Drinking Water Quality Regulator for Scotland

Incident Assessment

Whitehillocks WTW Coagulation Failure 11 August 2014

DWQR Inspector:
William Byers

Event No. 6185

Event Category: Significant

Summary of Incident

The standby operator for the treatment works was alerted to a turbidity alarm on the filtered water stream at 04:35 hrs on 11 August. On attending the site it was quickly established that a power interruption had occurred but since the emergency generator was not active, mains power had been restored. One of the rapid gravity filters was in the wash cycle and all of the others were in alarm and queued for washing. It was also found that the clarifier blankets had risen in the tanks to overflow into the outlet channel and onto the filters causing the high turbidity alarm. The operator fitted a *Cryptosporidium* filter and reduced the flow through the plant. Investigation found the aluminium sulphate dosing pump had reset to a low default value on restoration of the mains power, leading to a poor floc in the clarifiers.

Adjustment was made to the dosing pump to restore coagulation and further checks on other aspects of treatment process found there to be no other issues. Monitoring of the various stages of production over the next few hours showed the problem with the coagulation process and clarifier to have been resolved and an improving trend of water quality being achieved onto the filters. The final water supplied into the distribution system however was showing a deteriorating trend with the aluminium level rising to 240 µg/l by mid-day, breaching the regulatory standard. Due to uncertainty of the degree to which the water in the clear water storage tank (CWT) had been affected by the process failure, a decision was taken to close down the works and carry out flushing of the CWT and trunk mains. The key service reservoir in the distribution system at Meikle Tullo was also isolated until quality could be assessed there. Sampling from consumer taps at properties between the works and Meikle Tullo was also initiated. One sample showed a minor failure of the Aluminium standard but iron and manganese exceedences were recorded in two samples. DWQR is satisfied that these are most likely related to the operation to flush the trunk water mains to Meikle Tullo and not the failure of treatment.

The system was restored to normal operating condition at around 20:00hrs on 11 August after monitoring showed water supplied from the CWT to be within the regulatory standards.

DWQR Assessment of Cause of Incident

DWQR is satisfied that the incident was caused by a failure of coagulant dosing and that this was a consequence of the power interruption. Scottish Water's investigation found that a power blip at 01:30 hrs had been of such short duration, that the emergency generator had been unable to trip in to service.

DWQR Assessment of Actions Taken by Scottish Water

Scottish Water took appropriate actions to restore the coagulation process and to initiate the required sampling of the works, in the distribution system and at consumer taps likely to have been affected by the problem. A detection of 1 *Cryptosporidium* Oocyst in the monitoring sample on 12 August, whilst of low level, demonstrates the importance of ensuring efficient coagulation process to ensure an effective barrier is maintained. On-going *Cryptosporidium* monitoring after this event showed there to be no further detections.

DWQR acknowledges that the new procedure put into action to limit the discharge of non-compliant water from the works, developed as a consequence of earlier coagulation failures in May and July, brought the desired control to this event and limited the impact on water quality in the distribution system.

The event has been categorised as significant. Scottish Water has identified a number of actions and DWQR accepts that these are appropriate and will be monitoring to ensure all are completed prior to signing off the incident.