

# Incident Summary

Sanday WTW  
Coagulation failure  
21 September 2016

DWQR Inspector:  
William Byers

Event No. 8039

## Event Category: Significant

A high treated water aluminium alarm was generated from the works at 22:45hrs on 20th September. A bench test was carried out on the final water which found a lower level of Aluminium to that shown by instrumentation. Further checks were carried out on the raw water and processes and these were found to be normal. Discussions of the situation took place with the team leader in reference to a similar alarm the week earlier where again, the bench test was significantly below the monitored values. It was decided to suppress the Aluminium alarms until the instruments could be checked. Regular checks the next day found filtered turbidity above normal operating level and aluminium above the PCV at 220µg/l. The aluminium dose was reduced and the operator continued to monitor the works. Raw water quality was constantly changing due to high winds causing disturbance in the shallow loch. As there was no improvement by 26th September, the second DAF unit was brought on line to reduce the loading on the clarification process and the process scientist attended site to assist with investigation and optimisation of the process.

Water leaving the treatment works exceeded the 200µg/l standard for aluminium from 21<sup>st</sup> to 31<sup>st</sup> September. Formal sampling of the water leaving the works and within the distribution zone commenced on 28<sup>th</sup> September with 8 samples failing through to 1st October. The highest level of aluminium recorded in samples of water supplied to consumers was 347µg/l.

The cause of this event was the failure to respond to changing water quality from the loch. There is no pH correction at this works to ensure optimised coagulation, the only mechanism being alteration to the aluminium dose. The dose level is determined in reference to changes in clarified turbidity and with this being a manual process, it is imperative that there is confidence in process instrumentation and monitoring equipment. In this case, bench test results were given more credence than the instrumentation values and it was not until 26th September that the instrument was confirmed to be in order and accurate. Valuable time was lost therefore in bringing appropriate expertise to bear in resolution of the coagulation process issues.

A significant finding in the investigation of processes was the poor performance of the DAF unit in removing the aluminium floc due to low levels of air saturation. This meant the unit was unable to produce an effective blanket which resulted in higher turbidity water and aluminium passing through the works.

The event has been categorised as serious. Scottish Water has identified eleven actions which DWQR accepts are appropriate and will monitor to ensure they are completed prior to signing off the incident. DWQR made one additional recommendation.

