

DRINKING WATER QUALITY IN SCOTLAND 2014

PRIVATE WATER SUPPLIES





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EXECUTIVE SUMMARY

The Drinking Water Quality Regulator for Scotland (DWQR) has a role in ensuring that local authorities are meeting their responsibilities to regulate private water supplies. DWQR also regulates the quality of water supplied by Scottish Water. The role of DWQR was created by the Water Industry (Scotland) Act 2002 (“the Act”), which gives the Regulator various powers to enter premises as part of an investigation, to obtain information and to take enforcement action. This report fulfils the requirement under the Act that the DWQR publishes a report on the exercise of the Regulator’s functions during the previous year. This report relates to the calendar year 2014.

Private water supplies (PWS) are drinking water supplies which are not the responsibility of Scottish Water but of their owners and users. The Private Water Supplies (Scotland) Regulations 2006 (“the 2006 Regulations”) are enforced by local authorities, and the DWQR supervises this enforcement.

The sources of PWS are many and varied, and a large number of households and businesses depend on them for their drinking water supplies. In 2014 there were 20,170 registered PWS in Scotland which were reported to the DWQR, 2,393 Type A and 17,777 Type B. Type A supplies are those which supply 50 or more people or 10m³ water or more, and any PWS which is used in a commercial or public activity. The Type B classification relates to smaller, domestic supplies. Around 3.5% of Scotland’s population relies on PWS for their drinking water, but a significant number of others, for example visitors and tourists, will also use these supplies.

Environmental Health teams from local authorities annually review risk assessments and sample larger Type A PWS. In 2014, 94% of Type A PWS had either a completed or reviewed risk assessment, with 19 local authorities reporting that they had reviewed risk assessments for all of their Type A supplies. A total of 44,812 tests were carried out on samples taken from Type A PWS, with 94% of tests complying with the standards. The smaller Type B supplies fall outwith the prescribed monitoring regime but some are sampled at the request of users, grant applications or as part of public health investigations. Of those sampled, 13,971 tests were undertaken, of which 88% met the required standard.

E. coli, which has the potential to cause illness and provides an indication that faecal contamination of the supply has occurred, was detected in 13.4% of Type A private water supply samples taken across Scotland. This indicates that these supplies are either not receiving the appropriate amount of treatment before use, or that the existing treatment is not being satisfactorily managed and maintained. All failures are thoroughly investigated by the local authority with advice issued to protect public health (e.g. boil water notices where *E. coli* is isolated), guidance is given on how to improve the supply and enforcement work is initiated with the owners/users, where necessary.

In 2014 Improvement Notices were served on 13 failing supplies across the whole of Scotland. DWQR finds this number low when compared to the number of supplies failing to meet drinking water quality standards. However, DWQR is encouraged that this has increased from that of the previous two years and views this as an indication that local authorities have exhausted collaborative approaches with owners of an increasing number of PWS. There are 138 supplies that have failed for *E. coli* for three years or more, with 12 supplies failing for five years. It is vital that such supplies are tackled and, although responsibility for private supplies rests with owners and users, local authorities are urged to continue to provide appropriate advice and DWQR expects them to make full use of the enforcement powers available to tackle such supplies.

Other parameters which recorded significant numbers of failures on private water supplies in 2014 included coliforms, colour, iron, manganese, copper, lead and hydrogen ion (pH). Although the quality of private supplies is a complex area and improvements are not always easy to achieve or maintain, DWQR believes owners and users must take greater responsibility for the quality of their private supplies, especially where the parameters failing are of significance for health, such as *E. coli*. It is essential that owners and users recognise their responsibilities and the risk of consuming poor quality untreated water, and that they work with local authorities to obtain support to improve their private water supplies.

The data presented in this report does not indicate that there have been significant improvements in the quality of private water supplies, but it is important to recognise that there is considerable work being undertaken by local authorities and also through initiatives such as the Private Water Supplies Improvement Strategy and the VTEC/*E. coli* O157 Action Plan. These initiatives aim to secure lasting improvements not only to the quality of private water supplies but also to reduce the risk to health.

DWQR will be seeking to further discuss the findings of this report with local authorities and ensure that the Frameworks in place are effective. The development of performance measures, in conjunction with the Society of Chief Officers of Environmental Health will measure key areas relating to local authority private water supply activity, and also evidence that public health advice is issued on every occasion where there is an *E. coli* failure.

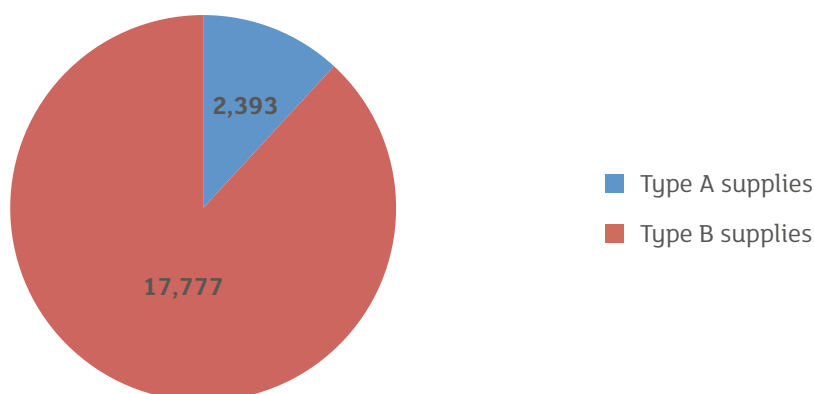
The Scottish Government does provide financial support for owners and users of PWS to support improvements through the provision of a non-means tested grant of up to £800 per property. These are available from local authorities to all who own or use a PWS. In 2014–2015, £704,440.40 was awarded for PWS improvements. According to the data provided by local authorities this funding improved 241 supplies to 574 properties.

1 PRIVATE WATER SUPPLIES IN SCOTLAND

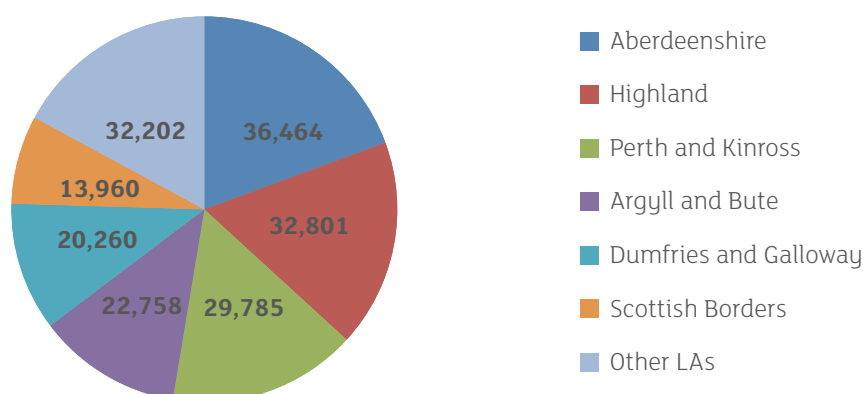
Private water supplies (PWS) are drinking water supplies which are not provided by Scottish Water as part of their core function and are the responsibility of the owners and users of the supplies.

In 2014, the data provided to the Drinking Water Quality Regulator for Scotland (DWQR) by local authorities stated that there are 20,170 private supplies in Scotland. This data shows that around 188,230 people (3.5% of Scotland's population) live or work in premises that rely daily on a private water supply. This figure, however, does not take into account the large numbers of the public who may use premises with a private water supply in the course of leisure activities, or visitors to Scotland each year who use these private water supplies.

Private supplies vary greatly in their nature, ranging from springs and boreholes serving individual properties to larger groundwater or surface water supplies. Not all private water supplies are found in rural areas; some can be found in towns and cities, even in areas where there is a public supply of water. **Table 1.0** provides a summary of private water supplies in each local authority area. There are 2,393 Type A supplies and 17,777 Type B supplies. The pie charts below (**Figures 1.1 and 1.2**) illustrate this, and show the distribution of population on PWS across Scotland. Type A PWS are those which supply 50 or more people, provide 10 or more cubic metres a day, or regardless of the number of people served or the volume supplied, are supplying a premises that is part of a commercial or public activity. These Type A supplies serve a variety of holiday lets, B&Bs, hotels, caravan parks/campsites, community halls and a range of other facilities. Type B PWS are all other domestic PWS, many of which serve single properties.



Figure_1.1 Private Water Supplies by Type



Figure_1.2 Distribution of Population on Private Supplies Across Scotland

Table_1.0 Summary of Private Water Supplies by Local Authority Area

LOCAL AUTHORITY	NUMBER OF TYPE A SUPPLIES	NUMBER OF TYPE B SUPPLIES	TOTAL	% POPULATION SERVED BY PWS
Aberdeen City	2	44	46	0.06
Aberdeenshire	222	7,626	7,848	14.15
Angus	43	390	433	3.18
Argyll and Bute	471	1,431	1,902	25.85
Clackmannanshire	5	22	27	0.88
Dumfries and Galloway	167	1,242	1,409	13.48
Dundee City	0	1	1	0.02
East Ayrshire	15	185	200	0.72
East Dunbartonshire	1	15	16	0.14
East Lothian	5	36	41	0.65
East Renfrewshire	3	143	146	1.46
Edinburgh, City of	1	16	17	0.05
Eilean Siar	13	37	50	1.74
Falkirk	1	8	9	0.08
Fife	36	297	333	1.24
Glasgow City	0	0	0	0.00
Highland	708	1,703	2,411	14.08
Inverclyde	8	53	61	1.61
Midlothian	4	61	65	0.47
Moray	97	711	808	4.30
North Ayrshire	18	259	277	2.14
North Lanarkshire	0	15	15	0.01
Orkney Islands	32	207	239	9.25
Perth & Kinross	264	1,285	1,549	20.16
Renfrewshire	6	11	17	0.04
Scottish Borders	143	1,278	1,421	12.26
Shetland Islands	2	61	63	1.00
South Ayrshire	24	208	232	0.96
South Lanarkshire	21	5	26	0.10
Stirling	66	368	434	6.91
West Dunbartonshire	5	14	19	0.18
West Lothian	10	45	55	0.33
Scotland	2,393	17,777	20,170	3.53

1.1_RISK ASSESSMENT

The Private Water Supplies (Scotland) Regulations 2006 (“the 2006 Regulations”) place a duty on local authorities to risk assess all Type A supplies and to review these risk assessments annually. Additionally, local authorities must provide advice and assistance on risk assessments to those responsible for Type B supplies on request. These risk assessments should determine whether the supply poses a potential risk to health and, if so, the action required to safeguard health in the short term and improve the supply in the longer term.

Table 1.1 below shows that in 2014 94% of Type A supplies had a completed or reviewed risk assessment. This is a slight decrease on last year where 96% had a completed or reviewed risk assessment.

Table_ 1.1 Risk Assessment of Type A Supplies

LOCAL AUTHORITY	NUMBER OF TYPE A SUPPLIES	TYPE A RISK ASSESSMENT OR REVIEW	RA COMPLIANCE
Aberdeen City	2	2	100.00
Aberdeenshire	222	205	92.34
Angus	43	43	100.00
Argyll and Bute	471	437	92.78
Clackmannanshire	5	5	100.00
Dumfries and Galloway	167	164	98.20
Dundee City	0	-	-
East Ayrshire	15	15	100.00
East Dunbartonshire	1	1	100.00
East Lothian	5	5	100.00
East Renfrewshire	3	3	100.00
Edinburgh, City of	1	0	0.00
Eilean Siar	13	13	100.00
Falkirk	1	1	100.00
Fife	36	36	100.00
Glasgow City	0	-	-
Highland	708	678	95.76
Inverclyde	8	8	100.00
Midlothian	4	4	100.00
Moray	97	80	82.47
North Ayrshire	18	16	88.89
North Lanarkshire	0	-	-
Orkney Islands	32	32	100.00
Perth & Kinross	264	264	100.00
Renfrewshire	6	6	100.00
Scottish Borders	143	119	83.22
Shetland Islands	2	2	100.00
South Ayrshire	24	24	100.00
South Lanarkshire	21	20	95.24
Stirling	66	51	77.27
West Dunbartonshire	5	5	100.00
West Lothian	10	10	100.00
Scotland	2,393	2,249	93.98



DWQR considers the risk assessment process to be a vital part of the management of private water supplies. Although analysis of water samples is a useful tool, this only provides an indication of the water quality at the time a sample is collected. A comprehensive and regularly updated risk assessment is a means of examining all the challenges to a supply and is the first step towards the creation of a drinking water safety plan to comprehensively manage those risks.

1.2_ SAMPLING COMPLIANCE

Local authorities are required by the 2006 Regulations to sample each Type A supply in their area at least once a year. The table below shows the minimum sampling frequency required for Type A supplies. Type B supplies must be sampled by local authorities within 28 days of being requested by the owner or user of the supply and are not subject to routine annual monitoring.

Table 1.2_ Sampling Required for Type A Samples

VOLUME	REQUIRED SAMPLES
<= 100	1
>100 to <=1000	4
>1000	4 + 3 for every additional 1000 m ³ /d

The 2006 Regulations require that every Type A supply is sampled annually for at least the minimum range of parameters. **Table 1.3** shows the number of Type A supplies that were tested for at least one parameter during the year, broken down by local authority. In 2014, across Scotland overall, 91.93% of supplies were sampled, a slight improvement on 2013. 22 local authorities met the requirements for more than 90% of their Type A supplies, and of these, 13 local authorities achieved 100% compliance. Of the local authorities with large numbers of supplies Aberdeenshire, Highland and Perth and Kinross were able to sample 95% or more of their Type A supplies. Others, notably Dumfries and Galloway, Fife, North Ayrshire and Scottish Borders achieved considerable improvements in sampling compliance when compared to 2013.

Table 1.3_ Type A Supplies Sampling Compliance

LOCAL AUTHORITY	NUMBER OF TYPE A SUPPLIES	SUPPLIES SAMPLED	SAMPLING COMPLIANCE	2013 SAMPLING COMPLIANCE
Aberdeen City	2	2	100	100
Aberdeenshire	222	213	95.95	92.72
Angus	43	39	90.7	100
Argyll and Bute	471	381	80.89	84.26
Clackmannanshire	5	5	100	100
Dumfries and Galloway	167	157	94.01	89.08
Dundee City	0	-	-	-
East Ayrshire	15	13	86.67	93.33
East Dunbartonshire	1	1	100	100
East Lothian	5	5	100	83.33
East Renfrewshire	3	1	33.33	16.67
Edinburgh, City of	1	1	100	100
Eilean Siar	13	5	38.46	47.06
Falkirk	1	1	100	100
Fife	36	35	97.22	88.57
Glasgow City	0	-	-	-
Highland	708	679	95.9	95.18
Inverclyde	8	8	100	100
Midlothian	4	4	100	100
Moray	97	95	97.94	92.55
North Ayrshire	18	16	88.89	68.42
North Lanarkshire	0	-	-	-
Orkney Islands	32	31	96.88	100
Perth & Kinross	264	258	97.73	99.62
Renfrewshire	6	6	100	100
Scottish Borders	143	127	88.81	69.08
Shetland Islands	2	2	100	50
South Ayrshire	24	21	87.5	90.91
South Lanarkshire	21	21	100	96
Stirling	66	58	87.88	82.26
West Dunbartonshire	5	5	100	100
West Lothian	10	10	100	100
Scotland	2,393	2,200	91.93	90.09

The 2006 Regulations require “check monitoring” for all Type A supplies. This is a standard suite of tests from the Regulations and the purpose of this monitoring is to provide information on the microbiological and organoleptic (taste and odour) quality of a supply, as well as information on the effectiveness of any water treatment on it. The check monitoring parameters are ammonium, coliform bacteria, colony counts, colour, conductivity, *E. coli*, hydrogen ion (pH), odour, taste and turbidity. Samples should be taken for aluminium and iron where these metals are used as flocculants during water treatment, *Clostridium perfringens* must be monitored where the water originates from or is influenced by surface water and nitrite must be monitored if chloramination is used as a means of disinfectant.

In 2014 a total of 58,783 tests were carried out on PWS, 44,812 from Type A supplies and 13,971 from Type B supplies.

Sample rates for colour, taste and odour remain low. Coloured water is very common in Scottish surface waters and many private water supplies have no treatment that will remove it. Colour is an important parameter because it provides an indication of the organic content of the water, which can have a detrimental effect on the efficacy of UV disinfection, and must be sampled at the required frequency. Research is underway to better understand the significance of the impact of colour on the UV treatment processes used for PWS. Taste and odour has a lower sampling compliance because analysis is not undertaken where the microbiological quality of the sample is unsatisfactory due to the potential health risks to the health and safety of staff in the laboratory.



AN IMPROVED PRIVATE WATER TREATMENT SUPPLY

2 THE QUALITY OF PRIVATE WATER SUPPLIES

Many private water supplies suffer from inadequate treatment and poor or variable raw water quality. Consequently, compliance with the standards for drinking water quality is often much lower than for Scottish Water's public supplies. Year on year comparisons are hard to make, especially with the smaller, Type B, supplies which are not required to be sampled consistently every year.

2.1 TYPE A PRIVATE WATER SUPPLIES

Table 2.1a_ Type A Private Water Supply Compliance for Key Parameters

PARAMETER	NO. TYPE A SAMPLES	NO. TYPE A SAMPLES FAILED	TYPE A % SAMPLES FAILED	TYPE A COMPLIANCE
All Parameters	44,812	2,700	6.03	93.97
Coliform Bacteria	2,266	549	24.23	75.77
<i>E. coli</i>	2,264	303	13.38	86.62
Colour	2,126	382	17.97	82.03
Turbidity	2,217	41	1.85	98.15
Hydrogen ion (pH)	2,228	374	16.79	83.21
Aluminium	816	17	2.08	97.92
Iron	1,012	136	13.44	86.56
Manganese	891	65	7.30	92.7
Lead (10)	1,001	99	9.89	90.11

Overall, Type A compliance deteriorated slightly, from 94.48% last year to this year's 93.97%. This slight deterioration seems to be across a number of parameters. **Figure 2.1a** shows percentage compliance for Type A supplies over the past five years. No overall trend is apparent, suggesting that the efforts of local authorities and the Scottish Government to bring about a lasting improvement in the quality of these supplies has either not been effective or is simply not visible in this type of dataset.

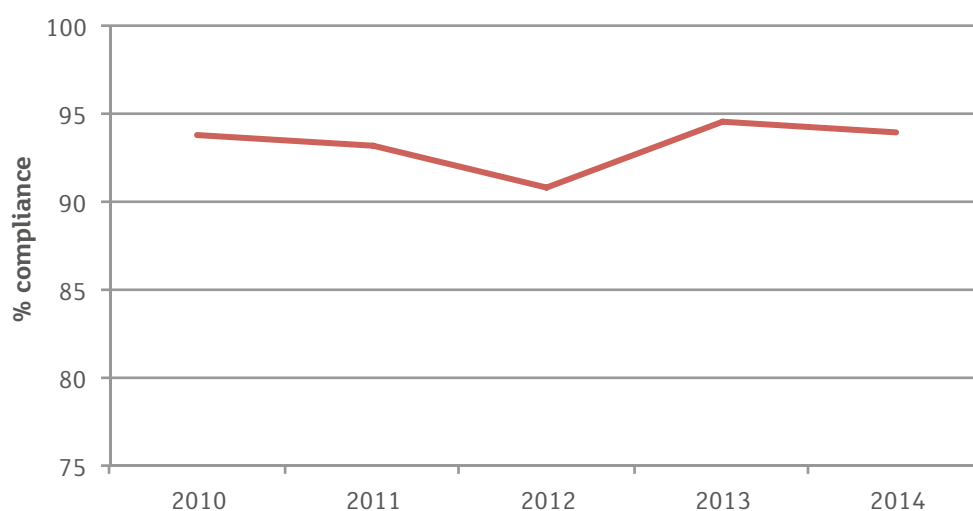


Figure 2.1a_ Type A Private Water Supply Overall Compliance Year on Year

In 2014, nearly 18% of Type A samples did not meet the standard for colour. Water containing colour above the regulatory standard will have a visible tint and, more importantly, be difficult to disinfect effectively. Coloured water is usually the result of water sources derived from areas with peaty soils, of which there are many in Scotland.



PWS AT SKERRICHA, LOCH A CHADH-FI, HIGHLAND

2.1.1_ METALS

Many Type A private water supplies in Scotland do not comply with the standards for a number of metals. Iron (13.44% of samples failing), manganese (7.30% of samples failing) and aluminium (2.08% of samples failing) all occur naturally, and many private water supplies have no treatment process capable of removing them. In many cases, simple filtration is all that is required, although in some cases a pre-oxidation stage is also needed. Iron can also be derived from corroding iron pipework and fittings within the private water supply itself.

The effect of these metals is mostly aesthetic, although they can clog filters and coat ultra-violet disinfection lamps, rendering them ineffective and potentially exposing the users to unseen microbiological hazards. **Figure 2.1b** shows the manganese concentration in private water supplies by size. It can be seen that there is a clear relationship between the potential concentration of manganese in a supply and its size, with smallest supplies being most at risk. It should of course be remembered that this is an overview across all supplies, and in some areas where geological conditions are favourable, even the smallest supplies may be completely unaffected by manganese.

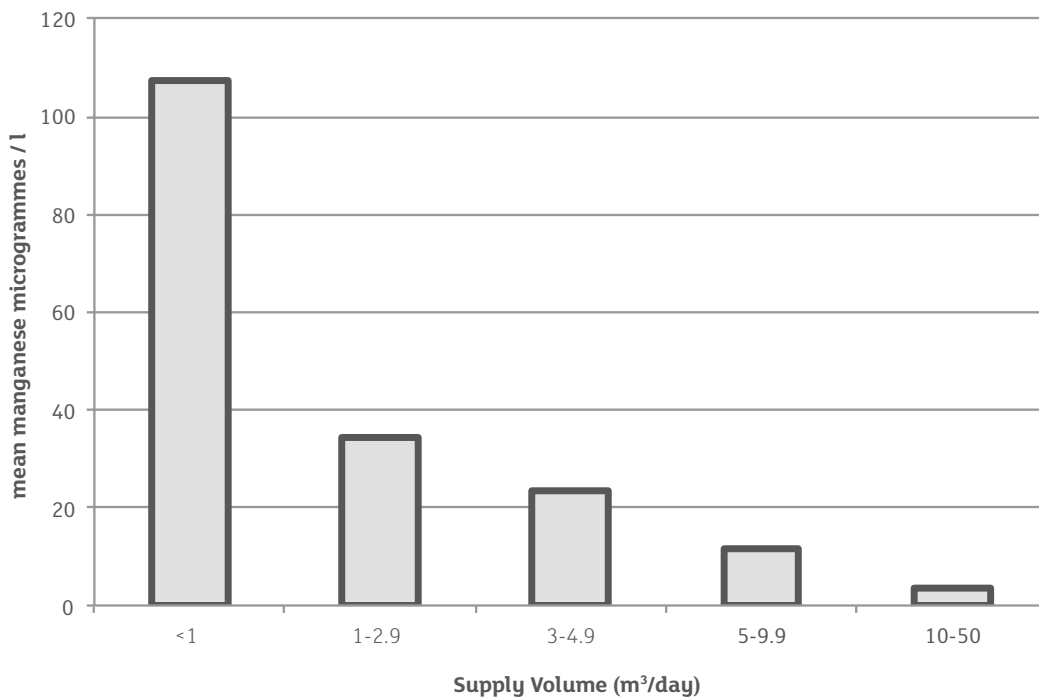


Figure 2.1b_ Mean Manganese Concentration by Supply Size

Compliance for lead and other metals found in plumbing systems is poor. These metals can dissolve into water where the water is corrosive. Nearly 10% of samples from Type A supplies failed the standard for lead which is disappointing when it is considered that lead has not been used as a plumbing material for over 40 years. Compliance for copper is even worse, with over 30% of the 811 samples taken from Type A supplies in 2014 not meeting the standard. High concentrations of plumbing metals can have consequences for health as well as aesthetic consequences. The latter include staining of sanitary ware and even hair.

Many Scottish waters are naturally soft and corrosive to metals without further treatment and conditioning. This is an essential but often neglected part of the treatment process, and many private water supplies do not have any adequate conditioning stage. This is also reflected in the compliance figure for hydrogen ion (pH) which shows that just fewer than 17% of samples were outside the permitted range for this parameter.

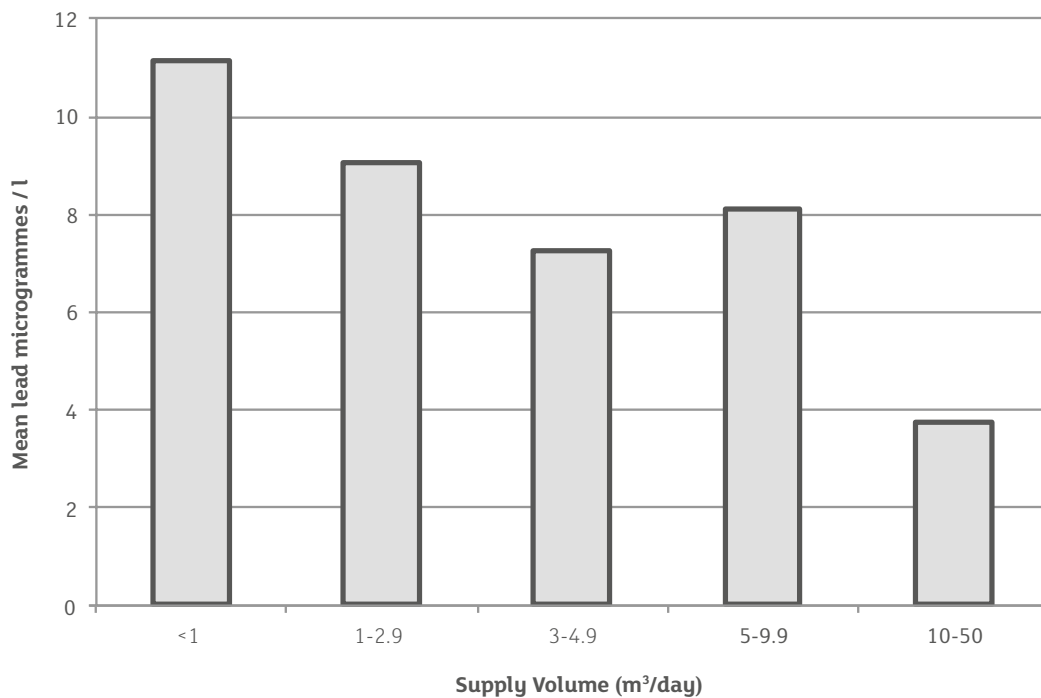


Figure 2.1c_ Mean Lead Concentration by Supply Size

Figure 2.1c shows that the risk of lead non-compliance increases in smaller supplies in the same way as for manganese. The most likely explanation for this is that the smallest supplies may tend to be the least well managed and, consequently, the least likely to have any form of treatment to prevent plumbosolvency.

In order to prevent dissolution of plumbing metals, soft waters need to have their alkalinity increased, which, in simple terms, means the pH and the concentration of dissolved minerals needs to be increased so that the water no longer has a tendency to corrode metals. This can be achieved simply and at low cost through the use of a filter containing a suitably alkaline medium such as limestone chips, although its success is dependent on the specific supply and raw water quality,

This issue can additionally be controlled through careful design of the plumbing system and use of the appropriate, approved, materials. Knowledge and control of the materials used in the distribution of private water supplies is often poor, and a thorough water safety plan for a supply should aim to document all materials used in the system and assess any potential impact they might have on water quality.

2.1.2_ MICROBIOLOGY

In 2014, just over three-quarters of samples taken from private water supplies across Scotland did not contain any coliforms, a similar figure to last year. This leaves 549 samples that contained at least one coliform. Although mostly non-pathogenic in themselves, the presence of coliforms can indicate that the water has become contaminated or that any disinfection process on the supply is not operating correctly.

The percentage of water supplies failing for *E. coli* is also similar to 2013, with 13.4% of samples containing *E. coli*. This is potentially of more concern as *E. coli* can cause illness in humans. Another faecal indicator organism, *Enterococci*, was present in 10% of Type A water supplies. This is unacceptable, given that Type A supplies are those most likely to be consumed by members of the public visiting a commercial enterprise or staying in tourist accommodation. It is worth noting that it is standard practice by local authorities to inform users on unsatisfactory supplies where *E. coli* is isolated as a precaution and to protect public health. This advice can include notice to boil water for human consumption or to use an alternative supply.

Table 2.1b_ Sample Compliance for *E. coli* – Type A Supplies

LOCAL AUTHORITY	NUMBER OF TYPE A TESTS	NUMBER OF TYPE A FAILS	COMPLIANCE (%)
Aberdeen City	2	0	100
Aberdeenshire	213	21	90.14
Angus	45	6	86.67
Argyll and Bute	397	76	80.86
Clackmannanshire	11	0	100
Dumfries and Galloway	182	28	84.62
Dundee	0	0	-
East Ayrshire	10	2	80
East Dunbartonshire	1	0	100
East Lothian	7	2	71.43
East Renfrewshire	1	0	100
Edinburgh, City of	1	0	100
Eilean Siar	5	1	80
Falkirk	1	0	100
Fife	35	4	88.57
Glasgow	0	0	-
Highland	674	75	88.87
Inverclyde	8	0	100
Midlothian	4	1	75
Moray	95	3	96.84
North Ayrshire	19	0	100
North Lanarkshire	0	0	-
Orkney Islands	31	1	96.77
Perth & Kinross	278	43	84.53
Renfrewshire	1	0	100
Scottish Borders	125	27	78.4
Shetland Islands	1	0	100
South Ayrshire	21	2	90.48
South Lanarkshire	23	5	78.26
Stirling	58	3	94.83
West Dunbartonshire	5	0	100
West Lothian	10	3	70
Scotland	2,264	303	86.62

Table 2.1b shows compliance for *E. coli* by local authority. It is difficult to compare compliance results between local authorities due to the wide disparity in the numbers of supplies between local authorities and the number of different factors which may influence sample results. Of the authorities with a larger number of supplies, where a comparison is meaningful, there is considerable variation in compliance. For example, compliance in Scottish Borders Council lags behind other areas where 78.4% of samples did not contain *E. coli*, compared with 90.14% in Aberdeenshire, which has a comparable number of Type A supplies. Other local authorities with large numbers of Type A supplies fall somewhere in between.

As in previous years, DWQR will be meeting with local authorities to discuss private water supplies that have recorded *E. coli* failures for a number of years in succession. Similar discussions have taken place previously and these identified issues with the reporting dataset and a variety of reasons for these results. These include the fluctuating raw water quality, inadequate or inconsistent treatment processes and poor or no maintenance of treatments systems. With Type A supplies, the requirement to take a representative sample of the supply invariably results in some samples being taken from properties where the water may be untreated or treated to a lower quality than the standard of treatment in the commercial properties on the supply. These discussions will seek to understand the reasons for the recurring failures and what the local authority has done in an effort to improve the quality of the supply. Although the quality of private supplies is a complex area and improvements are not always easy to achieve or maintain, DWQR and local authorities believe that owners and users must take greater responsibility for the quality of their private supplies, especially where the parameters failing are of significance for health, such as *E. coli*.



STERILISING A TAP BEFORE TAKING A WATER SAMPLE

2.2_ TYPE B PRIVATE WATER SUPPLIES

Table 2.2a_ Type B Private Water Supply Compliance for Key Parameters

PARAMETER	NO. TYPE B SAMPLES	NO. TYPE B SAMPLES FAILED	TYPE B % SAMPLES FAILED	TYPE B COMPLIANCE
All Parameters	13,971	1,696	12.14	87.86
Coliform Bacteria	1,127	486	43.12	56.88
<i>E. coli</i>	1,128	244	21.63	78.37
Colour	220	37	16.82	83.18
Turbidity	961	50	5.20	94.8
Hydrogen ion (pH)	1,034	277	26.79	73.21
Aluminium	122	15	12.30	87.7
Iron	626	88	14.06	85.94
Manganese	603	74	12.27	87.73
Lead (10)	894	75	8.39	91.61

For most of the main parameters, the smaller Type B supplies show a similar trend to the Type A supplies, although compliance is often slightly worse, reflecting an even greater tendency for there to be minimal treatment and management of the supply. This is especially true with microbiological compliance where 12% of samples contained *E. coli* and 43% contained coliforms. This suggests that disinfection of these supplies is only present and consistently effective in just over half. In addition to this the data is influenced by the fact that most Type B supplies are first sampled when applying for a grant to upgrade the supply and therefore the sample will reflect the poor quality of untreated supplies. Further samples are taken once treatment has been installed to demonstrate the efficacy of the treatment before the grant funding is awarded. This 'before and after' effect is not distinguished in the table.

Table 2.2b_ Microbiological Compliance by Source Type

SOURCE TYPE	COMPLIANCE	
	(TYPE A)	(TYPE B)
Groundwater Borehole	93.21	81.88
Groundwater Spring	88.04	72.66
Groundwater Well	89.6	75.22
Mixed Ground and Surface	87.5	n/a
Surface Water Loch	75.46	72.5
Surface Water Rainwater	55.88	46.15
Surface Water Watercourse	80.75	70.4
Unknown	81.4	68.35

As in previous years, source type appears to have a significant bearing on microbiological quality. Table 2.2b shows compliance of scheduled samples for microbiological parameters (in this instance, comprising coliforms, *E. coli*, *Clostridium perfringens*, *Enterococci*) by water source type, regardless of any treatment present on the supply. This clearly shows that groundwater sources, especially boreholes, are far less likely to suffer from microbiological contamination than surface water sources. Having said this, they are not completely compliant and it should not be assumed that underground waters are immune from contamination. In Scotland many groundwater supplies are heavily influenced by surface water, so are vulnerable to faecal contamination. Further contamination may occur between the point of abstraction and the location the water is consumed.



2.3_ NOTICES

Once a local authority has identified that a supply has quality or quantity issues and poses a risk to health, action is taken by local authorities to ensure that all users are informed and given appropriate advice to safeguard their health in the short term (e.g. boil water for human consumption). Users must also be informed of any required improvement works and the timescales in which these works must be carried out. Where public health is not at risk, other advice may relate to cleaning and disinfecting storage tanks, replacing UV tubes or filter cartridges or cleaning out the catchment area. In many instances, local authorities work with users of the supply to achieve improvement and only where this is unsuccessful, is a formal Improvement Notice issued.

DWQR is of the opinion that when local authorities' efforts to bring about improvements through the provision of advice and support for owners and users have failed, then lasting improvements must be achieved by putting in place a Notice formally setting out the requirements. The benefit of a Notice compared to informal advice is that if there is any disagreement about the need for a supply to be improved or who is responsible for carrying out the work, there is a formal legal process in place and the relevant person(s) is under a legal duty to carry out the necessary improvements. It also ensures any required works are carried out in a suitable timescale, as this is determined by the local authority based on the risk to health and the extent of the improvement works required.

In 2014 Notices were served on 13 failing supplies across the whole of Scotland. DWQR finds this number low when compared to the number of supplies failing to meet drinking water quality standards. However, DWQR is encouraged that this has increased from that of the previous two years and views this as an indication that local authorities have exhausted collaborative approaches with owners of an increasing number of PWS. There are 138 supplies that have failed for *E. coli* for three years or more, with 12 supplies failing for five years. It is vital that such supplies are tackled and, although responsibility for private supplies rests with owners and users, local authorities are urged to provide appropriate advice and make full use of the enforcement powers available to them.

3 PRIVATE WATER SUPPLY GRANT

The Scottish Government introduced a grant scheme in conjunction with the 2006 Regulations to assist owners and users of private supplies to bring their supplies up to modern standards. The scheme is non-means tested and available to domestic households and businesses. The maximum grant which may be awarded is £800 per property. However, the local authority may pay in excess of £800 where they are satisfied that the eligible person could not, without undue hardship, finance the expense of the approved works without such a grant.

The scheme is intended to assist with the one-off capital cost of installing treatment to help ensure the provision of safe drinking water. It does not cover the ongoing maintenance and disinfection of a private supply which is the responsibility of the user. In the 2014–2015 financial year £704,440.40 was awarded for PWS improvements. According to the data provided by local authorities this money improved 241 supplies and 574 properties.

An example of where grant funding has been awarded is an estate near Dunbar in East Lothian. East Lothian Council, Environmental Health approved their largest grant under the scheme when a grant of £29,000 was paid in April 2015. The grant was to provide treatment to a spring supplying a large farming estate with 40 properties comprising a mix of estate owned and owner-occupied houses. The spring and infrastructure were well established having first been used in the 1850s to supply the estate, overhauled in early 1900s and again in 1991. The microbiological and chemical quality of the source water was generally good, however the local authority supported the application for the need of a filter house with associated works, installation of a coarse sediment filter and UV system and replacement of valves and various pipe work which would ensure more robust treatment of the supply. A post treatment sample tap was fitted; however, the fixed roof of the filter house will have to be altered to provide a hatch to allow the UV lamp to be changed. To facilitate the work, the estate set up a limited company which oversaw the project, and also collects a fee from the users of the supply to provide a maintenance fund. Samples taken since the works have been completed are satisfactory.

This is a good example of a community working together to find a collective solution rather than individuals trying to find individual household solutions. In doing this they have found a solution to their private water supply issues as well as taking measures to ensure this is sustainable in future years.

DWQR recognises the importance of the grant scheme in supporting users to improve private water supplies, but it is essential that they commit to maintaining treatment systems to protect public health in the long term. Owners and users of PWS should contact their local authority's Environmental Health department for advice and details of how to apply for a grant.

4 IMPROVING PRIVATE WATER SUPPLIES

During 2014 DWQR staff were involved in a number of activities and strands of work involving private supplies. A lot of this work will only fully show benefits in the longer term.

This includes:

PWS Strategy

The three main objectives which this strategy aims to ensure are:

- A robust, clear regulatory framework to ensure that Scotland is complying with European obligations;
- Comprehensive information and advice is available for owners and users of private water supplies and local authorities; and
- Measurable improvements in compliance and reduction in risk to public health.

A copy of the strategy can be found at:

<http://www.dwqr.org.uk/media/9065/pws-strategy-final-version-10-15-august-2014.pdf>

Monitoring progress with implementation of the strategy will be managed by the Scottish Government (Drinking Water Quality Division). A Steering Group has been established to guide and advise the lead agencies, and consists of representatives from the Health Protection Scotland, DWQR, Scottish Government Health, Society of Chief Officers of Environmental Health in Scotland (SoCOEHS) and the Royal Environmental Health Institute of Scotland (REHIS). The group is chaired by DWQR. Progress is reviewed annually with implementation of the actions in the strategy by the Steering Group, and progress with performance measures shall be measured three years after the launch of the Strategy.

VTEC Action Group

Following recent *E. coli* outbreaks in Scotland a multi-agency group was formed to consider ways to disrupt the transmission of VTEC/*E. coli* O157 from source to humans. The resulting Action Plan comprises 86 recommendations designed to tackle VTEC/*E. coli* O157 infection in Scotland. An Implementation Group oversees the progress on implementation of the recommendations. A number of the recommendations relate to drinking water and DWQR is represented on the public and private water supply sub-groups, which report to the Implementation Group. These actions have been included in the PWS Strategy. A copy of the Action Plan can be found at

<http://www.scotland.gov.uk/Publications/2013/11/8897/0>

EURATOM Directive

The Scottish Government is required to transpose the EC Directive on radon in drinking water into Scottish legislation within 2015. Water sampling, under the guidance of DWQR, is currently being undertaken to investigate whether radon is present in private supplies and to establish guideline limits.

Rural Provision

DWQR is working with the Scottish Government Rural Provision Group to support the delivery of the Scottish Government priorities in rural communities, in particular with a view to improving water and sewerage provision in rural areas.

Communication

In conjunction with Health Protection Scotland and the REHIS PWS sub group, DWQR developed and produced a leaflet highlighting the public health risks posed by poorly maintained private supplies. These were given to all local authorities with private supplies for distribution to owners and users to increase awareness. A copy of the leaflet can be downloaded from the website http://www.dwqr.org.uk/media/10229/pws-health-awareness-and-advice-leaflet-final-published-version-14_11_14.pdf

In addition, the Scottish Government is developing a communication strategy to improve engagement with local authorities, to encourage grant uptake and increase awareness of both the health risks and the legal implications for owners, users and landlords of private supplies in Scotland.

Lead

Lead in drinking water arises mostly from plumbing in buildings: from lead pipes, storage cisterns and lead solder. The Scottish Government, with support from DWQR, is developing a policy for the reduction of exposure to lead in drinking water, both in private and public supplies. The project is looking to identify enablers and to strengthen or introduce mechanisms with a range of stakeholders and influencers for the removal of lead services pipes and plumbing.

Improved Data

Local authorities must provide annual data returns to DWQR on the private supplies in their area. Additional guidance and information was given to local authorities in 2014 on how to complete the data return and what we expect to see reported in it. This increased detail has allowed us to give much more detailed analysis on the state of private supplies across the country.

A trial in several local authorities began in 2014 to coordinate the use of water charges for the Council Tax Register to provide an accurate list of domestic properties on private supplies (as these properties do not pay water charges). Further domestic work is ongoing, with the view to rolling this out nationwide if this is shown to be a useful tool. Clear guidance will be issued and consultation with local authorities will take place before this is implemented.

Performance Measures

We have been working with the Society of Chief Officers of Environmental Health in Scotland to develop appropriate performance measures for private water supplies. This will allow comparison and benchmarking to be undertaken and improve data reporting. These measures relate to performance on sampling requirements, risk assessment and a means of demonstrating that effective health advice is issued on every occasion where there is an *E. coli* failure, in the interests of protecting public health.

CURRENT RESEARCH

During 2014 DWQR contributed and supported a number of research projects commissioned either by the Scottish Government or other agencies, which relate to private water supplies.

Colour

A research project looking into the effect of raw water quality on the effectiveness of UV disinfection of private supplies was undertaken in 2014. The results have recently been received and are being scrutinised. A workshop is being arranged for autumn 2015 for local authorities and following this a factsheet to assist owners and users will be available on our website.

Beavers

DWQR contributed to research by Scottish Natural Heritage, Argyll and Bute Council and Health Protection Scotland on the likelihood that the reintroduced beaver population in Knapdale, Argyll would be an increased risk to water quality. The findings suggested that there are no increased risks to the public or private supplies in the area. The full report is available at: <http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=2273>

PWS Grant

This project was commissioned to look at how grant funding has been used to improve private supplies across Scotland, it is a useful tool to improve quality and if these improvements are sufficiently robust and sustainable will protect public health. The research has concluded and has made a number of recommendations for improvements to the scheme and the data collected. The Scottish Government is currently reviewing the findings of this research.

5 PRIVATE WATER SUPPLIES QUERIES AND COMPLAINTS

If owners or users have any queries about their PWS they should contact their local authority Environmental Health department for advice. There is also advice on our website www.dwqr.org.uk. Any complaints about a local authority's PWS duties should be directed to the relevant local authority and if the complaint is not satisfactorily resolved the local authority's formal complaints process should be followed. However, if there is an immediate concern for health or if it is thought that the complaint has not been dealt with satisfactorily, the DWQR can be contacted for advice.

6 FURTHER INFORMATION

Further information and advice on PWS and the grant scheme can be obtained from Environmental Health teams at local authorities and also at www.dwqr.org.uk

ANNEXES

ANNEX A _THE REGULATORY FRAMEWORK

The regulatory standards for drinking water quality in Scotland largely stem from European Directives. These standards are based on guidelines developed by the World Health Organisation to protect public health.

Our key domestic water quality legislation includes:

Water (Scotland) Act 1980 (as amended)

- Scottish Water must supply wholesome water for domestic purposes. It is a criminal offence to supply water unfit for human consumption;
- Scottish Ministers must take enforcement action against Scottish Water if it fails in its duty to supply wholesome water (as defined in the relevant regulations) unless the failure is trivial or Scottish Water is complying with a legally binding undertaking to remedy the matter;
- Local authorities must take appropriate steps to keep themselves informed about the wholesomeness of public water supplies in their area and notify Scottish Water if not satisfied; and
- Local authorities are required to secure improvements to private water supplies if they consider them necessary.

Water Industry (Scotland) Act 2002

- Created the post of Drinking Water Quality Regulator for Scotland (DWQR);
- Set out responsibility for enforcing the Water Supply (Water Quality) (Scotland) Regulations 2001;
- Defines DWQR's independent status;
- Defines DWQR power to obtain information, power of entry or inspection and power of enforcement; and
- DWQR also has emergency powers to require a water supplier to carry out works to ensure quality of water supplied is safe for public consumption.

The Private Water Supplies (Scotland) Regulations 2006

- Define wholesomeness in accordance with the EC Drinking Water Directive 98/83/EC;
- Require local authorities to classify private supplies according to size and use;
- require local authorities to monitor, risk assess and report on private supplies in their area according to classification and risk; and
- Require local authorities to provide advice to private supply owner and ensure improvements are carried out.

The Private Water Supplies (Grants) (Scotland) Regulations 2006

- Provides for grants to be paid to eligible persons to enable them to improve their private water supply; and
- Is administered by local authorities and provides for non-means tested grants of up to £800 per property.

The Water Quality (Scotland) Regulations 2010

- Further transpose the requirements of Directive 98/83/EC most particularly in respect of water quality failures which are attributable to the domestic distribution system in establishments and premises where water is supplied to the public;
- Require local authorities to investigate such water quality failures to determine its cause;
- Instruct remedial action through the service of a notice on the person who owns, or is responsible for, the domestic distribution system;
- Ensure that affected consumers are notified of any risks to their health;
- Make a number of technical amendments to The Water Supply (Water Quality) (Scotland) Regulations 2001 and The Private Water Supplies (Scotland) Regulations 2006; and
- Create a duty to minimise contamination from disinfection by-products and to verify the effectiveness of the disinfection process.

ANNEX B_INDEX OF INFORMATION LETTERS ISSUED DURING 2014

Information Letter number	Title
Public Supply	
2014/1	Monitoring of Radioactivity in Scottish Drinking Water
2014/2	Not issued
2014/3	Update on DWQR Requirements for the Reporting of Water Quality Events
Private Supply	
2014/2	Updated PWS Financial Implications – Reimbursement Claims Under S47 of the Local Government in Scotland Act 2003

Copies of these letters are available on the DWQR website:

www.dwqr.org.uk

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