

SEPA begins analysis of first samples in COVID-19 RNA fragment waste water monitoring trial

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The Scottish Environment Protection Agency (SEPA) has begun its analysis work on the first samples of waste water (sewage) in a new trial aimed at helping monitor the spread of coronavirus in Scotland.

With the backing of Scottish Government and Health Protection Scotland, part of Public Health Scotland, the agency's scientists are building on exploratory work started by Scottish Water and academic partners from the University of Edinburgh's Roslin Institute to monitor the levels of fragments of COVID-19 ribonucleic acid (RNA) in waste water.

If successful, the trial could form the basis of an ongoing monitoring programme that would provide additional information to further strengthen the nation's Test and Protect strategy in response to the pandemic.

The trial will see samples collected by Scottish Water and its operators from incoming waste water at public waste water treatment works in each of the 14 NHS Scotland health board areas being analysed by SEPA. It is estimated the samples will be representative of waste water from between 40-50 percent of the Scottish population and could contribute to helping understand trends in the prevalence and distribution of the virus in Scotland, in combination with community testing and hospital admissions data.

The World Health Organization has said there is currently no evidence that coronavirus has been transmitted via sewerage systems. This project will track non-infective, COVID-19 RNA fragments – a genetic footprint which can be measured in waste water even after the virus has been destroyed.

SEPA is among the first European agencies to begin this exploratory work.

The first waste water samples from eight health board areas are now being analysed in SEPA's Lanarkshire Angus Smith laboratories using techniques based on the latest scientific research trialled by the University of Edinburgh's Roslin Institute and other leading academic institutions in the field.

Scientists at The Roslin Institute have been working with Scottish Water and SEPA to develop robust methodologies for detecting and measuring SARS-CoV-2 genetic material in wastewater. Funding from the Centre of Expertise for Waters (CREW), which is supported by Scottish Government, has allowed scientists in Scotland to work with academic colleagues across the UK to keep pace with international developments in the rapidly expanding field of wastewater epidemiology.

Terry A'Hearn, SEPA's CEO, said:

"As Scotland's environmental watchdog, we're playing an important role in the national effort against coronavirus. As one of the first European Environmental Protection Agencies to do so, we're in the early stages of this exploratory work to trace the presence of coronavirus RNA in Scotland's waste water. Our expertise in designing and implementing monitoring networks, coupled with our scientific capabilities, meant that we were able to get up and running quickly with the support of our partners. We believe we are one of the first agencies in Europe to begin this work.

"Our hope is that our analysis could provide useful data in Scotland's efforts to trace the virus. However, we first have to understand what the samples are telling us and that's the important work our experts, alongside Health Protection Scotland, The Roslin Institute and others in the scientific community are embarking on now."

George Ponton, head of research and innovation at Scottish Water, said:

"Taking away and managing the nation's waste water is a vital service, and a key part of ensuring public health is maintained, and Scottish Water has infrastructure in communities the length and breadth of Scotland.

"We are delighted to be working with SEPA and the other partners to determine whether the waste water system can be used to track the spread of the coronavirus in the community and help prevent the spread of the virus."

Dr Alexander Corbishley of the University of Edinburgh's Roslin Institute, said:

"Detecting viral genetic material in waste water is relatively easy, however the challenge is measuring how much genetic material is present accurately and relating that to disease levels in the community. The support from CREW has allowed us to use our expertise in disease monitoring to inform SEPA and Scottish Water's efforts to develop a Scottish wastewater monitoring programme".

Environment Secretary Roseanna Cunningham said:

"The COVID-19 pandemic has been an unprecedented global crisis which has fundamentally affected us all.

"There has of course been much research work carried out globally to better monitor, assess and understand the virus. Such work is crucial to ensure our recovery and I welcome this important project being undertaken by SEPA, Scottish Water, academia and other partners to monitor the prevalence of the virus across the Scottish population."

SEPA is also in discussions about how our monitoring could assist UK government scientific advisors, who are engaging with the research community to investigate if waste water monitoring could be used to track the transmission of coronavirus.

SEPA's response to the COVID-19 pandemic can be found at coronavirus.sepa.org.uk.

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