

Bradan WTW  
Disinfection Failure  
19 June 2013

DWQR Inspector:  
Bill Byers

Event No. 5380

## Event Category: Significant

### Summary of Incident

The Bradan water treatment works suffered a failure of the disinfection process on 19 June 2013. Chlorine dosing at the site failed at approximately 10:30pm and was not fully restored until 1:15am the following morning.

The problem was alerted to standby staff through a low chlorine alarm from the site and on attending the works, the operator checked the control information. This led him to believe that the chlorine gas drum had reached its low pressure setting causing it to trip to standby and there was no gas available from the standby drum. He adjusted the pressure setting on the system to utilise remaining gas in the duty drum and he also initiated emergency chlorine dosing at the clear water tank. Once further assistance arrived, they started preparations to exchange the chlorine drum. In carrying out checks, it was established that an isolation valve from the standby drum was in a closed position and the drum was in fact full. A check was carried out on the chlorine dosing system and the closed valve was opened to restore the disinfection system to normal. Once this was seen to be in order, the emergency dosing to the clear water tank was stopped.

### DWQR Assessment of Cause of Incident

Scottish Water's investigation has determined that in carrying out maintenance work on the chlorine dosing system on 12 June, the valve was left in a closed position. Procedures for this work detail that the system must be tested under pressure and this step had not been carried out. Had the step been taken, the closed valve would have been identified. A further compounding element was that in carrying out the changeover of the chlorine drums after the maintenance work, the plant operators did not test them 'live' in the system. Had this been done, again, the closed valve would have been discovered. DWQR considers the root cause of the event to have been the failure to ensure the system was left in a fully functioning position following maintenance work.

### DWQR Assessment of Actions Taken by Scottish Water

The investigative and recovery actions carried out by the standby operators were appropriate to the situation. However, DWQR considers the two failures of procedures concerning this most important element of water treatment to be a serious matter. Had either the maintenance or the chlorine changeover procedures been adhered to, the event would not have occurred.

Whilst there has been no consequential failure of water quality standards in samples taken within the distribution system, DWQR has a concern that the samples taken to verify water quality may not have been fully aligned with the travel time of the affected water through the water mains and storage tanks in the system. Scottish Water must ensure that the sampling strategy in such events is carried out with this in mind.

DWQR notes that the investigations of the disinfection process have shown the actual flows through the chlorine contact tank and the Clear Water Tank to be significantly different to the expected pattern and flow rates. Their identified actions to better understand the performance of the disinfection process is welcomed.

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

