

Durcha SR
Elevated Chlorine
25 April 2015

DWQR Inspector:
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Event No. 6865

Event Category: Significant

Summary of Incident

On Saturday 25th April 2015 a low tank level alarm was raised from Durcha service reservoir (SR), downstream of Bonar Bridge water treatment works. The SR inlet bypass valve was opened as there was very little water in the SR, and investigations into the source of the burst causing the increase in water usage began. Over the next two days, tankered water was brought in to refill the SR and two bursts were found downstream of the SR and repaired.

On the morning of Sunday 26th, the Standby Treatment Operator noted that the secondary chlorine dosing unit at Durcha SR had dropped rapidly and by midday was almost empty. Handheld readings of chlorine were not possible as they were too high for the equipment to read and dilution equipment was obtained. The dosing unit was switched off. Tankering continued to dilute the chlorine and at this point the burst was still ongoing so most of the water from the SR was being lost through the burst. Despite the dosing unit being switched off, the treatment operative noticed that the drum level was still dropping, so physically disconnected the pipework from the delivery head to prevent further loss. The chlorine flow alarm did not activate.

Tankering continued and hydrants were opened downstream to draw through fresh water. Samples were taken and flushing continued until residual chlorine levels returned to acceptable limits and secondary chlorine dosing was eventually resumed on Tuesday 28th April.

The highest chlorine sample recorded during the event in distribution was 15.6mg/l – DWQR expect this to be below 1mg/l at customer's taps.

Two water quality contacts were received during the event: one for milky/cloudy water (probably as a result of the bursts) and one for a chemical taste/smell.

DWQR Assessment of Cause of Incident

The cause of the incident was the syphoning action from the chlorine dosing drum which was activated when the PRV, located between the chlorine dosing system and the SR inlet, was bypassed and increased the pressure within the main. Scottish Water's investigation into the failure discovered that the chlorine dosing valve did not completely fail, but rather it either partially failed or rather the valve was incorrectly set, as although set to the manufacturer's instructions for normal operating conditions, these may not have included the worst case bypass condition.

The conditions that caused the syphoning of the drum also caused the chlorine monitor to be starved of flow, so it was not picked up by the alarm.



DWQR Assessment of Actions Taken by Scottish Water

DWQR are satisfied that Scottish Water acted appropriately to resolve the incident and minimise risk to consumers. However DWQR finds it unacceptable that the outcome of the event took eight months to be reported to DWQR.

Several issues were noted and are pertinent:

1. The actions of the Treatment Operator to identify the issue and physically remove the chlorine drum reduced the timescale of the event.
2. The samples taken during the tankering operation do not reflect the chlorine levels expected from a chloraminated supply. Although this did not affect the event, this highlights deficiencies in training for tanker drivers which should be addressed.
3. The Treatment Operator took samples by dilution during the event to monitor the chlorine levels, but no regulatory samplers were available to take extra property samples because the event occurred on Sunday. As a result of a previous incident (6344) this lack of resource has since been addressed.
4. Further investigations by Scottish Water revealed one previous incident of potential syphoning on 23rd September 2014 which led to a relatively high chlorine residual of 1.81mg/l at Durcha SR. The indication that this has occurred on more than one occasion highlights the possibility that a similar situation could arise at similarly configured assets.

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

