

**LONDON BOROUGH OF MERTON**

**WATER SAFETY AND THE PREVENTION  
OF LEGIONELLOSIS**

**CORPORATE MANAGEMENT PLAN**

**FOR OPERATIONAL BUILDINGS  
OWNED, MANAGED & MAINTAINED BY  
THE LONDON BOROUGH OF MERTON**

**July 2020**

Revised – July 2020

Date of next review July 2021

## Part 2 – Corporate Management Plans

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Revision Log

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## 1. Introduction

Legionellosis is the generic term used to cover legionnaires' disease, Pontiac fever and Lochgoilhead fever.

Legionnaires' disease is a rare form of pneumonia caused by an infection with legionella, a gram-negative rod shaped bacterium, widespread in nature, indigenous to Britain and commonly found in soil samples. Outbreaks only occur when three criteria are satisfied:

- the organism must be present
- the organism must be disseminated in an inhalable aerosol form and
- a susceptible individual must inhale the infected aerosol.

In the absence of specific treatment, legionnaires' disease produces about 12% mortality due to progressive pneumonia or shock. In the other 88% recovery is usually slow and may be complete, although lung or nervous system damage may lead to permanent disability. Pontiac and Lochgoilhead fever are milder forms of the disease.

To reduce the risk it is essential to carry out good engineering housekeeping of water systems as part of a planned preventative maintenance regime. Such procedures must be clearly defined naming individuals responsible for carrying out and confirming operations with an audit system to identify omissions or deviations, all of which must be recorded in a single contemporaneous log.

The London Borough of Merton (LBM) accepts its responsibilities to take every reasonable precaution necessary to protect the people occupying and visiting its properties, as well as passers-by within the vicinity of its buildings from legionella. This Legionella Management Plan refers to any premises owned, managed or maintained by LBM. A list of these premises is held within the Corporate Property Asset Register.

LBM is committed to implement preventive measures across its building and premises portfolio for the protection of staff, tenants, contractors and visitors.

The following conditions have been documented as affecting the rate of growth of legionella:

- The presence of sediment, sludge, scale and organic material which provide nutrients and protection for legionella. Legionella has been shown to colonise certain types of material used in the construction of water systems many of which also provide nutrients.
- Other organisms commonly encountered in water systems such as bacteria, amoeba and algae can provide a suitable nutrient and habitat in which legionella can survive, multiply and concentrate.
- Installations containing biofilms can harbour and provide favourable conditions for legionella growth. Legionella, which can grow in protozoa and within biofilms, may be protected from biocides that would otherwise kill or inhibit growth within the water system.
- Legionella is most likely to proliferate in water systems which have a temperature between 20°C and 45°C. Human body temperature of approximately 37°C is that at which the bacterium is most active. Water within the above temperature range and which is stagnant appears to provide the ideal conditions to promote colonisation by legionella.
- Legionella will survive at temperatures below 20°C but is considered to be in a dormant state with no colonisation activity. The bacterium does not survive for extended periods at temperatures maintained consistently at 60°C or above

It is not the purpose of this document to provide the reader with a detailed understanding of water hygiene, nor to give guidance on mechanical maintenance, but rather to bridge the gap between the two and to lay down standards and guidelines for achieving conditions conducive to good hygiene by means of appropriate design, operation and maintenance.

This document needs to be read in conjunction with:

- London Borough of Merton, Water Safety and the Prevention of Legionellosis, Part 1, Policy Document
- Health and Safety Commission Approved Code of Practice (ACOP) L8 regarding 'Control of legionella bacteria in water systems' and the accompanying guidance contained in: HSG 274::
  - HSG 274 - Part 1: The control of legionella bacteria in evaporative cooling systems
  - HSG 274 - Part 2: The control of legionella bacteria in hot and cold water systems
  - HSG 274 - Part 3: The control of legionella bacteria in other risk systems

### 3 Management Lines of Communication

#### Appointed Persons (Corporate Services)

<u>Category</u>	<u>Persons</u>
<b>London Borough of Merton Responsible Person (Operations)</b>	Edwin O'Donnell Head of Facilities Management London Borough of Merton 6 <sup>th</sup> Floor, Merton Civic Centre, London Road, Morden, SM4 5DX  Tel No: 020 8545 4176 Mob: 07944 228 230 Email: edwin.odonnell@merton.gov.uk
<b>London Borough of Merton Nominated Person</b>	Nick Layton Compliance and Maintenance Manager London Borough of Merton 6 <sup>th</sup> Floor, Merton Civic Centre, London Road, Morden, SM4 5DX  Tel No: 020 8274 5213 Mob: 07557 938651 Email: nick.layton@merton.gov.uk
<b>Water Safety Maintenance Contractor (WSMC)</b>	T Brown

### 3. Identification of Installations at Risk

Legionnaires' disease is most commonly caused by the inhalation of contaminated water droplets. It is therefore necessary to identify the sources of possible infection where respirable water sprays or aerosols are created.

ACoP L8 require that all systems susceptible to colonisation by legionella and which may create water droplets be identified and their risk assessed. This legionella risk assessment (LRA) must be completed not only for routine operations but also circumstances such as breakdown, abnormal operation, commissioning and any other unusual circumstances.

This LRA will take account of

- Incubation temperature
- Nature of exposed population and degree of exposure
- Droplet formation
- Source condition
- Measures for preventing or controlling risk.

It is important to note that droplets may be created in ways other than spraying, bubbling and impact within hard surfaces. Large water droplets may be reduced to respirable size by further impact or evaporation; such respirable water droplets may persist for long periods or be carried on air currents.

The importance of the LRA and precautionary measures is highlighted where:

- The exposed population contains a high number of susceptible people as for example in hospitals and nursing homes
- A high number of people at potential risk, for instance, in densely populated areas.

The LRA should ideally be reviewed annually or sooner if it is thought that the original assessment may no longer be valid, and changes to the control measures adopted. Such circumstances would typically include:

- Changes to plant or water systems or its use
- Changes to the use of the building
- New/revised information relating to risk or control measures.
- The results of checks, which indicate that control measures are no longer effective. These may be elevated TVC (Total Viable Count) levels or a positive sample analysis result when tested specifically for the presence of legionella.

The following sources are those most likely to promote conditions where legionella will thrive and are capable of creating water droplets, which become airborne and in turn can be inhaled. The details of the control measures to be adopted are provided in HSG274 which is available free of charge from the HSE website.

### 3.1 Hot and Cold Water Systems – [HSG274 part 2](#)

The potential risk within hot and cold water systems can be increased by a number of indicators including: excess water storage capacities; inadequate sealing of water tanks by the lack of or ill-fitting lids; unscreened over-flow pipes; and inadequate or unsuitable thermal insulation. Lack of circulation and flow in water tanks created by unsuitable or incorrect positioning of water inlet and discharge connections resulting in stagnation should also be considered.

Temperature stratification, stagnation and sediment build up can occur in domestic hot water calorifiers, water heaters, expansion vessels and cold water tanks.

Domestic water systems should supply hot water to all outlets at a temperature of at least 50°C and cold water at less than 20°C. In some cases this may prove difficult to achieve because of inadequate insulation or poor circulation. In such cases careful risk assessment of these circuits and outlets must be made to determine appropriate action.

Pipework dead-legs can contribute to the proliferation of legionella in that they often contain sediment, sludge and scale, and in some instances where the outlet being served is infrequently used, water temperatures stabilise within the critical range. Positioning of drain cocks on distribution pipework should be given due consideration to prevent the creation of avoidable dead-legs.

### 3.2 Showers and Spray Heads - [HSG274 part 2](#)

Showers are a potential source of infection by legionella bacteria. The risk potential increases with reduction in use, and the lack of a facility to dump blended water between operations. Water retained within the shower unit can remain within the ideal proliferation range until the next user operates the shower, thereby creating an aerosol spray from water, which may have remained stagnant.

Further consideration within the category of showers should be given to the equipment utilised in kitchens to pre-wash dirty dishes. This type of spray unit is invariably complete with a hand operated control valve linked by flexible or solid connections to the hot and cold water supplies, whose valves are left at pre-set positions to achieve the desired temperature blend. This may give an ideal breeding temperature for the bacteria when not in use, but can also cause cross-contamination between hot and cold systems as a result of pressure variations.

Also, within this category are spray taps attached to wash hand basins within toilet facilities. These taps again create the ideal spray to promote water aerosol.

### 3.3 Spas and Whirlpool Baths – [HSG274 Part 3](#)

Spas and whirlpool baths, which can create a spray or aerosol, have been linked with various infections including legionnaires' disease. No spas or whirlpool baths are operated by LBM, but they may be present on LBM premises and be operated by appointed contractors.

### 3.4 Adiabatic Coolers – [HSG274 Part 1](#)

Adiabatic coolers can create a spray or aerosol, which may be disseminated over a wide area and therefore present a significant risk of causing legionnaires' disease. A separate LRA is required for adiabatic coolers.

### 3.5 Other Systems – [HSG274 Part 3](#)

L8 also identifies the following systems which may also present a risk:

- Humidifiers
- Water softeners

- Emergency showers and eye wash sprays
- sprinkler and hose-reel systems
- Indoor fountains and water features

The above identify the main high-risk sources susceptible to colonisation by legionella. It is therefore important to ensure that all operation and maintenance instructions contained within this document are adhered to. It will be the responsibility of delegated personnel, be they LBM employees or its agents, to implement the necessary procedures for the control of legionella within LBM buildings.

#### **4. Maintenance Requirements**

It is a requirement that all new buildings and installations therein shall adopt the design practices laid down in BS EN 806 & BS 8558 and conform to the Water Byelaws. All materials utilised in future installations (be they new or modifications to existing systems), will be materials which comply with The Water Supply (Water Fittings) Regulations 1999 and are identified in the WRAS (Water Regulations Advisory Scheme) water fittings and materials directory. To ensure the correct procedures are carried out effectively, it will be necessary for up-to-date record drawings of the various installations to be included with the operating manuals, complete with manufacturer's information.

It is assumed that new equipment provided by manufacturers and sold as package items for use within the mechanical services installations throughout LBM buildings will have been designed and constructed with due consideration to the control of the legionella bacteria and necessary precautions required to prevent the bacterium colonising the specified equipment. This will entail the use of appropriate materials and practices covered by British Standards Institutes specifications and codes of practice with due consideration being given to HSE directives. All suppliers must provide full operating and maintenance instructions relating to their equipment.

It is a requirement of these procedures that the recommendations within manufacturers' maintenance routines will be adopted to ensure effective operation of specific equipment. These maintenance routines will be carried out in addition to the procedures referred to in this document.

Within any building there is likely to be some connection between the water systems, for example the rising main not only supplies drinking water but also makes up the cold water storage tank. The cold-water storage tank will supply both the domestic cold water systems and the hot water service calorifier. This in turn has its own distribution system and outlets where there may even be further connection, for example where cold and hot water services are mixed in a shower unit or mixer tap. It is assumed that such serial connections and cross connections shall be taken into account when drawing up the legionella control measures.

Where the LRA indicates that there is a foreseeable risk, there must be a written scheme for minimising the risk of exposure. It is vital that such a scheme should be suitably detailed to enable it to be implemented and managed effectively.

The written scheme contains all relevant information relating to the plant or system as necessary, such as:

- An up-to-date schematic plan of the system showing layout, including parts temporarily out of use
- Details of correct and safe operation
- Precautions to be taken.

When implementing the maintenance procedures and when cleaning and de-contamination work is carried out it will be necessary for operatives to ensure that adequate safety precautions are taken and that suitable protective wear and equipment is utilised as required to comply with The Personal Protective Equipment at Work Regulations 1992 (as amended). The procedures laid down in L8 and HSG274 must be considered.

It is a requirement that full records are kept of all maintenance procedures carried out, and that copies of the records are maintained in an accessible position on the site for routine inspection by visiting engineers, surveyors and statutory officers. Records must be kept for a period not less than 7 years.

All contractors providing maintenance and water treatment for the LBM or their agents must ensure that they comply with the requirements of this document as a minimum. Written confirmation of this is required.

LBM will appoint a water safety maintenance contractor (WSMC) who will be responsible implementing the maintenance and water treatment procedures which apply at each site.

All management appointees and the water safety maintenance contractor (WSMC) employed by the LBM or its representatives will be required to submit a copy of their health & safety procedures and method statements before undertaking any activities on LBM buildings.

To ensure that installations utilising water within LBM buildings are maintained to the requisite standards, a regime of water treatment will be adopted if deemed necessary by the risk assessment. This regime must comply with the Control of Substances Hazardous to Health Regulations (COSHH), including L8 and the EU Biocides Regulations (528/2012).

Monitoring by the WSMC will be undertaken to comply with the preceding information, L8 and HSG274. All readings and observations are to be recorded in the site log book and copied to the LBM Responsible Person.

In the event that any temperature is out of range the WSMC takes corrective action at the time to bring back within range. If the temperatures cannot be brought back within range, or other issues are identified during the maintenance procedures the issues are escalated within the WSMC's organisation and the LBM Responsible Person informed.

The WSMC and Responsible Person decide upon an action plan to ensure the system meets the requirements of L8.

If deemed appropriate the system is sampled and tested for legionella. Sampling will be carried out by competent personnel employed by the WSMC and tested by a UKAS accredited laboratory. The results, along with suitable certification are made available to the LBM Responsible Person as soon as they are available. Appendix A describes the processes to be followed should there be a positive result.

## Appendix A

Actions to be taken in the case of a legionella positive test result on a London Borough Of Merton site

For an infection with legionella to occur three factors must be satisfied:

- a) The organism must be present.
- b) The organism must be dispersed into the air within a fine aerosol.
- c) A susceptible individual must inhale the infected aerosol.

### **IN THE CASE OF A LEGIONELLA-POSITIVE TEST RESULT**

#### **ACTION ONE**

Inform the London Borough of Merton 'Nominated Person' or 'Deputy' as listed in The Management Plan responsible for the site.

#### **ACTION TWO**

As soon as a Legionella-positive analysis is notified, endeavour to control one or more of the factors a, b, c above.

#### **ACTION THREE**

Undertake remedial action as described in ACOP L8 and HSG 274.

#### **HOT AND COLD WATER SYSTEMS**

Legionella bacteria more than 100 cfu/litre but less than 1000 cfu/litre

Either:

- a) If only one or two samples are positive, the system should be re-sampled. If a similar count is found again, a review of the control measures and risk assessment should be carried out to identify any remedial actions.
- b) If the majority of samples are positive, the system may be colonised, albeit at a low level, with legionella. Disinfection of the system should be considered but an immediate review of control measures and risk assessment should be carried out to identify any other remedial action required.

Legionella bacteria more than 1000 cfu/litre

The system should be re-sampled and an immediate review of the control measures and risk assessment carried out to identify any remedial actions, including possible disinfection of the system.

Remedial actions should be undertaken by a suitably qualified contractor. If there is any doubt whatever about how to achieve the eradication, specialist assistance must be sought.

#### **ACTION FOUR**

Once the eradication procedure has been completed, the system is put back into service. Five to ten days later, further samples must be taken to confirm the effectiveness of the procedures. Once two consecutive negative tests have been obtained no further testing is required.

## Appendix B

Actions to be taken in the event of a suspected outbreak of legionnaires' disease implicating a London Borough of Merton site

The responsibility for declaring an outbreak of legionnaires' disease lies with Public Health England and as a notifiable disease LBM would follow its operational guidance and the London Boroughs Legionellosis Incident Protocol (2012).

### **IN THE CASE OF A SUSPECTED OUTBREAK OF LEGIONNAIRES' DISEASE**

#### **ACTION ONE**

Inform the London Borough of Merton 'Nominated Person' (**Head of Facilities Management**) or 'Deputy'. This person should liaise with the Head of the Regulatory Services Partnership or the Environmental Health Commercial Manager who will then initiate actions in accordance with the **London Boroughs Legionellosis Incident Protocol**.

Inform the CEO and Members of CMT by telephone immediately and confirm in writing as soon as possible.

#### **ACTION TWO**

Assume that any aerosol-producing water source could be responsible and take such steps to prevent any further risk of exposure. It will be necessary to inform the operatives carrying this out to ensure compliance with the provisions of the Health and Safety at Work Act, COSHH Regulations and ACOP (L8).etc

#### **ACTION THREE**

Contact your WSMC to arrange for an investigation into the systems to identify any contaminated water source, which may be implicated, and to seek other relevant advice. (Any investigation undertaken must be strictly in line with any course of action and instruction issued as a result of the **London Boroughs Legionellosis Incident Protocol**. - Action One above).