

The Provision and Quality of Drinking Water in Ireland

A Report for the Years 2008-2009



Environmental Protection Agency

The Environmental Protection Agency (EPA) is a statutory body responsible for protecting the environment in Ireland. We regulate and police activities that might otherwise cause pollution. We ensure there is solid information on environmental trends so that necessary actions are taken. Our priorities are protecting the Irish environment and ensuring that development is sustainable.

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- Office of Environmental Enforcement
- Office of Environmental Assessment
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet several times a year to discuss issues of concern and offer advice to the Board.



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Environmental Protection Agency

An Ghníomhaireacht um Chaomhnú Comhsaoil
PO Box 3000, Johnstown Castle, Co. Wexford, Ireland

Telephone: +353 53 916 0600 Fax: +353 53 916 0699
Email: info@epa.ie Website: www.epa.ie

LoCall 1890 33 55 99

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Authors: John Feehan, Yvonne Doris, Cliona Ni Eidhin, Nigel Hayes, Darragh Page,
Brendan Wall and Gerard O'Leary

ISBN: 978-1-84095-379-4

11/2010/500

Price: €25

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ACKNOWLEDGEMENTS

The Environmental Protection Agency (EPA) would like to acknowledge the help and contribution of all the local authorities and the National Federation of Group Water Schemes in the preparation of this report. Thanks also to Deirdre Kirwan and Una Cullen (EPA) for their work with the EDEN system to manage the drinking water data, to Aisling McElwain (EPA) for her assistance in the preparation of the geographic information system maps for this report and to Brian MacDomhnaill of the National Federation of Group Water Schemes for the section on 'Group Water Schemes and Private Water Supplies'.

The authors would also like to acknowledge the assistance of colleagues: Ann Marie Egan, Alan Stephens, Bobby O'Keefe, Derval Devaney, Leo Sweeney, Lorna Dempsey, Margaret Keegan, Niall Dunne, Niamh O'Neill, Ruth Barrington, Suzanne Monaghan and Teresa Byrne.

Photographs were provided by: Nigel Borrington of Studio 63, Clare Keogh of Provision (Cork), John Doheny (EPA), Emer Cooney (EPA) and John Feehan (EPA).

This report was prepared under the direction of Mr. Dara Lynott, Director of the Office of Environmental Enforcement.

EXECUTIVE SUMMARY

The European Communities (Drinking Water) No. 2, Regulations, 2007 assign the Environmental Protection Agency (EPA) the role of supervisory authority over public drinking water supplies and provides powers of enforcement to ensure actions are taken where the quality of public drinking water is deficient.

Each year the EPA collects and analyses over 250,000 local authority monitoring results for all drinking water supplies. This current report assesses the safety and security of drinking water supplies based on the results of local authority monitoring carried out in 2008 and 2009 and enforcement by the EPA in the same period.

In Ireland, the majority of drinking water comes from public water supplies (85%) with the remainder provided by group water schemes and private supplies (including wells serving single houses).

In relation to the safety of water supplies, the EPA found that:

- *Escherichia coli* (*E. coli* – a bacteria that is an indicator of whether human or animal waste has entered a water supply) was detected on at least one occasion in 2.9% of public water supplies (27) during 2009. Figure E-1 below shows the trend in microbiological compliance for public water supplies since 2004.

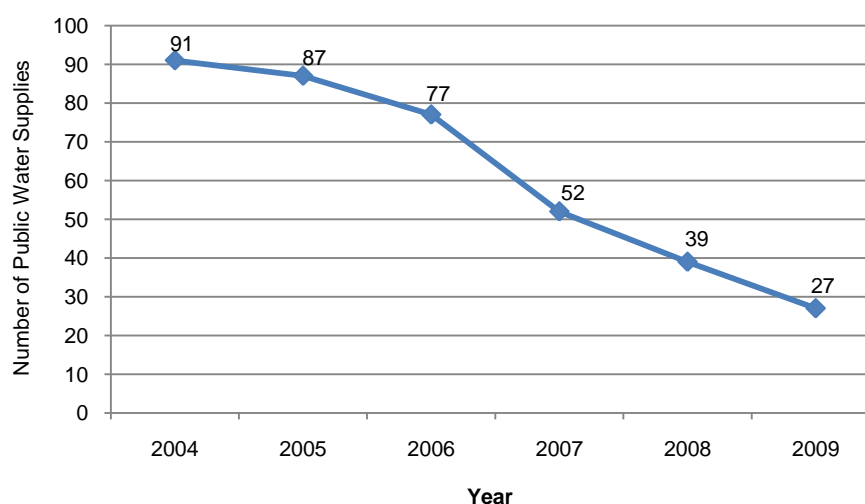


Figure E-1: Number of public water supplies in which *E. coli* was detected at least once from 2004 to 2009.

- The number of private group water schemes where *E. coli* was detected dropped from 134 (25%) in 2008 to 87 (17%) in 2009. In general, the microbiological quality of private group water schemes remains inferior to public water supplies.
- Compliance with the chemical standards overall was 99.2% in 2009 and this remains high for most chemical standards. This is a drop from 99.5% in 2008 because of poorer compliance with the new¹ trihalomethanes standard.
- Compliance with the indicator parameters such as aluminium (97%) and turbidity (92% at the water treatment plant) remains an area for improvement.

¹ Trihalomethanes standard changed from 150 µg/l to 100 µg/l on 25th December 2008.

For the security of water supplies, the EPA found that:

- A remedial action list (RAL) of public water supplies was prepared by the EPA in 2008. Since then, 42% (i.e. 142) of supplies on the original RAL have been removed from the RAL because the necessary remedial actions have been completed. This includes the public water supplies in three cities (Limerick, Galway and Waterford) which were upgraded and removed from the RAL.
- At the end of September 2010, 269 public water supplies remained on the RAL (72 new supplies have been added to the RAL since 2008). The list includes 73 supplies identified as high risk where appropriate barriers to *Cryptosporidium* need to be installed (50 supplies using surface water and 23 spring sources influenced by surface water). The progress made with the reduction in the number of public water supplies on the RAL is illustrated in Fig. E-2. The population served by supplies that have been removed from the RAL is over 500,000. The remaining supplies on the RAL collectively supply water to a population of 1,162,112 persons. Thirteen Water Services Authorities did not provide an estimation of the timeframe for the completion of remedial actions for 44 supplies.

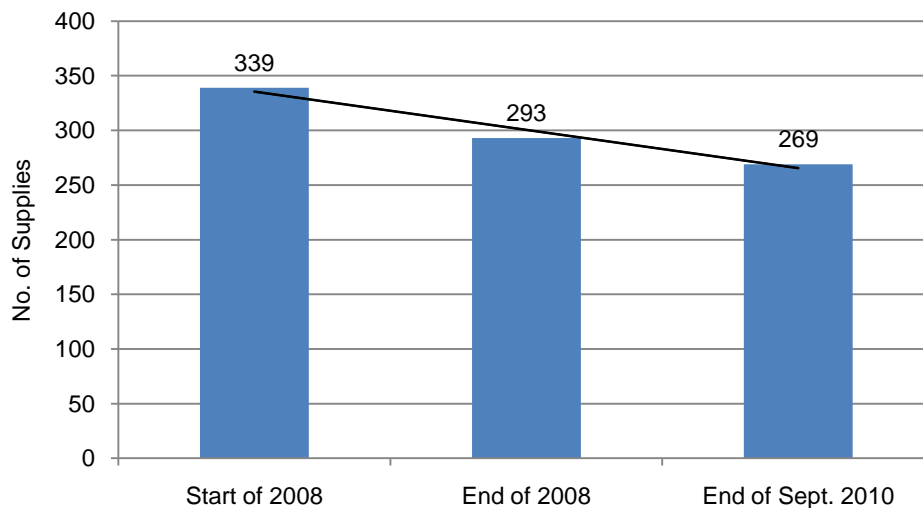


Figure E-2: Progress with the number of public water supplies on the Remedial Action List.

- There has been a 41% increase in the provision of chlorine monitors and alarms at treatment plants. These are a vital instrument to control the disinfection process and thus reduce the incidence of *E. coli* in drinking water. At the end of 2009, 81% of public water supply treatment plants had such equipment in place (see figure E-3). The remaining work is scheduled for completion by local authorities.

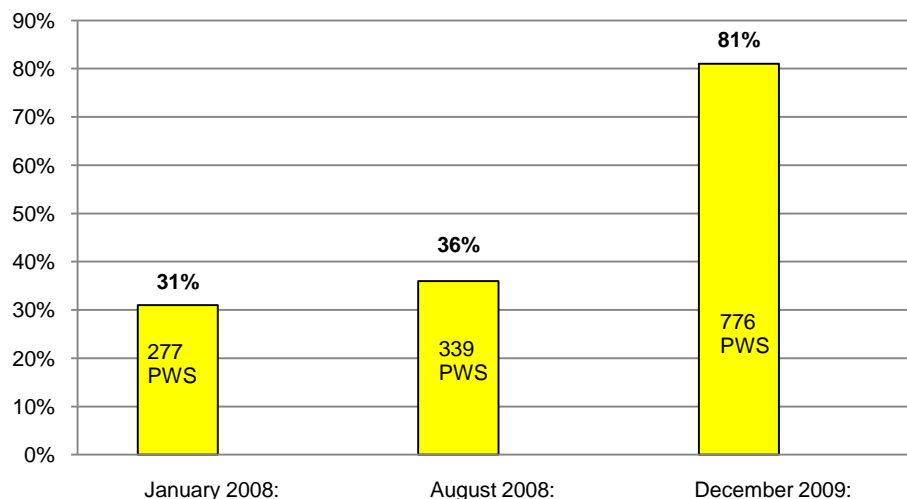


Figure E-3: Number and percentage of public water supplies with alarmed chlorine residual monitors.

- 40 new boil water notices and 13 water restrictions notices (serving approximately 93,000 persons) were put in place by 17 Water Services Authorities in 2009. Adverse weather conditions in November 2009 alone led to the imposition of boil water notices on 10 public water supplies (serving approximately 70,000 persons).

The Enforcement of Drinking Water Quality in Ireland

The EPA has adopted a risk based and outcome-driven approach to the enforcement of the Drinking Water Regulations – focusing on issues that present the greatest risk to health, such as contamination with *E. coli* and *Cryptosporidium*. The Agency will continue to track and report the following outputs: the number of supplies on the RAL closed out; the number of drinking water exceedance notifications received; the number of active boil water notices on public water supplies; the number of public water supplies that do not have chlorine monitors and alarms, the number of supplies served by surface water that do not have *Cryptosporidium* barriers in place; and the number of local authority staff trained in the *Disinfection Manual* and the *Drinking Water Handbook*.

The EPA is notified by local authorities of each failure to meet the microbiological and chemical standards or where there is a potential danger to human health.

The EPA received and assessed 238 new notifications of failure to meet the drinking water standards in 2009 and 352 in 2008. There was a significant increase in the number of new files opened for trihalomethanes in 2009. This increase appears to indicate increases in the level of disinfection, inadequate total organic carbon removal along with a tightening of the standard for trihalomethanes. Water Service Authorities are reminded of the World Health Organisation's (WHO) advice that disinfection should never be compromised.

The EPA carried out 66 audits of water treatment plants in 2008 and 114 audits in 2009. Inadequate protection of the source water and improvements to the operation of filters and disinfection processes were among the main findings. The EPA issued 44 legally binding Directions to 16 local authorities in 2008 and 28 legally binding Directions to 9 local authorities in 2009. The Directions require specific actions to be undertaken to improve the security of the relevant public water supply.

Advice and Guidance on Drinking Water Management

A broad range of guidance documents, advice notes and circulars on drinking water are now published on the web by the EPA. The most significant guidance document published was a *Handbook on the Implementation of the Regulations for Water Service Authorities for Public Water Supplies* and another for *Private Water Supplies*. This guidance was a successful collaborative project with the Water Services National Training Group (WSNTG)². A revision of the *Disinfection Manual* will be published in 2011.

Securing our Supplies

According to the World Health Organisation (WHO), waterborne disease remains one of the major health concerns in the world. This EPA report highlights the continuing downward trend of incidence of *E. coli* in drinking water in Ireland.

In 2008, the incidence of *E. coli* in the larger public water supplies was 0.10% of samples. Further actions and investment is necessary, however, to reduce this figure and to bring it in line with countries such as England and Wales (0.02%), Netherlands (0.02%) and Scotland (0.01%) and to remove all supplies from the EPA's RAL.

Finally, health-based standards provide a necessary 'benchmark' for water suppliers. However, to secure our supplies into the future the application of a risk-assessment and management approach supported by appropriate monitoring is necessary. The EPA is encouraging all Water Service Authorities to adopt the Water Safety Plan approach. This approach is the most effective means of consistently ensuring the safety and security of a drinking water supply from the catchment to consumer.

² The WSNTG provides a range of training programmes through its five regional training centres for all grades of staff operating in the water/waste water sections of the local authorities and for personnel working with group water schemes.

1.

Drinking Water in Ireland



1. Drinking Water in Ireland

This report covers the quality of drinking water in Ireland in 2008 and 2009. Issues identified by the Environmental Protection Agency (EPA) during compliance checking on the safety and security of water supplies are also presented along with the enforcement actions taken by the EPA in 2008 and 2009.

1.1 Drinking Water Supply in Ireland

To ensure that the EU and national drinking water standards are met, each water supply must be monitored on a regular basis. The monitoring frequency is legally set out in national Regulations, and minimum monitoring frequencies for drinking water depend on the size of the supply in question. Though the Regulations specify two types of supplies (“public” and “private”), in practice there are five distinct categories of water supply in Ireland (see also Table 1-1):

- **Public Water Supplies (PWS).** These are local authority operated schemes (though these may be run by a private contractor on behalf of the local authority). They supply water to the majority of households in Ireland.
- **“Public” Group Water Schemes (PuGWS).** These are schemes where the water is provided by the local authority but responsibility for distribution of the water rests with the group scheme. These schemes tend to be supplied by larger public water supplies.
- **“Private” Group Water Schemes (PrGWS).** These are schemes where the owners of the scheme (usually representatives of the local community) source and distribute their own water. Combined, the “public” and “private” group water schemes supply water to around 8% of the population of Ireland.
- **Small Private Supplies (SPS).** This is a group of different types of supplies (1,245) comprising industrial water supplies (such as those used in the brewing industry) to boreholes serving commercial premises (e.g. pubs, hotels etc.) and public buildings (e.g. schools, nursing homes).
- **Exempted Supplies.** These are supplies serving less than 50 persons and not supplying water as part of a public or commercial activity. The majority of these supplies are private wells serving individual houses. These supplies serve approximately 6% of the population.

This report and the assessment of monitoring carried out covers the years 2008 and 2009.

Table 1-1: Water Supply Zones (WSZs) and Proportion of the Population Served, 2009.

| Type of Supply | No. of WSZs ³ | % of Total Population Served |
|--------------------------------|--------------------------|------------------------------|
| Public Water Supply | 956 | 85.1 |
| Public Group Water Scheme | 672 | 2.7 |
| Private Group Water Scheme | 529 | 5.3 |
| Small Private Supply | 1,245 | 0.6 |
| Exempted Supplies ⁴ | N/A | 6.3 |

³ A water supply zone (WSZ) is a geographically defined area within which drinking water comes from one or more sources and water quality is uniform.

⁴ Exempted supplies are supplies that are provided from either an individual supply providing less than 10m³ a day on average or serving fewer than 50 persons and do not supply water as part of a public or commercial activity. Exempted supplies may also be a supply used exclusively for the purposes in respect of which the sanitary authority is satisfied that the quality of the water has no influence, either directly or indirectly, on the health of consumers concerned (e.g. industrial cooling water).

In Ireland the majority of drinking water originates from surface water (81.6%) and the remainder originates from groundwater (10.3%) and springs (8%). Public water supplies are particularly reliant on surface water sources. The numbers of Small Private Supplies reported have increased in the past year. This may be because of more comprehensive reporting by Water Services Authorities. The owners of Small Private Supplies are subject to the requirements of the Drinking Water Regulations and Water Services Authorities have an enforcement role with regard to these supplies, which is set out in the Regulations.

Figure 1-1 gives a further breakdown of the 956 public water supplies. This shows that Cork has the highest number of public water supplies (185) followed by Waterford (101) and Kerry (81). The large number of public water supplies presents a significant challenge to Water Services Authorities to maintain the high standard of treatment and disinfection required for all supplies.

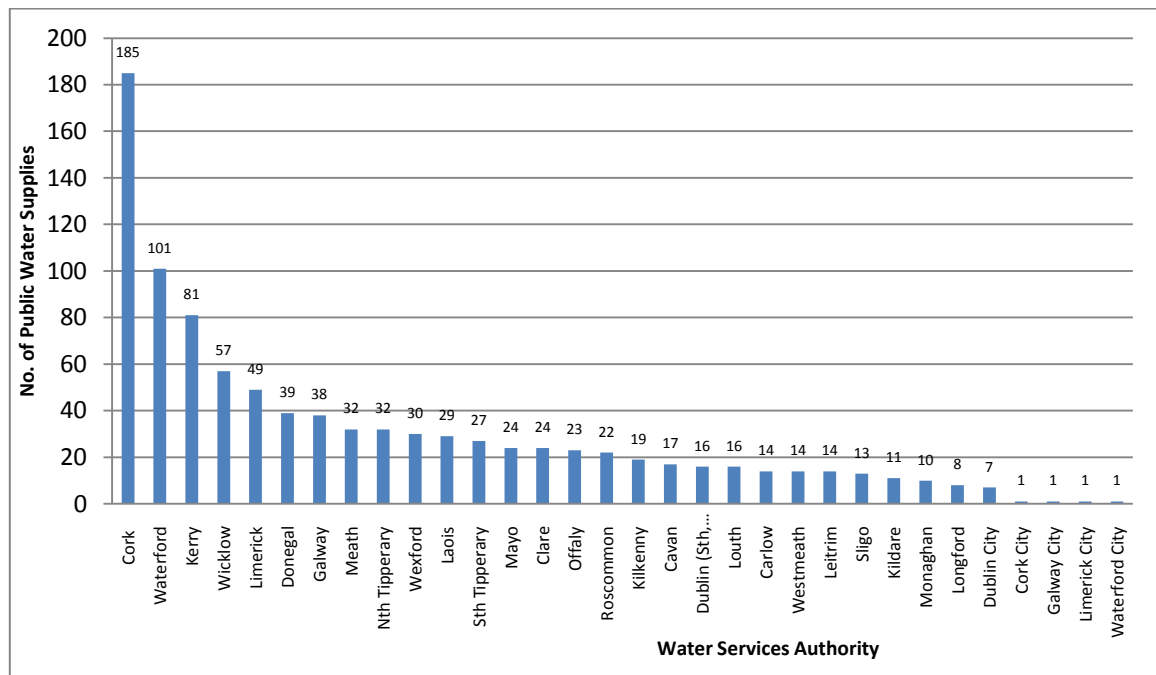


Figure 1-1: Number of public water supplies per Water Services Authority in Ireland (2009 data).

1.2 Quality of Drinking Water in Ireland

The Regulations set out the required standard for each of the 48 parameters. Compliance is assessed by comparing the results of the analysis of samples taken from supplies with the required standard set out in the Regulations.

Table 1-2 lists the level of compliance with seven key water quality parameters of the 48 parameters to be monitored under the Regulations. These parameters are *E. coli*, Enterococci, lead, nitrate, trihalomethanes, aluminium and turbidity (at the water treatment plant). Full details of the compliance of drinking water in Ireland against the 48 parameters set out in the Regulations, for each supply category is provided in Appendix IV.

Table 1-2: Non-compliance with Drinking Water Standards by Supply Category for samples taken in 2009⁵.

| Parameter | Public Water Supplies | | Public Group Water Schemes | | Private Group Water Schemes | |
|-----------------------------------|------------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| | No. of non-compliant samples | % of non-compliant samples | No. of non-compliant samples | % of non-compliant samples | No. of non-compliant samples | % of non-compliant Samples |
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 33 | 0.3 | 5 | 0.4 | 122 | 6.5 |
| <i>Enterococci</i> | 20 | 0.8 | 1 | 0.5 | 14 | 4.2 |
| Chemical Parameters | | | | | | |
| Lead | 29 | 1.1 | 0 | 0 | 1 | 0.2 |
| Nitrate | 5 | 0.1 | 1 | 0.2 | 3 | 0.3 |
| Trihalomethanes (Total) | 186 | 12.6 | 24 | 29.6 | 28 | 10.6 |
| Indicator Parameters | | | | | | |
| Aluminium | 228 | 2.9 | 54 | 5.4 | 31 | 2.6 |
| Turbidity (at WTW) | 115 | 7.8 | 1 | 3.4 | 7 | 17.9 |

Chapter 2 provides a discussion of compliance with the microbiological, chemical and indicator parametric values per water supply zone in 2008 and 2009. Appendix I contains a summary report on a county-by-county basis for all Water Services Authorities.

European Union (EU) Member States are required to report to the European Commission on the quality of drinking water in supplies serving more than 5,000 persons every three years to historically compare the quality of drinking water across Europe. A number of Member States including Ireland, the UK and the Netherlands publish this information on an annual basis. However, the majority of EU Member States do not make drinking water quality information available in this format.

A comparison of non-compliance with the *E. coli* parametric value in Irish public water supplies with the UK and the Netherlands shows that further improvement is necessary in Ireland. The majority of public water supplies in Ireland are small (serving less than 5,000 persons) while in the UK and the Netherlands few public water supplies of this size exist. Hence, Fig. 1-2 illustrates the comparison of larger Irish public water supplies with those in the UK and the Netherlands. It also illustrates that the

⁵ This assessment of compliance is based on results submitted.

smaller supplies have a higher rate of non-compliance with the *E. coli* parametric value as compared to the larger supplies.

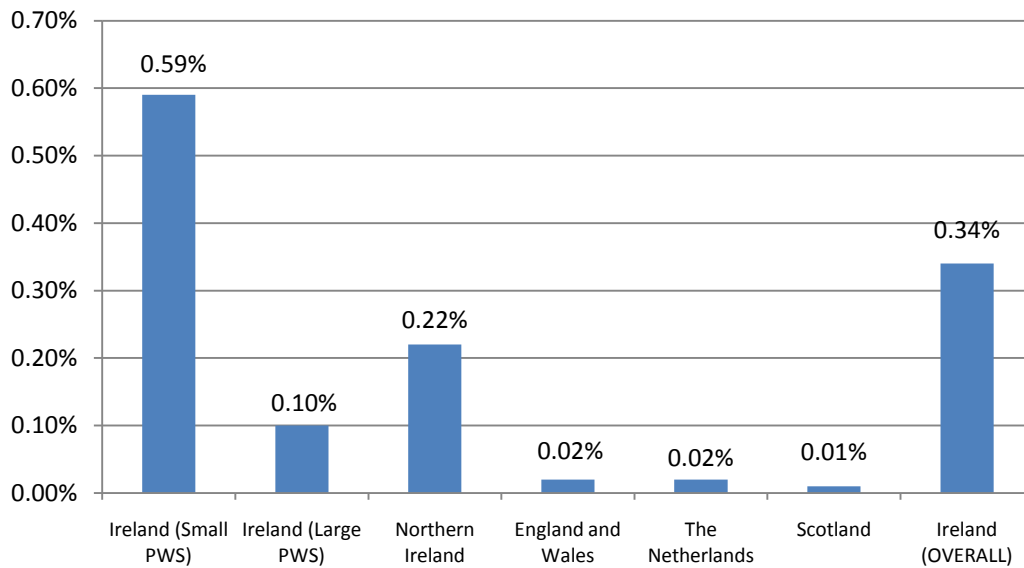


Figure 1-2: Comparison of non-compliance with the *E. coli* parametric value in large public water supplies (> 5,000) in Ireland and other EU Countries for 2008 (for number of non-compliant *E. coli* samples)
(Source: Member State Annual Drinking Water Reports).

1.3 Securing Water Supplies

The EPA advocates the World Health Organisation’s water safety plan approach as the most effective means of consistently ensuring the safety of a drinking water supply from the catchment to the consumer. In Ireland, responsibility for the development and implementation of water safety plans for public water supplies rests with the Water Services Authorities. The EPA collaborated with Galway City Council and neighbouring Water Services Authorities to develop a water safety plan for the Terryland public water supply. This pilot project will provide a useful reference to other Water Services Authorities in adopting and implementing their own water safety plans.



Photograph 1-1: Pictured at the completion of the water safety plan pilot project by Galway City Council are L to R: Billy Dunne and Ciaran Hayes, Galway City Council; Dara Lynott and Gerard O’Leary, EPA.

2.

The Safety of Drinking Water



2. THE SAFETY OF DRINKING WATER

2.1 Monitoring

This report assesses the monitoring carried out on treated drinking water. The results of drinking water analyses presented in this report are of value only if the drinking water supply in question has been monitored adequately, i.e. at the frequencies set out in the 2007 Drinking Water Regulations. Where supplies have not been monitored at these frequencies, the water suppliers in question cannot assure consumers as to the water quality.

Table 2-1 below provides a summary of the number of water supply zones (WSZ⁶) not monitored in 2008 and 2009:

Table 2-1: Summary of the Water Supply Zones (WSZs) not monitored in 2008 and 2009.

| Parameter | No. of WSZs Not Monitored in 2009 | Estimated Population Served in 2009 | No. of WSZs Not Monitored in 2008 | Estimated Population Served in 2008 |
|-----------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| Public Water Supplies | 3 (0.3%) | 522 | 1 (0.1%) | 60 |
| Public Group Water Schemes | 2 (0.3%) | 375 | 78 (10%) | 5,954 |
| Private Group Water Schemes | 1 (0.2%) | 49 | 22 (4%) | 2,377 |

2.1.1 Monitoring of Public Supplies

In 2009, no monitoring was carried out at three (0.3%) public water supplies, serving a population of 522 people. In 2008, no monitoring was carried out at one (0.1%) small public water supply, serving a population of 60 people.

2.1.2 Monitoring of Private Supplies

Monitoring of private water supplies has improved. Two public group water schemes (0.3%) serving 375 persons were not monitored in 2009. This compares to 78 public group water schemes (10%), serving 5,954 persons not monitored in 2008.

One private group water scheme (0.2%), serving 49 persons was not monitored in 2009. This compares to 22 private group water schemes (4%), serving 2,377 persons not monitored in 2008.

2.1.3 Overall Monitoring

In total, 6 drinking water supplies (serving 946 persons) were not monitored in 2009; this can be compared to the 101 drinking water supplies (serving 8,391 persons) that were not monitored in 2008. The monitoring of public and private water supplies has improved greatly but the monitoring of a number of small private supplies remains somewhat inadequate. It should also be noted that many of the compliant Water Services Authorities are carrying out monitoring far in excess of that required by the Regulations.

⁶ A WSZ is a geographically defined area within which water intended for human consumption comes from one or more sources and water quality may be considered as being approximately uniform.

2.2 Compliance with the Microbiological Standards

The most important health indicators of drinking water quality in Ireland are the microbiological parameters and, in particular, *E. coli*. These parameters are present in very high numbers in human or animal faeces and are rarely found in the absence of faecal pollution in surface waters or groundwaters. As such, the presence of *E. coli* in drinking water indicates that the treatment process at the water treatment plant is not operating adequately or that contamination has entered the water distribution system after treatment. The World Health Organisation (2008⁷) states that: “the presence of *E. coli* provides evidence of recent faecal contamination, and detection should lead to consideration of further action, which could include further sampling and investigation of potential sources such as inadequate treatment or breaches in the distribution system integrity”.

Similar to *E. coli*, *Enterococci* bacteria are present in large numbers in sewage and water environments polluted by sewage or wastes from humans and animals. They are generally present in numbers lower than *E. coli* but they survive longer than *E. coli* and thus can indicate pollution that has occurred in the past.

2.2.1 *E. coli*

In 2009, a total of 200 supplies (out of 3,016 supplies) failed to meet the standard for *E. coli* at one time or more during the year (Table 2-2). However, there has been a decrease across all water supplies in the number of supplies where *E. coli* was detected. Overall, *E. coli* was detected at least once for 6.6% of water supplies during 2009, an improvement from 9.9% in 2008. The majority of supplies where *E. coli* was detected were private group water schemes and small private and public water supplies.

Table 2-2: Summary of Water Supply Zones (WSZs) where *E. coli* was Detected at Least Once in 2008 and 2009.

| | No. of WSZs monitored in 2009 | No. of WSZs with exceedances in 2009 | No. of WSZs monitored in 2008 | No. of WSZs with exceedances in 2008 |
|-----------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|
| Public Water Supplies | 944 | 27 (2.9%) | 956 | 39 (4.1%) |
| Public Group Water Schemes | 593 | 3 (0.5%) | 622 | 16 (2.6%) |
| Private Group Water Schemes | 511 | 87 (17.0%) | 538 | 134 (24.9%) |
| Small Private Supplies | 968 | 83 (8.6%) | 932 | 113 (12.1%) |
| Total: | 3,016 | 200 (6.6%) | 3,048 | 302 (9.9%) |

The majority of the population (85.1%) receive their water from public water supplies. There has been a big improvement in the percentage of public water and private group water schemes contaminated with *E. coli* during 2009. However, the percentage of samples exceeding the *E. coli* parametric value in private group water schemes remains unacceptably high at 17.0% (Fig. 2-1). The number of private group water schemes contaminated with *E. coli* during 2009, as a proportion of the total number of schemes, is illustrated in Fig 2-2.

⁷ World Health Organisation (2008). WHO - Guidelines for Drinking-water Quality – third edition incorporating the first and second addenda, Volume 1, Recommendations (see Appendix IV).

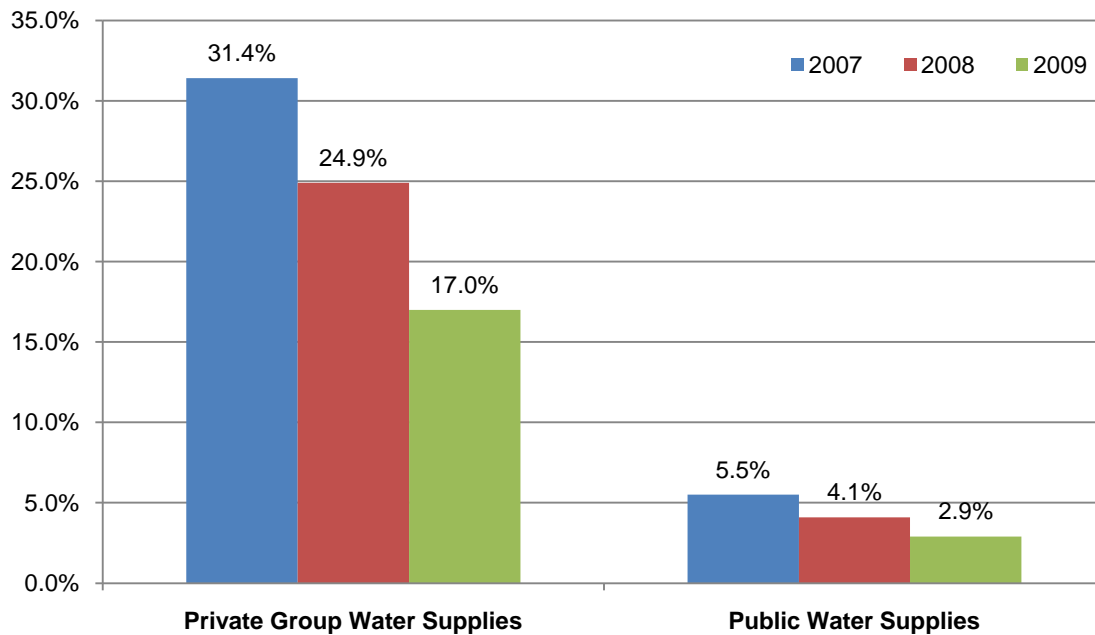


Figure 2-1: Percentage of supplies where *E. coli* was detected, 2007 to 2009.

2.2.2 *Enterococci*

The total number of supplies where *Enterococci* was detected in 2009 was 83 compared to 78 in 2008. There was an increase in the number of public water supplies failing to meet the *Enterococci* parametric value while there was a decrease in the number of public group water schemes and private group water schemes where *Enterococci* was detected. The level of non-compliance with the *Enterococci* parametric value in small private supplies remained at the same level.

Table 2-3: Summary of Compliance with the *Enterococci* Parametric Value, 2008 and 2009.

| | No. of WSZs monitored in 2009 | No. of WSZs with Exceedances in 2009 | No. of WSZs Monitored in 2008 | No. of WSZs with Exceedances in 2008 |
|-----------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|
| Public Water Supplies | 703 | 20 (2.8%) | 719 | 12 (1.7%) |
| Public Group Water Schemes | 119 | 1 (0.8%) | 132 | 3 (2.3%) |
| Private Group Water Schemes | 248 | 14 (5.6%) | 263 | 18 (6.8%) |
| Small Private Supplies | 465 | 48 (10.3%) | 416 | 45 (10.8%) |
| Total: | 1,535 | 83 (5.4%) | 1,530 | 78 (5.1%) |

2.3 Compliance with the Chemical Standards

Of the 26 chemical parameters, full compliance was reported for 11 parameters in 2009, while compliance in excess of 99% was reported for a further 10 parameters (Table 2-4). Compliance for 2 parameters was less than 99% in 2009 (fluoride and trihalomethanes).

While compliance with the chemical standards in Ireland was good overall in 2009 at 99.2%, standards for bromate and total trihalomethanes became more stringent on 25 December 2008.

Table 2-4: Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for Chemical Parameters, 2009.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|--|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Chemical⁸ Parameters | | | | | | |
| 1,2-dichloroethane | 948 | 0 | 100 | 1795 | 0 | 100 |
| Antimony | 995 | 3 | 99.7 | 1815 | 4 | 99.8 |
| Arsenic | 1038 | 4 | 99.6 | 1925 | 4 | 99.8 |
| Benzene | 954 | 0 | 100 | 1806 | 0 | 100 |
| Benzo(a)pyrene | 897 | 2 | 99.8 | 1442 | 2 | 99.9 |
| Boron | 1001 | 0 | 100 | 1856 | 0 | 100 |
| Bromate | 992 | 9 | 99.1 | 1647 | 10 | 99.4 |
| Cadmium | 1098 | 0 | 100 | 1986 | 0 | 100 |
| Chromium | 1098 | 0 | 100 | 1987 | 0 | 100 |
| Copper | 1303 | 6 | 99.5 | 2435 | 6 | 99.8 |
| Cyanide | 904 | 0 | 100 | 1487 | 0 | 100 |
| Fluoride | 1151 | 65 | 94.4 | 4443 | 143 | 96.8 |
| Lead | 1507 | 24 | 98.4 | 3733 | 31 | 99.2 |
| Mercury | 957 | 0 | 100 | 1774 | 0 | 100 |
| Nickel | 1125 | 2 | 99.8 | 2002 | 2 | 99.9 |
| Nitrate | 2096 | 16 | 99.2 | 7504 | 18 | 99.8 |
| Nitrite (at tap) | 2171 | 4 | 99.8 | 8170 | 4 | 100 |
| Nitrites (at WTW) | 97 | 0 | 100 | 568 | 0 | 100 |
| PAH | 897 | 2 | 99.8 | 1445 | 2 | 99.9 |
| Pesticides – Total | 832 | 2 | 99.8 | 1372 | 2 | 99.9 |
| Selenium | 999 | 0 | 100 | 1868 | 0 | 100 |
| Tetrachloroethene & Trichloroethene | 927 | 0 | 100 | 1578 | 0 | 100 |
| Trihalomethanes (Total) | 979 | 153 | 84.4 | 1851 | 242 | 86.9 |

2.3.1 Lead

The Regulations impose a parametric value of 25 µg/l Pb until 24 December 2013, after which the parametric value of 10 µg/l Pb becomes effective. The results for 2009 are examined in the context of compliance with the current standard of 25 µg/l Pb, as well as the future standard of 10 µg/l Pb.

⁸ Compliance with the acrylamide, epichlorohydrin and vinyl chloride parametric values is to be determined by product specification and not by laboratory analysis.

Table 2-5: Compliance with the Lead Parametric Value, 2009.

| | Current Standard (25 µg/l) | | 2013 Standard (10 µg/l) | |
|-----------------------------|----------------------------|---------------------------|-------------------------|---------------------------|
| | % of Samples Complying | No. of Non-Compliant WSZs | % of Samples Complying | No. of WSZs with >10 µg/l |
| Public Water Supplies | 98.9 | 22 | 97.1 | 55 |
| Public Group Water Schemes | 100 | 0 | 98.8 | 1 |
| Private Group Water Schemes | 99.8 | 1 | 99.4 | 3 |
| Small Private Supplies | 99.8 | 1 | 99.4 | 3 |
| Overall: | 99.2 | 24 | 97.7 | 62 |

A total of 24 supplies reported lead exceedances during 2009 (no change from 2008); however, 62 supplies have reported levels of lead in excess of the 2013 parametric value of 10 µg/l for lead (56 in 2008).

Reduction of the plumbosolvency can be implemented by correcting pH. Implementation of this measure can assist the Water Services Authorities in achieving a higher level of compliance, but the best means of assuring full compliance is to initiate a programme for removing all lead pipes from the distribution network. Owners of dwellings where lead pipes are used should be informed of the risks and given advice by the water supplier on their safe replacement.

To date, many samples tested for lead tend to have been fully flushed before sampling. However, this does not meet the requirements of the current Regulations and it is recommended that the random daytime sampling⁹ method be used. All Water Services Authorities should move to implement this sampling method, if they have not already done so. The EPA guidance ('Lead compliance monitoring and surveys') should be followed by each Water Services Authority to determine the extent of lead in the distribution network of each water supply. Further EPA guidance ("Action programme to restore the quality of drinking water impacted by lead pipes") outlines a risk-based strategy for dealing with lead pipes. In 2009, the EPA issued two legally binding Directions to two Water Services Authorities requiring action programmes to remove lead mains (see Section 3.6).

2.3.2 Nitrate

Exceedances of the nitrate parametric value were reported in 16 supplies in 2009 (down from 41 in 2008). There was a decrease in the number of public water supplies with elevated levels of nitrates. The population affected by nitrate exceedances also decreased, 17,802 in 2008 and 5,254 in 2009 (Table 2-6).

Table 2-6: Summary of Water Supply Zones (WSZs) Non-Compliant with Nitrate Parametric Value, 2009 and 2008.

| | No. of WSZs with Exceedances in 2009 | Population Affected in 2009 | No. of WSZs with Exceedances in 2008 | Population Affected in 2008 |
|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|
| Public Water Supplies | 5 | 4,636 | 9 | 16,536 |
| Public Group Water Schemes | 1 | 78 | 0 | 0 |
| Private Group Water Schemes | 3 | 540 | 9 | 1,266 |
| Small Private Supplies | 7 | N/A | 23 | N/A |
| Overall: | 16 | 5,254 | 41 | 17,802 |

⁹ Random daytime sampling is defined as taking water directly from the tap normally used for consumption without any prior water abstraction, flushing or cleaning of the tap prior to sampling. The sample should be chosen randomly within the day but during normal office hours.

2.3.3 Trihalomethanes – Total

Trihalomethanes (THMs) are formed in drinking-water primarily as a result of chlorination of organic matter present naturally in raw water supplies. The rate and degree of THM formation increase as a function of the chlorine and humic acid concentration, temperature, pH and bromide ion concentration.

There were 1,851 samples analysed for trihalomethanes in 979 water supply zones in 2009. The Regulations impose a parametric value of 100 µg/l. The results, as shown in Table 2-7 show that 15.6% (153 supplies) failed to comply with the trihalomethanes parametric value in 2009 and that 105 (16.1%) public water supplies were non-compliant. Public water supplies are sampled more frequently than other supply types for trihalomethanes.

Table 2-7: Compliance with the Trihalomethanes (Total) Parametric Value in 2009.

| | No. of WSZs Monitored | No. of Non-compliant WSZs | No. of Samples Analysed | No. of Non-compliant Samples |
|-----------------------------|-----------------------|---------------------------|-------------------------|------------------------------|
| Public Water Supplies | 654 | 105 (16.1%) | 1,480 | 186 (12.6%) |
| Public Group Water Schemes | 76 | 24 (31.6%) | 81 | 24 (29.6%) |
| Private Group Water Schemes | 236 | 23 (9.7%) | 265 | 28 (10.6%) |
| Small Private Supplies | 13 | 1 (7.7%) | 25 | 4 (16.0%) |
| Overall: | 979 | 153 (15.6%) | 1,851 | 242 (13.1%) |

2.3.4 Fluoride

Naturally elevated levels of fluoride are quite rare in Ireland and thus any exceedances reported are due almost entirely to public water supplies being dosed with fluoride at levels in excess of the legally permitted dose. There has been an increase on the previous year for the number of public water supplies (53 in 2009) and public group water schemes (10 in 2009) failing to meet the fluoride parametric value. There has been a decrease in the number of private group water schemes exceeding the fluoride parametric value (2 in 2009). There were no fluoride exceedances reported for small private supplies in both 2008 and 2009. It is important to note that the Irish standard of 0.8mg/l is more stringent than the EU Drinking Water Directive Standard of 1.5 mg/l. No fluoride result exceeded the 1.5 mg/l standard in 2009.

Table 2-8: Compliance with the Fluoride Parametric Value, 2008, 2009.

| | No. of WSZs Monitored in 2009 | % of Samples Complying in 2009 | No. of non-Compliant WSZs in 2009 | No. of non-Compliant WSZs in 2008 |
|-----------------------------|-------------------------------|--------------------------------|-----------------------------------|-----------------------------------|
| Public Water Supplies | 713 | 96.6 | 53 | 40 |
| Public Group Water Schemes | 156 | 96.5 | 10 | 7 |
| Private Group Water Schemes | 262 | 99.4 | 2 | 4 |
| Small Private Supplies | 20 | 100 | 0 | 0 |
| Total: | 1,151 | 96.8 | 65 | 51 |

2.4 Compliance with the Indicator Parametric Values

The indicator group of parameters is a diverse group of parameters designed to provide information on the management of the treatment process and the organoleptic (perception by sensory organs) and aesthetic quality of drinking water. As such, several parameters do not have quantitative standards but are dependent on acceptability to consumers. Others are based on practical consideration, for example, the iron parametric value is set at a level that will ensure that water is

acceptable to consumers rather than that which is a risk to public health. In this regard, comparing the indicator parameter monitoring results to the parametric values should be given less importance than comparing the microbiological or chemical monitoring with their respective parametric values. In other words, a value reported above the indicator parametric value should not, de facto, be considered a cause for concern but a guide for the Water Services Authority to initiate an investigation into the cause of the elevated level of the particular parameter. In many cases, it is not the indicator parameter that is of concern, rather, it is what the presence that parameter may imply. For example, elevated levels of indicator parameters may indicate that the treatment plant is not operating adequately, that the plant is operating above its design capacity, or that the plant is not capable of providing a treatment barrier. A summary of compliance with the indicator parameters is provided in Table 2-9.

Table 2-9: Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for the Indicator Parameters, 2009.

| Parameter ¹⁰ | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-----------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Indicator Parameters | | | | | | |
| Aluminium | 2041 | 153 | 92.5 | 10723 | 318 | 97.0 |
| Ammonium | 2961 | 28 | 99.1 | 15473 | 41 | 99.7 |
| Chloride | 1117 | 2 | 99.8 | 2061 | 2 | 99.9 |
| Clostridium Perfringens | 2125 | 134 | 93.7 | 11973 | 167 | 98.6 |
| Coliform Bacteria | 3017 | 737 | 75.6 | 15892 | 1021 | 93.6 |
| Colony Count @ 22°C | 649 | 42 | 93.5 | 1449 | 49 | 96.6 |
| Colour | 2998 | 284 | 90.5 | 15793 | 548 | 96.5 |
| Conductivity | 2933 | 2 | 99.9 | 15880 | 2 | 100 |
| Iron | 2263 | 222 | 90.2 | 10111 | 348 | 96.6 |
| Manganese | 1729 | 131 | 92.4 | 5224 | 163 | 96.9 |
| Odour | 2728 | 183 | 93.3 | 14363 | 358 | 97.5 |
| Oxidisability | 31 | 0 | 100 | 44 | 0 | 100 |
| pH | 3005 | 494 | 83.6 | 15842 | 863 | 94.6 |
| Sodium | 1105 | 16 | 98.6 | 2022 | 18 | 99.1 |
| Sulphate | 952 | 0 | 100 | 1740 | 0 | 100 |
| Taste | 1536 | 22 | 98.6 | 9214 | 42 | 99.5 |
| Total Organic Carbon | 847 | 22 | 97.4 | 1615 | 26 | 98.4 |
| Turbidity (at tap) | 3001 | 117 | 96.1 | 15713 | 137 | 99.1 |
| Turbidity (at WTW) | 183 | 62 | 66.1 | 1533 | 123 | 92.0 |
| Radioactivity | | | | | | |
| Tritium | 10 | 0 | 100 | 31 | 0 | 100 |
| Total Indicative Dose | 6 | 0 | 100 | 31 | 0 | 100 |

Most failures to meet the indicator parametric values are caused by:

1. Poor performance of a water treatment plant, for example, elevated levels of turbidity indicate poor treatment of water in the filters.
2. Poor disinfection efficiency, for example, regrowth of coliform bacteria can occur in an inadequately disinfected water supply.
3. Naturally present substances, for example, iron and manganese may be naturally present in groundwater.

2.4.1 Aluminium

The level of compliance with the aluminium parametric value rose to 97.0% in 2009 from 95.8% in 2008. Compliance with the aluminium parametric value has been poor in a number of supplies in Ireland due to inadequate control over addition of treatment chemicals. Failure to meet the aluminium parametric value can be due to several reasons, including naturally elevated levels of aluminium in the raw water, operation of the treatment plant above design capacity, poor management of the

¹⁰ For several of the indicator parameters there are no specific standards in the Regulations. Therefore, for comparison purposes arbitrary levels have been assigned above which the local authority may be concerned about the quality of the water and should investigate further.

treatment plant or inadequate management of the distribution network. While a small number of water supply zones have naturally elevated levels of aluminium, the majority of aluminium non-compliances in Ireland in 2009 are due to operational management and design, in particular, poor control over pH.

The compliance rates in the different types of water supplies are presented in Table 2-10.

Table 2-10: Summary of Aluminium Monitoring, 2009.

| | No. of WSZs Monitored | % of Samples Complying | No. of Non-Compliant WSZs |
|-----------------------------|-----------------------|------------------------|---------------------------|
| Public Water Supplies | 740 | 97.1 | 83 |
| Public Group Water Schemes | 471 | 94.6 | 48 |
| Private Group Water Schemes | 386 | 97.4 | 17 |
| Small Private Supplies | 444 | 99.3 | 5 |
| Total: | 2,041 | 97.0 | 153 |

The low percentage of compliance in public group water schemes may indicate poor aluminium dosing at the treatment plant or a requirement for a programme of regular flushing and scouring of the distribution network.

2.4.2 Coliform Bacteria

A large number of supplies tested positive for the presence of coliform bacteria in 2009, particularly private group water schemes.

Table 2-11: Summary of Coliform Bacteria Monitoring, 2009.

| | No. of WSZs Monitored | % of Samples Complying | No. of Non-Compliant WSZs |
|-----------------------------|-----------------------|------------------------|---------------------------|
| Public Water Supplies | 944 | 97.2 | 190 |
| Public Group Water Schemes | 593 | 96.9 | 37 |
| Private Group Water Schemes | 511 | 84.6 | 194 |
| Small Private Supplies | 969 | 75.3 | 316 |
| Total: | 3017 | 93.6 | 737 |

The low level of compliance with the parametric value for coliform bacteria needs to be addressed. This is particularly so for the private group water schemes, 38% of which contained coliform bacteria at least once during 2009 down from 44% in 2008 [Table 2-11]. These non-compliances are caused by a combination of poor-quality water being supplied into the distribution network and by poor management of the distribution mains. There should be a regular programme of flushing and cleaning to ensure that there is no contamination in the network.

2.4.3 Turbidity

A turbidity value of 1.0 NTU (nephelometric turbidity units) must be strived for at the water treatment plant. Turbidity at the tap indicates a very different problem to turbidity at the treatment plant. Elevated levels of turbidity at the tap may indicate sediment in the mains or ingress into the distribution network while turbidity at the treatment plant may indicate poor performance of filters and inadequate treatment barriers.

Table 2-12: Percentage of Samples in Compliance with the Turbidity Parametric Values in 2009.

| Parameter | Overall | PWS | PuGWS | PrGWS | SPS |
|------------------------|-------------|------|-------|-------|------|
| Turbidity (at the tap) | 99.1 | 99.6 | 99.6 | 98.9 | 95.3 |
| Turbidity (at WTW) | 92.0 | 92.2 | 96.6 | 82.1 | N/A |

[A parametric value of 4.0 NTU at the tap is used for comparative purposes as this was the parametric value in the 1988 Drinking Water Regulations].

Measuring turbidity at the plant is a useful tool to determine whether *Cryptosporidium* is being removed adequately. Turbidity monitoring as set out in Table 2-12 indicates a low rate of compliance with the turbidity parametric value at the water treatment works. Although limited monitoring was reported, the results indicate that 33.9% (62 of 183) of supplies monitored at the water treatment works reported results in excess of the turbidity parametric value (see Appendix IV). Elevated levels of turbidity have been shown to be associated with outbreaks of *Cryptosporidium* (Carlow in 2006 and Galway City in 2007). If this trend were scaled up, many public water supplies may be unable to remove *Cryptosporidium* oocysts (if present in the raw water).



Photograph 2-1: Blakestown Britonstown Group Water Scheme (Co. Wicklow).

2.5 Group Water Schemes and Private Water Supplies

Water quality in a significant proportion of group water schemes continues to be inferior to that in public water supplies. Whereas, the quality of drinking water in publicly-sourced group water schemes is broadly similar to that of the public water supplies themselves, the same cannot be said for the microbiological quality of water supplied by many privately-sourced group water schemes.

The results for 2009 shows that 87 schemes or 17% (down from 24.9% in 2008) of all privately-sourced schemes monitored were contaminated with *E. coli* at least once during 2009. The percentage of supplies contaminated with *E. coli* from 2007 to 2009 is illustrated in Fig. 2-1.

The upgrading of private group water schemes continued to be a priority in 2008 and 2009. This involved one of three routes (i) design, build, operate (DBO) bundling (ii) connection to a public main or (iii) minor upgrade (predominantly for good quality groundwater supplies).

The year-on-year investment in improving the performance of the group water scheme sector continued in 2009 with an allocation of €100 million under the Rural Water Programme. As in recent years, a substantial portion of this investment (40%) was directed towards DBO bundling contracts, with other upgrading works (including interim solutions for schemes awaiting major upgrades) accounting for further €10 million. Some €14 million was allowed for taking-in-charge of schemes, with €1.5 million for schemes connecting to public mains.



Photograph 2-2: Gormanstown/Usk Group Water Scheme (Co. Kildare) which was part of the Leinster DBO bundle completed in 2009.

The DBO bundling strategy has proven successful. At the end of 2009, 17 projects in all were addressing non-compliance on 218 schemes, many of which amalgamated as part of the upgrade process. This amalgamation has left 151 current group water schemes in the DBO bundling process. One such bundle, the South Leinster project, was virtually completed in 2009. Substantial works in advance of DBO projects in Galway, Mayo and Roscommon continued during 2009, although work had still to begin on a small number of schemes.

A total of 41 schemes that were privately-sourced in 2008 were connected to public mains in 2009. Many schemes with immediate quality issues and not being connected or otherwise upgraded immediately were provided with interim treatment solutions by 2009.

Water Services Authorities (as supervisory authorities for the Group Water Schemes) have issued Directions in cases where schemes were failing to agree a viable upgrade strategy. For several schemes this has resulted in action to upgrade. However, a small minority of schemes in a number of counties were still without an upgrade plan. Where a potential risk to public health exists, Water Services Authorities are obliged under the Drinking Water Regulations to take the steps necessary to remedy the situation.

Training for group water scheme staff remained a core element of the National Federation of Group Water Scheme's work in 2009. A total of 126 group water schemes completed the Quality Assurance course, bringing the total since the course began roll-out to 200.

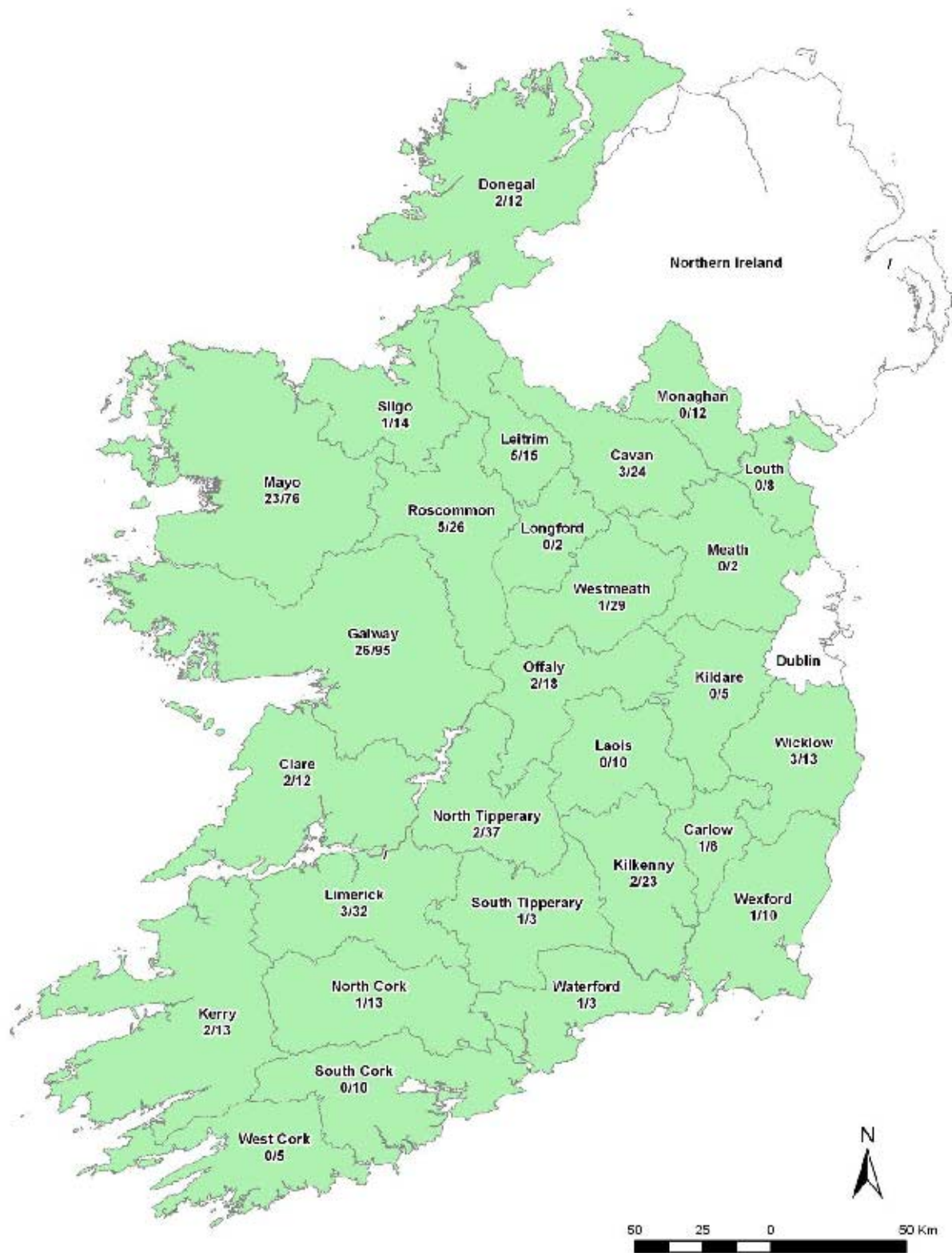


Figure 2-2: Number of Private Group Water Schemes contaminated with *E. coli* during 2009¹¹ as a proportion of the total number of schemes.

¹¹ There are no group water schemes serving >50 persons in any of the four Dublin local authority areas.

3.

EPA Enforcement of Public Drinking Water Supplies



3. EPA Enforcement of Public Drinking Water Supplies

3.1 Statutory Powers of the EPA

The powers assigned to the EPA under the 2007 Drinking Water Regulations include:

- The use of enforceable Directions to ensure that water supplies comply with the relevant quality standards.
- The oversight of actions taken by Water Services Authorities in public water supplies to continue to meet the relevant quality standards.
- The oversight of monitoring carried out by Water Services Authorities.
- The completion of audits at Water Services Authorities water treatment plants.
- The publication of guidance to assist compliance with the Drinking Water Regulations.

Water Services Authorities, have been designated as the supervisory authority over private water supplies (including group water schemes) and have similar powers and responsibilities to the EPA in relation to these supplies.

The Regulations require Water Services Authorities to notify the EPA of failures to meet the quality standards following which the EPA can direct the Water Services Authority to take corrective action where necessary. Only when a corrective action, as directed, is not complied with, can a prosecution be considered by the EPA. In other words the EPA may prosecute a Water Services Authority only if it fails to comply with an EPA Direction and not for supplying water that is not clean and wholesome.

3.2 Remedial Action List

As part of its supervisory role under the Regulations, the EPA prepares a list of public water supplies where remedial action or management action is required to ensure compliance with the requirements of these Regulations into the future. This list is called the “Remedial Action List for Public Drinking Water Supplies” (RAL). The EPA uses the RAL to focus attention on resolving any deficiencies in public water supplies and to ensure that Water Services Authorities prepare and implement an action programme for each public water supply on the list.

a. Criteria for inclusion on the RAL

Public water supplies were included on the original RAL in 2008 for one or more reasons:

- The supply had reported failure(s) of the following priority RAL parameters in the previous two years:
 - Table A (microbiological parameters): *E. coli*
 - Table B (chemical parameters): nitrate, trihalomethanes, bromate
 - Table C (indicator parameters): aluminium, turbidity
- The supply had inadequate treatment (e.g. no treatment other than chlorination for a surface water supply or poor turbidity removal or excessive levels of aluminium in the treated water).
- Monitoring results or compliance checks by the EPA indicate a lack of operational control at the supply’s treatment plant.
- The supply was identified by the Health Service Executive as a supply where improvements are required.

The RAL includes supplies where the primary issue to be addressed is the water treatment plant. The list does not include supplies where there are issues of quality caused by the distribution network. For example, supplies that have failed to meet the lead parametric value due to the presence of lead pipework in the distribution network are not included on the list.

b. Adding to and removing supplies from the RAL

This list of supplies that require remedial action is dynamic. At quarterly intervals, additional supplies may be added to the RAL as further information is gathered from EPA audits, notifications of exceedances or information gathered from Water Services Authorities, the Health Service Executive and the Department of Environment, Heritage and Local Government. Supplies are removed from the list at each quarterly update when sufficient corrective action is taken by the Water Services Authority. In general, a supply will not be removed from the list on the basis of monitoring results alone, the local authority must demonstrate that appropriate actions have been taken (e.g. new infrastructure, procedures or training) to ensure that compliance is secured and the risks of failure have been minimised.

In 2009, the EPA published revised guidance (Guidance Booklet No.3) to outline the purpose of the RAL and the actions that must be taken before a supply can be removed from the RAL. This guidance has subsequently been incorporated into the *European Communities (Drinking Water) Regulations (No.2) 2007: A Handbook on the Implementation of the Regulations for Water Service Authorities for Public Water Supplies*, available to download at www.epa.ie

c. Numbers of supplies on the RAL

The first RAL collated by the EPA in January 2008 identified 339 public water supplies representing 36% of public drinking water supplies that require detailed profiling to ensure that the supply is providing clean and wholesome drinking water. Progress by supplies on the original RAL is as follows:

1. 142 (42%) of the original 339 supplies have been removed from the RAL.
2. 30 supplies were added to the original RAL but have been subsequently removed.
3. 72 supplies were added to the original RAL and remain on the current RAL.
4. 269 supplies in total were on the RAL as of the end of September 2010 (see Fig. 3-1).

The population served by supplies that are now safe and secure and have been removed from the RAL is over 500,000, however, the remaining supplies on the RAL collectively supply water to a population of 1,162,112 persons.

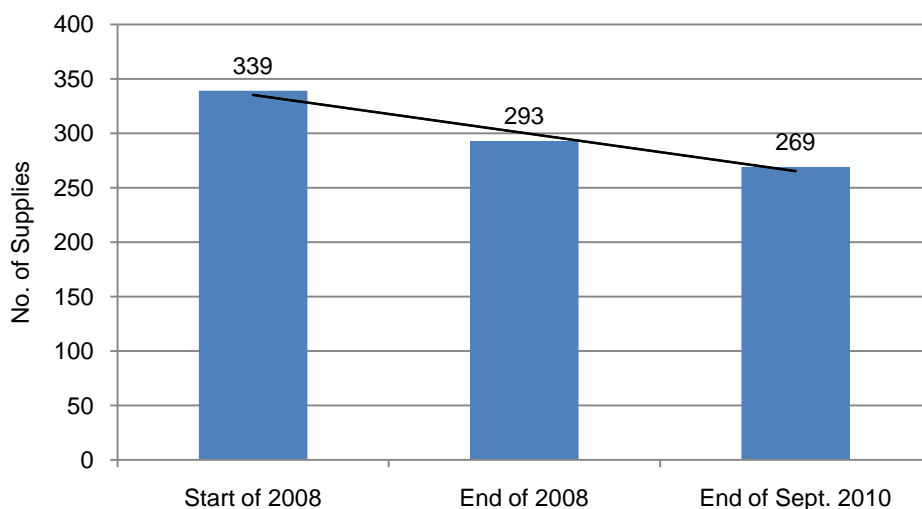


Figure 3-1: Progress with the number of public water supplies on the Remedial Action List.

Table 3-1 gives a summary of the supplies added or removed from the original RAL.

Table 3-1: Summary of Supplies Added or Removed from the Remedial Action List.

| | No. of water supplies |
|---|-----------------------|
| Supplies added to RAL that are still on the RAL | |
| Table A: Microbiological failure e.g. <i>E. coli</i> , <i>Cryptosporidium</i> | 50 |
| Table B: Chemical Failure e.g. Nitrate, Trihalomethanes | 9 |
| Table C: Indicator Failure e.g. aluminium, coliforms | 1 |
| Other ¹² | 12 |
| Total No. of Supplies Added | 72 |
| Supplies removed from the RAL | |
| Abandoned or Replaced | 52 |
| Upgraded | 76 |
| Improved Operations | 31 |
| Other ¹ | 13 |
| Total No. of Supplies Removed | 172 |

d. Progress with Remedial Actions

Water Services Authorities with supplies on the RAL were requested by the EPA to put in place a programme of remedial actions to ensure water supplies were made safe and secure. It was outlined to Water Service Authorities that each action programme should involve the profiling of the water supply from catchment to consumer, the identification of risks to the safety and security of the water supply and the management measures to address the risks identified. These measures could include abandoning or replacing the source, upgrading the treatment facilities or improving operational and maintenance arrangements. Each Water Services Authority was required to submit a report to the EPA by 30 November 2009 outlining the remedial actions proposed and an estimate of the timeframe for the completion of these remedial actions. A brief summary of the proposed actions is available on the RAL summary which is available to download from the EPA's website (www.epa.ie) while Table 3-2 gives an overview of the actions proposed.

Table 3-2: Summary of Actions to be taken for the 269 Current RAL Supplies (to end September 2010).

| | No. of Water Supplies |
|-------------------------------|-----------------------|
| To be Abandoned or Replaced: | 43 |
| To be Upgraded: | 203 |
| To Improve Operations: | 23 |
| Total No. of Supplies: | 269 |

¹² Other includes supplies identified as having lack of operational control or improvements required, as identified by the EPA or HSE.

Since its initial publication in January 2008, a number of large public water supplies have been removed from the RAL. In particular, the major water supplies to Galway, Limerick and Waterford cities have all been upgraded to the satisfaction of the EPA such that they have been removed from the RAL. However, progress with the upgrade of the Cork City water supply has been slower and the supply is not likely to be upgraded until 2014.

Furthermore, the water supply in Dublin that supplies part of the city and originates from the Vartry and Stillorgan reservoirs has been added to the RAL. The water is transported from the Vartry Reservoir to Newtownmountkennedy through the Callow Hill tunnel, which is an unlined tunnel and there are inherent risks in the open storage of treated drinking water at Stillorgan.

Progress in undertaking the remedial actions necessary to ensure that the water supplies are secure varies between Water Services Authorities. Table 3-3 shows the number of supplies each Water Services Authority had on the original RAL and the number that have been removed from the original RAL. Clare, Donegal, Laois, Limerick County, Limerick City, Longford, Monaghan, Offaly, Waterford, Waterford City, Westmeath and Wicklow County Councils have been proactive in implementing remedial actions and over 50% of the supplies in each of these areas have now been removed from the original RAL. All supplies in Galway City, Limerick City, Waterford City, Offaly, Westmeath have now been removed from the RAL.

| Water Services Authority | No. of Water Supplies on the Original RAL | No. of Water Supplies Removed from the Original RAL | No of Water Supplies added to the RAL | No. of Supplies on the Current RAL | Works Completed | To be completed 2010 - 2012 | To be completed after 2013 | No Timeframe for Completion |
|--------------------------------|---|---|---------------------------------------|------------------------------------|-----------------|-----------------------------|----------------------------|-----------------------------|
| Carlow County Council | 4 | 2 | 2 | 4 | 1 | 3 | | |
| Cavan County Council | 10 | 4 | 1 | 7 | 3 | 4 | | |
| Clare County Council | 9 | 6 | 1 | 3 | | | | 3 |
| Cork City Council | 1 | 0 | 0 | 1 | | | 1 | |
| Cork Co. Co. (North) | 12 | 6 | 3 | 8 | | 7 | | 1 |
| Cork Co. Co. (South) | 9 | 1 | 2 | 9 | | 9 | | |
| Cork Co. Co. (West) | 17 | 6 | 5 | 16 | | 11 | | 5 |
| Donegal County Council | 33 | 19 | 3 | 16 | | 6 | | 10 |
| Dublin City Council | 1 | 0 | 2 | 3 | | | 3 | |
| Dun Laoghaire Rathdown Co. Co. | 0 | 0 | 3 | 3 | | | 3 | |
| Fingal County Council | 0 | 0 | 1 | 0 | | | | |
| Galway City Council | 1 | 1 | 0 | 0 | | | | |
| Galway County Council | 34 | 8 | 6 | 31 | | 29 | | 2 |
| Kerry County Council | 41 | 4 | 16 | 53 | | 50 | 3 | |
| Kildare County Council | 0 | 0 | 0 | 0 | | | | |
| Kilkenny County Council | 7 | 1 | 2 | 8 | 1 | 4 | | 3 |
| Laos County Council | 8 | 7 | 0 | 1 | | | 1 | |
| Leitrim County Council | 2 | 1 | 1 | 2 | 1 | 1 | | |
| Limerick City Council | 1 | 1 | 0 | 0 | | | | |
| Limerick County Council | 12 | 8 | 6 | 8 | 1 | 7 | | |
| Longford County Council | 5 | 3 | 1 | 3 | | 2 | | 1 |
| Louth County Council | 3 | 0 | 0 | 3 | | 3 | | |
| Mayo County Council | 15 | 4 | 0 | 11 | | 10 | 1 | |
| Meath County Council | 8 | 3 | 6 | 7 | | 4 | 1 | 2 |
| Monaghan County Council | 12 | 9 | 0 | 3 | | 1 | | 2 |
| North Tipperary County Council | 6 | 2 | 2 | 4 | 1 | 3 | | |
| Offaly County Council | 8 | 8 | 0 | 0 | | | | |
| Roscommon County Council | 10 | 1 | 5 | 13 | 1 | 11 | 1 | |
| Sligo County Council | 8 | 3 | 0 | 5 | | 5 | | |
| South Dublin County Council | 0 | 0 | 0 | 0 | | | | |
| South Tipperary County Council | 14 | 2 | 2 | 13 | | 10 | 1 | 2 |
| Waterford City Council | 1 | 1 | 0 | 0 | | | | |
| Waterford County Council | 18 | 13 | 13 | 15 | | 4 | | 11 |
| Westmeath County Council | 3 | 3 | 0 | 0 | | | | |
| Wexford County Council | 4 | 2 | 1 | 3 | 1 | 1 | | 1 |
| Wicklow County Council | 22 | 13 | 14 | 16 | | 7 | 8 | 1 |

Table 3-3: Number of Supplies Removed from the Original RAL and Time Frames for the Completion of Remedial Action Plans for each Water Services Authority
(Colour legend: orange = same number as on original list; green = decrease in number from original list and red = an increase in numbers from the original RAL list).

A timeframe for the completion of the remedial actions for each supply on the RAL has been submitted to the EPA by each Water Services Authority. A summary of the completion dates for the remedial actions is illustrated in Fig. 3-2.

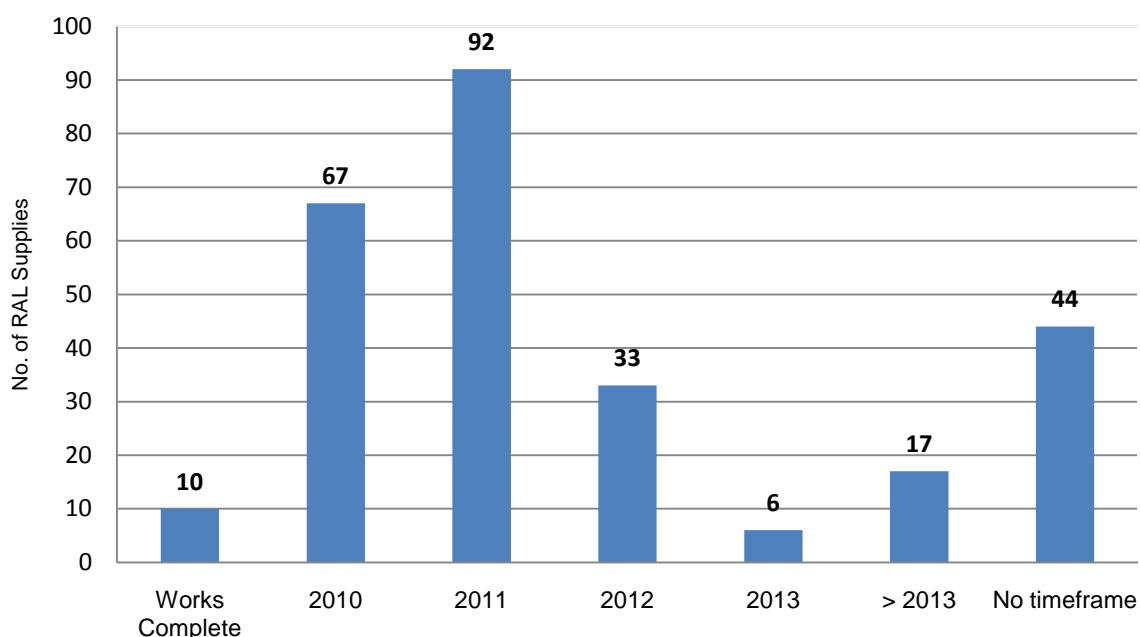


Figure 3-2: Timeframes for completion of Remedial Action Plans.

The reports submitted by the Water Services Authorities indicate that actions are complete or largely complete for 10 supplies on the RAL. Many of these supplies will be removed from the RAL once the appropriate monitoring has been carried out in the supply to verify that the actions taken have been successful in improving the security of the supply. A number of supplies in Cork (19) and Waterford (6) have carried out the necessary improvement works (in these cases the disinfection system has been upgraded) and have installed chlorine monitors and alarms to improve the management of the disinfection system. However, such supplies cannot be removed from the RAL until systems and protocols are in place to respond appropriately to out-of-hours alarms. Cork County Council has indicated that this response procedure will be in place by March 2011 while Waterford County Council has developed a response procedure that is currently under review.

Water Services Authorities have indicated that a further 67 supplies will have the necessary remedial actions completed by the end of 2010. Thus, if the works are carried out as planned by the Water Services Authorities the EPA anticipates that approximately 30% of supplies on the RAL should be capable of being removed from the list by the end of 2010.

Thirteen Water Services Authorities did not provide an estimation of the timeframe for the completion of the remedial actions for one or more of the supplies within their functional area (44 in total). The most common reasons provided for this were the lack of available funds to carry out the necessary work and/or uncertainty over the actions to be carried out. The largest number of supplies are located in Donegal (10) and Cork West (5). While some of these supplies were recently added to the RAL, 31 supplies were on the original EPA list published in January 2008.

The new Water Services Investment Programme 2010 – 2012 includes some €274 million to allow for the commencement of contracts in respect of supplies on the RAL. Where risks are identified by the EPA in future reports, the Department of the Environment, Heritage and Local Government has committed to working with the EPA and the Health Service Executive, to identify the most appropriate and effective solution, and where necessary, amend the Investment Programme through their annual review process.

The complete list of public water supplies currently on the RAL, including details of the proposed remedial measures and associated timeframes, is available to download from the EPA's website.

3.3 Audits of Public Water Supplies

The 2007 Drinking Water Regulations provide for the supervising authority to undertake audits of water supplies for which it has supervisory responsibility. Because the EPA is the supervisory authority with respect to public water supplies, it may audit the performance of Water Services Authorities to verify their compliance with the regulatory requirements. For private water supplies, the Regulations provide for the Water Services Authority, as the supervisory authority, to audit the performance of private water suppliers within its functional area to verify compliance with regulatory requirements.

The EPA conducted 66 audits of Water Services Authorities drinking water treatment plants during 2008 and 114 audits during 2009. Table 3-4 provides a summary of issues identified during EPA audits of local authority drinking water treatment facilities in 2009.

The main compliance issues identified are discussed in the following sections of this report:

- a. Inadequate protection of the source;
- b. Inadequate treatment;
- c. Distribution system hazards;
- d. Management and control vulnerabilities; and
- e. Risk from hazardous events.

The EPA also conducts scheduled and unscheduled audits of Water Service Authority drinking water treatment supplies as issues arise.

Table 3-4. Issues Identified by EPA Audits of Drinking Water Treatment Plants during 2009.

| Issue | No. of Water Supplies where Issues were Confirmed during Audit | % of Supplies Audited (where item was applicable) |
|---|--|---|
| 1 Inadequate source-protection measures in place. <i>Reason: Potential sources of pollution could be present to contaminate the supply.</i> | 57 | 51% |
| 2 No chlorine monitor and alarm. <i>Reason: Chlorine monitors and alarms alert the operator of the plant to inadequate treatment of the supply even when the plant is unattended.</i> | 20 | 19% |
| 3 Inadequate disinfection contact time. <i>Reason: Inadequate contact time may result in micro-organisms posing a risk to human health.</i> | 34 | 32% |
| 4 No duty and standby chlorine pumps. <i>Reason: If a pump fails undisinfecting water may enter the water supply and pose a risk to human health.</i> | 24 | 23% |
| 5 Problems in the operation of the filters. <i>Reason: Poor filtration indicates inadequate treatment of the water which may result in contaminants not being removed.</i> | 26 | 55% |
| 6 No turbidity monitors on each filter. <i>Reason: Turbidity monitors are critical for controlling the quality of treated water post filtration.</i> | 25 | 53% |
| 7 Final water turbidity >1.0 NTU¹³. <i>Reason: Excessive levels of turbidity indicate that if Cryptosporidium is present in the source water it is likely to be in the treated water and may pose a risk to human health.</i> | 17 | 29% |
| 8 Floc carryover from the clarifier. <i>Reason: Floc carryover indicates poor control over chemical dosing and may result in excessive chemicals in treated water or inadequate treatment of water.</i> | 12 | 43% |
| 9 Inadequate chemical dosing arrangements. <i>Reason: Failure to dose correctly will result in excessive chemicals in treated water or inadequately treated water.</i> | 27 | 36% |
| 10 Unapproved/inappropriate chemicals used. <i>Reason: Unapproved/inappropriate chemicals may pose a risk to health.</i> | 6 | 6% |
| 11 Treatment process partially or fully bypassed. <i>Reason: Bypassing treatment processes reduces the protection to the supply that these treatment processes provide and increase the likelihood of contamination.</i> | 11 | 10% |
| 12 Plant operating >10% above design capacity. <i>Reason: Excessive loading on plant places stresses on treatment processes making them vulnerable to failure.</i> | 7 | 6% |
| 13 Reservoir/clearwater tank not completely and securely covered. <i>Reason: Direct contamination of treated water by animals or malicious intent may occur and may pose a risk to human health.</i> | 8 | 10% |

¹³ Nephelometric Units

a. Inadequate Protection of the Source

Source protection is the first barrier for the production of safe drinking water quality. By decreasing contamination of source water, the amount of treatment and quantity of chemicals needed to treat the water is reduced. This may also reduce the production of treatment by-products and minimise operational costs. Therefore, source protection is vital for effective drinking water risk management.

Audits conducted by the EPA on public water supplies during 2009 found that:

- Inadequate protection of the source was noted in 51% of audits conducted by the EPA on public water supplies. This is an increase from 45% for 2008.

These audits were targeted at public water supplies that already had exceedances of the drinking water standards or were on the RAL and highlights an area of drinking water treatment requiring significant improvement.



Photograph 3-1: A poorly protected source.



Photograph 3-2: A well protected source with secure fencing around the area of the abstraction point.

b. Inadequate Treatment

Water is rarely suitable for drinking without some form of treatment. Exceptions would include an adequately protected borehole with a small distribution network (e.g. a house with a private well). All public water supplies should be subject to some form of treatment. The type of treatment that is necessary to ensure that the water supplied is clean and wholesome depends on the:

- source of the water supply (e.g. surface water supplies require more treatment than groundwaters);
- quality of the untreated water;
- risks to the quality of the water.

The most reliable approach to achieving a safe and secure water supply is to have multiple barriers in place that keep water contaminants from reaching the consumer. The security provided by the multiple-barrier approach is reliant on each individual barrier being of the appropriate specification, and operated in accordance with best practice and guidance.

i. Disinfection

All water supplies should as a minimum be disinfected to ensure the safety of the final water for drinking. The disinfection system should be reliable (e.g. flow-proportional dosing, adequate contact time and with duty and standby dosing pumps) and verifiable (i.e. should have a chlorine monitor and an alarm). The most common disinfection technology used in the treatment of drinking water in Ireland is chlorination.

In 2009, the Agency audited 114 public water supplies on the adequacy of disinfection systems and found that:

- 23% of plants audited did not have a duty and standby disinfectant dosing arrangement as required; a decrease from 34% for the previous reporting period. This may leave consumers vulnerable to receiving water that is not adequately disinfected in the event of the failure of one chlorine dosing pump.
- 19% of drinking water treatment plants audited did not have a chlorine monitor and alarm in place; a decrease from 50% for the previous reporting period. In the absence of a chlorine monitor and alarm, the adequacy of chlorination cannot be verified nor can a reduction below the required chlorine level be detected rapidly and responded to.
- 32% of plants audited had inadequate disinfection contact time; an increase from 13% of plants where the issue was observed during the previous reporting period.
- Of the 84 drinking water treatment plants with chlorine monitors and alarms in place, 13 were found to be either without a dial-out facility or had a dial out facility but alarms were not being responded to when triggered.



Photograph 3-3: Chlorine gas drums for disinfecting water.

Outbreaks of Verotoxigenic *E. coli* (VTEC), a strain of *E. coli* that produces a powerful toxin and can cause severe illness, have been found by the Health Protection Surveillance Centre (HPSC) to be linked to the consumption of untreated private well water during heavy rainfall such as that experienced in November 2009 (<http://www.ndsc.ie/hpsc/A-Z/Gastroenteric/VTEC/>).

The HPSC advises that in times of heavy rainfall, users of vulnerable private supplies should consider boiling their water or take appropriate action to prevent the risk of illness. Twenty six cases of VTEC were reported to the HPSC in November 2009 (extensive flooding occurred on a national scale during this period), compared with between 2 and 10 cases for the same period in previous years. Well water can become contaminated with surface water without any noticeable change in taste or smell. Where cases were reported, householders were advised to disinfect their private wells regularly and to protect them from contaminated surface water.

ii. Treatment Barriers

For proper disinfection and treatment, two barriers at a minimum are required. In the case of groundwater, the natural geology acts as one barrier and disinfection acts as the second. In the case of surface water supplies, a treatment system is required to act as the first barrier and disinfection as the second. This requirement is to ensure that water is wholesome and clean and to prevent the entry of *Cryptosporidium* into the water supply. When a Water Services Authority detects *Cryptosporidium* in a drinking water supply, it must consult with the Health Service Executive to establish if there is a risk to human health.

There was a rise in the number of cases of cryptosporidiosis reported to the Health Protection Surveillance Centre (HPSC) in 2009 (447 in 2009 up from 415 in 2008) (www.hpsc.ie). However, this represents an overall decrease since 2007 when 605 cases were reported to the HPSC. This high figure in 2007 was primarily attributed to the outbreak of cryptosporidiosis in Galway during 2007.

The adequacy of installed barriers at drinking water treatment plants was examined during audits conducted by the EPA in 2009. The main findings in relation to barriers were that:

- Inadequate maintenance of filters were observed at 55% of plants audited (with filters in place as a barrier). While this is a decrease from 67% in the previous reporting period, this finding indicates the need for improvements in the management of filters.
- 53% of plants audited with filters in place did not have individual turbidity monitors on each filter. This does not facilitate an assessment of the performance of individual filters and optimisation of the filter process.
- 44% of treatment plants with slow sand filters in place had either inadequate infrastructure or insufficient capacity to permit the running to waste of water in the phase of raised turbidity that immediately follows skimming or replacement of filter media. This leads to a risk of water with increased turbidity getting into the supply for a short time period.
- 43% of plants with clarifiers in place displayed floc carryover representing a decrease from 48% for the previous reporting period. This indicates poor control over chemical dosing and may compromise filter operation.
- 29% of plants had a final water turbidity reading that exceeded 1.0 NTU; a decrease from 45% for the previous reporting period.



Photograph 3-4: Sedimentation tank.

c. Distribution System Hazards

There are a number of hazards¹⁴ which can occur after treated water enters the distribution system; these may have the potential to compromise drinking water security and, consequently, its safety.

i. Integrity of treated water storage tanks:

Water Services Authorities can store treated water at the plant or at a location in the distribution system. Drinking water storage tanks or reservoirs that are poorly constructed or inadequately sealed increase the risk of contamination of treated water by animals or those with malicious intent.

The integrity of treated water storage (clearwater) tanks and reservoirs was examined during EPA audits in 2009. The main findings were that:

- 10% of the drinking water treatment plants with water storage tanks audited by the EPA had issues regarding the integrity of the clearwater tank/storage reservoir.
- 32% of clearwater tanks/storage reservoirs inspected during audits were found to have inadequately sealed vents.



Photograph 3-5: Inadequately sealed clearwater tank/reservoir.

d. Management and Control Vulnerabilities

All treatment technologies employed at drinking water treatment plants require management by trained personnel to maintain their performance and reliability. Verification of the effectiveness of various stages of treatment is essential to assure drinking water security.

During EPA audits of public water supplies, management and control systems were assessed to highlight good practices and alert plant operators to any potential vulnerabilities. A total of 114 drinking water audits were completed by the EPA during 2009 and the following process management and system issues of concern were observed:

¹⁴ The WHO defines a **hazard** as 'any biological, chemical, physical or radiological agent that has the potential to cause harm' (e.g. *Cryptosporidium* is a water quality hazard, a potential danger to public health).

i. Treatment Plant Capacity

Operating a drinking water treatment plant above its design capacity can place stress on the treatment processes and increase the risk of poor performance. Of the 114 Water Services Authority treatment plants audited by the EPA during 2009:

- 6% were reported to be operating greater than 10% above their design capacity.

These drinking water treatment plants were: Louth County Council – Omeath; Galway County Council - Gort; Offaly County Council – Clonaslee; Cork City Council - Lee Road; Kerry County Council - Lough Cummernamuck and Waterville; and Waterford County Council - Currabaha West. Of the plants identified above, 4 (Gort, Clonaslee, Lee Road and Waterville) are listed in the 2010-2012 Water Services Investment Programme as plant-upgrade projects.

ii. Control & Supervision of chemicals used in the treatment of drinking water.

The use of chemicals as coagulants, coagulant aids and disinfectants is an essential part of the treatment of water - without their use the quality of drinking water would be compromised. Issues can arise where inappropriate or unapproved chemicals are used in treatment plants, where dosing is poorly controlled or where accidents occur. While the majority of chemicals used in Ireland are fit for purpose and used correctly, audits conducted by the EPA during 2009 identified the following issues associated with their use:

- 36% of plants audited where chemical dosing (excluding chlorination, i.e. coagulation and flocculation) was used, need to improve their dosing arrangements.
- 6% of plants audited that had chemical treatment in place were found to be using unapproved or inappropriate chemicals.
- sodium hypochlorite was found to be out of date at 8% of plants where it was used as the primary disinfectant.

e. Risks from Hazardous Events (Flooding)

Severe flooding events in recent years have posed a significant threat to many drinking water supplies. Flooding can lead to hazards such as increased bacterial loadings in the raw water due to wastes from sewage treatment plants, septic tanks and farms being washed into surface waters, and also through the direct inundation of treatment plants with floodwaters. The effects of climate change may also pose a threat to some drinking water supplies in the future.

f. Flooding in 2009

Between the 15 and 20 November 2009, heavy rainfall in combination with near total ground saturation, resulted in severe flooding in many parts of the country, particularly the country's major river systems: the Lee, the Shannon and the Liffey. In Cork, this resulted in the flooding of Cork City Council's Lee Road drinking water treatment plant. A boil water notice was imposed that lasted for five days. Tables 3-5 to 3-7 illustrate, how across the country, boil water notices were issued on the following supplies during November 2009, with flooding/heavy rainfall cited as the likely cause.

Table 3-5: Boil Water Notices issued due to exceedances caused by flooding:

| Supply | Issue/Parameter Exceeded | Population Affected |
|-----------------------|---|---------------------|
| Innishannon, Co. Cork | <i>Cryptosporidium</i> | 10,000 |
| Clondrohid, Co. Cork | <i>Clostridium perfringens</i> | 200 |
| Ballineen, Co. Cork | Elevated turbidity & no barrier in place. | 700 |
| Slane, Co. Meath | <i>E. coli</i> , <i>Enterococci</i> & coliform bacteria | 3360 |
| Mid Galway | <i>E. coli</i> , total coliforms | 3,917 |

Table 3-6: Precautionary Boil Water Notices issued due to flooding:

| Supply | Population Affected |
|---|---------------------|
| Lee Road, Cork City | 54,000 |
| Inchigeelagh, Co. Cork | 150 |
| Ballinasloe Co. Galway | 10,300 |
| Mount Talbot / Four Roads, Co. Roscommon. | 3,500 |
| Taghmon, Co. Wexford. | 850 |

Table 3-7: Other Boil Water Notices Issued - Due to Heavy Rain or Other Reasons:

| Supply | Issue/Parameter Exceeded | Population Affected |
|---------------------------------------|--------------------------|---------------------|
| Raheen, Baltinglass Co. Wicklow* | <i>E. coli</i> | 10 houses |
| Castlerea Regional, Co. Roscommon | <i>Cryptosporidium</i> | 2,600 |
| Knockcroghery/Lecarrow, Co. Roscommon | <i>Cryptosporidium</i> | 450 |

(*This is not the main supply to Baltinglass)



Photograph 3-6: Queuing for water in Cork city after flooding of the Lee Road drinking water treatment plant (November 2009)

(Source: Provision, Cork).

3.4 Notifications of Failures to meet Parametric Values

The Drinking Water Regulations require Water Services Authorities (local authorities) to ensure that any failure to meet the limits set in the Regulations is immediately investigated to determine the cause of such a failure. The Water Services Authority must notify the EPA of any failure and the results of its investigations in accordance with the *Drinking Water Handbook on the Implementation of the Regulations for Water Service Authorities for Public Water Supplies*.

The EPA assesses each notification received and the corrective actions proposed by the Water Services Authority. If the corrective action is not deemed to be satisfactory the EPA may carry out an audit of the treatment plant to assess the actions taken or it may issue a legally binding Direction.

During 2009, the EPA received and assessed notifications leading to the opening of 238 new notification files. This represents a decrease from 352 new files opened in 2008. By the end of 2009, corrective actions had been deemed satisfactory by the EPA in respect of a number of these files, however, investigations, corrective actions and remedial actions are at various stages of completion regarding 430 notifications.

In advance of notifying the Agency, Water Services Authorities (WSA) are required to consult with the Health Service Executive where there is a potential danger to human health. The agreement reached determines whether the EPA is notified under Regulation 9 or Regulation 10 of the 2007 Drinking Water Regulations. Regulation 9 deals with circumstances where there may be a potential danger to human health while Regulation 10 deals with circumstances where there is an exceedance of the drinking water standards but there is not a potential danger to human health.

A breakdown of new notification files opened by the EPA under Regulation 9 and 10 during 2008 and 2009 is provided in Fig. 3.3.

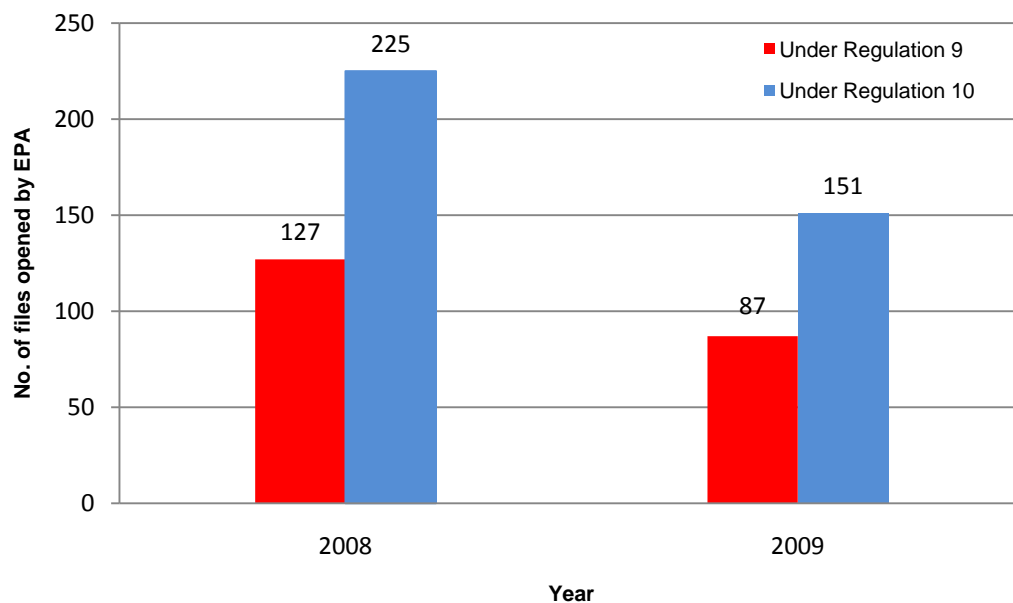


Figure 3-3: Numbers of new notification files opened by the EPA for public water supplies under Regulations 9 and 10, 2008 and 2009.

The EPA assesses each notification of the failure to meet the parametric values within one working day of receipt. Priority is given to notifications received under Regulation 9, where the WSA has indicated there is a risk to public health. Where the investigation indicates that the risk cannot be resolved quickly and is due to the water treatment plant, the supply is added to the Remedial Action List. The WSA is then required to prepare a corrective action programme outlining what remedial

measures are to be undertaken and to submit a timeframe for the completion of these remedial measures to the EPA.

Figure 3-3 shows the number of Regulation 9 notifications received in 2008 and 2009. The EPA assessed each of these notifications at the time and while many of these notifications related to supplies that were already on the RAL, these notifications led to 33 supplies being added to the RAL in 2008 and a further 37 in 2009.

3.4.1 Boil Water Notices/Water Restrictions

In certain circumstances, the Health Service Executive (HSE) may advise the Water Services Authority that there is a potential danger to human health. The Water Services Authority must implement the advice provided by the HSE which may be to either prohibit the supply of water, boil the water prior to consumption, or to restrict the use of water.

In some cases, a boil water notice or water restriction notice does not apply to all of the supply. For example, the notice may apply to only those areas of a distribution network using lead piping, or to water used for consumption by vulnerable groups such as infants, pregnant women, the elderly and immunocompromised patients.

During 2009, 40 new boil water notices and 13 water restriction notices were put in place by 17 Water Services Authorities on 49 supplies. Sixty-nine individual boil water or water restriction notices were active at some stage during the 2009, representing a slight increase from the 66 notices active during 2008 (see Table 3-8).

Table 3-8: Summary of New Boil Notices / Water Restrictions during 2008 and 2009.

| Restriction Type | 2008 No. issued | 2009 No. issued |
|--|-----------------|-----------------|
| Boil Water Notices: | 46 | 40 |
| Water Restrictions: | 8 | 13 |
| Total No. of Boil Notices / Water Restrictions: | 54 | 53 |

Further details of the public water supplies affected by boil water notices or water restriction notices during 2009 are provided in Fig. 3-4 and in Appendix II.

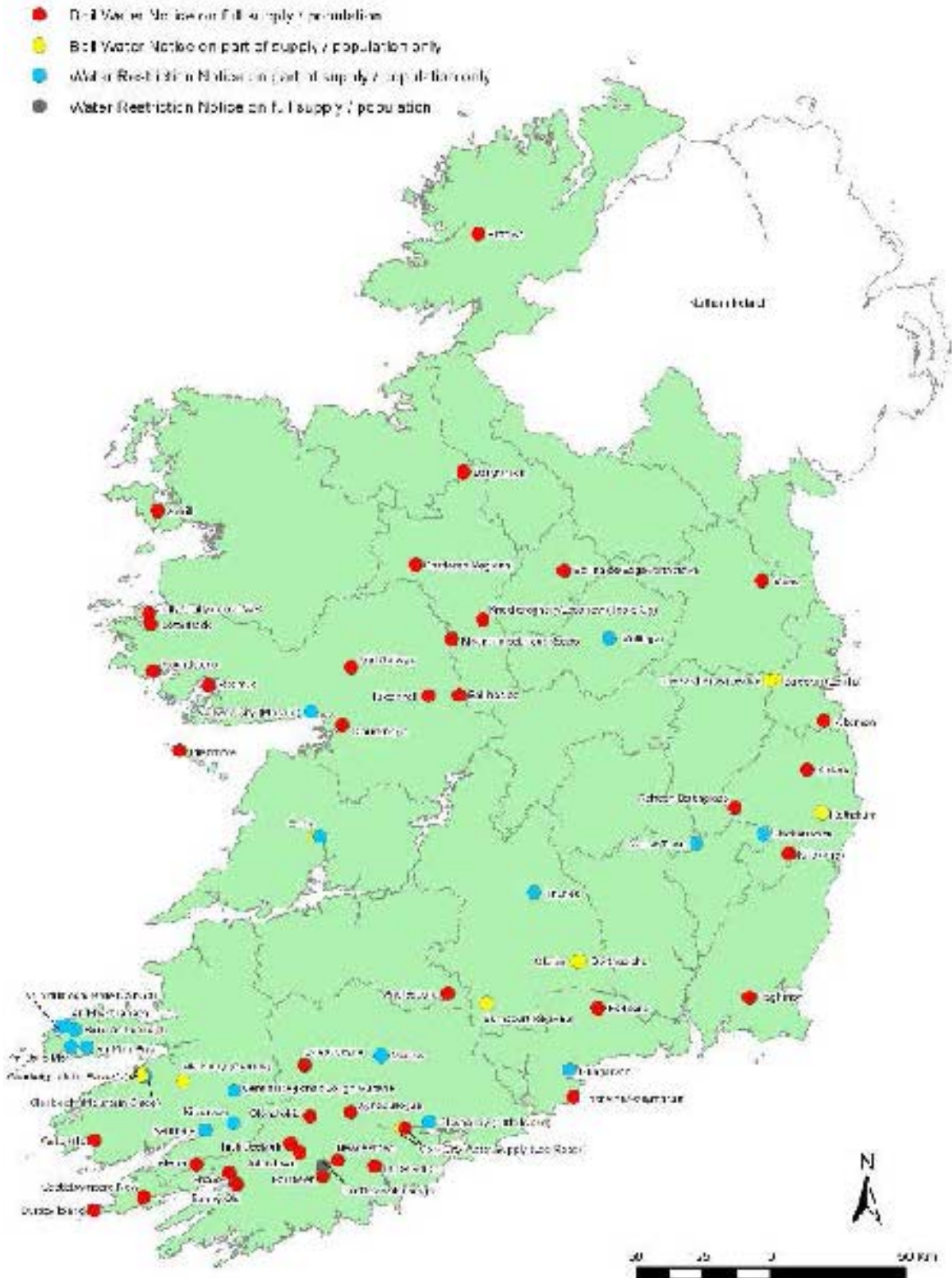


Figure 3-4: Map of Boil Water Notices/Restrictions of Use Placed or Active in Public Water Supplies during 2009.

3.5 Directions and Prosecutions

Following an exceedance of a parametric value, the EPA may issue a Direction under the Drinking Water Regulations, if it is not satisfied that the actions taken by the Water Services Authority are adequate.

The EPA issued 28 legally binding Directions to nine Water Services Authorities (local authorities) during 2009, requiring specific actions to be undertaken to improve the security of the supply in question. A full list of all Directions issued by the EPA is included in Appendix III with details of the reason associated with each provided on the county pages in Appendix I.

Table 3-9: Summary of EPA Enforcement Actions, 2008 and 2009.

| Action | Received / Issued under: | 2008 | 2009 |
|---------------------------|-------------------------------------|------|------|
| Directions Issued: | Under Regulation 9: | 18 | 6 |
| | Under Regulation 10: | 3 | 1 |
| | Under Regulation 16 ¹⁵ : | 23 | 21 |
| Prosecutions: | Under the DW Regulations 2007: | 1 | 1 |

The Agency's report on *The Provision and Quality of Drinking Water in Ireland – A Report for the years 2007 – 2008* identified five public water supplies (all using groundwater) where there was no disinfection in place. The EPA issued Directions to the three Water Services Authorities operating the five public water supplies requiring them to install disinfection systems. By the end of 2009, all five supplies had disinfection systems in place.

Of the 28 Directions issued by the EPA during 2009, 10 have been complied with by the Water Services Authorities and these Directions were closed by the end of 2009.

The two Water Services Authorities that received the most number of Directions in 2008 and 2009 (Waterford County Council and Kerry County Council) have both made significant investments and improvements in their public water supplies particularly in their disinfection systems in the past two years. Kerry County Council has upgraded its chlorination systems with chlorine monitors and alarms installed in over 96% of their supplies and appointed a dedicated water-quality compliance team. Waterford County Council is taking a strategic approach to compliance with the drinking water regulations. It has conducted internal audits of all their public water supplies (101), assessed chlorine contact time at all supplies and plans to install additional storage capacity and/or UV systems to ensure no undisinfecting water enters a public water supply.

The EPA prosecuted Galway County Council in 2008 for failing to comply with a Direction issued to it in relation to the Craughwell public water supply (failure to install a chlorine monitor and alarm). The Council pleaded guilty, a fine was imposed and costs were awarded to the EPA. The EPA prosecuted Galway County Council again in 2009 for failing to comply with a Direction issued to it in relation to the Clarinbridge public water supply (failure to operate the UV treatment unit within its validated range). The Council pleaded guilty, costs were awarded to the EPA, but the case was struck out and no conviction was recorded. The plant was shut down and replaced with water from Luimnagh public water supply.

Table 3-10 provides a further breakdown on the Directions issued in 2009.

¹⁵ Regulation 16 enables a supervisory authority to issue such binding directions as it considers appropriate for the purposes of fulfilling its functions.

Table 3-10: Breakdown of Directions Issued to Water Services Authorities in 2009.

| Local Authority | No. of Directions Issued in 2008 | No. of Directions Issued in 2009 |
|--|----------------------------------|----------------------------------|
| Cavan County Council | 1 | 1 |
| Clare County Council | 2 | 1 |
| Cork County Council | 1 | 5 |
| Donegal County Council | 1 | - |
| Galway City Council | 1 | - |
| Galway County Council | 5 | 1 |
| Kerry County Council | 1 | 13 |
| Kilkenny County Council | 2 | - |
| Longford County Council | 2 | - |
| Mayo County Council | 2 | 4 |
| North Tipperary County Council | 1 | 1 |
| Roscommon County Council | 3 | 1 |
| South Tipperary County Council | 3 | - |
| Waterford County Council | 15 | 1 |
| Wexford County Council | 1 | - |
| Wicklow County Council | 3 | - |
| Total No. of Directions Issued: | 44 | 28 |

3.5.1 Strategic Initiatives

i. Supplies with no treatment barrier

The EPA has identified a total of 73 public water supplies (50 supplies using surface water and an additional 23 spring sources influenced by surface water) that had no treatment other than disinfection (an increase from 64 in the previous reporting period).

All of these supplies are on the Remedial Action List (RAL) of public water supplies as they are at high risk from the potential entry of *Cryptosporidium* into the supply if present in the source water. The EPA required Water Services Authorities to prepare and submit an action programme with timeframes for the installation of an appropriate barrier. Progress has been slow in putting appropriate barriers in place on these supplies. However, 46 supplies (of the original 50 supplies using surface water) have completion dates for the installation of a treatment barrier.

The supplies for which no completion date has been identified are Letterkenny, Glenties-Ardara, Inishboffin (all Donegal) and Gortnapisha (South Tipperary). The main factor causing the delayed progress in installing barriers has been that the majority of these supplies require either the construction of a new water treatment plant or the replacement of an existing plant with an alternative supply. The scale of works required has frequently necessitated public procurement and the lengthy formal steps and timeframes associated with the planning and implementation of water services projects. The EPA is in contact with these Water Services Authorities to secure completion dates.

Where barriers are installed, their adequacy and effective management is critical to their successful performance in preventing the entry of *Cryptosporidium* into the drinking water supply where it is present in the source water.

During 2009 and 2010, an additional 23 supplies with inadequate barriers were identified. The majority of the new supplies added were spring sources that have since been identified as being vulnerable to contamination from surface water and where the treatment is chlorination only (i.e. not capable of providing an adequate treatment barrier against *Cryptosporidium*). As of September 2010, a total of 73 public water supplies were on the RAL due to the absence of an adequate treatment barrier.

ii. **Supplies with no Chlorine Monitors and Alarms**

To tackle the high instances of *E. coli* contamination of drinking water supplies, the Agency has targeted proper disinfection of all public water supplies. The Agency determined that a key compliance factor was the lack of chlorine monitors and alarms to alert operators when the drinking water plant runs out of chlorine that is needed for disinfection.

The remedial actions required were identified and communicated to the City and County Managers Association. A Circular letter was issued to all Water Services Authorities in August 2008 requesting timeframes for addressing this issue. This guided Water Services Authorities on the setting up of an adequate disinfection system and on the preparation of an action programme for the installation of chlorine monitors and alarms on all public water supplies. The Department of the Environment, Heritage and Local Government was engaged and agreed to fund the initiative.

Significant investment has been made by all Water Services Authorities to complete this work particularly where there were a large number of public water supplies or supplies in remote locations. Progress was tracked by the EPA through regular liaison with Water Services Authorities and through audits of drinking water treatment plants.

Figure 3-5 illustrates the good progress made in this area since January 2008. At the end of 2009, 81% of public water supplies had alarmed chlorine residual monitors in place.

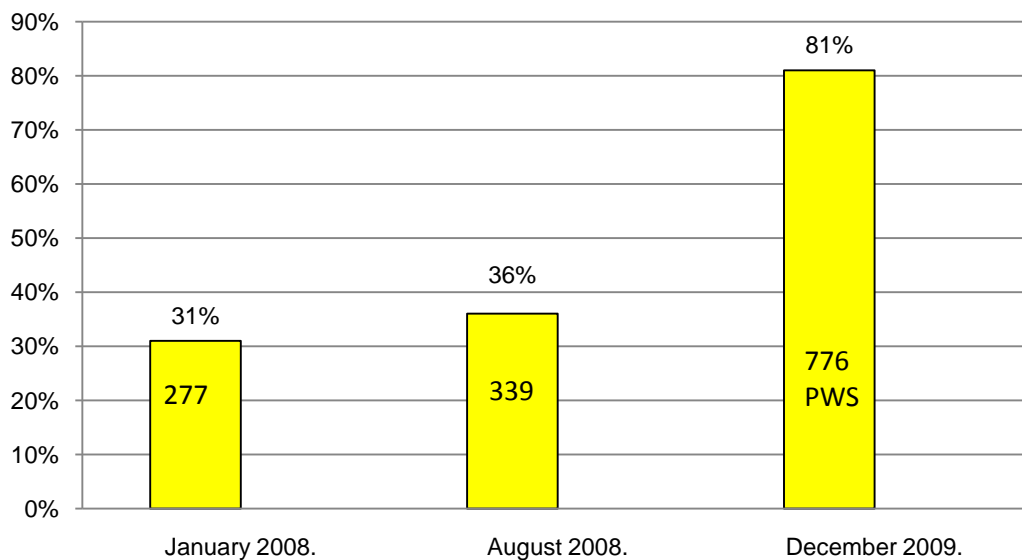


Figure 3-5: Number and percentage of Public Water Supplies with alarmed chlorine residual monitors.

The six Water Services Authorities with supplies without chlorine residual monitors (at the end of 2009) have plans to have such equipment in place. Verification of the disinfection system through the correct operation of the monitors and alarms is important and will provide proof that the treatment system is working satisfactorily.

4.

Findings and Recommendations



4. FINDINGS AND RECOMMENDATIONS

The main recommendations presented in this chapter are based on an assessment of monitoring results for 2008 and 2009 and EPA enforcement of the Drinking Water Regulations in 2009. Recommendations are aimed at all Water Service Authorities and should be adopted for all public water supplies, public group water schemes, private group water schemes, and private supplies, as applicable.

Findings – Water Supply in Ireland

1. The majority of the population of Ireland (85.1%) is supplied with drinking water from one of the 956 local authority operated public water supplies. The remainder of the population is served by public group water schemes (672 supplies serving 2.7%), private group water schemes (529 supplies serving 5.3%), small private supplies (1,245 supplies serving 0.6%) and exempted supplies (single house private wells serving 6.3%).

Findings – Public Water Supplies

1. 142 (42%) of the original 339 public water supplies placed on the EPA Remedial Action List (RAL) have completed the necessary action programmes and have been either replaced, upgraded or have improved operations. The public water supplies in three cities (Limerick, Galway and Waterford) were upgraded and removed from the RAL. The population served by supplies that are now safe and secure and have been removed from the RAL is over 500,000. Thirteen Water Services Authorities did not provide an estimation of the timeframe for the completion of remedial actions for 44 supplies.
2. At the end of September 2010, 269 public water supplies remained on the Remedial Action List. Improvement plans have been developed for supplies in the RAL; however, 44 supplies on the RAL have no completion date for the necessary improvements.
3. 73 public water supplies have been identified by the Agency (50 supplies using surface water and 23 spring sources influenced by surface water) that have no treatment other than disinfection in place and where appropriate barriers to *Cryptosporidium* need to be installed.
4. *E. coli* was detected in 27 (2.9%) public water supplies in 2009 as compared to 77 supplies in 2006. This is a reduction of almost two-thirds in three years.
5. Compliance with the chemical standards for public water supplies was 99.5% in 2008 and 99.2% in 2009. Poorer compliance with the trihalomethanes standard is the main factor in this drop.
6. Compliance with the indicator parameters aluminium (97%) and turbidity (92% at the water treatment plant) parametric values remains an area for improvement.
7. There has been a rise in the number of public water supplies that failed to meet the trihalomethanes parametric value which rose from 4.0% in 2008 to 16.1% in 2009. This is due to a number of factors including the lower parametric value effective from 25 December 2008, an increase in the level of disinfection and inadequate total organic carbon removal in the raw water source.
8. The EPA received and assessed 238 new notifications of failure to meet the drinking water standards in 2009 and 352 in 2008.
9. 40 new boil water notices (serving 92,476 persons) and 13 water restrictions (serving 931 persons) were put in place by 17 Water Services Authorities on 49 public water supplies in 2009. Adverse weather conditions in November 2009 alone led to the imposition of boil water notices in 10 public water supplies (serving approximately 70,000 persons), 5 of these were precautionary boil water notices.

10. At the end of 2009, chlorine residual monitors and alarms were in place in 81% of public water supplies as compared to 40% in August 2008.
11. The EPA carried out 66 and 114 audits of drinking water treatment plants in 2008 and 2009 respectively.
12. EPA audits in 2009 found a range of areas in need of improvement including source protection, disinfection, inadequate disinfection contact time and inadequate chemical dosing.
13. The EPA issued 28 legally binding Directions to nine Water Services Authorities (local authorities) during 2009, requiring specific actions to be undertaken to improve the security of the supply in question. 44 Directions were issued to sixteen Water Services Authorities in 2008.
14. In September 2010, Galway City Council completed a pilot water safety plan for the Terryland Water Treatment Plant. This is the first Water Services Authority to establish such a comprehensive risk assessment and risk management system.
15. The requirement for all Water Services Authorities to ensure that treatment plants can cope with adverse weather conditions and have Drinking Water Incident Response Plans (DWIRP) in place was highlighted once again in 2009, particularly by the effects of exceptional flooding events on several water supplies.
16. A broad range of guidance documents, advice notes and circulars on drinking water are now published on the web by the EPA.

Findings – Public Group Water Schemes, Private Group Water Schemes and Small Private Supplies

1. The microbiological quality of **public group water schemes** in 2009 was improved in 2009 with 0.5% of supplies contaminated with *E. coli*, down from 2.6% in 2008.
2. Failure to meet the trihalomethanes parametric value is an emerging issue in **public group water schemes** with 31.6% of schemes monitored failing to meet the trihalomethanes parametric value in 2009. The incidence of failure to meet the trihalomethanes parametric value is higher than the parent public water supply from which the water is taken indicating that management of the networks needs to be improved.
3. There has been an improvement in microbiological quality of the **private group water schemes** in 2009. Nonetheless, 87 schemes (17.0%) were found to be contaminated with *E. coli* at least once during 2009, down from 134 (24.9%) in 2008. The quality of drinking water in private group water schemes remains inferior to that in public water supplies.
4. There has been a slight improvement in microbiological quality in the **small private supplies** in 2009. Despite the positive trend, 83 supplies (8.6%) were found to be contaminated with *E. coli* at least once during 2009, down from 113 (12.1%) in 2008.
5. A total of 126 group water schemes completed the National Federation of Group Water Scheme's Quality Assurance course in 2009, bringing the total number that have completed the course at the end of 2009 to 200.

Recommendations - Public Water Supplies

1. Water Services Authorities should ensure that all failures to meet the microbiological, chemical and indicator parametric values are investigated to ensure that the cause of the failure is identified and the appropriate corrective action is taken. Lessons learnt and corrective measures should be implemented in other supplies in the county.
2. Water Services Authorities should ensure that all disinfection systems are operated in such a way that undisinfected water does not enter the distribution mains at any time. Water Services Authorities should have regard to EPA Advice Notes and the EPA Water Treatment Manual on Disinfection and should optimise the disinfection system to minimise trihalomethanes formation.
3. Water Services Authorities should review the management of chlorine monitors and alarms and ensure that such monitors are managed correctly (i.e. in the correct location and with an appropriate alarm setting) and that documented response protocols are in place for dealing with activations of the alarm.
4. Water Services Authorities should prioritise remedial works in supplies that are on the Remedial Action List of Public Water Supplies. The actions outlined to the EPA should be completed as soon as possible and within the timeframe specified to the EPA. Water Services Authorities responsible for one or more of the 44 supplies for which no timeframe has been submitted should prepare an action programme with associated timeframes and submit this plan to the EPA.
5. Water Services Authorities should implement the World Health Organisation (WHO) Water Safety Plan approach to the management of water supplies.
6. Water Services Authorities should have in place operational Drinking Water Incident Response Plans (DWIRP) in accordance with the requirements of the Department of the Environment, Heritage and Local Government (DEHLG) Circular letter L4/09 issued in April 2009 (including for adverse weather conditions). An annual review and rehearsal of the DWIRP procedures should be carried out so that all personnel involved understand and are familiar with exactly what they have to do when an incident or emergency occurs.
7. Water Services Authorities should prioritise improvement works on supplies with a boil water or water restriction notice in place on all or part of the supply in order to have the required works completed as a matter of urgency. Following completion of the works, the Water Services Authority must liaise with the Health Service Executive in order to determine whether the completed works allow the removal of the boil water notice or restriction.
8. Water Services Authorities with public water supplies without a *Cryptosporidium* treatment barrier in place and those that are using surface water or water influenced by surface water as their source, should implement an appropriate improvement plan without delay which may involve upgrading, replacing or closing the plant.
9. Water Services Authorities should when conducting a lead survey, have regard to the current lead parametric value of 25µg/l which will decrease to 10µg/l from 2013 and to the EPA Advice Note No. 1: *Lead Compliance Monitoring and Surveys*.
10. Water Services Authorities should remove lead distribution mains as a priority in accordance with EPA Advice Note No. 2: *Action programmes to restore the quality of drinking water impacted by lead pipes and lead plumbing*.

Recommendations - Public Group Water Schemes, Private Group Water Schemes and Small Private Supplies

1. Water Services Authorities should ensure that all failures to meet the microbiological, chemical and indicator parametric values in private water supplies are investigated to ensure that the cause of the failure is identified and the appropriate corrective action is taken. Water

Services Authorities should take the appropriate enforcement action where there is evidence that such investigations and actions are not being undertaken.

2. Water Services Authorities should focus on the private group water schemes that are not being upgraded as part of a planned design build operate (DBO) bundle. Where a group water scheme has not prepared a corrective action programme in accordance with the requirements of Regulation 10 of the Regulations and where there is little evidence of action being taken to improve the quality of the water supply, the local authority should use enforcement powers under the 2007 Regulations to bring the supply into compliance.
3. Services Authorities should ensure that operators of public group water schemes clean and maintain the distribution networks regularly so that the quality of the water supplied by the local authority does not deteriorate in the group water schemes distribution network.

5.

Appendices



APPENDIX I - SUMMARY REPORTS FOR ALL LOCAL AUTHORITIES.

CARLOW COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Carlow County Council is responsible for the operation of 14 Public Water Supplies (PWS) serving a population of 42,776.

Microbiological compliance has increased marginally in PWSs in Carlow from 99.6% in 2008 to 99.7% in 2009 whilst chemical compliance levels have improved from 99.4% in 2008 to 99.9% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.6% | 99.4% |
| 2009 | 99.7% | 99.9% |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|------------------|--------------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Ballinkillen (1) | - |
| <i>Enterococci</i> | - | Leighlinbridge (1) |
| Total No.: | 1 | 2 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---------------------------|-----------------------------|
| | Name of PWS | Name of PWS |
| Trihalomethanes | - | Carlow Central Regional (2) |
| Copper | Carlow North Regional (1) | - |
| Nitrate | Ballinkillen (3) | - |
| Nitrite | Tinnahinch (1) | - |
| Total No.: | 5 | 2 |

Boil Water Notices & Water Restrictions

A summary of water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/ Active (End 09) | BWN/ WR ¹ | Name of PWS | Reason |
|-------------|------------------------------|----------------------|-------------|--------|
| May-09 | Sep-09 | WR | Hacketstown | Lead |
| May-09 | Sep-09 | WR | Carlow Town | Lead |

The two water restrictions above related to the presence of lead pipework in two national schools. At the end of 2009 there were no active boil water or water restriction notices in place on any PWS.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 6 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no Carlow County Council PWS was added to or removed from the RAL.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all of Carlow County Council's public water supplies by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-------------------------------|
| 2008 | 1 | Borris |
| 2009 | 2 | Carlow Town Leighlinbridge |

¹ In some instances the boil notice or water restriction only applies to part of the supply.

CAVAN COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Cavan County Council is responsible for the operation of 17 Public Water Supplies (PWS) serving a population of 21,919.

Microbiological compliance in PWSs in Co. Cavan increased from 98.7% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased from 99.8% in 2008 to 97.9% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 98.7 | 98.8 |
| 2009 | 100 | 97.9 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-----------------------------------|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Arvagh (1), Cavan Regional (1) | - |
| Total No.: | 2 | 0 |

A number of these exceedances may have been subject to a boil water notice / water restriction. See below.

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|-----------------------------------|---|
| | Name of PWS | Name of PWS |
| Bromate | - | Ballyhaise (1) |
| Lead | - | Arvagh (1) Baileboro (1) |
| Pesticides - Total | - | Cavan Regional (1) |
| Trihalomethanes | - | Ballinagh (1) Ballyhaise (1) Cavan Regional (1) |
| Fluoride | Belturbet (1), Cavan RWSS (4). | Belturbet (1) Cavan RWSS (6) |
| Total No.: | 5 | 14 |

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers during 2009 and none remained active during 2009 from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 8 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 1 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no Cavan County Council PWS was added to the RAL and 1 was removed (Ballinagh PWS).

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all of Cavan County Council's public water supplies by the end of 2009.

Directions

The EPA issued 1 Direction to Cavan County Council during 2008 and 1 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-------------|-----------------------------------|
| 2008 | Dowra | Aluminium |
| 2009 | Cavan | Coliform Bacteria, <i>E. coli</i> |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-------------------------------------|
| 2008 | 2 | Cavan Arvagh |
| 2009 | 3 | Ballyconnell Kingscourt Cavan |

CLARE COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Clare County Council is responsible for the operation of 24 Public Water Supplies (PWS) serving a population of 84,313.

Microbiological compliance has increased in PWSs in Co. Clare from 99.7% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased from 99.3% in 2008 to 99.0% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.7 | 99.3 |
| 2009 | 100 | 99.0 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---------------|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Whitegate (1) | - |
| Total No.: | 1 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|---|
| | Name of PWS | Name of PWS |
| Trihalomethanes | Ennis (6) | Ennis (6) Flagmount (2) Limerick City Co, (3) Shannon/Sixmilebridge(1) W. Clare (1) |
| Total No.: | 6 | 13 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices active or issued to consumers by Clare County Council during 2009 is as follows (full details in Appendix II):

| Date Issued | Date Lifted/ Active (End 09) | BWN/ WR ² | Name of PWS | Reason |
|-------------|------------------------------|----------------------|-------------|---------------------------------|
| Jan-05 | Dec-09 | BWN | Ennis | <i>E. coli, Cryptosporidium</i> |
| Oct-08 | Active end '09 | WR | Ennis | Lead |

The BWN notice in Ennis was issued to vulnerable groups (immunocompromised) and not the entire population served by the supply. One boil notice and 1 water restriction notice remained active during 2009 from previous years. At the end of 2009, 1 water restriction notice remained active on the Ennis PWS.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 3 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 7 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 7 PWS were removed from the RAL (Ardataggle, Broadford, Ennis, Ennistymon, Kildysert, Miltown Malbay, Shannon Sixmilebridge) and none were added.

Chlorine Monitors and Alarms

| | |
|---|----|
| Total No. of PWS: | 24 |
| No. of PWS without Chlorine Monitors at end 2009: | 1 |
| No. of PWS without working Chlorine Alarms at end 2009: | 1 |

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. By the end of 2009, chlorine monitors and alarms were in place on all of Clare County Council's public water supplies by the end of 2009 with the exception of 1.

Directions

The EPA issued 2 Directions to Clare County Council during 2008 and 1 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|----------------|----------------------------|
| 2008 | Miltown Malbay | Aluminium |
| | Ennis | By-passing membrane filter |
| 2009 | Ennis | Lead |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---|
| 2008 | 3 | Ennis Miltown Malbay Kildysart |
| 2009 | 5 | Shannon/Sixmilebridge Ennis Miltown Malbay Ballyvaughan Kildysart |

² In some instances the boil notice or water restriction only applies to part of the supply.

CORK CITY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Cork City Council is responsible for the operation of 1 Public Water Supply (PWS) serving a population of 123,000.

Microbiological compliance levels in Cork City Council's PWS were 100% in both 2008 and 2009. Chemical compliance levels increased from 99.6% in 2008 to 100% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.6 |
| 2009 | 100 | 100 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|-------------|
| | Name of PWS | Name of PWS |
| - | - | - |
| Total No.: | 0 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---------------|-------------|
| | Name of PWS | Name of PWS |
| Fluoride | Cork City (2) | - |
| Total No.: | 2 | 0 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers by Cork City Council or active during 2009 is as follows (full details in Appendix II):

| Date Issued | Date Lifted/ Active (End 09) | BWN/ WR ³ | Name of PWS | Reason |
|-------------|---------------------------------|----------------------|-------------------------|----------------|
| Jul-09 | Jul-09 | BWN | Cork City Water Supply* | <i>E. coli</i> |
| Nov-09 | Dec-09 | BWN | Cork City Water Supply | Flooding |

Two new boil water notices were issued during 2009. The BWN imposed in July 2009 affected 2,000 people and followed the detection of *E. coli*. The BWN notice issued in November 2009 followed the flooding of the water treatment plant and affected a population of approximately 54,000. These were serviced by tanker, standpipes and bottled water. At the end of 2009, no boil notices or water restrictions remained in place on Cork City Council's PWS.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 1 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. Progress with the upgrade of Cork City's water supply has been slow and the supply is not likely to be upgraded until 2014.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. A chlorine monitor and alarm is in place on Cork City Council's public water supply.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-----------------------------------|
| 2008 | 1 | Lee Road - Cork City Water Supply |
| 2009 | 1 | Lee Road - Cork City Water Supply |

³ In some instances the boil notice or water restriction only applies to part of the supply.

CORK COUNTY COUNCIL (NORTH)

Summary of Public Water Supply Quality in 2008 and 2009

Cork County Council (North) is responsible for the operation of 76 Public Water Supplies (PWS) serving a population of 73,008.

Microbiological compliance levels have increased in PWSs in Co. Cork (North) from 99.3% in 2008 to 99.8% in 2009 whilst chemical compliance levels have improved from 99.7% in 2008 to 100% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.3 | 99.7 |
| 2009 | 99.8 | 100 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances (North) during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---|-----------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Killavullen (1) Labbamollogga (1) Olivers Cross (1) | Lyreavucane (1) |
| Total No.: | 3 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---------------|-------------|
| | Name of PWS | Name of PWS |
| Lead | Mallow (1) | - |
| Nitrate | Rahan (1) | - |
| Fluoride | Glanworth (1) | - |
| Total No.: | 3 | 0 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/ Active (End 09) | BWN/ WR ⁴ | Name of PWS | Reason |
|-------------|---------------------------------|----------------------|-------------|----------------|
| Oct-09 | Active | BWN | Lyreavucane | <i>E. coli</i> |
| Sep-08 | Mar-09 | WR | Mallow* | Lead |

*WR affected part of supply zone

One new boil water notice was issued during 2009 and no new water restriction notices were issued. The BWN issued in Lyreavucane affected just 6 people and related to the detection of *E. coli*. The Lyreavucane PWS is now no longer operational and has been replaced by the Millstreet PWS. The WR in Mallow affected 71 people and related to lead piping. At the end of 2009, there were no active water restriction notices in place.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 6 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 5 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 5 PWS were removed from the RAL (Allow Regional, Kilavullen, Kilmagner, Mitchelstown Galtee, Olivers Cross Ballyvinitier) and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. By the end of 2009, chlorine monitors and alarms were in place on all but 15 of Cork County Council's public water supplies in the northern division of the county. Systems for out-of-hours response to alarms still have to be implemented by Cork County Council (North).

| | |
|---|----|
| Total No. of PWS: | 76 |
| No. of PWS without Chlorine Monitors at end 2009: | 15 |
| No. of PWS without working Chlorine Alarms at end 2009: | 15 |

Directions

The EPA issued no Directions to Cork County Council (North) during 2008 and 1 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-------------|----------------------|
| 2008 | - | - |
| 2009 | Mallow | Lead |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|-------|------------|---|
| 2008 | 5 | Killavullen Knoppogue Mallow Doneraile |
| 2009: | 0 | - |

⁴ In some instances the boil notice or water restriction only applies to part of the supply.

CORK COUNTY COUNCIL (SOUTH)

Summary of Public Water Supply Quality in 2008 and 2009

Cork County Council (South) is responsible for the operation of 74 Public Water Supplies (PWS) serving a population of 206,386.

Microbiological compliance in PWSs in Co. Cork (South) has decreased from 100% in 2008 to 99.7% in 2009 whilst chemical compliance levels were 99.9% in both 2008 and 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.9 |
| 2009 | 99.7 | 99.9 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances (South) during 2008 and 2009 is as follows:

| Parameter: | 2008 | 2009 |
|----------------|-------------|----------------------------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | - | Aghabullogue (1) Corbally (1) |
| Total No.: | 0 | 2 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|------------|-------------------|-------------------|
| | Name of PWS | Name of PWS |
| Arsenic | - | Robert's Cove (1) |
| Nitrate | Roberts Cove (1). | - |
| Total No.: | 1 | 1 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ⁵ | Name of PWS | Reason |
|-------------|-----------------------------|---------------------|--------------|------------------------|
| Nov-08 | Active | WR | Glashaboy* | Lead |
| Jul-09 | Jul-09 | BWN | Aghabullogue | <i>E. coli</i> |
| Aug-09 | Nov-09 | BWN | Newcestown | <i>E. coli</i> |
| Nov-09 | Nov-09 | BWN | Clondrohid | Flooding incident |
| Nov-09 | Nov-09 | BWN | Innishannon | <i>Cryptosporidium</i> |
| Nov-09 | Nov-09 | BWN | Inchigeelagh | Flooding |

*WR affected part of supply zone

Five new boil water notices were issued during 2009 and no new water restriction notices were issued. The WR issued in Glashaboy affected 150 people and was related to lead piping.

At the end of 2009, 1 water restriction notice (Glashaboy) remained in place.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 9 |
| No. of PWS added to RAL in 2009: | 1 |
| No. of PWS removed from RAL in 2009: | 2 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 2 PWS were removed from the RAL (Kilbritten and Roberts Cove) and 1 was added (Newcestown PWS).

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. By the end of 2009, chlorine monitors and alarms were in place on all but 5 of Cork County Council's public water supplies in the southern division of the county. Systems for out-of-hours response to alarms still have to be implemented by Cork County Council (South).

| | |
|---|----|
| Total No. of PWS | 74 |
| No. of PWS without Chlorine Monitors at end 2009: | 5 |
| No. of PWS without working Chlorine Alarms at end 2009: | 5 |

Directions

The EPA issued no Directions to Cork County Council (South) during 2008 and 1 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-------------|----------------------|
| 2008 | - | - |
| 2009 | Glashaboy | Lead |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009.

| Year | No. of PWS | PWS Audited |
|------|------------|--|
| 2008 | 1 | Youghal |
| 2009 | 5 | Glashaboy Ballingeary Ballymakeera Aghabullogue Newcestown |

⁵ In some instances the boil notice or water restriction only applies to part of the supply.

CORK COUNTY COUNCIL (WEST)

Summary of Public Water Supply Quality in 2008 and 2009

Cork County Council (West) is responsible for the operation of 35 Public Water Supplies (PWS) serving a population of 35,044.

Microbiological compliance levels have increased in PWSs in Co. Cork (West) from 99.1% in 2008 to 99.5% in 2009 whilst chemical compliance levels have decreased from 100% in 2008 to 98.4% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.1 | 100 |
| 2009 | 99.5 | 98.4 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances (West) during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|----------------------------|------------------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Crosterra (1) Snave (1) | Castletownbere New (1) |
| Total No.: | 2 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|--|
| | Name of PWS | Name of PWS |
| Trihalomethanes | - | Bantry Old (1) Drimoleague (1) Keakill (1) Castletownbere New (2) Glengarriff (1) Schull (1) Drinagh (1) |
| Bromate | - | Castletownbere New (1) |
| Total No.: | 0 | 9 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ⁶ | Name of PWS | Reason |
|-------------|-----------------------------|---------------------|--------------------|-------------------------|
| Mar-07 | Active end '09 | WR | Castletownkinneigh | Nitrate |
| Jun-08 | Active end '09 | BWN | Dursey | <i>E. coli</i> |
| Jul-08 | Active end '09 | BWN | Crosterra | <i>E. coli</i> |
| Mar-09 | Active end '09 | BWN | Snave | <i>E. coli</i> |
| Jun-09 | Active end '09 | BWN | Johnstown | Inadequate Disinfection |
| Jun-09 | Dec-09 | BWN | Castletownbere New | <i>E. coli</i> |
| Sep-09 | Oct-09 | BWN | Bantry Old | <i>Cryptosporidium</i> |
| Nov-09 | Dec-09 | BWN | Ballineen | Turbidity |

Five new boil water notices were issued during 2009 and 2 remained in place from previous years. No new water restriction notices were issued but 1 remained in place from a previous year. The Castletownkinneigh WR affected the full supply (33 people). At the end of 2009, 4 boil notices remained in place on the Dursey, Crosterra, Snave, Johnstown, PWS and 1 water restriction remained in place on the Castletownkinneigh supply. (The Snave PWS is no longer operational and was replaced with the Bantry

Derryginagh PWS. The Bantry Old PWS is no longer operational and was replaced with the new Bantry Cahernacrin PWS).

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 18 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 2 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 2 PWS were removed from the RAL (Castletownbere Old and Coppeen No. 2) and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. By the end of 2009, chlorine monitors were in place on all of Cork County Council's public water supplies in the western division of the county. Chlorine alarms were in place on all supplies with the exception of 1. Systems for out-of-hours response to alarms still have to be implemented by Cork County Council (West).

| | |
|---|----|
| Total No. of PWS: | 35 |
| No. of PWS without Chlorine Monitors at end 2009: | 0 |
| No. of PWS without working Chlorine Alarms at end 2009: | 1 |

Directions

The EPA issued 1 Direction to Cork County Council (West) during 2008 and 3 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|--------------------|----------------------|
| 2008 | Johnstown | No treatment |
| 2009 | Castletownbere New | Trihalomethanes |
| | Snave | <i>E. coli</i> |
| | Castletownkinneigh | Nitrate |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of Audits | PWS Audited |
|------|---------------|---|
| 2008 | 3 | Crosterra Keakill Coppeen |
| 2009 | 9 | Johnstown Snave Clonakilty Ballineen Castletownkinneigh Schull Dromore Drimoleague Castletownbere (New) |

⁶ In some instances the boil notice or water restriction only applies to part of the supply.

DONEGAL COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Donegal County Council is responsible for the operation of 39 Public Water Supplies (PWS) serving a population of 133,176.

Microbiological compliance in PWSs in Co. Donegal was 99.8% in both 2008 and 2009 whilst chemical compliance levels have decreased from 99.7% in 2008 to 99.4% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.8 | 99.7 |
| 2009 | 99.8 | 99.4 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|----------------|---------------|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Creelough (1) | Pettigo (1) |
| Total No.: | 1 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|------------------|--|--|
| | Name of PWS | Name of PWS |
| Lead | Ballintra (1) Bundoran Urban(1) Letterkenny (1) Milford (1) | Pettigo (1) |
| Trihalo-methanes | Cashilard (1) Kilcar (1) Malinmore (1) | Ballintra (1) Ballyshannon (2) Carrick-Teelin (1) Cashilard (2) Glenties-Ardara (1) Greencastle (1) Letterkenny (1) Lough Mourne (1) Malinmore (2) Pollan Dam (1) |
| Copper | Donegal (River Eske) (1) Milford (1) | Donegal (River Eske)(1) |
| Fluoride | Creelough (1) Inisowen (1) Killybegs (1) | Gortahork-Falcarragh(1) Lough Mourne (1) |
| Total No.: | 12 | 17 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ⁷ | Name of PWS | Reason |
|-------------|-----------------------------|---------------------|-------------|-------------------|
| Oct-09 | Nov-09 | BWN | Fintown | Coliform Bacteria |

One new boil water notice was issued during 2009 on the Fintown PWS. At the end of 2009, no boil notices or water restrictions remained in place and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 17 |
| No. of PWS added to RAL in 2009: | 1 |
| No. of PWS removed from RAL in 2009: | 14 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 14 PWS were removed from the RAL (Carrigar-Downings, Cullionboy, Donegal [River Eske], Dunkineely, Kilcar, Manorcunningham, Mountcharles Lower, Mountcharles Upper, Fanad West [Tullyconnell], Frosses-Inver, Inishowen West, Pettigo, Cresslough and Portnoo-Narin. One supply was added (Owenteskna-Kilcar).

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. By the end of 2009 chlorine monitors and alarms were in place on all Donegal County Council PWSs.

Directions

The EPA issued 1 Direction to Donegal County Council during 2008 and none during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|--------------|----------------------|
| 2008 | Lifford Old* | No Treatment |
| 2009 | - | - |

*Not main supply to Lifford. (full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---|
| 2008 | 0 | - |
| 2009 | 7 | Cashilard Letterkenny Lough Mourne Lettermacaward Glenties – Ardara Fintown Ballintra |

⁷ In some instances the boil notice or water restriction only applies to part of the supply.

DUBLIN CITY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Dublin City Council is responsible for the operation of 7 Public Water Supplies (PWS) serving a population of 476,500.

Microbiological compliance in PWSs in Dublin City was 99.9% in both 2008 and 2009 whilst chemical compliance levels have improved from 99.5% in 2008 to 99.8% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.9 | 99.5 |
| 2009 | 99.9 | 99.8 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances notified during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|------------------------------|------------------------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Vartry-Ballymore Eustace (1) | Vartry-Ballymore Eustace (1) |
| Total No.: | 1 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|--|------------------------------------|
| | Name of PWS | Name of PWS |
| Lead | Ballymore Eustace-Lexlip (1) Ballymore Eustace –Lexlip & Vartry/Ballymore Eustace (1), Vartry-Ballymore Eustace (1). | Ballymore Eustace(1) Lexlip (1) |
| Nickel | Ballymore Eustace-Lexlip (1), Vartry-Ballymore Eustace (1). | - |
| Total No.: | 5 | 2 |

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 1 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no Dublin City Council PWS was added to or removed from the RAL.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Dublin City Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---|
| 2008 | 3 | Ballymore Eustace Vartry Reservoir Ballyboden |
| 2009 | 0 | - |

DUN LAOGHAIRE RATHDOWN COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Dun Laoghaire Rathdown County Council is responsible for the operation of 8 Public Water Supplies (PWS) serving a population of 220,670.

Microbiological compliance levels have marginally improved in PWSs in Dun Laoghaire Rathdown from 99.5% in 2008 to 99.7% in 2009 whilst chemical compliance levels have decreased from 100% in 2008 to 99.6% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.5 | 100 |
| 2009 | 99.7 | 99.6 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------|---------------|---------------|
| | Name of PWS | Name of PWS |
| Enterococci | Roundwood (1) | - |
| E. coli | Saggart (1) | Kilternan (1) |
| Total No.: | 2 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-----------------|-------------|--------------------|
| | Name of PWS | Name of PWS |
| Trihalomethanes | - | Ballyedmonduff (2) |
| Fluoride | - | Saggart (1) |
| Total No.: | 0 | 3 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ⁸ | Name of PWS | Reason |
|-------------|-----------------------------|---------------------|-------------|---------|
| Jul-09 | Aug-09 | BWN | Kilternan | E. coli |

One new boil water notice was issued during 2009 on the Kilternan PWS and no new water restriction notices were issued.

At the end of 2009, no boil notices or water restriction notices remained in place on the Dun Laoghaire Rathdown PWSs.

EPA Enforcement in 2008 and 2009

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Dun Laoghaire Rathdown County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|----------------|
| 2008 | 1 | Ballyedmonduff |
| 2009 | 1 | Kilternan |

⁸ In some instances the boil notice or water restriction only applies to part of the supply.

FINGAL COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Fingal County Council is responsible for the operation of 4 Public Water Supplies (PWS) serving a population of 252,000.

Microbiological compliance levels have decreased in PWSs in Fingal from 99.8% in 2008 to 99.2% in 2009 whilst chemical compliance levels were 100% in both 2008 and 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.8 | 100 |
| 2009 | 99.2 | 100 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Lexlip (1) | Lexlip (3) |
| Total No.: | 1 | 3 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|-------------|
| | Name of PWS | Name of PWS |
| - | - | - |
| Total No.: | 0 | 0 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ⁹ | Name of PWS | Reason |
|-------------|-----------------------------|---------------------|------------------------|----------------|
| Jul-09 | Aug-09 | BWN | Balseskin (Leixlip) | <i>E. coli</i> |
| Sep-09 | Sep-09 | BWN | The Orchards (Leixlip) | <i>E. coli</i> |

The two boil water notices were in localised parts of the distribution network and related to localised contamination.

EPA Enforcement in 2008 and 2009

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Fingal County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-------------|
| 2008 | 1 | Leixlip PWS |
| 2009 | 0 | - |

⁹ In some instances the boil notice or water restriction only applies to part of the supply.

GALWAY CITY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Galway City Council is responsible for the operation of 1 Public Water Supply (PWS) serving a population of 72,414.

Microbiological compliance in the Galway City PWS was 100% in both 2008 and 2009 whilst chemical compliance levels have improved from 99.8% in 2008 to 100% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.8 |
| 2009 | 100 | 100 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|-------------|
| | Name of PWS | Name of PWS |
| - | - | - |
| Total No.: | 0 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-----------------|-------------|
| | Name of PWS | Name of PWS |
| Nickel | Galway City (1) | - |
| Fluoride | Galway City (1) | - |
| Total No.: | 2 | 0 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ¹⁰ | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|----------------------|--------|
| Sep-08 | Nov-09 | WR | Galway City (Mervue) | Lead |

No new boil water notices or water restriction notices were issued to consumers by Galway City Council during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. A chlorine monitor and alarm is in place on Galway City Council's PWS.

Directions

The EPA issued 1 Direction to Galway City Council during 2008 and none during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-------------------------|----------------------|
| 2008 | Galway City Council PWS | Lead, nickel, copper |
| 2009 | - | - |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-------------------------|
| 2008 | 0 | - |
| 2009 | 1 | Galway City Council PWS |

¹⁰ In some instances the boil notice or water restriction only applies to part of the supply.

GALWAY COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Galway County Council is responsible for the operation of 38 Public Water Supplies (PWS) serving a population of 133,210.

Microbiological compliance levels have decreased in PWSs in Co. Galway from 100% in 2008 to 98.8% in 2009 whilst chemical compliance levels have improved from 98.5% in 2008 to 99.0% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 98.5 |
| 2009 | 98.8 | 99.0 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|-------------|---|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | - | Inishmore (1) Kilconnell (1) Mid-Galway (2) Tully-Tullycross (1) |
| <i>Enterococci</i> | - | Balygar (1) |
| Total No.: | 0 | 6 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---|--|
| | Name of PWS | Name of PWS |
| Selenium | Inishere (1), Inishmore (1). | |
| Trihalo-methanes | Carraroe (5) Derryinver (2) Gort (8) Killimor (2) Kinvara (9), Letterfrack (2) Portumna (8) Roundstone (2) Teeranea/Lettermore(1) Tully-Tullycross (3) Williamstown (2) | Ballinasloe (1) Carraroe (2) Clifden (1) Dunmore/Glenamaddy(1) Gort (2) Inishere (1) Killimor (1) Kinvara (2) Oughterard (2) Portumna (3) Rosmuc (1) Spiddal (2) Teeranea/Lettermore (1) Tully-Tullycross (1) Williamstown (1) |
| Lead | - | Gort (1) |
| Fluoride | Clonbur (1), Cornamona (1). | - |
| Total No.: | 48 | 23 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End '09) | BWN/WR ¹¹ | Name of PWS | Reason |
|-------------|------------------------------|----------------------|------------------|--------------------------------|
| Nov-07 | Apr-09 | BWN | Clarinbridge | <i>Clostridium perfringens</i> |
| Nov-07 | Apr-09 | BWN | Roundstone | <i>E. coli</i> |
| Oct-08 | Active end '09 | BWN | Letterfrack | <i>Cryptosporidium</i> |
| Oct-08 | Active end '09 | BWN | Rosmuc | <i>Cryptosporidium</i> |
| Jul-09 | Jul-09 | BWN | Tully/Tullycross | <i>E. coli</i> |
| Aug-09 | Aug 09 | BWN | Kilconnell | <i>E. coli</i> |
| Sep-09 | Sep-09 | BWN | Inishmore | <i>E. coli</i> |
| Nov-09 | Active end '09 | BWN | Ballinasloe | Flooding |
| Nov-09 | Active end '09 | BWN | Mid Galway | <i>E. coli</i> |

Five new boil water notices were issued during 2009 and 4 remained in place from previous years. No new water restriction notices were issued and none remained in place from a previous year.

At the end of 2009, 4 boil water notices remained active on the Ballinasloe, Mid Galway, Letterfrack, Rosmuc PWS.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 35 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 3 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 3 PWSs were removed from the RAL (Clarinbridge/Kilcolgan, Roundstone and Tuam) and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Galway County Council PWS by the end of 2009.

Directions and Prosecutions

The EPA issued 5 Directions to Galway County Council during 2008 and 1 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|------------------------|--------------------------------|
| 2008 | Roundstone | <i>E. coli</i> |
| | Clarinbridge/Kilcolgan | <i>Clostridium perfringens</i> |
| | Gort | Coliform Bacteria |
| | Letterfrack | <i>Cryptosporidium</i> |
| | Rosmuc | <i>Cryptosporidium</i> |
| 2009 | Carraroe | Trihalomethanes |

Note: The Clarinbridge/Kilcolgan and Roundstone PWSs are no longer in operation. These areas are now supplied from alternative supplies). (full details in Appendix III).

¹¹ In some instances the boil notice or water restriction only applies to part of the supply.

Galway County Council was prosecuted for 1 drinking water offence during 2008 (Craughwell) and for 1 drinking water offence in 2009 (Clarinbridge) following proceedings taken by the EPA for the reasons specified below:

| Year | Name of PWS | Reason for Prosecution |
|------|--------------|---|
| 2008 | Craughwell | Chlorine monitor or alarm not installed as directed. |
| 2009 | Clarinbridge | UV unit not operating within its validated range as directed. |

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---|
| 2008 | 3 | Clarinbridge/Kilcolgan Roundstone Portumna |
| 2009 | 11 | Clarinbridge/Kilcolgan (x2) Gort Letterfrack Rosmuc Carraroe Inishmore Kilconnell Tully / Tullycross Tuam Portumna |

KERRY COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Kerry County Council is responsible for the operation of 81 Public Water Supplies (PWS) serving a population of 116,489.

Microbiological compliance levels have improved in PWSs in Co. Kerry from 99.3% in 2008 to 99.9% in 2009 whilst chemical compliance levels have decreased from 99.8% in 2008 to 99.0% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.3 | 99.8 |
| 2009 | 99.9 | 99.0 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|---|----------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | An Baile Breach (1) An Ghleann (1) Kilgarvan (1) Tieraclea (Tarbert) (1) | Gleann Fan (1) |
| <i>Enterococci</i> | Barraduff (1) Central Regional: Ballymacadam (1). | - |
| Total No.: | 6 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---|--|
| | Name of PWS | Name of PWS |
| Lead | Central Regional: Lisloose(2) Central Regional: Lissardboola (1) | Dromin: Ballyduff (1) |
| Trihalo-methanes | Central Regional: Killsarkin (1). | Aughacaslá (2) Barraduff (1) Camp (1) Castlegregory (1) Central Regional: Ballintobeenig (2) Ballymacadam (2) Killsarkin (1) Knockaninane (1) Lisloose (3), Lissardboola (5) Shereree (1) Lough Guitane (1) Scart (2) Kilgarvan (1) Mid Kerry (1) Shrone (1) Sneem (1) Templenoë (2) |
| Fluoride | Mid Kerry Gearha (1). | - |
| Total No.: | 5 | 30 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ¹² | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|------------------------------------|-------------------------|
| Jan-09 | Active end '09 | BWN | Glenbeigh | <i>E. coli</i> |
| Feb-09 | Active end '09 | BWN | Mid Kerry: Gearha | <i>E. coli</i> |
| Jul-09 | Active end '09 | WR | Kenmare | Inadequate Disinfection |
| Jul-09 | Active end '09 | WR | Glenbeigh | Inadequate Disinfection |
| Aug-09 | Active end '09 | WR | Kilgarvan | Inadequate Disinfection |
| Aug-09 | Active end '09 | WR | An Mhuirioch/ Baile Na nGall | Inadequate Disinfection |
| Aug-09 | Active end '09 | WR | An Baile Mór | Inadequate Disinfection |
| Aug-09 | Active end '09 | WR | An Mhin Aird | Inadequate Disinfection |
| Aug-09 | Active end '09 | WR | An Fheothanach | Inadequate Disinfection |
| Aug-09 | Active end '09 | WR | Baile an Lochaigh | Inadequate Disinfection |
| Aug-09 | Active end '09 | WR | Central Regional: Lough Guitane | Inadequate Disinfection |
| Aug-09 | Sep-09 | BWN | Waterville | <i>E. coli</i> |

Three new boil water notices were issued during 2009 and 9 new water restriction notices were issued. The BWN notice issued for the Glenbeigh PWS applied to part of the supply and affected 16 people. The BWN issued in Mid Kerry - Gearha also applied to part of the supply and affected 25 people. All other WRs issued only applied to part of the supply zone.

At the end of 2009, 2 boil water notices remained in place and all 9 active water restriction notices remained active.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 54 |
| No. of PWS added to RAL in 2009: | 12 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no supplies were removed from the RAL and 12 supplies were added; An Cheapaigh Iarthair, An Chlochán, Baile an Fheirtearaigh, Baile an Lochaigh, Cill Maolcheadair, Dun Chaoin, Glenderry, Glenn Fan, Maulin, Milltown (Poulgorum), Minard (Puck Island) and Portmagee.

Chlorine Monitors and Alarms

| | |
|---|----|
| Total No. of PWS: | 81 |
| No. of PWS without Chlorine Monitors at end 2009: | 8 |
| No. of PWS without working Chlorine Alarms at end 2009: | 8 |

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. By the end of 2009 chlorine monitors and alarms are in place on all Kerry County Council PWS with the exception of 8. In total, however, 58 PWS did not have a dial-out facility in place to alert operators to a triggered low-chlorine alarm.

¹² In some instances the boil notice or water restriction only applies to part of the supply.

Directions

The EPA issued 1 Direction to Kerry County Council during 2008 and 13 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|----------------------------------|---|
| 2008 | Shrone | Coliform bacteria |
| 2009 | Glenbeigh | <i>E. coli</i> |
| | Mid Kerry (Gearha) | <i>Cryptosporidium</i> , <i>Clostridium perfringens</i> |
| | Kenmare | No <i>Cryptosporidium</i> barrier |
| | Tieraclea | <i>E. coli</i> |
| | Kilgarvan | <i>E. coli</i> |
| | Camp | Disinfection system inadequate |
| | All Co. Kerry PWS | Disinfection system inadequate (Chlorine contact time) |
| | An Mhuirioch / Baile na nGall | No <i>Cryptosporidium</i> barrier |
| | Camp | No <i>Cryptosporidium</i> barrier |
| | Castlegregory | No <i>Cryptosporidium</i> barrier |
| | Ceann Trá | No <i>Cryptosporidium</i> barrier |
| | An Daingean | Trihalomethanes |
| | Central Regional : Lough Guitane | <i>E. coli</i> , Coliform bacteria |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|--|
| 2008 | 5 | Mid Kerry Gearha Shrone (Rathmore) Shrone Mid Kerry (Gearha) Tarbert (Tieraclea) |
| 2009 | 14 | Glenbeigh (x2) Kilgarvan Waterville Kenmare Cahersiveen Camp Mountain Stage Dingle Ventry An Muirioch/Baile na nGall Castlegregory Lough Guitane Lough Cummemamuck |

KILDARE COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Kildare County Council is responsible for the operation of 11 Public Water Supplies (PWS) serving a population of 162,958.

Microbiological and chemical compliance levels in PWSs in Co. Kildare were 100% for both 2008 and 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 100 |
| 2009 | 100 | 100 |

Microbiological Parametric Values:

No non-compliance of the microbiological parametric values occurred during 2008 or 2009.

Chemical Parametric Values:

No non-compliance of the chemical parametric values occurred during 2008 or 2009.

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Kildare County Council PWSs by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-------------|
| 2008 | 1 | Athy |
| 2009 | 0 | - |

KILKENNY COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Kilkenny County Council is responsible for the operation of 19 Public Water Supplies (PWS) serving a population of 61,581.

Microbiological compliance has improved marginally in PWSs in Co. Kilkenny from 99.6% in 2008 to 99.7% in 2009 whilst chemical compliance levels have marginally decreased from 99.5% in 2008 to 99.4% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.6 | 99.5 |
| 2009 | 99.7 | 99.4 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------------------|-----------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Uringford Johnstown (1) | Castlecomer (1) |
| Total No.: | 1 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-----------------------------------|--|
| | Name of PWS | Name of PWS |
| Arsenic | Inistogue (1) | - |
| Nitrate | Glenmore (1) | - |
| Lead | - | Uringford Johnstown(1) |
| Trihalomethanes | - | Inistogue (1), Kilkenny City – Radestown (3) |
| Fluoride | Ballyragget (1), Radestown (5) | Castlecomer (Old) (1), Graiguenamanagh (1), Kilkenny City, (Radestown) (2), Mooncoin Regional (1). |
| Total No.: | 8 | 10 |

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 9 |
| No. of PWS added to RAL in 2009: | 1 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no PWS were removed from the RAL and 1 was added (Castlecomer (Old) PWS).

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Kilkenny County Council PWS by the end of 2009.

Directions

The EPA issued 2 Directions to Kilkenny County Council during 2008 and none during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-------------|------------------------|
| 2008 | Callan | Mercury |
| | Paulstown | <i>Cryptosporidium</i> |
| 2009 | - | - |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-------------------------------|
| 2008 | 2 | Bennettsbridge Ballyragget |
| 2009 | 1 | Inistogie |

LAOIS COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Laois County Council is responsible for the operation of 29 Public Water Supplies (PWS) serving a population of 63,272.

Microbiological compliance levels in PWSs in Co. Laois were 100% in both 2008 and 2009 whilst chemical compliance levels have decreased from 99.8% in 2008 to 99.2% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.8 |
| 2009 | 100 | 99.2 |

Microbiological Parametric Values:

No non-compliance of the microbiological parametric values occurred during 2008 or 2009.

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|------------------|--|
| | Name of PWS | Name of PWS |
| Trihalomethanes | Mountmellick (3) | Mountmellick (1) |
| Fluoride | - | Abbeyleix (2) Mountmellick (2) Mountrath (4) |
| Total No.: | 3 | 9 |

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 1 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 3 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no supplies were added to the RAL and 3 were removed (Ballinakill, Clonaslee and Durrow).

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Laois County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|--------------|
| 2008 | 1 | Mountmellick |
| 2009 | 1 | Portlaoise |

LEITRIM COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Leitrim County Council is responsible for the operation of 7 Public Water Supplies (PWS) serving a population of 25,131.

Microbiological compliance levels have decreased in PWSs in Co. Leitrim from 100% in 2008 to 99.1% in 2009 whilst chemical compliance levels have improved from 99.5% in 2008 to 99.7% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.5 |
| 2009 | 99.1 | 99.7 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|----------------|-------------|--------------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | - | Fivemilebourne (1) |
| Total No.: | 0 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|------------|--|-------------------|
| | Name of PWS | Name of PWS |
| Lead | Kiltyclogher (1) Manorhamilton (1) South Leitrim (2) | Manorhamilton (1) |
| Total No.: | 4 | 1 |

Boil Water Notices & Water Restrictions

No boil water notices or water restrictions notices were issued to consumers during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 2 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no PWS were added to or removed from the RAL.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Leitrim County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|------------------------|
| 2008 | 1 | South Leitrim Regional |
| 2009 | 0 | - |

LIMERICK CITY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Limerick City Council is responsible for the operation of 1 Public Water Supply (PWS) serving a population of 55,000.

Microbiological compliance levels in the Limerick City PWS were 100% for both 2008 and 2009 whilst chemical compliance levels have decreased marginally from 99.9% in 2008 to 99.7% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.9 |
| 2009 | 100 | 99.7 |

Microbiological Parametric Values:

No non-compliance of the microbiological parametric values occurred during 2008 or 2009.

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------------|-------------------|
| | Name of PWS | Name of PWS |
| Lead | - | Limerick City (1) |
| Trihalomethanes | - | Limerick City (2) |
| Fluoride | Limerick City (1) | |
| Total No.: | 1 | 3 |

Boil Water Notices & Water Restrictions

No boil water or water restrictions notices were issued to consumers during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 1 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. As the Limerick city public water supply was already on the RAL, there were no changes in 2009.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. A chlorine monitor and alarm is in place on Limerick City Council's PWS..

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|-------|------------|--|
| 2008 | 1 | Clareville- Limerick City Water Supply |
| 2009: | 1 | Clareville- Limerick City Water Supply |

LIMERICK COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Limerick County Council is responsible for the operation of 49 Public Water Supplies (PWS) serving a population of 67,014.

Microbiological compliance levels have decreased in PWSs in Co. Limerick from 99.7% in 2008 to 99.3% in 2009 whilst chemical compliance levels have decreased marginally from 99.9% in 2008 to 99.7% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.7 | 99.9 |
| 2009 | 99.3 | 99.7 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|-----------------------------|--|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Glin (1) Pallasgreen (1) | Adare (1) |
| <i>Enterococci</i> | - | Ardagh (1) Ballylanders (1) Fedamore (1) Foynes/Shannon (1) Glin (1) |
| Total No.: | 2 | 6 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------------------|--|
| | Name of PWS | Name of PWS |
| Nitrate | Balingarry (1) | - |
| Copper | Rathkeale (1) | - |
| Trihalo-methanes | - | Kilmallock (1) Limerick City Environs (6) |
| Fluoride | Adare (2) Murroe (1) | Kilbeheny (1) Kilglass (2) Limerick City (1) |
| Total No.: | 5 | 11 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ¹³ | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|-------------|----------------|
| Jan-09 | Mar-09 | BWN | Anglesboro | <i>E. coli</i> |

At the end of 2009, no boil water notices remained in place.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 15 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no PWSs were added or removed from the RAL.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Limerick County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---|
| 2008 | 1 | Shannon Estuary Water Supply |
| 2009 | 5 | Ballyhahill Anglesboro Banogue Balingarry Kildimo |

¹³ In some instances the boil notice or water restriction only applies to part of the supply.

LONGFORD COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Longford County Council is responsible for the operation of 8 Public Water Supplies (PWS) serving a population of 16,587.

Microbiological compliance levels have decreased in PWSs in Co. Longford from 98.9% in 2008 to 98.2% in 2009 whilst chemical compliance levels have improved from 98.0% in 2008 to 99.7% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 98.9 | 98.0 |
| 2009 | 98.2 | 99.7 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|-------------------------------|--|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Ballinalee/Edgeworthstown (1) | - |
| <i>Enterococci</i> | - | Ballymahon (1) Longford Central (1) |
| Total No.: | 1 | 2 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|--|-------------|
| | Name of PWS | Name of PWS |
| Lead | Ballinalee/Edgeworthstown (1) | - |
| Fluoride | Ballymahon (1) Gowna (1) Granard (1) Longford Central (2) | Gowna (1) |
| Total No.: | 6 | 1 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/ Active (End 09) | BWN/ WR ¹⁴ | Name of PWS | Reason |
|-------------|------------------------------------|--------------------------|-------------------------------|----------------|
| Aug-08 | Feb-09 | BWN | Ballinalee/ Edgeworthstown | <i>E. coli</i> |

The Ballinalee/Edgeworthstown supply has been replaced with an alternative supply. At the end of 2009, no boil water notices or water restriction notices remained in place on Longford County Council's PWSs.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 2 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 1 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, the Ballinalee/Edgeworthstown supply was removed from the RAL and no PWS was added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Longford County Council PWS by the end of 2009.

Directions

The EPA issued 2 Directions to Longford County Council during 2008 and none during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|---------------------------|------------------------|
| 2008 | Longford Central | Aluminium, Iron |
| | Ballinalee/Edgeworthstown | <i>Cryptosporidium</i> |
| 2009 | - | - |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---|
| 2008 | 2 | Longford Central Ballinalee/Edgeworthstown |
| 2009 | 0 | - |

¹⁴ In some instances the boil notice or water restriction only applies to part of the supply.

LOUTH COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Louth County Council is responsible for the operation of 15 Public Water Supplies (PWS) serving a population of 99,820.

Microbiological compliance levels have improved in PWSs in Co. Louth from 99.0% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased from 98.9% in 2008 to 97.6% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.0 | 98.9 |
| 2009 | 100 | 97.6 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|---------------------------|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Carlingford (1) | - |
| <i>Enterococci</i> | Collon (1) Staleen (1) | - |
| Total No.: | 3 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---|--|
| | Name of PWS | Name of PWS |
| Lead | Ardee (1) Cavanhill (2) Rosehall (1) Staleen (1) | - |
| Pesticides Total | Staleen (1) | - |
| Trihalomethanes | - | Cavanhill (3) Clogherhead (3) Dunbin (1) Staleen (1) Tallanstown (2) |
| Fluoride | Greenmount (1) Staleen (3) | Cavanhill (6) Staleen (8) |
| Antimony | - | Rosehall (1) Staleen (1) |
| Total No.: | 10 | 26 |

Boil Water Notices & Water Restrictions

No boil water or water restrictions notices were issued to consumers during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 3 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no Louth County Council PWS was added to or removed from the RAL.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Louth County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---------------------------------|
| 2008 | 1 | Staleen |
| 2009 | 3 | Cavanhill Kilineer Omeath |

MAYO COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Mayo County Council is responsible for the operation of 24 Public Water Supplies (PWS) serving a population of 77,970.

Microbiological compliance levels have improved in PWSs in Co. Mayo from 99.4% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased from 100% in 2008 to 98.7% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.4 | 100 |
| 2009 | 100 | 98.7 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|-------------|-------------|
| | Name of PWS | Name of PWS |
| <i>Enterococci</i> | Cong (1) | - |
| Total No.: | 1 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|---|
| | Name of PWS | Name of PWS |
| Trihalomethanes | - | Cong (1) Foxford (1) Lough Mask (3) Westport (1) |
| Lead | - | Ballina (1) |
| Fluoride | - | Kiltimagh (1) Lough Mask (1) |
| Total No.: | 0 | 9 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ¹⁵ | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|-------------|----------------|
| May-09 | May-09 | BWN | Achill | <i>E. coli</i> |

One boil water notice was issued during 2009 on the Achill PWS and no new water restriction notices were issued.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 14 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 1 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, the Shrulue PWS was removed from the RAL and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Mayo County Council PWS by the end of 2009.

Directions

The EPA issued 2 Directions to Mayo County Council during 2008 and 4 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-------------|------------------------|
| 2008 | Kiltimagh | Trihalomethanes |
| | Cong | <i>Cryptosporidium</i> |
| 2009 | Lough Mask | Trihalomethanes |
| | Mulranny | Aluminium |
| | Achill | Aluminium |
| | Westport | Aluminium |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|--|
| 2008 | 3 | Lough Mask Swinford Westport |
| 2009 | 6 | Cong Kiltimagh Swinford Mulranny Achill Foxford |

¹⁵ In some instances the boil notice or water restriction only applies to part of the supply.

MEATH COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Meath County Council is responsible for the operation of 32 Public Water Supplies (PWS) serving a population of 101,189.

Microbiological compliance levels have improved in PWSs in Co. Meath from 99.2% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased from 99.5% in 2008 to 99.2% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.2 | 99.5 |
| 2009 | 100 | 99.2 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|---|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Castletown (1) | - |
| <i>Enterococci</i> | Barrerstown (1) Castletown (2) Trim (1) Woodview (1) | - |
| Total No.: | 6 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|---------------------------------|--|
| | Name of PWS | Name of PWS |
| Nitrate | Cloneycavan (2) | Cloneycavan (1) |
| Pesticides - Total | Navan-Mid Meath (1) Trim (1) | East Meath (1) |
| Trihalo-methanes | East Meath (2) | Drumcondrath (2) East Meath (3) Trim (2) |
| Arsenic | Woodview (3) | Woodview (1) |
| Antimony | - | East Meath (2) |
| Fluoride | East Meath (1) | Dunshaughlin (1) |
| Total No.: | 10 | 13 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/ Active (End 09) | BWN/ WR ¹⁶ | Name of PWS | Reason |
|-------------|------------------------------|-----------------------|-------------|----------|
| Nov-09 | Dec-09 | BWN | Slane | Flooding |

One boil water notice was issued to consumers by Meath County Council during 2009.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 8 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 2 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 2 PWS were removed from the RAL (Summerhill and Ballivor) and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Meath County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|--|
| 2008 | 1 | Navan-Mid Meath |
| 2009 | 6 | Kells-Oldcastle Lobinstown Castletown Carricleck Slane Trim |

¹⁶ In some instances the boil notice or water restriction only applies to part of the supply.

MONAGHAN COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Monaghan County Council is responsible for the operation of 10 Public Water Supplies (PWS) serving a population of 39,726.

Microbiological compliance levels have decreased in PWSs in Co. Monaghan from 100% in 2008 to 99.4% in 2009 whilst chemical compliance levels were 99.4% in both 2008 and 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.4 |
| 2009 | 99.4 | 99.4 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|--------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | - | Newbliss (1) |
| Total No.: | 0 | 1 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|----------------|---|
| | Name of PWS | Name of PWS |
| Lead | Glashlough (2) | Glashlough (1) |
| Trihalomethanes | - | Clones (1) LERWSS (3) |
| Fluoride | Monaghan (2) | Carrickmacross (4) Clones (8) LERWSS (6) Monaghan (17) |
| Total No.: | 4 | 40 |

Boil Water Notices & Water Restrictions

No boil water notices or water restrictions notices were issued to consumers during 2009 and none remained active during 2009 from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 3 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 5 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 5 PWS were removed from the RAL (Drumully, Inniskeen, Newbliss, Monaghan and Smitborough PWS) and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Monaghan County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|----------------|
| 2008 | 1 | Clones |
| 2009 | 1 | Carrickmacross |

NORTH TIPPERARY COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

North Tipperary County Council is responsible for the operation of 32 Public Water Supplies (PWS) serving a population of 46,547.

Microbiological compliance levels have improved in PWSs in North Tipperary from 99.6% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased marginally from 99.9% in 2008 to 99.7% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.6 | 99.9 |
| 2009 | 100 | 99.7 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|------------------------------------|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Cloughjordan (1), Toomevara (1) | - |
| Total No.: | 2 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|-------------|
| | Name of PWS | Name of PWS |
| Lead | - | Roscrea (1) |
| Trihalomethanes | - | Thurles (1) |
| Fluoride | Roscrea (2) | Thurles (2) |
| Total No.: | 2 | 4 |

Boil Water Notices & Water Restrictions

No new boil water notices (BWN) or water restriction (WR) notices were issued to consumers during 2009. One water restriction notice remained in place during 2009 since its issue in 2008. Details are as follows (full details in Appendix II):

| Date Issued | Date Lifted/ Active (End 09) | BWN/ WR ¹⁷ | Name of PWS | Reason |
|-------------|------------------------------------|--------------------------|-------------|--------|
| Oct-08 | Active end '09 | WR | Thurles | Lead |

At the end of 2009, no boil notices remained in place and 1 water restriction notice was active on the Thurles PWS which affected 318 people on the supply.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 4 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 4 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 4 PWS were removed from the RAL (Ballingarry Eglish, Cloughjordan, Templemore and Toomevara) and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all North Tipperary County Council PWS by the end of 2009.

Directions

The EPA issued 1 Direction to North Tipperary County Council during 2008 and 1 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-------------|------------------------------|
| 2008 | Thurles | Lead |
| 2009 | Thurles | No alarm on Chlorine monitor |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-------------|
| 2008 | 0 | - |
| 2009 | 1 | Thurles |

¹⁷ In some instances the boil notice or water restriction only applies to part of the supply.

OFFALY COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Offaly County Council is responsible for the operation of 23 Public Water Supplies (PWS) serving a population of 44,267.

Microbiological compliance levels have improved in PWSs in Co. Offaly from 99.2% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased from 99.8% in 2008 to 99.3% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.2 | 99.8 |
| 2009 | 100 | 99.3 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|---------------------|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Shinrone/Brosna (1) | - |
| <i>Enterococci</i> | Birr (1) | - |
| Total No.: | 2 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---------------|---------------------------------|
| | Name of PWS | Name of PWS |
| Trihalomethanes | Tullamore (1) | Clara/Ferbane (1) Dungar (1) |
| PAH | - | Kilcormac (1) |
| Fluoride | - | Rahan-Tully (1) |
| Benzo(a)pyrene | - | Kilcormac (1) |
| Total No.: | 1 | 5 |

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 3 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 1 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 1 PWS was removed from the RAL (Tullamore) and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Offaly County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|----------------------|
| 2008 | 1 | Clara |
| 2009 | 1 | Clonasee (Tullamore) |

ROSCOMMON COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Roscommon County Council is responsible for the operation of 22 Public Water Supplies (PWS) serving a population of 44,238.

Microbiological compliance levels have decreased in PWSs in Co. Roscommon from 98.7% in 2008 to 96.9% in 2009 whilst chemical compliance levels have decreased from 99.9% in 2008 to 98.7% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 98.7 | 99.9 |
| 2009 | 96.9 | 98.7 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|---|---|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Ballinlough/Loughglynn(1) Boyle/Ardcarne (1) Knockrockery/Lecarrow(1) SRRWS Killegan (1) | Ballyfarnan (1) Boyle/Ardcarne (1) |
| <i>Enterococci</i> | - | Ballinlough/ Loughglynn (1) Ballyfarnan (1) Castleree Urban (1) Grangemore (1) Rooskey (1) Tarmonbarry (1) Roscommon Central(1) |
| Total No.: | 4 | 9 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|---|
| | Name of PWS | Name of PWS |
| Lead | - | Castleree Urban (1) North Roscommon (2) |
| Trihalo-methanes | - | Strokestown/Elphin (2) North Roscommon (2) |
| Copper | Boyle (1). | - |
| Fluoride | - | Castleree Urban (1) NERWSS - Rooskey (1) NERWSS - Tarmonbarry (1) Roscommon Centra (2) |
| Total No.: | 1 | 12 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices active or issued to consumers during 2009 is as follows (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ¹⁸ | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|--|------------------------|
| May-09 | May-09 | BWN | Ballyfarnan | <i>E. coli</i> |
| Nov-09 | Nov-09 | BWN | Mount Talbot/ Four Roads | <i>Cryptosporidium</i> |
| Nov-09 | Active end '09 | BWN | Castleree Regional | <i>Cryptosporidium</i> |
| Dec-09 | Dec-09 | BWN | Knockcroghery/ Lecarrow (Tobre Og) | <i>Cryptosporidium</i> |

Four new boil notices were issued to consumers by Roscommon County Council during 2009. At the end of 2009, 1 boil notice remained in place on the Castleree Regional PWS.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 13 |
| No. of PWS added to RAL in 2009: | 1 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, the Castleree Regional PWS was added to the RAL and none were removed.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Roscommon County Council PWS by the end of 2009.

Directions

The EPA issued 3 Directions to Roscommon County Council during 2008 and 1 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|---------------------------|--|
| 2008 | Castleree Urban | <i>E. coli</i> , Coliform Bacteria, <i>Clostridium perfringens</i> |
| | Castleree Regional | <i>Cryptosporidium</i> |
| | Mount Talbot / Four Roads | <i>Cryptosporidium</i> |
| 2009 | Castleree Regional | <i>Cryptosporidium</i> |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---|
| 2008 | 2 | North Roscommon Regional Knockcroghery / Lecarrow |
| 2009 | 5 | Mount Talbot / Four Roads Castleree Regional Ballyfarnan Arigna NER WSS – Strokestown/ Elphin |

¹⁸ In some instances the boil notice or water restriction only applies to part of the supply.

SLIGO COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Sligo County Council is responsible for the operation of 13 Public Water Supplies (PWS) serving a population of 41,425.

Microbiological compliance in PWSs in Co. Sligo was 100% in both 2008 and 2009 whilst chemical compliance levels have decreased from 99.6% in 2008 to 97.0% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.6 |
| 2009 | 100 | 97.0 |

Microbiological Parametric Values:

No non-compliance of the microbiological parametric values occurred during 2008 or 2009.

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|----------------------------------|--|
| | Name of PWS | Name of PWS |
| Lead | Kilsellagh (1) Lough Gill (1) | Lough Gill (Carins Hill) (1) Lough Gill (Foxes Den) (4) Lough Talt (1) South Sligo Regional (1) |
| Trihalo-methanes | - | Kilsellagh (Calry) (1) Kilsellagh (Rosses Point) (1) Kilsellagh (1) Kilsellagh (Farnacardy) (5) Lough Gill Regional Supply (3) Lough Talt Regional Supply (6) South Sligo Regional (1) |
| Fluoride | Lough Gill (1) | Lough Talt Regional Water Supply (2) |
| Total No.: | 3 | 27 |

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers during 2009 and none issued in previous years were active during 2009.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 6 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 1 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, the Lough Gill Regional Water Supply was removed from the RAL and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Sligo County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|--|
| 2008 | 3 | Kilsellagh (Rosses Point) North Sligo Regional Lough Easkey Regional |
| 2009 | 2 | Lough Talt Lough Easkey Regional |

SOUTH DUBLIN COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

South Dublin County Council is responsible for the operation of 4 Public Water Supplies (PWS) serving a population of 247,180.

Microbiological and chemical compliance in South Dublin PWSs was 100% in both 2008 and 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 100 |
| 2009 | 100 | 100 |

Microbiological Parametric Values:

No non-compliance of the microbiological parametric values occurred during 2008 or 2009.

Chemical Parametric Values:

No non-compliance of the chemical parametric values occurred during 2008 or 2009.

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers during 2009 and none remained active during all or part of 2009 from previous years.

EPA Enforcement in 2008 and 2009

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all South Dublin County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

None of South Dublin County Council's drinking water treatment plants were audited by the EPA during 2008 or 2009.

SOUTH TIPPERARY COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

South Tipperary County Council is responsible for the operation of 27 Public Water Supplies (PWS) serving a population of 73,800.

Microbiological compliance levels have decreased in PWSs in South Tipperary from 99.3% in 2008 to 98.9% in 2009 whilst chemical compliance levels have improved from 98.5% in 2008 to 99.3% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.3 | 98.5 |
| 2009 | 98.9 | 99.3 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|---|---|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Clonmel Glenary (1) Cloran Regional (1) Gortnapisha Regional(1) | Graigie (1) Mullinabawn (1) Templetny Borehole(1) Tullohea (2), Mullinabawn (1) |
| <i>Enterococci</i> | - | Mullinabawn (1) |
| Total No.: | 3 | 6 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|--|---|
| | Name of PWS | Name of PWS |
| Trihalo-methanes | - | Ardfinnan Regional (1) Gortnapisha Regional (1) |
| Fluoride | Ardfinnan Regional (4) Cahir (1) Clonmel Glenary (8) Clonmel Poulavanogue(2) Galtee Regional (2) Springmount (2) Tipperary (1) | Ardfinnan Regional (3) Cahir Reservoir (1) Carrick-on-Suir (Lingaun River) (1) Clonmel Glenary (3) Clonmel Poulavanogue (2) Galtee Regional (2) Gortnapisha Regional (1) Tipperary (1) |
| Total No.: | 21 | 17 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices active or issued to consumers during 2009 is as follows (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ¹⁹ | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|--------------------|--|
| Oct-08 | Active end '09 | BWN | Cloran | <i>E. coli</i> , Coliform bacteria, pH |
| Oct-08 | Active end '09 | BWN | Gortnapisha | <i>E. coli</i> |
| Sep-09 | Active end '09 | BWN | Burncourt Regional | <i>E. coli</i> |

One new boil water notice was issued during 2009 on part of the Burncourt Regional. At the end of 2009, 3 boil notices remained in place on part of the Burncourt Regional PWS, part of the Cloran PWS and part of the Gortnapisha PWS.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 14 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 1 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, the Clonmel Glenary supply was removed from the RAL and no PWS were added.

Chlorine Monitors and Alarms

| | |
|---|----|
| Total No. of PWS: | 27 |
| No. of PWS without Chlorine Monitors at end 2009: | 1 |
| No. of PWS without working Chlorine Alarms at end 2009: | 1 |

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. By the end of 2009 chlorine monitors and alarms were in place on all of South Tipperary County Council's PWS with the exception of 1 supply.

Directions

The EPA issued 3 Directions to South Tipperary County Council during 2008 and none during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-----------------|--|
| 2008 | Galtee Regional | Aluminium |
| | Cloran | No disinfection on a portion of the supply, <i>E. coli</i> , Coliform bacteria, pH |
| | Gortnapisha | No disinfection on a portion of the supply, Coliform Bacteria, pH, <i>E. coli</i> , <i>Clostridium Perfringens</i> |
| 2009 | - | - |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|--|
| 2008 | 3 | Clonmel Glenary Tipperary Urban District Council PWS Galtee Regional |
| 2009 | 4 | Cloran Gortnapisha Burncourt Tipperary Urban District Council PWS |

¹⁹ In some instances the boil notice or water restriction only applies to part of the supply.

WATERFORD CITY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Waterford City Council is responsible for the operation of 1 Public Water Supply (PWS) serving a population of 45,748.

Microbiological compliance in the Waterford City PWS was 100% in both 2008 and 2009 whilst chemical compliance levels have decreased from 100% in 2008 to 98.0% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 100 |
| 2009 | 100 | 98.0 |

Microbiological Parametric Values:

A summary of the microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|-------------|
| | Name of PWS | Name of PWS |
| - | - | - |
| Total No.: | 0 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|-----------------------------|
| | Name of PWS | Name of PWS |
| Lead | - | East Waterford Regional (2) |
| Fluoride | - | East Waterford Regional (7) |
| Total No.: | 0 | 9 |

Boil Water Notices & Water Restrictions

No boil water notices or water restriction notices were issued to consumers during 2009 and none remained active from previous years.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 1 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 0 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, there were no Waterford City Council PWS added to or removed from the RAL.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. A chlorine monitor and alarms is in place on Waterford City Council's PWS.

WATERFORD COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Waterford County Council is responsible for the operation of 101 Public Water Supplies (PWS) serving a population of 36,013.

Microbiological compliance levels have improved in PWSs in Waterford from 98.7% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased from 99.4% in 2008 to 98.5% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 98.7 | 99.4 |
| 2009 | 100 | 98.5 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|--|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Ballyduff/Ballylemon (1) Smoorbeg (1) Stradbally (1) Tinknock/Tinnabinn (1) | - |
| Total No.: | 4 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---|---|
| | Name of PWS | Name of PWS |
| Nitrate | Adramone (1) LCB Lismore/ Cappoquin/ Ballyduff (3) | Glenawilliam (1) Kealfoun (1) LCB Lismore (1) |
| Trihalomethanes | Ring/Helvic/ Seaview (1) Tallow (1) | Bonmahon (1) LCB Lismore (1) Ring/Helvic/Seaview (1) |
| Lead | - | - |
| Bromate | - | Bonmahon (1) Ring/Helvic/Seaview (1) |
| Arsenic | - | Ballyogarty (1) |
| Fluoride | Kilmacomma (2) | Aglish/Glencairn (1) Deelish/Ballinacourty (2) LCB Lismore/Cappoquin/ Ballyduff (2) Portlaw(1) Ring/Helvic/Seaview (3) |
| Total No.: | 8 | 18 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ²⁰ | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|-----------------------|----------------|
| Apr-09 | Active end '09 | WR | Dungarvan | Lead |
| Apr-09 | Jun-09 | BWN | Loskeran/ Ballymacart | <i>E. coli</i> |
| May-09 | Jun-09 | BWN | Feddans | <i>E. coli</i> |

Two new boil water notices and 1 new water restriction notice were issued to consumers by Waterford County Council during 2009. The WR issued in Dungarvan affected 5 people and related to lead piping. At the end of 2009, 1 water restriction notice remained in place on the Dungarvan PWS.

²⁰ In some instances the boil notice or water restriction only applies to part of the supply.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|----|
| No. of PWS on the RAL at the end of 2009: | 21 |
| No. of PWS added to RAL in 2009: | 4 |
| No. of PWS removed from RAL in 2009: | 8 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 8 PWS were removed from the RAL (Adamone, Ballymacourty-Deelish, Geolish, Glengad Scrothea, Kilganey, LCB Lismore / Cappoquin / Ballyduff, Shanacoolle and Shekskin) and 4 PWS were added (Ballyhane, Cappoquin, Colligan and Tramore Carriganvantry).

Chlorine Monitors and Alarms

| | |
|---|-----|
| Total No. of PWS: | 101 |
| No. of PWS without Chlorine Monitors at end 2009: | 30 |
| No. of PWS without working Chlorine Alarms at end 2009: | 10 |

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. At the end of 2009, 30 of Waterford County Council's PWS did not have a chlorine monitor in place, and 10 supplies did not have a chlorine alarm installed.

Directions

The EPA issued 15 Directions to Waterford County Council during 2008 and 1 during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|-----------------------|-----------------------------|----------------------|
| 2008 | Tallow Hill | <i>E. coli</i> |
| | Scrothea | Coliform bacteria |
| | Kill / Bonmahon | No Chlorine Alarm |
| | Tramore / Carriganvantry | No Chlorine Alarm |
| | Dunmore East Regional | No Chlorine Alarm |
| | Ballyduff / Kilmeaden | No Chlorine Alarm |
| | Ardmore | No Chlorine Alarm |
| | Kilmacthomas | No Chlorine Alarm |
| | Lismore/Cappoquin/Ballyduff | No Chlorine Alarm |
| | Tallow | No Chlorine Alarm |
| | Stradbally | No Chlorine Alarm |
| | Smoorbeg (Carrigphillip) | No Chlorine Alarm |
| | Ballyduff / Ballylemon | No Chlorine Alarm |
| | Ring/Helvic/Seaview | No Chlorine Alarm |
| Deelish/Ballinacourty | No Chlorine Alarm | |
| 2009 | Ballyhane | Nitrate |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|--|
| 2008 | 3 | Kill / Bonmahon East Waterford Regional Ring/Helvic/Seaview |
| 2009 | 8 | Tramore / Carriganvantry Ballyduff / Kilmeaden Ardmore Kilmacthomas Colligan Curabaha West Loskeran / Ballymacart Feddans |

WESTMEATH COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Westmeath County Council is responsible for the operation of 14 Public Water Supplies (PWS) serving a population of 62,225.

Microbiological compliance levels have improved in PWSs in Westmeath from 99.4% in 2008 to 100% in 2009 whilst chemical compliance levels have decreased from 99.4% in 2008 to 98.4% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.4 | 99.4 |
| 2009 | 100 | 98.4 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-----------------|-------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Ballinahown (1) | - |
| Total No.: | 1 | 0 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|-------------|--|
| | Name of PWS | Name of PWS |
| Copper | - | Athlone (1) |
| Lead | - | Ardonagh (3) Athlone (1) |
| Fluoride | Ballany (3) | Athlone (1) Ballany High reservoir (2) Ballany Low Reservoir (2) Delvin (2) Frewin (2) |
| Total No.: | 3 | 14 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (End 09) | BWN/WR ²¹ | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|-------------|--------|
| Aug-09 | Active end '09 | WR | Mullingar | Lead |

One boil water notice was issued to consumers by Westmeath County Council during 2009. The WR issued for part of the Mullingar PWS affected 345 people and related to lead piping.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 0 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 1 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, the Moate PWS was removed from the RAL and none were added.

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Westmeath County Council PWS by the end of 2009.

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|-------------|
| 2008 | 1 | Ballinahown |
| 2009 | 0 | - |

²¹ In some instances the boil notice or water restriction only applies to part of the supply.

WEXFORD COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Wexford County Council is responsible for the operation of 30 Public Water Supplies (PWS) serving a population of 105,015.

Microbiological compliance levels have decreased in PWSs in Wexford from 100% in 2008 to 99.2% in 2009 whilst chemical compliance levels have marginally decreased from 99.8% in 2008 to 99.6% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 100 | 99.8 |
| 2009 | 99.2 | 99.6 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|----------------|-------------|----------------|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | - | Coolgreany (2) |
| Total No.: | 0 | 2 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-----------------|-----------------|------------------|
| | Name of PWS | Name of PWS |
| PAH | - | Sow Regional (1) |
| Trihalomethanes | - | New Ross (1) |
| Nitrate | Enniscorthy (1) | - |
| Fluoride | - | Gorey (1) |
| Total No.: | 1 | 3 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/ Active (End 09) | BWN/ WR ²² | Name of PWS | Reason |
|-------------|------------------------------|-----------------------|-------------|----------|
| Nov-09 | Dec-09 | BWN | Taghmon | Flooding |

One new boil water notice was issued during 2009 on the Taghmon PWS and no new water restriction notices were issued.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 3 |
| No. of PWS added to RAL in 2009: | 1 |
| No. of PWS removed from RAL in 2009: | 1 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, 1 PWS was removed from the RAL (Kiltealy) and 1 was added (Sow Regional).

Chlorine Monitors and Alarms

| | |
|---|----|
| Total No. of PWS: | 30 |
| No. of PWS without Chlorine Monitors at end 2009: | 1 |
| No. of PWS without working Chlorine Alarms at end 2009: | 22 |

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. By the end of 2009 all of Wexford County Council's PWS, with the exception of 1 PWS, had a chlorine monitor in place. There were 22 PWS without chlorine alarms in place.

Directions

The EPA issued 1 Direction to Wexford County Council during 2008 and none during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|-------------|----------------------|
| 2008 | Davidstown | <i>E. coli</i> |
| 2009 | - | - |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|---|
| 2008 | 5 | New Ross Taghmon Clohamon Davidstown Oulart |
| 2009 | 2 | Gorey Regional Sow Regional |

²² In some instances the boil notice or water restriction only applies to part of the supply.

WICKLOW COUNTY COUNCIL

Summary of Public Water Supply Quality in 2008 and 2009

Wicklow County Council is responsible for the operation of 57 Public Water Supplies (PWS) serving a population of 92,578.

Microbiological compliance levels have decreased in PWSs in Wicklow from 99.7% in 2008 to 98.9% in 2009 whilst chemical compliance levels have decreased from 98.5% in 2008 to 98.1% in 2009.

| | Micro | Chemical |
|------|-------|----------|
| 2008 | 99.7 | 98.5 |
| 2009 | 98.9 | 98.1 |

Microbiological Parametric Values:

A summary of the PWS with microbiological non-compliances during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|--------------------|-----------------|---|
| | Name of PWS | Name of PWS |
| <i>E. coli</i> | Killavaney (1) | Greystones (1) Killavney (1) Raheen/Baltinglass (2) |
| <i>Enterococci</i> | Blessington (1) | Baltinglass (1) Blessington (1) Redcross (1) |
| Total No.: | 2 | 7 |

Chemical Parametric Values:

A summary of the PWS with non-compliances of the chemical parametric values during 2008 and 2009 is as follows:

| Parameter | 2008 | 2009 |
|-------------------|---|--|
| | Name of PWS | Name of PWS |
| Trihalo-methanes | Aughrim Annacurra (1) Avoca Ballinacdash (2) Bray (1) Bray Reservoir (1) Greystones (1) Wicklow Regional (4) | Aughrim Annacurra (4) Avoca Ballinacdash (2) Blessington (2) Bray (1) Enniskerry (1) Wicklow Regional (11) Windgates Templecarraig (1) Ballynavortha (1) |
| Nitrate | - | Ballynavortha (1) |
| Bromate | - | Blessington (1) |
| Fluoride | Blessington (1) Enniskerry (3) Laragh (1) Tinahely (1) Wicklow Regional (3) | Enniskerry (1) |
| Total No.: | 19 | 25 |

Boil Water Notices & Water Restrictions

A summary of boil water notices (BWN) and water restriction (WR) notices issued to consumers or active during 2009 are detailed below (full details in Appendix II):

| Date Issued | Date Lifted/Active (end 09) | BWN/WR ²³ | Name of PWS | Reason |
|-------------|-----------------------------|----------------------|-----------------------|-------------------------|
| Oct-08 | Jan-09 | BWN | Killavaney | No Disinfection |
| Sep-09 | Active end '09 | BWN | Rathdrum* | Inadequate Disinfection |
| Oct-09 | Dec-09 | BWN | Killavaney | <i>E. coli</i> |
| Nov-09 | Active end '09 | BWN | Raheen Baltinglass | <i>E. coli</i> |
| Dec-09 | Dec-09 | BWN | Kirikee | Flooding |

*part of supply only.

Four boil water notices were issued to consumers by Wicklow County Council during 2009 and 1 issued during 2008 remained in place for part of 2009. At the end of 2009, 2 boil notices remained in place on the Rathdrum and Raheen Baltinglass PWS.

EPA Enforcement in 2008 and 2009

Remedial Action List

| | |
|---|---|
| No. of PWS on the RAL at the end of 2009: | 9 |
| No. of PWS added to RAL in 2009: | 0 |
| No. of PWS removed from RAL in 2009: | 8 |

The RAL is a list of PWSs where remedial action is required to ensure compliance with the requirements of the Drinking Water Regulations. In 2009, no PWS was added to the RAL and 8 were removed (Laragh/Annamoe, Tinahely Regional, Windgates/Templecarraig, Ballyellis, Ballymoneen/Avoca, Ballynavortha, Killavaney and Redcross).

Chlorine Monitors and Alarms

The installation of chlorine monitors and alarms is required to ensure that the supply is adequately disinfected at all times. Chlorine monitors and alarms were in place on all Wicklow County Council PWS by the end of 2009.

Directions

The EPA issued 3 directions to Wicklow County Council during 2008 and none during 2009. Details are as follows:

| Year | Name of PWS | Reason for Direction |
|------|---------------------|----------------------|
| 2008 | Ballyellis | No treatment |
| | Ballymoneen (Avoca) | No treatment |
| | Killavaney | No Treatment |
| 2009 | - | - |

(full details in Appendix III).

Audits of Drinking Water Treatment Plants

The following drinking water treatment plants were audited by the EPA during 2008 and 2009:

| Year | No. of PWS | PWS Audited |
|------|------------|--|
| 2008 | 2 | Wicklow Regional Arklow |
| 2009 | 6 | Ballyellis Ballymoneen (Avoca) Killavaney Redcross Rathdrum Kirikee |

²³ In some instances the boil notice or water restriction only applies to part of the supply.

APPENDIX II - LIST OF ALL BWNS OR WRs PLACED OR ACTIVE ON PUBLIC WATER SUPPLIES DURING 2009.

| Local Authority | Name of Public Water Supply | Reason | Boil Water Notice (BWN) or Water Restriction (WR) | Population Affected | Affecting Full Supply or Part of Supply? | Date Notice Imposed | Date Notice Lifted | No. of Restriction Days |
|--------------------------------|---------------------------------------|------------------------------|---|---------------------|--|---------------------|--------------------|---------------------------|
| Limerick Co. Council | Anglesboro | <i>E. coli</i> | BWN | 13 | Full Supply | Jan-09 | Mar-09 | 45 |
| Kerry Co. Council | Mid Kerry (Gearha) | <i>Cryptosporidium</i> | BWN | 25 | Part of Supply | Feb-09 | - | Still in place at end '09 |
| Cork (West) Co. Council | Snave | <i>E. coli</i> | BWN | 180 | Full Supply | Mar-09 | - | Still in place at end '09 |
| Waterford Co. Council | Dungarvan | Lead | WR | 5 | Part of Supply | Apr-09 | - | Still in place at end '09 |
| Waterford Co. Council | Loskeran/Ballymacart | <i>E. coli</i> | BWN | 60 | Full Supply | Apr-09 | Jun-09 | 42 |
| Mayo Co. Council | Achill | Precautionary - no parameter | BWN | 2,000 | Full Supply | May-09 | May-09 | 4 |
| Carlow Co. Council | Hacketstown | Lead | WR | 1 National school | Part of Supply | May-09 | Sep-09 | 114 |
| Carlow Co. Council | Carlow Town | Lead | WR | 240 | Part of Supply | May-09 | Sep-09 | 114 |
| Roscommon Co. Council | Ballyfarnon | <i>E. coli</i> | BWN | 200 | Full Supply | May-09 | May-09 | 2 |
| Waterford Co. Council | Feddans | <i>E. coli</i> | BWN | 24 | Full Supply | May-09 | Jun-09 | 22 |
| Cork (West) Co. Council | Johnstown | Inadequate Disinfection | BWN | 15 | Full Supply | Jun-09 | - | Still in place at end '09 |
| Kerry Co. Council | Glenbeigh (John Falvey's) | Inadequate Disinfection | BWN | 16 | Part of Supply | Jun-09 | - | Still in place at end '09 |
| Cork (West) Co. Council | Castletownbere New | <i>E. coli</i> | BWN | 1,750 | Full Supply | Jun-09 | Dec-09 | 172 |
| Cork City Council | Cork City Water Supply (Lee Road) | <i>E. coli</i> | BWN | 2,000 | Part of Supply | Jul-09 | Jul-09 | 7 |
| Fingal Co. Council | Baleskin (Leixlip PWS) | <i>E. coli</i> | BWN | 400 | Part of Supply | Jul-09 | Aug-09 | 37 |
| Cork (South) Co. Council | Aghabullogue | <i>E. coli</i> | BWN | 165 | Full Supply | Jul-09 | Jul-09 | 7 |
| Galway Co. Council | Tully / Tullycross PWS | <i>E. coli</i> | BWN | 325 | Full Supply | Jul-09 | Jul-09 | 9 |
| Kerry Co. Council | Kenmare | Inadequate Disinfection | WR | 20 | Part of Supply | Jul-09 | - | Still in place at end '09 |
| Kerry Co. Council | Glenbeigh (Mountain Stage) | Inadequate Disinfection | WR | 3 | Part of Supply | Jul-09 | - | Still in place at end '09 |
| Dun Laoghaire Rathdown Co. Co. | Kiltarnan | <i>E. coli</i> | BWN | 200 | Full Supply | Jul-09 | Aug-09 | 11 |
| Westmeath Co. Council | Mullingar | Lead | WR | 345 | Part of Supply | Aug-09 | - | Still in place at end '09 |
| Kerry Co. Council | Kilgarvan | Inadequate Disinfection | WR | 5 | Part of Supply | Aug-09 | - | Still in place at end '09 |
| Kerry Co. Council | An Mhuiríoch/ Baile Na nGall | Inadequate Disinfection | WR | 3 | Part of Supply | Aug-09 | - | Still in place at end '09 |
| Kerry Co. Council | An Baile Mór | Inadequate Disinfection | WR | 150 | Part of Supply | Aug-09 | - | Still in place at end '09 |
| Kerry Co. Council | An Mhín Aird 2 | Inadequate Disinfection | WR | 30 | Part of Supply | Aug-09 | - | Still in place at end '09 |
| Kerry Co. Council | An Fheothanach | Inadequate Disinfection | WR | 50 | Part of Supply | Aug-09 | - | Still in place at end '09 |
| Kerry Co. Council | Baile an Lochaigh | Inadequate Disinfection | WR | 50 | Part of Supply | Aug-09 | - | Still in place at end '09 |
| Kerry Co. Council | Central Regional: Lough Guitane | Inadequate Disinfection | WR | 30 | Part of Supply | Aug-09 | - | Still in place at end '09 |
| Cork (South) Co. Council | Newcestown | <i>E. coli</i> | BWN | 500 | Full Supply | Aug-09 | - | Still in place at end '09 |
| Kerry Co. Council | Waterville | <i>E. coli</i> | BWN | 893 | Full Supply | Aug-09 | Sep-09 | 32 |
| Galway Co. Council | Kilconnell | <i>E. coli</i> | BWN | 200 | Full Supply | Aug-09 | Aug-09 | 4 |
| South Tipperary Co. Council | Burncourt Regional | <i>E. coli</i> | BWN | 178 | Part of Supply | Sep-09 | - | Still in place at end '09 |
| Fingal Co. Council | The Orchards (Leixlip PWS) | <i>E. coli</i> | BWN | 30 | Part of Supply | Sep-09 | Sep-09 | 6 |
| Cork (West) Co. Council | Bantry Old | <i>Cryptosporidium</i> | BWN | 894 | Full Supply | Sep-09 | Oct-09 | 49 |
| Galway Co. Council | Inishmore | <i>E. coli</i> | BWN | 830 | Full Supply | Sep-09 | Sep-09 | 3 |
| Wicklow Co. Council | Rathdrum (Ballygahan and Ballinderry) | Inadequate Disinfection | BWN | 45 | Part of Supply | Sep-09 | - | Still in place at end '09 |

| | | | | | | | | |
|--|-----------------------------------|---------------------------------------|-----|--------|------------------------|--------|--------|---------------------------|
| Donegal Co. Council | Fintown | Coliform Bacteria | BWN | 310 | Full Supply | Oct-09 | Nov-09 | 34 |
| Cork (North) Co. Council | Lyreavucane | <i>E. coli</i> | BWN | 6 | Full Supply | Oct-09 | - | Still in place at end '09 |
| Wicklow Co. Council | Killavaney | <i>E. coli</i> | BWN | 18 | Full Supply | Oct-09 | Dec-09 | 49 |
| Wexford Co. Council | Taghmon | Flooding | BWN | 850 | Full Supply | Nov-09 | Dec-09 | 17 |
| Wicklow Co. Council | Raheen Baltinglass | <i>E. coli</i> | BWN | 30 | Full Supply | Nov-09 | - | Still in place at end '09 |
| Galway Co. Council | Ballinasloe | Flooding | BWN | 10,300 | Full Supply | Nov-09 | - | Still in place at end '09 |
| Meath Co. Council | Slane | Flooding | BWN | 3,360 | Full Supply | Nov-09 | Dec-09 | 17 |
| Cork (South) Co. Council | Clondrohid | Flooding | BWN | 200 | Full Supply | Nov-09 | Nov-09 | 7 |
| Cork (West) Co. Council | Ballineen | Turbidity | BWN | 700 | Full Supply | Nov-09 | Dec-09 | 32 |
| Cork (South) Co. Council | Innishannon | Precautionary - Flooding | BWN | 1,000 | Full Supply | Nov-09 | Nov-09 | 7 |
| Roscommon Co. Council | Mount Talbot/Four Roads | <i>Cryptosporidium</i> | BWN | 3,500 | Full Supply | Nov-09 | Nov-09 | 5 |
| Roscommon Co. Council | Castlerea Regional | <i>Cryptosporidium</i> | BWN | 2,600 | Full Supply | Nov-09 | - | Still in place at end '09 |
| Cork (South) Co. Council | Inchigeelagh | Precautionary - Flooding | BWN | 150 | Full Supply | Nov-09 | Nov-09 | 2 |
| Cork City Council | Cork City Water Supply (Lee Road) | Precautionary - Flooding | BWN | 54,000 | Part of Supply | Nov-09 | Dec-09 | 3 |
| Galway Co. Council | Mid Galway | <i>E. coli</i> | BWN | 3,917 | Full Supply | Nov-09 | - | Still in place at end '09 |
| Roscommon Co. Council | Knockcroghery/Lecarrow (Tobre Og) | <i>Cryptosporidium</i> | BWN | 450 | Full Supply | Dec-09 | Dec-09 | 5 |
| Wicklow Co. Council | Kirikee | Flooding | BWN | 142 | Full Supply | Dec-09 | Dec-09 | 2 |
| Notices listed below this line were issued prior to 2009, but remained active for all or part of 2009, as indicated: | | | | | | | | |
| Clare Co. Council | Ennis | <i>E. coli, Cryptosporidium</i> | BWN | 30,000 | Vulnerable groups only | May-05 | Dec-09 | 1690 |
| Cork (West) Co. Council | Castletownkinneigh | Nitrate | WR | 33 | Full Supply | Mar-07 | - | Still in place at end '09 |
| Galway Co. Council | Clarinbridge | <i>Clostridium perfringens</i> | BWN | 1,000 | Full Supply | Nov-07 | Apr-09 | 532 |
| Galway Co. Council | Roundstone | <i>E. coli</i> | BWN | 1,815 | Full Supply | Nov-07 | Apr-09 | 513 |
| Cork (West) Co. Council | Dursey Island | <i>E. coli</i> | BWN | 10 | Full Supply | Jun-08 | - | Still in place at end '09 |
| Cork (West) Co. Council | Crostera | <i>E. coli</i> | BWN | 50 | Full Supply | Jul-08 | - | Still in place at end '09 |
| Longford Co. Council | Ballinalree/Edgeworthstown | <i>E. coli</i> | BWN | 1,735 | Full Supply | Aug-08 | Feb-09 | 182 |
| Galway City Council | Galway City (Mervue) | Lead | WR | 430 | Part of Supply | Sep-08 | Nov-09 | 410 |
| Cork (North) Co. Council | Mallow | Lead | WR | 71 | Part of Supply | Sep-08 | Mar-09 | 182 |
| Clare Co. Council | Ennis | Lead | WR | 180 | Part of Supply | Oct-08 | - | Still in place at end '09 |
| North Tipperary Co. Council | Thurles | Lead | WR | 318 | Part of Supply | Oct-08 | - | Still in place at end '09 |
| Wicklow Co. Council | Killavaney | No disinfection | BWN | 18 | Full Supply | Oct-08 | Jan-09 | 100 |
| Galway Co. Council | Letterfrack | <i>Cryptosporidium</i> | BWN | 300 | Full Supply | Oct-08 | - | Still in place at end '09 |
| Galway Co. Council | Rosmuc | <i>Cryptosporidium</i> | BWN | 1,090 | Full Supply | Oct-08 | - | Still in place at end '09 |
| South Tipperary Co. Council | Cloran | <i>E. coli, Coliform bacteria, pH</i> | BWN | 78 | Part of Supply | Oct-08 | - | Still in place at end '09 |
| South Tipperary Co. Council | Gortnapisha | <i>E. coli</i> | BWN | 9 | Part of Supply | Oct-08 | - | Still in place at end '09 |
| Cork (South) Co. Council | Glashaboy (Little Island) | Lead | WR | 150 | Part of Supply | Nov-08 | - | Still in place at end '09 |
| Kerry Co. Council | Glenbeigh (John Falvey's) | <i>E. coli</i> | BWN | 41 | Part of Supply | Dec-08 | Oct-09 | 303 |

Note: Some notices indicated to be active at the end of 2009, above, may have been rescinded between the end of 2009 and the date of publication of this report.

APPENDIX III - LIST OF DIRECTIONS ISSUED BY THE EPA TO LOCAL
AUTHORITIES DURING 2008 AND 2009.

DIRECTIONS ISSUED DURING 2008

| Local Authority | Supply | Reason for Direction | Date | Enforcement Status at End 2009 (Closed/Open) |
|-----------------|---------------------------------------|--|-----------|--|
| Kilkenny | Callan PWS | Mercury | 02-Jan-08 | Closed |
| Longford | Longford Central PWS | Aluminium, Iron | 24-Jan-08 | Open ² |
| Galway | Roundstone PWS | <i>E. coli</i> | 29-Jan-08 | Closed |
| Waterford | Tallow Hill PWS | <i>E. coli</i> | 29-Jan-08 | Closed |
| Waterford | Scrothea PWS | Coliform bacteria | 29-Jan-08 | Open ² |
| Mayo | Kiltimagh PWS | Trihalomethanes | 22-Feb-08 | Closed |
| South Tipperary | Galtee Regional PWS | Aluminium | 22-Feb-08 | Open ² |
| Kilkenny | Paulstown PWS | <i>Cryptosporidium</i> | 03-Mar-08 | Open ² |
| Clare | Miltown Malbay PWS | Aluminium | 31-Mar-08 | Closed |
| Clare | Ennis PWS | Bypassing membrane filter | 31-Mar-08 | Closed |
| Longford | Ballinallee/ Edgeworthstown PWS | <i>Cryptosporidium</i> | 31-Mar-08 | Closed |
| Roscommon | Castlerea Urban PWS | <i>E. coli</i> , Coliform Bacteria, <i>Clostridium perfringens</i> | 22-Apr-08 | Closed |
| Galway | Clarinbridge PWS | <i>Clostridium perfringens</i> | 20-Jun-08 | Closed |
| Cavan | Dowra PWS | Aluminium | 27-Jul-08 | Closed |
| Wexford | Davidstown PWS | <i>E. coli</i> | 24-Jul-08 | Closed |
| Roscommon | Castlerea Regional PWS | <i>Cryptosporidium</i> | 11-Sep-08 | Closed |
| Mayo | Cong PWS | <i>Cryptosporidium</i> | 11-Sep-08 | Open ² |
| Donegal | Lifford (Old) PWS | No treatment | 11-Sep-08 | Closed |
| Cork | Johnstown PWS | No treatment | 11-Sep-08 | Open ² |
| Wicklow | Killavane PWS | No treatment | 11-Sep-08 | Closed |
| Wicklow | Ballyellis PWS | No treatment | 11-Sep-08 | Closed |
| Wicklow | Ballymoneen Avoca PWS | No treatment | 11-Sep-08 | Closed |
| Waterford | Smoorbeg (Carrighphillip) PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Tallow PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Tramore/Carriganvantry PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Stradbally PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Kill/Bonmahon PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Dunmore East Regional PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Deelish/Ballinacourty PWS | Clearwater tank not covered | 17-Sep-08 | Closed |
| Waterford | Ballyduff/Kilmeaden PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Ballyduff/Ballylemon PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Ardmore PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Ring/Helvick/Seaview PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | LCB Lismore, Cappoquin, Ballyduff PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Waterford | Kilmacthomas PWS | Installation of Chlorine Alarm | 17-Sep-08 | Closed |
| Roscommon | Mount Talbot/Four Roads PWS | <i>Cryptosporidium</i> | 18-Sep-08 | Open ² |
| Galway City | Galway City PWS | Lead, Nickel, Copper | 24-Sep-08 | Closed |
| Galway | Gort PWS | Coliform bacteria | 03-Oct-08 | Open ² |
| Kerry | Shrone PWSS | Coliform bacteria | 11-Nov-08 | Closed |
| North Tipperary | Thurles PWS | Lead | 18-Nov-08 | Open ² |
| South Tipperary | Cloran Regional PWS | No disinfection on a portion of the supply, <i>E. coli</i> , Coliform bacteria, pH | 18-Nov-08 | Closed |

| | | | | |
|-----------------|--------------------------|--|-----------|-------------------|
| South Tipperary | Gortnapisha Regional PWS | No disinfection on a portion of the supply, Coliform Bacteria, pH, <i>E. coli</i> , <i>Clostridium Perfringens</i> | 18-Nov-08 | Closed |
| Galway | Letterfrack PWS | <i>Cryptosporidium</i> | 16-Dec-08 | Open ² |
| Galway | Rosmuc PWS | <i>Cryptosporidium</i> | 16-Dec-08 | Open ² |

² Open: Action programme being implemented by local authority.

³ Closed: Indicates that the requirements of the Direction have been met by the Water Services Authority. Note: For a number of Directions recorded as 'Closed', above, the implementation of an action programme by the Water Services Authority is on-going. These Directions are deemed by the EPA to be closed as the Direction stipulated only that an Action had to be submitted by the Water Services Authority.

DIRECTIONS ISSUED DURING 2009

| Local authority | Supply | Reason for Direction | Date | Enforcement Status at end 2009 (Closed/Open) |
|-----------------|------------------------------------|---|-----------|--|
| Kerry | Glenbeigh (040A) PWS | <i>E. coli</i> | 08-Jan-09 | Open ² |
| Kerry | Mid Kerry – Gearha PWS | <i>Cryptosporidium</i> , <i>Clostridium perfringens</i> | 08-Jan-09 | Closed |
| Cork | Castletownbere New PWS | Trihalomethanes | 16-Jan-09 | Open ² |
| Cork | Glashaboy PWS | Lead | 16-Feb-09 | Closed ³ |
| North Tipperary | Thurles PWS – Zone 4 - Archerstown | Installation of Chlorine Alarm | 31-Mar-09 | Closed |
| Waterford | LCB Ballyhane PWS | Nitrate | 03-Apr-09 | Closed |
| Kerry | Kenmare PWS | No <i>Cryptosporidium</i> barrier | 15-Apr-09 | Open ² |
| Kerry | Tieraclea (Tarbert) PWS | <i>E. coli</i> | 16-Apr-09 | Closed |
| Kerry | Kilgarvan PWS | <i>E. coli</i> | 16-Apr-09 | Closed |
| Mayo | Lough Mask PWS | Trihalomethanes | 21-Apr-09 | Open ² |
| Cork | Snave PWS | <i>E. coli</i> | 23-Apr-09 | Closed |
| Mayo | Mulranny PWS | Aluminium | 29-Apr-09 | Open ² |
| Mayo | Achill PWS | Aluminium | 29-Apr-09 | Open ² |
| Clare | Ennis PWS | Lead | 25-May-09 | Open ² |
| Kerry | Camp PWS | Disinfection system | 16-Jul-09 | Closed |
| Kerry | All PWS in County Kerry | Disinfection (Chlorine contact time) | 28-Jul-09 | Open ² |
| Mayo | Westport PWS | Aluminium | 21-Aug-09 | Open ² |
| Kerry | An Mhuirioch/Baile na nGall PWS | No <i>Cryptosporidium</i> barrier | 15-Sep-09 | Open ² |
| Kerry | Camp PWS | No <i>Cryptosporidium</i> barrier | 15-Sep-09 | Open ² |
| Kerry | Castlegregory PWS | No <i>Cryptosporidium</i> barrier | 15-Sep-09 | Open ² |
| Kerry | Ceann Trá PWS | No <i>Cryptosporidium</i> barrier | 15-Sep-09 | Open ² |
| Kerry | An Daingean PWS | Trihalomethanes | 15-Sep-09 | Open ² |
| Kerry | Central Regional:Lough Guitane PWS | <i>E. coli</i> , Coliform bacteria | 15-Sep-09 | Open ² |
| Cavan | Cavan PWS | Coliform bacteria, <i>E. coli</i> | 30-Sep-09 | Closed |
| Cork | Mallow PWS | Lead | 23-Oct-09 | Open ² |
| Cork | Castletownkinneigh PWS | Nitrate | 17-Nov-09 | Closed |
| Galway | Carraroe PWS | Trihalomethanes | 12-Dec-09 | Open ² |
| Roscommon | Castlerea Regional PWS | <i>Cryptosporidium</i> | 17-Dec-09 | Open ² |

² Open: Action programme being implemented by Water Services Authority.

³ Closed: Indicates that the requirements of the Direction have been met by the Water Services Authority. Note: For a number of Directions recorded as 'Closed', above, the implementation of an action programme by the Water Services Authority is on-going. These Directions are deemed by the EPA to be closed as the Direction stipulated only that an Action had to be submitted by the Water Services Authority.

APPENDIX IV - SUMMARY OF MONITORING CARRIED OUT IN 2008 AND 2009

Table A-1. Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for All Parameters in Public Water Supplies in 2008.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-------------------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 956 | 39 | 95.9 | 11357 | 39 | 99.7 |
| <i>Enterococci</i> | 719 | 12 | 98.3 | 2508 | 13 | 99.5 |
| Chemical Parameters | | | | | | |
| 1,2-dichloroethane | 664 | 0 | 100 | 1455 | 0 | 100 |
| Antimony | 679 | 0 | 100 | 1390 | 0 | 100 |
| Arsenic | 683 | 2 | 99.7 | 1554 | 4 | 99.7 |
| Benzene | 664 | 0 | 100 | 1408 | 0 | 100 |
| Benzo(a)pyrene | 613 | 0 | 100 | 1168 | 0 | 100 |
| Boron | 671 | 0 | 100 | 1489 | 0 | 100 |
| Bromate | 653 | 0 | 100 | 1260 | 0 | 100 |
| Cadmium | 683 | 0 | 100 | 1540 | 0 | 100 |
| Chromium | 684 | 0 | 100 | 1555 | 0 | 100 |
| Copper | 704 | 5 | 99.3 | 1866 | 5 | 99.7 |
| Cyanide | 635 | 0 | 100 | 1231 | 0 | 100 |
| Fluoride | 707 | 40 | 94.3 | 3608 | 74 | 97.9 |
| Lead | 702 | 21 | 97.0 | 2033 | 25 | 98.8 |
| Mercury | 678 | 0 | 100 | 1388 | 0 | 100 |
| Nickel | 688 | 3 | 99.6 | 1550 | 3 | 99.8 |
| Nitrate | 803 | 9 | 98.9 | 4773 | 14 | 99.7 |
| Nitrite (at tap) | 821 | 1 | 99.9 | 5947 | 1 | 100 |
| Nitrites (at WTW) | 99 | 0 | 100 | 547 | 0 | 100 |
| PAH | 608 | 0 | 100 | 1150 | 0 | 100 |
| Pesticides - Total | 587 | 3 | 99.5 | 1115 | 3 | 99.7 |
| Selenium | 682 | 2 | 99.7 | 1519 | 2 | 99.9 |
| Tetrachloroethene & Trichloroethene | 668 | 0 | 100 | 1924 | 0 | 100 |
| Trihalomethanes (Total) | 675 | 27 | 96.0 | 1988 | 72 | 96.4 |
| Indicator Parameters | | | | | | |
| Aluminium | 769 | 104 | 86.5 | 8071 | 349 | 95.7 |
| Ammonium | 955 | 14 | 98.5 | 10945 | 21 | 99.8 |
| Chloride | 673 | 1 | 99.9 | 1497 | 1 | 99.9 |
| <i>Clostridium perfringens</i> | 755 | 82 | 89.1 | 9603 | 103 | 98.9 |
| Coliform Bacteria | 956 | 253 | 73.5 | 11364 | 491 | 95.7 |
| Colony Count @ 22°C | 464 | 46 | 90.1 | 1304 | 50 | 96.2 |
| Colour | 944 | 142 | 85.0 | 10733 | 355 | 96.7 |
| Conductivity | 954 | 0 | 100 | 12188 | 0 | 100 |
| Iron | 829 | 108 | 87.0 | 7337 | 242 | 96.7 |
| Manganese | 716 | 51 | 92.9 | 3107 | 91 | 97.1 |
| Odour | 842 | 24 | 97.1 | 10156 | 36 | 99.6 |
| Oxidisability | 31 | 1 | 96.8 | 39 | 1 | 97.4 |
| pH | 955 | 246 | 74.2 | 11323 | 579 | 94.9 |
| Sodium | 691 | 5 | 99.3 | 1469 | 5 | 99.7 |
| Sulphate | 645 | 0 | 100 | 1254 | 0 | 100 |
| Taste | 691 | 18 | 97.4 | 7378 | 27 | 99.6 |
| Total Organic Carbon | 616 | 14 | 97.7 | 1244 | 17 | 98.6 |
| Turbidity (at tap) | 949 | 76 | 92.0 | 10716 | 102 | 99.0 |
| Turbidity (at WTW) | 183 | 60 | 67.2 | 1711 | 150 | 91.2 |
| Radioactivity | | | | | | |
| Tritium | 4 | 0 | 100 | 25 | 0 | 100 |
| Total Indicative Dose | 4 | 0 | 100 | 27 | 0 | 100 |

Note:

WTW = Water treatment works.

PAH = Polycyclic aromatic hydrocarbons.

Table A-2. Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for All Parameters in Public Group Water Schemes in 2008.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-------------------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 622 | 16 | 97.4 | 1485 | 19 | 98.7 |
| <i>Enterococci</i> | 132 | 3 | 97.7 | 226 | 3 | 98.7 |
| Chemical Parameters | | | | | | |
| 1,2-dichloroethane | 71 | 0 | 100 | 79 | 0 | 100 |
| Antimony | 65 | 0 | 100 | 71 | 0 | 100 |
| Arsenic | 68 | 0 | 100 | 74 | 0 | 100 |
| Benzene | 66 | 0 | 100 | 71 | 0 | 100 |
| Benzo(a)pyrene | 74 | 0 | 100 | 80 | 0 | 100 |
| Boron | 66 | 0 | 100 | 72 | 0 | 100 |
| Bromate | 96 | 0 | 100 | 105 | 0 | 100 |
| Cadmium | 68 | 0 | 100 | 74 | 0 | 100 |
| Chromium | 68 | 0 | 100 | 74 | 0 | 100 |
| Copper | 164 | 1 | 99.4 | 269 | 1 | 99.6 |
| Cyanide | 55 | 0 | 100 | 58 | 0 | 100 |
| Fluoride | 171 | 7 | 95.9 | 307 | 7 | 97.7 |
| Lead | 170 | 1 | 99.4 | 276 | 1 | 99.6 |
| Mercury | 64 | 0 | 100 | 68 | 0 | 100 |
| Nickel | 89 | 0 | 100 | 95 | 0 | 100 |
| Nitrate | 382 | 0 | 100 | 822 | 0 | 100 |
| Nitrite (at tap) | 475 | 1 | 99.8 | 1038 | 1 | 99.9 |
| Nitrites (at WTW) | 5 | 0 | 100 | 28 | 0 | 100 |
| PAH | 75 | 0 | 100 | 81 | 0 | 100 |
| Pesticides - Total | 52 | 0 | 100 | 57 | 0 | 100 |
| Selenium | 68 | 0 | 100 | 74 | 0 | 100 |
| Tetrachloroethene & Trichloroethene | 142 | 0 | 100 | 262 | 0 | 100 |
| Trihalomethanes(Total) | 241 | 7 | 97.1 | 450 | 11 | 97.6 |
| Indicator Parameters | | | | | | |
| Aluminium | 530 | 59 | 88.9 | 1176 | 82 | 93.0 |
| Ammonium | 612 | 1 | 99.8 | 1423 | 3 | 99.8 |
| Chloride | 65 | 0 | 100 | 69 | 0 | 100 |
| <i>Clostridium perfringens</i> | 599 | 15 | 97.5 | 1423 | 19 | 98.7 |
| Coliform Bacteria | 622 | 55 | 91.2 | 1481 | 69 | 95.3 |
| Colony Count @ 22°C | 50 | 4 | 92.0 | 54 | 4 | 92.6 |
| Colour | 622 | 47 | 92.4 | 1479 | 66 | 95.5 |
| Conductivity | 613 | 0 | 100 | 1495 | 0 | 100 |
| Iron | 504 | 40 | 92.1 | 1093 | 54 | 95.1 |
| Manganese | 349 | 7 | 98.0 | 738 | 11 | 98.5 |
| Odour | 592 | 0 | 100 | 1393 | 0 | 100 |
| Oxidisability | 0 | 0 | | 0 | 0 | |
| pH | 622 | 32 | 94.9 | 1472 | 43 | 97.1 |
| Sodium | 87 | 1 | 98.9 | 93 | 1 | 98.9 |
| Sulphate | 65 | 0 | 100 | 69 | 0 | 100 |
| Taste | 314 | 0 | 100 | 736 | 0 | 100 |
| Total Organic Carbon | 136 | 0 | 100 | 214 | 0 | 100 |
| Turbidity (at tap) | 620 | 11 | 98.2 | 1470 | 12 | 99.2 |
| Turbidity (at WTW) | 0 | 0 | | 0 | 0 | |
| Radioactivity | | | | | | |
| Tritium | 0 | 0 | | 0 | 0 | |
| Total Indicative Dose | 0 | 0 | | 0 | 0 | |

Table A-3. Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for All Parameters in Private Group Water Schemes in 2008.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-------------------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 538 | 134 | 75.1 | 2020 | 211 | 89.6 |
| <i>Enterococci</i> | 263 | 18 | 93.2 | 351 | 19 | 94.6 |
| Chemical Parameters | | | | | | |
| 1,2-dichloroethane | 229 | 0 | 100 | 246 | 0 | 100 |
| Antimony | 226 | 0 | 100 | 240 | 0 | 100 |
| Arsenic | 233 | 2 | 99.1 | 254 | 2 | 99.2 |
| Benzene | 231 | 0 | 100 | 249 | 0 | 100 |
| Benzo(a)pyrene | 227 | 1 | 99.6 | 241 | 1 | 99.6 |
| Boron | 232 | 0 | 100 | 253 | 0 | 100 |
| Bromate | 250 | 0 | 100 | 290 | 0 | 100 |
| Cadmium | 234 | 0 | 100 | 255 | 0 | 100 |
| Chromium | 235 | 0 | 100 | 257 | 0 | 100 |
| Copper | 260 | 1 | 99.6 | 326 | 1 | 99.7 |
| Cyanide | 225 | 0 | 100 | 244 | 0 | 100 |
| Fluoride | 260 | 4 | 98.5 | 307 | 5 | 98.4 |
| Lead | 286 | 0 | 100 | 426 | 0 | 100 |
| Mercury | 226 | 0 | 100 | 240 | 0 | 100 |
| Nickel | 235 | 0 | 100 | 255 | 0 | 100 |
| Nitrate | 427 | 9 | 97.9 | 1300 | 18 | 98.6 |
| Nitrite (at tap) | 425 | 2 | 99.5 | 1286 | 2 | 99.8 |
| Nitrites (at WTW) | 5 | 0 | 100 | 13 | 0 | 100 |
| PAH | 225 | 1 | 99.6 | 238 | 1 | 99.6 |
| Pesticides - Total | 226 | 0 | 100 | 242 | 0 | 100 |
| Selenium | 233 | 0 | 100 | 254 | 0 | 100 |
| Tetrachloroethene & Trichloroethene | 235 | 0 | 100 | 481 | 0 | 100 |
| Trihalomethanes(Total) | 239 | 2 | 99.2 | 485 | 3 | 99.4 |
| Indicator Parameters | | | | | | |
| Aluminium | 396 | 17 | 95.7 | 1379 | 31 | 97.8 |
| Ammonium | 535 | 8 | 98.5 | 1918 | 12 | 99.4 |
| Chloride | 246 | 1 | 99.6 | 288 | 1 | 99.7 |
| <i>Clostridium perfringens</i> | 416 | 96 | 76.9 | 1538 | 137 | 91.1 |
| Coliform Bacteria | 538 | 238 | 55.8 | 2018 | 421 | 79.1 |
| Colony Count @ 22°C | 119 | 11 | 90.8 | 135 | 11 | 91.9 |
| Colour | 535 | 85 | 84.1 | 1964 | 167 | 91.5 |
| Conductivity | 515 | 0 | 100 | 1945 | 0 | 100 |
| Iron | 428 | 36 | 91.6 | 1385 | 63 | 95.5 |
| Manganese | 377 | 28 | 92.6 | 940 | 45 | 95.2 |
| Odour | 505 | 2 | 99.6 | 1814 | 2 | 99.9 |
| Oxidisability | 0 | 0 | | 0 | 0 | |
| pH | 536 | 60 | 88.8 | 1982 | 113 | 94.3 |
| Sodium | 231 | 1 | 99.6 | 256 | 1 | 99.6 |
| Sulphate | 229 | 0 | 100 | 247 | 0 | 100 |
| Taste | 370 | 0 | 100 | 920 | 0 | 100 |
| Total Organic Carbon | 248 | 2 | 99.2 | 279 | 2 | 99.3 |
| Turbidity (at tap) | 536 | 54 | 89.9 | 1971 | 60 | 97.0 |
| Turbidity (at WTW) | 17 | 2 | 88.2 | 25 | 2 | 92.0 |
| Radioactivity | | | | | | |
| Tritium | 5 | 0 | 100 | 5 | 0 | 100 |
| Total Indicative Dose | 0 | 0 | | 0 | 0 | |

Table A-4. Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for All Parameters in Small Private Supplies 2008.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-------------------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 932 | 113 | 87.9 | 1479 | 136 | 90.8 |
| <i>Enterococci</i> | 416 | 45 | 89.2 | 687 | 49 | 92.9 |
| Chemical Parameters | | | | | | |
| 1,2-dichloroethane | 19 | 0 | 100 | 27 | 0 | 100 |
| Antimony | 53 | 0 | 100 | 62 | 0 | 100 |
| Arsenic | 86 | 0 | 100 | 97 | 0 | 100 |
| Benzene | 19 | 0 | 100 | 27 | 0 | 100 |
| Benzo(a)pyrene | 22 | 0 | 100 | 30 | 0 | 100 |
| Boron | 70 | 0 | 100 | 79 | 0 | 100 |
| Bromate | 24 | 0 | 100 | 26 | 0 | 100 |
| Cadmium | 181 | 0 | 100 | 201 | 0 | 100 |
| Chromium | 183 | 0 | 100 | 203 | 0 | 100 |
| Copper | 326 | 2 | 99.4 | 410 | 2 | 99.5 |
| Cyanide | 25 | 0 | 100 | 34 | 0 | 100 |
| Fluoride | 26 | 0 | 100 | 34 | 0 | 100 |
| Lead | 367 | 2 | 99.5 | 470 | 2 | 99.6 |
| Mercury | 18 | 0 | 100 | 26 | 0 | 100 |
| Nickel | 181 | 0 | 100 | 199 | 0 | 100 |
| Nitrate | 631 | 23 | 96.4 | 904 | 29 | 96.8 |
| Nitrite (at tap) | 650 | 1 | 99.8 | 978 | 1 | 99.9 |
| Nitrites (at WTW) | 1 | 0 | 100 | 5 | 0 | 100 |
| PAH | 18 | 0 | 100 | 24 | 0 | 100 |
| Pesticides - Total | 23 | 0 | 100 | 31 | 0 | 100 |
| Selenium | 71 | 0 | 100 | 81 | 0 | 100 |
| Tetrachloroethene & Trichloroethene | 18 | 0 | 100 | 26 | 0 | 100 |
| Trihalomethanes(Total) | 20 | 0 | 100 | 29 | 0 | 100 |
| Indicator Parameters | | | | | | |
| Aluminium | 377 | 3 | 99.2 | 469 | 3 | 99.4 |
| Ammonium | 864 | 16 | 98.1 | 1311 | 18 | 98.6 |
| Chloride | 186 | 1 | 99.5 | 242 | 1 | 99.6 |
| <i>Clostridium perfringens</i> | 479 | 43 | 91.0 | 675 | 47 | 93.0 |
| Coliform Bacteria | 932 | 317 | 66.0 | 1473 | 398 | 73.0 |
| Colony Count @ 22°C | 14 | 1 | 92.9 | 22 | 1 | 95.5 |
| Colour | 863 | 41 | 95.2 | 1322 | 47 | 96.4 |
| Conductivity | 868 | 3 | 99.7 | 1329 | 4 | 99.7 |
| Iron | 630 | 64 | 89.8 | 855 | 72 | 91.6 |
| Manganese | 420 | 64 | 84.8 | 527 | 74 | 86.0 |
| Odour | 830 | 2 | 99.8 | 1214 | 2 | 99.8 |
| Oxidisability | 2 | 0 | 100 | 2 | 0 | 100 |
| pH | 902 | 158 | 82.5 | 1377 | 201 | 85.4 |
| Sodium | 66 | 5 | 92.4 | 81 | 5 | 93.8 |
| Sulphate | 15 | 1 | 93.3 | 23 | 1 | 95.7 |
| Taste | 294 | 1 | 99.7 | 418 | 1 | 99.8 |
| Total Organic Carbon | 15 | 0 | 100 | 24 | 0 | 100 |
| Turbidity (at tap) | 881 | 60 | 93.2 | 1337 | 67 | 95.0 |
| Turbidity (at WTW) | 11 | 2 | 81.8 | 19 | 2 | 89.5 |
| Radioactivity | | | | | | |
| Tritium | 2 | 0 | 100 | 2 | 0 | 100 |
| Total Indicative Dose | 0 | 0 | | 0 | 0 | |

Table B-1. Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for All Parameters in Public Water Supplies in 2009.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-------------------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 944 | 27 | 97.1 | 11115 | 33 | 99.7 |
| <i>Enterococci</i> | 703 | 20 | 97.2 | 2614 | 20 | 99.2 |
| Chemical Parameters | | | | | | |
| 1,2-dichloroethane | 653 | 0 | 100 | 1467 | 0 | 100 |
| Antimony | 666 | 3 | 99.5 | 1453 | 4 | 99.7 |
| Arsenic | 668 | 3 | 99.6 | 1517 | 3 | 99.8 |
| Benzene | 656 | 0 | 100.0 | 1476 | 0 | 100 |
| Benzo(a)pyrene | 606 | 1 | 99.8 | 1130 | 1 | 99.9 |
| Boron | 666 | 0 | 100 | 1488 | 0 | 100 |
| Bromate | 657 | 5 | 99.2 | 1265 | 5 | 99.6 |
| Cadmium | 666 | 0 | 100 | 1511 | 0 | 100 |
| Chromium | 666 | 0 | 100 | 1512 | 0 | 100 |
| Copper | 686 | 2 | 99.7 | 1700 | 2 | 99.9 |
| Cyanide | 625 | 0 | 100 | 1186 | 0 | 100 |
| Fluoride | 713 | 53 | 92.6 | 3814 | 131 | 96.6 |
| Lead | 771 | 22 | 97.1 | 2683 | 29 | 98.9 |
| Mercury | 658 | 0 | 100 | 1444 | 0 | 100 |
| Nickel | 672 | 0 | 100 | 1506 | 0 | 100 |
| Nitrate | 776 | 5 | 99.4 | 4865 | 5 | 99.9 |
| Nitrite (at tap) | 724 | 0 | 100 | 5207 | 0 | 100 |
| Nitrites (at WTW) | 91 | 0 | 100 | 523 | 0 | 100 |
| PAH | 607 | 2 | 99.7 | 1133 | 2 | 99.8 |
| Pesticides - Total | 587 | 2 | 99.7 | 1107 | 2 | 99.8 |
| Selenium | 666 | 0 | 100 | 1502 | 0 | 100 |
| Tetrachloroethene & Trichloroethene | 641 | 0 | 100 | 1271 | 0 | 100 |
| Trihalomethanes(Total) | 654 | 105 | 83.9 | 1480 | 186 | 87.4 |
| Indicator Parameters | | | | | | |
| Aluminium | 740 | 83 | 88.8 | 7823 | 228 | 97.1 |
| Ammonium | 941 | 5 | 99.5 | 10898 | 8 | 99.9 |
| Chloride | 663 | 2 | 99.7 | 1517 | 2 | 99.9 |
| <i>Clostridium perfringens</i> | 721 | 37 | 94.9 | 8885 | 49 | 99.4 |
| Coliform Bacteria | 944 | 190 | 79.9 | 11104 | 310 | 97.2 |
| Colony Count @ 22°C | 474 | 29 | 93.9 | 1255 | 36 | 97.1 |
| Colour | 945 | 132 | 86.0 | 11122 | 315 | 97.2 |
| Conductivity | 934 | 0 | 100 | 11348 | 0 | 100 |
| Iron | 816 | 90 | 89.0 | 7139 | 194 | 97.3 |
| Manganese | 699 | 34 | 95.1 | 3266 | 53 | 98.4 |
| Odour | 903 | 77 | 91.5 | 10282 | 227 | 97.8 |
| Oxidisability | 26 | 0 | 100 | 39 | 0 | 100 |
| pH | 945 | 233 | 75.3 | 11161 | 505 | 95.5 |
| Sodium | 678 | 2 | 99.7 | 1502 | 3 | 99.8 |
| Sulphate | 656 | 0 | 100 | 1410 | 0 | 100 |
| Taste | 719 | 13 | 99.2 | 7549 | 33 | 99.6 |
| Total Organic Carbon | 570 | 20 | 96.5 | 1279 | 24 | 98.1 |
| Turbidity (at tap) | 945 | 34 | 96.4 | 11029 | 44 | 99.6 |
| Turbidity (at WTW) | 161 | 54 | 66.5 | 1465 | 115 | 92.2 |
| Radioactivity | | | | | | |
| Tritium | 4 | 0 | 100 | 25 | 0 | 100 |
| Total Indicative Dose | 5 | 0 | 100 | 30 | 0 | 100 |

Table B-2. Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for All Parameters in Public Group Water Schemes in 2009.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-------------------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 593 | 3 | 99.5 | 1369 | 5 | 99.6 |
| <i>Enterococci</i> | 119 | 1 | 99.2 | 212 | 1 | 99.5 |
| Chemical Parameters | | | | | | |
| 1,2-dichloroethane | 55 | 0 | 100 | 58 | 0 | 100 |
| Antimony | 55 | 0 | 100 | 58 | 0 | 100 |
| Arsenic | 56 | 0 | 100 | 59 | 0 | 100 |
| Benzene | 54 | 0 | 100 | 57 | 0 | 100 |
| Benzo(a)pyrene | 65 | 1 | 98.5 | 69 | 1 | 98.6 |
| Boron | 56 | 0 | 100 | 59 | 0 | 100 |
| Bromate | 75 | 0 | 100 | 78 | 0 | 100 |
| Cadmium | 56 | 0 | 100 | 59 | 0 | 100 |
| Chromium | 56 | 0 | 100 | 59 | 0 | 100 |
| Copper | 77 | 0 | 100 | 80 | 0 | 100 |
| Cyanide | 44 | 0 | 100 | 46 | 0 | 100 |
| Fluoride | 156 | 10 | 93.6 | 283 | 10 | 96.5 |
| Lead | 77 | 0 | 100 | 80 | 0 | 100 |
| Mercury | 54 | 0 | 100 | 57 | 0 | 100 |
| Nickel | 77 | 0 | 100 | 80 | 0 | 100 |
| Nitrate | 290 | 1 | 99.7 | 557 | 1 | 99.8 |
| Nitrite (at tap) | 346 | 0 | 100 | 732 | 0 | 100 |
| Nitrites (at WTW) | 4 | 0 | 100 | 29 | 0 | 100 |
| PAH | 65 | 0 | 100 | 69 | 0 | 100 |
| Pesticides - Total | 33 | 0 | 100 | 35 | 0 | 100 |
| Selenium | 56 | 0 | 100 | 59 | 0 | 100 |
| Tetrachloroethene & Trichloroethene | 53 | 0 | 100 | 55 | 0 | 100 |
| Trihalomethanes(Total) | 76 | 24 | 68.4 | 81 | 24 | 70.4 |
| Indicator Parameters | | | | | | |
| Aluminium | 471 | 48 | 89.8 | 1008 | 54 | 94.6 |
| Ammonium | 593 | 1 | 99.8 | 1359 | 1 | 99.9 |
| Chloride | 54 | 0 | 100 | 57 | 0 | 100 |
| <i>Clostridium perfringens</i> | 579 | 4 | 99.3 | 1272 | 6 | 99.5 |
| Coliform Bacteria | 593 | 37 | 93.8 | 1369 | 42 | 96.9 |
| Colony Count @ 22°C | 47 | 3 | 93.6 | 50 | 3 | 94.0 |
| Colour | 593 | 30 | 94.9 | 1367 | 37 | 97.3 |
| Conductivity | 593 | 0 | 100 | 1366 | 0 | 100 |
| Iron | 401 | 30 | 92.5 | 831 | 30 | 96.4 |
| Manganese | 258 | 6 | 97.7 | 509 | 7 | 98.6 |
| Odour | 530 | 62 | 88.3 | 1214 | 81 | 93.3 |
| Oxidisability | 0 | | | 0 | | 100 |
| pH | 593 | 20 | 96.6 | 1368 | 23 | 98.3 |
| Sodium | 77 | 0 | 100 | 80 | 0 | 100 |
| Sulphate | 54 | 0 | 100 | 57 | 0 | 100 |
| Taste | 268 | 2 | 99.3 | 555 | 2 | 99.6 |
| Total Organic Carbon | 47 | 0 | 100 | 52 | 0 | 100 |
| Turbidity (at tap) | 593 | 5 | 99.2 | 1371 | 5 | 99.6 |
| Turbidity (at WTW) | 4 | 1 | 75.0 | 29 | 1 | 96.6 |
| Radioactivity | | | | | | |
| Tritium | 0 | 0 | | 0 | 0 | |
| Total Indicative Dose | 0 | 0 | | 0 | 0 | |

Table B-3. Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for All Parameters in Private Group Water Schemes in 2009.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-------------------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 511 | 87 | 83.0 | 1890 | 122 | 93.5 |
| <i>Enterococci</i> | 248 | 14 | 94.4 | 335 | 14 | 95.8 |
| Chemical Parameters | | | | | | |
| 1,2-dichloroethane | 227 | 0 | 100 | 251 | 0 | 100 |
| Antimony | 232 | 0 | 100 | 254 | 0 | 100 |
| Arsenic | 232 | 0 | 100 | 254 | 0 | 100 |
| Benzene | 231 | 0 | 100 | 254 | 0 | 100 |
| Benzo(a)pyrene | 216 | 0 | 100 | 229 | 0 | 100 |
| Boron | 232 | 0 | 100 | 254 | 0 | 100 |
| Bromate | 248 | 3 | 98.8 | 290 | 4 | 98.6 |
| Cadmium | 232 | 0 | 100 | 254 | 0 | 100 |
| Chromium | 232 | 0 | 100 | 254 | 0 | 100 |
| Copper | 246 | 4 | 98.4 | 307 | 4 | 98.7 |
| Cyanide | 224 | 0 | 100 | 238 | 0 | 100 |
| Fluoride | 262 | 2 | 99.2 | 320 | 2 | 99.4 |
| Lead | 274 | 1 | 99.6 | 502 | 1 | 99.8 |
| Mercury | 232 | 0 | 100 | 254 | 0 | 100 |
| Nickel | 232 | 0 | 100 | 254 | 0 | 100 |
| Nitrate | 370 | 3 | 99.2 | 1169 | 3 | 99.7 |
| Nitrite (at tap) | 375 | 1 | 99.7 | 1123 | 1 | 99.9 |
| Nitrites (at WTW) | 2 | 0 | 100 | 16 | 0 | 100 |
| PAH | 215 | 0 | 100 | 229 | 0 | 100 |
| Pesticides - Total | 203 | 0 | 100 | 216 | 0 | 100 |
| Selenium | 231 | 0 | 100 | 253 | 0 | 100 |
| Tetrachloroethene & Trichloroethene | 221 | 0 | 100 | 234 | 0 | 100 |
| Trihalomethanes(Total) | 236 | 23 | 90.3 | 265 | 28 | 89.4 |
| Indicator Parameters | | | | | | |
| Aluminium | 386 | 17 | 95.6 | 1206 | 31 | 97.4 |
| Ammonium | 511 | 4 | 99.2 | 1832 | 4 | 99.8 |
| Chloride | 240 | 0 | 100 | 287 | 0 | 100 |
| <i>Clostridium perfringens</i> | 393 | 60 | 84.7 | 1240 | 77 | 93.8 |
| Coliform Bacteria | 511 | 194 | 62.0 | 1888 | 291 | 84.6 |
| Colony Count @ 22°C | 124 | 10 | 91.9 | 130 | 10 | 92.3 |
| Colour | 511 | 77 | 84.9 | 1870 | 144 | 92.3 |
| Conductivity | 485 | 0 | 100 | 1775 | 0 | 100 |
| Iron | 392 | 34 | 91.3 | 1217 | 46 | 96.2 |
| Manganese | 345 | 22 | 93.6 | 940 | 28 | 97.0 |
| Odour | 463 | 32 | 93.1 | 1634 | 38 | 97.7 |
| Oxidisability | 5 | 0 | 100 | 5 | 0 | 100 |
| pH | 511 | 56 | 89.0 | 1870 | 103 | 94.5 |
| Sodium | 237 | 1 | 99.6 | 280 | 1 | 99.6 |
| Sulphate | 230 | 0 | 100 | 255 | 0 | 100 |
| Taste | 313 | 7 | 99.8 | 796 | 7 | 99.1 |
| Total Organic Carbon | 226 | 2 | 99.1 | 274 | 2 | 99.3 |
| Turbidity (at tap) | 511 | 17 | 96.7 | 1879 | 20 | 98.9 |
| Turbidity (at WTW) | 18 | 7 | 61.1 | 39 | 7 | 82.1 |
| Radioactivity | | | | | | |
| Tritium | 5 | 0 | 100 | 5 | 0 | 100 |
| Total Indicative Dose | 0 | 0 | | 0 | 0 | |

Table B-4. Total Number of Water Supply Zones (WSZs) Monitored and Samples Analysed for All Parameters in Small Private Supplies in 2009.

| Parameter | No. of WSZs Monitored | No. of WSZs with Exceedances | % of WSZs Complying | No. of Samples Analysed | No. of Samples Exceeding | % of Samples Complying |
|-------------------------------------|-----------------------|------------------------------|---------------------|-------------------------|--------------------------|------------------------|
| Microbiological Parameters | | | | | | |
| <i>E. coli</i> | 968 | 83 | 91.4 | 1537 | 93 | 93.9 |
| <i>Enterococci</i> | 465 | 48 | 89.7 | 772 | 53 | 93.1 |
| Chemical Parameters | | | | | | |
| 1,2-dichloroethane | 13 | 0 | 100 | 19 | 0 | 100 |
| Antimony | 42 | 0 | 100 | 50 | 0 | 100 |
| Arsenic | 82 | 1 | 98.8 | 95 | 1 | 98.9 |
| Benzene | 13 | 0 | 100 | 19 | 0 | 100 |
| Benzo(a)pyrene | 10 | 0 | 100 | 14 | 0 | 100 |
| Boron | 47 | 0 | 100 | 55 | 0 | 100 |
| Bromate | 12 | 1 | 91.7 | 14 | 1 | 92.9 |
| Cadmium | 144 | 0 | 100 | 162 | 0 | 100 |
| Chromium | 144 | 0 | 100 | 162 | 0 | 100 |
| Copper | 294 | 0 | 100 | 348 | 0 | 100 |
| Cyanide | 11 | 0 | 100 | 17 | 0 | 100 |
| Fluoride | 20 | 0 | 100 | 26 | 0 | 100 |
| Lead | 385 | 1 | 99.7 | 468 | 1 | 99.8 |
| Mercury | 13 | 0 | 100 | 19 | 0 | 100 |
| Nickel | 144 | 2 | 98.6 | 162 | 2 | 98.8 |
| Nitrate | 660 | 7 | 98.9 | 913 | 9 | 99.0 |
| Nitrite (at tap) | 726 | 2 | 99.7 | 1108 | 2 | 99.8 |
| Nitrites (at WTW) | 0 | 0 | | 0 | 0 | |
| PAH | 10 | 0 | 100 | 14 | 0 | 100 |
| Pesticides - Total | 9 | 0 | 100 | 14 | 0 | 100 |
| Selenium | 46 | 0 | 100 | 54 | 0 | 100 |
| Tetrachloroethene & Trichloroethene | 12 | 0 | 100 | 18 | 0 | 100 |
| Trihalomethanes(Total) | 13 | 1 | 92.3 | 25 | 4 | 84.0 |
| Indicator Parameters | | | | | | |
| Aluminium | 444 | 5 | 98.9 | 686 | 5 | 99.3 |
| Ammonium | 916 | 18 | 98.0 | 1384 | 28 | 98.0 |
| Chloride | 160 | 0 | 100 | 200 | 0 | 100 |
| <i>Clostridium perfringens</i> | 432 | 33 | 92.4 | 576 | 35 | 93.9 |
| Coliform Bacteria | 969 | 316 | 67.4 | 1531 | 378 | 75.3 |
| Colony Count @ 22°C | 4 | 0 | 100 | 14 | 0 | 100 |
| Colour | 949 | 45 | 95.3 | 1434 | 52 | 96.4 |
| Conductivity | 921 | 2 | 99.8 | 1391 | 2 | 99.9 |
| Iron | 654 | 68 | 89.6 | 924 | 78 | 91.6 |
| Manganese | 427 | 69 | 83.8 | 509 | 75 | 85.3 |
| Odour | 832 | 12 | 98.6 | 1233 | 12 | 99.0 |
| Oxidisability | 0 | 0 | | 0 | 0 | |
| pH | 956 | 185 | 80.6 | 1443 | 232 | 83.9 |
| Sodium | 113 | 13 | 88.5 | 160 | 14 | 91.3 |
| Sulphate | 12 | 0 | 100 | 18 | 0 | 100 |
| Taste | 236 | 0 | 100 | 314 | 0 | 100 |
| Total Organic Carbon | 4 | 0 | 100 | 10 | 0 | 100 |
| Turbidity (at tap) | 952 | 61 | 93.6 | 1434 | 68 | 95.3 |
| Turbidity (at WTP) | 0 | 0 | | 0 | 0 | |
| Radioactivity | | | | | | |
| Tritium | 1 | 0 | 100 | 1 | 0 | 100 |
| Total Indicative Dose | 1 | 0 | 100 | 1 | 0 | 100 |

APPENDIX V - MICRO, CHEMICAL AND INDICATOR PARAMETERS IN THE 2007 DRINKING WATER REGULATIONS.

MICROBIOLOGICAL, CHEMICAL AND INDICATOR PARAMETRIC VALUES

| | Parameter | Parametric Value | Unit | Comments | Notes |
|-----------------------------------|-----------------------------------|------------------|-----------|---|--------|
| Microbiological Parameters | | | | | |
| 1 | <i>Escherichia coli (E. coli)</i> | 0 | No./100ml | The <i>E. coli</i> bacteria is present in very high numbers in human or animal faeces and is rarely found in the absence of faecal pollution. As such, its presence in drinking water is a good indication that either the source of the water has become contaminated or that the treatment process at the water treatment plant is not operating adequately. | |
| 2 | <i>Enterococci</i> | 0 | No./100ml | <i>Enterococci</i> originate in human or animal waste and thus their presence provides an indication that the water supply has been contaminated with faeces | |
| Chemical Parameters | | | | | |
| 3 | Acrylamide | 0.10 | µg/l | Acrylamide can be present in water supplies from the use of polyacrylamides as coagulant aids in water treatment. It is classified by the International Agency for Research on Cancer (IARC) in Group 2A (i.e., probably carcinogenic to humans). | Note 1 |
| 4 | Antimony | 5.0 | µg/l | Antimony is a naturally occurring trace element used in the metal industry and in flame retardant materials. It can also occur naturally from weathering of rocks. The toxicity of antimony depends on the form it occurs in (naturally occurring antimony is likely to be in the less toxic form) and while there is some evidence for the carcinogenicity of certain antimony compounds by inhalation, there is no data to indicate carcinogenicity by the oral route. | |
| 5 | Arsenic | 10 | µg/l | Arsenic is widely distributed through-out the Earth's crust and is used in certain industrial applications (primarily as alloying agents in the manufacture of transistors, lasers and semi-conductors) and has been used in the past as a component of the wood preservative CCA (Copper-Chromium-Arsenic) though it is no longer in use. However, the primary source of arsenic in drinking water is from its dissolution into groundwater from naturally occurring ores and minerals. Arsenic has been shown to have significant health effects in some parts of the world (e.g. Bangladesh). Arsenic is one of the few substances shown to cause cancer in humans through consumption of drinking water and there is overwhelming evidence that consumption of arsenic through drinking water is causally related to the development of cancer in several different locations in the body. | |
| 6 | Benzene | 1.0 | µg/l | The principle source of benzene is from vehicle emissions which may find their way into water. Benzene is carcinogenic to humans. | |
| 7 | Benzo(a)pyrene | 0.010 | µg/l | Benzo(a)pyrene was formerly included in the group of chemicals called PAHs (Polycyclic Aromatic Hydrocarbons) which are generally undesirable in water. The absolute undesirability of benzo(a)pyrene in drinking water has been emphasised by its inclusion as a separate parameter. It is carcinogenic. | |

| | Parameter | Parametric Value | Unit | Comments | Notes |
|----|--------------------|------------------|------|--|---------|
| 8 | Boron | 1.0 | mg/l | Boron is a naturally occurring element and can occur naturally in groundwater. It is also used in the manufacture of glass, soap, and detergents and as flame retardants. Development toxicity has been demonstrated in laboratory animals at levels in excess of the parametric value. | |
| 9 | Bromate | 10 | µg/l | Bromate is classified by the International Agency for Research on Cancer (IARC) in Group 2B (i.e., possibly carcinogenic to humans). Bromate is not normally found in water but may be formed during ozonation when the bromide ion is present in water. Under certain conditions, bromate may also be formed in concentrated hypochlorite solutions used to disinfect water (WHO, 2004). | Note 2 |
| 10 | Cadmium | 5.0 | µg/l | Cadmium is used in the steel and plastics industry and is a common component of batteries. It may also enter water from trace impurities in the zinc of galvanised pipes and solders and some metal fittings. Cadmium can accumulate in the kidneys. | |
| 11 | Chromium | 50 | µg/l | Chromium is commonly found in the Earth's crust, though can be present in water from contamination from timber treatment chemicals (Copper-Chromium-Arsenic). The toxicity of chromium depends on the form in which it is found, with hexavalent chromium classified as a human carcinogen. | |
| 12 | Copper | 2.0 | mg/l | Copper is a nutrient essential for health, though at elevated levels can become a contaminant (elevated levels can cause acute gastrointestinal effects). The primary source of copper in drinking water is from corrosion of internal copper plumbing. The levels of copper in drinking water depend on the length of time the water has been stagnant in the copper piping and thus fully flushed water generally has low levels of copper. | Note 3 |
| 13 | Cyanide | 50 | µg/l | Cyanide is a reactive, highly toxic entity, which, in excessive amounts, will cause mortality to humans. It is a common constituent of industrial wastes, especially from metal plating processes and electronic components manufacture. | |
| 14 | 1,2-dichloroethane | 3.0 | µg/l | 1,2-dichloroethane is a synthetic intermediate and organic solvent used in the manufacture of chemicals. It can enter water from discharges from facilities using the chemical. It is a toxic substance which can cause a variety of ill-effects including eye damage, dermatitis and narcotic effects. It has also been classified by the IARC in Group 2 (possible human carcinogen). | |
| 15 | Epichlorohydrin | 0.10 | µg/l | Epichlorohydrin can be present in water supplies from the use of polyamines as coagulant aids in water treatment and from epoxy resin linings of water mains and water retaining structures. It is classified by the International Agency for Research on Cancer (IARC) in Group 2A (i.e., probably carcinogenic to humans). | Note 1 |
| 16 | Fluoride | 0.8 | mg/l | Fluoride arises almost exclusively from fluoridation of public water supplies and from industrial discharges, although it occurs naturally in quite rare instances. Past health studies have shown that the addition of fluoride to water supplies at levels above 0.6mg/l F ⁻ leads to a reduction in tooth decay in growing children and that the optimum beneficial effects were thought to occur around 1.0 mg/l. However, in light of recent international and Irish research which shows an increasing occurrence of dental fluorosis, the Forum on Fluoridation (2002) recommended the lowering of the fluoride levels in drinking water to a range of 0.6 to 0.8 mg/l, with a target of 0.7 mg/l. | Note 11 |

| | Parameter | Parametric Value | Unit | Comments | Notes |
|----|--|------------------|------|---|---------------|
| 17 | Lead | 10 | µg/l | Lead is present in drinking water primarily from its dissolution from lead pipes or lead-containing solder and thus the concentration of lead in drinking water depends on a number of factors including pH, temperature, water hardness and standing time of the water. Consequently, the method of sampling for lead is critical and depending on the method used results can vary significantly. According to the World Health Organisation (WHO, 2004) lead is a general toxicant that accumulates in bone. Infants, children up to 6 years of age and pregnant women are the most susceptible to its health effects. It is toxic to both the central and peripheral nervous systems. | Notes 3 and 4 |
| 18 | Mercury | 1.0 | µg/l | Mercury is a very toxic metal that primarily effects the kidney. It has been used in electrical appliances, batteries, plastics and in dental amalgams, though many of these uses are no longer applicable. | |
| 19 | Nickel | 20 | µg/l | Nickel is a metal used in the production of stainless steels and alloys and thus may be present in drinking water from water that comes into contact with nickel or chromium plated taps particularly where the water has been stagnant prior to consumption. Nickel compounds are carcinogenic and metallic nickel is possibly carcinogenic. | Note 3 |
| 20 | Nitrate | 50 | mg/l | Nitrate in the environment originates mostly from organic and inorganic sources such as waste discharges, animal slurries and artificial fertiliser. High levels of nitrate in drinking water may induce "blue baby" syndrome (methaemoglobinemia). The nitrate converts to nitrite which reacts with blood haemoglobin thus reducing the availability of the blood to hold oxygen. | Note 5 |
| 21 | Nitrite | 0.50 | mg/l | Nitrites exist in very low levels principally because the nitrogen will tend to exist in other forms (such as ammonia). Nitrite is an intermediate in the oxidation of ammonia to nitrate. Nitrite is associated with methaemoglobinemia as previously discussed. | Note 5 |
| 22 | Pesticides | 0.10 | µg/l | Pesticides refers to a wide range of chemicals used for the control of pests. The parametric value is set on a precautionary basis. Where pesticides are detected the individual pesticide detected must be considered and its toxicology. | Notes 6 and 7 |
| 23 | Pesticides – Total | 0.50 | µg/l | Pesticides refers to a wide range of chemicals used for the control of pests. The parametric value is set on a precautionary basis. Where pesticides are detected the individual pesticide detected must be considered and its toxicology. | Note 6 and 8 |
| 24 | Polycyclic aromatic hydrocarbons (PAH) | 0.10* | µg/l | Polycyclic Aromatic Hydrocarbons (PAHs) are a group of organic compounds containing 2 or more fused aromatic rings of carbon and hydrogen atoms. Although there are many compounds in this group, for the purposes of determining compliance with the Drinking Water Regulations only four are considered – benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(1,2,3-cd)pyrene. They originate from many sources including coal-tar coating of drinking water pipes, soot, vehicle emissions and as combustion products of hydrocarbon fuels. This group of compounds are widely regarded as carcinogens, though the potency of the different PAHs varies. | Note 9 |
| 25 | Selenium | 10 | µg/l | Selenium originates from the weathering of rocks and soils but is also used in industry as a chemical catalyst. It is an essential biological requirement though only very small concentrations of | |

| Parameter | Parametric Value | Unit | Comments | Notes | |
|-----------|-----------------------------------|------|--|--|---------|
| | | | selenium are required, above which it is toxic and can cause a variety of illnesses. | | |
| 26 | Tetrachloroethene/Trichloroethene | 10* | µg/l | Tetrachloroethene and trichloroethene are synthetic solvents used in the dry-cleaning industry and other various industrial and manufacturing processes as well as being used as a degreaser. It may be carcinogenic but otherwise can have a variety of ill effects. | |
| 27 | Trihalomethanes – Total | 100* | µg/l | <p>Trihalomethanes (THMs) are derivatives of the simplest organic compound - methane, CH₄ - in which 3 of the hydrogen atoms are substituted by halogen atoms. The principal halogens are fluorine (F₂), chlorine (Cl₂), bromine (Br₂) and iodine (I₂), but while many combinations are theoretically possible, the term trihalomethanes is applied to four specific compounds containing only chlorine and/or bromine as the halogen elements. The four compounds are <i>chloroform</i> (CHCl₃), <i>bromodichloromethane</i> (CHBrCl₂), <i>dibromochloromethane</i> (CHBr₂Cl) and <i>bromoform</i> (CHBr₃).</p> <p>Chlorine (or appropriate compounds of it) is undoubtedly the most important chemical used in water treatment in Ireland today, as it has been in the past. Although it is a highly poisonous gas in its pure form and a powerful oxidising agent, chlorine in very dilute solution is a most effective agent for the disinfection of water. It is very efficient at destroying those bacteria which originate in human or animal waste and which cause undesirable and dangerous contamination of drinking water.</p> <p>As a powerful oxidising agent, chlorine also breaks down the complex and inert organic molecules which are the colouring agents of the water, forming smaller, reactive entities. These entities react with chlorine (and with bromine derived from the oxidation by chlorine of bromide naturally present) to form the THM compounds, the most abundant of which is chloroform(CHCl₃). There is thus a fairly straightforward relationship between the degree of colour in the water prior to chlorination and the quantities of THMs present following chlorination. If colour is present at the point of chlorination, THMs are likely to be formed.</p> <p>THM compounds are undesirable in drinking water for two reasons. Firstly, the actual compounds themselves may pose a hazard to the health of the consumer if present in excessive amounts, as chloroform is a suspected carcinogen. Secondly, the presence of the THM group may be an indicator of the possible presence of other organic by-products of chlorination in trace amounts. The WHO advises that "<i>In controlling trihalomethanes, a multistep treatment system should be used to reduce organic trihalomethane precursors, and primary consideration should be given to ensuring that disinfection is never compromised</i>".</p> | Note 10 |
| 28 | Vinyl chloride | 0.50 | µg/l | Vinyl chloride can be present in water supplies from the use of unplasticised polyvinyl chloride (uPVC) pipes in water distribution systems. It is carcinogenic. | Note 1 |

| | Parameter | Parametric value | Unit | Comments | Notes |
|-----------------------------|---|--|------------------------------|---|---------|
| Indicator Parameters | | | | | |
| 29 | Aluminium | 200 | µg/l | Aluminium is <u>present</u> in drinking water as a result of its use as aluminium sulphate (a coagulant) in the water treatment process, though can be naturally present in some waters. Historically, there has been some concern about possible links between aluminium in drinking water and Alzheimer's disease. However, the WHO states that: <i>"On the whole, the positive relationship between aluminium in drinking water and Alzheimer's disease which was demonstrated in several epidemiological studies, cannot be totally discounted. However, strong reservations about inferring a causal relationship are warranted in view of the failure of these studies to account for demonstrated confounding factors and for the total aluminium intake from all sources".</i> | |
| 30 | Ammonium | 0.30 | mg/l | Ammonium in water supplies originates from agricultural and industrial processes, as well as from disinfection with chloramines (a method of disinfection not in use in Ireland). Elevated levels of ammonium may arise from intensive agriculture in the catchment of the water source. Ammonium is therefore an indicator of possible bacterial, sewage and animal waste pollution. Ammonium in itself is not a health risk but the parametric value serves as a valuable indicator of source pollution. | |
| 31 | Chloride | 250 | mg/l | Chloride can originate from natural sources such as saltwater intrusion in coastal sources but can be present in sewage and industrial effluents and thus can be an indicator of pollution from these sources. | Note 12 |
| 32 | <i>Clostridium perfringens</i> (incl spores) | 0 | No/100 ml | <i>Clostridium perfringens</i> is a member of the bacterial intestinal flora of humans and therefore serves as an indicator of faecal pollution. The spores of <i>Clostridium perfringens</i> are particularly resistant to unfavourable conditions in the environment and thus they survive for long periods. As such they can be useful indicators of water that is intermittently polluted. | Note 13 |
| 33 | Colour | Acceptable to consumers and no abnormal change | | Colour in water is usually due to the presence of complex organic molecules derived from vegetable (humic) matter such as peat, leaves, branches etc. While colour, in itself is primarily as aesthetic parameter it may indicate other problems with the water supply particularly where the water is chlorinated. In such cases the formation of trihalomethanes may occur. | |
| 34 | Conductivity | 2500 | µS cm ⁻¹ at 20 °C | Conductivity is a measure of the ability of water to conduct an electrical current, therefore conductivity is related to the ionic content of the water. | Note 12 |
| 35 | Hydrogen ion concentration | ≥ 6.5 and ≤9.5 | pH units | pH is a measure of whether a liquid is acid or alkaline. The pH scale ranges from 0 (very acid) to 14 (very alkaline). The range of natural pH in freshwaters extends from around 4.5 for acid peaty upland waters to over 10 in waters where there is intense photosynthetic activity by algae. However, the most frequently encountered range is 6.5 to 8.0. The control of pH is a critical component of water treatment and distribution, influencing the effectiveness of coagulation, disinfection and the concentration of plumbing materials (such as lead, copper and nickel) in the final product. | Note 12 |

| | Parameter | Parametric value | Unit | Comments | Notes |
|----|--------------------------------|--|---------------------|---|---------|
| 36 | Iron | 200 | µg/l | Iron is an abundant metal found in the Earth's crust. It is naturally present in water but can also be present in drinking water from the use of iron coagulants or the corrosion of steel and cast iron pipes during water distribution. Iron is an essential element in human nutrition. The WHO (WHO, 2004) states that values of up to 2 mg/l (10 times the parametric value) do not present a hazard to health. However, at levels less than 2 mg/l but above the parametric value, the colour of water may turn brown, become turbid or may deposit solids on clothes washed in the water or food cooked using water. | |
| 37 | Manganese | 50 | µg/l | Manganese is an element abundant in the Earth's crust and is commonly found in groundwater. In common with iron, the problems associated with levels of manganese above the parametric value are primarily aesthetic, as manganese can cause staining problems. High levels of manganese also cause objectionable tastes in the water but there are no particular toxicological connotations. The WHO recommend a guideline value of 0.4 mg/l, which is twice the parametric value in the Regulations. | |
| 38 | Odour | Acceptable to consumers and no abnormal change | | | |
| 39 | Oxidisability | 5.0 | mg/l O ₂ | Oxidisability is a measure of the organic (and other oxidisable) matter present in a water. | Note 14 |
| 40 | Sulphate | 250 | mg/l | Sulphate is naturally occurring and is present in numerous minerals. The WHO review (WHO, 2004) did not identify a level of sulphate in water that is likely to cause adverse health effects but studies did indicate a laxative effect at concentrations of 1,000 to 1,200 mg/l (i.e., several times higher than the parametric value). | Note 12 |
| 41 | Sodium | 200 | mg/l | Sodium is an abundant natural constituent of rocks and soils and is always present in natural waters. Excessive intake can cause hypertension but the primary mode of intake is via food. | |
| 42 | Taste | Acceptable to consumers and no abnormal change | | | |
| 43 | Colony count 22 ⁰ C | No abnormal change | | This is the number of organisms per millilitre when the water is stored at 22 ⁰ C. The usefulness of this parameter is that sudden or significant changes in the levels of organisms can indicate problems with the water supply. | |
| 44 | Coliform bacteria | 0 | No./100 ml | The coliform bacteria (previously know as Total Coliforms) are a group of organisms that can survive and grow in water. They are a useful indicator of treatment efficiency and the cleanliness of the distribution mains. Coliform bacteria can occur in sewage and in natural waters. Coliform bacteria should not be present in a water that is disinfected and their presence indicates that either disinfection has not been complete, that there is ingress into the water mains in the distribution network or that the sample point is contaminated. | |
| 45 | Total Organic Carbon (TOC) | No abnormal | | This is a measure of the organic carbon in water. Sudden or significant changes in the level of | Note 15 |

| | Parameter | Parametric value | Unit | Comments | Notes |
|----|-----------------------|--|----------|--|-----------------|
| | | change | | TOC in the treated water can indicate problems with the water supply. | |
| 46 | Turbidity | Acceptable to consumers and no abnormal change | | The control of turbidity is one of the indicators of the efficiency of treatment at the plant. Elevated levels of turbidity in the treated water indicate that the treatment process is not operating adequately. It also provides a good indication of whether the treatment plant is capable of removing <i>Cryptosporidium</i> oocysts. While the parametric value for turbidity (at the tap) is that the water must be "acceptable to consumers and [there must be] no abnormal change" there is a parametric value for turbidity (for water leaving the treatment plant) of 1.0 NTU. However, it must be stressed that this value is for visual acceptability of the water. In practice turbidity levels need to be much lower and should not exceed 0.2 NTU and preferably be below 0.1 NTU to be protective against <i>Cryptosporidium</i> breakthrough in the treatment plant. | Note 16 |
| 47 | Tritium | 100 | Bq/l | Tritium, as a form of Hydrogen, is found naturally in air and water. It is produced naturally in the upper atmosphere when cosmic rays strike nitrogen molecules in the air. Tritium is also produced commercially in reactors. It is used in various self-luminescent devices, such as exit signs in buildings, aircraft dials, gauges, luminous paints, wristwatches and in life science research. The main human health hazard associated with Tritium relates to its ingestion or inhalation which, if in high levels, can lead to the generation of low energy radioactive decay products in the body. | Notes 17 and 19 |
| 48 | Total indicative dose | 0.10 | mSv/year | | Notes 18 and 19 |

* sum of concentrations of specified compounds

Notes

- Note 1:** The parametric value refers to the residual monomer concentration in the water as calculated according to specifications of the maximum release from the corresponding polymer in contact with the water.
- Note 2:** For the water referred to in sub-articles 6 (a), (b) and (c) the parametric value to be met by 1 January, 2004 is 25 µg/l. A value of 10 µg/l must be met by 25 December, 2008.
- Note 3:** The value applies to a sample of water intended for human consumption obtained by an adequate sampling method* at the tap and taken so as to be representative of a weekly average value ingested by consumers and that takes account of the occurrence of peak levels that may cause adverse effects on human health.
- *The Copper, Lead and Nickel parameters shall be monitored in such a manner as the Minister shall determine from time to time.
- Note 4:** For water referred to in sub-articles 6 (a), (b) and (c), the parametric value to be met by 1, January 2004 is 25 µg/l. A value of 10 µg/l must be met by 25 December, 2013.
- All appropriate measures shall be taken to reduce the concentration of lead in water intended for human consumption as much as possible during the period needed to achieve compliance with the parametric value.
- When implementing the measures priority shall be progressively given to achieve compliance with that value where lead concentrations in water intended for human consumption are highest.
- Note 5:** Compliance must be ensured with the conditions that $[\text{nitrate}]/50 + [\text{nitrite}]/3 < 1$, the square brackets signifying the concentrations in mg/l for nitrate (NO₃) and nitrite (NO₂) and the value of 0.10mg/l for nitrites ex water treatment works.
- Note 6:** Only those pesticides which are likely to be present in a given supply require to be monitored.
- “Pesticides” means:
- organic insecticides,
 - organic herbicides,
 - organic fungicides,
 - organic nematocides,
 - organic acaricides,
 - organic algicides,
 - organic rodenticides,
 - organic slimicides,
 - related products (inter alia, growth regulators)
- and their relevant metabolites, degradation and reaction products.
- Note 7:** The parametric value applies to each individual pesticide. In the case of aldrin, dieldrin, heptachlor and heptachlor epoxide the parametric value is 0.030 µg/l.
- Note 8:** “Pesticides – Total” means the sum of all individual pesticides detected and quantified in the course of the monitoring procedure.
- Note 9:** The specified compounds are:
- benzo(b)fluoranthene
 - benzo(k)fluoranthene
 - benzo(ghi)perylene
 - indeno(1,2,3-cd)pyrene.
- Note 10:** The specified compounds are: chloroform, bromoform, dibromochloromethane and bromodichloromethane.
- For the water referred to in sub-articles 6 (a), (b) and (c), the parametric value to be met by 1 January, 2004 is 150 µg/l. A value of 100 µg/l must be met by 25 December, 2008.

All appropriate measures must be taken to reduce the concentration of THMs in water intended for human consumption as much as possible during the period needed to achieve compliance with the parametric value.

When implementing the measures to achieve this value, priority must progressively be given to those areas where THM concentrations in water intended for human consumption are highest.

Note 11: The parametric value is 1.0mg/l for fluoridated supplies. In the case of supplies with naturally occurring fluoride the parametric value is 1.5mg/l.

Note 12: The water should not be aggressive

Note 13: This parameter need not be measured unless the water originates from or is influenced by surface water. In the event of non-compliance with this parametric value, the supply shall be investigated to ensure that there is no potential danger to human health arising from the presence of pathogenic micro-organisms, e.g. *cryptosporidium*.

Note 14: This parameter need not be measured if the parameter TOC is analysed.

Note 15: This parameter need not be measured for supplies of less than 10,000m³ a day.

Note 16: In the case of surface water treatment, a parametric value not exceeding 1.0 NTU (nephelometric turbidity units) in the water ex treatment works must be strived for.

Note 17: Monitoring frequencies to be set at a later date in Part 2 of the Schedule.

Note 18: Excluding tritium, potassium –40, radon and radon decay products; monitoring frequencies, monitoring methods and the most relevant locations for monitoring points to be set at a later date in Part 2 of the Schedule.

Note 19: **A.** The proposals required by Note 6 on monitoring frequencies, and Note 7 on monitoring frequencies, monitoring methods and the most relevant locations for monitoring points in Part 2 of the Schedule shall be adopted in accordance with the Committee procedure laid down in Article 12 of Council Directive 98/83/EEC.

B. Drinking water need not be monitored for tritium or radioactivity to establish total indicative dose where, on the basis of other monitoring carried out, the levels of tritium of the calculated total indicative dose are well below the parametric value.

APPENDIX VI - FURTHER INFORMATION AND GUIDANCE BY THE EPA.

5. Further Information and Guidance by the EPA

5.1 Access to Information on Drinking Water Quality

5.1.1 Background

Ready access by consumers to up-to-date data on drinking water quality empowers them to engage actively with the water supplier to seek information or reassurance in relation to their drinking water supply.

Monitoring of drinking water quality in Ireland is undertaken by Water Services Authorities (local authorities) for all public water supplies. For private supplies (other than supplies exempted under the Drinking Water Regulations) local authorities have a supervisory role and must ensure compliance with standards by these private suppliers.

The 2007 Drinking Water Regulations set out the chemical and micro-biological standards against which drinking water should be monitored and require that Water Services Authorities maintain up-to-date records of results for their own public supplies and for all other supplies for which they have supervisory responsibility. These records are required to be available to the general public for inspection. The Drinking Water Regulations require that the EPA collects and verifies monitoring results for all of the above supplies, i.e. all public and private supplies other than supplies exempted under the regulations.



The EPA's "*The Provision and Quality of Drinking Water in Ireland*" report which is published annually provides an assessment of the quality of drinking water based on the information submitted. This is available on the Agency's website to download free of charge (www.epa.ie).

The 2007 Drinking Water Regulations enable the Minister for the Environment, Heritage and Local Government to issue guidelines on the maintenance of records in electronic format to facilitate public access to drinking water data. The Minister for the Environment, Heritage and Local Government is also authorised under Section 30 of the Water Services Act 2007 Act to issue a Direction on the provision of public information and advice by water services providers (local authorities) on the format and content of records and reports.

5.1.2 Requirements for Local Authorities (Water Services Authorities)

On 20 July 2009, the Minister for the Environment, Heritage and Local Government issued instructions³⁹ to local authorities (Water Services Authorities) to commence publishing the results of their drinking water sampling programmes on their websites. The Minister directed that all Water Services Authorities should publish the results of their water sampling and that access to the data should be made available from a prominent position on each Water Services Authorities website homepage. The Minister⁴⁰ has also asked each Water Services Authority to establish a contact telephone hotline for responding to queries regarding drinking water quality.

³⁹ Circular Letter (WSP 6/09) on the *Publication of Drinking Water Quality Monitoring Results*.

⁴⁰ Press Release from the Department of the Environment, Heritage and Local Government dated 07/11/2008

The Minister's instruction also requires local authorities, as a minimum, to publish on their websites results in respect of the following parameters:

| <u>Microbiological and Chemical Parameters</u> | <u>Indicator and Other Parameters</u> |
|--|--|
| <ul style="list-style-type: none"> ▪ <i>E. coli</i>, ▪ <i>Enterococci</i>, ▪ lead, ▪ nitrate, ▪ trihalomethane. | <ul style="list-style-type: none"> ▪ aluminium, ▪ turbidity, ▪ <i>cryptosporidium</i> (if tested for) |

It also recommends that Water Services Authorities publish on their websites:

- a. Details of any notifications sent to the EPA under Regulations 9 and 10 of the European Communities (Drinking Water)(No. 2) Regulations 2007;
- b. The relevant local authority drinking water summary report from the most recently published EPA Drinking Water Report;
- c. Drinking Water Audit Reports conducted by the EPA;
- d. The Remedial Action List (RAL) of supplies in each local authority's functional area. (This should include summary details of the action programmes implemented to improve the supplies and a timeframe for completion of the necessary works).

Members of the general public looking for information on their drinking water quality should contact their local authority or refer to their local authorities' website. The contact details for all local authorities (County Councils and City Councils) are included in Appendix VI of this report.

Some Water Services Authorities have begun to make drinking water quality data and related information available through their websites but significant progress in this regard is still needed in order to comply fully with the requirements of the Department Environment Heritage and Local Government Circular letter on the Publication of Drinking Water Quality Monitoring Results.

5.2 Guidance, Advice Notes and Circular Letters by the EPA

The Environmental Protection Agency Act, 1992 empowers the EPA to publish criteria and procedures in relation to the management, maintenance, supervision, operation or use of drinking water treatment plants. Water Services Authorities are obliged to have regard to such criteria and procedures in the performance of their functions.

The European Communities (Drinking Water) (No.2) Regulations, 2007 also authorises the EPA to prepare binding guidance for local authorities in several specific areas.

Within this remit, the EPA has published a range of materials in relation to drinking water that can be broadly categorised as:

1. Drinking Water Guidance
2. Drinking Water Treatment Manuals
3. Drinking Water Advice Notes
4. Drinking Water Guidance Circulars

5.2.1. Drinking Water Guidance



(1) European Communities (Drinking Water) (No.2) Regulations 2007: A Handbook on Implementation of the Regulations for Water Service Authorities for **Public** Water Supplies.

(2) European Communities (Drinking Water) (No.2) Regulations 2007: A Handbook on Implementation of the Regulations for Water Service Authorities for **Private** Water Supplies.

Issued 2010.

The EPA has published a detailed Handbook for Water Services Authorities to assist in the implementation of the provisions of the 2007 Drinking Water Regulations.

The handbooks are published in a format that allows any future revisions or new sections to be easily incorporated. Water Services Authorities will be notified of any revisions that occur and for reference purposes the most up-to-date version of the handbooks and the individual sections will be available on the EPA's website (www.epa.ie).

The revised Drinking Water Handbook amalgamates all relevant content from the previous handbook on the 2000 Regulations, and incorporates recently published EPA guidance booklets Numbers 1-4, as follows:

- Guidance Booklet No.1: On Regulation 9 and 10 of the Regulations.
- Guidance Booklet No. 2: On Annual Reporting of Monitoring Results.
- Guidance Booklet No. 3: On the Remedial Action List (RAL).
- Guidance Booklet No. 4: *Cryptosporidium* Risk Assessment.

The handbook gives an overview of the Regulations including guidance on monitoring, sampling, analysis, procedures for dealing with non-compliances, complaints, incidents and emergencies, reporting, drinking water safety plans and audits, as well as some general guidance on water treatment and distribution matters.


Guidance is provided for local authorities on the format and manner in which monitoring results are to be submitted to the Agency each year, including instructions on the uploading of data into the EDEN system.

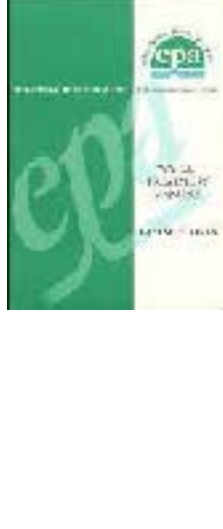
The revised Drinking Water Handbook includes an outline of actions required by Water Services Authorities for the removal and addition of public water supplies from the Remedial Action List (RAL).


Guidance is also provided for Water Services Authorities on the risk screening methodology for *Cryptosporidium*, to assist in prioritising supplies that are at a high risk of contamination with *Cryptosporidium*. It also identifies high risk factors, that can be mitigated to reduce the risk associated with the supply.

<http://www.epa.ie/downloads/pubs/water/drinking/DW%20Regs%20Handbook1.pdf>

5.2.2. Drinking Water Treatment Manuals


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|  | <p>(1) Water Treatment Manuals – Coagulation, Flocculation & Clarification.</p> <p>Version 1. Issued 2002.</p> <p>This Coagulation, Flocculation & Clarification manual sets out the general principles and practices that should be followed by those involved in the production of drinking water.</p> <p>It serves as practical guidance for those involved in the operation, use, management, maintenance and supervision of drinking water supplies.</p> <p>It includes recommendations for operating procedures, monitoring regimes, process actions and start-up and shutdown procedures at a drinking water treatment plant.</p> <p>Guidance for undertaking jar tests and tests how to determine the optimum chemical coagulant dose and the pH for water treatment are also provided.</p> |
| <p>http://www.epa.ie/downloads/advice/water/drinkingwater/EPA_water_treatment_mgt_coag_flocc_clar2.pdf</p> | |


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|  | <p>(2) Water Treatment Manuals – Disinfection.</p> <p>Version 1. Issued 1998.</p> <p>This Disinfection manual includes information on many aspects of disinfection for those involved in the operation, use, management, maintenance and supervision of drinking water supplies. The manual is currently being revised and the new version will include the following:</p> <ul style="list-style-type: none">▪ The World Health Organisations Drinking Water Safety Plan (DWSP) approach and the identification, risk-ranking and development of appropriate control measures for typical hazardous events linked to disinfection;▪ Standard forms and checklists for use by local authority staff managing the operation of treatment plants where the DWSP approach is used;▪ A tool for the calculation of contact time;▪ Best practice to minimise disinfection by-products (for reference alongside EPA Advice Note No. 4, below);▪ Practical guidance for operators to ensure the security of supplies using ultra violet, membrane, ozone, chloramination and chlorine dioxide treatment technologies. |
| <p>http://www.epa.ie/downloads/advice/water/drinkingwater/EPA_water_treatment_manual_disinfection1.pdf</p> | |


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|  | <p>(3) Water Treatment Manuals – Filtration.</p> <p>Version 1. Issued 1995.</p> <p>This Filtration manual contains practical and technical guidance for those involved in the operation, use, management, maintenance and supervision of drinking water supplies.</p> <p>The manual includes information on many aspects of the filtration process across the different filter types in use. Significant emphasis is placed on operating procedures for normal and abnormal operating conditions, start-up and shutdown situations and on the operation and maintenance of filters.</p> |
| <p>http://www.epa.ie/downloads/advice/water/drinkingwater/EPA_water_treatment_manual_%20filtration1.pdf</p> | |

5.2.3. Drinking Water Advice Notes

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|  | <p>(1) EPA Drinking Water Advice Note No. 1: Lead Compliance Monitoring & Surveys.</p> <p>Version 1. Issued: 21 April 2009.</p> <p>This Advice Note provides information to Water Services Authorities on lead compliance monitoring and surveys in the context of compliance with the current lead parametric value of 25µg/l and with the parametric value of 10µg/l which will be effective from 2013.</p> <p>It also provides information on how local authorities should conduct lead surveys and how monitoring should be targeted to ascertain the extent of a potential problem.</p> |
| <p>http://www.epa.ie/downloads/pubs/water/drinking/Advice%20Note%20No1.pdf</p> | |
|  | <p>(2) EPA Drinking Water Advice Note No. 2: Action Programmes to restore the Quality of Drinking Water impacted by Lead Pipes and Lead Plumbing.</p> <p>Version 1. Issued: 21 April 2009.</p> <p>This Advice Note provides information to Water Services Authorities on action programmes aimed at restoring the quality of drinking water impacted by lead pipes and plumbing.</p> <p>It outlines the types of water distribution pipes, demarcates local authority and householder's responsibilities and provides options for dealing with lead piping.</p> |
| <p>http://www.epa.ie/downloads/pubs/water/drinking/Advice%20Note%20No2.pdf</p> | |
|  | <p>(3) EPA Drinking Water Advice Note No. 3: <i>E. coli</i> in Drinking Water.</p> <p>Version 1. Issued: 2 November 2009.</p> <p>This Advice Note sets out the actions required to be undertaken following the detection of <i>E. coli</i>. This includes consultation with the HSE and also the preventative measures that should be taken to improve the security of the supply to prevent a reoccurrence. It is provided in the context of the EPA recommended approach to managing a drinking water supply i.e. the Drinking Water Safety Plan Approach.</p> <p>The presence of <i>E. coli</i> in drinking water is an indication that other more harmful micro-organisms may be present and that action is urgently required to identify the cause of the failure and to ensure that treatment is improved to adequately disinfect the water.</p> |
| <p>http://www.epa.ie/downloads/pubs/water/drinking/Advice%20Note%20No3.pdf</p> | |

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|  | <p>(4) EPA Drinking Water Advice Note No 4: Disinfection By-Products in Drinking Water.</p> <p>Version 1. Issued: 2 November 2009.</p> <p>This Advice Note provides guidance to operators on how the level of disinfection by-products in water (such as trihalomethanes and bromate) can be kept as low as possible without compromising disinfection. The only disinfection by-products for which the 2007 Drinking Water Regulations set parametric values for are trihalomethanes (100 µg/l) and bromate (10 µg/l).</p> |
| <p>http://www.epa.ie/downloads/pubs/water/drinking/Advice%20Note%20No4.pdf</p> | |

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|  | <p>(5) EPA Drinking Water Advice Note. Advice Note No. 5: Turbidity in Drinking Water.</p> <p>Version 1. Issued: 2 November 2009.</p> <p>This Advice Note outlines the actions required to be undertaken at water treatment plants where elevated levels of turbidity are detected. High levels of turbidity in final water can impair the effects of disinfection on micro-organisms and may also indicate that <i>Cryptosporidium</i> can break through the treatment process and enter the water supply.</p> |
| <p>http://www.epa.ie/downloads/pubs/water/drinking/Advice%20Note%20No5.pdf</p> | |

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|  | <p>(6) Drinking Water Regulations Advice Note No. 6: Restoring Public Water Supplies Affected by Flooding.</p> <p>Version 1. Issued 27 November 2009.</p> <p>This Advice Note provides guidance to Water Services Authorities on restoring a water supply affected by flooding. It relates primarily to monitoring of a public water supply prior to its reinstatement. The main water treatment plant and distribution system elements to be inspected, repaired and sampled prior to returning into service are identified. A three-phase monitoring plan is recommended and parameters for which tests should be considered are provided.</p> |
| <p>http://www.epa.ie/downloads/pubs/water/drinking/DWS_Restoration.pdf</p> | |

5.2.4. Drinking Water Guidance Circulars

(Note: Guidance Circulars issued by the DEHLG are listed in the Further Information section of this report)

(1) EPA Drinking Water Guidance Circular DW01/08 – *Disinfection of Public Water Supplies.*

Issued: 2008.

This Guidance Circular instructed Water Services Authorities to prepare an action programme for the installation of chlorine monitors and alarms in all public water supply treatment plants and re-chlorination stations. It stated that chlorine monitors with alarms and recording devices should be installed and that this work should be prioritised in supplies where there was a history of *E. coli* contamination.

This Guidance Circular provided guidelines on where chlorine monitors should be located, alarm settings and response procedures.

(2) EPA Drinking Water Guidance Circular Letter Re: *Guidance for Local Authorities on developing Drinking Water Safety Plans.*

Issued: 2009.

The EPA has recommended that all Water Services Authorities adopt the Water Safety Plan approach in the management of their drinking water supplies. This approach was developed by the World Health Organisation (WHO). If implemented by local authorities, it should lead to risk reduction, safer water, better targeted resources and reduced costs.

The Water Safety Plan manual describes how to develop and implement a Water Safety Plan in clear and practical terms. It is freely available on the WHO website at:

http://www.who.int/water_sanitation_health/publication_9789241562638/en/index.html

(3) EPA Drinking Water Circular Letter DW01/09: *Sampling of Drinking Water for Radioactivity.*

Issued: 2009.

This Guidance Circular outlined to Water Services Authorities the emergency procedures for the sampling and analysis of drinking water samples in the event of a nuclear accident.

The EPA is the designated point of contact for the co-ordination of the collection of drinking water samples for analysis by the Radiological Protection Institute of Ireland (RPII) in the event of a nuclear accident. Water Services Authorities were advised in this Circular letter that the EPA will contact the appropriate Water Services Authorities as part of an exercise to test the emergency sampling of drinking water each year.

5.3 References

5.3.1. Drinking Water-Related Topics

a) *Cryptosporidium*

1. **Carlow County Council (2006)**. *Report on Cryptosporidiosis Outbreak in Carlow Town and Environs 2005*.
2. **Drinking Water Inspectorate of England and Wales (2001)**. *Cryptosporidium in Water Supplies*.
3. **Health Protection Surveillance Centre (2009)**. *Annual Reports on Cryptosporidiosis in Ireland*.
4. **Institute of Public Administration (2009)**. *Review of the Management of the Outbreak of Cryptosporidiosis and E. coli in Galway City during 2007*.
5. **National Disease Surveillance Centre (2004)**. *Report of Waterborne Cryptosporidiosis Subcommittee of the Scientific Advisory Committee*. Available at <http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/Cryptosporidiosis/Publications/WaterborneCryptosporidiosisSub-CommitteeReport/File.898.en.pdf>
6. **National Health Services for Wales (2006)**. *Outbreak of Cryptosporidiosis in North West Wales, 2005*. Available at <http://www.anglesey.gov.uk/upload/public/attachments/51/cryptosporidiumenglish.pdf>
7. **World Health Organisation (2009)**. *Risk Assessment of Cryptosporidium in Drinking Water*. Available at http://whqlibdoc.who.int/hq/2009/WHO_HSE_WSH_09.04_eng.pdf

b) Lead

8. **Environmental Protection Agency (2009)**. *Advice Note No. 1: Lead Compliance Monitoring and Surveys*. Available at <http://www.epa.ie/downloads/pubs/water/drinking/Advice%20Note%20No1.pdf>
9. **Environmental Protection Agency (2009)**. *Advice Note No. 2: Action programmes to restore the quality of drinking water impacted by lead pipes and lead plumbing*. Available at <http://www.epa.ie/downloads/pubs/water/drinking/Advice%20Note%20No2.pdf>
10. **Health Service Executive (2008)**. *HSE Statement: Lead in drinking water*. Available at http://www.hse.ie/eng/services/Publications/HealthProtection/HSE_Statement_on_Lead_in_Drinking_Water.pdf

c) Drinking Water Safety Plans

11. **Drinking Water Inspectorate of England and Wales (2005)**. *A Brief Guide to Drinking Water Safety Plans*.
12. **World Health Organisation (2009)**. *WHO Water Safety (WS) Portal*. <http://www.who.int/wsportal/en/>
13. **World Health Organisation (2009)**. *Water Safety Plan Manual: Step-by-step risk management for drinking-water suppliers*. Available at http://whqlibdoc.who.int/publications/2009/9789241562638_eng_print.pdf
14. **World Health Organisation (2005)**. *Water Safety Plans: Managing drinking-water quality from catchment to consumer*. Available at http://www.who.int/water_sanitation_health/dwg/wsp170805.pdf

5.3.2. Drinking Water Legislation, Circular Letters and Guidance

a) Legislation

15. **Council Directive 98/83/EC** of 3 November 1998 on the Quality of Water Intended for Human Consumption. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:330:0032:0054:EN:PDF>
16. **Environmental Protection Agency Act, 1992** (No. 7 of 1992). Available at <http://www.irishstatutebook.ie/1992/en/act/pub/0007/index.html>
17. **European Communities (Drinking Water) Regulations (No.2), 2007** (S.I. No. 278 of 2007). Available at <http://www.irishstatutebook.ie/2007/en/si/0278.html>
18. **Health (Fluoridation of Water Supplies) Act, 1960** (No. 46 of 1960). Available at <http://www.irishstatutebook.ie/1960/en/act/pub/0046/index.html>
19. **Water Services Act, 2007 (No. 30 of 2007)**. Available at <http://www.irishstatutebook.ie/2007/en/act/pub/0030/index.html>

b) Circular Letters on Drinking Water issues - Department of the Environment, Heritage and Local Government (DEHLG)

(Available at <http://www.wsntg.ie/circulars.asp> and at <https://www.enforcementnetwork.ie/>)

20. **DEHLG (2010)**. *Circular Letter: L3/10. Water Services Training Grant Allocation 2010.*
21. **DEHLG (2010)**. *Circular Letter: L5/10. Rural water programme: Applications for Funding by Local Authorities in Respect of Water Supplies Included in EPA Remedial Action List.*
22. **DEHLG (2009)**. *Circular Letter: L4/09. Drinking Water Incident Response Plans.*
23. **DEHLG (2007)**. *Circular Letter: WSP6/07. European Communities (Drinking Water) (No. 2) Regulations 2007. (S.I. No. 278 of 2007).*
24. **DEHLG (2007)**. *Circular Letter: WSP 7/07. European Communities (Drinking Water) (No. 2) Regulations 2007.*
25. **DEHLG (2007)**. *Circular Letter: WSP 8/07. Implementation Of The European Communities (Drinking Water) (No. 2) Regulations 2007.*
26. **DEHLG (2006)**. *Circular Letter: L6/06 Protection of Drinking Water Supplies.*
27. **DEHLG (2005)** *Circular Letter: WSP3/05. Drinking Water National Monitoring Programme.*
28. **DEHLG (2005)**. *Circular Letter: WSP1/05. Management Of Water Treatment Sludges.*
29. **DEHLG (2005)**. *Circular Letter: WSP2/05. ECJ Drinking Water Monitoring Report 2004.*
30. **DEHLG (2003)**. *Circular Letter: L1/03 (WSP) Drinking Water National Monitoring Programme.*
31. **DEHLG (1998)**. *Circular Letter: L7/98. Protection of Water Supplies: Guidelines for Local Authorities on minimising the risk of Cryptosporidium in water supplies.*

c) Guidance & Codes of Practice - Non-EPA

32. **Health Service Executive (2008)**. *Drinking Water and Health: A Review and Guide for Population Health.* Available at http://www.hse.ie/eng/services/Publications/services/Environmentalhealth/HSE_Drinking_Water_and_Health_Review_and_Guide_2008.pdf
33. **Irish Expert Body on Fluorides and Health (2007)**. *Code of Practice on the Fluoridation of Drinking Water 2007.* Available at http://www.dohc.ie/publications/fluoridation_2007.html
34. **Environmental Enforcement Network (Suir Surface Water Working Group) (2009)**. *Guidance for the farming community on protection of water resources and habitat quality from impacts due to livestock access to waters.* Available at <http://www.epa.ie/downloads/advice/water/drinkingwater/Farming%20Community%20Doc.pdf>

35. **World Health Organisation (2008).** *WHO - Guidelines for Drinking-water Quality – third edition incorporating the first and second addenda, Volume 1, Recommendations.* Available at http://www.who.int/water_sanitation_health/dwq/fulltext.pdf

5.3.3. Other Drinking Water Reports

a) Previous EPA Annual Drinking Water Reports

36. **Environmental Protection Agency (2009).** *The Provision and Quality of Drinking Water in Ireland - A Report for the Years 2007-2008.* Available at [http://www.epa.ie/downloads/pubs/water/drinking/Final%20DW%20Report%202007%20\(2\)2.pdf](http://www.epa.ie/downloads/pubs/water/drinking/Final%20DW%20Report%202007%20(2)2.pdf)
37. **Environmental Protection Agency (2008).** *The Provision and Quality of Drinking Water in Ireland - A Report for the Years 2006-2007.* Available at <http://www.epa.ie/downloads/pubs/water/drinking/DW%20Report%2020062.pdf>
38. **Environmental Protection Agency (2007).** *The Quality of Drinking Water in Ireland - A Report for the Year 2005.* Available at <http://www.epa.ie/downloads/pubs/water/drinking/DW%20Report%202005%20Final%20Jan%2007.pdf>

b) Other Reports – Other Member States' Regulatory Agency

39. **Drinking Water Inspectorate of England and Wales (2009).** *Drinking Water Inspectorate Annual Report - Drinking Water 2008.*
40. **European Microbiological Advisory Group (2003).** *Clostridium perfringens as a Drinking Water Quality Parameter: A Summary Review Prepared by David Sartory on behalf of the European Microbiological Advisory Group (EMAG) for the Article 12 Technical Committee as a Contribution to the Rolling Revision of the Drinking Water Directive 1998*

b) Other Reports - Ireland

41. **National Federation of Group Water Schemes (2010).** *Annual Report 2009.* Available at <http://www.nfgws.ie/fckeditor/File/Annual%20Report%2009.pdf>
42. **Health Service Executive (2007)** *Report on a contaminated drinking water incident in Counties Cavan and Monaghan.* Available at http://www.hse.ie/eng/services/Publications/HealthProtection/Public_Health_/Report_on_a_contaminated_drinking_water_incident_in_Co_Cavan_and_Co_Monaghan.pdf

5.4 Relevant Websites / Useful Contacts



Environmental Protection Agency (EPA)

The EPA is required to collect and verify monitoring results for all water supplies in Ireland covered by the European Communities (Drinking Water) No. 2, Regulations, 2007. The EPA must ensure Water Services Authorities are taking the appropriate action to ensure that public water supplies comply with the relevant quality standards.

Website: <http://www.epa.ie>

Tel: LoCall 1890 33 55 99 or 053-9160600

E-mail: info@epa.ie / drinkingwater@epa.ie



Department of Environment, Heritage & Local Government (DEHLG)

The Department of the Environment, Heritage and Local Government is responsible for developing and implementing government policy in relation to drinking water, making sure that the necessary funding is made available to finance capital and operational programmes and for monitoring physical and financial progress on schemes.

Website: <http://www.environ.ie/en/Environment/Water/>

Tel: LoCall 1890 202021 or 01-888 2000



Geological Survey of Ireland (GSI)

The Geological Survey of Ireland (GSI) is responsible for providing geological advice and information, and for the acquisition of data for this purpose. The Groundwater Programme of GSI has completed groundwater protection schemes for 14 Water Services Authorities.

Website: <http://www.gsi.ie>

Tel: LoCall 1890 449900 or 01-678 2000

E-mail: gsisales@gsi.ie



Health Service Executive (HSE)

A Water Services Authority is obliged to consult the HSE where a drinking water sample fails to meet a parametric value in the Drinking Water Regulation to determine whether the non-compliance presents a potential danger to human health.

Website: <http://www.hse.ie/eng/>



National Federation of Group Water Schemes (NFGWS)

The primary role of the NFGWS is to assist the management committees/boards of group water schemes in meeting their legal responsibilities as potable water suppliers. The Federation helps schemes meet the standards set out in the Drinking Water Regulations by providing training and developmental support. The NFGWS has introduced, in conjunction with the National Rural Water monitoring Committee, a Quality Assurance System specially designed for group water schemes.

Website: <http://www.nfgws.ie>

Tel: 047-72766

E-mail: jean@nfgws.ie



Water Services National Training Group (WSNTG)

The WSNTG provides a range of training programmes through its five regional training centres for all grades of staff operating in the water/waste water sections of the local authorities and for personnel working with Group Water Schemes.

Website: <http://www.wsntg.ie/index.asp>

Tel: 0505-24688

E-mail: wsntg@eircom.net



Drinking Water Inspectorate (DWI) England and Wales

The Drinking Water Inspectorate (DWI) regulates public water supplies in England and Wales. It is responsible for assessing the quality of drinking water, taking enforcement action if standards are not being met and appropriate action when water is unfit for human consumption.

Website: <http://www.dwi.gov.uk>

Drinking Water Inspectorate for Northern Ireland (DWI NI)

The Drinking Water Inspectorate for Northern Ireland is a unit within the Northern Ireland Environment Agency. The Drinking Water Inspectorate regulates drinking water quality for public and private supplies, develops policy on drinking water issues and deals with incidents that do or could affect drinking water quality.

Website: http://www.ni-environment.gov.uk/water-home/drinking_water.htm.

APPENDIX VII - LOCAL AUTHORITY CONTACT DETAILS.

CITY COUNCILS

| | | | |
|----------------------------------|---|---|---|
| Cork City Council | City Hall, Cork. | Ph: (021) 4966222 Fax: (021) 4314238 | http://www.corkcity.ie/ |
| Dublin City Council | Civic Offices, Wood Quay, Dublin 8. | Ph: (01) 6722222 Fax: (01) 6773612 | http://www.dublincity.ie/ |
| Galway City Council | City Hall, College Road, Galway. | Ph: (091) 536400 Fax: (091) 567493 | http://www.galwaycity.ie/ |
| Limerick City Council | City Hall, Limerick. | Ph: (061) 415799 Fax: (061) 415266 | http://www.limerickcity.ie/ |
| Waterford City Council | City Hall, The Mall, Waterford. | Ph: (051) 309900 Fax: (051) 879124 | http://www.waterfordcity.ie/ |

COUNTY COUNCILS

| | | | |
|---|---|--|---|
| Carlow County Council | County Offices, Athy Rd, Carlow. | Ph: +353 59 9170300 Fax: +353 59 9141503 | http://www.carlow.ie/ |
| Cavan County Council | Courthouse, Cavan. | Ph: +353 49 4331799 Fax: +353 49 4361565 | http://www.cavancoco.ie/ |
| Clare County Council | New Rd, Ennis, Co. Clare. | Ph: + 353 65 6821616 Fax: +353 65 6828233 | http://www.clarecoco.ie/ |
| Cork County Council | County Hall, Cork. | Ph: +353 21 4276891 Fax: +353 21 4276321 | http://www.corkcoco.ie/ |
| Donegal County Council, | County House, Lifford, Co. Donegal. | Ph: +353 74 9172222 Fax: +353 74 9141205 | http://www.donegal.ie/ |
| Dun Laoghaire / Rathdown County Council | Town Hall, Marine Rd, Dun Laoghaire. | Ph: +353 1 2054700 Fax: +353 1 2806969 | http://www.dlrcoco.ie/ |
| Fingal County Council | Main St, Swords, Co. Dublin. | Ph: +353 1 8905000 Fax: +353 1 8725782 | http://www.fingalcoco.ie/ |
| Galway County Council | County Hall, Prospect Hill, Galway. | Ph: +353 91 509000 Fax: +353 91 509010 | http://www.galway.ie/ |
| Kerry County Council | Aras an Chontae, Tralee, Co. Kerry. | Ph: +353 66 7121111, Fax: +353 66 7122466 | http://www.kerrycoco.ie/ |
| Kildare County Council | Áras Chill Dara, Devoy Park, Naas, Co. Kildare. | Ph: +353 45 980200 Fax: +353 45 876875 | http://www.kildare.ie/ |
| Kilkenny County Council, | County Hall, John St, Kilkenny. | Ph: +353 56 7721076 Fax: +353 56 7794004 | http://www.kilkennycoco.ie/ |
| Laois County Council | County Hall, Portlaoise, Co Laois. | Ph: +353 57 8664000 Fax: +353 502 22313 | http://www.laois.ie/ |

| | | | |
|--|---|---|---|
| Leitrim County Council | Governor House, Carrick-on - Shannon, Co. Leitrim. | Ph: +353 71 9620005, Fax: +353 71 9622205 | http://www.leitrimcoco.ie/ |
| Limerick County Council | County Hall, Dooradoyle, Limerick. | Ph: +353 61 496000 Fax: +353 61 318478 | http://www.limerickcoco.ie/ |
| Longford County Council | Aras an Chontae, Great Water St, Longford. | Ph: +353 43 3346231 Fax: +353 43 41233 | http://www.longfordcoco.ie/ |
| Louth County Council, | County Office, Dundalk, Co Louth. | Ph: +353 42 933545 Fax: +353 42 9334549 | http://www.louthcoco.ie/ |
| Mayo County Council | Aras an Chontae, Castlebar, Co Mayo. | Ph: +353 94 90 24444 Fax: +353 94 90 23937 | http://www.mayococo.ie/ |
| Meath County Council | County Hall, Navan, Co Meath. | Ph: +353 46 9021581 Fax: +353 46 9097001 | http://www.meath.ie/ |
| Monaghan County Council | County Offices, The Glen, Monaghan. | Ph: + 353 47 30500 Fax: +353 47 82739 | http://www.monaghan.ie/ |
| North Tipperary County Council | Civic Offices, Limerick Rd, Nenagh, Co. Tipperary. | Ph: 353 67 44500 Fax: +353 67 33134 | http://www.tipperarynorth.ie/ |
| Offaly County Council | Courthouse, Tullamore, Co. Offaly. | Ph: +353 57 9346800 Fax: +353 506 46868 | http://www.offaly.ie/ |
| Roscommon County Council | Courthouse, Roscommon. | Ph: +353 903 37100, Fax: +353 47 82739 | http://www.roscommon.ie/ |
| Sligo County Council | Riverside, Sligo. | Ph: +353 71 9143221 Fax: +353 71 9141119 | http://www.sligococo.ie/ |
| South Dublin County Council | County Hall, Tallaght, Dublin 24. | Ph: +353 1 4149000 Fax: +353 1 4149111 | http://www.sdcc.ie/ |
| South Tipperary County Council | Aras an Chontae, Clonmel Co. Tipperary. | Ph: +353 52 34455 Fax: +353 52 24355 | http://www.southtippcoco.ie/ |
| Waterford County Council | Civic Offices, Dungarvan, Co Waterford. | Ph: +353 58 22000 Fax: +353 58 42911 | http://www.waterfordcoco.ie/ |
| Westmeath County Council | County Buildings, Mullingar, Co Westmeath. | Ph: +353 44 40861 Fax: +353 44 42330 | http://www.westmeathcoco.ie/ |
| Wexford County Council | County Hall, Wexford. | Ph: +353 53 42211 Fax: +353 53 43406 | http://www.wexford.ie/ |
| Wicklow County Council | County Offices, Wicklow. | Ph: +353 404 20100 Fax: +353 404 67792 | http://www.wicklow.ie/ |

An Gníomhaireacht um Chaomhnú Comhshaoil

Is í an Gníomhaireacht um Chaomhnú Comhshaoil (EPA) comhlachta reachtúil a chosnaíonn an comhshaoil do mhuintir na tíre go léir. Rialaímid agus déanaimid maoirsiú ar ghníomhaíochtaí a d'fhéadfadh truailliú a chruthú murach sin. Cinntímid go bhfuil eolas cruinn ann ar threochtaí comhshaoil ionas go nglactar aon chéim is gá. Is iad na príomh-nithe a bhfuilimid gníomhach leo ná comhshaoil na hÉireann a chosaint agus cinntiú go bhfuil forbairt inbhuanaithe.

Is comhlacht poiblí neamhspleách í an Gníomhaireacht um Chaomhnú Comhshaoil (EPA) a bunaíodh i mí Iúil 1993 faoin Acht fán nGníomhaireacht um Chaomhnú Comhshaoil 1992. Ó thaobh an Rialtais, is í an Roinn Comhshaoil agus Rialtais Áitiúil a dhéanann urraíocht uirthi.

ÁR bhFREAGRACHTAÍ

CEADÚNÚ

Bíonn ceadúnais á n-eisiúint againn i gcomhair na nithe seo a leanas chun a chinntiú nach mbíonn astuithe uathu ag cur sláinte an phobail ná an comhshaoil i mbaol:

- áiseanna dramhaíola (m.sh., líonadh talún, loisceoirí, stáisiúin aistrithe dramhaíola);
- gníomhaíochtaí tionsclaíocha ar scála mór (m.sh., déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta);
- diantalmhaíocht;
- úsáid faoi shrian agus scaoileadh smachtaithe Orgánach Géinathraithe (GMO);
- mór-áiseanna stórais peitreal.
- Scardadh dramhúisce

FEIDHMIÚ COMHSHAOIL NÁISIÚNTA

- Stiúradh os cionn 2,000 iniúchadh agus cigireacht de áiseanna a fuair ceadúnas ón nGníomhaireacht gach bliain.
- Maoirsiú freagrachtaí cosanta comhshaoil údarás áitiúla thar sé earnáil - aer, fuaim, dramhaíl, dramhúisce agus caighdeán uisce.
- Obair le húdaráis áitiúla agus leis na Gardaí chun stop a chur le gníomhaíocht mhídhleathach dramhaíola trí chomhordú a dhéanamh ar líonra forfheidhmithe náisiúnta, díriú isteach ar chiontóirí, stiúradh fiosrúcháin agus maoirsiú leigheas na bhfadhbanna.
- An dlí a chur orthu siúd a bhriseann dlí comhshaoil agus a dhéanann dochar don chomhshaoil mar thoradh ar a gníomhaíochtaí.

MONATÓIREACHT, ANAILÍS AGUS TUAIRISCIÚ AR AN GCOMHSHAOIL

- Monatóireacht ar chaighdeán aer agus caighdeán aibhneacha, locha, uisce taoide agus uisce talaimh; leibhéil agus sruth aibhneacha a thomhas.
- Tuairisciú neamhspleách chun cabhrú le rialtais náisiúnta agus áitiúla cinntiú a dhéanamh.

RIALÚ ASTUITHE GÁIS CEAPTHA TEASA NA HÉIREANN

- Cainníochtú astuithe gáis ceaptha teasa na hÉireann i gcomhthéacs ár dtiomantas Kyoto.
- Cur i bhfeidhm na Treorach um Thrádáil Astuithe, a bhfuil baint aige le hos cionn 100 cuideachta atá ina mór-ghineadóirí dé-ocsaíd charbóin in Éirinn.

TAIGHDE AGUS FORBAIRT COMHSHAOIL

- Taighde ar shaincheisteanna comhshaoil a chomhordú (cosúil le caighdeán aer agus uisce, athrú aeráide, bithéagsúlacht, teicneolaíochtaí comhshaoil).

MEASÚNÚ STRAITÉISEACH COMHSHAOIL

- Ag déanamh measúnú ar thionchar phleananna agus chláracha ar chomhshaoil na hÉireann (cosúil le plannanna bainistíochta dramhaíola agus forbartha).

PLEANÁIL, OIDEACHAS AGUS TREOIR CHOMHSHAOIL

- Treoir a thabhairt don phobal agus do thionscal ar cheisteanna comhshaoil éagsúla (m.sh., iarratais ar cheadúnais, seachaint dramhaíola agus rialacháin chomhshaoil).
- Eolas níos fearr ar an gcomhshaoil a scaipeadh (trí cláracha teilifíse comhshaoil agus pacáistí acmhainne do bhunscoileanna agus do mheánscoileanna).

BAINISTÍOCHT DRAMHAÍOLA FHORGHNÍOMHACH

- Cur chun cinn seachaint agus laghdú dramhaíola trí chomhordú An Chláir Náisiúnta um Chosc Dramhaíola, lena n-áirítear cur i bhfeidhm na dTionscnamh Freagrachta Táirgeoirí.
- Cur i bhfeidhm Rialachán ar nós na treoracha maidir le Trealamh Leictreach agus Leictreonach Caite agus le Srianadh Substaintí Guaiseacha agus substaintí a dhéanann ídiú ar an gcrios ózóin.
- Plean Náisiúnta Bainistíochta um Dramhaíl Ghuaiseach a fhorbairt chun dramhaíl ghuaiseach a sheachaint agus a bhainistiú.

STRUCHTÚR NA GNÍOMHAIREACHTA

Bunaíodh an Gníomhaireacht i 1993 chun comhshaoil na hÉireann a chosaint. Tá an eagraíocht á bhainistiú ag Bord lánaímseartha, ar a bhfuil Príomhstíúrthóir agus ceithre Stíúrthóir.

Tá obair na Gníomhaireachta ar siúl trí ceithre Oifig:

- An Oifig Aeráide, Ceadúnaithe agus Úsáide Acmhainní
- An Oifig um Fhorfheidhmiúchán Comhshaoil
- An Oifig um Measúnacht Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáide

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag ball air agus tagann siad le chéile cúpla uair in aghaidh na bliana le plé a dhéanamh ar cheisteanna ar ábhar imní iad agus le comhairle a thabhairt don Bhord.

**Headquarters, PO Box 3000
Johnstown Castle Estate
County Wexford, Ireland**

Ceanncheathrú, Bosca Poist 3000
Eastát Chaisleán Bhaile Sheáin
Contae Loch Garman, Éire

T:+353 53 916 0600
F:+353 53 916 0699

**Regional Inspectorate
McCumiskey House, Richview
Clonskeagh Road, Dublin 14, Ireland**

Cigireacht Réigiúnach, Teach Mhic Chumascaigh
Dea-Radharc, Bóthar Cluain Seach
Baile Átha Cliath 14, Éire

T:+353 1 268 0100
F:+353 1 268 0199

**Regional Inspectorate
Inniscarra, County Cork, Ireland**

Cigireacht Réigiúnach, Inis Cara
Contae Chorcaí, Éire

T:+353 21 487 5540
F:+353 21 487 5545

**Regional Inspectorate
John Moore Road, Castlebar
County Mayo, Ireland**

Cigireacht Réigiúnach, Bóthar Sheán de Mórdha
Caisleán an Bharraigh, Contae Mhaigh Eo, Éire

T:+353 94 904 8400
F:+353 94 902 1934

**Regional Inspectorate
Seville Lodge, Callan Road,
Kilkenny, Ireland**

Cigireacht Réigiúnach, Lóiste Sevilla,
Bóthar Challainn, Cill Chainnigh, Éire

T:+353 56 779 6700
F:+353 56 779 6798

**Regional Inspectorate
The Glen, Monaghan, Ireland**

Cigireacht Réigiúnach, An Gleann
Muineachán, Éire

T:+353 47 77600
F:+353 47 84987

E: info@epa.ie
W: www.epa.ie
Lo Call: 1890 33 55 99

