Drinking Water Quality Regulator for Scotland

Incident Assessment

Aviemore WTW
Consumer taste concerns on new supply
February – May 2012

DWQR Inspector:
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Summary of Incident

Scottish Water constructed a new water supply to serve the Badenoch and Strathspey area in the central Highlands. This supply, situated near Aviemore, replaced an old, basic water supply from Black Park WTW that took water from Loch Einich, high in the Cairngorms. The old supply did not meet a number of regulatory quality standards and was increasingly unable to satisfy demand due to growth in the area.

The new supply abstracts water from Boreholes near Aviemore and treats it on site by filtering the water through membranes. The new treatment works was put into supply on 8 February 2012, and has operated without incident since then and has comfortably met all regulatory quality standards. Chlorine residuals leaving the treatment works were initially quite similar to the old Black Park source, but the higher quality water meant that chlorine concentrations did not decrease as the water travelled through the distribution system, as had been the case with the old supply.

Consumers soon noticed the change in water quality, both in terms of an increase in chlorine reaching their homes and changes in other quality parameters, such as hardness (even though this was still comparatively soft water), caused by the different source. Scottish Water began to receive complaints from consumers about the following issues or perceived issues:

- Unpleasant taste (especially chlorine)
- Changes in appearance of tea
- “Popping” noises coming from boiling kettles
- Skin irritation

Scottish Water received 131 complaints from consumers between February and June, 82 of which were chlorine-related taste complaints. A local action group was set up which established a petition against the changes and this attracted 86 signatures. The issue also attracted local and national press coverage.

DWQR Assessment of Cause of Incident

The incident was caused by consumers’ reactions to a change in the source of their water supply from an upland surface water to a groundwater with very different aesthetic properties. Also the superior quality of the new supply meant that chlorine added at the treatment works persisted through the distribution system for a much greater time than it had in the old supply. Even though Scottish Water progressively reduced the amount of chlorine in the water over the Spring, it is likely that the majority of consumers in the area were still experiencing higher chlorine residuals than those to which they had been accustomed on the old supply. Confidence in the supply was eroded and people became concerned that the supply was unsafe or was making them ill. Once this happened, any reassurances from Scottish Water and NHS Highland had only minimal effect.

It is likely that the change in taste caused by the different supply and the higher chlorine residuals at consumers' taps was quite noticeable to consumers, as in the first few weeks of the supply's operation some consumers were receiving 0.9mg/l free chlorine even at the end of the distribution system. Once consumers were alert to the change, it is likely they began to notice other differences such as hardness and other characteristics that were attributed to the new supply. There is some evidence that consumer perception was also a significant factor, with some consumers apparently attaching a degree of affection for the old supply which they perceived to be an unspoilt source high in the mountains, and perceiving the new supply to be somewhat less pristine.

DWQR's conclusion is that at no time was the new Aviemore supply unfit for human consumption or non-compliant with the standards set out in the water quality regulations. In fact, the new supply has brought an improvement in quality and a significant reduction in the risk of non-compliance. Notwithstanding this, it is important that consumers trust their water supply and consider its quality to be aesthetically acceptable.

DWQR Assessment of Actions Taken by Scottish Water

Prior to the new works coming on line, Scottish Water took great care to consult with local groups, both on a statutory and community level. Communications with the local population commenced in earnest in August 2007 and continued from then on. However, there appears to have been little information given as to the exact date of the switchover, with the last press notice only being issued once the new works was in supply. Consequently, the sudden change in water quality may have come as something of a surprise to a large number of people. It is not clear whether this lack of immediate warning to consumers served to increase the number of complaints or actually prevented the total number being larger due to people anticipating the change.

Much of the communication following the introduction of the new supply was reactive, in response to press enquiries and the growing body of consumer concern. It is clear that Scottish Water made a concerted effort to take complaints seriously and investigate, as well as to continue to engage with the community. A public information meeting was held in early May.

Most consumer concerns were investigated thoroughly by Scottish Water, and where appropriate, advice from NHS Highland was sought. It is possible that in some cases the desire to help the local population come to terms with the change may have caused the company to extend investigations and assistance when it was already very clear that there was not a health or quality issue with the water. Although Scottish Water must investigate consumer contacts thoroughly, factors such as repeated sampling at properties may in some cases have only served to heighten concerns, when a slightly more authoritative, reassuring stance could perhaps have dampened fears.

The majority of contacts received by Scottish Water concern chlorinous tastes and odours. It is evident that in the early days of the new supply, chlorine concentrations at consumer taps were higher than those usually encountered in most water supplies in the UK, and considerably higher than had been typical for the area in the past. Although Scottish Water were actively monitoring residuals throughout the system and making some changes such as small adjustments to the chlorine set point at the works and turning off secondary chlorination at storage points, it was not until very early March that the data shows chlorine leaving the works to have fallen sharply from in excess of 1mg/l to around 0.5mg/l. This three week period of very high residuals, together with the fact that the greatly improved water quality probably meant residuals at consumers taps are still slightly higher than they had been, may have sensitised consumers to the changed supply so that complaints continued after concentrations had been reduced.

Scottish Water tried hard to improve the perception that consumers had of their water supply and considered a number of measures. One of these was to cease phosphate dosing, which enabled less lime to be added to the water with a corresponding reduction in pH, in case this had an impact on complaints. This was trialled from late March until in late May, when, following three exceedences of the lead standard in the supply zone

and no perceptible difference to the quality of water received by consumers, phosphate dosing was reinstated. It is presumed that this change was driven by a desire to modify the taste and hardness of the water to something more similar to the old Loch Einich source. DWQR is of the opinion that this trial by Scottish Water served little purpose, given that calculations of corrosivity indices undertaken during commissioning did not show the water to have significant scaling properties. It is unclear how Scottish Water would have achieved compliance with the lead standard in the zone in the longer term, had the decision been taken to discontinue phosphate dosing permanently.

DWQR visited the treatment works on 9 May to review the treatment process, taste the water produced and check chlorine residuals at several storage points. DWQR's assessment of this incident is that Aviemore now has a first class treatment works that should deliver high quality water on a sustainable basis to the area for many years. It is understandable that consumers noticed a change in the quality of the water when the supplies changed, and especially an increase in the chlorine concentrations in the first month of operation. Managing very necessary operational changes such as this is always difficult, and Scottish Water has undoubtedly worked hard to involve stakeholders and consumers in the change and keep them informed. Following the change, once it became apparent that there was some consumer concern about the quality of the water, Scottish Water continued to engage with consumers and investigate individual issues.

It is possible that Scottish Water could have been quicker to predict and respond to the much lower chlorine demand of the new water, and that such a response may have served to reduce the extent to which the negative perceptions of quality took hold in the community. It is not unreasonable to expect Scottish Water to make every effort to predict the chlorine demand of a new water supply and set initial doses accordingly although it is accepted that there will be an element of trial and error and a precautionary approach to protecting public health must always be taken. Chlorine concentrations in the area are now typical for a supply of this type, but as with all supplies, DWQR expects Scottish Water to continually review levels to ensure they remain appropriate.

Scottish Water has identified the need to review and learn from its experience in Aviemore and this is to be welcomed, as changes to water supplies for operational reasons will always be necessary and it is important that these are managed as effectively as possible.

Actions Identified by Scottish Water

Action Number	Action Description	Action Status
1	Review and communicate commissioning protocols for assessing potential customer impact of changing to a different raw water source; e.g. loch to bore hole, including chlorine optimisation	Complete
2	Amend Scottish Water Communication Plan to include full evaluation of appropriate communication when changing to a different raw water source	Complete
3	Review and update Drinking Water Safety Plan in light of the incident root causes and conclusions	Complete
4	Copy of the incident report to be circulated to all Water Operations Managers for information	Complete