

Monitoring the quality of private water supplies

Purpose

The European Directive (98/83EC) relating to the quality of water intended for human consumption (the Drinking Water Directive) came into force in 2000. It applies to all water supplied for food preparation, public and commercial activity and domestic purposes, irrespective of the source of that supply. In the UK, for historical reasons, the legislation differs for public supplies (i.e. from a statutory water company) and private supplies (where not supplied directly by a statutory or licensed water undertaker). Amending the private water supply regulations has lagged behind those for public supplies and the responsibility for monitoring water quality differs. This Policy Position Statement outlines the legislative background to monitoring private water supplies and how this is working in practice.

CIWEM's position

1. Whilst water from some private supplies is wholesome, this is less certain than with public supplies. Visitors should be aware of which premises are not supplied by a statutory water company. At present this is not easily recognized, except for public premises in Scotland where notices should be displayed. Regulating authorities should diligently find and monitor private supplies used by the public and provide guidance to all owners, users and visitors who are concerned about water quality.
2. The self-assessment form and technical manual prepared by the Scottish Government, in collaboration with other UK jurisdictions, should be updated once the private water supply regulation have been revised in England and Wales and N.Ireland.
3. The cost of treatment, especially to single dwellings and small supplies, is probably the greatest hindrance to bringing the water quality of private supplies up to the level of compliance seen in public supplies. Many owners and their families have not experienced illnesses linked to the water supply and can see no reason to assess the risk of contamination or to pay for water quality testing and subsequently installing treatment equipment. Owners should be better informed of the risks and made aware of grants available to install treatment. However, experience in Scotland, where non-means tested grants are available, indicates a surprisingly low rate of uptake of grants.
4. Advice to owners of private supplies to help them obtain and operate equipment for treating or testing water at a reasonable cost should be more readily available from non-commercial bodies such as the local authority.
5. There is currently no regulatory instrument in the UK to provide specific guidance on the proper installation, operation and maintenance of UV disinfection systems for private water supplies. This should be rectified in light of the recent amendment to the Water

Supply (Water Quality) Regulations which recognizes UV disinfection as a relatively inexpensive and effective means of inactivating *Cryptosporidium* that is suited to small systems.

6. Source protection is much more important for private supplies than public supplies because treatment is often inadequate or absent and the monitoring frequency is very unlikely to detect deterioration before it is too late to prevent ill health. A proper assessment of the risk of contamination is essential, followed up with action to mitigate any unacceptable risks. This should either be done by a trained person or the owner, with clear guidance from the regulatory authority. The risk assessment should include the intrinsic nature of the source, the likelihood of pollution and the suitability of all materials in contact with water between the source and the point of use.

CIWEM is the leading independent Chartered professional body for water and environmental professionals, promoting excellence within the sector.

Context

General

In the UK, for historical reasons, the legislation differs for public supplies (i.e. from a statutory water company) and private supplies (where not supplied directly by a statutory or licensed water undertaker). As a consequence, two sets of Regulations, one covering the public supplies and one covering private supplies, were written to transpose the European Drinking Water Directive (DWD) into UK law. Slightly differing Regulations were written for the three jurisdictions of England and Wales, Scotland and N. Ireland. Mineral waters and bottled waters are excluded from the DWD as they are covered by other Directives and Regulations.

A private water supply may be less than 1 m³/d or serving a single household. At the other end of the scale it can serve many dwellings or commercial premises and provide wholesome water to 1000 people or more. The raw water may be obtained from a variety of sources, including boreholes, wells, springs, rivers or lakes. In many cases treatment is minimal or non-existent. The monitoring requirements in the DWD vary according to the size of the supply.

In N. Ireland it is estimated that less than 1% of water comes from private supplies. The Inspectorate carries out an annual survey to identify the private water supplies falling within the Private Water Supplies Regulations. To date (October 2009), 12683 supplies have been identified, of which 1162 are dairy farms.

In Scotland around 1.5% of the population relies on private supplies for their drinking water. Grants of up to £800 to improve the supply are available from the local authority. The Grant Scheme is not means tested and owners may be eligible for financial assistance if:

- their home or business is in Scotland and served by a private water supply;
- the private water supply is the main or sole source of water for human consumption purposes to these premises; and
- the private water supply is in need of improvement to bring it up to modern standards.

The detailed eligibility criteria are set out in the Private Water Supplies (Grants)(Scotland) Regulations 2006.

In England and Wales about 1% of the population have private water supplies to their homes. Most private supplies are situated in the more remote, rural parts of the country.

Legislation

The Drinking Water Directive (DWD) was revised in 1998 as European Directive 98/83/EC, necessitating changes to the UK regulations to implement the requirements of the Directive by the end of 2000 and to comply with most of the standards in the Directive by the end of 2003. Whilst the public water supply regulations have been amended throughout the UK, in 2009 England and Wales were still operating under the Private Water Supplies Regulations 1991. A revised edition has been out for consultation (all local authorities) and is due to be published in 2009. In Northern Ireland consultation has been completed. Meanwhile, the Private Water Supplies Regulations (Northern Ireland) 1994 remain in force until the new regulations are in place in 2010. Scotland have complied with the new Directive and issued the Private Water Supplies (Scotland) Regulations 2006.

In Scotland, England and Wales the responsibility for monitoring private supplies, keeping records, investigating risks to health and reporting annually to the Secretary of State lies with the local authority. In Northern Ireland a unit within the Northern Ireland Environment Agency (NIEA), the Drinking Water Inspectorate for Northern Ireland, regulate supplies that serve more than one property or are used for commercial food production. The Drinking Water Inspectorate (DWI) in England and Wales and the Drinking Water Quality Regulator (DWQR) in Scotland have an advisory role in relation to private water supplies This includes the provision of technical advice and support to Local Authorities, on all aspects of drinking water quality. All three regulators have signed a Technical Manual (Scottish Exec. 2006) which is a reference document for Environmental Health staff.

Key Issues

Public Health

Many UK homes (over 1%) rely on a private supply. A very high proportion of UK residents and visitors may be exposed to water from private supplies when on holiday or engaged in everyday activities such as going to a restaurant in the countryside or buying food from a local market. Individuals who have compromised immune systems and infants are vulnerable to changes from their normal water quality. Without proper regulation of private supplies, much of the population could be exposed to the risk inherent in consuming unwholesome water at some time each year.

The mains water in the UK is of excellent quality as a result, in part, of investment in the treatment and infrastructure of water companies driven by strong regulation inaugurated at the privatisation of the water industry in England and Wales. The preparation of the Private Supplies Regulations and their enforcement has lagged behind that of the public water supplies. In consequence, the statistics published by the UK regulators each year, to characterize the public water supplies, present an unduly optimistic picture of water quality in

UK if quoted out of context. The report by DWQR for 2008 has summary information on private supplies that demonstrates the unsatisfactory quality at many premises in Scotland.

Source protection

The vulnerability of the source to pollution will not be apparent to owners unless they have been trained in such matters. Risk assessment by an independent, trained surveyor is clearly preferable, but expensive for a single householder where the cost is not borne by the local authority. The owner of a source may be more concerned about the potential cost of improving his supply than the risk of illness. Where self-assessment is an option, the owner must be given adequate guidance and advice. It would be prudent for the authorities to audit a proportion of the returns.

Materials of construction

The materials acceptable for use in public water supplies and within buildings are governed by regulations and advisory schemes. These do not extend to the collection and conveyance of raw water from a private supply or to premises not connected to a public water supply. There is potential of contamination through corrosion or leaching from inappropriate materials which is best evaluated whilst undertaking a risk assessment of the supply. Any assessment of the suitability of must take into account the source water quality such as the pH.

Maintaining treatment processes

Where equipment has been installed it is important to know that it is operating effectively. Dosing systems that have run out of disinfectant or a UV unit with fouled surfaces or aged lamps will not provide the protection expected. Granular activated carbon (GAC) contactors and filters will not work efficiently when run beyond their design life, and worse, may increase the microbiological contamination.

Owners should be made aware of the maintenance requirements when installing treatment equipment and this must be passed on to a new owner when the property changes hands.

Discussion

The water from private supplies, as with water supplied by pipe from a statutory undertaker must be wholesome, in that:

- ◆ it must conform to the standard set out in the European Directive on water for human consumption and where more stringent, the national criteria;
- ◆ it must be treated in a manner appropriate to the water source; and
- ◆ processes and materials used in its treatment and conveyance must be suitable.

Private water supplies to a single dwelling that is not open to the public are exempt from some requirements of the 1991 regulations and the draft 2008 regulations in England and Wales. In Scotland, Type B supplies, which are <10m³/day, serve <50 people or are not supplied as part

of public commercial activity are exempt from some of the requirements of the 2006 Regulations. Whilst it is accepted that the risks to health are low, it should be clear to people visiting dwellings with a private supply that the drinking water may not have been tested to the rigorous standards they expect of public water supplies. In Scotland premises used by the public are required to display a notice informing visitors about the water supply.

Water quality testing of private supplies is less frequent, but in accordance with the Directive, and they are not as comprehensively monitored as public supplies. This is justified as a risk-based approach to keep the cost of monitoring within reasonable bounds and to ensure that the risk is adequately managed. Local authorities in England and Wales are charged with carrying out a risk assessment of every private supply every five years. Experience in Scotland indicates that each risk assessment takes approximately one day. This is not required for supplies to a single dwelling unless the owner or occupier requests one. The costs can be recovered from the person requesting the assessment or sampling in accordance with the fees set out in the Regulations. The Scottish Government, in collaboration with other UK jurisdictions, has produced a self-assessment form and technical manual to help owners of small supplies complete the form themselves. This Manual is intended to be used throughout the UK.

Traditionally owners of remote properties have relied on a 'pure' water source, typically a spring or shallow well, without any treatment. Where this was not possible, some form of simple filtration has rendered the water clear with an acceptable taste. Despite appearances, clarity, odour and taste are insufficient to judge the wholesomeness of the supply. Simple chlorine dosing or a silver impregnated ceramic filter are commonly used to disinfect water, but chlorine-resistant *Cryptosporidium* has increasingly been found in public supplies where chlorine is the only disinfectant. Alternatives, such as UV irradiation, are needed as cheap, low maintenance packages for the general public if the risks of infection are to be reduced.

Whilst an untreated supply may be satisfactory for much of the time, it can become polluted in exceptional circumstances. The most common cause of pollution is probably high rainfall events which either flood an underground source with surface water or introduce contaminants through run-off from surrounding fields. Owners may not be aware of this and so it may be missing from the risk assessment.

Obtaining any type of equipment for treating or testing water is not easy, and rarely cheap, for a small home owner with no knowledge of the subject. CIWEM see this as an impediment to widespread installation of treatment in privately owned supplies.

CIWEM is pleased to see that in England and Wales and in N Ireland the confusing division of private supplies into eleven classes for the purposes of monitoring has been dropped from the 2009 revisions in favour of a simpler system based on the estimated flow.

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Note: CIWEM Policy Position Statements (PPS) represents the Institution's views on issues at a particular point in time. It is accepted that situations change as research provides new evidence. It should be understood, therefore, that CIWEM PPS's are under constant review, that previously held views may alter and lead to revised PPS's. PPSs are produced as a consensus report and do not represent the view of individual members of CIWEM.

References / Further Reading

Websites: DWI, DWQR, NIEA for guidance and links to the current regulations.

Scottish Executive (2006) Private Water Supplies: Technical Manual, ISBN: 0-7559-5151-4 Published by the Scottish Executive.

Camm, R., Ferrere, P., Hall, T., and G. Stanfield. (2008). UV Inactivation of Cryptosporidium. UK Water Industry Research (UKWIR) Report 08/DW/06/20. UKWIR, Queen's Gate, London.