Drinking Water Quality Regulator for Scotland

Incident Assessment

Neilston Water Supply Zone Taste and Odour Complaints 9 August 2014

DWQR Assessor:
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Event No. 6171

Event Category: Significant

Summary of Incident

On 9th August 2014 at 09:54 Scottish Water began to receive calls from consumers in the Neilston area complaining of a taste and/or odour in their drinking water supply. A networks service operator was despatched to investigate. The issue was escalated to the public health team and the team leader for the area. The status of Neilston WTW was investigated and though the plant was operating normally at 11:00, it became evident that during the previous 12 hours, the treatment process had been compromised, with DAF outlet turbidities in excess of 5 NTU passing forward onto the filters.

Algae had been noted to be present in the raw water supplying Neilston WTW from the 5th August, though up until 8th August this did not appear to be causing an adverse impact on the operation of the treatment works. No analysis for algae was conducted on the raw or treated water to assess the efficacy of treatment. On 8th August the turbidity of the raw water increased rapidly resulting in the generation of a turbidity alarm from the dissolved air flotation (DAF) treatment units at 17:23. Scottish Water responded to this by despatching the standby operator to site, who adjusted the de-sludge rate for the DAF unit and the turbidity was restored to an acceptable level.

A further alarm generated at 21:58 did not result in attendance to site. Discussions took place between the standby operator and the ICC regarding the monitoring of the treatment works status, there would appear to have been a significant degree of mis-communication over which turbidities were to be monitored. Lack of awareness of the status of the treatment works was compounded by a number of critical monitors being non-operational at the time of the incident, particularly the final water aluminium monitor. This situation was not escalated and water with a turbidity in excess of 1NTU entered supply for a period of approximately four hours. The turbidity of the raw water had decreased by 04:00 on 9th August and the treatment works returned to normal operating conditions by 08:00 without intervention from Scottish Water.

Once the problems associated with the treatment works performance in the early hours of the 9th August were linked to the taste and odour complaints, Scottish Water responded by convening an Incident Management Team (IMT); issuing bottled water on request to those affected; carrying out network flushing; taking samples to assess the extent of the problem and informing external stakeholders.

Neilston WTW was scheduled to be mained out from Milngavie WTW later in 2014. The new pipework necessary to allow this had been installed, pressure tested, sampled and was at that time running to waste whilst awaiting the installation of the final pipe spool piece. Scottish Water decided to remove the on-going

risk from the presence of algae in the raw water by bringing forward the connection of the new main and removing Neilston WTW from supply. This was completed on 10 August.

During the incident Scottish Water received 70 contacts from consumers dissatisfied with the quality of their drinking water. Of the four samples taken from consumers taps on 9th August, all exceeded the standard for aluminium and three exceeded the standard for odour. Resamples collected on 10th – 12th August showed the water quality to be satisfactory. It is assumed that the odour detected by consumers in their supply is due to elevated levels of algal cells passing through the treatment works.

DWQR Assessment of Cause of Incident

Scottish Water's investigation has identified the root cause of this incident to be highly turbid water passing from the DAF units onto the rapid gravity filters causing breakthrough of the filters. This led to water entering supply with elevated levels of turbidity and aluminium resulting in complaints from consumers receiving the supply. Scottish Water concluded that the high turbidities were the result of algal blooms passing into the WTW from Long Loch reservoir. As sampling for algae only occurred after the incident and no samples were taken from consumers taps it has not been possible for Scottish Water to evidence this assertion. On the basis of historic sample data from Neilston raw water and site diary logs which record visual observation of algae during August DWQR accepts that the elevated raw water turbidities were most likely due to algal blooms in Long Loch reservoir.

DWQR is of the opinion that Neilston WTW was presented with a challenging raw water quality with a high turbidity. However, high turbidities and the presence of algae in the raw water are documented risks in the water safety plan (WSP) for the site, which should have appropriate control measures in place. DWQR's review of the WSP has shown that the operating procedure documented against the recorded risk for algae is a procedure to deal with general pollution of the raw water, rather than a specific procedure for this problem. By failing to have an appropriate procedure and operator training in this regard, this risk has not been well managed by Scottish Water. The failure to respond appropriately to alarms received from the treatment works is in DWQR's opinion the most likely reason for this incident and if these had been responded to it is likely that this incident would have been preventable.

DWQR Assessment of Actions Taken by Scottish Water

DWQR considers Scottish Water's operational responses to have been inadequate in the events leading up to the receipt of consumer complaints on 9 August for the following specific reasons:

- The presence of algae was noted on 5 August but no sampling was undertaken in order to; verify the loading onto the treatment works; assess the type of algae present; or determine the efficacy of removal
- The presence of algae in the raw water was not escalated to the Public Health team and the procedures in the Scottish Waterborne Hazard Plan were not followed, which would have required notification at that point to the Health Boards
- Critical monitoring equipment was not operational which could have provided additional information to the ICC (two of three filtered water turbidity monitors and the final water aluminium monitor)
- When alarms were received indicating that the DAF units were not performing as normal these were not responded to appropriately and the issue was not escalated

Once consumer complaints began to be received, Scottish Water responded by despatching a network operator to the area to investigate. The issue was escalated and an Incident Management Team convened. The decision to bring forward the main out of Neilston WTW was appropriate in the circumstances and extensive flushing, enhanced chlorination and chlorine residual monitoring were correctly carried out during

the introduction of the new main into service. DWQR can find no evidence that the new main was sampled for microbiological parameters once brought into service, though a number of samples were taken from consumers taps on 10th – 12th August and were satisfactory.

The incident response fell below the standard expected by DWQR, and based upon feedback received from external stakeholders, it also fell short of the health board's expectations. Specific areas of concern are as follows:

- Scottish Water failed to notify Ayrshire and Arran Health Board of the problem, despite consumers in this Health board's area receiving poor quality water
- Based on the information Scottish Water have provided in the incident report, DWQR considers that the quality of the information given to the health boards regarding this incident in order to allow assessment of risk to public health was poor
- Sampling response was inadequate; only four samples were taken from consumers taps on 9th August, none for algal or toxin analysis, no sampling was carried out to determine *Cryptosporidium* risk

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