Spring Accelerator 4: Call for Innovation

Overview

The Spring Accelerator aims to identify innovative solutions that help address a significant need in the UK and Ireland water sector. Our current programme, Spring Accelerator 4, is looking for innovations to answer the question: “How can we better understand, monitor and manage emerging contaminants in wastewater?”

The Spring Accelerator’s purpose is to bring the right people together to drive the development and adoption of solutions. Spring is here to facilitate collaboration and mobilisation; we bring successful entrants and water companies together and act as a knowledge transfer partner for projects to ensure learnings are shared across the sector.

The Context

Emerging contaminants are (often unregulated) chemicals and other substances detected in water and the environment that pose a potential risk to human and/or ecosystem health. Despite the substantial media attention on perfluoroalkyl and polyfluoroalkyl substances (PFAS or "forever chemicals"), pharmaceuticals and personal care products (PPCPs), plasticisers, surfactants, fire retardants, nanomaterials, pesticides and other substances also fit into this broad category of "emerging contaminants".

Emerging contaminants enter wastewater treatment works in several ways. Industrial, agricultural and construction activities, as well as chemical spills, all play a role, but so does the domestic water customer. For instance, pharmaceuticals like antibiotics or contraceptives are often only partially absorbed, with the remainder excreted into toilets, and personal care products, such as fragrances, enter drains when they are washed off the body. Used water”, from both domestic and industrial sources, is then transported through the wastewater network to a treatment works, where it is treated to produce an effluent that is suitable to discharge to the surrounding environment.

The nature and effects of emerging contaminants vary. Some may be carcinogenic or alter nutrient levels of delicate ecosystems. Endocrine-disrupting compounds can affect reproductive systems in aquatic organisms and microplastics have been found to interfere with the physiological and biological processes of some organisms. Emerging contaminants can also transform into uncharacterised “chemical cocktails”, and undergo long-range transport, resulting in pollution far from the original source. The full extent of the health and environmental impact of emerging contaminants is still not fully understood.

The substances that are classified as emerging contaminants can change over time. For example, lead and asbestos were once considered ‘emerging’, but as we developed an understanding of the risks they pose and the methods to mitigate them, their classification changed. This ever-changing landscape makes regulation particularly challenging, and there isn't yet a definitive framework for water companies to adhere to. As a result, any solutions that are to be adopted by water companies in this space must be able to adapt to and meet any future regulatory requirements.

As some of these emerging contaminants are present in trace concentrations, it was only in the early 21st century that advances in analytical techniques have allowed for their detection; as such, wastewater treatment works were not designed to monitor or manage emerging contaminants.

There is an opportunity, however, for wastewater treatment works to act as the primary barrier to the persistence of emerging contaminants. If these contaminants were to be removed at the wastewater works, they would not be discharged into the environment where they are able to accumulate, persist and cause the damage to human and ecosystem health described above. Water utilities in the UK and Ireland aim to go beyond regulatory requirements and prevent the risks posed from emerging contaminants as close to source as they can, at wastewater treatment works.

The Challenge

How can we better understand, monitor and manage emerging contaminants in wastewater?

Spring invites innovators to provide solutions to help us better understand, monitor and manage emerging contaminants in all areas of wastewater treatment to protect the health of people and the environment.

Successful solutions for Spring Accelerator 4 will not only help safeguard the environment but help water companies operate more efficiently, saving them time, money and resources, proactively working with regulators rather than responding reactively to regulation.

Distinct opportunities in this challenge include:

- **Prioritisation and Risk Assessment:** An understanding of emerging contaminants entering a wastewater treatment works and their persistence throughout them is required to accurately understand and predict for the emerging contaminants of the future. Accurate risk assessment of emerging contaminants within wastewater and in wastewater treatment works would help water companies prioritise investments and efforts based on the potential risk posed to humans and ecosystems.
- **Monitoring:** Once the risks posed by emerging contaminants are understood, increased monitoring of emerging contaminants would help provide data to inform the regulatory decision-making process. However, the analytical difficulty of working at such small concentrations (ng/l) in a complex matrix such as wastewater can prove challenging, particularly when seeking reasonably priced solutions. Another challenge posed by monitoring emerging contaminants is that innovations can often be designed for individual substances and not for multiple substances together or chemical cocktails. Innovations designed for multiple substances would allow water utilities to operate above and beyond regulation.
- **Concentration and Removal:** The concentration and removal of emerging contaminants within wastewater treatment works could enable these contaminants to be treated effectively and proactively, mitigating potential harm for people and the environment. we are interested in technologies that minimise environmental impact, with low greenhouse gas emissions, minimal byproduct formation, and high energy efficiency. Additionally, these technologies should offer a cost-effective investment for water utilities and be implementable in a reasonable timeframe. Often, treatment methods are designed with a

single contaminant in mind, when in a real-world environment, it is often a cocktail of multiple different substances which require treatment. The innovation in this space could also be flexible to treat new contaminants as and when they are discovered.

- **Destruction and Reuse:** When emerging contaminants are removed from wastewater, they are concentrated. Often, once accumulated, emerging contaminants are moved, rather than destroyed or utilised for other purposes. For example, substances are often removed by the treatment process GAC, but the substances removed from the water course can be concentrated in the GAC media, which then requires disposal itself. The holistic life cycle of emerging contaminants is poorly understood and the fate of metabolites during the removal/broken down process is often unknown. If possible, it would be of interest to go beyond accumulating and moving emerging contaminants, either by looking at the circular economy potential for these substances or finding an effective and efficient means of destroying them.

Benefits to Innovators

The Spring Accelerator focuses on bringing the right people together to drive forward the adoption of solutions. Successful innovators can expect to have their ideas seen and heard from the people in the UK and Ireland Water Industry who want and need solutions and are guaranteed feedback on their solutions from these experts.

The goal of the Spring Accelerator is to speed up the process of finding, progressing, and adopting solutions to a given water industry challenge. This means that those who successfully navigate the accelerator process will go on to progress their solution with one or more water utilities. This could take the form of mentoring, the solution being mobilised with one or more water companies to test the solution in context, or anything in between.

At this time, financial support is not offered as part of the Spring Accelerator process. Project/trial delivery is at the discretion of the water companies involved.

Spring will also act as a knowledge transfer partner for projects that are mobilised to ensure learnings are shared across the sector.

Deployment Timescale

- Launch of the competition: October 22nd, 2024
- Deadline for applications: November 25th, 2024
- Selection & notification of finalists: 13th January 2025
- Innovation Exchange pitch day: 23rd January 2025

A more detailed timeline is displayed in the image below. Please note, dates are indicative and are subject to change over the duration of this challenge period.

Eligibility Criteria

- You can submit more than one entry to the Challenge.
- Innovators can be UK-based or international.
- Priority will be given for solutions not previously trialled in the UK and Ireland.
- The Accelerator is open to all innovators who have an idea or solution that addresses the challenge statement.
- Applicants may be individuals, businesses, consortia, academics, or partnerships.

Further information can be found in SA4 Terms and Conditions.

Application Form

To apply for Spring Accelerator 4, you will need to create an account to log in to the Spring Platform. This can be completed by following the link to the Spring Accelerator 4 website.

The questions and character limits can be found in our Innovator Guidelines document, which can also be found on the Spring Accelerator 4 website.

Please do not submit any confidential information with your application.

Assessment Criteria

Submissions for the Accelerator will be pre-screened by Spring's team of industry experts. This initial filter focuses primarily on the quality of the application, not of the proposed solution.

Applications will be pre-screened on:

- How relevant is the submission to the challenge?
- Does the proposed solution show novelty?
- How well is the application completed?

Following the Spring internal review, successful submissions will then be reviewed by subject matter experts (SMEs) at the participating water companies for that challenge.

Successful applications will be assessed on:

- Would the submission be of benefit to the water sector?
- Would the submission be of benefit in your water company?
- Would the solution help the water sector achieve the challenge statement?
- Would the solution help your water company achieve the challenge statement?
- Does the proposed solution show novelty?
- Do you think the solution is realistic for the water sector? Is there a clear and feasible amount of investment be required to make this solution possible in the water sector?

In the spirit of supporting innovators and providing a transparent and valuable challenge process we have provided the scoring criteria that will be used to assess submissions. See Innovator Guidelines Section 3.2 for further information.

Those applicants who are successful in their Call for Innovation application will be invited to pitch their solutions to key water company stakeholders at the Innovation Exchange. Further details of these steps can be found in the Innovator Guidelines Section 2.2.

IP & Potential Commercial Route

If your idea, product or solution is successful all intellectual property rights will be discussed on a case-by-case basis with the water companies mobilising a continued project. Spring's intellectual property rights position is to allow the idea submitter to retain all intellectual property over their idea, product or solution. More information can be found in SA4 Terms and Conditions.

Background: Spring and the Accelerator

Spring Innovation was founded in 2021 as the Centre of Excellence for UK and Ireland's water sector, dedicated to accelerating industry transformation through innovation and collaboration. We are the custodian of the Water Innovation Strategy 2050, a document that outlines key themes, opportunities, and drivers for innovation across the water sector and the huge gains that can be made by approaching these collaboratively. This document drives all of Spring's work and our mission to connect, integrate and enhance innovation excellence within and outside the water sector. You can find the Water Innovation Strategy here.

The Spring Accelerator calls out for specific implementable innovation for water companies to trial, progress and adopt as a collaborative group - facilitating collaborative working and breaking down barriers. Our current programme, Spring Accelerator 4, sits inside Water Innovation Strategy 2050 Theme 2: Providing clean water for all.

Our challenge statement has been designed in collaboration with the sector. Water utilities have been instrumental in selecting and refining our challenge area. We then hosted an Ambition Surgery, our problem definition and challenge setting mechanism, and brought together utilities, suppliers, academia and regulators to help us articulate the specific set of issues our challenge should focus on. This was then validated and further developed with a cross-sector group of subject matter experts. Thank you to everyone who helped develop this challenge.