

Stoneybridge WTW Aluminium Failure 10th May 2021

DWQR Inspector:
Moirra Malcolm

Event No. 11718

Event Category: Significant

On 10th May the operators at Stoneybridge WTW managed a decrease in raw water quality by manually adjusting the coagulant dose as per normal procedure. The following day during routine plant stop/starts there was a loss of coagulation control and the PCV (Prescribed Concentration or Value) for aluminium was breached for 1 hour. This was caused by the pH being set to flow-pace for 20 minutes on restart of the plant, so was unable to keep pace with the elevated coagulant dosing. In addition alarms are suppressed for the first 45 minutes after restart to allow the plant to stabilise. Operators responded by escalating the event, reducing the Clear Water Tank (CWT) to remove the high aluminium water and installing a *Cryptosporidium* filter.

On 19th May operators were called by the ICC for a high high turbidity alarm for filter 2. On investigation operators found the filter to be blocked from the high organic loading and additional coagulant dose from the previous week of poor raw water quality. The filter was taken offline, backwashed and left to turn overnight. The following day the filter had not improved so backwashing continued. It was thought that it would take several days to unblock.

By the 21st the filter had not recovered, so the filter was drained down and washed with sodium hypochlorite to break up the organics and mobilise the sand. The chlorine mix was left overnight and on the 22nd operators noted an improvement in the filter, so it was flushed to waste and the inlet valve opened with the filter still running to waste. The operator was later recalled by the ICC for a plant shutdown due to both chlorine pumps tripping on low flow. The plant was restarted. Aluminium and turbidity levels in the treated water were elevated which the operator attributed to the plant restart, so he concentrated on the chlorine issues. The operator escalated the issue to ICC and checked the filter valves where they found that the filter 2 outlet valve was passing water forward into supply. The inlet valve was re-closed and the incident escalated to ICC and Public Health Team (PHT). During the time that water passed from the cleaning filter through to the CWT, final water was above PCV for aluminium for over 4 hours, with turbidity elevated and chlorine decreased to 0.3mg/l.

The first failure was caused by a fluctuation in raw water quality which the site found difficult to manage as it must be changed manually – despite the fitting of a new Pi streaming current coagulation unit as stipulated by action 4836 from a previous water quality incident in 2019. The unit was fitted in August 2020 but was not fully commissioned and implemented. At time of writing this assessment the instrument is still not able to automatically control the coagulation dose, and is scheduled to be fully functional by the end of September 2021. In addition to this the coagulation pH control was set to flow pace for 20 minutes on plant start-up, which was not able to keep pace with the increased coagulant dosing.

The second failure was caused by the failure of filter 2 outlet valve during washing, which allowed non-compliant water to flow forward into supply.

The event has been categorised as significant. Scottish Water has identified twelve 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.

