Drinking Water Quality Regulator for Scotland

Incident Assessment

Clashbuie Service Reservoir, Skerray, Highland
Microbiological Failures
Sept 2012

DWQR Inspector:
Matt Bower

Summary of Incident

On 7 September 2012, a sample taken from Clashbuie service reservoir contained 6 coliform bacteria, and a resample the following day contained 13 coliforms of the same species. Scottish Water took additional samples in the area supplied by the reservoir over the next few days, and 5 out of 9 of these also contained coliforms. Following discussions with the NHS Highland Health Board, a boil water notice was delivered to the properties supplied by the reservoir on 10 September, with a population of approximately 96 affected in total.

Scottish Water cleaned the service reservoir and increased chlorine residuals. Following a number of sets of clear samples over the following days, the boil notice was lifted on 15 September.

DWQR Assessment of Cause of Incident

Scottish Water had historically added additional chlorine at this service reservoir in order to boost concentrations during the Summer months. Following the installation of more efficient disinfection equipment at Calder Hoy WTW earlier in the year, this practice was discontinued. Chlorine concentrations had held up well through the Summer, but can clearly be seen to drop off in the few weeks prior to the first failure. It is likely that nitrifying bacteria took hold within the distribution system as chlorine residuals dropped off, with a nitrite failure elsewhere in the supply zone providing further evidence for this. Sample evidence suggests that coliform contamination was limited to Clashbuie Service Reservoir and the area it supplied, so it is possible that minor contamination entered the system and chlorine residuals were insufficient to neutralise it.

DWQR Assessment of Actions Taken by Scottish Water

Scottish Water responded to the original exceedance by collecting further samples. When these failed, the boil notice was imposed and a further, wider, set of resamples was taken, many of which also failed. At this point the service reservoir was drained and cleaned, but a series of burst mains in the area delayed completion of this. Efforts were also made to increase chlorine residuals, and secondary chlorine dosing was re-instated at Clashbuie. The disinfection approach at Calder Hoy WTW was also changed, with the ratio of disinfection chemicals adjusted. DWQR audited Calder works in December 2012, partly in response to this. Four recommendations were made, although the works was generally performing well.

This incident serves to demonstrate the importance of a comprehensive understanding of all aspects of disinfection across a water supply system. In this incident, less than optimum disinfection conditions at the treatment works are likely to have combined with local circumstances to produce a situation that, while subsequently shown not to have directly threatened public health on this occasion, certainly served to inconvenience a number of people.

DWQR has made one recommendation in response to this incident, which applies to all water supply systems in Scotland.

Actions Identified by DWQR

Action Number	Action Description	Action Status
DWQR1	Scottish Water should produce and maintain site specific disinfection strategies for each public water supply system in Scotland. These strategies should establish and record the way in which disinfection is to be achieved and maintained throughout the system and, where possible should be based on measured and verified characteristics of each system. Any required action arising from each strategy should be clearly linked to the Water Safety Plan for the supply.	Ongoing