

## Loch Calder water supply zone Aluminum failure 8 November 2017

DWQR Inspector:  
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Event No. 8942

### Event Category: Significant

On 8th November 2017 Loch Calder water treatment works (WTW) shut down due to high filtered water aluminium with three filters out of service. The operator found that there was a failure of the post dissolved air flotation (DAF) polyelectrolyte (poly) dosing. He flushed the dosing lines and fitted new stators to the pumps. The plant was restarted and poly dosing manually increased from 14 l/h to 30 l/h to facilitate plant recovery and all filters washed. The poly dose was reduced during the day and returned to 14 l/h that afternoon. One sample was taken during the incident reading 300mg/l aluminium at the clear water tank (CWT), and it is estimated that water exceeding the regulatory standard for aluminium entered distribution for four and a half hours during the restart and backwashing cycle. No samples were taken in supply.

The incident was caused by a failure in the polyelectrolyte dosing system after a power brown-out on 7th November. During the power brown-out the poly dosing service water began to flow in a reverse direction and when the poly dosing pumps restarted they were unable to overcome the pressure of the service water flow, this resulted in no poly being dosed pre filters. The dosing pump alarm recognised the flow (but not the reversed direction), so the pump alarm did not activate. Due to the lack of poly dosing, filtered turbidity and aluminium began to rise as the formation of the flocculant blanket weakened, with the result that three filters were offline and queued for backwashing – this would have also prompted a works autosutdown, however this was pre-empted by the high aluminium shutdown.

To allow sufficient water for backwashing, the other filters must be brought into service. There is no run to waste facility at Loch Calder and limited storage in the CWT, so the WTW was restarted and non compliant water from the original filter break through and subsequent backwashing entered the network – with 1400 properties on direct feed before any possible dilution at service reservoirs.

The event has been categorised as Significant. Scottish Water has identified seven 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.

