sealing assembly was torn which is the main connecting point between the sealing point and the air valve float. Dirt was seen on the rolling seal assembly. The rolling seal is a critical component which seals the air valve.

8.18 The Inspectorate engaged an independent expert to undertake a water fittings inspection at a farm, to seek to identify any potential contamination risks to South West Water's supply with respect to backflow from the farm's private water supply (borehole).

8.19 The Inspectorate appointed an independent expert witness to provide a written opinion on the risks associated with mains contamination from the air valve and private water supply.

8.20 The Inspectorate sent questionnaires to approximately 300 consumers who were affected by the event to gain an understanding of the impact on consumers, consumers' knowledge of the boil water notice, how the company communicated with consumers, and any concerns they had about the handling of the event. Witness statements were taken from 22 consumers. All the consumers described symptoms of cryptosporidiosis (including diarrhoea, stomach cramps, sickness and dizziness) and the negative impact this has had on them, including in terms of work, school, businesses and socially. Consumers were also critical of their experience of communications from South West Water. Consumers who reside in the area (some statements were taken from visitors to the area) also state that they now have a lack of trust/confidence in their water supply and in some cases are still boiling water or using bottled water for drinking and brushing teeth. A number of consumers also explained that the communication from the company was poor.

8.21 In some cases, victims report a lasting impact from the outbreak: *"It has truly devastated and changed our lives".* The incident had a major impact on education in the area and more severely affected disadvantaged children, *"The Cryptosporidium incident had a very clear negative impact on the exam outcomes for our young people"*. The incident significantly undermined consumers trust and confidence in the supply of clean drinking water, with many continuing to use bottled water as opposed to tap water after the incident.

8.22 Witness statements were also taken from South West Water employees, the Cryptosporidium Reference Unit, the Moredun Research Institute and the air valve manufacturer.

8.23 An interview under caution was undertaken with a South West Water managing director on 8 November 2024.

8.24 The Inspectorate undertook an industry wide audit with respect to the inspection and maintenance of air valve, which included South West Water. The company was served with an 'Air Valve Risk Management Improvement' Notice SWB-2025-00002.

Previous Recommendation to South West Water

8.25 In 2020, the Inspectorate undertook an audit of three service reservoirs in the South West Water operating area. As part of the audit assessment, the following recommendation was made, *'The company confirmed that there is no routine inspection frequency for air valves and instead they are inspected on an ad-hoc basis in response to operational events, visible leaks, or aerated water contacts. We conclude that this reactive approach introduces the potential for uncontrolled risk of ingress into the supply network and subsequent supply of unwholesome water to consumers. Therefore, we recommend (reference: 2020/0520) that the company implements a regular programme of air valve inspections using a risk-based approach as outlined in paragraph 8.1 in the Principles of Water supply Hygiene to reduce uncontrolled risks of ingress into the supply network.'* South West Water's response to the recommendation was, *'The company has written a new air valve policy which describes our risk-based programme of air valve inspections.*' The company included a copy of the policy in the response to the recommendation. The company policy included a risk-based matrix to determine air valve inspection frequencies.

8.26 A recommendation is one of the regulatory enforcement options available to the Inspectorate, as part of a tiered approach to enforcement as set out in the Inspectorate's Enforcement Policy[11]. Where there is or has been a breach of regulation, or a likely breach and the Inspectorate are unable to conclude whether the breach is likely to occur or reoccur, the Inspectorate can make a written recommendation requiring the person or company to address the deficiency. Each recommendation is given a unique reference number. In turn, a written response to a recommendation is required from the company. A recommendation is issued to

[11] DWI Enforcement Policy – Drinking Water Quality Regulation

secure required improvements to prevent a breach, prevent a potential breach or to prevent a reoccurrence of a breach of regulation.

8.27 In response to information requests by the Inspectorate as part of the investigation of this event it was noted that the policy and a programme of air valve inspections had not been implemented. In addition, key failures included: no routine air valve inspection regime was in place, there was no central record of air valve inspections, the air valve chamber that was found damaged was incorrectly categorised as 'reactive only' and there was no documentation for inspection of the damaged air valve chamber since 2011.

The Principles of Water Supply Hygiene

8.28 The Principles of Water Supply Hygiene[12] is a document produced in 2015 and updated in 2017 by the Inspectorate, WaterUK and the Royal Society for Public Health (RSPH). The document states:

WaterUK's members agree to the following commitments in the pursuit delivering a secure supply of safe, wholesome drinking water.

- To ensure all involved in the treatment and supply of drinking water recognise the direct link between hygienic practices and public health;
- To ensure that the principles and good practice outlined in this document and the associated Technical Guidance Notes are incorporated into internal operational procedures and fully implemented;
- To ensure the competency, accountability and training of staff and contractors working on drinking water delivery;
- To work with stakeholders to maintain awareness and understanding of existing and evolving risks to the hygienic supply of drinking water.

8.29 Section 8 of Principles of Water Supply Hygiene refers to Distribution systems and states: 'Water undertakers should perform appropriate inspection and maintenance of key distribution infrastructure (for example air valves) using a risk-based approach. Air valves should be positioned in chambers above the point to where surface water might rise, to avoid the potential for contamination entering through the valve' and 'Backflow of water from customers' installations or via air valves and other distribution fittings into the mains can be a source of serious contamination. Backflow can occur when network pressure drops or is low, when mains are isolated for essential work, or where high-pressure installations in customers' premises overcome mains pressure.' Also 'Procedures should be in place to maintain a programme for inspecting installations at sites deemed to be at high risk (for example industrial plants and farms or where a site uses a blend of mains water and water taken from a private water supply).'

[12] Principles of Water Supply Hygiene, Final, 1 October 215 (updated 1 March 2017)

Chief Inspector's Reports

8.30 The Inspectorate publishes a report by the Chief Inspector on water quality annually and quarterly on the Inspectorate's website, the publication of these reports is notified to water companies.

8.31 References to air valves and the risk to water quality has been noted on a number of occasions in these reports. The Chief Inspector's Reports have repeatedly highlighted air valves as a persistent and material risk to drinking water quality, emphasising the need for water companies to identify high-risk assets, maintain accurate records, and implement risk-based inspection and maintenance programmes. The reports demonstrate a clear and consistent regulatory expectation that companies must manage air valves and other potential ingress points proactively, as part of robust water safety planning, to protect wholesome supplies and maintain consumer confidence. A summary of these references is in Table 1 below:

CIR Report	Page number(s)	Category	Company	Commentary
Summary of CIR for drinking water in England 2021	36	Audit programme (Service Reservoirs & Tanks)	n/a	The Quarter 4 audit programme focussed on service reservoirs and tanks, with a particular emphasis on structures which have not been removed from supply for inspection and cleaning for a period of greater than 10 years. The audit programme gave assurances that some companies were making progress against the removal of such assets. However, the Inspectorate took action where it was deemed there was unacceptable risks posed to water quality by the company's reluctance to remove these assets (whether due to the required enabling works or management of associated downstream risks). Common themes were also identified during the audit programme with issues identified with air valve inspection policies, substandard condition of regulatory sample points and sanitary sealing of hatches and other points of entry to prevent ingress. The audits findings are comprehensively reported in the quarterly reports.
CIR Q4 - 2021	26	Audit	TMS	A recommendation for the company to introduce a suitable policy for air valve inspection and maintenance using a risk-based approach was made with a suggestion that the company takes heed of guidance laid out in the Principles of Water Supply Hygiene including paragraphs 8.1 and 8.3 along with Technical Guidance Note 2. Both air valves observed at the audit were heavily corroded externally.
CIR Q4 - 2021	26	Audit	AFW	Similar to the Thames Water audit, Affinity Water had no policy for air valves inspections and an identical recommendation for the company to introduce a suitable policy for air valve inspection and maintenance using a risk-based approach was made.
Summary of CIR for drinking water in England 2020	42	Compliance	ANG	In August at Whittlebury tower (Anglian Water), coliforms were detected in water leaving the reservoir. The reservoir was isolated from supply, and an inspection revealed a point of ingress as the likely cause. The reservoir will not be returned to supply until remedial work has been completed. The company indicated that there were two air valves relating to this asset which were not accessed and one which had not yet been found. The Inspector repeated a recommendation to ensure the company can access the air valves to allow for maintenance and assessment of condition to take place.

Summary of CIR for drinking water in England 2020	106	Audit programme (Service Reservoirs & Tanks)	n/a	Air valves remain a potential contamination risk upstream of service reservoirs, which are often neglected and seldom inspected. All companies are reminded of the need to identify high risk air valves and ensure they are inspected and maintained appropriately. Air valves should also be considered as part of a company's investigation into events and compliance failures where appropriate.
Summary of CIR for drinking water in England 2020	109	Audit programme (Groundwater)	n/a	The perennial problems of poorly protected air valves (Anglian Water) and missing flap valves (Wessex Water and Yorkshire Water) were again identified on this audit programme. Whilst Anglian Water and Wessex Water acted to address the site-specific issues, more widespread issues are suspected across companies. Of more concern, is Yorkshire Water's view that flap valves are not robust assets and would do no more than assess the risk of contamination due to washout facilities at their treatment works. Whilst animal ingress is relatively rare, there have been further reports of dead animals in treated water processes within the past 12 months and a vermin risk existed on the site, with the remains of a rabbit carcass found on a treated water tank hatch. Operational issues of this kind often become the norm, especially if no action is taken when issues are raised by works operators or others visiting sites. All companies should have procedures in place to investigate points of ingress, such as air valves, overflows and hatches and more importantly ensure that measures are in place to prevent ingress at these points. A fresh pair of eyes challenging any deterioration can also be beneficial in resolving issues.
CIR Q1 - 2020	23	Audit	SEW	Figure 6: Air valve replaced, and gland fixed following the audit at Ford works

CIR - Q2 - 2020	7	Compliance	ANG	Two detections resulted in recommendations being made. At Anglian Water's Old Leake Tower a coliform detection was initially thought to be due to ingress into the tower through defects in the roof identified during an inundation test. Subsequently it became clear that in 2018 the sample point had been incorrectly attached to the inlet leg of the common inlet/outlet main after it splits from the outlet leg. The effect of this is that the sampling conducted at the site has not been representative of the water in the reservoir since 2018 when the sample line was tapped to the wrong main. Had it not been for the coliform detection in the incoming water, the defects in the roof and the incorrect sampling may have remained undetected until the next internal inspection. The company has committed to undertake a full review of all ten storage points that were upgraded as part of this programme to ensure that they are representative. At the time of writing seven of these have been assessed and no issues have been identified. Old Leake Tower itself remains out of service until the defects have been repaired and the sample line relocated. The company is inspecting air valves upstream of Old Leake Tower for signs of possible ingress.
CIR - Q3 - 2020	10	Compliance	ANG	In August at Whittlebury tower (Anglian Water), coliforms were detected in water leaving the reservoir. The reservoir was isolated from supply, and an inspection revealed a point of ingress as the likely cause. The reservoir will not be returned to supply until remedial work has been completed. The company indicated that there were two air valves relating to this asset which were not accessed and one which had not yet been found. The Inspector repeated a recommendation to ensure the company can access the air valves to allow for maintenance and assessment of condition to take place.
CIR - Q3 - 2020	29	Audit programme (SRs & Tanks)	Specific section on Pipework, Air Valves and Overflows / SWB	The air valve inspection at South West Water's Widworthy service reservoir showed evidence of recent excavation of sediments from around the structure (Figure 5). The company confirmed that there is no routine inspection frequency for air valves, and the Inspectorate recommended the company implements a regular programme of air valve inspections using a risk -based approach as outlined in the Principles of Water Supply Hygiene.

CIR - Q3 - 2020	30	Audit programme (SRs & Tanks)	Specific section on Pipework, Air Valves and Overflows / UU	United Utilities explained that air valves on trunk mains are inspected on a six-monthly basis, but inspections on other air valves are carried out on a reactive basis. The company were unable to provide any recent records for any of the valves in question. The company report that the maintenance strategy for these assets is under review. The company is required to provide the Inspectorate the outcome of this review.
CIR - Q3 - 2020	30	Audit programme (SRs & Tanks)	Specific section on Pipework, Air Valves and Overflows / SEW	South East Water had no policy for air valve inspection but following a recommendation it is developing a risk -based approach incorporating the guidance laid out in the Principles of Water Supply Hygiene including paragraphs 8.1 and 8.3 and Technical Guidance Note 2.There were several locations marked on site drawings as air valves at South East Water's Blatchington SR and some chamber covers marked with AV indicating air valves. However, on inspection no air valves were found, in many cases the pit under the hatch had been filled with soil. After the audit the company uncovered buried pipe sections but no air valves. These dead legs constitute a stagnation risk that the company committed to remove on the recommendation of the Inspectorate.
CIR - Q3 - 2020	30	Audit programme (SRs & Tanks)	Specific section on Pipework, Air Valves and Overflows / TMS	It was found that Thames Water lacked a risk -based policy for air valve inspection, but after a recommendation, the company committed to a risk-based programme of inspection and replacement of approximately 25% of all its air valves during the next Periodic Review.
CIR - Q4 - 2020	30	Audit programme (GW)	ANG	Anglian Water planned to replace the air valve, fit an isolation valve to aid future maintenance and construct a new chamber with lid after the discovery of the asset in a poor condition at West Pinchbeck works.
Summary of CIR for drinking water in England 2019	13	Compliance	SRN	Coliform breaches occurred at Southern Water's Testwood and Burham works in November and September respectively. Both sites are already subject to legal instruments to address treatment failings. Ingress risks at Testwood works were identified on an air valve and an associated break pressure tank . At Burham works wide ranging improvements are required to address potential microbiological issues including improvements to clarification and filtration processes.

Summary of CIR for drinking water in England 2019 (also noted in Q2 report)	20	Compliance	WSX	Wessex Water failed to determine a cause following a coliform detection at Tucking Mill works in May. The sample was taken within three hours of the site being returned to supply, subsequent samples were all clear and the investigation could not definitively identify a ca use. A faulty air valve was found at the site and repaired, but this could not be conclusively linked to the failure.
Summary of CIR for drinking water in England 2019 (also noted in Q1 report)	21	Compliance	SRN	Southern Water on their own accounted for 28% of the failures recording a total of 13 in 2019. Assuming all failures are equal, this is six times the expected failure rate for a company of this size. Whilst this is a cru de estimation it emphasises the disproportionate contribution by this company. From these failures, four were at Testwood works accounting for 8.5% of all the failures in the country. This works was the single largest contributor to the CRI in 2018 for coliforms accounting for 30% of the score. Whilst the score for 2019 is just over 14%, Southern Water as a whole accounts for 31% for 2019. Investigations pointed to an air valve on the main between the break pressure tank and the clear water tank or integrity issues on either of the tanks. Testwood works is subject to a legal improvement notice requiring a refurbishment of key stages of treatment in the next five years.
Summary of CIR for drinking water in England 2019 (also noted in Q1 report)	24	Compliance	TMS	The Inspectorate identified shortcomings in Thames Water's investigation of coliform failures at its Wyck Beacon reservoir, reported in January. Whilst enhanced monitoring was undertaken and satisfactory, there were issues to note including the chlorine level from the supplying works registering as zero coupled with a depressurisation of the upstream main, which the company had not sought to verify after previous failures and concerns around the air valves in the network. Recommendations were made to ensure that network flows and pressures were considered as part of bacteriological failure investigations at service reservoirs.
Summary of CIR for drinking water in England 2019	73	Audit programme (Staff competence)	n/a	Air valves are often essential in network operations, yet potentially present a significant contamination risk. Locations that may become flooded should be avoided where possible and all companies should have risk-based inspection programmes in place for air valves.

CIR - Q2 - 2019	26	Audit programme	n/a	Air valve maintenance deficiencies were identified in 2018 at Wessex Water and Anglian Water and they were found again at Bristol Water as part of this series of audits. There is no policy for air valve inspection, any inspections are carried out on an ad-hoc basis. This may lead to uncontrolled risks of ingress to the water supply network. To protect public health the Inspectorate recommended that the company introduces a suitable policy for air valve inspection and maintenance using a risk-based approach. Learning: All companies should take heed of guidance laid out in the Principles of Water Supply Hygiene including paragraphs 8.1 and 8.3 and also Technical Guidance Note 2.
CIR - Q3 - 2019	25	Audit programme (Air valves)	YKS	Yorkshire Water provided evidence of its air valve risk assessment methodology and procedures for its operation and maintenance. The company has recorded 15,298 air valves on its asset database. The company has acknowledged that air-valves represent a real risk of ingress and identified the location and hydraulic profile of all air-valves for its pump-fed service reservoirs, in order to prioritise inspections. The company does not proactively inspect each location on a routine basis, an approach it considers pragmatic. The combination of location, condition and the pressure situation, impact upon the risk. The company has taken the approach to inspect at risk locations following indications of unusual activity. For example, after service reservoir coliform detections. The Inspectorate welcomes the risk approach of Yorkshire Water. The company is now working towards including routine proactive inspection of 'at risk' air-valves for service reservoirs.
CIR - Q3 - 2019	25	Audit programme (Air valves)	SVT	Severn Trent Water's Strensham works has four air valves. All of these were replaced as part of water quality investigations or other site upgrades. These are inspected every six months. None of the air valves are in chambers that are considered likely to flood.
CIR - Q3 - 2019	25	Audit programme (Air valves)	TMS	A recommendation was made that Thames Water include the risks associated with ingress via air valves within its drinking water safety plans. The company is planning a desktop study to identify the highest risk air valves before developing an inspection programme. Reactive inspections of air valves are planned in response to service reservoir failures downstream.

CIR - Q3 - 2019	25	Audit programme (Air valves)	AFW	Affinity Water was unable to demonstrate that any inspections or maintenance had been carried out on air valves associated with Iver works or its downstream reservoirs due to a lack of records. The company failed to adequately address the Inspectorate's recommendation that a suitable air valve inspection policy be produced. Such inaction may lead to uncontrolled risks of ingress to the water supply network. Companies such as Affinity Water should have in place a risk-based air valve inspection policy and this should be considered alongside the guidance laid out in the Principles of Water Supply Hygiene including paragraphs 8.1 and 8.3 and also Technical Guidance Note 2. Not to do so retains unnecessary risk within the assets of a company.
Summary of CIR for drinking water in England 2018 (also noted in Q2 report)	62	Audit programme (Groundwater)	n/a	Other issues identified included: Air valves on the raw water main which are not maintained and run through agricultural land.
Summary of CIR for drinking water in England 2018	68	Audit programme (Faecal risks)	n/a	Avian faecal contamination was observed on the roof of a service reservoir, but this fact had not been reported as part of the company's investigation into an *E. coli* detection. Additionally, the company reported 11 air valves between the supplying works and the reservoir, none of which had been inspected as part of the investigation into the failure. Ten of the air valves were considered low risk. The one high risk valve had not been inspected as the company's contractors could not locate it. While the majority of the air valves were found to be in a satisfactory condition following the Inspectorate's recommendation to check them, three were found to contain water and two were submerged. The location of air valves should be recorded, and they should be inspected and assessed for the risk of them introducing contamination into the network after the disinfection process. Companies are reminded of the importance of considering the risk of ingress from all sources as part of risk assessments and also as part of investigations into microbiological failures. All companies should ensure that they have appropriate risk-based methodologies in place to ensure risks related to ingress via air valves are appropriately addressed.
CIR - Q1 - 2018	19	Site Inspections	WSX	Wessex Water had no policy for the inspection of air valves and inspections were carried out on an ad-hoc basis, but the company has since introduced a risk-based inspection policy based upon the requirements of the Principles of Water Supply Hygiene.

CIR - Q2 - 2018	18	Compliance	TMS	*E. coli* was detected at Thames Water's Hoddesdon reservoir in May, the subsequent investigation found that there was a leak on the roof/wall joint and deficiencies in a mesh screen had allowed a number of woodlice to enter via an access hatch. A broken air valve on the inlet main was found in a flooded chamber. There were several occasions in the month before the failure where the reservoir level dropped sufficiently to allow ingress. Appropriate maintenance of air valves is an ongoing problem across the industry, and this failure should serve as an appropriate reminder for companies to ensure that the air valves are visited on a risk-based programme to ensure that they are operational and remain free from the risk of contamination.
Summary of CIR for drinking water in England 2017	35	Audit programme	TMS	At Thames Water's Cleeve works audit, air valves present a risk of ingress. This knowledge represents an opportunity to reduce this risk if applied at all relevant sites.
CIR - Q2 - 2017	8	Audit programme (GW)	SRN	A number of site-specific risks were identified including a potential risk of raw water being able to bypass the treatment process at Southern Water's Burpham works, with the only mitigation a hand written note on the cap to a single valve. The company was unable to demonstrate that action was being taken to positively address this issue. It was also identified that the contact main at site runs only part-full, presenting an ongoing contamination risk via the associated air-valves
CIR - Q3 - 2017	13	Compliance	YKS	Yorkshire Water's West End service reservoir had a coliform detection on 30 June which was attributed to a leaking air valve in an upstream asset, as an internal inspection of the reservoir under inundation did not identify any ingress. A subsequent investigation of pressure identified two depressurisation events which, though not proven to be the cause, could have been contributory. The air valve was repaired, however a further failure on 15 August prompted a more thorough investigation and a wash out chamber was identified to 'theoretically' cause backflow into the asset.

Table 1 – Chief Inspector Report – Air valve references

Franklaw report

8.32 In 2017, the Inspectorate published a Report of the Drinking Water Inspectorate's Investigation into the *Cryptosporidium* Contamination of Franklaw treatment works in August 2015[5]. There were a number of potential factors considered as part of the investigation. It was noted in the report that a defective air valve and damaged chamber in a field used for grazing livestock noted the presence of *Cryptosporidium*.

8.33 A number of other recommendations were also made in the report. One of which was the availability of emergency portable high volume sampling equipment for detection of *Cryptosporidium*.

8.34 South West Water deployed emergency portable sampling equipment for *Cryptosporidium* as part of their investigations.

A Brief Guide to Drinking Water Safety Plans

8.35 In 2005, the Inspectorate issued A Brief Guide to Drinking Water Safety Plans[13]. The guide notes with respect to consumer installations '*There are two major hazards to be considered. The first is the possibility of backflow of contaminated water from a consumer's installation into the distribution network thereby causing the supply of contaminated water to consumers downstream*.'

Drinking Water Safety Guidance to Health and Water

8.36 In 2020, the Inspectorate issued the document Drinking Water Safety Guidance to Health and Water Professionals[14]. In section 4.1 Water Company Responsibility In Relation To Water Safety, it is noted 'Water companies should be aware of high-risk locations in their area (farms, industrial units) and ensure that an appropriate inspection regime is in place.'

UKWIR 2014 Air Valve Management report

8.37 UKWIR are an independent research organisation for the UK and Irish water sector and have been operating since 1993. The UK Water Industry Research (UKWIR) published a report in 2014 called Air Valve Management (reference: 13/WM/04/10)[15].

8.38 South West Water was noted as being consulted as part of UKWIR's Air Valve management report, in addition tests were undertaken in three parts of South West Water's network system as part of trial undertaken to inform the report.

8.39 The report concluded that across the water industry that air valves are generally not well maintained, there is a lack of dedicated funding, and

[13] Drinking Water Inspectorate, A Brief Guide to Drinking Water Safety Plans, October 2005

[14] Drinking Water Safety, Guidance to Health and Water Professionals, 2020

[15] Air Valve Management (13/WM/04/10), UKWIR, 2014

maintenance is generally reactive. The report also noted that contamination as dirty water could be drawn into a main via an air valve or other locations.

8.40 The report recommended a risk-based air valve maintenance strategy should be derived, taking account of mains criticality and the consequence of malfunctioning air valves. A conceptual framework was presented which the report suggested could be adopted by asset planners to determine a maintenance strategy.

9. Prosecution

9.1 The Inspectorate instigated prosecution proceedings against South West Water Ltd under section 70(1) of the Water Industry Act 1991, for supplying water unfit for human consumption.

9.2 The company pleaded guilty to the offence of supplying water unfit for human consumption at Exeter Magistrates' Court on 4 March 2026.

9.3 At the sentencing hearing on 2 June 2026, at Exeter Magistrates' Court, the Judge imposed a fine of £1,853,000 and a surcharge of £2,000. Costs of £75,000 were agreed.

9.4 The Judge noted that *'the cause of the outbreak was ingress of Cryptosporidium into the mains water system via two probably [SIC] points at [xxx] Farm; both the damaged AV chamber, and the illegal cross-connections.' 'The risk of contamination through AVs was known since as early as 2013 following a report prepared by UK Water Industry Research, which South West Water Limited participated in. The water regulator had also been publishing reports and notifying water companies repeatedly from 2016 as to the risks posed by AVs and reminding water companies to adopt risk-based inspection policies. 20. The Drinking Water Inspectorate had, in 2020, issued a clear recommendation to South West Water: that the company adopt a risk-based programme for the regular inspection and maintenance of air valves, which are known to present a potential ingress risk when damaged or submerged. The company drafted such a policy, but it was not implemented for a period of 4 years. Indeed, many operational staff later confirmed they had never been instructed in it, and no evidence exists that it was operationalised. It is not disputed that the air-valve at [xxx]field had not been visually inspected since at least 2011 and that after the incident further water valves were found to be buried or flooded. The disruption to daily life was extensive. Households were required to boil water for drinking, cooking, brushing teeth, and for infant feeding for periods of up to eight weeks.' 'Many residents spoke of confusion, conflicting messages, and persistent anxiety. The cumulative impact on public confidence in the safety of drinking water was substantial. In summary, this was a major public health incident. Contaminated water was supplied to a large community; hundreds*

became ill; essential public services were disrupted; and confidence in the region's drinking water was seriously undermined. The company accepts that it did not take all reasonable steps or exercise all due diligence to prevent the supply of unfit water, as required by law.'

10. The Drinking Water Inspectorate's Conclusions and Recommendations

10.1 The Inspectorate's investigation found that *Cryptosporidium* from animal faeces entered the drinking water supply network on agricultural land likely via an exposed and faulty air valve covered in mud. Soil samples taken in the vicinity of the air valve contained *Cryptosporidium* oocysts whose DNA matched the Brixham strain of the illness.

10.2 A second potential point of ingress was identified was identified from a cross connection between a private water supply and the public mains supply also on the main between Alston and Hillhead service reservoirs.

AV inspections – Importance of network asset maintenance

10.3 No definitive cause was found for how or when the air valve chamber became damaged. The last evidence that South West Water could provide to definitively prove that the air valve chamber was inspected was for 2011.

10.4 The Inspectorate has repeatedly highlighted air valves as a persistent and material risk to drinking water quality, emphasising the need for water companies to identify high-risk assets, maintain accurate records, and implement risk-based inspection and maintenance programmes.

10.5 Water companies should therefore have in place procedures to manage the inspection and maintenance of their air valves using risk-based methodologies.

10.6 Water companies should also have in place systems to accurately document and record air valve inspections.

Inspection of high-risk users

10.7 The Inspectorate has also previously issued drinking water safety planning guidance, which has highlighted the risk of contamination of the water supply network posed by water users that are deemed high risk.

10.8 Water companies should have procedures in place to determine the types of premises that may be connected to their network and the risk these may pose in terms of contamination (for example fluid categorisation or use), especially those which may also have a private supply.

10.9 Water companies should have in place procedures and systems to inspect these properties and systems to accurately document/record these inspections.

The company's communications with consumers and other stakeholders about the boil water advice

10.10 Information provided to the Inspectorate from witness statements and questionnaires with respect to this event, noted that a number of consumers rated the company's communications as poor.

10.11 Initial communications by the company on 14 May 2024, following the UKHSA contact, multiple contacts from consumers for illness and some media coverage, advised consumers to use water as normal. This advice to use water as normal has angered consumers. The company has noted in its statement that on 14 May 2024 that the evidence available at the time pointed to no issues with the water supply and that issuing a boil water notice at that time would risk losing public confidence in the water supply.

10.12 As part of the lifting of the boil water notice on 18 May 2024, the company incorrectly advised 28 properties that they no longer needed to boil their water. The company re-instated the boil water notice for these properties later the same day. The company attributed this error to issues with their digital mapping system.

10.13 Water companies should give careful consideration to the appropriateness of their messaging at the outset of an investigation into a potential public health outbreak. Also, where a phased or sequential approach is used to lift boil water notices, water companies should ensure, prior to lifting any notice, that their systems and processes accurately identify the relevant properties so that correct advice is provided to consumers.