



Scottish Executive Environment Group
WATER SUPPLIES IN PUBLIC BUILDINGS
A Consultation

March 2002
Paper 2002/8

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Compliance of Public Buildings with the new Drinking Water Directive

Annex B - Pre- Regulatory Impact Assessment (RIA)

REGULATION OF DRINKING WATER IN PUBLIC BUILDINGS

FOREWORD

One of the Scottish Executive's objectives is to ensure that all those who use drinking water in public buildings should do so with safety. Unfortunately the existing regulatory framework governing the quality of drinking water in public buildings such as schools, hospitals and restaurants is patchy to say the least and the Executive considers that it affords inadequate protection to the public's health.

Given the weak regulatory framework the Scottish Executive is preparing new Regulations that will address these problems and also comply with EC Directive 98/83/EC. The resulting improved regulatory framework will help to ensure protection of residents and visitors alike.

The purpose of this consultation is to encourage public engagement in the framing of the Scottish Executive's policy on the regulation of drinking water in public buildings. Your comments and suggestions will be welcomed and they will assist in the finalisation of the Executive's draft Regulations on which there will be a further public consultation later this year.

I am very glad to be launching this consultation and I look forward to receiving your comments and suggestions in due course.

A handwritten signature in black ink, appearing to read 'Ross Finnie', followed by a period.

Ross Finnie, MSP
Minister for Environment and Rural Development

March 2002

EXECUTIVE SUMMARY

1. European Council Directive 98/83/EC of 3 November 1998 on the quality of drinking water intended for human consumption sets new standards for drinking water quality in Member States. The standards set have to be met at drinking water taps that are normally used to supply water for human consumption. The Directive prescribes a monitoring regime to check for compliance with the standards set. Member States shall be deemed to have met their obligations where it can be shown that any failure to meet the standards was due to the domestic distribution system. However, this exemption does not apply to premises and establishments where water is supplied to the public such as schools, hospitals and restaurants.
2. The public water authorities are responsible for the quality of water delivered to premises but failures at taps due to the condition of internal distribution systems are the responsibility of the owners of the premises. A regulatory system is therefore required to check the quality of water supplied at taps in premises such as schools, hospitals and restaurants to determine if any non-compliance with the Directive is occurring as a result of internal distribution systems.
3. This consultation considers the major issues surrounding the establishment of a regulatory framework for monitoring drinking water quality in public buildings. The various options for responsibility for monitoring are discussed together with some of the more practical aspects of any monitoring regime. The question of remedial action and enforcement is also considered.

PURPOSE OF CONSULTATION

Introduction

4. This document contains proposals for the implementation of European Council Directive 98/83/EC of 3 November 1998 on the quality of drinking water intended for human consumption as it applies to public buildings. The responses to the consultation points identified in the document will assist in the finalisation of the Scottish Executive's policy regarding drinking water supplies in public buildings and the preparation of regulations governing such supplies.

Scope of Consultation

5. This consultation covers water supplied from taps in public buildings in Scotland that are normally used for human consumption.

6. Under the provisions of Directive 98/83/EC, drinking water supplied for human consumption in public buildings (such as schools, hospitals and restaurants) must be of a quality that complies with the standards set in the Directive. Failure to meet the standards set in the Directive as a result of the distribution system in the public building, or the maintenance thereof, is considered to be non-compliance with the Directive. This represents a change to the current regulatory framework that being primarily concerned with the quality of the water in water authority pipes.

7. The Water Supply (Water Quality) (Scotland) Regulations 2001 will continue to set standards for the quality of the water in water authority pipes. The purpose of the proposed legislation is to prevent any deterioration in the quality of that water as a result of the distribution system in public buildings.

8. A pre-assessment of the impact of the proposed legislation is contained at Annex B. A full regulatory impact assessment will be published as part of the consultation on the final form of the Regulations.

Consultation Points

Consultation Point 1: should the register of public buildings be (a) based on local knowledge and determined by the local authority with guidance from the Scottish Executive, or (b) a definitive list of property types identified in the Regulations ?

Consultation Point 2: should the standard monitoring frequency for public buildings be (a) based on the normal occupancy of the building with a facility to reduce the frequency if it can be shown that the water is compliant with the regulatory standards? For example:

<i>Occupancy</i>	<i>Standard Frequency</i>	<i>Reduced Frequency</i>
<i><5,000</i>	<i>2</i>	<i>1</i>
<i>≥5,000</i>	<i>4</i>	<i>2</i>

or (b) set at one visit per annum regardless of the size of the property and with no facility to reduce the frequency of the visits?

Consultation Point 3: assuming labels are highly visible and fixed, is it sufficient to label a tap supplying water that does not comply with the standards and to which the public has access as “not for drinking”?

Consultation Point 4: should the taps within a public building from which a member of the public can obtain a drink of water be (a) listed on the public buildings register, or (b) identified and selected by the sampler at the time the water samples are taken?

Consultation Point 5: at each visit water samples should be taken (a) from all taps within a public building from which water can be supplied for drinking, or (b) from just one tap chosen at random each visit, or (c) from a variable number of taps depending on the size of the building?

Consultation Point 6: the suggested list of parameters to be tested in public buildings is (a) too onerous, (b) about right, or (c) insufficient?

Consultation Point 7: should the results of regulatory sampling be reported to (a) the owner of the building, or (b) to the owner of the building and the Scottish Executive?

Consultation Point 8: should the results of regulatory sampling be (a) prominently displayed in the public building, or (b) kept on a public record by the local authority, or (c) both?

Consultation Point 9: the requirement to notify breaches of the Regulations to Scottish Ministers is (a) required to give transparency to the enforcement process, or (b) unnecessary because placing a duty on the local authority to enforce the Regulations is sufficient to ensure that effective enforcement will take place?

Consultation Point 10: should the power to issue authorised departures for water quality standards in public buildings rest with (a) local authorities, or (b) Scottish Ministers?

PUBLIC BUILDINGS – THE CURRENT POSITION

Review of Current Legislation – Water Quality

9. The primary legislation is the Water (Scotland) Act 1980. Section 76A(2) of the 1980 Act defines the extent of the public water authority's obligation regarding the wholesomeness of a supply. Section 76A(2) states: "water supplied by a water authority to any premises shall not be regarded as unwholesome at the time of supply where it has ceased to be wholesome only after leaving the authority's pipes". Sections 109 and 110 of the Act define where a water authority's pipes end. This is essentially at the boundary of a property. Beyond that point the pipes are the responsibility of the property owner.

10. Wholesomeness is defined in The Water Supply (Water Quality)(Scotland) Regulations 1990 as amended. The 1990 Regulations also require the water authority to treat the water where there is a risk that the water supplied by the authority might cease to comply with the wholesomeness standards after it has left the authority's pipes. However, this requirement contained in Regulation 24 only applies to the copper, lead and zinc parameters where there is a risk that these standards might be breached because the parameters are components of the property owners pipes. In particular, if there is non-compliance with the lead standard, Regulation 24 requires the water authority to remove any pipe containing lead that is in the ownership of the water authority. There is no duty (requirement) on the water authority to remove any portion of the pipe not under the ownership of the authority.

11. Article 6 of the new Drinking Water Directive (98/83/EC) allows for the deterioration of drinking water quality arising from domestic distribution systems but this exemption does not extend to "premises and establishments where water is supplied to the public, such as schools, hospitals and restaurants". In other words, the quality of water available for drinking in such buildings should fully comply with the standards of wholesomeness set out in the Directive. The Water Supply (Water Quality)(Scotland) Regulations 2001 that come into force on 25 December 2003 transpose the requirements of Directive 98/83/EC as far as the public water supply is concerned, they do not however address the issue of public buildings.

12. In some circumstances, health and safety legislation may apply to some drinking water quality failures in some public buildings. However, it is not clear that such legislation would provide sufficient protection to meet the requirements of EC Directive 98/83/EC. For instance, it is unclear whether this legislation would extend in all cases beyond employees to include members of the public.

13. It is clear therefore that current legislation does not ensure compliance with drinking water quality standards in public buildings, as laid down in the new Drinking Water Directive.

Review of Current Legislation – Definition of Public Building

14. Article 6 of the Directive refers to "premises and establishments" and while these are not specifically defined in the Directive, there is an intuitive understanding of what may be meant by the term. However, an intuitive approach does not allow for the construction of fair and effective regulations. A clear definition of what is meant by these terms must therefore be established as a starting point.

15. A starting point for a definition of “premises or establishments such as schools, hospitals and restaurants” may be to look for a legal definition of the term “public building” in current legislation, then evaluate whether such definitions fully encompass the spirit of the Directive.

- The Chronically Sick and Disabled Persons Act 1970 (Section 4) imposes a duty on “any person undertaking the provision of any building or premises to which the public are to be admitted, whether on payment or otherwise”.
- The Building Regulations 1991 do not apply to Scotland and they are no longer current. However, they include a useful definition of a public building - “a building consisting of or containing (a) a theatre, public library, hall or other place of public resort; (b) a school or other educational establishment not exempted from the operation of building regulations by virtue of section 4(1)(a) of the Act; or (c) a place of public worship”. A building is not to be treated as a place of public resort because it is, or contains, a shop, storehouse or warehouse, or is a dwelling to which members of the public are occasionally admitted. The 1991 Regulations also define an institution as a building “(whether described as a hospital, home, school or other similar establishment) which is used as living accommodation for, or for the treatment, care or maintenance of persons (a) suffering from disabilities due to illness or old age or other physical or mental incapacity, or (b) under the age of five years, where such persons sleep on the premises.
- In the Civic Government (Scotland) Act 1982 premises are defined as “any permanent or temporary building and any tent or inflatable structure. The definition includes - "a part of a building where the building is a sports complex but does not include a part of any other building”. In the same Act a sports complex is defined as “a building (a) which provides accommodation and facilities for both those engaging in sport and spectators; and (b) the parts of which are so arranged that one or more sports can be engaged in simultaneously in different parts of the building.

16. From the above it can be seen that there is no pre-existing definition of premises or establishments that adequately covers the scope outlined in the Directive.

Review of Current Compliance with Drinking Water Quality Standards

17. In April 2000 the Scottish Executive decided that the first step in determining the level of compliance in public buildings with the new Drinking Water Directive was to undertake a mapping exercise. In this respect it commissioned East of Scotland Water to carry out a study and to report on compliance with the Directive in public buildings in Scotland. East of Scotland Water’s report is reproduced at Annex A.

18. The results indicated that there was a high level of compliance with the Directive but that the main problem will be in achieving compliance with the new lead standard. Statistical analysis of the data for the 3 categories of public buildings covered by the study estimated the cost of compliance at £3.5M for the Health Service and £11.2M for Local Authority Education Services. A further £9.5M investment is required in private sector hotels and restaurants.

THE NEW EC DIRECTIVE

Why was a new Directive necessary?

19. The need for a fundamental review of the previous Drinking Water Directive (80/778/EEC) was agreed at the Brussels European Council in December 1993. The European Commission believed that, although this Directive had been a driving force behind the improvement in drinking water quality in Europe for over a decade, it had shortcomings that needed to be addressed. For instance, it did not provide Member States with an adequate legal framework within which to respond to variations in raw water quality and technical difficulties encountered in the production and distribution of drinking water. Moreover, the Directive no longer reflected current understanding of medical, scientific and technological issues.

When will the new Directive come into force?

20. The new standards generally come into force on 25 December 2003 although there are interim standards for bromate, lead and trihalomethanes. The final standards for bromate and trihalomethanes come into force in December 2008 but the final lead standard does not come into force until December 2013.

What is the objective of the new Directive?

21. The Directive's objective is to protect human health from adverse effects resulting from contamination of water intended for human consumption. It sets standards for water intended for drinking, cooking, food preparation or other domestic purposes, regardless of its origin and whether it is supplied from a distribution network, from a tanker, or in bottles or containers. The standards also apply to commercial premises and to water used in food production unless it cannot affect the wholesomeness of the foodstuff in its finished form.

What are the new standards?

22. The Directive sets parametric values for drinking water standards generally in line with the 1993 World Health Organisation (WHO) guidelines for drinking water quality. These guideline values represent the concentration of a constituent that does not result in any significant risk to the health of a consumer, usually over a lifetime of consumption. The most important change in the Directive is the reduction from 50 µg/l to 10 µg/l in the maximum permitted concentration of lead in drinking water. This change is introduced primarily in order to protect infants, young children and pregnant women from the neuro-toxic effects that are known to contribute to IQ deficits, learning and behavioural problems.

23. The value or concentration set for substances and parameters in the Directive incorporates margins that allow for uncertainties in our current estimation of risk. New parameters have been added where new scientific research has shown this to be necessary, but overall the total number of parameters has been reduced to include only those considered essential to ensure a continued high level of health protection. Member States are left to set values for additional national parameters where it is necessary, in light of local conditions, in order to protect human health.

How will the new standards be monitored?

24. Monitoring requirements are revised in the Directive, and allow Member States to adapt the amount and nature of monitoring to local conditions. The approach to reference methods of analysis for monitoring has also been revised to permit the use of methods meeting certain performance standards rather than requiring the use of certain defined methods. This allows Member States to adapt their methods to technical and scientific progress without necessitating changes to the Directive.

How will failures to meet the standards be addressed?

25. The Directive provides a flexible framework of derogations within which Member States can redress failures to meet the required standards provided there is no potential danger to human health and that the supply of drinking water cannot be maintained by any other reasonable means.

Where can I find out more about EC Directive 98/83/EC?

26. You will find the full text of EC Directive 98/83/EC at:

http://europa.eu.int/eur-lex/en/lif/dat/1998/en_398L0083.html

PUBLIC BUILDINGS – ISSUES FOR CONSULTATION

Introduction

27. Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption (the Drinking Water Directive) sets quality standards for all drinking water supplies. In the case of water supplied from a distribution network, the Directive requires the quality standards to be monitored within premises at taps that are normally used to supply water for human consumption. However, it will not be deemed to have been a breach of the Directive where it can be shown that a breach is due to the domestic distribution system, except in premises where water is supplied to the public, such as schools, hospitals and restaurants.

28. Any breach of the drinking water quality standards detected at a tap, used to supply water for human consumption in a public building, is therefore a breach of the drinking water Directive.

29. Although the Directive sets frequencies for monitoring drinking water supplies, it does not specifically set frequencies for monitoring premises where water is supplied to the public. However, the Directive does state that monitoring programmes should be appropriate to local needs. The results of a study commissioned by the Scottish Executive Water Services Unit study suggest that the standards set by the new Drinking Water Directive will be breached in about 12% of schools, hospitals and restaurants when the new Directive comes into force on 25 December 2003. Consequently, there is a need to improve the quality of drinking water supplies in these buildings in Scotland. The report on the study on compliance in public buildings is reproduced at Annex A.

30. It is considered that a monitoring and enforcement regime specifically targeted at public buildings is required to bring about compliance with the Drinking Water Directive in such buildings in Scotland.

Public Buildings Register

31. The first step in producing a monitoring and enforcement regime for public buildings in Scotland is the compilation of a register of all those properties that are to be covered by the regime. The Directive refers to schools, hospitals and restaurants but it is considered that within these groups “hospitals” would include all health care premises and “schools” would include all teaching and day-care premises. Similarly, “restaurants” would include all premises where food or accommodation is provided as a main activity or otherwise. Clearly there are many more public buildings than those groups referred to in the Directive. Community premises such as halls, libraries, galleries, museums, heritage premises and sporting centres and venues would also be included. It is not envisaged that office buildings or buildings that are workplaces should be included unless the building concerned has a public counter with facilities for members of the public to obtain a drink of water.

32. One option would be to allow each local authority to draw up its own list of public buildings. This would be supported by guidance but essentially it would be for the local authority to determine the public buildings that should be included on the list. The alternative would be to have a definitive list of the different types of public buildings in the Regulations. However, there would be considerable difficulty in producing a definitive list given the wide variety of public buildings. It is suggested, therefore, that it may be better to rely on the knowledge of local authorities to draw up a register.

Consultation Point 1: should the register of public buildings be (a) based on local knowledge and determined by the local authority with guidance from the Scottish Executive, or (b) a definitive list of property types identified in the Regulation ?.

Frequency of Monitoring of Public Buildings

33. The standards set for the quality of water supplied from taps in public buildings will be the same as those set in the Water Supply (Water Quality) (Scotland) Regulations 2001. In some instances the standards in the 2001 Regulations are tighter than those set in the Drinking Water Directive. However, the standards in the Regulations have been set with public health in mind and it would be inconsistent, and impractical, to set lower standards for public buildings. The water quality standards set for public buildings will therefore be the same as those in the 2001 Regulations.

34. The monitoring requirements in public buildings should be set to bring about compliance with the Drinking water Directive by 25 December 2003. It is clear that this may not be practicable in all situations and that it may be necessary to carry out a risk assessment on public buildings to ensure that those that pose the highest risk are tested first and prioritised for improvements where necessary.

35. The frequency of monitoring of public buildings could be based on the normal occupancy of the building. It is suggested that initially at least two visits per annum should be made to every public building. If the monitoring regime was to be based on occupancy levels then the number of visits required per annum might rise to four for larger buildings. It is expected however, that most properties would fall into the lower category and ultimately would be visited just once a year. The mechanism to reduce the number of visits required per annum from the standard to the reduced frequency would be two consecutive years of compliance with the regulatory standards.

Consultation Point 2: should the standard monitoring frequency for public buildings be (a) based on the normal occupancy of the building with a facility to reduce the frequency if it can be shown that the water is compliant with the regulatory standards? For example:

<i>Occupancy</i>	<i>Standard Frequency</i>	<i>Reduced Frequency</i>
<i><5,000</i>	<i>2</i>	<i>1</i>
<i>≥5,000</i>	<i>4</i>	<i>2</i>

or (b) set at one visit per annum regardless of the size of the property and with no facility to reduce the frequency of the visits?

Point of Compliance

36. The Drinking Water Directive states that the point of compliance should be the point within premises at which the water emerges from taps normally used for human consumption. No differentiation is made in the Directive between taps that are fed directly from the water main and those that are served from a storage tank. This is an important point because when the water authorities are carrying out sampling of domestic properties under the Water Supply (Water Quality) (Scotland) Regulations 2001, samples are taken from taps that are connected directly to the water main. Water authorities take this approach with domestic properties because non-compliance with Directive standards due to the plumbing within a property, or the maintenance thereof, is only considered to be a breach of the Directive in public buildings. Water authority sampling in domestic properties is primarily intended to demonstrate the compliance of the water supplied to the property by the water authority. Any non-compliance identified as a result of domestic plumbing system will however be notified to the property owner.

37. Any tap from which the public can obtain a drink of water in a public building must supply water compliant with the Directive, regardless of whether the tap is fed directly from the public main or a storage tank. Any tap from which the public can obtain a drink should therefore be included in the sampling programme for public buildings. This implies that water samples taken from public buildings, to demonstrate compliance with the Directive, could be taken from any floor of a building where a drinking water tap was available. This is different from water authority sampling of domestic premises where the normal procedure would be to take a sample from the tap closest to the authority's main. The protocol for taking samples from public buildings also has to be different from that used by a water authority in domestic premises. Since any non-compliance due to a domestic plumbing system would not be a breach of the Directive, water authority sampling officers routinely disinfect domestic taps to avoid any unnecessary failures due to the poor microbiological condition of the tap. It would however, not be appropriate to disinfect a tap in a public building, prior to taking a sample, because the condition of the tap is relevant to the quality of the water supplied from that tap and whether or not it complies with the standards set in the Directive.

38. In some buildings, taps fed from unsatisfactory plumbing may have been labelled "not for drinking". However, even if a notice is displayed, there is no guarantee in a public building that the person seeking the drink of water can actually read or understand the message. It is also not unheard of for taps labelled "not for drinking" to be used to fill kettles in the mistaken belief that boiling the water will make it safe. This may be the case if the contamination is microbiological but if the contamination is chemical, such as lead contamination from lead plumbing, then boiling the water will not make it safe to drink. This raises an issue about whether labelling taps "not for drinking" is sufficient.

Consultation Point 3: Assuming labels are highly visible and fixed, is it sufficient to label a tap supplying water that does not comply with the standards and to which the public has access as "not for drinking"?

39. Guidance would be given to samplers as to what constituted appropriate labelling. Guidance would also be given regarding what is considered to be "reasonable provision" in terms of the number of taps available to the public from which a drink can be obtained.

Consultation Point 4: should the taps within a public building from which a member of the public can obtain a drink of water be (a) listed on the public buildings register, or (b) identified and selected by the sampler at the time the water samples are taken?

Consultation Point 5: at each visit water samples should be taken (a) from all taps within a public building from which water can be supplied for drinking, or (b) from just one tap chosen at random each visit, or (c) from a variable number of taps depending on the size of the building?

Parameters to be Monitored

40. While the standards set for all the parameters in the Directive should be met at the tap, it is not necessary to check compliance in a public building with every parameter. The reason for this is that the water authority will be carrying out testing for all of the Directive's parameters in the supply zone within which the public building is situated. A number of these parameters will not be affected by the condition of the plumbing in the public building so it is not necessary to carry out further testing for these parameters.

41. It is proposed therefore to restrict testing to those parameters that might be affected by the condition of the internal plumbing. It is suggested that the following parameters be tested in public buildings:

E.Coli	Iron	Copper
Coliform Bacteria	Manganese	Enterococci
Residual Disinfectant	Nitrite	Lead
Colony Counts	Odour	Nickel
Colour	Taste	Conductivity
Hydrogen Ion	Turbidity	

Consultation Point 6: The suggested list of parameters to be tested in public buildings is (a) too onerous, (b) about right, or (c) insufficient?

(if option (a) or option (c) above is selected, please identify parameters to be removed or added)

Responsibility for Monitoring

42. It would be possible to place the responsibility for monitoring the quality of water in public buildings with either local authorities or water authorities since both have the necessary capabilities. However, since water authorities are primarily interested in the quality of the water in the public main and not the quality of the distribution system in public buildings it would seem appropriate to make local authorities responsible for monitoring the quality of drinking water in public buildings.

43. It is also important that samples are taken throughout public buildings and that all taps from which the public might obtain drinking water are sampled. This includes taps served by storage tanks as well as mains fed taps. Local authorities already have the necessary powers of access under Health and Safety legislation to take water samples from anywhere in a public building. While similar powers of access could be provided for water authority sampling officers, it is not considered appropriate to give such a wide power to a water authority.

44. The only practical option therefore is to place the duty of sampling of public buildings with the local authority. However, placing this duty with Environmental Health Officers (EHOs) does raise the question of self-regulation since local authorities own a significant number of public buildings. It is suggested therefore that local authorities report the results of their regulatory sampling to the Water Services Unit at the Scottish Executive and that all analysis be carried out at accredited laboratories. Such an approach would ensure that all results would be fully auditable and open to checking in the same manner as water authority results. Reporting the results to the Executive would also demonstrate that ultimately the responsibility for compliance with the Directive lay with Scottish Ministers and not the local authorities. Thus avoiding any concern there may be regarding self-enforcement.

45. If a duty were placed on local authorities to take water samples from public buildings, this would largely be a new burden on the local authorities. EHOs may take water samples under existing legislation but this is not routinely carried out. The cost associated with the taking, sampling and analysis of water supplies in public buildings should therefore be recoverable from the owner of the building. In some situations, the owner of the public building will also be the local authority and in these circumstances it may be necessary for one part of the authority to levy a charge against another. A study is currently underway to assess the cost and the impact of the Regulations on both the enforcing authorities and the owners of public buildings.

Consultation Point 7: should the results of regulatory sampling be reported to (a) to the owner of the building, or (b) to the owner of the building and the Scottish Executive?

Non-Compliance with Standards

46. The local authority shall investigate any non-compliance detected by the regulatory sampling programme. It will be important to confirm that the cause of the non-compliance was as a result of a deficiency in the internal plumbing and not the incoming water supplied by the water authority. This could involve checking the results of water authority sampling carried out in the relevant supply zone at the time the non-compliant sample was taken from the public building. In exceptional cases it may be necessary to arrange a sample to be taken from the public network at the same time as a re-sample is being taken from the public building.

47. It is proposed that public buildings should prominently display the latest water quality data so those visitors to the building can make themselves aware of the quality of the drinking water in the building.

Consultation Point 8: Should the results of regulatory sampling be (a) prominently displayed in the public building, (b) kept on a public record by the local authority, or (c) both?

Enforcement

48. If a water sample taken from a public building did not comply with the regulatory standards, it is proposed that the duty of enforcing the Regulations and securing improvements be placed with the local authority. An alternative option would be to make Scottish Ministers (in practice the Water Services Unit) responsible for enforcement. It is considered however that the duty of enforcing should be placed at a local level to make best use of local knowledge and expertise. It is important to note that it would be a duty that was placed on local authorities to enforce the Regulations rather than simply the provision of powers allowing them to enforce.

49. Self-regulation, or in this case self-enforcement, is once again an issue but it is considered that this can be resolved by setting up an open and transparent reporting regime. An approach mirroring that taken with public water supplies, where the water authorities notify breaches of the Water Supply (Water Quality) (Scotland) Regulations to the Scottish Executive should provide sufficient reassurances. As with the water supply Regulations, if the nature of the breach posed a risk to public health, the Consultant in Public Health Medicine at the local Health Board would also be notified.

50. In addition to providing transparency, the benefit of local authorities informing the Water Services Unit is to ensure that Scottish Ministers are kept informed of any breaches of the Regulations. Ministers need to be aware of any failures by owners of public buildings to carry out improvements aimed at bringing about compliance with the Drinking Water Directive. The reason for this is that Ministers cannot allow any non-compliance to result in a referral to the European Court of Justice (ECJ). Referral to the ECJ for a breach of the Directive could result in significant fines being levied on the UK Government and ultimately the Scottish Parliament.

51. Non-compliance with an enforcement notice would therefore be made an offence. In practice, non-compliance would result in a report being made to the Procurator Fiscal and it would be for him/her to decide how to proceed.

Consultation Point 9: the requirement to notify breaches of the Regulations to Scottish Ministers is (a) required to give transparency to the enforcement process, or (b) unnecessary because placing a duty on the local authority to enforce the Regulations is sufficient to ensure that effective enforcement will take place?

Remedial Action

52. All water intended for human consumption should meet the requirements of the Drinking Water Directive by 25 December 2003. In order to minimise the risk to public health and the risk of non-compliance with the Directive, a risk assessment should be carried out on the various categories of public buildings and a prioritised programme for sampling and analysis drawn up to determine where remedial works are required.

53. In the event of non-compliance the necessary remedial action shall be taken as soon as possible. If the non-compliance constitutes a potential danger to human health, then the use of water in the public building in question must be prohibited or its use restricted or such other action taken as necessary to protect human health. Where remedial action is required the public must be notified unless the non-compliance is considered to be trivial and has occurred on less than 30 days during the previous 12 months.

54. Where remedial action is required and where non-compliance does not constitute a potential danger to human health, local authorities may authorise a departure from the standard set in the Regulations. Authorised departures shall be for as short a time as possible and shall not exceed 3 years.

55. The estimated cost of the remedial work across Scotland in schools, hospitals and restaurants is around £25 million (see Chapter 3).

Consultation Point 10: should the power to issue authorised departures for water quality standards in public buildings rest with (a) local authorities, or (b) Scottish Ministers ?

Quality Assurance

56. Local authorities shall ensure that all analysis work carried out to determine compliance with the standards set in the Regulations complies with the specification for analyses set out in the Regulations. Other methods may be used providing it can be demonstrated that the results obtained are at least as reliable as those produced by the methods specified. The United Kingdom Accreditation Service (UKAS) must accredit all laboratories used for analysis work.

Information and Reporting

57. Local authorities shall provide the Water Services Unit with an annual report on the quality of water supplied in public buildings in their area in the previous year. The format of the report shall be specified the Regulations.

58. Local authorities shall make available for inspection by members of the public; all records maintained by it in respect of the public buildings water supplies Regulations.

59. The owners of public buildings shall display in a prominent position, the results of sampling carried out under the Regulations.

HOW TO MAKE YOUR CONTRIBUTION

Closing date for comments

60. Comments on the issues and proposals raised in this paper should reach the Scottish Executive by 21st June 2002.

Confidentiality of response to consultation exercise

61. The Scottish Executive may wish to publish responses to this consultation document, or deposit them in the Scottish Parliament Information Centre. Unless the respondent states otherwise the Scottish Executive will assume that there are no objections to their comments being made public in this way. If you would prefer your comments not to be made public, you should make this clear in your response, in which case your wishes will be respected.

Address to which comments should be sent

62. Comments may be made by post, e-mail or fax to:

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How to obtain further copies of this paper

63. Further copies of this paper may be obtained from the above address. It is also available on the Scottish Executive website under "consultations" - <http://www.scotland.gov.uk>

64. Copies of this paper can be made available in Braille and languages other than English on request.

**Report to the Scottish Executive Water Services Unit on
Compliance of Public Buildings with the new Drinking Water
Directive**

September 2000

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Executive Summary

The new Drinking Water Directive 98/83/EC requires that water supplies in public buildings such as hospitals, schools and restaurants are obliged to meet new water quality standards. Unlike domestic properties, there are no exemptions from the effects of internal plumbing.

Public buildings in Scotland, in these three broad categories, were selected at random and sampled over a period of 10 weeks during June, July and August 2000. A total of 303 public buildings were visited and 572 samples taken. In addition, data on age and type of property and plumbing installation was collected.

Samples were analysed for selected microbiological and chemical parameters that were likely to be affected by internal plumbing. Information on the quality of water actually supplied to these premises is available from Water Authority zone information reports.

The results from the buildings sampled indicated a high level of compliance and that the main problem will be in achieving the new lead standards set by the Directive.

A statistical analysis of the data was carried out and the cost of compliance was estimated at £3.5 million for the Health Service and £11.2 million for Local Authority Education Services. A further £9.5 million investment is required in private sector restaurants and hotels.

The report makes a number of recommendations on future work and data collection.

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Introduction

In June 2000, the Water Services Unit (WSU) of the Scottish Executive (SE) Rural Affairs Department commissioned East of Scotland Water (ESW) to carry out a scoping study on water quality compliance in public buildings as required by the new Water Supply (Water Quality) (Scotland) Regulations 2000 which will implement the new Drinking Water Directive 98/83/EC.

This directive sets out new requirements for the quality of drinking water. The new Regulations include these requirements as well as continuing existing standards, which in some cases are more stringent than those stated in the directive. In general, achievement of these standards is the responsibility of the water supply authorities, although they are not held responsible for any effects of pipework within the curtilage of properties.

Article 6 paragraph 2 of the Drinking Water Directive 98/83/EC states:

“In the case of water covered by paragraph 1(a), Member States shall be deemed to have fulfilled their obligations under this Article and under Articles 4 and 8(2) where it can be established that non-compliance with parametric values set in accordance with Article 5 is due to the domestic distribution system or the maintenance thereof *except in premises and establishments where water is supplied to the public, such as schools, hospitals and restaurants.*”

This means that there is an absolute requirement for Member States to comply with regulatory standards where the public are likely to drink. This differs from that in domestic premises, where there is an exemption if non-compliance is shown to be due to the internal plumbing system or supply pipework. These requirements are not included in the new Regulations, but will be included later as amendments after the consultation process is completed.

The overall aims of the study were to identify which types of public building were at risk of non-compliance and to estimate the cost of internal plumbing work to remedy this. It is hoped that the results will also be useful in preparing the Regulation amendments and an appropriate regulatory sampling programme.

Methodology

As quoted above, the Directive gives examples of public buildings as:
schools;
hospitals;
restaurants.

These broad categories were used for the basis of the survey.

Lists of schools and hospitals throughout Scotland were provided by the WSU, lists of restaurants were compiled by ESW's Environment and Quality Regulation team (E&QR) using Address Point (the Post Office address file).

As the purpose of the survey was to assess the quality of water as consumed by members of the public and to identify any internal plumbing problems, it was agreed with the client that the taps should not be flamed or otherwise disinfected prior to taking microbiological samples.

Parameters

Parameters tested were based on check and audit monitoring parameters listed in the Directive and were those considered to be likely to be affected by internal plumbing as well as possible non-compliance of the public water supply fed to the premises. They were as follows:

Escherichia coli (E.coli)

Faecal streptococci (F.Streps)

Copper (Cu)

Lead (Pb)

Turbidity

pH

Taste*

Odour

Temperature

Chlorine residual

} in situ

*For Health & Safety reasons, taste was only done where the water was known to be from a direct mains supply and had a reasonable chlorine residual.

Originally, the WSU included Nitrate in the list of suggested parameters. However, as this was an expensive parameter to test for it was agreed that it would be of more benefit to reduce the parameter list and increase the number of buildings sampled. It was also considered that nitrate was unlikely to be affected by internal plumbing. pH was not originally included, but it was thought that this would be of use to indicate the corrosiveness of the water in relation to metals results. Chlorine residual tests were also carried out in case further assessment was required in the event of a microbiological failure.

It is the policy of ESW Scientific to use procedures that are based on up to date and established standard methods such as the SCA "Blue Book methods; Methods for the Examination of Water and Associated Materials for chemical parameters and Report 71 for Microbiological parameters. All methods are performance tested based on the

recommendations in NS30: A Manual on Analytical Quality Control for the Water Industry. Methods are fully documented and under full internal Analytical Quality Control as well being externally assessed by Aquacheck and PHLS proficiency testing schemes. The above policies, which are documented in our Quality Manual and our Quality System, is regularly audited by UKAS.

The North of Scotland Water (NoSWA) Turriff laboratory was used for microbiological samples from the Inverness and Aberdeen areas. These are marked with an asterisk in the qualifier column of the raw results data. The NoSWA laboratory also holds UKAS accreditation for these parameters.

Selection of Sample Sites

It was important to achieve a random spread of sample sites both throughout Scotland and across the range of categories within the public building classifications.

Hospitals were already categorised by type:

- Acute Hospitals (46)
- Care of the Elderly Hospitals (68)
- Cottage Hospitals/Community Hospitals (34)
- Day Hospitals, Health Centres, Community Clinics, GP Surgeries and Clinics owned by NHSiS Holding Bodies (482)
- Hospitals for people with a mental illness (45)
- Other Hospitals (6)

Primary and secondary schools were considered together and categorised by size in the following bands:

- <100 pupils
- 100-249 pupils
- 250-499 pupils
- 500+ pupils

It was thought that the restaurant classification should include hotels, guesthouses, cafés and bars. Many of these places have restaurants or similar places to eat and it was felt to be of importance not to exclude them from the study. They were split into the following categories:

- Hotels/B&Bs/Guest Houses
- Restaurants/Cafés/Pubs

These categories were then split by area to ensure an equal spread throughout mainland Scotland. The areas of the three Water Authorities were used for this purpose. Initially, approximately 4% of each category within each area was calculated. This gave an even distribution and a suitable number of samples for the fixed cost of the survey. However, in the case of hospitals this method gave a very low number of acute hospitals and a high number of Health Centres & GP surgeries. It was thought that members of the public were more likely to consume water, and were more vulnerable to any ill effects of that water, in the former than in the latter. Numbers were adjusted accordingly.

Area lists of each category were printed, for example, schools in the North with less than 100 pupils, arranged alphabetically. The appropriate number was then picked randomly from the lists. Due to the constraints of microbiological sampling, if any of the public buildings picked was located more than four hours drive from the laboratory (for example on islands, remote peninsulas or in the far north) it was disregarded and a replacement picked from the same page.

Sample Numbers

It was decided that larger schools and hospitals should be sampled at a number of points in the building to ensure that more extensive systems were suitably covered. A table of sample numbers is included below:

Schools		Hospitals		Hotels/Restaurants	
Number pupils	Number samples	Number beds	Number samples	Number rooms	Number samples
<100	2	1-10	2	0	1
100-249	3	11-100	3	1-10	2
250-499	3	>100	4	11-100	3
500+	3			>100	4

In each building, one sample was taken from the kitchen tap where available (some schools, for example, had no kitchen). The remaining samples were taken throughout the building, at drinking fountains, wash basin taps, at sinks on wards, wherever seemed appropriate. This decision was left to the samplers to make when on site, as it was obviously impossible to predict the layout of the buildings in advance.

Questionnaire

In order to obtain as much information as possible about the types of buildings that were being sampled, a questionnaire was devised for samplers to complete during each visit. This information assists in attributing, for example, a lead failure to a lead service pipe rather than lead pipes used in internal plumbing. This information would assist in the costing of necessary improvements to ensure compliance.

Address Identification

The address details supplied schools and hospitals were problematic in a number of ways, e.g.:

- No full postal address or grid reference
- No phone numbers
- Spelling mistakes in details provided

Where possible, premises were located before visiting an area in order to reduce the length of time a sampler spent looking for each location. This was done in a number of stages. The full postal address was located, where possible, using the Royal Mail Internet service. Due to security measures at many schools and hospitals, contact had to be made prior to samplers' visits. The BT Internet service was used to acquire telephone numbers. Maps were supplied to the samplers to assist with the location of

buildings on the ground. IT systems from web sites and software such as Microsoft AutoRoute GB 2000 TM were used to cluster target buildings so as to maximise sampler efficiency once in an area.

Sampling

Samples were collected in purpose-made scientific bottles (manufactured by Aurora Scientific). One 500ml PEP sterile bottle with thiosulphate added for microbiological sampling and two 1-litre PEP general chemical bottles for the other parameters. Samples were carried in cool boxes with ice packs or in refrigerated vans.

Using the pre-identified Public Building addresses, teams of trained East Scotland Water samplers were sent out with detailed instructions, survey forms and letters from the Scottish Executive explaining the purpose of the visit. Where possible prior appointments were made and the customer service centres of the three Scottish water authorities were informed of when and where sampling was taking place. Sampling consisted of taking a random daytime first draw sample from the tap (i.e. without prior flushing) in order to obtain the highest metal levels likely to be consumed. This was followed by the microbiological sample, which was taken without prior flaming of the tap.

The samplers were asked to carry out a taste test on site, but only if they were completely satisfied with the quality of water and associated pipe work. It is not normal to carry out a taste test on a water sample until the microbiological analysis shows a satisfactory result.

Interestingly, three schools in the Glasgow area could not be sampled as the water was turned off whilst the buildings were re-plumbed. If the planned building could not be sampled a nearby one in the same category was chosen.

As a quality assurance check, administrative staff at East of Scotland Water made follow-up telephone calls to a random selection of the buildings sampled. This was in order to ensure that samples had been taken where stated, that the conduct of the samplers was satisfactory and that they had explained the purpose of their visit effectively.

Results

Results are summarised in the Statistical Analysis section below.

Results were treated as confidential and were not fed back to individual premises. The SE informed the appropriate Water Authority regarding microbiological failures, stressing that the tap had not been flamed.

The random telephone QA checks highlighted no problems and those spoken to were happy with the samplers' conduct and explanations.

Discussion

Main Findings

The parameter found to exceed the PCV most frequently was lead at above 10_g/l. The majority of lead failures were in Primary Schools (14 samples from 10 schools) and in Hotels etc. (15 samples from 12 establishments). A variety of different taps failed, including kitchen taps. Only three of these buildings, two primary schools and a guesthouse, had a lead mains pipe entering the building.

There was one failure in each of Copper, E.coli and F.Streps, at a Health Centre, Hotel and Primary School respectively.

Statistical analysis of data

In order to assess the likely level of compliance in public buildings across Scotland with the standards set in the new drinking water directive, the data were examined in order to derive statistically the true level of compliance in all buildings throughout the country.

There are approximately 7900 public buildings in Scotland, which fall into the three categories. The number in each category is summarised in Table 1.

Table 1 Number of public buildings in Scotland

Category	Number of buildings
Hospitals	681
Schools	2669
Hotels	1941
Restaurants	2596
Total	7887

Although the sampling category Hotels and Restaurants was split in two (Residential and non-residential), there are no figures for the total number in each category. Therefore it was assumed that the sampling split (57% non-residential and 43% residential) was representative of the situation as a whole. Hence, of the 4537 buildings, which form the combined category, it was assumed that 2596 were non-residential and 1941 were residential.

The number of samples taken from each category, together with the number of failures for each parameter, are shown in Table 2.

Table 2 Outcome of sampling programme

Parameter	Total		Hospitals		Schools		Restaurants		Hotels	
	Total	Fail	Total	Fail	Total	Fail	Total	Fail	Total	Fail
Pb	303	30	32	2	63	10	119	5	89	13
Cu	303	1	32	1	63	0	119	0	89	0
pH	303	0	32	0	63	0	119	0	89	0
Turb	303	0	32	0	63	0	119	0	89	0
E.coli	303	1	32	0	63	0	119	0	89	1
F.Streps	303	1	32	0	63	1	119	0	89	0
Any parameter	303	33	32	3	63	11	119	5	89	14

At the beginning of the survey it was decided to review data and modify the sampling programme accordingly. For example, if a large number of failures are found in a small population this indicates at an early stage that there is low compliance and it is therefore unproductive to continue sampling that category. Alternatively, if compliance is high then a lot more samples are required to establish statistically that this is in fact the case. From the table above it can be seen that the level of compliance within the sample population is generally fairly good. It was therefore decided to continue throughout with the original programme.

Parameters with zero failure rate

Although certain parameters have a zero failure rate, this does not mean that the true underlying failure rate is also zero, although this is obviously possible. It does, however, allow us to predict a 90% confidence interval for the actual failure rate. For a Type II risk¹ of 5%, the true compliance rate for each category for these parameters is given in Table 3 below.

Table 3 Estimates for Parameters with Zero Failure Rate

Category	90% CI for True Failure Rate	Number of buildings likely to fail
Hospitals	[0%, 8.94%]	0-61
Schools	[0%, 4.64%]	0-124
Hotels	[0%, 3.31%]	0-64
Restaurants	[0%, 2.5%]	0-65

Note that the prediction of the failure rate is obviously dependent on the number of samples taken. The greater the number of samples taken then the more confidence there is that the population as a whole is compliant. Hence, hospitals are seen as having a higher failure rate, but only 32 premises were sampled, in comparison with over 100 restaurants. Note also that the success/failure rate is the same for each parameter within a sampling category. For example, from the above results between zero and 61 hospitals are likely to fail to comply with copper, turbidity, F.Streps and

¹ Type II risk is the “probability of being wrong”.

E.coli standards. However, whether these failures all occur within the same hospitals cannot be determined.

Parameters with a number of failures

Of the six parameters sampled, four have exhibited one or more failures, with the lead standard being the one most frequently failed. Here it is not so straightforward to assess the likely level of true compliance. The question is, given that we know the sample exceedance rate (e.g. 30 buildings, from a total population of 303, failed to comply with the lead PCV), what might the population exceedance rate look like. This implies that we need to construct a confidence interval for the population exceedance rate. Confidence intervals were determined non-parametrically and are shown, together with the corresponding number of failing buildings in the following table.

Table 4 Confidence Intervals for Failing Parameters.

Category	Parameter	Number of buildings	Number of failures	90% CI for Underlying Failure
Hospitals	Pb	32	2	[1.12%,18.4%]
	Cu	32	1	[0.16%,14.0%]
	Any	32	3	[2.6%,22.48%]
Schools	Pb	63	10	[8.9%,25.4%]
	F.Streps	63	1	[0.08%,7.3%]
	Any	63	11	[10.1%,27.24%]
Hotels	Pb	89	13	[8.85%,22.2%]
	E.coli	89	1	[0.057%,5.21%]
	Any	89	14	[9.77%,23.5%]
Restaurants	Pb	119	5	[1.67%,8.65%]
	Any	119	5	[1.67%,8.63%]

Finally, a breakdown is given of the likely number of buildings, which will fail to comply with the revised Directive, specified by category and parameter.

Table 5 Estimated number of failing buildings by category and parameter

Category	Lead	Copper	pH	Turbidity	F.Streps	E.coli	Any Parameter	Best estimate for any parameter
Hospitals	7-125	1-95	0-61	0-61	0-61	0-61	18 – 153	64
Schools	238-678	0-124	0-124	0-124	2-195	0-134	270 – 727	466
Hotels	172-431	0-64	0-64	0-64	0-66	1-101	190 – 456	305
Restaurants	43-225	0-65	0-65	0-65	0-66	0-66	43 - 224	109

Note that no account has been taken in this analysis of the geographical spread of the sample population. It was felt that there was no benefit to be had by splitting the results by water authority area, this process was used simply to ensure that the majority of mainland Scotland was covered by the survey.

Statistical analysis suggests that between 18 and 153 buildings in the hospital classification could fail to comply with the Drinking Water Regulations for at least

one of the parameters tested. The “best estimate” from within this range is 64. A best estimate for any parameter failing in each of the categories is identified in the final column of Table 5 and this is used in the cost estimates.

Considering that the taps were not flamed prior to sampling, the number of microbiological failures was surprisingly low. This calls into question the necessity of flaming taps when undertaking statutory sampling.

It was noted that many of the larger hospitals had provision for secondary chlorination in the stored water system. This is likely to have contributed to the low number of microbiological failures despite the need for header tanks and is a practice to be commended.

Costs of complying with the new Regulations

Where failures of new regulatory standards have occurred as a result of the internal plumbing installation the owners of the public building will be required to carry out the necessary works. This is not the case in respect of private/domestic buildings. It is not yet clear how this will be enforced by the Regulations. For example, will all buildings be required to be tested and certificated? Will there be enforcement procedures as a result of non-compliance of a random sample? Should there be a survey carried out on the condition of plumbing in all of these buildings?

For full compliance and to audit this a combination of all 3 will probably be required, this would take a number of years and work would need to be done in a phased manner to spread the costs.

The survey carried out indicates that plumbing is generally satisfactory in the buildings looked at and that the main non-complying parameter is lead. Lead is not present in any significant levels in water supplies in Scotland and its presence indicates a plumbing problem. The survey indicated that as buildings had been extended and modernised over the years the plumbing had also been upgraded. Of all the sites where lead samples did not comply only three had any visible lead pipework and of all sites inspected we only found exposed lead pipe at seven sites.

The lead failure may be due to:

- the water authority owned communication pipe
- the supply pipe
- lead solder
- hidden internal lead piping

If the water authority owned communication pipe is the problem there is a responsibility on the water authority to replace it once all internal lead pipework has been removed, or once the Regulations are in place, after any sample taken has exceeded the PCV. The cost of replacement of lead communication pipes will be borne by water authorities and allowance for this is included in their investment plans.

The cost of a new supply pipe depends primarily on its length and the work required to lay it (i.e. whether it crosses hard areas or goes under buildings etc), rather than its diameter. Typically the cost of supply pipe replacement will be (based on an estimate of £20 per metre plus connection costs of £250):

- School £2-3K
- Hospital £2-5K
- Health Centre/Surgery £1K
- Hotel or Guest House £1-2K.

The Directive applies a phased standard for lead, i.e. 25_g/l from end of 2003 to 10_g/l from end of 2013. The former standard may be achieved by water authority measures to reduce the plumbosolvency of the water supply e.g. pH control and/or orthophosphate dosing but the latter standard is only likely to be met by removing all lead in the system.

Although the survey only identified three non-compliant sites with lead pipework the failures may be due to the presence of lead solder in the joints. Prior to 1989 lead solder could be used legally and since then we have found evidence of its use in contravention of water byelaws. This can only be accurately assessed by the use of test papers and detailed examination of supply and communication pipes. There may be a need for complete replumbing of the cold water system if this is the case.

Overall, the statistics and data from the survey indicate a generally high level of compliance but statistically there is the likelihood that there will be buildings that do not comply with any of the parameters tested.

We were required, therefore, to make an assessment of the cost of replumbing the cold water systems in a range of public buildings to meet the Regulations for points where the public may drink.

To this end our engineer visited four sites and carried out a detailed costing survey of replumbing that may be required. The estimates were then used to calculate total costs in the sectors under study. The estimates were also compared to recent work carried out on such buildings by registered plumbing contractors. (One of these contractors remarked that in his experience there were many public buildings with poor condition copper pipe which was pitted and tended to leak, although this was not reflected in copper analysis.)

The estimates were as follows:

Schools (e.g. Saline primary)	£11k
Plumbers range £4-100K (depending on school size.)	
Hospital (e.g. Haddington)	£41k
Plumbers range £10-500K (depending on numbers of beds and size.)	
Health Centre (e.g. Galashiels)	£7k
Plumbers range £7-10K	
Restaurants/Hotels (e.g. Blackadder Hotel)	£3k
Plumbers range £6-50K (depending on size, very large hotels could be considerable more.)	

Therefore, a best estimate (weighted average) of the cost of upgrading a building in each category is:

Schools	£24k
Hospitals	£54k
Restaurants	£3k
Hotels	£30k

Using the ‘best case’ statistical information from the sampling, which is calculated using the lowest estimated number for any failing parameter in a sector, best estimate cost figures give an estimated total compliance cost in each sector as follows:

Schools (270 number @ £24k)	£6.5million
Hospitals & Health Centres (18 number @ £54k)	£1million
Hotels (190 number @ £30k)	£5.7million
Restaurants (43 number @ £3k)	£0.1million

Using the ‘worst case’ statistical information from the sampling, which is calculated using the highest estimated number for any failing parameter and the best estimate cost figures gives an estimated total compliance cost in each sector as follows:

Schools (727 number @ £24k)	£17.4million
Hospitals & Health Centres (153 number @ £54k)	£8.3million
Hotels (456 number @ £30k)	£13.7million
Restaurants (224 number @ £3k)	£0.7million

Using the ‘best estimate’ figure for any failing parameters, best estimate cost figures give an estimated total compliance cost in each sector as follows:

Schools (466 number @ £24k)	£11.2million
Hospitals & Health Centres (64 number @ £54k)	£3.5million
Hotels (305 number @ £30k)	£9.2million
Restaurants (109 number @ £3k)	£0.3million

Conclusions

The compliance as measured by the sampling programme was better than expected but the limitation in the number of sites and samples taken means that statistically there is still a chance of a significant number failing on one or more parameters.

Using the best case estimates the assessed cost to the public purse is estimated at £3.5million for the Health Service and £11.2million for Local Authority Education Service.

It is estimated that a further cost of £9.5million will have to be borne by the private sector for restaurants and hotels etc.

The sampling indicated that lead was the most commonly failing parameter and the one that required attention. It has not been established if this results from use of lead solder or lead pipework. A similar situation exists in the domestic sector.

The survey indicated that the standard of internal plumbing was generally good and that as development over the years had occurred plumbing had been upgraded.

It was reassuring that hospitals were maintaining chlorine residuals in their cold water systems.

Recommendations

There are many buildings used by the public that were not covered by this scoping study. For example, universities and colleges, sports centres, libraries, public halls, dental surgeries and public toilets, all of which offer tap water to members of the public. We recommend that subsequent research be commissioned to cover such buildings.

We recommend that the research be expanded to include areas further afield, including the islands, where lower regional economic investment may have resulted in fewer modernised internal distribution systems.

We recommend a separate sampling regime for public buildings under an amendment to the new Drinking Water Regulations and that the data obtained is used in association with this report to improve the statistical robustness of our assumptions.

We recommend that drinking water taps are clearly labelled as such. This will also help in the correct sampling of buildings under the new Regulations.

We recommend that all public buildings be required to establish if they are served by lead service pipes and that if so they are replaced as soon as possible. If lead failures still occur the presence of lead soldered joints should be assessed.

We recommend detailed guidance for owners of public buildings to establish their duties in respect of the new Amended Drinking Water Regulations and in inspection and upgrading of their plumbing systems.

Acknowledgements

We are particularly grateful to East of Scotland Water's sampling team and the analysts at ESW Scientific for all their efforts.

We also thank the Regulation team of the Water Services Unit for their help and assistance.

DRINKING WATER IN PUBLIC BUILDINGS
Pre- REGULATORY IMPACT ASSESSMENT (RIA)

1. BACKGROUND

1.1 This pre - RIA forms annex B of the Scottish Executive consultation paper on proposals for the regulation of drinking water quality in public buildings. These proposals address issues associated with drinking water in public buildings in Scotland and transpose EC Directive 98/83 EC (water intended for human consumption).

1.2 It is Scottish Executive policy to consult on the impact of regulations, including the financial and resource implications for citizens and business. In accordance with normal practice the Scottish Executive will publish a full formal regulatory impact assessment along with the consultation on the draft Regulations later this year. In the meantime it is possible to provide some initial analysis and the details are shown below.

2. PURPOSE AND INTENDED EFFECT OF THIS MEASURE

2.1 The main two purposes of these proposals are:

- to improve efficiency / cost effectiveness of the monitoring and enforcement of drinking water quality in public buildings in Scotland
- to implement EC Directive 98/83 EC as it relates to public buildings

2.2 The intended effect of the final Regulations is to benefit public health by ensuring that revised water quality standards are monitored and enforced effectively.

3. RISK ASSESSMENT - OVERVIEW

Risk of EC infraction proceedings

3.1 EU Member States are obliged to comply with EC Directive 98/83/EC. Therefore, failure to transpose this Directive would put the UK at risk of EC infraction proceedings that could result in a hefty fine against the UK Government.

Significant public health risks

3.2 Failure to comply with the standards to be set in the new Regulations would expose the community to significant health risks, and consequent NHS costs, due to contaminated water.

3.3 The initial consultation lists concentrations of constituents that will not result in any significant health risk over a lifetime of consumption, and will in the opinion of WHO, protect consumers from the risks associated with exposure. For example the final standard for lead is set at 10ug/l which, in the opinion of WHO, will protect consumers from risks associated with high lead levels in water such as impaired neuro-psychological performance in children.

3.4 Standards are also set to minimise the risks arising from chemical and microbiological contaminants. Risks from chemical contaminants arise primarily from their ability to cause adverse health effects after prolonged periods of exposure. There are few that can lead to acute health problems except through massive accidental contamination of a supply. In contrast contamination of water for a short period with harmful microbiological organisms can lead to serious illness and, in rare cases, death.

3.5 The UK has traditionally set some drinking water standards that are more stringent than those now required by EC legislation. These standards are based on UK scientific and medical advice. It is proposed that these standards are maintained in the new Regulations for drinking water in public buildings. However, as they are all continuations of current regulatory standards, there are no associated additional costs and they are, therefore not covered separately in this RIA.

Financial risk

3.6 The proposals are designed to minimise the potential financial impact associated with costs relating to monitoring, enforcement and improvement. They aim to achieve this by contracting research to inform the analysis of the impact of the Regulations and by giving full consideration to measures that can minimise the financial impact such as:

- committing to examining the administrative burden on local authorities;
- helping to ensure that charges reflect the actual cost of the service (cost recovery);
- considering methods of financial assistance such as:
 - low cost loans
 - centrally funded grant scheme
 - dedicated improvement grant funded by the Scottish Executive

4. OPTIONS FOR DEALING WITH THIS ISSUE AND ASSOCIATED RISKS/COSTS

4.1 The main options would appear to be:

- a) do nothing
- b) develop a regulatory framework along the lines set out in this consultation document
- c) develop an alternative regulatory model

4.2 It would be premature to examine each of these options in any detail. It is wiser to await consultation responses and the economic assessment that has been contracted before doing so. A full analysis will be included in the formal RIA that will be published along with the draft Regulations later this year.

5. BENEFITS

5.1 The values or concentrations set for substances and parameters in the new Directive incorporate margins which allow for uncertainties in our current estimation of risk. By definition the benefits of such safety margins are difficult to quantify in monetary terms. However it is possible to identify that the following benefits are associated with improved monitoring and enforcement of drinking water quality in public buildings:

Compliance with EU law

- The UK Government will avoid the risk of infraction proceedings and any associated fine

Health Benefits (and associated financial benefits)

- consumers will receive water meeting current WHO guidelines and Directive requirements
- consumers will be less likely to experience long term adverse health effects with a beneficial impact not only on the individual's health but on NHS costs
- particularly significant benefits are likely to arise from the setting of the lead standard at 10ug/l, for example, quoted in monetary terms in a 1997 WRc report, the benefits for England and Wales were estimated at £724m - £2741 (health benefits) and £124m - £360m (non health benefits). (Note that these benefits were assessed using conventionally accepted economic methods. However the Report states that there is an underlying uncertainty regarding the impacts quantitatively studied and that numerous assumptions had to be made in estimating costs/benefits). Scottish figures are not available. However, as a general indication of the scale of the benefits to Scotland we might state them as 10% of the English and Welsh figures quoted above

Financial Benefits

- potential benefits to tourism
- potential improvements in property values
- "non-marketed" value such as property saleability
- potential NHS savings

6. COMPLIANCE COSTS

6.1 Compliance costs will depend, to some extent, on the operational details of the charging regime and any assistance schemes. However it is possible to identify two main areas in which costs will arise:-

- local authority human and other resources (but possible to recover some costs through charging)
- remedial work to comply with Regulations (businesses, individuals, public authorities and other owners of public buildings)

6.2 A full and formal assessment of costs and analysis of benefits will be included in the next consultation document. In the meantime, a recent study commissioned by the Scottish Executive (see Annex A), stated that, based on an estimate of £20 per meter plus connection costs of £250, typical lead pipe replacement costs would be:

- school £2-3K
- hospital £2-5K
- health centre/surgery £1K
- Hotel or guest house £1-2K

6.3 The study also offered estimates of costs that may arise from compliance with all of the standards, including lead. For instance the best estimate of the cost of upgrading is:

- school £24K
- hospital £54K
- Restaurant £3K
- Hotels £30K

6.4 The study offered a best estimate for any failing parameters and noted estimated total compliance costs as:

- schools £11.2m
- hospitals and health centres £3.5m
- hotels £9.2m
- restaurants £0.3m



Small changes in the way we perform everyday tasks can have huge impacts on Scotland's environment.

Walking short distances rather than using the car, or being careful not to overfill the kettle are just two positive steps we can all take.

This butterfly represents the beauty and fragility of Scotland's environment. The motif will be utilised extensively by the Scottish Executive and its partners in their efforts to persuade people they can do a little to change a lot.