Validation Impact Assessment			
Amendments to the Water Supply (Water			
Quality) Regulations 2000			
Defra			
April 2016			
EU			
02/10/2015			
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Low-cost regulation (fast track)			

Rationale for intervention and intended effects

Drinking water in England is supplied by private water companies that operate in de facto local monopolies due to the economies of scale in water collection, treatment and distribution. A system of drinking water quality regulation is in place to protect the interests of water consumers which would otherwise not be protected.

The regulations covering public water supplies in England¹ are the Water Supply (Water Quality) (or WSWQ) Regulations 2000 and three sets of amending regulations. The regulations describe water supplied for domestic purposes as consisting of or including cooking, drinking, food preparation and washing.

Amendments are proposed to consolidate the original and amending regulations, which is a commitment Defra has made under the red tape challenge. Other specific amendments are also proposed as follows:

i. Transposition of EU Directive 2013/51/Euratom: The Euratom Directive published in the Official Journal on 7 November 2013 has a transposition deadline of 28 November 2015. Euratom introduces a new requirement on member states to monitor for radioactive substances (primarily radon) in public water supplies. Radioactive substances like radon can be incorporated into the human body by inhaling or ingesting water. Some studies have shown that inhaling or ingesting radon can lead to increased risks of lung and stomach cancer. The rationale for intervention is therefore to address the public health concerns posed by the presence of radon in drinking water, and the intended effects are to ensure that radon levels are monitored where there is a risk of radon occurring in water supplies and any necessary action taken as required.

In England water companies already monitor their water supplies according to a list of parameters set out in the current WSWQ regulations which includes some radioactive substances. Transposing the Euratom requirements mean that radon would be added to this list and water companies required to monitor for it as an additional parameter according to the monitoring frequencies specified in the Directive.

There has been discussion in the scientific community for some time about the presence of radon in drinking water; it is not a sudden new phenomenon. It is, however, considered more of an issue in other EU countries which is why there was a drive to have a new EU directive and follow due process in member state countries to transpose this. The regulations for England will therefore take a proportionate and risk-based approach as monitoring will not be required where it can be demonstrated that levels of radon are well below the parametric value set;² where it is exceeded monitoring must be carried out at the frequencies set out in the Euratom Directive.

ii. Clarification of DWD provisions: The WSWQ regulations transpose Directive 98/83/EC (the Drinking Water Directive, or DWD). In considering the amendments needed to transpose Euratom, lawyers have identified two areas where the wording

¹ The privatised water industry in Wales refers to its own consolidated WSWQ regulations introduced in 2010. Drinking water regulation is entirely devolved to Scotland and Northern Ireland.

² Euratom introduces a parametric value for radon of 100 Bq/l and allows member states to set a level higher than 100 Bq/l and lower than 1,000 Bq/l that will be judged inappropriate to be exceeded. The WSWQ regulations set this level at 100 Bq/l.

relating to the DWD could benefit from clarification:

- a) in the general monitoring provisions section: clarification that monitoring for a particular parameter may not be necessary if it can be proven that there is no risk of a breach of the relevant standard. We believe we may have been overimplementing the directive here by not making this clear. Intervening to clarify this in the regulations will reduce the monitoring burden on water companies and provide legal reassurance for lighter-touch monitoring in certain circumstances;
- b) in the risk assessment section: clarification of the wording to bring it in line with the wording of the DWD and thus ensure full compliance with it. This intervention is intended to remove any uncertainties caused by differences in wording and in so doing simplify the regulations for the water companies.

iii. Introduction of two changes to regulatory requirements:

- a) New water supplies: Water companies have suggested that it would be beneficial to be able to bring new water sources into use more quickly by reducing the time the Drinking Water Inspectorate (DWI) has to process risk assessments of new sources from 3 months to 1 month. This will increase efficiency for the water companies and give greater confidence in the security of their water supplies (in times of drought, emergency etc.) and their ability to maintain continuity of supply.
- b) Data records: This change will clarify the data records that need to be maintained by water companies by including a specific reference to electronic records in the existing list of data requirements. This will ensure that any electronic records collected are kept for the same length of time as other specified data records, and therefore that a consistent approach to maintaining data records is in place for all water companies. This consistency will allow the DWI and water companies to better inform their investigations when water quality incidents occur and enable their rapid resolution.

Viable policy options (including alternatives to regulation)

This proposal concerns amendments to existing regulations. There are no viable alternatives to regulation to implementing the amendments.

With respect to the Euratom requirements, the EU requires that all member states transpose the Euratom directive into their respective domestic law. Regulation allows quality standards to be set out in law and provisions made for the monitoring of compliance with those standards that other interventions (such as guidance) would not. Ensuring compliance is important because of the potential risk to public health that is associated with the presence of radon in drinking water.

The Drinking Water Directive (DWD) itself is EU legislation that all member states are required to transpose. In England this is done via these (WSWQ) regulations. Including the two clarifications proposed in the amendments is optional at this stage but beneficial, because they provide clarity and prevent gold-plating of the DWD requirements.

The two changes to regulatory requirements suggested by the DWI are also optional at this stage, but water companies have previously suggested it would be beneficial to be able to bring new water supplies into use more quickly. Clarifying data record requirements will mean that the DWI has a uniform records base on which to draw when carrying out investigations and resolving water quality incidents.

The viable policy options are therefore the following:

- 1. to amend the regulations to cover only the Euratom requirements (including a risk based approach to monitoring for radon); or
- 2. to amend the regulations to cover the Euratom requirements and the two DWD clarifications; or
- **3.** to amend the regulations to cover the Euratom requirements, the two DWD clarifications *and* the two changes to regulatory requirements.

The policy team's preferred option is to combine all of the required and suggested amendments into one new, clearer set of regulations and take forward **option 3**. Overall the amendments proposed amount to a low-cost regulatory intervention that is also de-regulatory in nature given its aims to consolidate and clarify existing regulations, and include a risk-based approach where possible, thereby reducing the regulatory burden on business.

Initial assessment of business impact

These proposals affect water companies in England only.³ There are 24 providers of public water supplies in England.

i. Transposition of the Euratom Directive: Water companies will be required to monitor water sources for radon and other radioactive substances. This involves conducting risk assessments to check the likely presence of radon in public water supplies in particular areas; taking samples; getting the samples analysed and taking any mitigating action required to address levels of radon found above the risk threshold stipulated by Euratom. This is unlikely to represent a significant additional burden or significant additional cost for water companies. Water companies already risk-assess their water supplies and take and analyse samples and will therefore be able to include radon in their existing sampling processes.

Moreover, a risk-based approach is proposed, such that the monitoring and testing required is proportional to the risk of radon in a certain area. Water companies that are able to demonstrate that radon levels are sufficiently low in a certain area (e.g. through sample surveys and monitoring data) will be able to apply to the DWI for a waiver that if successful, will exempt them from the Euratom monitoring requirements. Applying for a waiver is free of charge; more detail on the waiver process is provided below in the Evidence section).

The DWI has estimated the sample analysis costs water companies may incur based on which of their water sources are located in moderate to high risk radon areas. The estimates take into account the monitoring frequency stipulated by Euratom and the volume of water supplied by each source. Sample analysis costs could range from about £33 to up to £90 per sample. Based on the high-end estimate of £90 per sample, estimated costs across all water companies amount to £157,050 / year. This would be an on-going cost to water companies, though over time one could expect this to diminish as water companies take action to mitigate the presence of radon in moderate to high-risk areas and potentially receive more waivers if, as a result of such action, radon levels fall below the parametric set. Further detail on the cost estimates is provided in the Evidence section below.

- ii. Clarification of DWD provisions: Clarifying the DWD provisions in the WSWQ regulations is estimated to have a negligible impact on water companies with no additional burden or cost expected. This is because the clarifications proposed are to wording only and not to policy.
- iii. Introduction of two changes: The first of the new changes, concerned with bringing new water supplies into use more quickly, is something that the water companies have previously suggested would be beneficial. In response to the consultation, there was wide industry support for this proposal as it allows for greater flexibility and resilience in terms of water supply. Currently water companies wishing to start using a new water supply have to submit a risk assessment to the DWI. The DWI currently may take three months to process the risk assessment. The change proposed will require that the DWI take only one month to do this. Any new burden thus falls on the DWI and not on the water companies. Water companies will not incur increased costs as they will be under no additional obligation. They will benefit from earlier approval by being able to bring new water supplies into use more quickly which will particularly help in cases where security or continuity of supply is at risk.

In the period from 1 January 2012 to 31 December 2014, based on DWI records 36 risk assessments for new supplies were submitted, so an average of 12 per year. The

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³ The privatised water industry in Wales refers to its own consolidated WSWQ regulations introduced in 2010. Drinking water regulation is entirely devolved to Scotland and Northern Ireland.

main reason for needing to bring these new supplies into use was to augment supplies affected by drought conditions, but new supplies may also be needed quickly to replace existing supplies that have become contaminated or provide blending with other sources with high-levels of a particular substance, like nitrates.

The industry welcome this reduction in the time for introducing new supplies as a deregulation measure.

The second of the changes clarifies requirements for the data records that need to be maintained by water companies by including a specific reference to electronic data records. Keeping records is not in itself a new burden. The change is required however to ensure that any electronic records that are collected are kept for the same length of time as other specified data records. The DWI has found this has not always been the case, which has made it difficult for the DWI to access consistent and uniform records across all water companies.

This change will have some impact on water companies in terms of having to ensure all records are kept for the stipulated timeframe (5 years). The inclusion of electronic data records is not expected to create a significant additional burden on water companies as they do currently keep these records, but we do not have figures available to confirm for how long. Different water companies will have different data storage policies in place, so will be impacted differently by this proposal.

There was welcome and general support for the benefits of this proposal, from water companies responding to the consultation, in its providing for a standardised approach. The possible additional burden as a result of this proposal was raised but, to mitigate for this, water companies requested guidance on the scope of the information to be stored. The Drinking Water Inspectorate will be providing relevant guidance as part of the next steps in follow up to the consultation.

One-in, Three-out status

Defra's commitment to consolidate the existing regulations with the amending regulations is part of the red tape challenge which is **out of scope** of OI3O. Transposing the Euratom directive is an implementation of EU legislation and will not "gold plate" the EU requirements. These amendments are therefore **out of scope**. Similarly, the amendments proposed to clarify the requirements of the DWD are **out of scope** since the DWD is also EU legislation.

The amendments proposed to introduce two changes to regulatory requirements are **within scope**; There is no additional burden on businesses for DWI to process risk assessment quicker. Businesses would benefit from a quicker decision from DWI. There is no evidence from business to monetise the benefits and assumed to be small. There may be some burden on businesses to store information longer but in response to the consultation, water companies could not quantify the burden. The burden is assumed not to be significant aand business welcomes the benefit in having a standardised approach. For purposes of the business impact target these changes would be a qualified regulatory provision with neutral impact as costs and benefits are assumed too small and disproportionate to monetise.

Rationale for Triage rating

We estimate that the maximum costs in any one year will amount to under £160,000, less than the £1m threshold that defines 'low-cost regulation' and determines eligibility for the fast-track route. Defra's commitment to consolidate the existing regulations with the amending regulations qualifies for a fast-track appraisal as part of the red tape challenge.

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Date: 02/10/2015

Economist signoff (senior analyst): Nick Haigh

Date: 05/10/2015

Better Regulation Unit signoff: Mustafa Siddique

Date: 12/10/2015

Supporting evidence

1. The policy issue and rationale for Government intervention

The intervention proposed concerns amending existing water quality regulations. Drinking water is a 'merit good' commodity, its quality regulated to protect public health. The main rationale for intervention is to transpose the Euratom directive to ensure compliance with new water quality standards, in particular, for radon in public drinking water supplies. Ensuring compliance is important because of the potential public health risk associated with the presence of radioactive substances including radon in drinking water that water companies would not otherwise necessarily monitor. Current regulations include provisions for monitoring some radioactive substances but do not include radon, and do not therefore include the latest quality standards.

Amending the regulations to transpose the Euratom directive is an opportunity to improve the efficiency of government intervention by including other clarifications and changes that will benefit water companies.

Clarifying two instances of wording relating to the Drinking Water Directive provisions will remove any uncertainties the water companies may face about their monitoring procedures and ensure consistency with the wording in the directive. Finally, the new changes proposed should benefit water companies by enabling them to bring new water supplies into use more quickly than is currently the case and remove any doubt about the data records water companies are required to keep and for what duration.

2. Policy objectives and intended effects

- To ensure that domestic drinking water supplies are monitored for radioactive substances (including radon) and that measures are in place to protect health of consumers from actual or potential risks associated with the presence of these radioactive substances in public water supplies;
- To clarify elements of the existing regulations to bring them up to date and improve the efficiency of government intervention;
- To introduce two new changes to the regulations to improve efficiency with regards to bringing new public water supplies into use and data record requirements.

3. Policy options considered, including alternatives to regulation

This proposal concerns amendments to the Water Supply (Water Quality) Regulations 2000. As discussed above, there are no viable alternatives to implementing the Euratom requirements, though there is scope to decide whether the other changes should be made at this stage.

The policy options considered are therefore the following:

- 1. to amend the regulations to cover only the Euratom requirements (including a risk based approach to monitoring for radioactive substances including radon); or
- **2.** to amend the regulations to cover the Euratom requirements *and* the two DWD clarifications; or
- to amend the regulations to cover the Euratom requirements, the two DWD clarifications *and* the two changes to regulatory requirements.

A non-risk-based approach to implementing Euratom has not been considered since this would gold-plate and over-implement the requirements of the directive.

The policy team's preferred option is to combine all of the required and suggested amendments into one new, clearer set of regulations and take forward option **3**.

Overall the amendments proposed amount to a low-cost regulatory intervention that is also de-regulatory in nature given its aims to consolidate and clarify existing regulations, and include a risk-based approach where possible, thereby reducing the regulatory burden on business.

4. Expected level of business impact

Impact

'Business impact' in this context refers to water companies and licensed water suppliers in England. There are 24 providers of public water supplies in England that are affected by these regulations.

There will be a negligible impact on small businesses within the water industry: two of the 24 water companies are considered small businesses. However, their water supplies are not located in moderate or high-risk radon areas so it is not expected that they will be impacted by the regulatory amendments proposed.

The policy team's preferred option above is option 3. This combines the consolidation and Euratom requirements with the DWD clarifications and the two new changes, and is therefore the most complete of the options and the one likely to have the most impact on business.

Costs

Our assessment of the cost to business of option 3 focuses on the Euratom requirements relating to radon. To reduce the burden (and associated costs) of the radon requirements on water companies, a waiver process is included in the regulations to allow for monitoring and testing for radon to be carried out in a risk-based manner, proportional to the risk of radon in a certain area.⁴ Applying for a waiver will carry no cost to the water company.⁵

We have worked closely with the DWI in assessing cost implications. Their estimations have been based on a recent research report and are as follows:

<u>Cost of risk assessment for radon</u>: expected to be negligible, since water companies already conduct risk assessments on their water supplies.

<u>Cost of taking samples for radon</u>: expected to be negligible, since water companies already take samples to test for other parameters, or contract laboratories to do this for them. The requirement to test for radon does not imply additional sampling.

Cost of analysing the samples: whilst a sample for radon would be taken at the same time as any other samples, analysing a sample for radon does require separate analysis techniques. This does not in itself imply an increased per unit sample cost. However, water companies may face increased sampling costs if they are required to take and test samples for radon more frequently than their existing sampling regime, which may be the case if their water sources are located in areas where the presence of radon is more likely.

The DWI research splits the UK into three bands. These bands are based on analytical data, geological radon potential and levels of radon in the air, which together give a level of risk of radon occurring in water supplies and effectively reflect the following: high (radon values above 500 Bq/I), medium (radon values between 50 and 500 Bq/I) and low radon risk (radon values below 50 Bq/I).

Water companies will be able to use the DWI research report to assess the likely risk of radon occurring in water supplies in their area/s and this in turn will inform the type and frequency of monitoring they will need to undertake. The legislation includes tables setting out monitoring frequency according to the volume of water distributed or produced each day within a particular supply zone. The DWI has estimated sampling frequency over a one year period per water company based on the numbers of supplies each company has in moderate and high-risk radon areas. Their method for doing this was as follows:

- 1. Recent DWI research indicates that 16 (out of 24) water companies have supplies in moderate and high-risk radon hazard areas in England;
- 2. DWI holds records of raw water abstraction points (that are used for drinking water purposes) and their location, the water supply zones receiving water from these

⁴ Water companies will be able to refer to recent DWI research to help them determine whether their water supplies are located in low, moderate or high-risk radon areas. If, through sample surveys and monitoring data, water companies are able to demonstrate that radon levels are sufficiently low in a certain area, they will be able to apply to the DWI for a waiver and if successful, exempt themselves from the Euratom requirements.

⁵ Based on 2013 figures for the number of waivers granted in 2013 for the monitoring of tritium, another radioactive substance that can occur naturally in drinking water, we might expect 10 (of the 24) water companies to apply and be successful in the radon waiver application process.

- abstraction points and the volume of water supplied. From this information, DWI has established that the 16 companies would have to monitor a total of 241 zones;
- 3. The number of samples required in one year has then been calculated using the volume supplied to each zone and referencing the frequency for monitoring tables in the legislation, to give a total of 1745 samples;
- 4. A unit cost of £90 per sample analysis has been applied to the number of samples to give a one-year cost per water company and a grand total as follows:

 $1745 \times £90 = £157,050$

Estimated costs across all water companies therefore amount to £157,050 / year⁶. However, £90 per sample analysis is thought to be a top-end, worst-case single unit cost. A recent tender answered by one laboratory cited unit costs of £32.50 per sample, and large sampling programmes for example could also drive the unit cost down. Using the lower-end cost of £32.50 per sample and following the same steps as above, the estimated cost across all water companies for one year would amount to $(1745 \times £32.50) = £56,713$.

This would be an on-going cost though over time one could expect this to diminish as water companies take action to mitigate the presence of radon in moderate to high-risk value areas. Existing accredited laboratory capacity is believed to be sufficient to accommodate the sampling required for radon, and the sample analysis costs cited are inclusive of the laboratories' operating costs.

Cost of mitigating high-levels of radon found in water supplies: there is limited information available currently on the range and cost of the measures water companies would need to take to reduce levels of radon where these are found to be above the safe limit. One method is aeration, whereby oxygen is passed through water, reacting with the radon present and neutralising it. It is unlikely that aeration would be carried out as a standalone treatment, since any water treatment process in place at a works would already introduce aeration into the water. It is therefore difficult to isolate the cost of aeration specifically for radon mitigation purposes. What's more, any treatment would depend on the size of the water supply and the volume needing to be treated.

Further, treating radon with oxygen would only be an option necessary for groundwater supplies (those found underground) as with surface water supplies (from e.g. lakes and reservoirs) radon is likely to be lost to the air. Groundwater supplies account for 35% of all public supplies according to DWI research. The same research indicates that of 2,047 groundwater and mixed source supplies in England and Wales, 248 (12%) are located on moderate hazard aquifers and only 42 (2%) are located on high hazard aquifers. To conclude, it is thought unlikely that specific treatment will be needed to remove radon in public water supplies: the level of risk of radon occurring in sources used for public supplies is low and where existing treatment is already in place, this will be effective in removing any radon present.

The other drivers of the amendments proposed (RTC consolidation commitment, DWD clarifications and the two new changes relating to bringing new supplies into use more quickly and including electronic records in the data the water companies are required to keep for the stipulated length of time) are not expected to cause water companies either any significant additional burden or any significant additional cost.

Benefits

Transposing the Euratom directive to include a new focus on radon in water companies' existing risk assessment and monitoring procedures will have health benefits for consumers of drinking water across England. It is important to remember that drinking water is not only water that we drink, but water used for washing, cooking, heating and other sanitary purposes.

Radon is a radioactive substance that can be released from water and therefore, may contribute to the concentration of radon found in the air. Some studies suggest that if radon is present in drinking water in certain levels (the Euratom directive gives a threshold of 1,000 Bq/l above which would be unacceptable), consumers of the water will be at risk of exposure via ingestion and inhalation of the radon, with the greater risk coming from inhalation.

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⁶ See full break down of DWI figures in annex 1

Inhalation of radon may lead to an increase in the risk of lung cancer, with smokers more at risk. Radioactive particles can get trapped in the lungs which can damage lung tissue thereby increasing the risk of lung cancer. Ingestion of radon exposes the gastrointestinal tract to irradiation, and can increase the risk of stomach cancer.

Research in America referenced by the Environmental Protection Agency (EPA) estimates drinking radon water causes around 168 deaths that in а year http://water.epa.gov/scitech/drinkingwater/dws/radon/qa1.cfm). These figures are now dated (1999) which makes it difficult to extrapolate implications for England from the American research. It is worth noting, however, that the same research indicates that approximately half of the drinking water in the United States comes from ground water that is tapped by wells,⁷ compared to the 35% of public supplies that come from groundwater in the UK. There is currently no federally-enforced drinking water standard for radon in the USA, though the EPA has in the past proposed to regulate radon in drinking water from community water suppliers and ensure these suppliers provide water with radon levels no higher than 4,000 pCi/L.8 This corresponds to about 148 bg/l, which is higher than the limit of 100 bg/l we are proposing for England in the WSWQ regulations, which is in itself much lower that the upper limit set by the Euratom directive of 1,000 bq/l. DWI research indicates very few water supplies in the UK will have levels of radon in drinking water above the risk threshold value of 1,000bg/l (only 2% or groundwater and mixed source supplies in England and Wales are located on high hazard aquifers) and therefore, it is unlikely deaths will occur in England due to the potential presence of radon in drinking water.

The benefits of the other parts of policy option 3, as discussed earlier in this document, are largely de-regulatory in nature and aim to reduce the burden on business. Water companies will be able to refer to one, amended set of regulations instead of one original set and three amending sets; they will have enhanced clarity on two of the DWD provisions; they will be able to bring new water supplies into use more quickly and take measures to improve the data records they keep to provide consistency across the industry. For the introduction of new supplies, although the average has been shown as 12 risk assessments per annum, in advance of implementing the reduction in time there is no evidence for establishing the benefit and so it is not possible to monetise the saving. Monetising for the change for data records would be disproportionate as the cost is unknown, would vary across the different companies and be relatively small.

Early assessment of OI3O

Transposition of EU Directive 2013/51/Euratom and Clarification of DWD provisions fall **out of the scope** of Ol3O because they transpose and clarify EU Directives.

The amendments proposed to introduce two new changes recommended by the DWI are within scope of OI3O. However, the proposal to allow water companies to bring new supplies into use faster is a benefit to business - the new burden falling on the Drinking Water Inspectorate and not on the water companies themselves.

Amending data records requirements to specifically include electronic records is not a new regulation in itself but may have a small initial increased burden on those water companies not already maintaining electronic records for the stipulated length of time. There is no evidence which business would be affected. We assume this burden not to be significant as business recognises the benefit in having a standardised approach.

Both these changesshould increase efficiency for water companies over the long-term at negligible cost. For purposes of the business impact target these changes would be a qualified regulatory provision with neutral impact as costs and benefits are assumed too small and disproportionate to monetise. Annex 1: Estimated maximum sampling requirements in moderate and high-risk radon areasⁱ

⁷ http://www.nap.edu/openbook.php?record_id=6287&page=2

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	Number of	Number of	Coat of analysis per
Water	water supply	samples	Cost of analysis per year (at £90 per
Company	zones ⁱⁱ	required per	sample)
		year ⁱⁱⁱ	. ,
Severn Trent	66	500	£45,000
Northumbrian Water	29	198	£17,820
Wessex Water	30	192	£17,280
Southern Water	24	176	£15,840
Thames Water	24	172	£15,480
Anglian Water	19	148	£13,320
South East Water	12	96	£8,640
United Utilities	12	89	£8,010
Sutton & East Surrey Water	6	48	£4,320
South Staffs Water	5	40	£3,600
Yorkshire Water	7	34	£3,060
Hartlepool Water	3	20	£1,800
Bristol Water	1	8	£720
Cambridge Water	1	8	£720
Essex & Suffolk Water	1	8	£720
South West Water	1	8	£720
Total	241	1745	£157,050

Source: DWI figures, April 2015

Notes:

ⁱ The eight water companies not listed in this table have no sources of supply in moderate to high-risk radon areas and therefore would not be required to undertake sampling and testing for radon.

This is the estimated number of water supply zones that receive water from the raw water abstraction points a water company uses in its local area for drinking water purposes.

The number of samples required in one year has been calculated from the volume of water supplied to each water

supply zone (information held by the DWI) and according to the frequency for monitoring tables in the legislation.