英国Brixhamにおける水道水を原因とした クリプトスポリジウム集団感染事故と対応の概要

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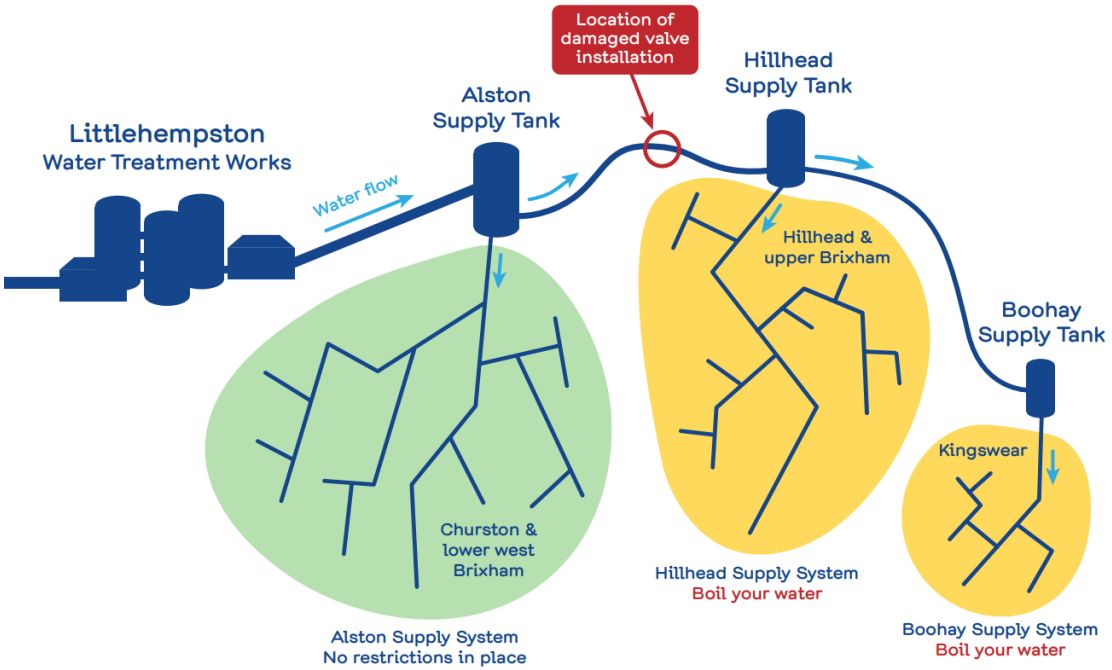
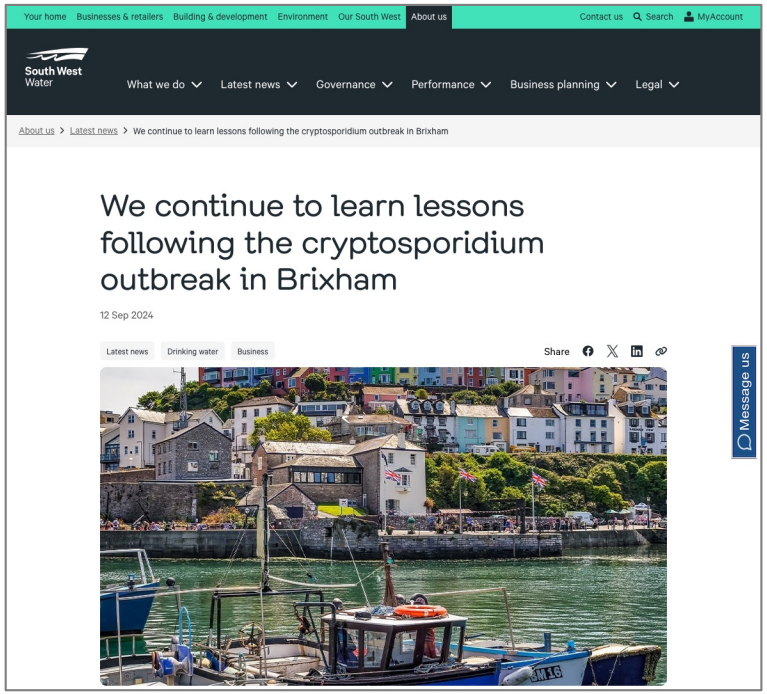
クリプトスポリジウム集団感染事故の概要

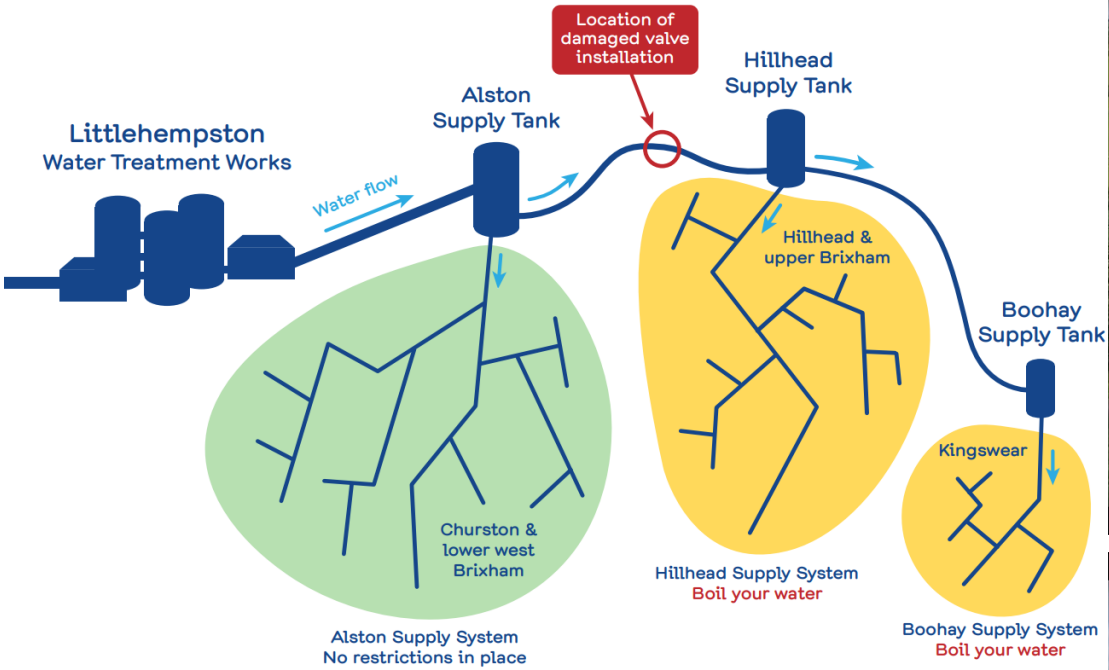


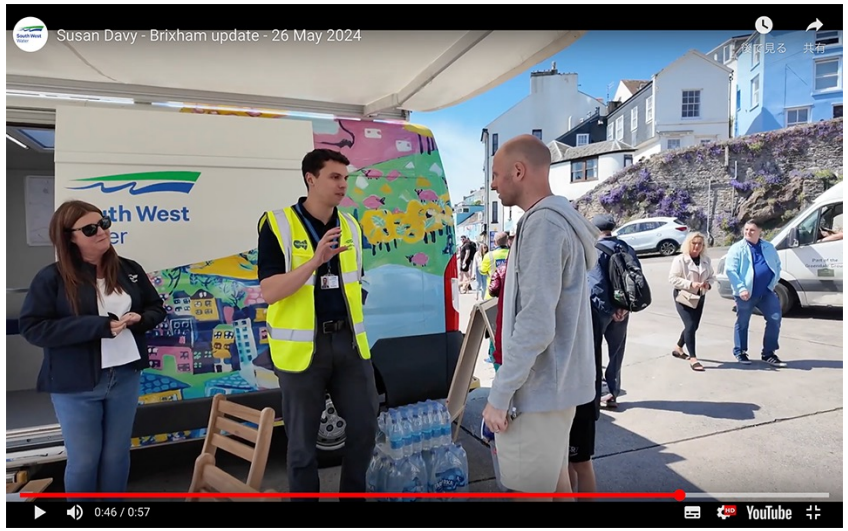


- 2024年5月，英国南西部のBrixhamで送水管の空気弁ケーシングが破損[1)]
- 空気弁は牧場内にあり，クリプトスポリジウムを含む畜牛の糞尿が汚染源の可能性[2)]
- 5月13日に8人のクリプトスポリジウム症患者発生を検知，水質検査を実施[3)]
- 15日に17,000世帯に煮沸通告，18日にAlston給水区域（14,500世帯）は解除[1,3)]
- 30日時点で100人以上がクリプトスポリジウム症と診断[4)]
- 7月8日にすべての給水区域において煮沸通告解除（674世帯ではおよそ8週間）[5)]

1) https://www.southwestwater.co.uk/about-us/latest-news/south-west-water-to-reduce-boil-water-notice-area-in-brixham-after-all-clear-test-results (18 May 2024)
2) https://metro.co.uk/2024/05/17/parasite-devon-water-caused-cow-manure-revealed-20856971/
3) https://www.southwestwater.co.uk/siteassets/documents/service-updates/brixham/brixham-event-summary.pdf
4) https://www.bbc.com/news/articles/c0337j145v3o
5) https://www.southwestwater.co.uk/about-us/latest-news/south-west-water-lifts-cryptosporidium-boil-water-notice-for-all-remaining-customers (08 Jul 2024)

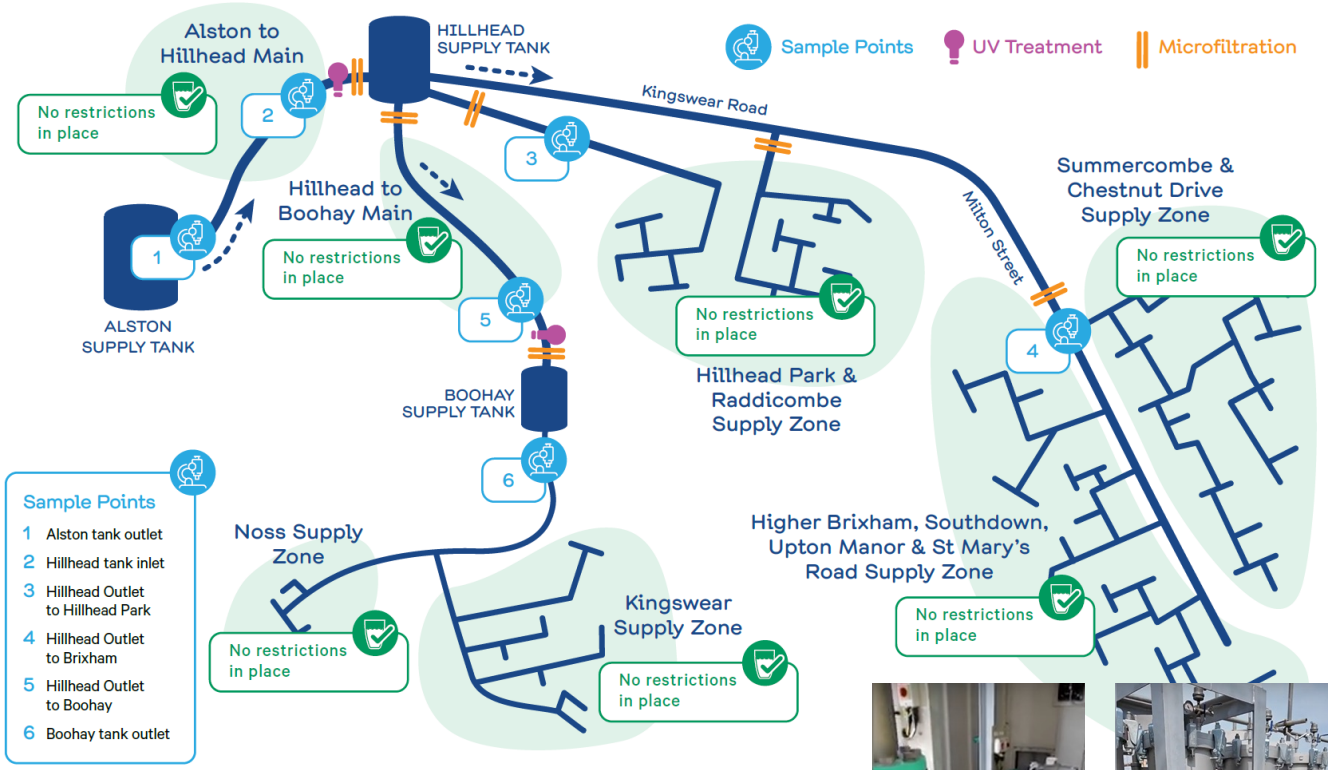
汚染されたHillhead配水池と周辺環境





https://www.southwestwater.co.uk/about-us/latest-news/video-updates-brixham

対応の概要
汚染された給水区域での対応・対策

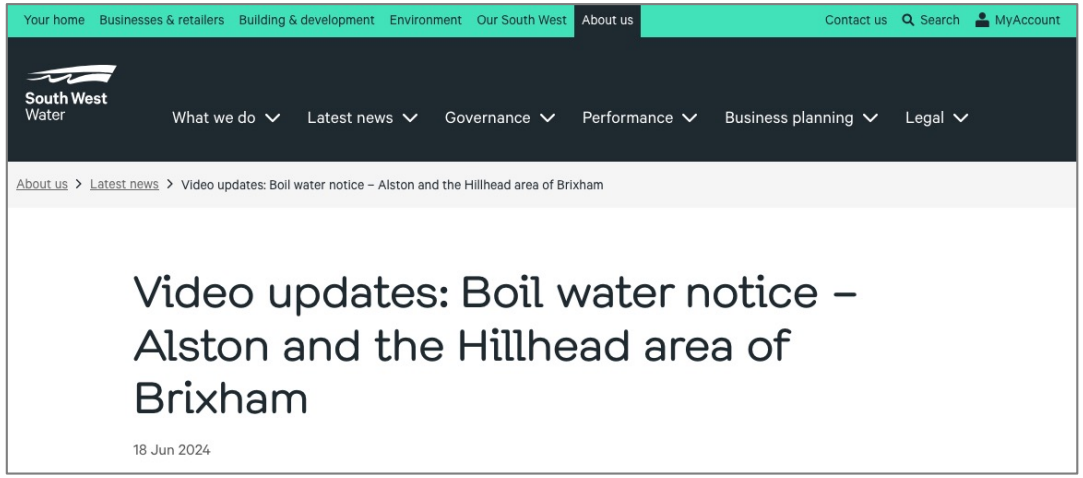


- ボトル水の配布
- 採水とクリプトスポリジウム検査
- 34 kmに渡る配水管をフラッシングにより27回洗浄
- 送水管と配水管をアイスピグやスワブで洗浄（17フェーズ）
- UV照射装置とMF膜処理を配水管網に設置（家庭に給水されるまでに2～3回処理）
- 1.2 kmの新しい管を敷設

https://www.southwestwater.co.uk/about-us/latest-news/we-continue-to-learn-lessons-following-the-cryptosporidium-outbreak-in-brixham

事故対応に関する広報

・事業体ウェブページでの情報提供



対策作業の内容等を動画でも解説
（5月18日～6月18日）

・ 事業体SNSアカウントからの情報提供
・メディアによる情報発信
・住民説明会の開催
・リーフレットの配布

A video to explain the process followed to remove Cryptosporidium - 5 June 2024

フラッシングやアイスピグによる洗浄をアニメーションで解説

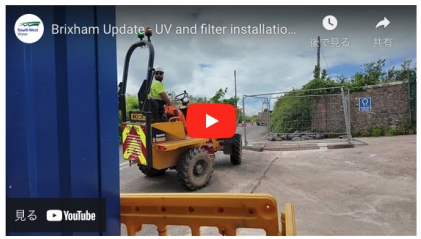
Interview with Tom Martin about the works carried out at Hillhead reservoir - 4 June 2024

フラッシングによる洗浄作業を紹介

Drone footage showing progress of development at Hillhead reservoir - 3 June 2024

ドローン撮影による作業の進捗説明

Brixham Update - UV and filter installation in Hillhead - 2 June 2024

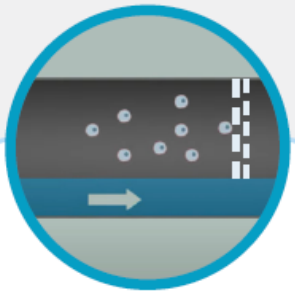


可搬型UV照射装置や膜処理装置を紹介

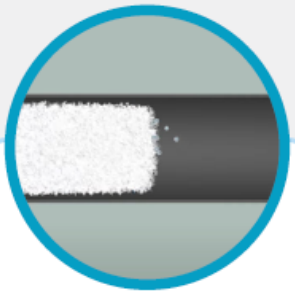
https://www.southwestwater.co.uk/about-us/latest-news/video-updates-brixham

洗浄作業の説明（住民説明会資料より）

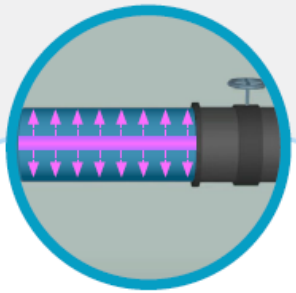
What's involved in removing cryptosporidium



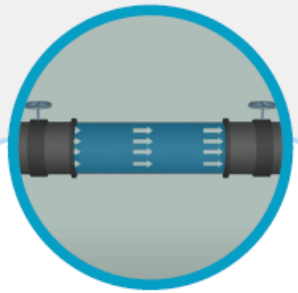
Filters
Specialised filters have been installed at our Hillhead and Boohay supply tanks, which act as barriers to the parasite.



Ice Pigging
To clear larger pipes, an ice crystal solution is pumped in, scouring the pipes as it passes through. This process is called Ice Pigging.



Ultra Violet treatment
We are installing ultra violet treatment at our Hillhead and Boohay supply tanks, which kills cryptosporidium.

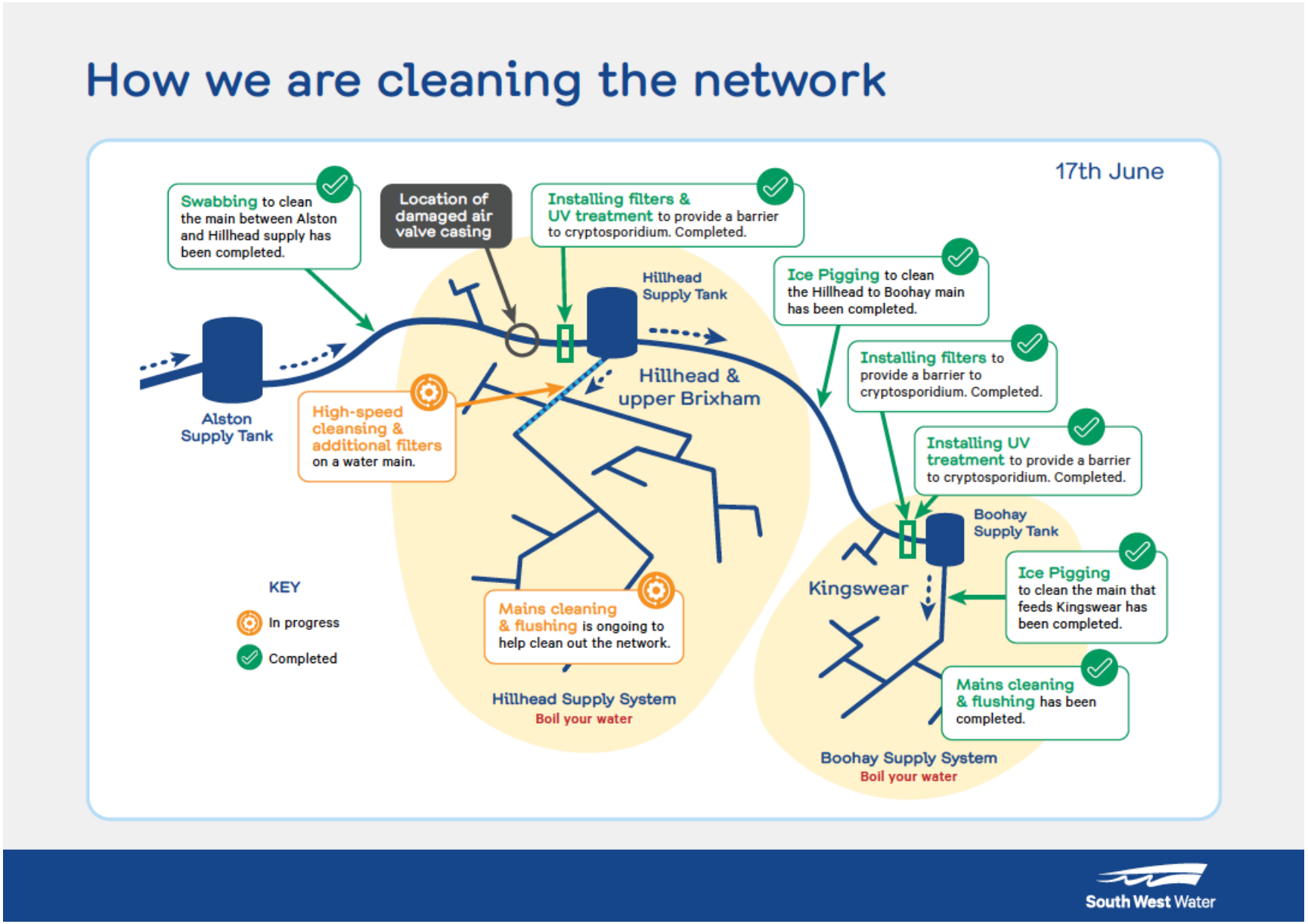


Flushing
To clear cryptosporidium from the system, we open hydrants to increase flow, flushing through the network.

South West Water

https://www.southwestwater.co.uk/siteassets/documents/service-updates/brixham/kingswear-drop-in-170624.pdf

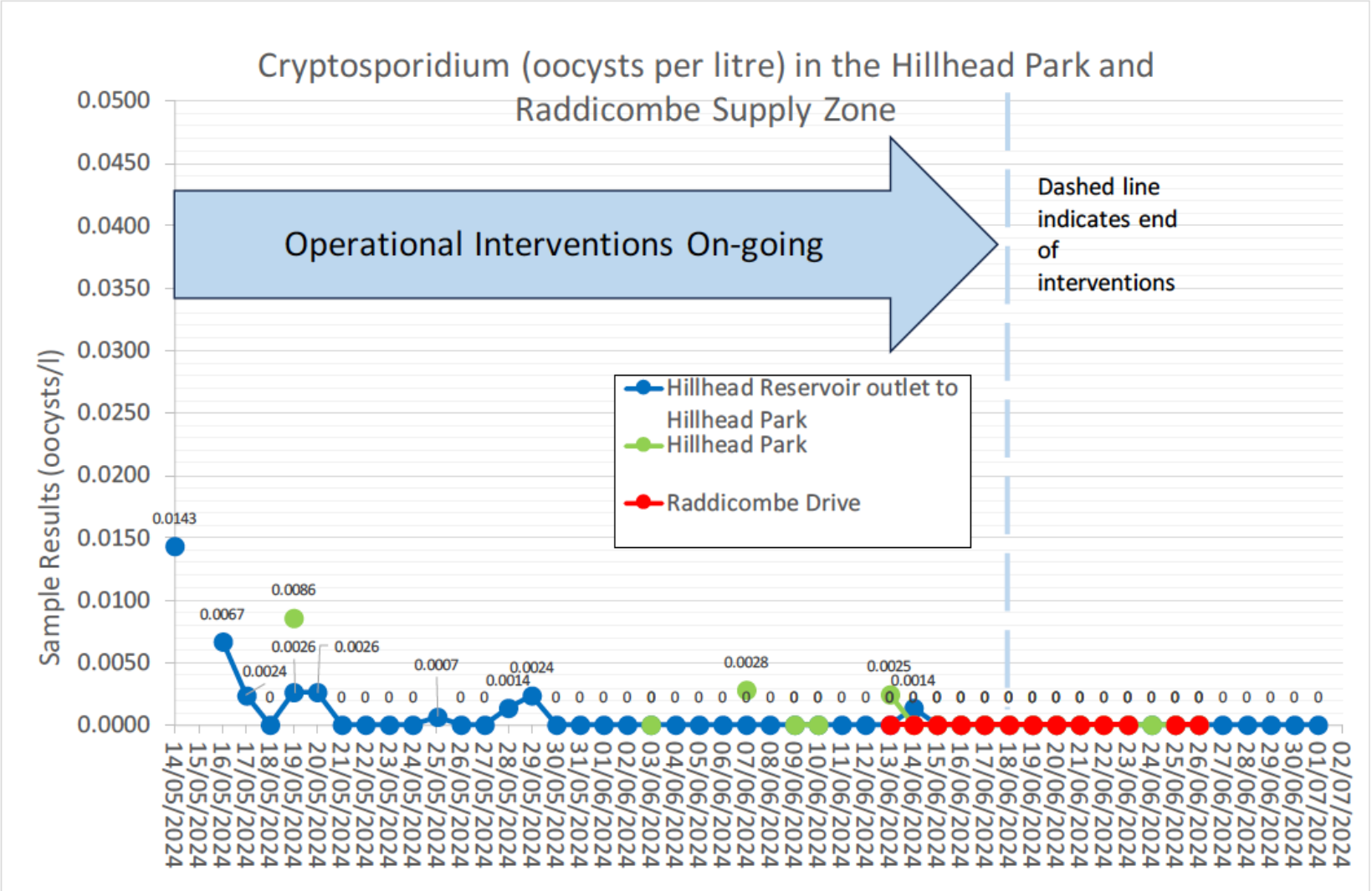
対策作業の進捗の説明（住民説明会資料より）



https://www.southwestwater.co.uk/siteassets/documents/service-updates/brixham/kingswear-drop-in-170624.pdf

クリプトスポリジウム測定結果の報告（事業体ウェブページより）

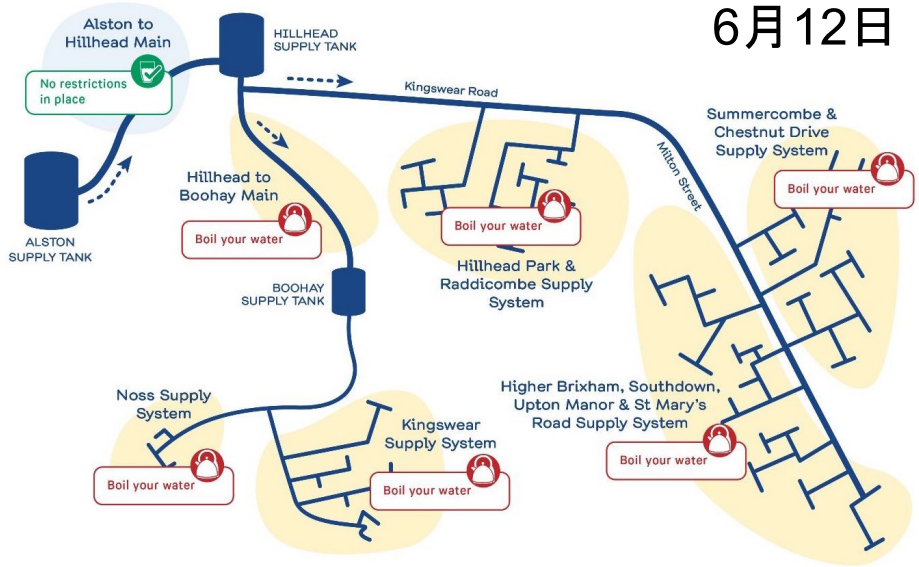
South West Water



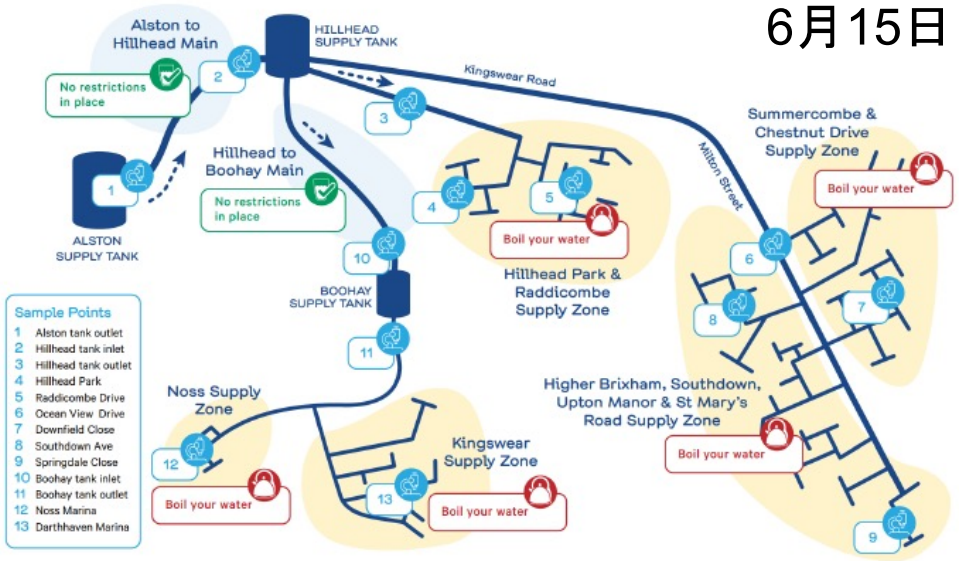
https://www.southwestwater.co.uk/siteassets/documents/service-updates/brixham/daily-cryptosporidium-results-2nd-july.pdf

クリプトスポリジウム測定地点と煮沸通告の有無

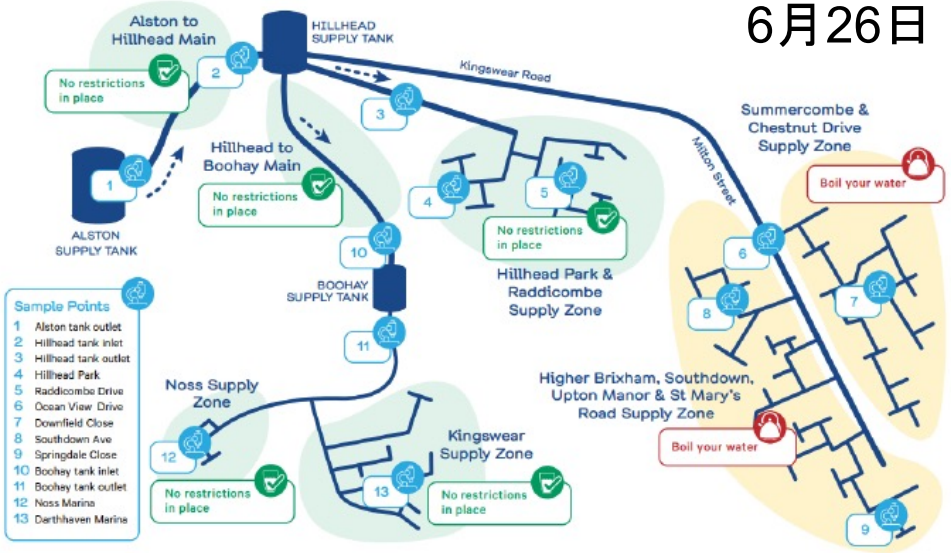
6月12日



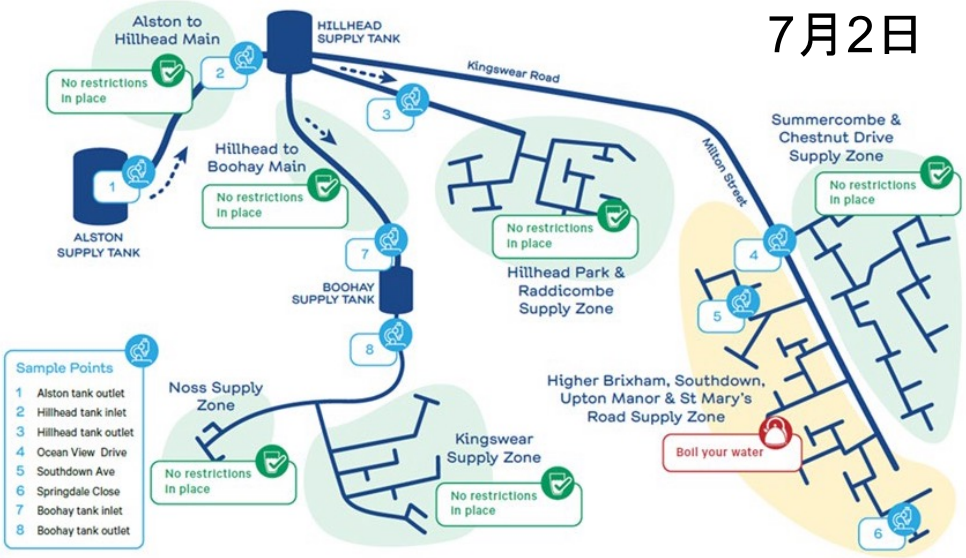
6月15日



6月26日



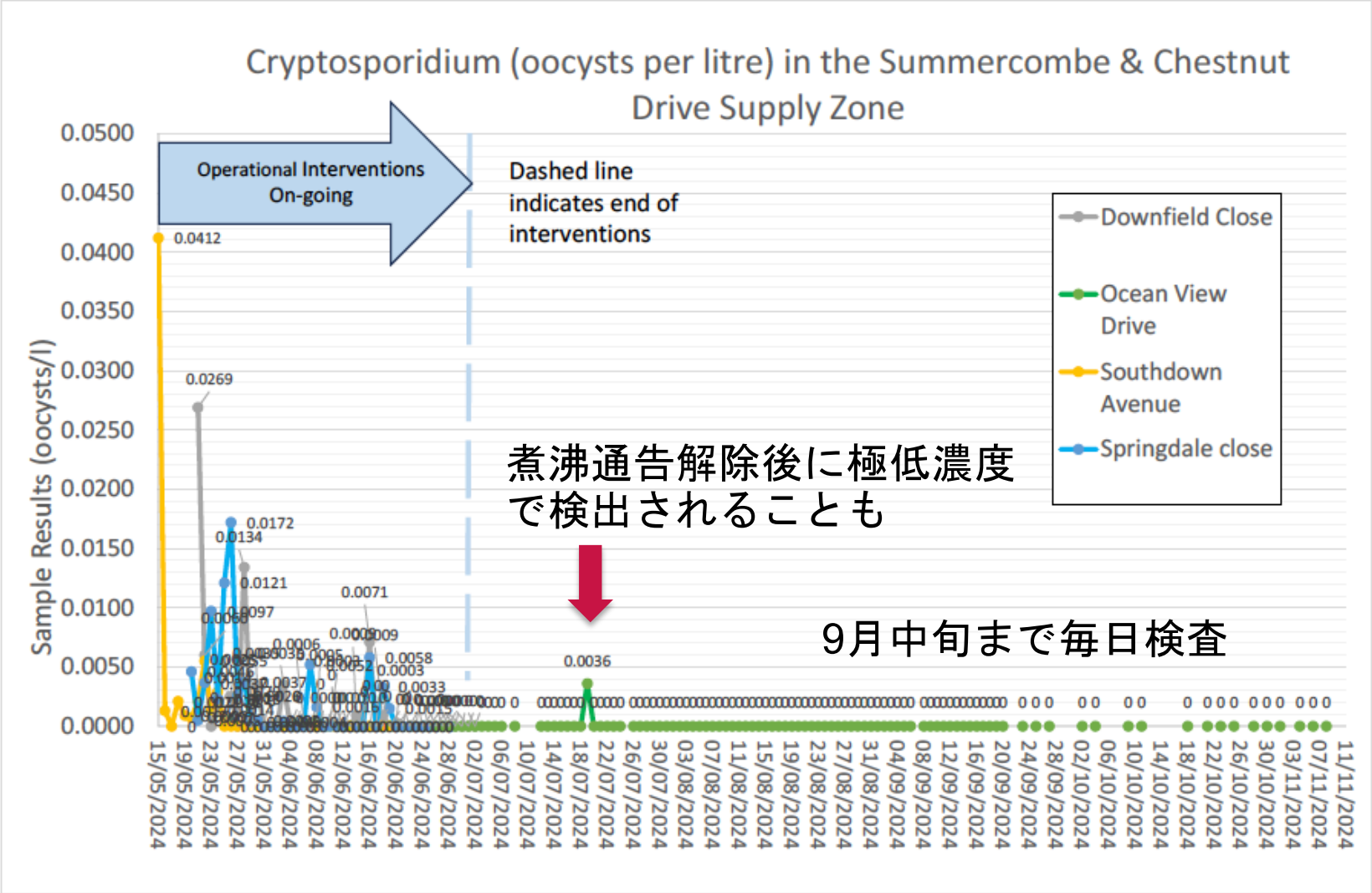
7月2日



https://www.southwestwater.co.uk

クリプトスポリジウム測定結果の報告（事業体ウェブページより）

South West Water



https://www.southwestwater.co.uk/siteassets/documents/service-updates/brixham/daily-cryptosporidium-results-11th-november-2024.pdf

低濃度で検出される場合があることの説明

South West Water

Daily Cryptosporidium Results by Supply Zone 20th November 2024

Extensive interventions have been undertaken to both remove and destroy cryptosporidium from the water supply system.

時々クリプトスポリジウムが低濃度で検出される採水地点があるかもしれない

Whilst we have not seen any detections for many weeks, from time to time, we may see low-level detections of cryptosporidium at sampling points even after interventions are complete. Each of these detections is fully investigated and shared with public health bodies.

Investigations undertaken so far have confirmed:　給水システムへの汚染源はこれ以上存在しない

- there is no further source of contamination into the system.
- the levels of cryptosporidium we are detecting are lower than concentration levels that would cause illness.　クリプトスポリジウムの検出レベルは病気を引き起こす濃度レベルより低い
- the additional treatment we have installed continues to operate as designed and is effectively protecting supplies.

追加の処理システムは設計通りに稼働しており，給水システムを有効に保護している

Whilst it is not possible to test whether cryptosporidium detected are *alive or dead*, it is increasing unlikely they will be in a condition that might cause illness or infection due to the time that has now elapsed since the source of contamination was isolated on 15th May. Expert opinion confirms that cryptosporidium degrades over time when in water systems. In addition, any residual contamination has been subject to aggressive cleaning techniques which significantly reduces its harmful lifespan further.

In addition, UV treatment has been installed because it is highly effective in making cryptosporidium harmless, and filters remain in place to ensure residual levels are removed prior to reaching customer homes.

Based on the findings of our investigations the water remains safe to continue to use as normal.

You may notice a slight change in the data shown in the graphs from 24th July for Alston and 23rd September for all others, where there is a gap of 2-3 days between sample results. This is because we have moved to exchanging the sampling devices we use to collect composite samples for analysis from every day to three times a week.

https://www.southwestwater.co.uk/siteassets/documents/service-updates/brixham/daily-cryptosporidium-results-20th-november-2024.pdf

煮沸通告の解除に係る広報（リーフレット）

5 key steps you need to take before using your water as normal

Make sure you complete all the steps relevant to your household before using your water as normal. Thank you. If you have been away, or your property is a holiday home or let please follow these same instructions.

Step 1. Flush cold water tanks

Cryptosporidium can be removed from pipes by flushing water through them.

If you have a cold water storage tank, or have been away from your property during the Boil Water Notice, please run all your cold taps on full for 30 minutes. This will flush the system through.

If you don't have a water storage tank, your water is fed directly from the mains. This means that as you used the water for things like washing and toilet flushing, you will have been flushing your system already.

We will automatically apply a run-off allowance to all our measured customers' accounts for this.

To find out if you have a cold water tank:

1. Locate and turn off the internal stop tap; this is normally located under the kitchen sink.
2. Open all your cold taps.

If water continues to flow from your taps, it indicates that you are likely to have a tank - normally located in the loft space.
If the water stops, you're on mains supply.

Step 2. Replace filters around your home

This applies to filter jugs and plumbed-in water filters. Please replace all filters with new ones.

Step 3. Make fresh ice cubes

Please discard all ice cubes. Wash any containers that held the ice, and remake.

If you have a plumbed-in ice machine, discard the stored ice. Create a fresh batch of ice (this will flush the plumbing). Repeat. The second batch of fresh ice will be safe to use.

Step 4. Flush out boats and caravans

Please drain your water tank and system. Then fill the tank with clean water. Turn on all the taps and empty the tank again – this will flush the system. Once you've done that, you can refill the tank and use as normal.

Step 5. Contact us if you have a swimming pool

If you have a private pool and need advice, please contact us on **0344 346 2020** and we can help support you.

https://www.southwestwater.co.uk/siteassets/documents/service-updates/brixham/brixham-lift-bwn-info-leaflet-hh.pdf

まとめ

2024年5月に英国南西部のBrixhamで発生した水道水を介したクリプトスポリジウム集団感染事故とその対応について報告した

- 送水管の空気弁ケーシングが破損し，水道水がクリプトスポリジウムを含む畜牛の糞尿に汚染され，100人以上がクリプトスポリジウム症と診断
- 送水管と配水管をフラッシングやアイスピグ等で洗浄，UV照射装置とMF膜処理装置を配水管網に設置，新しい管を敷設等の対応・対策がとられ，クリプトスポリジウムの不検出を確認して，煮沸通告が解除
- 対応や対策作業は，ウェブページやSNS等で図や動画を用いて広報
- クリプトスポリジウム検査結果は，ウェブページで一定の期間は毎日報告

事故を教訓にして・・・

- 「断水時に弁室内の汚水、土砂等を吸引することがあるため、弁室内は常に清掃しておく。」（日本水道協会，水道維持管理指針2016，P.486，8.7.3　空気弁）に基づく管理の徹底が重要
- 汚染された給水区域で採水・検査する試料の体積，有効な濃縮・精製方法（特に鉄さびを含む試料からのオーシスト精製方法）を検討しておく必要