Drinking Water Quality Regulator for Scotland

Incident Assessment

Penwhapple WTW
Clarifier Failure
27 March 2012

DWQR Inspector:
William Byers

Summary of Incident

A failure of the control system for the return of supernatant liquor to the inlet of the works allowed the pumps to run on and draw up sludge from the lower levels of the filter wash water settling tanks. This in turn overloaded the Dissolved Air Flotation clarifier units causing the loss of the flocculation blanket and carry over onto the filters. The problem occurred outwith normal working hours in the early hours of 27th March with a system alarm alerting control room staff to the problem. A standby Treatment Operator attended the site at 04:15 hrs and carried out an investigation but failed to identify the problem. The normal site operator arrived on site at 08:00 hrs and realised the process had still not recovered. The problem was escalated to team leaders and with Turbidity in excess of 3 NTU and Aluminium at 600µg/l at around midday on 28th, the works was shut down until controlled steps could be taken to reset the processes and systems. Cleaning of filters and a section of the clear water tank allowed a staged reintroduction of the plant and full production was achieved by 18:00 hrs on 28th March.

DWQR Assessment of Cause of Incident

The problems at the works were caused by the return of settled sludge to the inlet of the works. Whilst this was a recoverable situation, the failure to interpret process and alarm information adequately, led to non-compliant water being produced and the need to shut down the works and carry out cleaning of the filters. DWQR is of the view however that there were deficiencies in the training of plant operators and their understanding of the functionality of the supernatant liquid quality monitoring at this site which meant that automatic control of the return pumps was not on-line. In addition, the reliability of the aluminium monitoring equipment had been an issue for an extended period of time and they were not functioning at the time of the incident.

DWQR Assessment of Actions Taken by Scottish Water

DWQR considers there to have been a failure to ensure adequate training of staff in the understanding and effective operation of the works. A failure to ensure that key water quality monitoring equipment is in serviceable use is also unacceptable. The effectiveness of the aluminium monitors had been an issue for some 9 months and DWQR considers the priority given to repair or replacement of the faulty control instrumentation to be inappropriate, leading to an unacceptable level of operating risk.

Scottish Water identified a number of actions from this incident. DWQR accepts that these were appropriate and in addition, made one recommendation. DWQR will be monitoring these to ensure all are completed prior to signing off the incident.