DWI PR24 AMP8 Overview

Content

- DWI Role
- Price Review Process
- DWI Process – Water Quality
- PR24 vs PR19
- Drinking Water Quality Legal Instruments
- Determinations
- Per - and Polyfluoroalkyl Substances (PFAS)
- Lead
- Water Scarcity
- Questions/Discussion

DWI Role

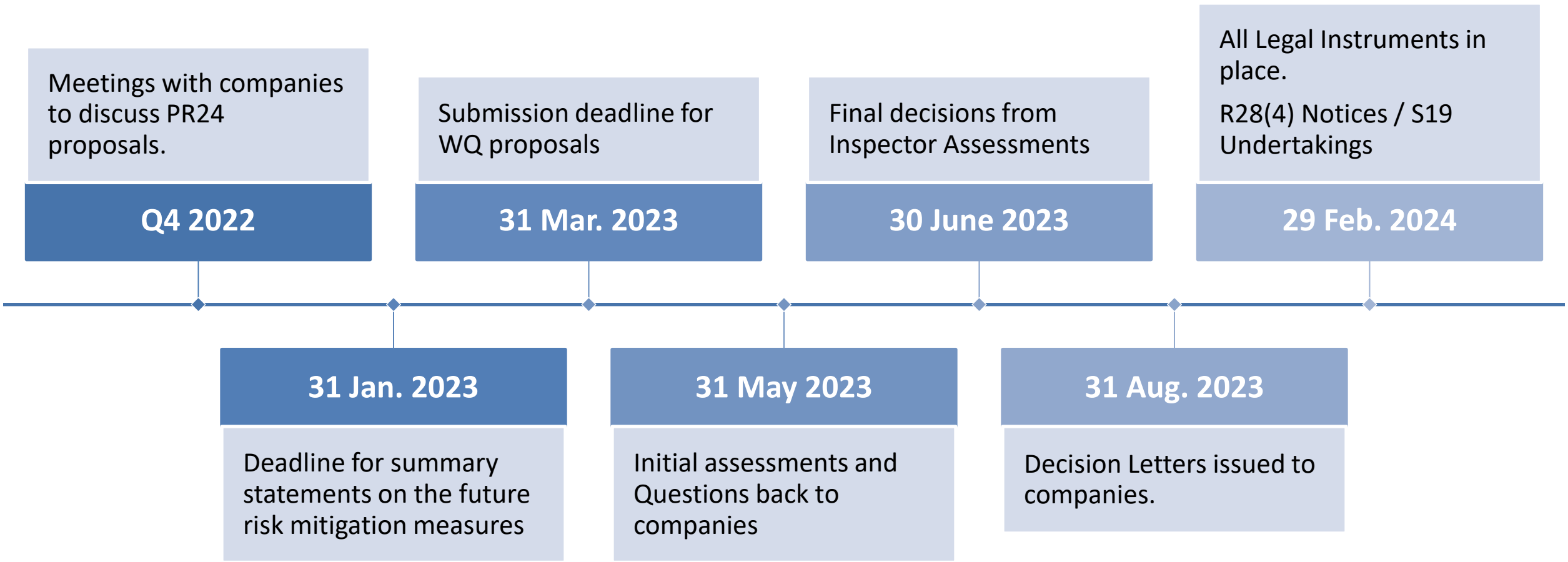
- **The Drinking Water Inspectorate (DWI)** is the independent regulator of drinking water quality in England and Wales. We protect public health and maintain confidence in public water supplies by ensuring water companies supply safe clean drinking water that is wholesome, and that they meet all related statutory requirements. Where standards or other requirements are not met, we have statutory powers to require water supply arrangements to be improved.

  - **Ofwat** - The economic regulator of the water sector in England and Wales.
  - **Environment Agency** - Catchment management, sewage, pollution.

Price Review Process

- The price review process is a five-yearly cycle that determines the prices that water companies charge customers in England and Wales:
  - **Plan:** Water companies set out their plans for the next five years, including how they will provide water, sewerage, and other services.
  - **Regulate:** Ofwat, the independent economic regulator, sets wholesale price limits for each water company. Ofwat balances the interests of customers with the need to ensure that water companies can finance their operations and meet environmental responsibilities.
  - **Regulate:** DWI Support or do not support proposed schemes.
  - **Decide:** The final decisions are announced, setting the levels of service and bills for the next five years.
  - AMP8 2025-2030

DWI process – Water Quality



PR24 vs PR19

	DWQ schemes	SEMD schemes	NIS schemes	Total Schemes	Total Legal Instruments
PR19	110	0	0	110	76
PR24	209	110	50	370	186

- SEMD and NIS were new at PR24.
- Supported schemes given **Notice** or **Undertaking.**
- Now tracking “commend for support” through Acknowledged Actions.
- Every company* got a PFAS undertaking.
- Every company got a Lead undertaking.

*Not HDC

Drinking Water Quality Legal Instruments

Affinity Water (10)	Nitrate, PFAS, Lead	Southern Water (10)	Nitrate, Disinfection, Emerging contaminants, PFAS, Lead
Anglian Water (20)	Nitrate, PFAS, Lead, Odour	South Staffordshire & Cambridge Water (6)	Acceptability, Antimony, Nitrate, PFAS, Lead, Disinfection
Dŵr Cymru (8)	Disinfection, Resilience, Tanks, Discolouration, Lead, PFAS, Catchment investigation	Severn Trent Water (13)	PFAS, Crypto, Nitrate, Algae, Lead, Disinfection
Hafren Dyfrdwy (1)	Lead	South West Water (inc. BRL) (17)	Works upgrades, Discolouration, Reservoirs, PFAS, Lead, Emerging contaminants
Northumbrian Water (5)	Works refurbishment, Works Upgrades, PFAS, Lead	Thames Water (6)	Crypto, PFAS, Lead
Portsmouth Water (7)	Nitrate, Reservoirs, Works upgrades, PFAS, Lead	United Utilities (10)	Taste & Odour, Discolouration, PFAS, Lead
SES Water (4)	Crypto, Lead, PFAS	Wessex Water (8)	Nitrate, Discolouration, PFAS, Lead
South East Water (9)	Nitrate, Discolouration, Works upgrades, PFAS, Lead	Yorkshire Water (7)	Disinfection, Nitrate, Taste & Odour, Discolouration, PFAS, Lead

dwi

Determinations

- Draft Determination delayed due to General Election, published on **12 July 2024.**
- Following the Draft Determination, companies could make representations to Ofwat by end of **August 2024** (supplying additional evidence for allowances).
- Ofwat are now re-assessing any additional information provided by companies for their Final Determination (due **17 Dec 2024**).
- We may be asked to vary our legal instruments – First response: ***"You have proven the risk, you must now mitigate it!"***
- Companies that are still not happy with the Final Determination can make representations to the CMA (Completion and Markets Authority).

Key Themes

Science project reveals high lead levels in schools' water

Concentrations at 14 sites were five times higher than recommended limit

'Forever chemical' in English tap water samples carcinogenic, WHO rules

Exclusive: Move to categorise PFOA as linked to cancer in humans by World Health Organization ups pressure on UK government

Water firms on track to remove dangerous lead pipes – by the year 3273

Drinking water watchdog warns about England's 5.7 million lead pipes, which put health at risk

PFAS

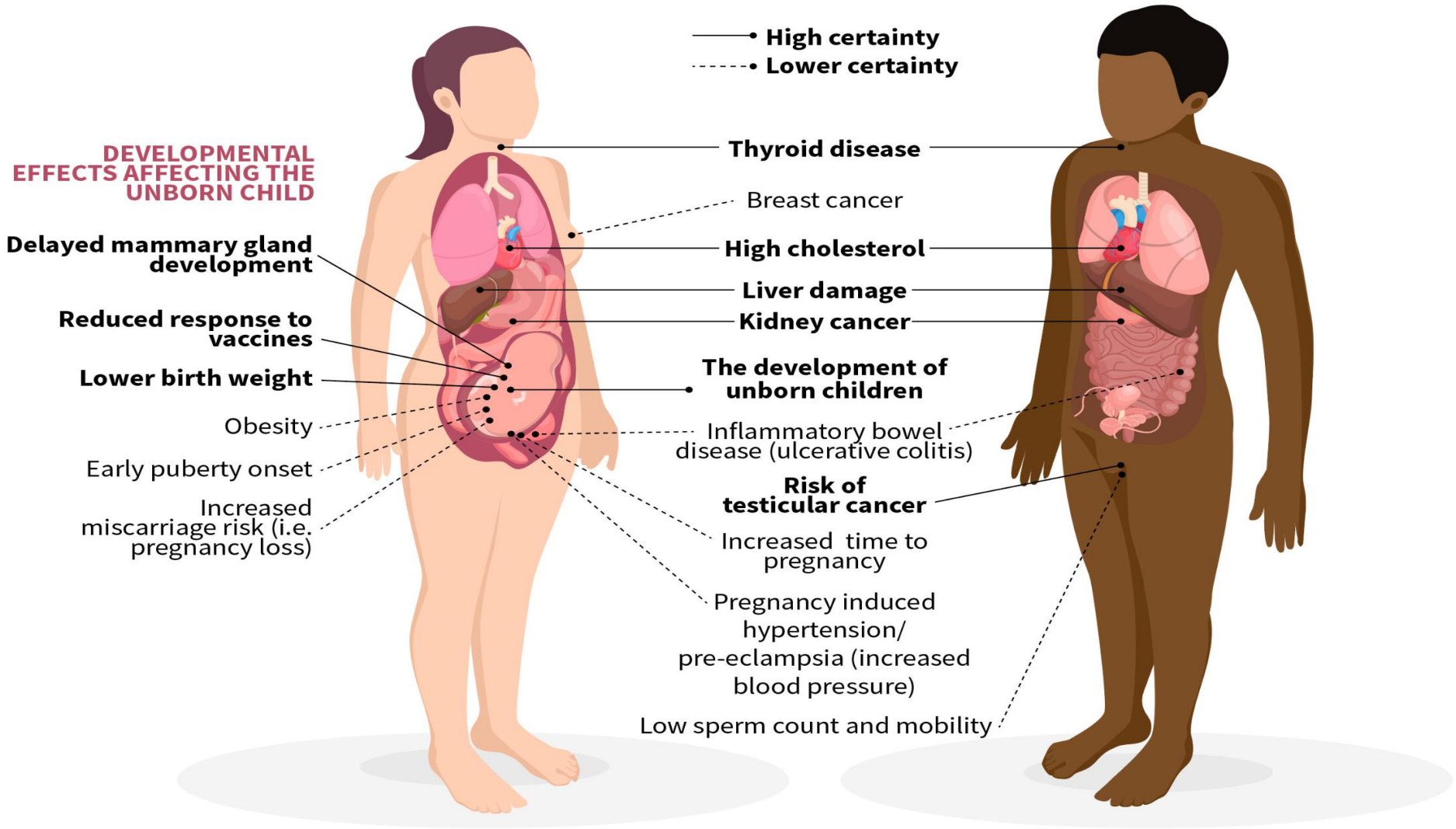
- Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that are used in many products and are known to be persistent in the environment. They are sometimes called "forever chemicals" because they do not break down easily.
- PFAS rose to the public's attention in the UK, in the aftermath of the 2005 Buncefield oil disaster. In order to bring this fire under control, PFOS (Perfluorooctane Sulfonate) was used as a key surfactant in hundreds of tons of firefighting foam. PFOS and PFOA were subsequently found to be present in the main aquifer below the site and further monitoring showed its presence in numerous water sources throughout the country.

PFAS Uses

- Due to their unique properties, PFAS use was widespread.

- Popular uses include:
  - Waterproofing (including clothing and footwear sprays)
  - Stain protection (carpets, clothing)
  - Chrome plating
  - Food packaging
  - Types of firefighting foam
  - Cookware
  - Aviation hydraulic fluid

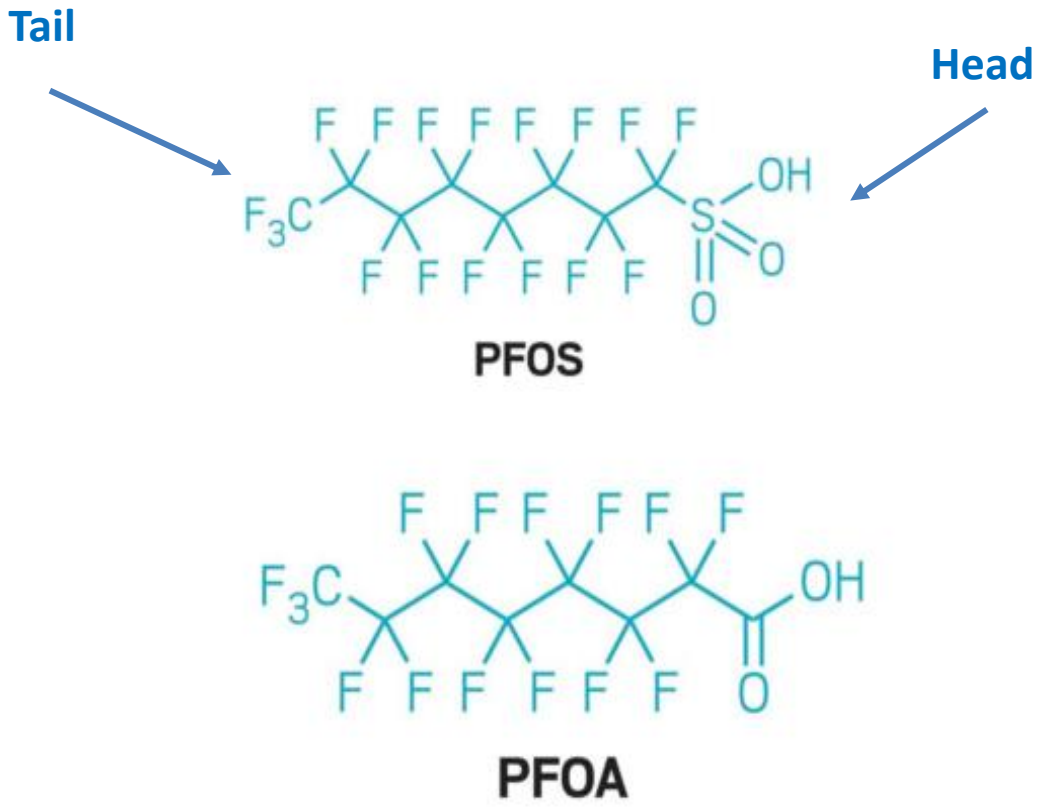
PFAS Health Effect



Royal Society of Chemistry: Cleaning up drinking water, 2024.

What Are PFAS?

- Per - and polyfluoroalkyl substances.
  - Per (completely)
  - Poly (multiple)
    - Fluoro (fluorine)
    - Alkyl (alkyl groups are the C_nH_{2n+1})
- Carbon-fluorine (C-F) bonds in the tail are hydrophobic whereas the functional groups in the head are hydrophilic (Amphiphilic chemicals).
- **Making them repel water and oil.**
- The carbon-fluorine bond is amongst the strongest in nature and therefore difficult to break down.
- **Water, oil, stain, heat resistant.**



PFAS Examples

- The UK drinking water inspectorate as of the 31st December 2021 requires that all drinking water is monitored for a list of 47 PFAS compounds in order to gather further information on their levels and prevalence in UK supplies.
  - **PFOA:** A perfluoroalkyl carboxylic acid (PFCA) with eight carbons (non-stick cookware, carpets, upholstery, floor wax).
  - **PFOS:** A perfluoroalkyl sulfonic acid (PFSA) with eight carbons (firefighting foams at airports, military airfields, and firefighter training facilities).
  - **PFNA:** A perfluoroalkyl carboxylic acid with nine carbons (non-stick and stain-repellent coatings, firefighting foams).
  - **PFHpA:** A perfluoroalkyl carboxylic acid with fewer than nine carbons (breakdown product of grease-proof and stain-resistant coatings on carpets, couches, and food packaging).
  - **PFHxA:** A perfluoroalkyl carboxylic acid with fewer than nine carbons (used in a variety of products to make them resistant to oil, stains, water, and grease).
  - **GenX:** A replacement chemical for PFOA.
  - **PFBS:** A replacement chemical for PFOS.

PFAS Undertaking

- There are currently no statutory standards for PFAS in drinking water in England and Wales. However, the Drinking Water Inspectorate (DWI) has produced tiered guideline values for water companies to adhere to.

- **PFAS Tiers:**
  - Tier 1 <0.01 µg/L – Have a plan ready incase levels increase.
  - Tier 2 <0.1 µg/L – Mitigate to Tier 1 as a matter of priority.
  - Tier 3 ≥0.1 µg/L – Take action now to reduce to Tier 1.


Water Industry Act 1991 (as amended) ("the Act"): Section 19(1)(b)
South West Water Limited – AMP8 PFAS Strategy
Reference: SWB-2023-00014
Acceptance Notice:
The Drinking Water Inspectorate, on behalf of the Secretary of State for Environment, Food, and Rural Affairs:

- Supply systems to be included for Legal Instruments:
  - 2 or more detections in the raw water or,
  - 1 Detection in the treated.
    - Take action dependant on Tier level.
    - Monitor for two years and reduce to Tier 1 before removal from Undertaking.

PFAS Treatment

- **Current strategies being used/planned?**
  - **Conventional treatments**
    - Coagulation/filtration, chemical oxidation/aeration and disinfection)
    - Unable to remove PFASs.
  - **Blending (mitigation)**
    - Primary approach
    - Lower cost
  - **Adsorption technologies (GAC, Ion exchange)**
    - Effective at removing long chain PFAS but less effective for short chain PFAS.
    - Short chain PFAS can show rapid breakthrough – must be monitored frequently.
    - IX has been touted as a superior adsorbent over GAC for PFAA removal due to IX regeneration capabilities, greater effectiveness in removing short chain PFAAs, and overall higher sorption capacity relative to GAC.
    - IX is likely more cost effective than GAC in meeting short and long chain treatment.
    - IX media must be designed for PFAS removal.

Lead

- Lead consumption is associated with impaired neurodevelopment, and can cause cardiovascular disease, kidney disease and raised blood pressure. There is no apparent health-based threshold for lead indicating that there is no safe level of lead in drinking water. Yet, exposure to lead through drinking water persists.
- Homes built after 1970 are unlikely to have lead pipes.

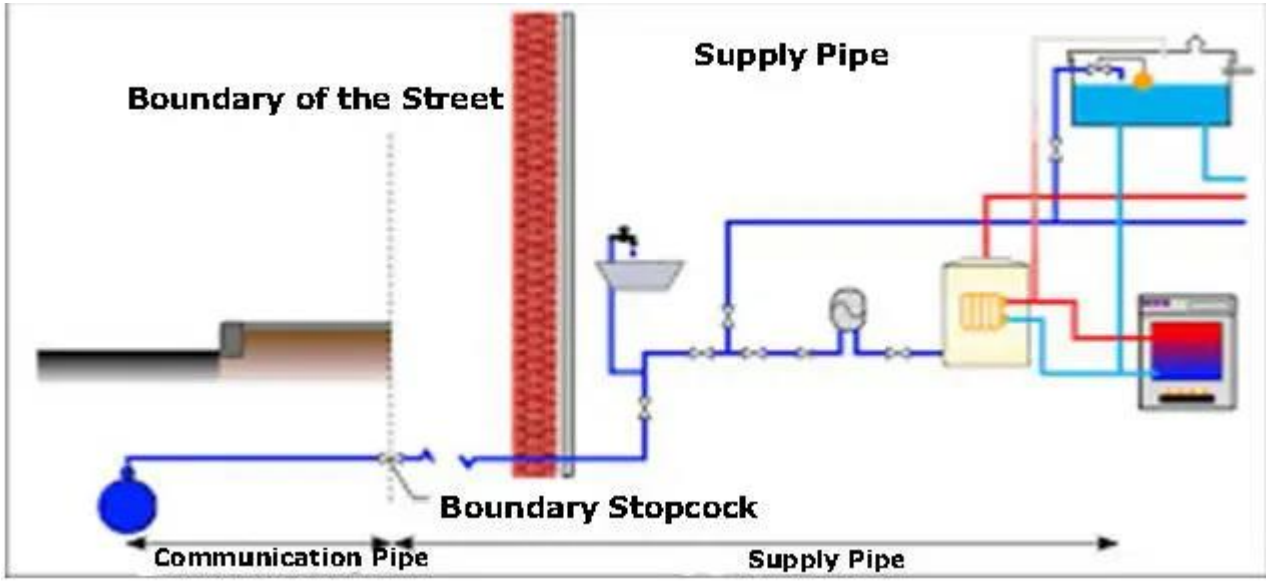
Lead pipes found in older homes

Lead

- Lead can be present in raw waters however treatment processes can effectively remove lead making it safe at the point of leaving the treatment works.
- The key area for concern is lead leaching in distribution systems and from water fittings in domestic plumbing. Many water companies dose chemicals, namely orthophosphoric acid, for plumbosolvency control but this has environmental, and financial implications.
- Dosing must be reliable and continuous to ensure lead does not leach from the pipes. Even with plumbosolvency control, in 2023 there were 45 breaches in the regulatory standard of 10 µg/l for lead in England.
- Standard sampling frequencies for a population of 5000 – 100,000 people for lead are 8 per year and therefore the risk of exposure is known to be far higher than compliance results indicate.
- All water companies signed up to a Lead Undertaking for AMP8.

Lead

- **Regulation 4:** Under section 68 of the Water Industry Act 1991 water suppliers have a statutory duty to supply wholesome water. Water is deemed to be wholesome if it contains concentrations or values in respect of various properties, elements, organisms and substances that do not contravene the prescribed maximum, and in some cases, prescribed minimum, concentrations or value (PCV).
- The point of compliance for Lead is measured at the customers tap.
- Companies must comply with regulation 4.
- Discussion.



Item	Parameters	Concentration or value (maximum)	Units of measurement	Point of compliance
15.	Lead	10	µgPb/1	Consumers' taps

Lead Undertaking Common Themes

- 4c(1). **Replacement of company lead communication pipes** when lead is detected at or above 5µg/l.
- 4c(2). Proactive **lead risk investigations at up to 1000 schools or nurseries**, with lead communication pipe replacements where required and provision of risk mitigation advice.
- 4c(3). **Trial a means-tested grant scheme** for consumer lead supply pipe replacement for up to 500 consumers.
- 4c(4). Conduct a **phosphate disengagement trial**, pending confirmation of Ofwat enhancement funding.
- 4c(5). **Opportunistic lead communication pipe replacement** during other network activities.
- 4c(6). **Collaborate with Water UK and regulators** to make positive progress on lead reduction and awareness as an industry.
- 4c(7). Continue the company's **free connection policy for customers who replace their lead supply pipe** by replacing the communication pipe if it is lead.
- 4c(8). Develop and submit the company's **draft Lead reduction plans for AMP9**, demonstrating the proposed ramp-up pipe replacement rate.

Water Scarcity

- The average person in the UK uses around ??? litres of water per day.
- The average UK household uses around ??? litres of water per day.
- England - Up to 13 billion litres of high-quality drinking water per day.
- Wales – Up to 900 million litres of high-quality drinking water per day.
- The National Infrastructure Commission estimates that England will need an extra 4 billion litres of water per day by 2050.

- Key issues:
  - Climate Change
  - Increasing population
  - Water intensive industry

Industry - Water Resource Management Planning

- **Water Transfer:** Moving millions of litres of water from wetter to drier areas – major new schemes to transfer water through rivers, canals and new pipelines towards the south and east to tackle water stress using excess water from elsewhere.
- **New Reservoirs:** Storing more water for drier periods – securing permissions to build major new reservoirs to hold back rainfall making more available for customers and the environment throughout dry periods.
- **Sustainable abstraction:** especially in sensitive areas and at peak times – this will leave more water in rivers and lakes during the summer protecting our environment in periods of drought and extreme temperatures.
- Fitting **smart water meters** for homes and businesses – empowering customers to make financial savings, find leaks more quickly, reducing the amount of water we need to take from the environment .
- **Water efficiency advice** – helping customers choose more efficient kitchen appliances or switch to rainwater butts for garden irrigation, saving customers money and protecting the environment.

Questions/Discussion

dwi