

Incident Summary

Mannofield WTW Loss of control of coagulation Process 5th November 2021

DWQR Inspector:
Bill Byers

Event No. 12215

Event Category: Significant

In the early morning of 5th November, a high turbidity alarm was generated from the site and upon attendance, the operator found coagulation pH to have risen. Corrective action was taken by making adjustment to the pH dose control and advancing the desludging of the poorest performing clarifiers. Throughout the day however, further adjustment of coagulation was required to respond to deteriorating raw water quality. Towards the end of the following day, it was noticed the clarified water turbidity was again rising and again manual control over the lime dosing for pH correction was used to make adjustment. The operator found the polymer dosing pump to be noisy and investigation found this to be air-locked and the batching tank empty. An immediate change-over to the standby tank did not restore dosing and Electrical and Maintenance support was sought. It was subsequently discovered that a fault had taken place in the control wiring to the polymer dosing system and a fix was made to enable restoration of the process. Throughout the events, a schedule of reactive sampling was put in place to monitor water quality. Over the course of the event, nine of the samples taken breached the standard for Aluminium and two also breached the standard for treatment works turbidity. The most severe failure of the Aluminium standard recording 3150µg/l in the final water. Both events combined to provide an effect on drinking water quality over three days with clear samples being recorded from the 8th November, onwards.

Scottish Water has determined the cause of the two events to be due to a worn part within the sample pump causing wrong readings to be used for control of coagulation pH control. Coincident with this however was a failure of polymer dosing which had a more pronounced impact in the process failure on 6th November and I consider this to be a significant aspect of the incident. In the days prior to the events, a contractor had been making changes to the polymer dosing system including software controls for automation of the changeover of duty and standby apparatus. The work had not been fully completed and the interim

arrangements made, had caused isolation of the required batching and dosing changeover and a system failure in recognising the subsequent impact on dosing. Although the work had the necessary approvals it is clear there was not a full appreciation held of the possible consequences of failure modes.

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

