

Assynt WTW Loss of Coagulation 3rd December 2024

Event No. 15242

Event Category: Significant

A gradual blockage of the coagulation lime dosing pumps resulted in a loss of coagulation control and elevated aluminium levels passing forward into the rising main (online monitor 0.18mgAl/l, whilst a lab sample failed at 0.22mgAl/l) before Assynt WTW was manually shut-down by the operator. During the plant restart, non-complaint water in the rising main passed forward into the clear water tanks (CWT) and a 10-minute delay in manually changing the Coagulation pH controlling monitor resulted in conditioned pH increasing to pH 11 and treated aluminium spiked at 1.0mg/l. The site run-to-waste was only partially implemented during a 60 minute period whilst coagulation recovered with 60% of the plant flow passing forward into the CWT's. In total, 1 megalitre of non-compliant water passed forward into the CWTs equating to approximately 6% of the combined tank volume. It is unknown whether there was any impact in distribution as Scottish no additional samples were taken around the time of the failure.

The initial loss of coagulation and spike in aluminium was caused by a blockage of the lime dosing pumps. The loss of coagulation during plant restart was due to a delay in manually adjusting the coagulation pH set point when the controlling pH monitor automatically changed to the Post-PACL pH monitor on restart. There were multiple contributory and exacerbating factors including:

- A defective auto flushing system and a lack of routine maintenance on the lime dosing system;
- Elevated backpressure on the lime dosing system during periods of high plant flows and membrane stacks being unavailable;
- The Emergency Action Levels and coagulation pH shutdown triggers being set too low;
- The aluminium monitor being a 3-stream monitor meaning that there was a delay in the high permeate aluminium shutdown being triggered;
- A slight delay in the operator manually inputting the coagulation dosing set point due to dealing with an unrelated issue with the PACL dosing pump;
- A failure to successfully implement to works run-to-waste system due to a lack of training.

The event has been categorised as significant. 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 two additional recommendations.

