

# Incident Assessment

Invercannie WTW  
Disinfection Failure  
22 September 2014

DWQR Inspector:  
William Byers

Event No. 6366

## Event Category: Significant

### Summary of Incident

On arrival at the Invercannie treatment works and carrying out morning checks on 22 September, the operator noted the disinfection process was in alarm with low chlorine levels at the contact tank. There were no other process alarms and after initial investigations of the disinfection equipment showed no obvious cause of any problem, the works was shut down at 8:35 to prevent further transmission of un-disinfected water into supply.

The operators found that although there was chlorine gas available in the supply lines, the chlorinator was seemingly not achieving normal injection to the production stream. Arrangements were made for maintenance fitters to attend and an alternative dosing system was temporarily brought into service to re-establish disinfection. With this working effectively on manual control, the works was gradually restarted at a reduced flow rate to allow stabilisation of processes. Stripping down the chlorinators revealed a chlorine residue over components and in pipes and it became clear that this was forming a restriction to the flow of gas. The residue can occasionally be drawn from the chlorine drums and is more often retained in catch pots. Once cleaned and reassembled, the gas chlorination system was reintroduced and normal operation restored to the works. Throughout the event, bench tests were carried out to verify chlorine residuals at the key process stages and samples were taken from the final water leaving the works and at points in the distribution system. There was one failure of microbiological standards, 1 coliform, in a sample of the final water from the works. There was also one failure of 1 coliform, in a sample from Mount Street service reservoir in the Banchory distribution system. Further sampling has shown water quality to have been unaffected by the incident.

### DWQR Assessment of Cause of Incident

DWQR is satisfied that Scottish Water's determination of chlorine residue forming a restriction to the proper flow of gas to the chlorinators is the root cause of this incident. It is disappointing to note that process alarms that would have automatically shut down the plant in the event chlorine dosing problems, did not come into play. Investigations and subsequent testing of the chlorinators identified a fault with a low vacuum sensor which prevented the system tripping to the standby equipment has now been rectified.

### DWQR Assessment of Actions Taken by Scottish Water

Monitoring instruments indicate this problem to have occurred around 07:30, shortly before the operator arrived at the works. It is clear from the investigations that the disinfection failure was discovered and

prompt actions taken before further alarms on the final water chlorine levels, designed to close down the plant automatically, were activated by the reducing level of chlorine in the final water from the works.

The decisions taken to put in place alternative dosing arrangements and the managed restoration of production played a significant part in limiting the impact of this event. DWQR has found the response to the event and the investigations carried out, to have been of a high standard.

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.

