PRIVATE WATER SUPPLIES – CASE STUDY 2014/11

Illegal connection

On 13 November 2014, a water company meter reader visited a farm near Pickering in North Yorkshire to take a meter reading, and discovered the meter was running backwards. The meter reader also identified that there was a private borehole on site being used for domestic purposes, and arranged for a Water Regulations Inspector to attend site.

The company promptly investigated in order to establish whether the meter was running backwards due to a fault or whether there was an illegal cross connection between the mains water supply and the private borehole. Chlorine readings indicated that there may have been a cross connection with the private, untreated borehole supply. The Water Regulations Inspector identified an illegal cross connection and removed it. Figure 20 shows the pipework following removal of the cross connection.

Although the farm had a private supply, it was classified as a single domestic dwelling and had not been risk assessed as the owner of the supply had not requested it. In January 2014 the owner had returned a completed form to the local authority indicating that there was no treatment on site other than an ion exchange unit for softening. The owner informed the company that he had recently experienced a power dip on his borehole which had led to low pressure at the tap. In order to increase the water pressure he had opened up the stop tap allowing the cross connection between private and public supplies. The site had not had a water fittings inspection, but the company were aware of the dual supply and had included the site on a list for a future inspection. The meter is scheduled to be read quarterly, but in reality it had last been read in June 2014, and potentially this cross connection could have been open since then, although the owner informed the company it had only been open for a week.

It was noted that following removal of the cross connection, the valves were leaking even when shut off, so even with the pipe in place and valves shut the mains supply would have remained unprotected as there was still a risk of untreated water entering the mains distribution system through this connection.

Figure 20: Pipework after illegal cross connection had been removed

Prior to the cross connection being removed, the private borehole was found to be delivering a pressure of 4.5 bar and the water from the private supply could potentially have reached the pumping station supplying the mains water in addition to the properties supplied from the pumping station. In reality, due to pressure being maintained by the pumping station, it was thought that the farm and a neighbouring farm were the only ones affected. Historic water quality data for the borehole was generally good, and a microbiological sample taken as part of the investigation was satisfactory. However, phosphate results at a neighbouring farm were lower than would have been expected for an exclusively mains fed supply and bottled water was supplied as a precaution until flushing had been undertaken and satisfactory sample results reported.

The water company are to be commended on taking prompt action when they discovered a potential issue which led to a quick resolution. However, this cross connection was only discovered by accident following an unusual meter reading.

Elsewhere in the country, backsiphonage from a private water supply was also uncovered during a routine visit in August by a meter reader in North Devon for the local water company. The supply comprised of a farm, a commercial cheese dairy and a house. The site has a public supply connection and two boreholes – one of which is 25 years old, the other is more recent.

The farm manager described the supply arrangements; the mains supply feeds the house and the dairy. The borehole water is not hydraulically linked to either of these premises. The untreated borehole water feeds into a large black plastic tank to supply the farm (Figure 21) – this has a connection to the mains supply for a top up if required. These arrangements mean that borehole water is only used for domestic purposes at the farm, therefore the supply constitutes a single domestic dwelling and as such the owner had not requested a risk assessment or monitoring.

Figure 21: Tanks in which mains water and borehole water were blended and stored

A water fittings inspection revealed that the mains connection into the storage tanks for the farm had no air gap as required and therefore the borehole water could backflow into the public water supply through the meter as observed by the meter reader. The water from the boreholes has very similar water quality to the water in the public supply. Initial sampling surveys were therefore inconclusive as to whether borehole water was circulating in the wider public distribution network. Microbiological results showed that the water supply at the farm itself and one downstream property contained coliforms, and the downstream property also contained Enterococci. Further samples over the following two days were microbiologically satisfactory.

The company served a water fittings Notice requiring several improvements, including the creation of an air gap between the private and public supplies where they mix in the tanks. They also replaced the meter with one with an inbuilt non-return valve. In this case the water company were not aware of the private water supply on site and therefore the potential for cross-connection or backsiphonage.

These cases highlight the need for a proactive approach to be taken to risk assessing supplies where there may be public and private supplies connected together and the collaboration needed between local authorities and water companies.

It is also a reminder to local authorities that the Water Fittings Regulations are enforceable where cross connections with mains supplies exist.