

Continuation Statement of: Statement of: Barry Chapman

immediately with [REDACTED]

I do not know how the pipe was prepared for the akathane, there were no grit blasters on site and so I know the pipe was not prepared with grit blasting, it may have been hand prepared.

I had to send some guys to clean the tank (tank B) due to algae issues at the works on the 07 October 2016. I went to site to support the work, this was at the request of [REDACTED] from Anglian Water. Balfour Beatty put an overlander in to fill tank B. Anglian Water said that they did sampling to check the tank was ok before putting it into supply. I do not know whether the tank had gone through the full sign off process at this point to be put into supply but I was told samples had past. I do not know if an emergency impact plan had been created. I know that the coating on the pipework had cured correctly before this emergency, into supply happened.

The project was very dis-jointed. Balfour Beatty did not understand the work they were doing. At One were not supplying enough information or materials. Stonbury were supporting [REDACTED] (Balfour Beatty) to help make sure some of the jobs were done correctly. Stonbury even supplied the cables so that an alarm could be installed when the tank went into emergency supply.

I had emails from [REDACTED] (Anglian Water) congratulating everyone who worked on the tank to get it into supply in the emergency. The tank was into supply for a while as we did not go back until 2017. We returned in 2017 to finish the original job from 2016. This included installing reservoir covers as they were not a proper double skin cover. There was also an issue with the coating on the floor that needed rectifying but I cannot remember if this was done before or after October 2016 when the tank was put into supply in the emergency.

Initially the Inspecting Engineer ([REDACTED]) from At One visited the site at the beginning of August in 2016. The site failed as the hatch covers were incorrect and the alarms were not connected properly. [REDACTED] inspects all the coatings within the tank, everything within the tank is checked by [REDACTED]. The Inspector normally visits after the work is completed, before it is chlorinated. [REDACTED] is supposed to check coatings of pipework. I helped [REDACTED] out by telling him which hatch covers to order from Technicover. I don't think anyone had thought about the alarms until [REDACTED] picked up on it. This is again when I helped Balfour Beatty out by sending the Stonbury electrical engineer to install the alarm cable. The project got a bit much to be honest, even the pipework storage area was untidy, no ends on the pipes for example. I raised this with [REDACTED] and nothing was done until a senior member of staff told [REDACTED] to fix it. At One tried to blame Stonbury but we were only there to install the pipework in a period of 16 to 18 weeks. The project actually ran on for 18 months.

[REDACTED] inspected the tank A again in 2017 and signed the tank off. This was the end of Stonbury's work on the project after the final chlorination once Ed had exited the tank.

Stonbury's used GMP Limited to build a wall and install the pipework through the wall in 2016. GMP Limited did make some errors in the 2016 stages of the project such as the the insertion of the pipe was incorrect. The penstock was also found to be leaking but I do not know when that was installed or by whom. I got involved to sort all these issues out in late 2016.

[REDACTED] was a very busy guy and difficult to contact, there was no real supervision of Stonbury's on site. We were left to get on with the job. This is why I got annoyed when [REDACTED] was blaming the storage area on Stonbury's because it was Balfour Beatty's responsibility.

The project was not properly planned out, it felt like we were retrofitting a lot of items and mopping up mistakes.

When I entered that tank in 2016 I immediately saw that the colour was not right and that the Scotchcoat was not used. I knew this needed to be rectified and that is why Akathane was used on the two short pieces of pipe.

Signature: [REDACTED]

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(Criminal Procedure Rules, r16; Criminal Justice Act 1967, s9)

Statement of: [REDACTED]

Age of witness (if over 18 enter "over 18"): Over 18

Occupation of witness: Regional Director

This statement, consisting of pages each signed by me, is true to the best of my knowledge and belief and I make it knowing that, if it is tendered in evidence, I shall be liable to prosecution if I have wilfully stated in it anything which I know to be false or do not believe to be true.

Signature: [REDACTED]

Dated: 02/08/2022

My name is [REDACTED], I work for Stonbury Ltd. which is located at Chawston House, Chawston Lane, Chawston, MK44 3BH. I work full time as Regional Director. I was the Civils Project Manager at the time of the Pitsford project in 2015. At the time of the event I reported to [REDACTED] the Contracts Director. At the time of the event Stonbury's were part of the Anglian At One Alliance. We were involved with the work within the contact tank at Pitsford, this was the connection into contact tank number 2 (if stood outside the building it was the tank on the right hand side). There was a site manager/ agent at the time called [REDACTED] who was my non-working supervisor at the time. [REDACTED] was the working supervisor during the project. I was responsible for liaison with the Anglian At One Alliance at the project level, [REDACTED] was the day to day liaison. I visited site once or twice a week. I was employed to do the pipework scheme. A few years before we did the tank refurbishment itself and then in 2015 we did the pipe connections which were split into a phase 1 and 2 build. We cored into the wall, put the pipework through the wall, built the stack and then attached the bell-mouth (this was phase 1). Carrying the pipework on externally and then doing the same in the second contact tank was phase 2.

I have done the POSWASH training with Anglian as part of the induction, I did this on site at Pitsford prior to the work starting. I cannot be certain if this included training on Regulation 31. The training was given by the at One Alliance training team.

To complete the work we had drawings and material lists. The At One Alliance provided the documents, I liaised with [REDACTED] mostly. The raw materials for the job were all provided to us, Stonbury's only provided the Natcem which was used to reinstate the hole around the pipework.

Two years before I took on the project Stonbury's had been in the tank and coated all the walls in a Cementous coating (2013).

In 2015 the pipework was installed as delivered. When we left the tank all four sections were uniform blue, I finished the project in the tank in July 2015. I have seen the photos of the pipe now and it looks like it is covered in Acathane. It is unusual that only two sections of pipework are coated, typically the whole length of pipework would be coated. The pipe sections would have had to be shot blasted or hand prepped before the coating could be applied.

[REDACTED] was the site agent for us in 2016, he took on the phase 2 piece of work. I believe this was after the first tank was put into service. [REDACTED] no longer works for Stonbury's, he moved to work for the At One Alliance.

In 2016 Stonbury's installed the valve chamber ([REDACTED] was the project manager for that scheme).

[REDACTED] works for Stonbury's and was the Anglian Water project manager for refurbishment schemes. We have talked to [REDACTED] about what had gone on, [REDACTED] doesn't remember anything about the pipework in the tank, he looked after the original scheme (2013) coating the walls of the tank. [REDACTED] still works for Stonbury's as a Framework Manager.

I am aware that [REDACTED] and [REDACTED]'s names are on the Anglian Material in Contact forms. From talking to them, none of us know how Stonbury staff names have got onto the Anglian Materials in Contact forms for Acathane.

Signature: [REDACTED]

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Continuation Statement of: Statement of: [REDACTED]

To my knowledge the stack was not damaged during the time I was project manager for the site. The access hatch was in the middle of the tank so there was no regular traffic past the new pipework. We removed the scaffolding in 2015 and at this time there was no damage to the uniform blue coating. Stonbury's swabbed and chlorinated the pipework in 2015. This is considered the final sign off from Stonbury's before handing over to Anglian Water. To my knowledge the pipework was not damaged.

I am not aware of Anglian Water doing any internal inspections on the tank. The pipework obtained was all approved when it was provided to Stonbury's for installation.

We have checked our systems for data, but in 2016 there was a pirate hack on the systems and a lot of data was lost, this includes the Pitsford data.

[REDACTED] was my equivalent in Phase 2. [REDACTED] may have supported [REDACTED] to assist with the wall coating refurbishment.

I was approached by Anglian Water when they started investigating the event approximately 6 to 9 months ago. Stonbury's stepped back from the framework temporarily due to some framework agreement issues, we are now back on the framework and completing jobs for Anglian. There has been no discussion with Anglian on giving statements, they have been asking for information trying to get to the root cause for the investigation.

We have no records that Acathane was used on this tank, we do not have any records of Anglian Water being invoiced for the use of Acathane for this job. The company was involved in the Northumbrian Water South Moore event and since this event there has been a lot of learning on Regulation 31, I feel that we are more covered on Regulation 31 than any other contractor in the industry.

I have not worked with Anglian Water for a long time, when I worked with them POSWASH was a big part of working with the company but Regulation 31 was not mentioned so much. The training was for awareness, there was no assessment. Refresher training had to be undertaken every few months to ensure all contractors were maintaining sufficient levels of competency. Anglian had a big focus on water hygiene in the course.

Signature: [REDACTED]

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(Criminal Procedure Rules, r16; Criminal Justice Act 1967, s9)

Statement of: [REDACTED]

Age of witness (if over 18 enter "over 18"): Over 18

Occupation of witness: Framework Delivery Manager

This statement, consisting of pages each signed by me, is true to the best of my knowledge and belief and I make it knowing that, if it is tendered in evidence, I shall be liable to prosecution if I have wilfully stated in it anything which I know to be false or do not believe to be true.

Signature: [REDACTED]

Dated: 08/08/2022

My name is [REDACTED], I work for Stonbury Ltd. based at Chawston House, Chawston Lane, Chawston, MK44 3BH. At the time of the scheme I was a Team Leader which has very similar responsibilities to a Framework Delivery Manager. My line manager was [REDACTED] who was the Delivery Director. I had three project managers reporting to me at the time. I did not receive any Regulation 31 training from Anglian Water or @One alliance. The on site Stonbury teams received POSWSH training. In 2018 Anglian Water hosted a Regulation 31 training event for on site teams up to project manager level but this was after the event.

Stonbury have worked on the Pitsford tank a number of times over the years including work in 2014 to complete overbanding and re-coating on the walls. Richard Harrison was the project manager in 2015 completing pipework installations. In 2016 Stonbury restructured into area teams and at that point I took on the Team Leader role. There was a leaking penstock in the corner of the Pitsford contact tank. The project manager at the time was [REDACTED] who has since left Stonbury to work for the IOS alliance within Anglian Water. [REDACTED] left in August 2016 and I picked the project up at this time for a number of weeks before handing over to [REDACTED] to complete work on the pipework. [REDACTED] does more of our civils jobs so he picked up the project and ran with it through to completion.

None of the on site teams escalated anything to me at the time I was working on this project.

I first became aware of a problem at Pitford as Anglian Water contacted [REDACTED] because his name was on some of the forms. [REDACTED] contacted me as I was involved with some of the works in early 2022. No one has told me exactly what is wrong with the tank. I was not aware of any pipework issues when I worked on the project. I filled in some of the MIC form which is why my name is on the form. I do not remember putting acothane on the MIC form. I do not recall asking anyone to put any coatings on the inlet pipework. There is a possibility that [REDACTED] may have asked someone to put acothane on the pipework.

I liaised with [REDACTED] when the MIC form for this project was being completed. [REDACTED] was a project manager for the @One alliance.

Traditionally Stonbury would help Anglian Water or @One Alliance populate the material and products used on the MIC form. We are not involved with the sign off on the form. At the time I was working on the project I remember seeing the MIC form. Occasionally there are queries on volumes of products placed in the tank. As part of the form the DWI regulation 31 approval number is included. Anglian Water, through @One alliance had a query regarding the surface area of the acothane used in the tank on the pipework and the volume of the joint repair material being used (called Masterseal 930/933) which was on the form. I had to justify the surface area used for acothane and the joint repair material (930/933). These queries were in September 2016. I do not remember speaking to [REDACTED] when I worked on the project.

Signature: [REDACTED]

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Continuation Statement of: Statement of: [REDACTED]

The pipe was provided 'free issue' from the @One alliance, this means that the @One alliance ordered the pipework and then gave it to Stonbury to install into the tank. No one from the @One alliance indicated that there were issues with the pipework delivered.

In the couple of weeks that I was responsible for the project we were held up because the @One were providing hatch covers and a valve which had some delivery delays preventing us from finishing the work in the tank. The project schedule was very long with multiple changes from 2014 to 2016.

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(Criminal Procedure Rules, r16; Criminal Justice Act 1967, s9)

Statement of: [REDACTED]

Age of witness (if over 18 enter "over 18"): Over 18

Occupation of witness: Drinking Water Inspector

This statement, consisting of 48 pages each signed by me, is true to the best of my knowledge and belief and I make it knowing that, if it is tendered in evidence, I shall be liable to prosecution if I have wilfully stated in it anything which I know to be false or do not believe to be true.

Signature: [REDACTED]

Dated: 22 August 2024

1. I am employed as a Principal Inspector with the Drinking Water Inspectorate (DWI) based in Area 1A, Nobel House, 17 Smith Square, London, SW1P 3JR. I graduated with a BSc (Hons) degree in Geography from the University of Wales, Aberystwyth in 1998. I then went on to study for a master's degree (MRes) at Cranfield University in Water Pollution Control Technology and graduated in 1999. I have a post graduate certificate in Management and a BTEC qualification in Investigative Practice.
2. I have over 20 years of experience in the drinking water industry in technical, scientific, managerial, and regulatory roles.
3. I was assigned the four events at Anglian Water whilst I was employed as an Inspector for the DWI. I have held my role as an Inspector since 15 May 2017 until October 2019. I returned to the DWI as an Inspector in February 2021. I have been doing the role of Principal Inspector since November 2022 on a secondment basis and was promoted to the Principal Inspector role permanently in July 2023.
4. As an Inspector (or Principal Inspector) for DWI, I am authorised to perform my duties by the Secretary of State under Section 86 (4) (a-c) of the Water Industry Act 1991. On behalf of the Secretary of State I am appointed as an assessor of water quality. In accordance with sections 68-70 of the Act, I am authorised to enter any undertakers' premises, obtain measurements, reports and records pertaining to the provision of wholesome water or water unfit for human consumption.
5. I am responsible for investigating any circumstances which may be considered an Offence under the Water industry Act 1991, or the Water Supply (Water Quality) Regulations 2016 (as amended).

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6. On 22 June 2021 at 11:47 hours, Anglian Water notified the DWI about the first of four events that took place at four different drinking water treatment assets in relation to contraventions of the requirements of regulation 31 of the Water Supply (Water Quality) Regulations 2018 (from here referred to as 'the regulations').
7. The company state in the event notification (which I exhibit as **(SEV001)** 'we identified that sections of pipework installed within the tanks did not comply with Regulation 31 of the Water Supply (Water Quality) Regulations 2018'. As per the notification, the asset affected was Kedington Water Treatment Works (WTW) which supplies a population of 78,758 (to consumers in the Haverhill and Bury St Edmonds public water supply systems).
8. A 3-day report was submitted by the company for the event at Kedington on 25 June 2021 at 17:05 hours **(SEV002)**, and a further 20-day report **(SEV003)** was submitted on 20 July 2021 at 16:54 hours. The event was assigned DWI event number **8118-2021**.
9. My role as an Inspector is to investigate events reported by the companies to determine any breaches of the regulatory requirements. The introduction of materials into drinking water that do not meet the requirements of Regulation 31(1) is considered a criminal offence under regulation 33(3). There is no due diligence defence written into regulation 31.
10. Based on the company reports that the requirements of Regulation 31 had not been met, I requested (by a letter attached in an email) that the board level representative, [REDACTED] attended an Interview Under Caution (IUC) on 12 November 2021. The Interview Under Caution was planned to take place on 17 December 2021 to discuss the matters surrounding the event.
11. The company requested a short notice Microsoft Teams Meeting three days after the invitation to attend the IUC was sent, on 15 November 2021. At this meeting myself and [REDACTED] (my line manager at the time) were informed by [REDACTED] and [REDACTED] (of Anglian Water) that they had discovered there had been further, similar, repeat instances in the company where pipework that did not meet the requirements of regulation 31 had been identified at other drinking water assets. At the time of the meeting, the company suspected up to a further 9 assets (including treated water tanks and reservoirs) in total could be affected. Some of the assets suspected of being affected also exported drinking water supplies to consumers who pay their bills to other water companies. The industry term for this supply arrangement is known as an 'export'.
12. The IUC with [REDACTED] was cancelled to give the company time to investigate, remove assets from supply and report the assets affected as DWI reportable events. Following

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the company investigations, three further events were formally reported to the Inspectorate.

13. On 15 November 2021 at 16:47 hours Anglian Water (interchangeably referred to as 'the company') formally notified the second regulation 31 event. The notification (**SEV004**) stated that on 2 November 2021, sections of pipework has also been found in Diddington reservoir that did not comply with the requirements of regulation 31. This asset supplies a population of 89449 to areas of Huntingdon. This incident was given DWI event number **8338-2021**.
14. A 3-day report was submitted for the reportable event at Diddington Reservoir on 18 November 2021 at 17:33 hours (**SEV005**).
15. On 21 December 2021 the company formally notified two further events to the Inspectorate.
16. At 17:53 hours the notification was received which stated Hannington Reservoirs 1A and 1B had sections of pipework installed which did not meet the requirements of regulation 31 (**SEV006**). This asset supplies a consumer population of 852,695 to areas of Milton Keynes and Northampton. Water is also exported to Thames Water and Independent Water networks consumers. This incident was given event reference number **8379-2021**.
17. The 3-day report for the Hannington event was received on 24 December 2021 at 14:34 hours (**SEV007**). The 20-day report (**SEV008**) was submitted by the company to the Inspectorate on 21 January 2022 at 17:58 hours.
18. At 18:02 hours on 21 December 2021 the company further notified the Inspectorate (**SEV009**) that Pitsford Storage Tank B had sections of pipework installed within the tank that did not comply with regulation 31. This asset supplies a population up to 291,864 to consumers in areas of Northampton and Daventry. Water is also exported to customers of Independent Water Networks Limited (IWNL).
19. The 3-day report from the company for the Pitsford event was received by the Inspectorate on 24 December 2021 at 14:34 hours (**SEV010**). The 20-day report was submitted to the Inspectorate on 21 January 2022 at 18:00 hours (**SEV011**).
20. I was assigned as the Lead Investigating Inspector for the four events by my line manager, [REDACTED]. I have drawn my conclusions from the information, sample results and reports supplied by the company. I have also obtained voluntary witness statements from company representatives, the company's contractors, and suppliers. I have also referred to published toxicological information from the United Kingdom Water Industry Research (UKWIR) Toxicity Datasheets, The Regulation on the registration, evaluation,

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authorisation, and restriction of chemicals (REACH) and the European Chemical Agency (ECHA), where I have researched the lower exposure limits for the chemical compounds found through sampling of the water supply and by analysis of the compounds used in the coatings of the pipework implicated in each of the four regulation 31 events. The references I have used are appended to this report.

21. After reviewing the information obtained in my investigation, I conducted an Interview Under Caution (IUC) with company board level representative [REDACTED], in the presence of the company legal representative, [REDACTED] on 21 and 28 February 2023.
22. The company provided a pre-written statement on 20 February 2023 (**SEV078**). The company insisted on reading out the pre-written statement on the CD recording of the interview under caution. The interview therefore had to be continued on 28 February 2023 for time and wellbeing purposes. The full IUC transcript is exhibited as **SEV079**.
23. My statement starts with the event at Hannington reservoir(s) since this was the first scheme (out of the four events) where the pipes that were not compliant with the requirements of regulation 31 were installed in the drinking water supply system and were used to supply drinking water to consumers.
24. **Hannington Reservoir 1 (sides 1A and 1B)** were both modified as part of an AMP6 Capital Engineering scheme to improve resilience of supplies on the Grahams Water supply system (as detailed in exhibit **SEV007 and SEV008**).
25. Drinking water reservoirs store treated, potable water before water is forwarded into the underground network of drinking water mains, which supply water to consumers. Treated water reservoirs can be split into two compartments, as is the case at Hannington, with side 1A and 1B running in parallel with each other. Most storage reservoirs have an inlet pipe (used to fill the reservoir) and an outlet pipe (used to transfer water out into the mains network).
26. As per the 3- and 20-day reports (**SEV007 and SEV008**) two new outlet mains were installed into each reservoir at Hannington (side 1A and 1B) as part of the scheme, resulting in four new outlet mains in total. The four outlet mains (of 500 mm diameter) protruded into the tank structure by 500 mm and were in contact with drinking water.
27. The design of the scheme was commissioned by Mott McDonald and construction was carried out by JN Bentleys on behalf of Anglian Water.
28. The pipework in contact with drinking water is known as Electrofresh Plus pipe. This is a ductile iron pipe, and the product holds WRAS approval (for the conveyance of water) as well as DWI regulation 31 approval. This approval is only for the inside of the pipe. When

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a pipe is used in a tank, the outside of a pipe is also in contact with drinking water as it becomes submerged. Therefore, the outside of the pipe should comply with the requirements of regulation 31.

29. Electrofresh Plus pipe is not approved for use in drinking water in a submerged environment. Page 8 of the 20-day report (**SEV008**) explains the process for making and modifying Electrofresh Plus pipe.
30. Electrofresh Plus pipe is normally used underground, for the conveyance of water as the inside of the pipe is approved for this purpose. However, the outside of the pipe is not approved for any contact with water. The external barrel of the four pipes used at Hannington had been coated for aesthetic purposes by the supplier. The paint used was V&M enamel paint also known as Dacrylate. This product holds no approval for contact with drinking water. I exhibit the safety data sheet for the product as exhibit **SEV012**.
31. As can be seen from the safety information, there are many hazards associated with the product and its constituent chemicals. Page 21 (of exhibit **SEV012**) lists the hazard statements in full. The hazards include the product being harmful to skin, that it may cause damage to eyes, cause lung damage if swallowed, that it may cause genetic defects and cancer. The product may damage fertility, or an unborn child. The product may cause damage to organs through repeat exposure. Although any chemicals would have been diluted with drinking water, the listed hazards demonstrate that this product was not suitable for being in contact with drinking water and should not have been used to paint the external surface of the pipe.
32. It is the company's responsibility to ensure that all materials used to supply drinking water comply with the legal requirements of regulation 31. This includes the products selected, procured, and installed by contractors. This product was also applied to the pipework at Diddington reservoir.
33. According to page 7 of the company 20-day report (**SEV008**), Hannington Side 1A was isolated from supply on 15 December 2021 for inspection of the pipework. The pipes were inspected by the company on 20 December 2021. During this inspection sections of blue pipework were identified as having areas of blistering of the pipe coating.
34. Hannington Reservoir 1B remained in supply until 24 January 2023, supplying drinking water to consumers throughout. This is over a year since the issue pertaining to the pipework was initially discovered and reported as an event to the Inspectorate.
35. The 20-day report (**SEV008**) states that following the capital work to introduce the pipework, Hannington Side 1A went into drinking water supply on 16 April 2016. Hannington side 1B went into drinking water supply on 7 February 2017 following the

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capital work.

36. The company keep records known as 'Materials in Contact' (MIC) forms where materials used in construction, or modifications, are recorded. Materials used are supposed to be signed off by the company's water quality scientists before any materials are bought or installed on any capital schemes or upgrades. This is the company's policy for complying with regulation 31. I exhibit the company's document 'Policies and Standards for Materials and Chemicals in Contact with Water' as **SEV013**. Page 1 of the document specifies that products will be verified prior to purchase and use.
37. The requirement is also reflected in company procedure 3.01 'Materials in Contact with Water' (which I exhibit as **SEV014**). Page 2 of the company's own procedure (Point 5 of the table) specifies that 'All materials should be confirmed by the Water Quality Risk Team as compliant with Regulation 31 before the decision is made to purchase and install.'
38. I discovered that the company's own procedures were not followed to ensure compliance with regulation 31. This was common to all four repeat events – particularly the procurement and installation of products prior to verification and approval by the Anglian Water Risk Teams.
39. Page 9 of the 20-day report for Hannington (**SEV008**) states that the company sampled Hannington Side 1A 'for Materials in Contact' parameters after 16 hours stand time on 16 April 2016. The report also states that side 1A was returned to supply on 16 April 2016. I considered this to be unusual as the parameters being analysed (such as a bacteriological sample) take at least 16 hours to incubate and same day results are not usually expected.
40. The company did not mention that there had been any issues whilst returning the assets into supply in the 3 or 20-day reports at any of the affected assets.
41. I formally requested the company 'materials in contact' (MIC) records for the assets at Diddington, Hannington and Pitsford Reservoirs on 23 February 2022. Except for the first event notified (for Kedington), these were missing and not provided alongside the 3 or 20-day reports by the company.
42. These are important records to provide for regulation 31 issues and it was unusual that these were not provided alongside the 3 or 20-day reports for such an event.
43. The company responded to my request for information on 9 March 2022. I exhibit the company reply as **SEV015**. The response states that when Hannington (1a) was being filled (between 15 and 16 April 2016), the inlet valve had failed to close causing water to

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pass through the overflow. The company's Operational Control Manager (OCM), Water Quality Scientist and Regional Water Quality Scientist had subsequently agreed to put the asset forward into drinking water supply.

44. The Materials in Contact form (MIC form) associated with the work on Hannington reservoir side 1A is exhibited as **SEV016**. It is MIC form number 2361. This form did not start to become populated until 18 April 2016, after the incident. This confirms that at the time the asset went into supply on Saturday 16 April 2016, following the work within it, the company were unaware of any of the materials used on the scheme. This is in contravention of the company's own procedures and demonstrates that the company were not in control of their processes for ensuring compliance with regulation 31.
45. Based on my own operational experience, the company should not have considered filling the reservoir without a complete understanding of the materials used and an appropriate sign off that all products used complied with the drinking water regulations.
46. The pipework was ordered on 8 January 2016 by JN Bentleys, several months before the incident. I exhibit the invoice as **SEV017**.
47. A statement from the Company Duty Manager ([REDACTED]) on 10 August 2022 states that the situation was not treated as an incident at the time. The water from the reservoir was going down the overflow to a local brook and that there was sensitivity about flowing into the brooks in the area.
48. Based on my own operational management knowledge, the company could have avoided putting the asset into the drinking water supply at the time the inlet valve failed and ensured no detriment or risk to public health. For example, before any water was introduced for filling the reservoir the company could have exercised the valves to check their functionality. This is a usual step seen in many operational impact plans in other companies.
49. Once the inlet valve had failed to close, causing the tank to overflow, the company could have also diverted the water to the local dyke and used chemicals such as sodium thio-sulphate to de-chlorinate the water. This operational plan could have been agreed with the Environment Agency at the time. This practice is commonplace in the Industry.
50. There are specialist emergency contractors that can use special equipment and provide 24/7 support to free or tighten ceased/inoperable valves.
51. The investigation has found there was no available data on the materials used on the scheme when the asset (Hannington side 1A) went into supply. Samples were taken retrospectively, whilst water was already passing into the drinking water supply. The outlet

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pipework (which did not comply with regulation 31) used on the scheme was not recorded on the MIC form until 10 May 2016 (**SEV016 – refer to line 3**).

52. As can be seen from the MIC form (**SEV016- line 3**) the product has been signed off as approved by the company's [REDACTED] and [REDACTED], despite the pipework product holding no approval for submersion and being coated with V&M Dacrylate paint.
53. The asset remained in supply for four days (from 16 April to 20 April as per exhibit **SEV015**) before it was removed from supply. The asset was re-introduced into supply on 10 June 2016. The asset and regulation 31 non-compliant products remained in the drinking water supply until 15 December 2021, when the reservoir was isolated for inspection.
54. The Client Project Manager responsible for the scheme ([REDACTED] of Anglian Water) gave a statement to DWI on 19 May 2022 saying that she helped JN Bentleys representatives complete the MIC form. She rang up suppliers and manufacturers and checked their approval for the items that were going to be procured.
55. This contrasts with the statement made by [REDACTED] (dated 18 July 2022) and the date and content of the MIC form (**SEV016**) which shows the form was not completed until 18 April 2016. [REDACTED]'s statement confirms that [REDACTED] was responsible for the inventory of materials used on the scheme. He also exhibits an email he forwarded to his line manager on his return to work as **RMB01**.
56. The email (**RMB01**) was originally from [REDACTED] on 20 April 2016 (after the incident). She states she has been trying to complete the MIC form. A product called 'Fosroc Conbextra HF High Flow Grout' had also been used on the inside of the reservoir. She says she "will make sure all the other materials and products used on site have been listed on the MIC form and approved before anything is put back in supply. I sincerely apologise for this breach in Water Quality Standards. It had been assumed that all the materials used had been checked beforehand, but this was clearly not the case".
57. [REDACTED] reports to his line manager, [REDACTED] that he assumes this (issue) has been taken forward as a breach of Regulation 31 in his absence. [REDACTED] states that he did not receive a reply.
58. The incident was **not** reported to the DWI as a water quality event as would be expected by the Inspectorate in accordance with notification criteria. At the IUC with the company, [REDACTED] said that he believed a risk assessment was carried out at the time and only minor modifications had been made to the tank. He could not provide details of the risk assessment and said he believed at the time 'the company procedures were robust'.

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59. As a Drinking Water Inspector with a role to protect public health, I disagree that the company procedures were robust. The materials had been procured, installed, submerged, and put into the drinking water supply before an assessment was made for their suitability for drinking water. This is not in accordance with best practice or the company's own procedures or the regulations.

60. In his statement, [REDACTED] states that he cannot locate the Materials in Contact procedure that was in place at the time of the incident for the company to follow and instead refers to the version in place as of 2018 and the duties of the people responsible for ensuring compliance with Regulation 31 within.

61. There were no records available of the materials used in the tank when the decision was made (on a weekend outside of normal working hours) to valve the asset into the drinking water supply. The company had an option to discharge water to a local dyke but chose to divert the water into the drinking water supply instead. There were no sample results available from the asset at the time to justify this decision, or to assess the risk to public health.

62. As mentioned above, there had been use of unapproved grout in the tank (**as per RMB01**) that did not hold WRAS or DWI approval. Such materials are likely to need to cure and comply with manufacturers 'Instructions for Use' and regulation 31(4)(b). There were no records to demonstrate these conditions had been complied with, which is also a requirement of the regulations.

63. The company conducted 'soak tests' on samples of the paint taken from the affected pipes on 5 January 2022. I exhibit the results as **SEV018**. As can be seen from the tests, there were low level compounds detected on samples that had been soaked in de-ionised water for 24 hours. These included Nonanal, Oleic Acid, Hexanal, Phthalic Anhydride, Tridecene. The company compared the limits to Operational, 1 day and 7 day suggested no adverse response limits (SNARLs) which have been set by UKWIR. However, when products in contact with drinking water are tested for regulation 31 compliance, SNARLs which are for short term exposure, are not reviewed. Instead, long term exposure is reviewed. A toxicologist would typically look at each ingredient in a formulation as well as review results from laboratory testing over a period of time.

64. I have not seen any reference to other published health limits by the company such as the European Food Safety Authority (EFSA) food contact materials information, the 4 Member States initiative (MSi) organics positive list, guidelines from the Organisation for Economic Co-operation and Development (OECD), the Joint FAO/WHO Expert Committee on Food Additives (JECFA), the World Health Organisation (WHO) and the United States Environmental Protection Agency (USEPA). Furthermore, there are many relevant

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toxicological papers ensuring the most accurate information for establishing risk to human consumption over a lifetime of exposure whose evaluation also considers adult, child, and infant exposure rates. The company have not carried out any such assessments or analysis or reviewed any risks from the presence of multiple chemical, rather than each chemical being considered in isolation (as one chemical).

65. The levels of the chemicals found in the paint samples from the Hannington pipework are lower than the levels found in the samples taken from the pipework at Diddington reservoir (**SEV027**) despite the samples being from the same paint product, Dacrylate.
66. [REDACTED] states in the IUC (page 25 CD1 21 February 2023) that “During the period in which Hannington Reservoir 1A was in supply, April 2016 to December 2021, a total of 302 regulatory monitoring samples were undertaken. 126 internal monitoring samples were undertaken, and 86 operational samples were undertaken. A number of different water quality parameters were analysed on each sample. All sample results collected at the Hannington Reservoir 1A between April 2016 and December 2021 have been satisfactory and below regulatory limits”.
67. I exhibit the samples results of samples taken from Hannington 1A whilst it was in supply as **SEV019**. Such samples are usually taken from an official tap on the outlet from a treated water reservoir. Almost all the results from the samples taken from the asset are bacteriological samples. They demonstrate whether the water is bacteriologically safe.
68. These bacteriological tests would be incapable of detecting any compounds introduced into the water supply from the paint coatings. Trace organics tests would be required to detect paint contamination.
69. As can be seen in exhibit **SEV019**, there were only two tests taken from the asset for trace organics. These were conducted on 16 April 2016 (as part of the incident retrospective MIC sampling). The results are listed under the ‘purge and trap’ and ‘water profile’ analysis parameters. The samples were clear of any trace organics detections.
70. However, this is shortly after the asset (and pipework) had been exposed to water. The asset had not been left to stand for 16 hours ahead of sampling, as per the company’s procedures for bringing their assets back into the drinking water supply (**SEV014**). The sample results are also supposed to be signed off by a member of the water quality team before the assets are put into supply. As discussed above, this sampling did not occur.
71. There are no further appropriate (trace organics) tests from Hannington Side 1A to demonstrate that there were no chemicals released from the paint going into supply. The point [REDACTED] makes about the extent of sampling and number of samples is therefore not

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backed with evidence.

72. Enhanced trace organic sampling is not required in the regulations as the risk from materials introduced into the water supply is intended to be controlled by restricting the introduction of materials (under regulation 31), which makes extensive organics samples unnecessary (assuming compliance with regulation 31).

73. Hannington Reservoir side 1B went into supply on 7 February 2017 and remained in supply until 24 January 2023. The company said they have kept the asset in supply (aware of the issues with the pipework) because 'it would put customers at high risk of loss of supply' (as stated in the 20-day report **SEV008, page 24**). The company also said that they anticipated the tank would be out of supply by February 2022 (**SEV008, page 24**).

74. The risk to supply or water quality is for the company to manage and the DWI cannot mandate removal of assets if this results in loss of supply as this creates further public health risk and cost to the company. On 23 February 2022, I asked the company for any trace organics sample results to date from Hannington 1B whilst it was in supply. On 9 March 2022 the company replied (**SEV015, question 6**) to say "*The samples to date from Hannington Reservoir 1B have identified two compounds, Nonanal, a naturally occurring essential oil not listed on UKWIR Toxicity database and Tridecanol, identified as a best fit in one sample and not listed on UKWIR Toxicity database. We do not believe that these compounds are related to the small sections of outlet main within the reservoir*".

75. The company did not lead me to believe that there was a risk to water quality. Furthermore, they did not mention any sample results from customer taps in the affected supply areas. Several months after the IUC with [REDACTED], the company provided a toxicology report (**SEV074**) which was carried out in October 2023. The report uses previously undisclosed information on sample results taken from customer taps whilst the assets were in supply. This matter only came to light after I had written my witness statement and is discussed below in detail.

76. When the toxicology report was issued to the DWI on 23 November 2023, the company still had not provided the sample result data from the customer taps and the DWI had to request these by email. The results were then provided later on the same day 23 November 2023 (**SEV076**).

77. On 1 September 2022, I inspected pipework at Grafham water treatment works, Anglian Water, which had been removed from the tanks at Pitsford and Kedington. [REDACTED] told me that the pipework at Hannington and Diddington had not been removed from the tanks and had instead been encased in concrete *in situ*.

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78. On 2 September 2022, I wrote to the company to request to be present during an inspection of the tanks whilst they were out of supply, so that I could check any remedial work and to leave the tanks empty (**SEV080**). I also requested an update on the status of the tanks and return to supply dates.

79. My line manager subsequently told me that although the company had not removed the pipework as planned, any remedial work and reintroduction of assets into supply with the original pipework encased in concrete was up to the company's own risk assessment. It was therefore considered that an internal inspection by the DWI was not necessary.

80. I wrote to the company again on 14 September 2022 (**SEV081**) to advise we would not be inspecting the tanks in person and that the company should provide an update on the operational status of the assets. I requested that the company provided photographs of the pipework before the assets were placed back in supply.

81. Between the dates of the two letters to the company (**SEV080** and **SEV081**), on 5 September 2022, a whistle-blower contacted me to say that Diddington reservoir was empty; Kedington contact tank was empty; Pitsford storage tank B was empty; Hannington 1A was empty; however, Hannington 1B was 95% full. This was seven months after the company informed me that it would be removed from supply. Nobody from the company advised me that the asset remained in supply or made any attempt to discuss the results from sampling from their customer's taps or the length of time the asset remained in supply to the public, despite knowing that the water being supplied to consumers was potentially unfit for human consumption and the pipework within the asset was in breach of regulation 31.

82. On 16 September 2022, I asked questions in relation to the status of Hannington 1B following contact from the whistleblower. I got a response on 21 October 2022 (**question 21, SEV082**). The company's response stated that "*Tank 1A is out of supply and 1B is in supply. Tank 1A is undergoing on going remedial work; Tank 1B remains in supply until Tank 1A is returned to service*".

83. At the time of the questions being asked in relation to the tanks' operational status (**SEV082**), I noticed that not all sample results were available from 2016, so I asked for the sample results to be provided from Hannington (both compartments) from 2016 including trace organics (question 24). The results were provided on 21 October 2022 which I exhibit as **SEV020**. The trace organic results (purge and trap column BD, and water profile column BR) give only a result of 1 or 0 on the analysis report, which indicates the presence or absence of trace organics.

84. On 4 November 2022, I asked the company to provide the results where the sample

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report indicated there was 'something to report' (denoted as a "1") (**SEV083, Question 28**). The response demonstrates that the company were aware of low-level organic detections from the asset since January 2022 whilst the asset remained in supply and was subject to trace organics sampling. These results had not been communicated to the Inspectorate.

85. On 25 November 2022, I received an email from the company [REDACTED] to say that Hannington 1A remedial work had taken place and that they expected the asset to return into supply early the following week (**SEV084**). As can be seen from the before and after pictures (**SEV085**) and (**SEV086**) only a small section of pipe (50 cm in length) had to be removed from the tank and a stainless-steel plate applied to the wall of the tank. This amount of work should not have taken almost 12 months to complete. The company had indicated that the work would be completed by February 2022. They did not proactively advise the DWI of the delays or the trace organics detections, until the tank status was escalated by a whistleblower.
86. On the 19 January 2023, the DWI Risk Assessment Team had asked the company questions about the risk lines submitted previously, for all the reservoirs and tanks mentioned in this statement, which had breached regulation 31 (**SEV087**). Updated sample results from Hannington 1B were provided upon request by the DWI risk Assessment team (**SEV022**).
87. It was presumed that Hannington 1B would have been removed from supply immediately following the return of Hannington 1A as indicated by the company in the 20 day report. However, on 2 February 2023, I was informed by a member of the DWI Risk Assessment team that the asset had still not been removed from supply, following receipt of an email from the company to them (**SEV087**) in which the company incorrectly state that Hannington 1B was still in supply.
88. Hannington 1B could have been taken out of supply on the same day as Hannington 1A was returned to service, 29 November 2022, since the risk of loss of supply had been mitigated. The company provide no explanation for why Hannington 1B was not removed from service immediately. In the response the company provided on 2 February 2023 (**SEV087**), to the questions the DWI Risk Assessment team asked on 19 January 2023, the company write "*Hannington Reservoir 1A (RCGJL) - returned to supply 29th November 2022 following pipework remedial work. Currently in 3 month monitoring phase.*"
89. The company don't expand on what the 3 month monitoring is for at Hannington 1A, and the comment implies this is the reason for Hannington 1B still having remained in supply. However, Hannington 1B was not taken out of supply three months after Hannington 1A was placed back in to supply. Hannington 1B was taken out of supply four days after the

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DWI Risk Assessment Team had asked the company to provide an update on whether any of the tanks were still in supply, despite the risks being identified. It is likely to have served as a reminder to the company that Hannington 1B was still in supply.

90. At the IUC on 28 February 2023, [REDACTED] states that Hannington 1 B was removed from supply on 24 January 2023 (IUC disk 2 transcript, page 32). He did not give an explanation that justified the significant delays in removing the asset from supply. He said that the enhanced sampling demonstrated that the water was wholesome. He did not disclose any customer tap sample data. The toxicology report and associated samples from customer taps provided by the company on 20 November 2023 (**SEV074, SEV075 and SEV076**), later show that detections of similar compounds were found in samples from customer taps downstream of Hannington 1B, including the compounds ethyl hexanol and tridecanol.

91. Hannington 1B was originally sampled for trace organics following a 16-hour standing period and before going into supply on 7 February 2017 (**SEV008, page 9**). The result was clear of any trace organic detections.

92. According to the 20-day report (**SEV008**), the company commenced trace organics sampling on 10 January 2022 from Hannington 1B whilst the asset remained in supply (following the discovery of unapproved pipework in compartment 1A). Low level trace organic compounds were found on some of the additional samples from reservoir side 1B. Exhibit **SEV020** lists all of the samples from Hannington Side 1B. Exhibit **SEV021 page 4** lists the results from the trace organics tests with detections from 20 January 2022 to 29 September 2022. Exhibit **SEV022** gives the results for the trace organics samples from the same sample point to 6 December 2022.

93. The trace organic compound detections found in the samples from Hannington 1B included nonanal; tridecanol; oleic acid and ethyl hexanol. It is possible that the presence of Ethyl Hexanol in the samples is from the paint on the outlet pipes as this compound is a metabolite of some of the phthalates listed on the samples from the soak tests at Hannington and Diddington (**SEV018** and **SEV027**) respectively. The samples of the paint (used in the soaks tests) were taken directly from the pipe barrels at Hannington and Diddington.

94. Ethyl Hexanol is particularly associated with Di-ethylhexyl phthalate (DEHP). DEHP is also known as diisooctyl and dioctyl phthalate. This chemical is a controlled substance under REACH (the Registration, Evaluation, Authorisation, and restriction of Chemicals). REACH is a regulation that applies to most chemical substances that are manufactured or imported into Great Britain.

95. DEHP has been included in the EU REACH list of substances of very high concern

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(SVHC). Publications have identified a risk to children exposed to DEHP via the environment with effects to testes, kidneys and fertility as noted in the UKWIR Toxicity datasheet (**Appendix 1**) and ECHA chemical factsheet (**Appendix 2**). DEHP also has endocrine disrupting properties and requires authorisation before it can be used. Consumer exposure previously cited have been from toy and childcare articles, food and environmental exposure from cites using DEHP for sealants, adhesives, plants and lacquers, sites recycling paper and sewage treatment works. The International Agency for research on Cancer (IARC) has concluded that DEHP is possibly carcinogenic to humans (**Appendix 1**).

96. As discussed above, the warnings in the safety datasheet for V&A enamel are listed in exhibit **SEV012**. The product is not intended to be used in water environments and it is not approved for use in drinking water systems.
97. The company refer to 'SNARLs' when determining the health risk from chemicals found in trace organics tests. These are the 'Suggested No Adverse Response Limits' for short term exposure to chemicals. The company consider (in accordance with their process and procedures) that low level organics detections are deemed acceptable if below their respective SNARL levels. However, for materials in contact with drinking water, long term exposure is assessed.
98. [REDACTED] (at the IUC) would not answer any questions of a scientific nature or questions in relation to risks to public health. He said that there was no evidence of any of the paint going into supply. He said every compound in the paint samples were below published SNARLs. The company have only used the SNARL limits to determine the risk to consumers. The SNARL limits are based on 24 hour and 7-day exposure levels.
99. There is no evidence that the company looked at any long-term exposure limits or carried out any calculations to account for the risk to human consumption over a lifetime of exposure which would seem appropriate in this situation, with consumers potentially exposed to the presence of the paint and its chemicals over many years.
100. The long-term exposure limits are typically much lower than SNARL levels and are based on several different standards. I did not find any evidence the company had considered the health impact of the cumulative exposure to the full suite of chemicals all at once over an extended period of time (the SNARLs only consider the health impact from individual compounds over 1 and 7 days). They did not make reference to any long-term standards.
101. [REDACTED] considered that his water quality team were qualified to make this assessment using SNARLs. In the IUC he said "We absolutely maintain that water was fit for human consumption. The water at all times was wholesome. The requirements of

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regulation 4 were met at all times.' (Page 13 CD2 IUC 21.2.23)

102. Regulation 4 (2)(b) of the Water Supply (Water Quality) Regulations 2016 requires that the water does not contain any substance (whether or not a parameter) at a concentration or value which, in conjunction with any other substance it contains (whether or not a parameter) would constitute a potential danger to human health.

103. My investigation has revealed the paint coating on the pipework had blistered and reverted to a powder form. This is confirmed in witness statements by the reservoir engineers and the 3- and 20-day reports provided by the company. Given the paint reverted to a powder form this material could be expected to have become easily suspended in moving water. The nature of the company sampling strategy **exhibited as SEV019 and SEV020** (consisting of predominantly spot samples taken for bacteriological parameters) would not have detected any residual paint in the drinking water supply.

104. The trace organic samples from Hannington side 1B showed there were regular trace organic detections when a sampling strategy was in place. The Ethyl Hexanol could be linked to the paint as it is a metabolite of DEHP, which was found in the paint. The levels detected are after many years of the paint on the outlet pipes being submerged in drinking water.

105. At the time the company took specimen (soak test) samples from the barrels of the pipework, however many years had passed since the pipework had first become submerged in drinking water. It is unlikely that the full suite of compounds in the paint in their original quantities would have been present at the time of sampling, and lower concentrations can be expected.

106. Regulation 31 is designed to prevent the introduction of unapproved materials so that extensive trace organic sample strategies are not required. All Regulation 31 approved products are certified as safe to be in contact with drinking water.

107. The company introduced a risk to public health that cannot be accurately quantified by failure to comply with the requirements of regulation 31.

108. Section 70 of the Water Industry Act covers duties on water undertakers to ensure that water is fit for human consumption. The company is required to demonstrate that it took all reasonable steps and exercised all due diligence for securing that the water was fit for human consumption on leaving the company's pipes.

109. My investigation concludes that the company did not exercise all due diligence and that repeat failures to protect public health and comply with regulation 31 were evident in

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all the four repeat events.

110. The health risks listed as being associated with the compounds in the paint (such as fertility issues, risks to unborn children and being cancer causing) would be enough for a consumer of sound mind to reject the water for drinking should they be aware of the presence of the unapproved pipes coated with dangerous chemicals in their supply. A risk to public health that the company should have been in control of.

111. Witness statements were taken from contractors involved with the scheme. [REDACTED] (WS04) (JN Bentley's) states he worked alongside [REDACTED] and [REDACTED] to collate the materials information and check the approvals. [REDACTED] s statement (WS04) confirms that he did not receive any Regulation 31 training from Anglian Water. He also worked with [REDACTED] and [REDACTED] to collate materials used in construction for the Diddington scheme.

112. I checked the Regulation 31 training records provided by Anglian Water (**SEV031 and SEV032**) for all names mentioned on the MIC forms. There were no training records for [REDACTED]. [REDACTED] was not trained until 15 July 2016 (alongside his line manager [REDACTED]). The Project Manager for the scheme, [REDACTED], was not trained until 14 June 2018.

113. During the IUC, when questioned on training of the company's staff, [REDACTED] stated that "what we have got is a number of people had grandfather or grandmother rights to the training, which they had done previously. But there was not the record of it".

114. As can be seen from the design drawings (**SEV023 and SEV024**), the tank was retrofitted with the new outlet pipes by core drilling four holes through the existing tank walls (4 holes in sides 1A and 1B). The invoice to Electrosteel (**SEV017**) confirms that each of the four sections of pipe purchased was 2332mm long and was threaded through the core-drilled holes in the tank so that 4 sections of the pipes were in the reservoirs and submerged in contact with water.

115. [REDACTED] from Electrosteel gave a witness statement (WS08). He also confirms the pipes were externally coated in Dacrylate paint and went through a standard order process for underground pipe.

116. Following the failures in the design, water quality approval, procurement, and installation stages to identify the issue, the reservoirs were also visually inspected by Anglian Water Reservoir Engineers after the modifications to install the pipes were made. Hannington Side A was first inspected on 14 April 2016. Side B was inspected on 16 December 2016 and 30 January 2017.

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117. I exhibit the reports as **SEV025**. The reports dated 14 April 2016 (1A) and 30 January 2017 (1B) make no reference to the new pipework in both tanks, or its condition beyond stating that the pipework in 1A needed cleaning. The structure of the reservoir had been physically modified but there is no reference to this work.

118. The Inspecting reservoir engineer did not identify an issue with the pipework or lack of DWI Regulation 31 approval. The statement by [REDACTED] quotes that historically the reservoir engineers were not trained to look for unapproved materials and they assumed others (contractors and water quality scientists) were in control of the regulation 31/MIC sign off process. If pipework looked new, blue and in good condition it was considered OK.

119. There had been several critical control points in the Hannington scheme which failed and led to the contravention of regulation 31. The contractors failed to procure the correct product and the company failed to control the items which were procured. The MIC form was retrospectively raised (in conflict to the company's own processes and procedures. Nobody had the correct regulation 31 training and internal visual inspections failed to identify an issue.

120. The company did not consider the issue of side 1A going into supply without prior sampling and approval, or any records of materials used in construction, serious enough to report to the DWI as a notifiable event. This was also after the company realised that they had used unapproved grout to make repairs around the new outlet pipes.

121. The issues at Hannington in isolation may have been considered a genuine human error/ oversight but the same repeat failures to comply with regulation 31 are observed in the remaining three cases in my investigation.

122. Diddington Reservoir was a newly constructed reservoir built as a capital project in AMP 6. The asset was in supply for 3 years, 6 months and 24 days or 1301 days in total from 27 February 2018 to 21 September 2021 equalling 31224 hours.

123. The design of Diddington reservoir was completed by Mott McDonald and the construction by JN Bentley (the same contractors who were involved with Hannington Reservoir).

124. Diddington Reservoir has two tank cells (East and West). Each cell has a capacity of 20,000 m³.

125. According to the company 3-day report (**SEV005, page 5**) it was identified on 2 November 2021 that the overflow pipework of both tanks had sections of unapproved

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pipework. The pipes showed areas of blistering and peeling of the coating. Images of the coating can be seen on page 6 of the 3-day report (**SEV005**).

126. An overflow pipe prevents a reservoir being overfilled with water. In this reservoir, each cell had an overflow pipe which was located inside the tank with a bell-mouth at the top. Should the tank overfill, water would go down the overflow pipe and would be diverted outside the tank. A simplified diagram of an overflow pipe in the reservoir can be seen on page 13 of the 3-day report (**SEV005**). The sections of pipe that were not approved for contact with drinking water are the sections in white.
127. As in the case of Hannington Reservoir, the unapproved sections of pipe were Electrosteel Electrofresh Plus ductile iron pipework which had been coated in Dacrylate V&M enamel paint (the safety datasheet is exhibited as **SEV012**).
128. There were four sections of pipework installed in Diddington reservoir which were not approved for contact with drinking water. Page 8 of the 3-day report (**SEV005**) lists the sections as two sections of 900 mm diameter puddle flanged socket pipe at a length of 275 mm (one in each compartment). There were also two sections of 900 mm diameter double flanged pipe at a length of 3195 mm (one in each compartment).
129. The company took 'materials in contact' (MIC) samples before each of the compartments went into supply after construction. On 26 January 2018 a sample from the West cell (after filling and being left for 19 hours standing) contained 0.14 ug/L ethyl hexanol. The same chemical was found on a sample from the East cell on 26 January 2018 which contained 0.19 ug/L ethyl hexanol. Further samples from both cells on 8 February 2018 were clear of any trace organics (**SEV026**).
130. In the 3-day report (**SEV005**) the company compare these values to the SNARLS only. The did not refer to any other toxicological limits or the LEL limit.
131. There had only been one trace organics sample taken from each compartment since the reservoir went into supply for the first time on 27 February 2018 (**SEV026**). As discussed, these are the only suitable tests capable of detecting chemicals from the paint.
132. As mentioned in point 74 above, ethyl hexanol had been repeatedly detected in low amounts in samples from Hannington 1B reservoir, which contained the same Electrofresh Plus pipes coated in Dacrylate V&M enamel paint.
133. The company took samples from the paint coatings on the barrels of the pipes in the East and West compartments on 19 November 2021 This is almost 4 years after the asset first went into supply on 27 February 2018. As can be seen from exhibit **SEV027** (the 'soak tests'), there was an extensive suite of compounds found in the paint after

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various soak times in de-ionised water.

134. It can be assumed that after four years of being in contact with water that the levels of the compounds would be lower than the original concentrations. The chemicals in the highest concentrations are substances known as phthalates.

135. Phthalates are also known as phthalate ester. They are esters of phthalic acid. They are commonly used as a plasticiser, resins, polymers (**Appendix 3**).

136. Chemicals in the 'soak tests' (as listed in **SEV027**) include total diisooctyl phthalate and dioctyl phthalate at 50 and 37 ug/L respectively. These chemicals are present are in the highest concentrations in the samples from the flange of the pipework in the East tank. They chemicals are form of, or another name for, Di-ethylhexyl phthalate (DEHP) (**Appendix 1**).

137. Diisobutyl phthalate (DIBP) shows the next highest concentrations in the sample results. At a concentration of 30.08 µg/L Diisobutyl phthalate (DIBP) is at a concentration of over half of the limit of the 7 day Suggested No Adverse Response Limit (SNARL) of 60 µg/L. This level is after four years after being in the drinking water system. Four samples contain this chemical.

138. DIBP is considered a substance of very high concern. It is labelled persistent, bio accumulative and toxic. It is a known endocrine disruptor and may cause damage to reproduction and unborn children. The substance may be fatal if swallowed and if the chemical enters airways (**Appendix 4**).

139. On line 10 of the sample report (**SEV027**) dibutyl phthalate (DBP) is present in quantities at over the quarter of the 7-day SNARL of 60 ug/L (at a result of 17.48 ug/L). This chemical appears in four of the samples at a similar concentration. Information about this chemical is found in **Appendices 5 and 6**.

140. DBP is considered a substance of very high concern. It is labelled persistent, bio accumulative and toxic. It is a known endocrine disruptor and may cause damage to reproduction and unborn children.

141. Benzyl butyl phthalate (BBP) was also found at a concentration of up to 6.96 ug/L. BBP is found on four of the samples. Information on this chemical is found in **Appendix 7**.

142. There are other oestrogenic chemicals of concern in the paint samples including diethyl phthalate and other phthalate compound in the analysis.

143. DEHP (di-ethylhexyl phthalate), BBP (benzyl butyl phthalate), DIBP (Diisobutyl

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phthalate) and DBP (dibutyl phthalate) are restricted chemicals under EU and UK REACH which controls the use of chemicals which are hazardous to health and environment.

144. Under REACH BBP DBP and other phthalates shall not be used as substances or constituents of preparations, at concentrations of greater than 0.1% by mass of the plasticised materials, in toys and childcare articles under the EC Directive 2005/84/EC (**Appendix 8**).
145. As can be seen in the sample report (**SEV027**) the company compared the individual compounds against 24 hour and 7-day SNARLS limits only. The potential health impacts on consumers were only considered as isolated individual compounds (not as a mixture of multiple compounds present at the same time). At the IUC with [REDACTED], he also only mentioned assessments being carried out against the SNARL limits.
146. [REDACTED] said there was no evidence that the paint went into supply, but the risk was present and caused using unapproved painted pipework. If Regulation 31 approved pipework had been used there would have been no risk to consumers, as the pipes would have been subject to extensive testing.
147. The paint used on the pipes at Diddington reservoir had deteriorated to a powder and this is confirmed in the statement from the company's Reservoir Engineer, [REDACTED]. The fact that the paint deteriorated to a powder cannot be overlooked when assessing the risk to consumers since a powdered material would be readily suspended and mobilised in water.
148. Diddington Reservoir had not been in the drinking water supply as long as Hannington Reservoir cell 1A, which first went into supply on 15 April 2016. This may explain the more extensive number of chemicals and higher concentrations of chemicals detected in the paint samples from pipes in Diddington Reservoir (exhibits **SEV018** and **SEV027**).
149. The company's regulatory sampling regime in place for reservoirs is mainly bacteriological sampling, which as previously explained, would be incapable of detecting the compounds in the paint. The samples taken from Diddington reservoir are exhibited as **SEV028**. The lack of trace organics sampling means that it is unlikely that the samples would detect a problem.
150. The materials used on the Diddington reservoir construction scheme are listed on Materials in contact (MIC) form number 2428. As can be seen from the MIC form (**SEV029**) [REDACTED] signed off all 201 lines of materials used on the scheme (58 lines were related to pipework in the tank). He states in his witness statement (WS02) that he did not believe that the materials were not approved, but now understands that they were not approved for submersion in drinking water. This highlights the flaws in the company's

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use of the materials in contact form as the critical control point for ensuring the use of approved products. The form makes no reference to drawings or the environments in which materials are being used. This does not demonstrate a robust company process, which [REDACTED] alludes to in the IUC.

151. The MIC form (**SEV029**) was raised on 14 June 2016. Lines one and two appear to be pipes used in the construction of the overflow pipes in each reservoir. The pipes were signed off by [REDACTED] as being approved by the company for use on 27 July 2016 and 14 October 2016 respectively.
152. As was previously noted in the case for Hannington, the pipes had been purchased by JN Bentley's (before approval from water quality teams was obtained) on 24 November 2015 (**SEV030**). The pipes were delivered on 7 December 2015. This contravenes the company's own policies and procedures.
153. As in the case of Hannington, [REDACTED] was responsible for ensuring the materials on the scheme complied with Regulation 31 on behalf of Anglian Water.
154. Throughout my investigation I found little evidence of training for personnel involved in the scheme, including contractors involved. [REDACTED] (first trained in regulation 31 on 15 July 2016), was the only person trained with regards Regulation 31 at the time of the Diddington project. He worked under the guidance of other staff in water quality when signing off the materials at Hannington and Diddington reservoirs.
155. [REDACTED], [REDACTED] and [REDACTED] who are also named on the MIC form (**SEV029**) did not have any training from Anglian Water regarding Regulation 31. This is confirmed in the statement from [REDACTED] and training records provided by the company (**SEV031 and SEV032**).
156. [REDACTED] the engineer responsible for running the project on behalf of JN Bentley's was not trained by Anglian Water until 14 June 2018 (**SEV032**). This training is after the asset was commissioned and in supply.
157. The company have been unable to provide an inspection report for the reservoir before it went into supply (as confirmed in the statement from [REDACTED]).
158. When looking at photographs of the overflow on the East cell/reservoir taken on internal inspections in 2019 (**SEV033 page 13**), it is clear to see that the sections of pipework used to create the overflows are two different materials and colours. The ductile iron (unapproved for submersion) is dark blue, and the approved carbon steel has a lighter turquoise coat. Ductile iron has a dappled appearance, known as 'peening' and the

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steel is smooth with a shiny coating.

159. The difference in the appearance pipework was not questioned by Anglian Water, the contractors installing the pipe, or the reservoir inspection engineers.

160. The reservoirs had been inspected by reservoir engineer [REDACTED] previous to the problem with the overflow pipework being discovered. The East reservoir was inspected on 29 May 2020 and 8 November 2021 (Exhibits **SEV034** and **SEV035**, respectively). The West reservoir was inspected on 22 May 2020 and (**SEV036**) and 8 November 2021 (**SEV037**). All four inspection reports referred to deposits in the tanks which were attributed to flushing.

161. The pictures associated with the inspections (**SEV033**) shows that blue deposits were seen in the tank on the inspection of the West cell in 2019.

162. [REDACTED] refers to the paint flakes in Diddington reservoir in his statement. He says he saw that the paint was a little bit flaky (in previous inspections) but didn't see this to be a risk as he assumed the pipes were regulation 31 approved. He said sometimes paint flakes come off from jet washing or flushing operations. He did not know the origin of the paint flakes.

163. On the final inspection on 8 November 2021, he noted that there were more blue flakes and the paint had deteriorated to a powder. This first-hand account, based on visual inspection, demonstrates that the paint was actively deteriorating whilst the reservoir was in supply. This also suggests the paint would have been capable of becoming suspended and being supplied to customers.

164. The 3-day report (**SEV005**) states that the pipework within the reservoir would be removed and replaced with a suitably approved alternative, that was compliant with Regulation 31. It was noted on inspection of the photographs from the reservoir during taking witness statements on 10/11 August 2022 that the overflow pipework had been encased in concrete to prevent the pipes and paint coating being in contact with water (**SEV038**).

165. The company emailed the DWI Liaison Inspector to say that the East cell went back into supply on or around 1st September 2023, following remedial works and encasing the affected sections of overflow pipework. The West cell also went back into supply on 9 September 2023 (**SEV039**).

166. As in the case of Hannington, there were several repeat failures of critical control points in the Diddington scheme, which failed and led to the contravention of regulation 31. The contractors failed to procure the correct product and the company failed to control

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the items which were procured. The MIC form was retrospectively raised (in conflict to the company's own processes and procedures. Nobody had the correct regulation 31 training and internal visual inspections failed to identify an issue. This is despite clear evidence that the coating was deteriorating on the inspection in May 2020 and November 2021.

167. As in the case of Hannington, I do not consider that the company met the requirements of regulation 4(2)(b), Regulation 31, or Section 70 of the Act. This is due to the presence of chemicals of concern being used in the water supply that would not have been present had the company complied with regulation 31 and used suitable approved and available products. Some chemicals of concern such as Diisobutyl phthalate (DIBP) were present in the paint concentration of over half of the 7-day SNARL limit after 4 years of being in the water supply. This presented unnecessary risk to consumers.
168. Pitsford Storage tank B was modified and retrofitted with a new inlet pipe in 2015. The new inlet was created for water supply resilience purposes and allowed water to be transferred from Hannington Reservoirs into Pitsford Storage Tank B.
169. The storage tank acts as an onsite reservoir for the storage of treated drinking water. After the new inlet pipe was installed, the asset was in supply from 7 October 2016 to 13 December 2021.
170. The design of the inlet pipe was carried out by the Anglian Water @1 Alliance. The construction of the inlet pipework was carried out onsite by Stonbury.
171. As noted in the 3 and 20-day reports (**SEV010 and SEV011**) the tank was inspected by Anglian Water on 17 December 2021 following identification of the issues at Kedington and Diddington. It was reported that the inspection team noted two sections of ductile iron pipework used to create the inlet stack pipework had been overcoated in what the company 'believed to be' Acothane DW blue.
172. The Acothane coating on the sections of ductile iron was found to be flaking away from the pipe. The company stated the Instructions for Use had not been followed for applying the Acothane coating.
173. Four sections of pipework had been used to create the inlet stack (as per Fig 7 page 9 of the 20-day report (**SEV011**)). The company claim that the bell-mouth and bend were coated with Resicoat 4 (a WRAS approved product), and the straight sections of ductile iron are claimed to be coated with Scotchkote 162 PWX (a regulation 31 approved product). It is the straight sections of pipework which were further coated with Acothane.
174. As can be seen on figures 7 and 8 (page 9) of the 20-day report (**SEV011**), the pipe sections are two different colours of blue and the straight ductile iron sections and bolts

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had been overpainted. This is in contrast to the pipework shown on page 7 of the 20 day report (figure 4) which shows all four sections being a uniform blue colour.

175. The pipework was procured by the Anglian Water @1 Alliance from Jindall Sigma on 5 February 2015 (**SEV040**).

176. The company claim that tank B went into supply on 11 August 2017 following installation of the inlet pipework. This is clearly quoted in the 3 and 20-day reports. The company also claim that the associated 'materials in contact' (MIC) sampling for the work had passed the necessary tests. The company did not provide the materials in contact forms in either the 3 day or 20-day reports (**SEV010 and SEV011**). Upon DWI request, an MIC form dated 24 March 2017 (reference number 2790) was sent to the Inspectorate by Anglian Water, which I exhibit as **SEV041**. This MIC form had [REDACTED]'s name on the form as the main point of contact responsible for the scheme.

177. I took a witness statement from [REDACTED] (WS22) on 13 May 2022. He said that he had never seen the form before or had been involved with the work in 2017.

178. [REDACTED] said he did not know [REDACTED] or understand why his name was on the form for signing off the materials. He provided an MIC form from 2015 with MIC number 1984 (**DF01**). [REDACTED] claimed the inlet stack was all constructed from approved material. He exhibited an email from [REDACTED] (**DF02**) and provided WRAS approvals for Scotchcote PWX162 (**DF03**) and Resicoat 4 (**DF04**). He said when he left site that the inlet was a uniform blue colour (as in the photograph the 20-day report **SEV011** p9).

179. According to line 5,6, 7 and 8 of MIC form 1984, the materials had been signed off on behalf of Anglian Water on 29 January 2015 by [REDACTED]. The sign off refers to the pipework and coating as being small surface area. As mentioned previously Anglian water training and procedures specify pipework to be large surface area.

180. [REDACTED] provided an email (at the time of giving his statement) which had been sent to himself and [REDACTED] (who was the engineer responsible for the scheme). It was sent on 23 December 2021 by [REDACTED] (Anglian Water – Water Quality Risk Scientist). The email (**DF05**) mentions two materials in contact forms that existed in relation to the schemes which mentioned the use of Acothane. The email also mentions additional pipework in a new outlet chamber in the tank which did not appear on any of the MIC records. [REDACTED]'s investigation was taking place before the 20-day report was submitted to the Inspectorate. However, none of the information is relayed in the 20-day report to the Inspectorate. This is evidence of the company withholding information relevant to the case.

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181. I requested photographs from the internal inspections of Pitsford Tank B. As can be seen from exhibit **SEV042** the tank had been inspected in March and May 2021. The condition of the pipe was the same as it was found in December 2021, but no concerns were raised by the inspection team (refer to reservoir inspection exhibits **SEV053**).

182. Exhibit **SEV042** shows a selection of pictures of the pipework in the reservoir and outlet chamber. A ductile iron pipe, similar to the sections of ductile iron used to construct the inlet pipework, is found in the outlet chamber (**slide 3**). There are no records of this pipe in the outlet chamber of the tank on any materials in contact form for this newly constructed chamber, which I consider is further evidence of the company's poor control of Regulation 31 and introduction of materials into potable water that have not been approved or checked.

183. The company confirmed this was a newly constructed chamber within the tank (as per question 20 in exhibit **SEV044**).

184. I requested all of the MIC records for the tank that ever existed on 20 June 2022. The records (**SEV043**) show that Acothane was applied in the tank in 2017 (as per the MIC form 2790) but it is also clear that Acothane had been used before this date (not as had been implied in the 20-day report (**SEV011**)). MIC form 1796 lists Acothane as being used and approved for use by the company on 29 September 2016 by [REDACTED]. The form had no final sample results or signature of approval for putting the tank back into supply.

185. I took statements from Stonbury, the contractors responsible for installing the inlet pipework and whose names appeared on the MIC records.

186. A statement was taken from [REDACTED] (Stonbury's Civils Project Manager at the time of construction). He said that he had no awareness of the inlet pipework or use of Acothane. He said that [REDACTED] and [REDACTED] had no involvement with the use of Acothane nor were aware of any issues when speaking with them.

187. [REDACTED] (Stonbury's Team Leader at the time of construction) said that he raised an MIC form for the work on the tank but was never involved with applying any Acothane (despite his name appearing on MIC1796). He said he liaised with [REDACTED] throughout the project (who also appeared on the MIC form). He says he was asked about the amount of Acothane, and repair material used on the project in September 2016. He says the @1 Alliance ordered the pipework and Stonbury installed it. Nobody from the Anglian Water @1 Alliance reported any issue with the pipework to him.

188. [REDACTED] (Project Manager for Stonbury) provided a statement which provided

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clarity on what had happened with the pipework and use of Acothane. He confirms that he did not receive any Regulation 31 training from Anglian Water. [REDACTED] states that his main point of contact throughout the project was [REDACTED], which contradicts the statement by [REDACTED] that he did not know [REDACTED].

189. He says the two sections of ductile pipework were not approved for submersion in water. He says the pipes did not have the correct colour to be approved. He says he told [REDACTED] that the pipes would need to be changed (for an approved product).

190. There was no lifting gear available to remove the pipes from the tank, so he instructed for them to be coated them in Acothane. He states that he also told [REDACTED] that he was coating the pipes in Acothane by email (not provided). [REDACTED] says Scotchkote PWX162 is a green colour rather than blue - so he knew it had not been used. It was standard ductile iron pipe which is normally used underground. He states Scotchkote is used on steel pipes and the pipes installed were ductile iron with just a blue epoxy coat.

191. [REDACTED] says he could tell it was the ductile iron pipework that should be used underground. His statement confirms that the instructions for use were not followed when applying the Acothane. There was no equipment on site such as grit blasters, heaters, or dehumidifiers. He says that he 'knows that the product had cured correctly' before the tank went into supply, but there are no records to prove this.

192. Failure to comply with the instructions for use (IFU) and to be able to provide records that the IFU's were followed is also considered a breach of Regulation 31.

193. Other items on MIC form 1796 (**SEV043**) include Flexcrete Monolevel 844 SP. This product is required to be cured for a minimum of 21 days above 7 degrees Celsius or in accordance with the manufacturer's instructions for use. Flexcrete 851 should also meet the same requirements. When questioned, the company stated that that it did not require records from contractors to demonstrate compliance with instructions for use until 2017 following a DWI recommendation (**question 17a SEV044**).

194. In my investigation I discovered that an event had taken place in October 2016 and the company had rushed the Pitsford Storage Tank B into supply in an emergency because Pitsford works was impacted by algae. Water from Hannington reservoirs was being used to supplement supply from the works. This is confirmed in the statement by [REDACTED]

195. [REDACTED] claims he inspected Pitsford Tank B out of hours (following the work to build the inlet pipework and the Acothane application) before 3 am on 6 October 2016 (incorrectly stated 7 October) so that the tank could be put into supply fed by Hannington

Continuation Statement of: [REDACTED] Statement of: [REDACTED]

Water. This is confirmed in the company provided control centre timeline (**SEV045**).

196. The MIC samples associated with the tank going back into supply were taken at 11:15 am on 6 October 2016 (**SEV046**). This means the tank could not have been filled to a high level or have subsequently been left to stand for 16 hours at 70% full before samples were taken. The tanks would also need to be cleaned and disinfected following the inspection, before filling the tank. This is not in accordance with company procedures for materials in contact sampling and the results would be considered unrepresentative.

197. The extent of the paint flaking on the inlet pipework (page 11) can be seen on exhibit **SEV042**. The company conducted soak tests on the flaking Acothane (as stated in the 3- and 20-day reports **SEV010 and SEV011**). This test did not result in any compounds being leached from the Acothane (20 day report page 15). When the instructions for use are followed properly, Acothane is a suitable material for being in contact with drinking water. I exhibit the instructions for use and technical datasheet for Acothane as **SEV047, SEV048 and SEV049**.

198. The product was not applied properly to a suitable material for submersion, as confirmed in the statement by [REDACTED] who arranged for the coating to be applied. This resulted in the coating flaking away from the pipe. The lack of records and control of materials and contractor's activities has presented an unacceptable risk to consumers and their water supplies.

199. Stonbury did not invoice for the use of Acothane or have any records of its application (as confirmed in the statement from [REDACTED]).

200. Exhibit **SEV045** refers to the date paint was applied to the pipe in Storage Tank B (23 September 2016). The MIC form 1796 (**SEV043**) was raised on 21 September 2016. The products were listed by [REDACTED] on 21 September 2016. The products were signed off as acceptable by [REDACTED] on behalf of Anglian Water on 29 September 2016. Again, this is after products have been used on site, not before procurement.

201. The MIC form (1796) is also only partially completed with no sign off for the asset and the modifications being acceptable for going into supply (following materials sampling).

202. [REDACTED] provided a witness statement (WS11). He says that he dealt with [REDACTED] from Stonbury and obtained some information for him for the materials in contact form which he had raised. He exhibits the email exchange between himself and [REDACTED] as **WM01**. [REDACTED] confirms she has signed off the materials on part A of the form. She confirms that all pipes are considered large surface area. At no point are any questions raised about whether the instructions for use were followed.

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203. It is unclear why Acothane appears on two MIC forms (1796 and 2790 **SEV043**). I personally inspected the pipes removed from Pitsford Tank B on 1 September 2022. The pipes had been removed from the tank and stored at Grafham Works in a secure dry area, sealed in polythene sheets. It is possible that Acothane was applied twice on separate occasions as there were two distinct layers of paint applied to the pipe sections (**SEV050**). Enhanced corrosion can be seen on the surface of the ductile iron beneath the Acothane layers.

204. Aside from the issues of materials approval and suitability for drinking water, the physical state of the ductile iron pipe presents additional challenges to water quality. The dappled surface of the ductile iron and areas of flaking Acothane, provide suitable environments for bacteria to grow on the pipe surface and areas behind the coating.

205. Since the modified tank had been in supply, there had been 26 sets of samples for trace organics from the works final (**SEV051**). It is difficult to conclude the significance of the results from the works final as water is blended with water supplied from Storage Tank A, which does not have unapproved products and operates in parallel to tank B.

206. From trace organics samples there have been a few low-level detections. These were listed by the company in Q13 exhibit **SEV052**. 26 samples over a 5 year period is not many samples considering the quantity of water, which is produced from the works, but is higher than the number of samples taken from reservoir sites such as Hannington and Diddington.

207. Purge and trap samples on 19 February 2018 contained isopropyl alcohol and on 12 March 2021 a sample contained formamide. There were detections of nonanol on water profile samples on 19 February 2018 and 12 March 2021.

208. There was a coliform detection on the works final on 18 March 2021. This was shortly after the detections of formamide and nonanol on 12 March 2021.

209. There was one odour detection from the works on 24 February 2021. There was one taste detection from the works on 28 August 2020.

210. There have been several internal inspections of tank B since the new Hannington inlet was installed. The asset was inspected shortly before it went into supply (6 October 2016). Nobody from Anglian Water noted the issue with the pipework despite the obvious difference in colour of the four sections and being an unusual design not constructed of stainless or coated carbon steel. [REDACTED] confirms that the coating had been applied at this time.

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211. There were further previous internal tank inspections on 1 August 2017, 25 March 2021 and 11 May 2021 where nothing was picked up (**SEV053**). The condition of the pipe coating is unlikely to have been significantly different at the time of the May 2021 inspection to the inspection in December 2021 when the problem was identified. Pictures from the inspections confirm the pipe colours were noticeably different (**SEV042**).

212. [REDACTED] conducted all of the internal inspections. [REDACTED] states that "The Inspection form does not include the materials in contact form or consideration for materials used. If the pipework looked new, blue and in good condition it was considered ok. We would check the MIC form was completed during the inspection process but that was the responsibility of the contractor team and water quality risk scientist. I would check it had been signed off by the risk scientist and then sign off the tank."

213. It is clear from the duration of the scheme and the comments from witnesses that there was little active management of the project, materials used, or contractors involved with the scheme. Records were inaccurate and there were no checks on whether instructions for use had been followed. Several critical control points failed.

214. There is no evidence that any of the personnel from Stonbury's had any Regulation 31 training from Anglian Water (see Q6 **SEV052**). There are no training records for [REDACTED], [REDACTED], [REDACTED], or [REDACTED] (████████), all of whom appear on the Materials in Contact forms for Pitsford. This was checked by Anglian Water (**SEV054** and **SEV055**). [REDACTED] was trained on 6 April 2018 (but this is after the asset went into supply following the modifications (**SEV056**)).

215. At the IUC [REDACTED] was still of the opinion that the Acothane had been applied in 2017 after Pitsford Storage Tank B was first put back into supply following the installation of the new inlet. The account by [REDACTED] explains what had happened and the first coating of the pipework actually took place in September 2016. This demonstrates the flaws in the company's control of capital work, contractors, and compliance with the requirements of Regulation 31.

216. Upon initial notification of the second repeat regulation 31 event for Diddington Reservoir (**SEV004**), the company write that all new build reservoirs were due to be internally inspected to confirm that similar breaches of regulation 31 had not occurred, further highlighting the lack of confidence the company had in their own MIC paperwork, which the company could not use to identify assets where regulation 31 breaches had taken place. A full internal inspection was the only way to conclusively find out whether further breaches had occurred.

217. Kedington Water Treatment Works was a newly constructed works that was built to

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provide a low metaldehyde water source to blend with water from Great Wratting works. The works entered supply for a short period on 31 March 2020. This was followed by a longer period into supply from 27 April 2020 to 14 May 2020 (totalling 412 hours into supply). The works flow was approximately 50 L/s. The works supplies the areas of Kedington, Haverhill, Withersfield, Great Wratting, Hundon, Poslingford, Chilton Street, Clare and Cavendish. The population affected is 78,187.

218. The works was built to blend with water from Great Wratting Water Treatment works to dilute the levels of metaldehyde (a pesticide) in the treated water from Great Wratting.

219. The construction of Kedington works was covered by a DWI legal notice (reference ANH/2020/00001). Version 3 of the notice (**SEV057**) issued on 4 March 2021 specifies that “Any product or substance used as a result of the requirements in this Notice must comply with regulation 31”. The requirement to comply with the requirements of regulation 31 was explicit in this version of the notice.

220. On 28 May 2021, internal inspection of the contact and balance tanks revealed evidence of small blue flakes on the tank flooring. The company subsequently identified that sections of pipework located within the contact and balance tanks did not have the required Regulation 31 approval for the submerged environment they were installed in.

221. This was the first of the four regulation 31 events to be notified to the inspectorate, but the most recent construction scheme to be completed on behalf of the company.

222. Like the previous three events discussed, the circumstances involved the use of ductile iron pipework coated with unapproved materials and installed in a submerged environment, in contact with drinking water.

223. Following the internal inspection, the pipework was identified as Electrofresh Plus pipe. There were 8 sections of various lengths and diameters as listed in the 3- and 20-day reports (**SEV002** and **SEV003**, respectively).

224. The pipes were located in contact tank 1 and 2 and balance tank 1 and 2.

225. A contact tank is a tank in a water treatment process that provides adequate time for disinfection to take place before the water is considered fully treated and ready for distribution to consumers, as water leaves the tank. A balance tank can be used at any stage of a treatment process to balance out flows, provide blending or to stabilise water of varying quality.

226. As explained previously the Electrofresh plus pipe is only approved for the

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conveyance of water inside the pipe and the outside of the pipe is not approved for submersion or contact with drinking water.

227. In the 3-day report (**SEV002**) the company stated the pipes had been coated with QD5 Promatch paint for aesthetic purposes by the supplier.

228. In the 20-day report (**SEV003**) the company said the pipe was painted with QD8 Promatch paint, not QD5 as previously reported in the 3-day report. I exhibit the manufacturers safety datasheet as **SEV058**. As can be seen from the datasheet, xylene makes up 30-50% of the product.

229. According to the UKWIR Toxicity Datasheet (Appendix 9), Xylene is described as moderately soluble and causes skin irritation. Animals subject to repeat dosing of xylenes demonstrated decreased body weight and increased mortality in lab tests. Repeat oral exposure also increased the incidence of foetal malformations (predominantly cleft palate).

230. The UKWIR Toxicity Datasheet for Xylene suggests an operational SNARL of 20 micrograms/Litre. The datasheet states that xylene gives a taste or odour described as sweet aromatic. The datasheet suggests that a detectable taste can be picked up at concentrations between 0.3-1mg/L xylene.

231. I exhibit samples taken from the works by Anglian Water whilst Kedington works was in supply as **SEV059**. A taste described as 'sweet' was reported on samples taken from the unblended final on 11 May 2020 by two analysts at the Anglian Water laboratory. The sample was taken whilst the works was running into supply. This sample is taken from the works before the supply is diluted with water from Great Wrating works.

232. This is an unusual taste for potable drinking water and possibly linked to paint compounds going into supply. At the lowest limit for taste detection applying UKWIR toxicity sheet criteria, this suggests xylene concentrations could have been above 0.3 mg/L at the time of sampling.

233. The company report there are issues at Kedington works with regards to treatment of sulphide in the raw water, which would impart an eggy taste/odour. This is not usually associated with sweet tastes or odours.

234. On 28 May 2021, the company took samples from the paint which coated the pipes located in the contact/balance tanks. I exhibit the analysis as **SEV060**. The results show that xylene (with ethylbenzene) was present in the paint sample at a concentration of 71.92 micrograms/Litre.

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235. I requested this information (**SEV060**) on 9 January following taking a witness statement from [REDACTED] (WS13), company risk scientist. The report was sent to me on 31 January 2023.

236. Other chemicals in the paint sample (**SEV060**) included dibutyl phthalate (DBP) and Benzyl Butyl Phthalate (BBP), which I have previously mentioned were in the paint samples at Diddington and Hannington. These chemicals are controlled under UK REACH regulations, they can be carcinogenic, cause fertility issues and foetal defects.

237. At the interview under caution [REDACTED] stated that all of the sample results from the paint were below published SNARLS and there was no risk to public health at any time. I pointed out that the concentration of xylene was at a higher level than the operational SNARL.

238. The information in the sample report from the sample taken 28 May 2021 (**SEV060**) was available at the time the company made the event notification to DWI on 22 June 2021. The sample report was not mentioned in the 3-day report on 25 June 2021 (**SEV002**), or 20-day report submitted 20 July 2021 (**SEV003**).

239. The company made no voluntary attempt to share information on the sample results from the paint. The company said in the 20-day report that there was a delay in reporting the Kedington event (of four weeks) so they could obtain as much information about the event as possible. However, this information on the analysis only came to light when I took a witness statement from [REDACTED] (Anglian Water Quality Risk Manager) on 5 December 2022, and he mentioned the analysis undertaken (WS13).

240. I had to personally request all the samples results from the tests carried out on the paint samples by the company, for all four events. I consider this testing and associated sample results would have been important information used by the company to assess the public health risks presented to consumers from the pipes and coatings.

241. Omission of this analysis from the company event reports, in addition to the missing materials in contact forms, does not demonstrate the open and transparent approach to the investigation that [REDACTED] alludes to at the Interview Under Caution.

242. Due to abnormal result of a sweet taste on the samples leaving the works (before blending) detected by two analysts, and the quantities of xylene in the paint, it is important not to overlook the risk to consumers that was present before the works was removed from supply.

243. The 20-day report makes no reference to the sweet taste detection, or the quantities

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of xylene found in the analysis of the flakes. The sample taken from the works represents a small volume of the water supplied to consumers in a snapshot of time. The 3- and 20-day reports are an opportunity for the company to present their view on the risk to consumers based on their own internal investigation.

244. I took a statement from [REDACTED] who was the Inspecting Engineer who discovered the blue flakes in the tank on 27 May 2021. The paint had blistered and flaked off the pipes creating the blue flakes found on the floors of the tanks. He explained that he had never seen bubbling (of the paint) like this before and that the (paint) flakes were on the floor and walls. He was concerned that jetting the tank would spread the flakes around the tank. I consider this supports the fact that the material was easily removed from the pipe and its presence on the walls confirms the material had been suspended whilst the tank contained water.

245. Several images were obtained at the time of the inspection **SEV061**. These were shared by the company with me on 10 and 11 August 2022 in person and by follow up email. As can be seen from the images, the paint has clearly reacted to the environment it is exposed to, and this caused it to bubble and blister.

246. The paint was reverting to a powder form that was easily removed from the pipes by rubbing away with a finger as seen in the pictures (**SEV061**).

247. Enhanced corrosion can be seen around the flanges and joints.

248. There are large flakes of paint that can be seen floating on the water in the bottom of the tanks. Some flakes are also stuck to the concrete walls of the tank.

249. The full extent of the degradation of the pipe coating and enhanced corrosion which took place is more evident in the pictures (**SEV061**) than those presented by the company in the 3- and 20-day reports (**SEV002 and SEV003**).

250. The reservoir inspections which took place before the asset went into supply for the first time did not identify any issues with the pipework. The inspections were conducted by Andy Moss who was physically present on both internal inspections (**SEV062 and SEV063**). There is some mention of the flakes and deterioration of the pipes in the May 2021 inspection report (**SEV063**).

251. On 1 September 2022, I attended Grafham Water and inspected the pipework which had been removed from Kedington tanks and stored at Grafham Works. I obtained samples and pictures of the pipes, but I did not get the samples analysed as the chain of custody was not intact from the time that the pipes were removed and transported.

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252. There was some pipework at Grahams Water that I had not been made aware of. I discovered that the company had used this pipework to undertake some 'soak test trials' on. I requested the soak test report from the company.

253. [REDACTED] (company risk scientist manager) had led the 'soak test trial' which he said commenced on 5 November 2021. [REDACTED] also made a witness statement on 5 December 2022 (WS13).

254. In the trial, sections of the Electrofresh Plus pipe had been coated in QD8 paint and left to stand for 6 weeks in contact with chlorinated and unchlorinated sections of pipe. The sections of pipe which were coated in QD8 showed a visible deterioration in condition in as little as 4 weeks. At the end of the trial when the pipes were removed, flakes of paint were visible in the bottom of both tanks (**SEV064**).

255. The experiment shows the deterioration of the coating and removal from the pipe surface starts rapidly when the paint is in contact with water. It may explain why there were relatively higher concentrations of the chemicals in the paint at Kedington and Diddington (being in contact with water for less time) compared to the lower levels in the paint on the Hannington pipes, where the pipework had been in contact with water for much longer.

256. The visual impact on the pipes being submerged in the treatment process is much more evident on the pictures from Kedington than the assets that had been in supply for a longer period (at Hannington, Diddington and Pitsford).

257. I took statements from Anglian Water teams who were involved with the Kedington scheme, the area water quality scientists, the Anglian Water @1 Alliance, the pipework suppliers (FT Ductile), and FLI Water (contractors).

258. The pipework order to FT Ductile was placed on 1 August 2019 by FLI Water. (**SEV065**). There is no date on the Materials in Contact 'MIC' form (**SEV066**) but the scientist responsible for approving the pipework ([REDACTED]) states in her witness statement (WS14) that the relevant line on the MIC form is excel row 123 and the pipework should have been Saint Gobain System CL.

259. [REDACTED] signed the pipework off as approved on the MIC form (**line 123 - SEV066**) on 4 March 2020. This is only two weeks before commissioning testing and sampling commenced and after installation of the pipe had taken place.

260. Page 3 (3.31.3) of the companies Materials in Contact procedure (**SEV013**) states that all materials should be signed off and approved before materials are purchased and

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installed. This did not happen in all four events. In the case of Hannington, the reservoir was in supply before materials were listed on the scheme.

261. As per [REDACTED]'s statement and [REDACTED]'s statement the Electrofresh Plus pipe is not listed and there is no reference on the form as to the pipe materials used in the contact tank and balance tank on the form, which shows the company's control over the regulation 31 approval process. [REDACTED] explained that the pipework on line 123 refers to cross site pipework underground, not any pipework in tanks.

262. The MIC form (**SEV066**) records several samples with bad egg odours. For example, Part C of the form mentions Lines 320 to 339 report bad egg and farmy odours.

263. Lines 340-344 of the MIC form (**SEV066**) states that samples from the collection tank, supernatant pumps, supernatant line, and surge vessel contained methyl isopropyl ketone at concentrations at or above 0.15 ug/L. These treatment processes recycle water back to the beginning of the treatment works process and are usually (but not always) intermittent.

264. I asked the company why these concentration levels (of methyl isopropyl ketone) were considered as a pass level for signing off the materials in contact form and whether any resamples had been carried out. Their response (**SEV067**) states 'At the time the MIC procedure (revision 5 November 2019) had no TRACE ORGANICS ANALYSIS – RESULTS INTERPRETATION PROCESS GUIDANCE. The results were reviewed internally and as the concentrations were very low and more sampling would be done whilst running to waste, it was decided that the levels were acceptable'.

265. [REDACTED] was the Project Delivery Manager responsible for the Kedington scheme. He confirms in his statement that he had not undertaken any materials in contact, or regulation 31 training. He claimed that the Contractors FLI were responsible for procuring the correct materials with associated Regulation 31 approval for the pipework in the contact and balance tanks.

266. A statement was taken from [REDACTED] (FLI Water) he gave a different account to that provided by [REDACTED]. He said that the original design was for the pipework to be made from epoxy coated carbon steel or stainless steel as specified by the company. He exhibits the original design specification which he gave me alongside his statement (**EN01**).

267. He then states on 17 July 2019 at 0950 hours he received an email from [REDACTED] [REDACTED] under the instruction of [REDACTED] to change the material he needed to order from carbon coated epoxy steel to ductile iron and further instruction that it was in his scope to

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make the required change (**EN02**).

268. [REDACTED] feels that the Project Manager, [REDACTED], was trying to expedite the programme to meet the delivery date which is why the materials were changed.

269. There are some signs to suggest there were some time pressures on the scheme as the legal notice associated with the scheme has a date for putting the works into supply of 31 March 2020. Approval to put the works into supply by the Regional Supply Manager was not made until 16:31 hours 31 March 2020 (the date in the legal notice). The works needed to be put into supply for the first time outside of working hours.

270. A process already exists where the company can make change applications to the DWI to amend legal date deadlines in notices. Anglian Water are aware of these and have used them in the past. There were no change applications made to the DWI to amend the due date of 31 March 2020 by the company. The works went into supply for only a few hours on 31 March 2020 then it was removed from supply until 10:00 on 27 April 2020, when it was in supply until 12:00 on 14 May 2020, following quantitative odour detections from the regulatory sample point. The total duration that Kedington WTW had pumped in to supply was 412 hours (**SEV003**).

271. On 18 August 2022 [REDACTED] made telephone contact with me because he was concerned that [REDACTED] (Regulations Manager from Anglian Water) had been in touch with him to request copies of the witness statement he gave to the Inspectorate (WS19). He forwarded the email he received from Anglian Water to me on 18 August 2022 (**EN13**).

272. Page 15 of the company Materials in Contact procedure (**SEV013**) confirms that pipes are considered large surface area by the company. This also reflects the information on the specific regulation 31 training the company issued, and the notes in the materials in contact forms associated with the four schemes.

273. The training records for the personnel involved with the Kedington scheme are given in exhibit **SEV068** and **SEV069**, where records exist.

274. As can be seen from the training records (**SEV070**), the training covers BS6920 testing, materials considered large or small surface area, and the requirement for materials to be approved before ordering.

275. As demonstrated by the training records, the online training states that an exception risk assessment can be carried out only if there is no alternative product available with Regulation 31 approval.

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276. Based on the names involved with the scheme on the Kedington MIC form (**SEV066**), [REDACTED] was trained on 6 April 2018, [REDACTED] on 11 April 2018, [REDACTED] [REDACTED] on 24 February 2017, [REDACTED] and [REDACTED] on 10 July 2017, [REDACTED] on 27 March 2017, [REDACTED] on 1 August 2018, and [REDACTED] [REDACTED] on 14 March 2017. This is ahead of the scheme being constructed and the people involved are mainly operational or contractors working on the scheme.

277. [REDACTED] did not undergo online training until 19 August 2021.

278. There is no evidence of training or assessment of the Anglian Water risk scientists who were responsible for signing off the materials as suitable for use. [REDACTED] was reported to have undertaken the training on 16 April 2016 (according to a site attendance diary, not actual training reports/assessment). There are also no records of training or assessments for [REDACTED].

279. At the Interview Under Caution, when asked whether he had been advised by water quality teams on what the interview would cover (page 6) he said “So, my written statement is very much based on those reports. Yes, I have been advised by my water quality team, independent, scientific experts, and professionals, yes”.

280. Throughout the interview additional questions were asked in relation to health advice and toxicity limits on some of the chemical parameters which [REDACTED] would not comment on, requesting that I posed questions in email. The purpose of the 3- and 20-day reports is for the company to present findings from their own investigation and risks to public health. The reports and procedures indicate that only SNARL values had been considered and that the chemicals were looked at as single items not as a mixture of multiple toxic chemicals over many years.

281. The SNARL limits only consider short term exposure over 1 and 7 days. There are other toxicological assessments which could have been used which consider long term exposure such as LTEL limits.

282. [REDACTED] would not comment on the health implications of some of the chemicals in the datasheets presented. His legal representative repeatedly answered questions on his behalf throughout the interview despite reminders to let [REDACTED] answer the questions.

283. He said there was no evidence that any of the paint went into supply. However, there is evidence of the paint reverting to a powder form with evidence of paint flakes on the floors and walls within the structure affected. In his own statement, [REDACTED] states the coating had flaked off, exposing the bare fitting underneath.

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284. [REDACTED] stated that in all four events the water always remained wholesome and compliant with the requirements of regulation 4 (of the Water Supply, Water Quality) Regulations 2016). As discussed, the analysis conducted on most samples would not have been capable of detecting the chemicals contained in the paint. Regulation 31 exists to prevent unsuitable products being introduced into the water supply so that extensive chemical and/or trace organic analysis is not required on a routine basis.

285. There is some evidence of trace organics being present in drinking water samples from Hannington reservoir whilst it was in supply, such ethyl hexanol. This is a chemical in the V&A enamel paint.

286. Where enhanced chemical sampling did take place (as in the Kedington event) there was a sweet detection which may be associated with high concentrations of xylene (a main component of QD8 paint). The company samples from the paint detected high levels of xylenes.

287. Regulation 4 (2)(b) requires that the water does not contain any substance (whether or not a parameter) at a concentration or value which, in conjunction with any other substance it contains (whether or not a parameter) would constitute a potential danger to human health.

288. Through the introduction of an unapproved material into supply the company cannot demonstrate that the water **does not** contain substances which would constitute a potential danger to human health.

289. The concentrations of chemicals in the paint (at the time of sampling) are reflective of chemical components of paint which has been in drinking water supply (submerged in water) for many years. At the time the analysis has been undertaken the levels are likely to have deteriorated significantly. [REDACTED] did not elaborate on this point.

290. The company agreed that they did not use materials which complied with the requirements of the Secretary of State, but it was for the DWI to prove whether the company committed an offence. Under Regulation 33(3) of the Water Supply (Water Quality) Regulations it is an offence to introduce any substance or product in contravention of regulation 31 (1).

291. Regulation 31(1) requires that the company meet the requirements of paragraph 4 of regulation 31 which requires the product to have approval by the secretary of state or to comply with regulation 31(4)(b).

292. Regulation 31(4)(b) is covered under DWI guidance sheet 8 (**appendix 10**). The

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Secretary of State is satisfied that substances or products either alone or in combination with any other substance or product in the water is unlikely to affect adversely the quality of the water supplied when that product offers only a small surface area contact ratio with the water; and that the material of which the product is made, despite the small surface area contact with the water, does not give rise to unintended odour/flavour to the water and does not support the growth of microbial organisms.

293. To be considered small surface area, the c-score of the product must be below 100 when it **may** be appropriate to use the product under the provisions of 31(4)(b). In this case the supplier must satisfy itself as part of its risk assessment that use of the product is not likely to adversely impact the quality of the water, particularly in respect of odour and flavour and microbial growth. Use of BS6920 parts 2.2.1 and 2.4 is recommended (**appendix 11 and 12**).

294. [REDACTED] said at the IUC, speaking on behalf of the company, that he considers that because the calculations the company made of the pipe size and contact with drinking water that they could be considered small surface area under DWI Guidance note 8. However, these calculations on C-scores were retrospectively applied.

295. Clearly no risk assessment on the pipework and coatings had been applied by the company at any point from procurement stages through to going into supply. Had the company applied these principles the repeat events may have been avoided.

296. The company approach to filling the tanks and taking a sample after standing several hours after materials are installed does not meet the requirements of the testing in BS6920 and parts 2.21 and 2.4. The accredited test method specifically tests the materials used, not the body of water.

297. This statement by [REDACTED] which had been written in conjunction with his water quality advisors, further demonstrates the company's misunderstanding of the requirements of regulation 31.

298. The company failed to exercise all due diligence for securing that the water was fit for human consumption. Every barrier to preventing the four events were repeatedly bypassed by the company in every case. This includes procurement controls, management of contractors, training, and failure to adhere to the company's own process and procedures.

299. The multiple, repeat failings presented an unnecessary risk to consumers that should have been easily mitigated through compliance with the requirements of regulation 31. The paint in particular contained chemicals associated with sinister health risks.

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300. The company provided a copy of their lessons learned report on 9 March 2022 for capital work and materials in contact (**SEV088**).

301. There have been previous issues with the company and compliance with regulation 31. The company installed agitators in their clean water tanks for the removal of disinfection by-products at Hall Water Treatment works. These agitators were not regulation 31 approved.

302. The company argued that the agitators fell under the requirements of regulation 31(4)(b) as the stainless steel was a recognised material and the other components were minor. The product was retrospectively tested, and it was found not to comply to the requirements of BS6920 and failed the enhancement of microbial growth test. The company did not follow the requirement laid out in Advice Sheet 8. The Inspectorate served the company with a Notice on 11 June 2019 (**SEV089**). The Notice was served two years before the four repeat regulation 31 breaches discussed in this statement were discovered and should have served as a timely warning for the company to ensure their procedures and practices were robust in ensuring a similar breach of regulation 31 did not recur in future.

303. The Notice (**SEV089**) specifically required a review of the governance of regulation 31 within the company. In response, the company provided a written response to show compliance with step (b)ii and (e)ii of the Notice, on 30 September 2019 (**SEV090**). This document outlines the many processes the company has in place to ensure compliance with regulation 31, including the company's procedure PSW-PRO-3.01 Materials and chemicals in contact with water (**revision date 26 September 2019, SEV091**), which covers all materials and chemicals used in contact with untreated or treated water from the point of abstraction up to the customer's boundary.

304. Page 4 of the governance review document (**SEV090**) lists the key individuals and their responsibilities for the governance of the company's regulation 31 process. This includes the company's Manager/Engineer responsible for the installation, the water quality risk team, company scientists and the supply chain professional. However, in this statement, I have already discussed the failings which occurred at every stage of this process, which whilst on paper may appear robust, but in practice, was not followed by any party.

305. Page one of the PSW-PRO 3.01 Materials and Chemicals in Contact with Water document (**SEV091**) lists the changes made as part of the document review. This includes job role titles and mailbox details; minor changes to text and flow diagrams related to changes of MIC form; general formatting changes and the inclusion of additional advice sheets.

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306. A whistle-blower contacted DWI in February 2022 to advise that Anglian Water had laid 16 km of main as part of a strategic plan for moving water from Lincoln to Grantham (known as the 'SPA main'). This was another capital project delivered by contracted third parties. The pipes had been repaired using an unsuitable product (Acothane DW, as used at Pitsford) that did not comply with the instructions for use on the Noksel pipe coated with Eurocoat Thixo product.

307. The demonstrates that the company had not learned from their lessons in relation to use of products and following Instructions for use. Their own lessons learned report (**SEV088**) dated December 2021 refers to the use of touch up paints and repairs.

308. The DWI contacted the company about the matter and advised that if the pipes were used to supply drinking water, they would be committing an offence. The company responded with a document outlining their issue and the challenges faced (**SEV071**).

309. The DWI regulation 31 team in conjunction with Anglian Water organised BS6920 testing on the products used (**SEV072**). All samples to date from the main have failed the testing and the 16 km of pipe remains out of use. The company are currently in negotiation with the DWI regarding future usage of this pipework, which the company have been advised that once in service, a breach of regulation 31 would have occurred.

310. The statement by [REDACTED] and his comments at the IUC explain what the company have done to improve their position with regards to compliance with regulation 31 since the four events.

311. After completion of my assessment and witness statement, on 20 November 2023, I was forwarded an email sent to the DWI Principal Inspector responsible for Anglian Water by company representative [REDACTED] (**SEV073**). The email attached a toxicological report conducted by independent toxicologist Dr [REDACTED] in October 2023 based on the levels of the chemicals found in the soak tests conducted by Anglian Water (**SEV074**) and trace organics sample results from samples taken at customer taps in the areas supplied by the assets.

312. An assessment of the risk to public health is presented in the report (**SEV074**) based on chemicals found in the soak tests where a common chemical was also found in the samples taken from customer taps during the period each asset was in supply. The report concludes on page 8 that "Based on the hazard and risk assessment provided above, it is highly unlikely that water supplied to customers from either [(i) Kedington; (ii) Hannington; (iii) Diddington and (iv) Pitsford], any time during the periods in question, was unfit for human consumption".

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313. The report also concludes that any adverse health risk from multiple compounds presented as an admixture to consumers was also highly unlikely (**page 15, SEV074**).

314. The report gives a moderate to high confidence level to their conclusions made based on published datasets related to each chemical.

315. Whilst I acknowledge that the company have finally looked at the long-term risks to consumers, this is a retrospective reflection carried out several years after the company became aware of the issues on each site and after the Interview Under Caution with Ian Rule.

316. I would have expected an assessment on the potential harm to consumers being made at the time the company became aware of the problem and the chemical composition of the coatings on the pipes.

317. I had not previously had sight of the trace organics sample results from customer taps which accompanied the toxicology report (**SEV076**) but I had seen the limited trace organics sample results data obtained from the assets (**SEV075**).

318. To get an independent view of the report and conclusions, on 11 December 2023, I requested that UKHSA – the UK Health Security Agency (formerly Public Health England) review the report and sample results.

319. The UKHSA provided their own risk assessment review of short- and long-term risks from exposure to the chemicals found on 21 March 2023 (**SEV077**). The UKHSA health risk assessment was also based on the chemicals which had been detected in both the soak tests from the pipework and samples from customer taps.

320. The report concludes that the chemicals found in the water supply at customers taps (which were also found in the soak tests) were unlikely to present a significant risk to health at the concentration levels detected. This agrees with the Anglian Water toxicology report (**SEV074**).

321. The UKHSA report (**SEV077**) mentions some limitations in the dataset used for the risk assessment. For example, on page one reference is made to the fact the methods used to extract chemicals from the pipe coating in the soak tests did not use chlorinated water, which would typically be done under controlled regulation 31 test methods when testing the suitability for products being used in drinking water.

322. As previously mentioned, the coating material had also been submerged in the drinking water system for many years before the materials were tested. The

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concentrations of chemicals detected in the coating may have been significantly depleted before the time of analysis.

323. In relation to consumer tap sample trace organics results presented by the company (**SEV076**), there were no trace organics samples obtained from the Kedington supply system whilst the asset was in supply. We do not know the full extent of the health risk presented to consumers from the chemicals at the time the asset was in supply.

324. The chemical composition of the coating used at Kedington (QD Promatch 8) was different to the coatings used at Pitsford (Acothane) and Hannington and Diddington (Darcylate V&M Enamel). Therefore, the risks to consumers cannot be evaluated based on trace organics sample results from consumer taps in other supply areas.

325. As mentioned, there is evidence of suspended blue particles up the tank walls suggesting the flakes were in suspension and a sweet taste detection on treated water whilst the asset was supplying customers with drinking water.

326. The soak test at Kedington (**SEV060**) was carried out after soaking the material in deionised water for only 24 hours. Some of the highest concentrations of chemicals were found in the soak tests at Kedington of all the soak tests. The other soak tests on the pipes in the Pitsford and Diddington tanks were tested after soaking for up to 168 hours in de-ionised water.

327. There were only 16 trace organics tests taken from customer taps in the areas supplied from Diddington between 10 October 2018 and 12 August 2019 (**SEV076**). The asset went into supply on 27 February 2018. There were no trace organics samples from the customer taps for 8 months after the asset went into supply and therefore no opportunity to detect any chemicals. The asset was removed from supply on 21 September 2021. This was 2 years after the last sample was taken from the asset.

328. The 16 samples taken from customer taps fed by Diddington only took place on four days throughout the period the asset was in supply and from only four separate locations located in almost the same streets/locale. The samples are not of sufficient number or geographic spread to present a significant level of reassurance on the risk presented to consumers.

329. The soak tests from Diddington (**SEV027**) provided a list of 37 different chemicals found in the flakes from the paint soaked over a range of time periods in de-ionised water. The number of customer tap samples and geographic locations would not have been a representative set of results to assess the risk based on the asset being in supply for over three and a half years.

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330. One sample result from Elizabeth Court (supplied by Diddington) had a result of 0.15 µg/L Tridecanol. Tridecanol is found in both the soak tests from Diddington and in repeat operational samples of the reservoir before it went into supply at concentrations as high as 0.86 µg/L (**SEV075**).

331. Of the 62 consumer tap samples taken in the areas supplied by Pitsford, these only were taken on 22 dates between 29 March 2017 and 3 September 2020. The first sample is five months after the pipe coated in Acothane first went into supply. The asset remained in supply until 13 December 2021. This is over a year since the last customer tap sample.

332. The samples are also restricted to samples taken in 14 specific geographical areas and therefore these factors do not give a representative sample dataset to make a reliable assessment on the health risk to customers across the region supplied by the asset.

333. For Pitsford works there are 31 trace organics samples taken from the works final sample tap. This point is blended with water from Pitsford supplied through Pitsford Storage Tank A when it is in supply, so any sample results from Storage Tank B would be diluted with water from Tank A.

334. No chemicals were released from the Acothane coating at Pitsford in soak tests using de-ionised water over 24 to 186 hours. It is unknown if the soak test would still be clear had chlorinated water been used for the extraction.

335. There were 268 trace organics tests taken on samples from customer taps supplied by Hannington 1A throughout the 5 and half year period that the asset was in supply (**SEV076**). The samples were taken on 78 dates and only 56 sample locations.

336. The soak test on the coatings from the pipework in Hannington 1A was also only tested for 24 hours in de-ionised water (**SEV018**).

337. Of the chemicals found in the soak test, nonanal; oleic acid and hexanal were also found in customer tap samples at maximum concentrations of 0.14µg/L; 3.25µg/L; and 0.5µg/L, respectively.

338. The samples taken from customer taps supplied by Hannington 1A contained some chemicals in common with the chemicals detected on the soak tests from Diddington pipework (**SEV027**). The same paint was used in Hannington as at Diddington to coat the pipes.

339. Tridecanol was detected in one sample from the customer taps fed by Hannington 1A (**SEV076**) at a concentration of 0.15µg/L. There are five detections of dibutyl phthalate at

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a maximum concentration of 5.86µg/L; two detections of palmitic acid (at a maximum of 0.34µg/L); one detection of diethyl phthalate (at 0.2µg/L); one detection of diisooctyl phthalate (at 0.55 µg/L) and one detection of diisobutyl phthalate at 0.53 µg/L.

340. There are also detections of ethyl hexanol on 14 August 2017 on repeat samples from one location at a maximum concentration of 0.97µg/L. This is a chemical found on the samples leaving Hannington 1B whilst it was in supply (**SEV075**).

341. Unfortunately, the opportunity for determining the origin of such chemicals is long gone and should have been investigated at the time the detections were reported. The similarities in detections from the asset and at customer taps can only be commented on.

342. There was no soak test carried out on the pipework at Hannington 1B as the reservoir remained in supply after the issue had been discovered. The asset went into supply on 7 February 2017 after the pipework modifications. There were no trace organics samples taken from the asset until 10 January 2022 – five years later.

343. During the period 10 January 22 to 24 January 2023 Anglian Water carried out 60 trace organics tests on the water going into supply from Hannington 1B (**SEV076**). There were 10 detections of nonanal (maximum concentration 0.31µg/L); two detections of tridecanol (maximum concentration 0.19µg/L); one detection of heavy gas oil (maximum 0.69µg/L); two detections of ethyl hexanol (maximum 0.12µg/L) and three detections of oleic acid (maximum 0.73µg/L).

344. As Hannington 1B feeds a similar supply area to Hannington 1A, some of the chemical analysis on the downstream customer taps is relevant to both assets (**SEV076**).

345. From the customer tap samples supplied by Hannington 1B there were nine detections of nonanal (maximum concentration of 0.23 µg/L); two detections of tridecanol (maximum concentration 0.18µg/L); two detections of heavy gas oil (maximum 1.84µg/L); six detections of oleic acid (maximum concentration 3.25 µg/L). Ethyl hexanol was detected in nine samples with a maximum concentration of 0.97µg/L. The chemicals also had been detected in samples from the sample tap at the reservoir itself.

346. Chemicals detected in samples from customer taps in the areas supplied by Hannington 1B which also were found in the soak test at Diddington (**SEV027**) included two detections of dibutyl phthalate (maximum concentration 0.56µg/L); one detection of diethyl phthalate at 0.63µg/L; one detection of diisobutyl phthalate at 0.53µg/L and one detection of diisooctyl phthalate at 0.55 µg/L.

347. The late retrospective analysis carried out by Anglian Water confirms that these harmful and toxic chemicals were present in these water supplies following installation of

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the pipework which did not meet the requirements of regulation 31. At this late stage a conclusion cannot be drawn on the origin of the chemical detections or the risk to consumers given the limitations in the datasets. However, the public should not be subject to increased risk from exposure to these chemicals because Anglian Water introduced such chemicals into the water supply due to the inadequate control and management of their regulation 31 processes and procedures, or failure to comply with Regulation 31.

348. Consumers have little choice but to drink the water as supplied to them from their regional supplier and should be able to trust that water companies control and adhere to the drinking water regulations, preventing them being exposed to avoidable risk and harm.

349. It should never be the case that a water supplier introduces an increase in public health risk to consumers through their acts or omissions.

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