

# Incident Summary

Mannofield WTW  
Coagulation failure  
21 September 2017

DWQR Inspector:  
William Byers

Event No. 8824

## Event Category: Significant

A high turbidity alarm from the clarified water instrumentation was received at Scottish Water's Control Centre (ICC) at 18:30 on 21 September 2017. Attendance by the operators found the floc blanket in the clarifiers to be poor and subsequent jar tests confirmed poor floc forming conditions. Incremental changes to the coagulant dose, polyelectrolyte dose and increased frequency of clarifier desludging were made and monitored at various stages to aid recovery of the clarifier process. Increased filter wash frequencies were also introduced to restore final water quality. Stability had been restored to water production by 03:00 the following morning. Formal sampling of treated water showed an aluminium level of 2330µg/l (micrograms per litre) and a turbidity of 2.2NTU were recorded. Operators had initially been unaware of the magnitude of aluminium levels due to a scaling issue with the SCADA system. A review of instrument monitoring data showed aluminium levels to have exceeded 2000µg/l at times over the course of the event.

Sampling carried out at service reservoirs within the distribution system however showed the level of aluminium to be marginally above the standard of 200µg/l. This improvement is attributed to the dilution provided by the series of large water storage tanks in the system prior to distribution to consumers.

Scottish Water's investigations of the cause of this event has identified a restriction in the flow rate of coagulant from one of the dosing pumps. I am satisfied that the evidence submitted shows a different dose being delivered from the otherwise identical pumps. With the rotation of the pump from standby to duty status, the resulting gradual deterioration of the floc blankets in the clarifiers, allowed poorly clarified water to pass onto the filters. I am satisfied also that although the difference in dose with the change of pump was slight, the changing raw water quality and particularly pH, at this time, was a key factor in triggering the loss of coagulation.

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 one additional recommendation.