



EPA DRINKING WATER ADVICE NOTE
Advice Note No. 1:
Lead Compliance Monitoring and Surveys

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1 INTRODUCTION

SUCCESSIVE EPA reports on the Quality of Drinking Water in Ireland have recommended that local authorities carry out a lead survey to determine the extent of lead piping in the distribution network and in the population served.

The purpose of this guidance circular is to provide additional information to local authorities on lead compliance monitoring and surveys. This is done in the context of compliance with the current lead parametric value of 25 µg/l and the parametric value of 10 µg/l, which will be effective from 2013.

The traditional method to carry out a **lead survey** was to test the water supply for lead. This approach is highly variable as the results of analysis can depend on:

- ▼ The type of sampling method (fully flushed, random daytime sampling or stagnation sampling); and
- ▼ The time of sampling (sampling carried out following recent use of the tap will yield lower results than where the tap has not been used for a period of time);

While it can be assumed that high levels of lead in test results indicate the presence of lead pipework, it cannot be assumed that low levels in test results of lead indicate the absence of lead pipework.

The European Communities (Drinking Water) (No. 2) Regulations, 2007 (SI No. 278 of 2007) requires local authorities to carry out both **check monitoring** and **audit monitoring**. However, to effectively manage the risk of failure of achieving a parametric value due to lead in public water supplies, this approach, while fulfilling the requirement of the Drinking Water Regulations, is not adequate. The lead parameter is not classified as a check monitoring parameter but is classified as an audit monitoring parameter under the Drinking Water Regulations. The minimum frequency of monitoring required is low (for example in the case of supplies serving less than 5,000 persons, the requirement is for one sample per annum to be analysed for lead as part of the audit monitoring). This limited sampling regime will not assist in identifying the extent of lead in the distribution network.

2 REVIEW OF HISTORICAL RESULTS

THERE is generally a history of monitoring for lead, especially on the major supplies. It is important that local authorities scrutinise their records of past analysis and review previous EPA Drinking Water Reports to identify supplies showing values around or over 25 µg/l. All supplies with levels over 25ug/l should be examined promptly. Furthermore, it is recommended that any supply with lead concentrations of 10ug/l or over should be assessed.

EPA reports on the Quality of Drinking Water in Ireland have indicated that approximately 20 public water supplies per annum fail to meet the lead parametric value at least once during the year.

3 THE LEAD SURVEY

THE purpose of a lead survey is to determine the extent of lead pipes in the distribution network of the water supply.

The survey should comprise of the following actions:

- ▼ Identification of any lead *distribution mains* in the ownership of the local authority;
- ▼ Identification of any lead *service connections* in the ownership of the local authority;
- ▼ Identification of the extent of lead plumbing in public buildings¹;
- ▼ Identification of the extent of lead plumbing in domestic dwellings. The information currently available indicates that, using a very precautionary approach, buildings built before 1970 are likely to contain lead, unless site-specific information indicates otherwise. However, lead pipe work may have been used in some cases after this period. This should be confirmed in the local area; and
- ▼ Targeted monitoring for lead in areas where the information above is uncertain or further information is required. Monitoring should be the final component of the lead survey.

Any lead survey should be planned in consultation with the Health Service Executive: Environmental Health Officers and Specialists in Public Health Medicine. These actions are further expanded upon below.

3.1 IDENTIFICATION OF ANY LEAD DISTRIBUTION MAINS IN THE OWNERSHIP OF THE LOCAL AUTHORITY

Each local authority should review records to determine when the use of lead distribution mains ceased in the local authority area. Such information may exclude areas of the distribution network that have not been constructed with lead. If it is not clear when the use of lead piping ceased, the local authority may, in general, assume that pipe work installed post 1970 does not contain lead. However, this should be confirmed on the ground.

For those areas of the distribution network that are at risk of containing lead the local authority should review available maps and records for the supply to determine if lead was used in the pipe work in the area and whether refurbishment of the pipe work has occurred since its original installation. The local authority should consult caretakers, fitters, water conservation teams etc who may have information about the distribution network that is either not documented or is not accessible.

The local authority should produce a map of the distribution network showing the extent of lead in the distribution network. Where gaps exist a programme of investigation should be commenced.

3.2 IDENTIFICATION OF ANY LEAD SERVICE CONNECTIONS IN THE OWNERSHIP OF THE LOCAL AUTHORITY

A similar exercise to the above should be carried out in relation to service connections that are in the ownership of the local authority. This information may be more difficult to obtain. It may be possible to carry out on the ground surveys to visually inspect stopcocks to determine if there is lead in the local authority service connection. In larger supplies where this is not feasible the local authority should identify

¹ A public building is a building where the water is supplied for human consumption as part of a commercial or public activity. These buildings include, but are not limited to, restaurants, hospitals and schools.

at risk areas. The local authority should produce a map of the distribution network showing areas of the distribution network where it is known that there are lead service connections (as indicated earlier it can generally be assumed that developments constructed since 1970 are not in this category if it is known that no lead pipe work was used or areas which have been refurbished by the local authority or private developer can also be excluded). Where gaps exist a programme of investigation should be commenced.

3.3 IDENTIFICATION OF THE EXTENT OF LEAD PLUMBING IN PUBLIC BUILDINGS

The local authority should identify all public buildings (schools, hospitals etc) that were constructed prior to around 1970 where the public may consume water and determine whether these buildings have had the entire internal plumbing refurbished since this period. This information should be notified to the local authority by the relevant owner. For buildings older than 1970 the Council will need to clearly identify such distribution networks for further investigation by the relevant owner, which should include inspection of the pipework and monitoring of the water for lead.

The local authority should notify the owner/manager of the premises of any lead failure, require that person to submit to the local authority a programme of remedial action to rectify the failure and give that person advice on the action he/she can take to protect his/her health and the health of any consumer in the premises. Local authorities should have written procedures for carrying out such notifications and for checking that the remedial action has been carried out. Where necessary the local authority should consider using the powers of Direction in Regulation 6(3) of the Drinking Water Regulations in the event that action is not being taken by the owner/manager of the premises.

3.4 IDENTIFICATION OF THE EXTENT OF LEAD PLUMBING IN DOMESTIC DWELLINGS

It will not be feasible for the local authority to determine the full extent of lead plumbing within domestic dwellings. However, the local authority should attempt to identify the areas where such houses may exist and the proportion of the supply these houses comprise. The local authority should assume, unless other information is to hand (e.g. where the local authority has refurbished local authority houses or local knowledge indicates that lead pipe work was used at a later date), that all houses constructed prior to 1970 are at risk of containing lead. The local authority should produce a map of the distribution network clearly showing areas of the distribution network where it is known that there is no lead internal plumbing within domestic dwellings (e.g. developments constructed since 1970 or areas which have been refurbished by the local authority or private developer). Public notices and engagement with local community groups may assist in delineating the extent of lead piping in the network. Local authorities should develop, in consultation with the HSE, a Frequently Asked Questions leaflet or put appropriate advice on their website outlining how the public can get their water tested and should include advice on what to do if lead is detected in their water supply.

3.5

TARGETED MONITORING FOR LEAD IN AREAS WHERE THE INFORMATION ABOVE IS UNCERTAIN OR WHERE FURTHER INFORMATION IS REQUIRED

When the steps outlined in Sections 3.1 to 3.4 have been carried out, the local authority should produce maps identifying areas of the distribution network that:

1. have lead in the distribution network
2. do not have lead in the distribution network
3. are at risk of having lead in the distribution network.

The map should be dynamic and made available for viewing on local authority websites.

The water services authority should develop an investigative monitoring programme targeting monitoring in areas of the distribution that are at risk of having lead in the distribution network. The purpose of this monitoring is not to determine the extent of lead exceedances in areas known to contain lead but rather to confirm the presence or otherwise of lead pipe work in areas of the distribution network where information is currently unavailable. However, the extent of the lead exceedance is an important factor to determine the necessary public health advice.

A key factor in the development of this monitoring programme is the method of sampling used. It is important to note that the sampling method for lead as part of the investigative monitoring programme is not the same as that for compliance monitoring under the Drinking Water Regulations. Sampling for compliance monitoring requires water services authorities to use *“an adequate sampling method at the tap so as to be representative of the weekly average ingested by consumers and that takes account of the occurrence of peak levels that may cause adverse effects on human health”*. For compliance monitoring, the EPA recommends that the Random Daytime Sampling² method be used. Irrespective of the sample method used the EPA recommend that samples are clearly labelled to identify the type of sample that was taken.

A brief summary of the three main types of sampling for lead and their purpose is below:

- ▼ **Random Daytime Sampling** - This is where the sample is taken directly from the tap normally used for drinking without flushing the tap. The sample is taken at a random time during the day and once the sampler enters the sample location he/she takes the first litre of water from the tap. The purpose of this is to replicate how people consume water during the day (i.e. at random times without flushing the tap). This type of sampling is used for compliance monitoring as the Regulations require that the sample be representative of the weekly average ingested by consumers and that takes account of the occurrence of peak levels that may cause adverse effects on human health.
- ▼ **Stagnation Sampling** - This is where the water is allowed to stagnate in the pipes for a set period prior to sampling. The water is fully flushed prior to the stagnation period. In general this period should be at least 30 minutes but to get the “worst-case” scenario the sample can be taken first thing in the morning before any taps are used (this is usually accomplished by the sampler leaving sample containers with the occupier of the house the previous day). This will give the “worst-case” scenario. This type of sampling should be used for lead surveys to determine where lead pipes are located (i.e. results <5 µg/l indicate no lead pipes present). Regard should be had to the location of lead in the plumbing system to ensure that the water sampled has been in contact with lead during the stagnation period.

² Random Daytime sampling is defined as taking water directly from the tap normally used for consumption of water without any prior water abstraction, flushing or cleaning of the tap prior to sampling. The sample should be at a time chosen randomly within the day but normally during office hours.

- ▼ **Fully Flushed Sampling** - This is where the water is fully flushed (run to waste) prior to sampling. The length of time a tap has to be run depends on several factors including the length of pipe, rate of flow through the pipe and water pressure. For example, if the service connection to a house is a 20 m long 1" pipe, approximately 10 L of water (i.e. a sink full) will need to be run to waste. This method determines the quality of water in the distribution network as the volume of water in the service connection and internal plumbing is run to waste. This method is used where consumers have been advised to fully flush their taps. The purpose is to confirm that the levels of lead in the fully flushed water (i.e. what is being consumed) are satisfactory. Where these levels are high it indicates that there may be a long service connection comprised of lead or there may be lead in the distribution main. The amount of water to be flushed through the system prior to sampling should be calculated having regard to the length of lead service pipe and design of the plumbing system.

For compliance monitoring the random daytime sampling method is required. For lead survey work a combination of all three sample methods may be required.

For the purposes of investigative monitoring local authorities should take stagnation samples. For such samples the pipes of the sample location should be flushed and run to waste and the sample should only be taken after a 30 minute stagnation time. Stagnation samples should inform the local authority whether there is lead pipework present.

In all cases where lead has been detected at levels above the parametric value (regardless of the sampling method used), or where lead pipes have been detected in the local authority's own pipework or pipework serving public buildings such as schools or hospitals, the local authority should promptly consult with the Health Service Executive to determine whether there is, or could be, a potential danger to human health arising from the detection of lead. The local authority should inform the HSE of the type of sampling method used when elevated levels of lead have been detected. Following such consultation, the local authority should inform consumers based on the HSE advice and give them the appropriate advice, and where relevant the local authority must notify the EPA in accordance with the guidelines issued in Guidance Booklet No.1. Notification is required in all cases where the lead parametric value is exceeded, and where advice is given to consumers.

Finally, nothing in this general guidance note should take precedence over any Direction or specific advice issued by the EPA or the Health Service Executive.

REFERENCES AND FURTHER INFORMATION

1. European Communities (Drinking Water) (No.2) Regulations, 2007 (S.I. No. 278 of 2007).
2. EPA Drinking Water Guidance Note on Lead. Advice Note No.2: Action programmes to restore the quality of drinking water impacted by lead pipes and plumbing.
3. Environmental Protection Agency 2009. The Provision and Quality of Drinking Water in Ireland. A Report for the Years 2007-2008.
4. EPA Booklet No. 1 Guidance for Local Authorities on Regulation 9 and 10 of the European Communities (Drinking Water) (No. 2) Regulations 2007 (S.I. No. 278 of 2007).
5. European Communities (Drinking Water) Regulations, 2000: A Handbook on Implementation for Sanitary Authorities.
6. Health Service Executive Statement on Lead and Frequently Asked Questions on Lead (www.hse.ie/eng/Publications/HealthProtection/).
7. CIWEM Policy on Lead in Water Supplies www.ciwem.org/policy/policies/lead.asp.

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