



Drinking Water Quality Regulator  
for Scotland

# Incident Summary

North Hoy WTW  
pH Failures  
13 January 2020

DWQR Inspector:  
Bill Byers

Event No. 10805

## Event Category: Significant

Following routine cleaning of the membrane filters at the treatment works on 13 January, both the treated water and final water monitors went into alarm state detecting a low pH and high Turbidity was indicated in the final water. The Operator opened up a flushing point to run the produced water to waste and alerted the Team Leader of the problem. Monitors showed that treated water had plummeted to a low point pH of 3.8. Discussions between Operations and Process Science staff concluded an issue had occurred with the chemical clean of the membranes. This resulted in an instruction to collect a hand held pH meter and sample Consumers taps in the area to monitor the supply. It was also agreed that the Clear Water Tank (CWT) should be drained to waste, in readiness for being refilled. Further washing of the membranes was carried out using flushing without any chemical cleaner and the limestone contact tank, agitated and flushed to remove any deposits arising from the cleaning chemical. Formal sampling was also arranged to be carried out at the works and in the distribution system. Treated water flow was returned to the CWT at 00:15 on 14 January, after the produced water had consistently shown to be above pH of 7.0. Production had been off line and running to waste for almost 11 hours due to the issue. There was however a short period of time in which very low pH water passed forward to the CWT and sampling within the distribution system showed this to have resulted in low pH being recorded and failures of the iron and lead standards arising from pipe deposits and pipework affected by the extreme change.

Scottish Water's investigation has found that the chemical cleaning of the membranes was carried out with a much greater amount of citric acid powder than the procedure required being added to the chemical tank. The excessively acidic solution tainted the membranes and had a consequent knock on effect into other process elements once the works was returned to production. A compounding factor was that the rinse time following the clean had

been set to a very short duration rather than the 2 hours more typically required. I am content that this is the root cause of the very low pH values subsequently experienced and the failures of iron and lead standards.

The event has been categorised as Significant. Scottish Water has identified five actions which DWQR accepts are appropriate and will monitor to ensure they are completed prior to signing off the incident. DWQR made no additional recommendations.

