



guardians of drinking water quality

DRINKING WATER INSPECTORATE

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To:

Richard Benyon MP,
Parliamentary Under-Secretary for Natural Environment and Fisheries

The annual report on drinking water quality in England and Wales will be published on 7 July 2011. *Drinking water 2010* provides a comprehensive independent commentary on the quality and safety of drinking water during 2010 and comes in nine parts: seven covering public water supplies and, new for this year, two additional parts covering private water supplies. I will be discussing the content of the report with the Consumer Council for Water at a series of regional meetings in July.

The role of drinking water inspectors is to independently check the quality of drinking water. Drinking water must be wholesome and fit for human consumption at all times. In relation to public water supplies inspectors take action to require improvements when there is sound evidence of a risk of a particular water supply failing to meet the drinking water standards. Improvement of private water supplies is the responsibility of local authorities and drinking water inspectors have a supervisory role. *Drinking water 2010* publicly records the work of inspectors together with measures indicating how well the water industry and local authorities are meeting the desired outcomes of drinking water policy which are:

- Water suppliers deliver water that is safe and clean
- Consumers have confidence in their drinking water
- People are not exposed to unsafe private water supplies

The publication of *Drinking water 2010* marks an important milestone in the history of drinking water regulation, namely the 20-year

anniversary of implementation by government of the EU Drinking Water Directive. In relation to public water supplies, which serve more than 99% of the population in England and Wales, it records how the regulatory regime has been applied successfully and improved upon since 1990. In particular, the regulatory framework now goes beyond rectifying deficiencies in drinking water quality converting two decades of essential investment into sustainable improved drinking water supplies through operator risk assessment. In relation to private water supplies, *Drinking water 2010* records for the first time how after two decades serious problems persist in relation to the quality and safety of these small supplies which are relied upon by over one million people across England and Wales. At the end of 2009, the previous 1991 regulations were amended to introduce transparency and risk assessment as a tool to enable local authorities to identify unsafe private supplies and improve them over a five year period (2010 – 2015).

Public Water Supplies

The purpose of drinking water regulation is to secure safe, clean drinking water for all and this outcome is measured objectively by the Inspectorate, using verified scientific data (Figure 1) alongside data to confirm the benefit in the form of consumer reports about tap water quality (Figure 2). These two outputs measured at the tap verify the benefits of all historical investment and operational management actions taken by water suppliers since 1990.

Figure 1 illustrates the improvement in drinking water quality in England and Wales over two decades in terms of declining numbers of failures of drinking water standards at consumers' taps. In 2010, 99.96% of all tests met the standards, up from the figure of 99.95% reported in 2009. The comparable figure for England was 99.97%. In 1317 out of the total of 1591 zones in England, all the tests passed every standard. In zones where failures were recorded, the remedial action taken or planned is described in the report. The figures for Scotland and Northern Ireland are reported separately by the drinking water regulators for those jurisdictions. Together, the figures for all four countries indicate compliance by the UK with the requirements of the EU Drinking Water Directive.

Figure 1: The percentage of tests failing the standards from 1991 to 2010

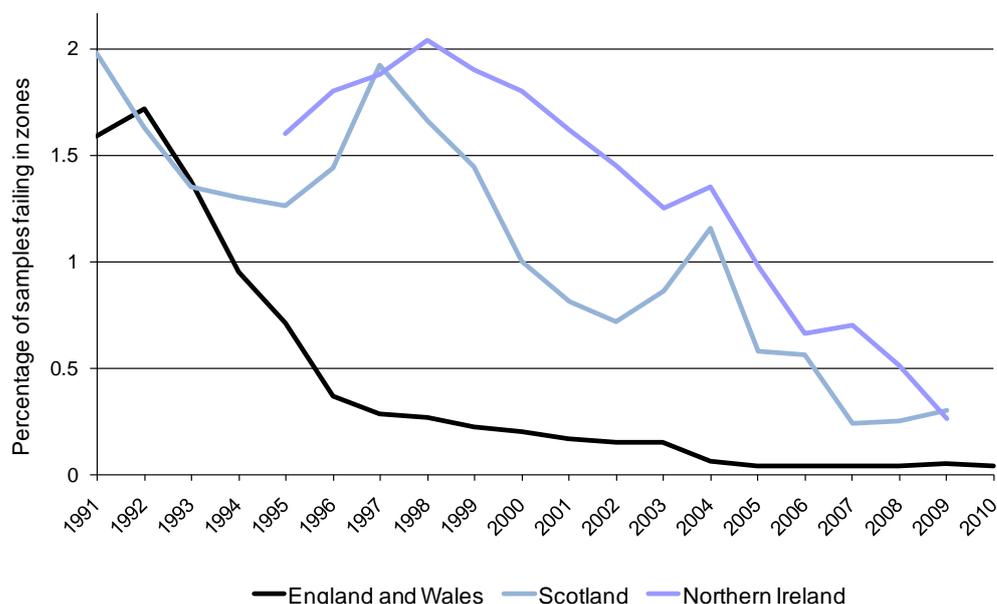
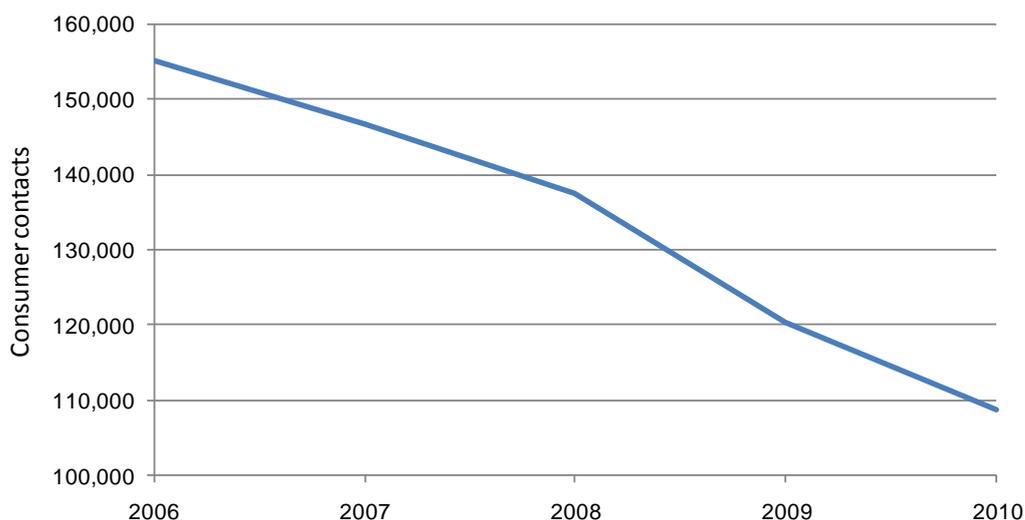


Figure 2 shows the improvement in drinking water quality as reported directly by consumers. Over the five-year period since 2006 the number of consumers contacting their water supplier to report a problem with the quality of drinking water in their home or workplace has fallen by one-third. *Drinking water 2010* contains maps illustrating where these improvements have taken place and also where further remedial work is planned or may be needed in the future.

Figure 2: Consumer reports of water quality problems 2006 to 2010



Footnote: consumer contacts about appearance, taste, odour or illness

The principal regulatory enforcement tool that has enabled this improvement in drinking water quality has been the putting in place of legally binding programmes of work to address clearly identified and specific deficiencies. Over 20 years these 'undertakings', given under Section 19 of the Water Industry Act 1991, have enabled water companies to design and deliver technically appropriate asset improvement schemes. An 'undertaking' comprises a schedule of sequential remedial steps; typically these will be an investigation, followed by changes to the operation of a treatment works/supply system or the installation of new treatment equipment at a works or the renovation/replacement/cleaning of water mains. The schedules set delivery dates for each milestone step with reporting requirements for progress monitoring and demonstration of benefit, for example, that the outcome required has been achieved.

In 2004, the World Health Organisation (WHO) published the water safety plan approach as the most effective means of securing a sufficient supply of safe, clean drinking water for all. In 2005, the Inspectorate adopted the water safety plan approach as its strategic policy for developing the regulatory regime for drinking water first introduced by Parliament in England and Wales in 1990. In 2007, the drinking water regulations in England and Wales were amended to formally embed this risk-based approach into the legal framework.

These amendments included provision for a new enforcement tool (Risk assessment and Notices) and this is now enabling water suppliers to convert two decades of investment into sustainable improved supplies of safe, clean drinking water. Notices set out the steps that are necessary to mitigate unacceptable residual risks. A Notice typically specifies the following types of actions: additional improvements or maintenance, regular reviews and audits of operational controls, conditions under which use of a supply is prohibited, management and other information requirements and reporting.

The principal difference between these two enforcement tools is that 'undertakings' are generally failure driven, whereas Notices are risk-based and preventative. Undertakings are used where a failure has already occurred and is considered likely to recur, identified usually through the audit activities of inspectors, or as part of a water company's business planning processes. Notices, by contrast, arise out of the process of continuous risk assessment carried out by water companies where the Inspectorate acknowledges the manner by which identified risks are being mitigated and controlled. If necessary for the protection of public health, certain controls or remedial actions can be

audited, imposed or made mandatory by the Inspectorate. Both enforcement tools serve as an incentive to improve drinking water supplies and to protect consumers. However, an important benefit of the new regulatory regime is the embedding of risk management within the industry in a way that can be measured objectively by the Inspectorate through recording of acknowledged actions to mitigate risk.

Across the industry, there are currently 469 mandatory schemes documented in *Annex 4* of the regional reports. This shows where enforcement has been used to improve those few drinking water supplies that continue to fail to meet drinking water standards (undertakings) or to mitigate previously unrecognised risks which pose a potential danger to public health (Notices). In addition there are 516 other preventative actions identified by the water companies through risk assessment and acknowledged by the Inspectorate. Table 3 reflects the progress of the industry in delivering these acknowledged preventative actions. Together all these data quantify the extent to which a proactive preventative approach to the management of drinking water quality is now embedded in water companies as a result of the switch to mandatory risk management. For example more than half (52%) of the 985 improvement actions are being delivered voluntarily without the need for enforcement action by the Inspectorate.

Table 3: Acknowledged actions to sustain safe, clean drinking water

Country	Additional acknowledged actions to mitigate risk (as at Dec 2008)	Acknowledged actions completed (as at Dec 2010)
England	205	97
Wales	311	35
Total	516	132

An important element of the risk assessment process is the characterisation of hazards within catchments, determining where these pose a risk to the quality of a specific drinking water supply, without actions in the catchment to protect or improve raw water quality. The direct benefits of catchment management are the potential for removing the need for costly water treatment or for reducing operational expenditure in relation to treatment already in place. These schemes also provide wider benefits where they result in improvements to the natural environment. A typical example is a scheme or action plan where the water company commits to carrying out an investigation to pinpoint the source of specific contaminants

(such as nitrate, one or more pesticides, or colour, as a precursor of disinfection by-products) by setting up a working partnership with local stakeholders such as the Environment Agency, farmers, land managers or agronomists, for example, to alter the way in which a product is being applied to land. The company will carry out targeted raw water monitoring and contribute other resources to set up and facilitate the work of the partnership. Table 4 summarises the current catchment management work to mitigate risk at treatment works.

Table 4: Catchment management activities

Company	Treatment works where regulated catchment management is in place	Risk being mitigated
England	119	Nitrate Colour Pathogens Pesticides Trihalomethanes

Private Water Supplies

Private supplies are water supplies which are not provided by water companies but instead they are the responsibility of owners and users. In England and Wales they supply water to a resident population of just over one million people, but many more are exposed to them when they are travelling throughout the UK or taking a holiday. The quality and safety of these supplies is controlled by the Private Water Supply Regulations which implement the European Drinking Water Directive. The standards and principles of regulation are the same for both public and private supplies: self-regulation by the owner/operator and independent scrutiny by the regulator.

Across Europe it has been recognised recently that member state arrangements put in place originally to comply with the Drinking Water Directive are deficient in relation to small community or private supplies. Evidence has been published to show the generally poor quality of these supplies and how they are more often linked to illness than larger public water supplies. Based on these and other findings published in a recent UNECE/WHO report¹, the EU Commission has acted using Lisbon Treaty powers to remove the exemption from small supply reporting and also to require more effective enforcement. In England and Wales, this change is reflected in updated Private Water

¹ UNECE/WHO *Small Scale water supplies in the pan-European region*. WHO Regional Office for Europe 2010 at http://www.unece.org/env/water/publications/documents/Small_scale_supplies_e.pdf

Supply Regulations which now contain a requirement for risk assessment together with more effective powers to identify, report on and remedy failing supplies. The environmental health staff of local authorities have an important role in relation to private supplies by identifying where they are and how they are used, and for arranging for risk assessments (including monitoring) to ensure owners/users are better informed and therefore better able to manage these supplies safely. It is now mandatory for local authorities to restrict the use of any unsafe supply until it has been improved.

Local authorities have always been under a duty to keep local records of private supplies in their area but they are now required to report key information in these records to the Inspectorate. *Drinking water 2010* is therefore the first official report about private water supplies in England and Wales. Similar reports for Scotland and Northern Ireland have been available for several years. Local authorities in England and Wales were given five years (until 2015) to fully implement the new regulations. It is expected that the completeness and accuracy of the information available for publication will improve year-on-year. The purpose of this first report is to describe what is currently known about the types and numbers of the private water supplies and to summarise the initial work of local authorities in relation to carrying out risk assessments, requiring improvements to safeguard public health and checking compliance with drinking water standards. The information in *Drinking water 2010* is set out in four sections in the form of regional maps and tables with commentary and case examples. Annexes to the report show which local authorities have provided some or all of the required information, or where information is not required (because there are no private supplies in the local authority's area). There were 23 local authorities (7%) in England who were unable to provide a first year return to the Inspectorate.

Drinking water 2010 shows how private supplies vary greatly in their nature ranging from springs and boreholes serving individual properties, to larger groundwater or surface water supplies serving hotels, businesses, holiday accommodation, leisure facilities, and small communities. However, not all private supplies are in rural areas, some can be found in larger towns and cities serving factories, business parks, educational centres, visitor attractions and healthcare premises. Local authorities have provided information about 53,945 private water supplies in England and Wales and well over half (62%) of these provide a supply of water for domestic purposes to a single

dwelling making them exempt from monitoring under the regulations. Taking into account the additional supplies which are subject only to risk assessment informed by limited testing, the proportion of supplies which are exempt under the regulations from the full monitoring

requirements of the EU Drinking Water Directive rises to 87%. This is an important point because the view has been expressed by some stakeholders that the new regulations are disproportionate in their effect. The tables in *Drinking water 2010* record the facts: 16% of all private water supplies are of a type and size that require full check and audit monitoring under the EU Drinking Water Directive and close to one-third (31%) require risk assessment with some limited testing. In relation to the remainder, the majority, testing and risk assessment is at the request of the owner.

Proportionality depends also on whether regulation is required in the public interest. Looking at the results of testing carried out by local authorities during 2010 it can be seen that 5% of samples collected from the set of 166 larger supplies thus far identified in England contained either *E.coli* or Enterococci. The finding of these organisms indicates that the water supply poses a potential danger to human health by virtue of it being contaminated with faecal matter. However the extent of contamination is considerably greater when the results of all private supplies regardless of size are looked at in relation to the use to which the water is being put by the owners. In England, either *E.coli* or Enterococci was found in 9% of samples from public buildings, 7% of samples from food premises (restaurants and cafes), 10% of samples from accommodation offered to the public in the form of holiday lets, hotels and Bed and Breakfast arrangements and 18% of samples from milking parlours. If these findings were not evidence enough, the results of chemical testing by local authorities in 2010 demonstrates that many supplies exceed the health based standards for a wide range of substances. For example 10% of tests on boreholes in England failed the standard for arsenic and 19% failed the standard for boron.

When viewed overall, and regardless of the coverage not yet being comprehensive, there is only one conclusion that can be drawn from the information provided by local authorities about the quality of private supplies in 2010: one out of every four private water supplies being used for commercial purposes and services to the wider public was not fit for purpose. It therefore follows that the introduction of the new regulations (and a more effective risk based enforcement regime) was a necessary health based intervention in the public interest.

Case examples in *Drinking water 2010* show that whilst there can be many different reasons why an individual private water supply is unsatisfactory in terms of its quality, the root cause is a common one, best summarised as “*a complete failure of the past regime of management and control*”. Under this past failed regime, owners and users of private water supplies, as well as the wider public, did not benefit from access to reliable information alerting them to the risks

posed by private water supplies. Furthermore, this lack of transparency encouraged a complacent attitude to grow up within the community of “relevant persons” in relation to the Water Act 1991 (persons responsible for the safety of a private supply) and also inside the regulatory authorities (responsible for surveillance and enforcement of improvements, where necessary). This complacency also extends wider to the service industry which designs, constructs, installs and maintains private water supplies for owners.

Notwithstanding the above conclusion about the unsatisfactory quality of private water supplies in England, the report clearly shows that the new regulatory regime is already turning this situation around. The Inspectorate is pleased to acknowledge those local authorities who have intervened effectively and proportionally to safeguard public health by informing users of the risks and advising owners on steps to be taken to remedy matters. It is noteworthy also that owners, once informed, have responded constructively through the taking of short term action and the planning of long term improvements, where necessary. The Inspectorate has observed that where local authorities have served Regulation 18 restriction and improvement notices there have been no appeals by owners illustrating the incentive based nature of the negotiable element of notices covering the actual remedies and timescales. However the Inspectorate has also noted that some local authorities have chosen not to act but instead continue with past informal practices. This information will inform the Inspectorate’s forward work programme of independent scrutiny and reporting of the activities of local authorities. In particular where there is evidence that a local authority is not implementing the new regime in the public interest, then, the Inspectorate will consider the need to direct that local authority by exercise of delegated powers in the Water Act 1991.

Local authorities were given five years to implement the new regulatory regime of risk assessment and the Inspectorate has noted that the way the change has been communicated to the owners of small supplies has not always been satisfactory. For example, it has not been explained clearly that a risk assessment is required only once in five years and, if satisfactory, can lead to exemption from future monitoring. As a consequence some owners have been caused concern regarding costs of regulation. The Inspectorate has established that the typical time to complete a simple risk assessment and associated report is five hours and the typical hourly charge is of the order of £40. By contrast the typical cost of testing under the old regime was about £50 a sample per year. Therefore, for many owners using a private water supply for domestic purposes there is unlikely to be a significant difference in cost over the five year period and the new regime provides additional benefits in form of usable practical

information and reduced testing thereafter. The owners who are most likely to be affected by the change are those offering leisure or hospitality services to the public. However, it should be noted that these are the circumstances which pose the highest risk to human health. In 2010 the Inspectorate received information confirming this high risk: for example, a private supply to bed and breakfast accommodation contained *E.coli* and on investigation was linked to illness (*Campylobacter* infection) in an otherwise healthy 21 year old.

It is an unfortunate fact that a major weakness of the previous 'failed' regime was the way it gave owners of private water supplies a false sense of assurance. The obtaining of a satisfactory test result very occasionally (at best once a year) did not mean that the water supply was safe, yet this misperception has passed into the folk lore of the community of relevant persons. Encouragingly the new regulatory regime puts the role of testing on a much firmer scientific footing, as a tool to inform risk assessment. As the case studies show, the safety of a supply can be determined in most instances from simple observations combined with appropriate technical knowledge translated into practical steps of management and maintenance, and this is what the risk assessment process is designed to achieve.

In relation to the activities of local authorities more generally, the Inspectorate has identified that there may have been a substantial shortfall in monitoring of the larger supplies (more than 1,000m³/day) in England and Wales during 2010. The regulations and the EU Drinking Water Directive require check monitoring of these supplies at a frequency of no less than 10 samples per year however on average fewer than two check samples have been reported for the 199 identified large supplies. This means that either local authorities were not carrying out check monitoring or the testing was being done, but the results have not been included in local authority returns to the Inspectorate. This monitoring shortfall and other reporting deficiencies by local authorities will need to be rectified before the end of 2011 when the Inspectorate is required to submit data to Europe on behalf of the UK government.

In summary, therefore, the facts now available about private water supplies in England and Wales confirm that in 2010 more than one quarter (28%) were of suspect quality requiring investigation and more than one tenth (14%) posed a potential danger to human health by virtue of the presence of *E.coli* which indicates contamination with faecal matter. In 2010 local authorities risk assessed around 13% of all private supplies and where necessary, most arranged for users to be warned until the supply was improved by the owner. Although this evidence of the failure of the previous regulatory regime is not a good situation to have to report on, not least because it is a great deal

worse than published research implied; the Inspectorate is pleased to record how some local authorities intervened very effectively through the new regulations this year. Provided that the new regulations are fully implemented by all local authorities between now and 2014, then it is expected that future reports by the Inspectorate will be comprehensive and able to record that the safety and quality of private water supplies has been improved. Meanwhile it is important to be aware that data about private water supplies and the extent of failure is due to be reported under the EU Drinking Water Directive towards the end of 2011.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Jeni Colbourne', with a long horizontal line extending to the right.

Prof. Jeni Colbourne MBE
Chief Inspector of Drinking Water