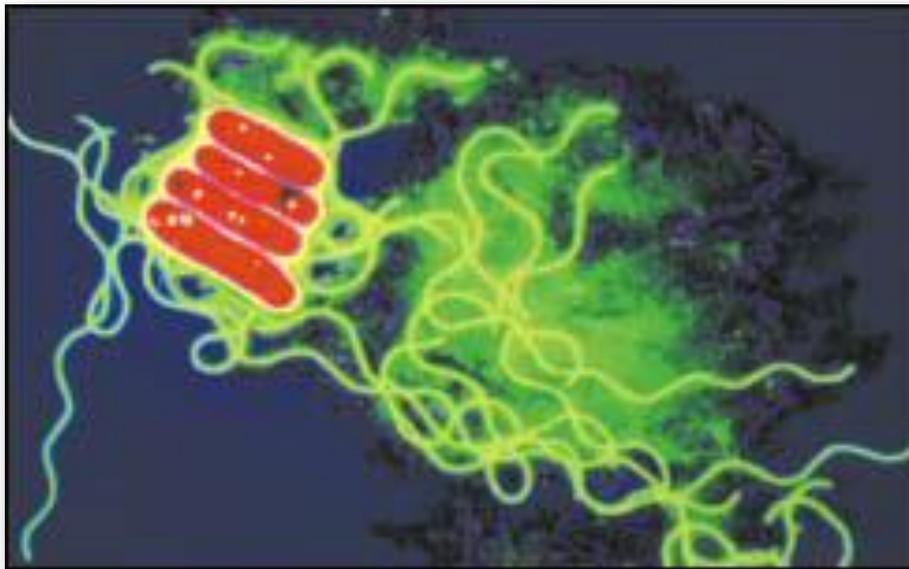


EMAP-35 Control of Legionella Bacteria in Water Systems



Issue No: E
Issue Date: 2015
Next Review: Aug 2017

Document Prepared By:
Stephen Metcalfe
Head of Maintenance
(Infrastructure & Maintenance)
QMUL

Original Reviewed By:
Steve Carter (QMUL)
Paul Lambert (QMUL)
James Martin (QMUL)

Approved By:
Mike Sheppard
Assistant Director Estates & Facilities
(Infrastructure & Maintenance)
QMUL

Table of Contents

1	General Arrangements	3
1.1	Purpose	3
1.2	Legislation, Codes of Practice and Guidance	3
1.3	Scope	3
1.3.1	QMUL Properties.....	3
1.3.2	Non-QMUL Properties.....	3
1.4	Managerial Responsibilities	3
1.4.1	Senior Duty Holder	3
1.4.2	Duty Holder	3
1.4.3	Responsible Person	4
1.4.4	Deputy Responsible Person.....	4
1.4.5	Competent Person	4
1.4.6	External Specialist Service Providers	4
2	Management Procedures	5
2.1	Identification and Assessment of Any Source of Risk.....	5
2.1.1	New Water Installations.....	5
2.1.2	Review of Risk Assessments	5
2.1.3	Validity.....	5
2.2	Procedure To Minimise The Risk From Exposure To Legionella	5
3	Operational Procedures.....	6
3.1	Minimum Control Measures	6
3.2	Little Used Outlets / Dead-legs	7
3.3	Water Treatment Regime.....	7
3.4	Cleaning and Disinfection	8
3.4.1	Storage Tanks.....	8
3.4.2	Flushing.....	8
3.4.3	Chemical Disinfection.....	8
3.4.4	Thermal Disinfection.....	8
4	Training and Competence	9
4.1	Training	9
4.2	Training Records	9
4.3	Tool Box Talks.....	9
5	Adverse Incident Management.....	10
5.1	Definition	10
5.2	Procedure in event of an Adverse Incident	10

5.2.1	Action Plan in Cases of a System Malfunction	10
5.2.2	Action Plan in Cases of Exceptional Microbiological Sample	10
5.2.3	Action Plan in Cases of a Positive Legionella Sample.....	10
5.2.4	Action Plan in Case of Suspected/Confirmed Outbreak of Legionnaires Disease	11
6	List of Duty Holders etc.	12
	Flow chart: CONTROL OF LEGIONELLA BACTERIA.....	14
	Project Process Check List for Water Management and Legionella Control	15
	Responsible Person - Legionella	17
	Deputy Responsible Person - Legionella.....	18

1 General Arrangements

1.1 Purpose

This Management Arrangements and Procedure document (EMAP-35) has been prepared for QMUL Estates & Facilities (Infrastructure & Maintenance) department to ensure that the risk of exposure to Legionella Bacteria is controlled and managed effectively as far as reasonably practicable, through the adoption of the control and management principles identified in the HSE Approved Code of Practice and Guidance L8 – “*The control of legionella bacteria in water systems*”

1.2 Legislation, Codes of Practice and Guidance

COSHH Regulations require that the risks from all hazardous substances including biological agents are controlled by a framework of control measures.

The Approved Code of Practice (ACoP) L8 “Legionnaires’ Disease – *The control of legionella bacteria in water systems*” 4th Edition published 2013 provides employers (and others as defined) that framework of guidance to control the risk of Legionellosis. Technical Guidance is provided by HSE in the form of publications HSG274:Part 1 / Part 2 / Part 3.

1.3 Scope

1.3.1 QMUL Properties

These procedures shall apply to all hot and cold water storage and distribution systems contained within QMUL owned and operated properties.

1.3.2 Non-QMUL Properties

Certain building properties are owned and operated by other Third Parties. QMUL shall not be responsible for the control and management of water systems after the property isolation valve and internal to the following building properties:

- Lincoln’s Inn Field

1.4 Managerial Responsibilities

1.4.1 Senior Duty Holder

The legal responsibility for the management of legionella is with the senior management team of QMUL (QMSE) as the employer, and this duty shall be undertaken by the Director of Estates & Facilities.

1.4.2 Duty Holder

To ensure that the risk from legionella bacteria are suitably controlled and managed with appropriate resources, the Assistant Director of Estates & Facilities (Infrastructure & Maintenance) shall ensure systems and procedures are in place to facilitate a safe system of work.

Responsibilities:

- To formally appoint in writing, the Responsible and Deputy Responsible Persons to take day-to-day responsibility for the management and control of legionella.
- To ensure that the management and control arrangements implemented to manage the risk from Legionella bacteria are audited / reviewed regularly by an external auditor.

1.4.3 Responsible Person

The Responsible Person should have status & sufficient authority, competence & knowledge of the water system installation's to ensure that all operational procedures and precautionary measures are being carried out in a timely & effective manner; this duty shall be undertaken by the Campus Maintenance Managers.

Responsibilities:

- To assume the day-to-day responsibility for the management and control of any identified risk from legionella bacteria in the water systems managed and operated by Estates & Facilities.
- To arrange for Legionella Risk Assessments to be carried out as and when significant changes to water systems are undertaken or after adverse incidents.
- To ensure that written schemes are available and all recommendations are implemented within defined timescales where improvements are required.
- To issue Permit to Work as required where works to existing water systems are being carried out.

1.4.4 Deputy Responsible Person

The Deputy Responsible Person should have similar status & sufficient authority, competence & knowledge of water system installations to that of the Responsible Person to ensure that all operational procedures and measures continue to be carried out, as and when the Responsible Person is absent from QMUL; this duty shall be undertaken by the Head of Maintenance and/or Senior Engineer.

1.4.5 Competent Person

Responsibilities:

- Preparing and producing detailed Legionella Risk Assessments for all water systems to include schematic plans and a list of the legionella risks.
- Undertaking formal audits and reviews of the management scheme, and issuing reports to the Responsible Person.
- Providing professional advice and water scheme proposals on new and refurbishment projects that are in compliance with the ACoP L8.

1.4.6 External Specialist Service Providers

Responsibilities:

- Delivery of control measures as set out in Section 3 of this document and in accordance with ACoP L8.
- Undertaking a regime of sampling and analysis of all water outlets in accordance with ACoP L8.
- Providing professional advice on the management and control of water systems.
- Implementing and monitoring control measures identified in the risk assessments.
- Undertaking specified cleaning and disinfection regimes as required by predefined programme schedules or as a result of a specific request.

- Updating records in the relevant Water Management log book.

2 Management Procedures

2.1 Identification and Assessment of Any Source of Risk

A suitable and sufficient assessment for the risk of exposure to legionella bacteria shall be undertaken for all water systems owned and operated by QMUL and any necessary precautionary measures shall be identified.

The Responsible Person shall appoint competent Water Hygiene Specialists to undertake a suitable and sufficient risk assessment of a specific water system and to produce the final report identifying any areas of potential risk and the associated written scheme of control measures.

Reference shall be made to Paragraphs 28–47 of the ACoP L8, that define the requirements for the identification and assessment of the risk.

2.1.1 New Water Installations

All new water system installations shall be subject to, prior to first occupancy by building users, a comprehensive Risk Assessment.

- For Extensive Modifications – a new Legionella Risk Assessment to be undertaken.
- For Minor Modifications to existing water installations – record the modification undertaken in the buildings and arrange for the information to be available for the next schedule review of the system risk assessment.
- Project Team to provide schematics, temperature monitoring/flushing records, chlorination certificates and the like.

2.1.2 Review of Risk Assessments

The Responsible Person shall ensure that risk assessments are reviewed regularly (at least every two years) and in any case whenever there is reason to believe that the original risk assessment to be no longer valid or where alterations to the water system have been carried out.

- This is especially important where the Project Team are carrying out alterations to existing systems or introducing new systems.

2.1.3 Validity

All risk assessments shall be retained throughout the period for which they remain current. In any case all written documentation shall be kept for a minimum of five years.

2.2 Procedure To Minimise The Risk From Exposure To Legionella

Estates & Facilities shall implement a written scheme of measures that will assist with controlling the risk from exposure. The written scheme shall include;

- an up-to-date building site/system plan.
- the correct and safe operational maintenance procedures.
- a schedule of monitoring checks and the frequency of such checks.
- pre-defined precautions to reduce the risk.

3 Operational Procedures

3.1 Minimum Control Measures

In accordance with the recommendations made within the HSG274:Part 2, EAF shall require the implementation of the following control measures to be undertaken by the Competent Person / appointed Service Provider

<u>System</u>	<u>Frequency</u>	<u>Item</u>	<u>Task</u>
Hot Water	Monthly	Sentinel Points	Check that the time to reach at least 50°C is less than 1 minute at the sentinel point. Results and observations to be recorded in the logbook
	Annually	Representative Points on a rotational basis	Check that the time to reach at least 50°C is less than 1 minutes at the sentinel point. Results and observations to be recorded in the logbook
	Weekly	Little Used Outlets	Assess usage and remove outlet if not required and modify pipework appropriately. Under controlled conditions to minimise aerosol generation, flush through and purge to drain until maximum temperature is achieved then for a further 5 minutes Results and observations to be recorded in the logbook
Cold Water	Monthly	Sentinel Points	Check that the time to reach 20°C or below is within 2 minutes at the sentinel point. Results and observations to be recorded in the logbook
	Annually	Representative Points on a rotational basis	Check that the time to reach 20°C or below is within 2 minutes at the sentinel point. Results and observations to be recorded in the logbook
	Weekly	Little Used Outlets	Assess usage and remove outlet if not required and modify pipework appropriately. Under controlled conditions to minimise aerosol generation, flush through and purge to drain until minimum temperature is achieved then for a further 5 minutes Results and observations to be recorded in the logbook
Hot Water Storage	Monthly	Storage Calorifiers	Check water flow and return temperatures are in the range 50°C to 60°C Results and observations to be recorded in the logbook
	Annually	Storage Calorifiers	Take sample from drain outlet and note condition of drain water. Drain contents and visually check internal surfaces for scale and sludge; clean and disinfect as necessary. Results and observations to be recorded in the logbook

<u>System</u>	<u>Frequency</u>	<u>Item</u>	<u>Task</u>
Cold Water Storage	Six Monthly (Winter / Summer)	Storage Tank	Check and record incoming mains cold water temperature. Check and record tank water temperature remote from the ball valve is less than 20°C Results and observations to be recorded in the logbook
	Annually	Storage Tank	Visual inspection of water tank to check on physical condition and cleanliness of stored water. Carry out cleaning/disinfection/remedial works where necessary. Results and observations to be recorded in the logbook
Shower Heads	Quarterly or as necessary	Heads and Hoses	Dismantle, clean, descale and disinfect all parts and supply hoses Results and observations to be recorded in the logbook
Thermostatic Mixing Valve	Monthly	Representative TMV on a rotational basis	Check that the time to reach respective temperatures in the hot and cold supply pipe to the TMV Results and observations to be recorded in the logbook
	Annually	TMV	Inspect, clean, descale and disinfect strainers or filters. Routine maintenance and servicing in accordance with manufacturer's instructions. Results and observations to be recorded in the logbook
Emergency Showers	Six Monthly	Shower Heads	Under controlled conditions, flush through and purge to drain Results and observations to be recorded in the logbook

3.2 Little Used Outlets / Dead-legs

Little used outlets / dead-legs are to be identified and to be taken out of use if they cannot be justified to remain.

- If removed, connecting pipework shall be cut back to nearest through branch so that no blind end is left containing static water.

Where little used outlets / dead-legs are to be retained, a planned programme of frequent flushing and temperature measurements shall be used to manage any potential risk.

- Water shall be flushed through the little used outlets / dead-legs, taking care not to produce aerosols, until the temperature has stabilised then for further 5 minutes duration.

3.3 Water Treatment Regime

Estates & Facilities implement a temperature regime within its hot and cold water systems as to avoid storing or distributing water in the temperature range that favours bacterial growth i.e. 20°C to 45°C.

- Cold Water systems shall be designed to maintain stored water temperatures below 20°C throughout the year.
- Cold Water supplies shall be designed and operated to reach 20°C or below within 2 minutes of outlet operation.

- Hot Water systems shall be designed and operated to maintain stored water at 60°C and returning water temperatures shall be 50°C or above.
- Hot Water systems shall be designed and operated so that draw-off temperatures above 50°C are obtained within one minute.

Where there is an increased risk of scalding to susceptible people, the installation of localised thermostatic mixing valves shall reduce the hot water temperature at the outlet.

3.4 Cleaning and Disinfection

3.4.1 Storage Tanks

All water storage systems shall be monitored and their physical condition visually inspected to ensure that storage systems and the water contained within them is clean and wholesome.

A standardised programme of visual inspections shall be carried out by Competent Persons.

All results shall be recorded along with inspection date in the Water Hygiene Logbook.

3.4.2 Flushing

Every new water service, storage cistern, distribution pipework, hot water cylinder or other appliance shall be thoroughly flushed before taken into first use.

Where a water system is not brought into immediate normal operational usage following its commissioning stage and is not regularly flushed afterwards, the system shall be disinfected before bringing into general use.

3.4.3 Chemical Disinfection

Hot and cold water systems shall be chemically disinfected to the requirements of BS6700 by a specialist Water Treatment Company as and when required.

Method statements and risk assessments are to be submitted by the Water Treatment Company before proceeding with the disinfection procedure.

Chemical disinfection shall take place following;

- Completion of a new water system installation
- Where major extension or alterations have been carried out to a water system
- Where new underground pipework has been installed that supplies water
- Where it is suspected that contamination may have occurred
- Where a building system has not been in regular use and prior to re-occupancy

All chemicals used in disinfection process shall be those listed in the Drinking Water Inspectorates list of approved substances.

3.4.4 Thermal Disinfection

Hot water systems can be thermally disinfected by raising the temperature of the whole of the calorifier contents and circulating this water throughout the system for at least 1 hour.

To be effective the temperature of the stored water at the calorifier should be high enough to ensure that the temperatures at all draw-off taps and appliances does not fall below 60°C. for the 1 hour period.

The risk of scalding needs to be considered and particular care should be taken to ensure that water systems are not inadvertently used until the thermal disinfection process is complete and the water temperatures have dropped to their normal operating levels.

Appropriate method statements and risk assessments are to be submitted and approved by Responsible Person before proceeding with any thermal disinfection procedure.

Chemical Disinfection is to be undertaken in preference to Thermal Disinfection.

4 Training and Competence

4.1 Training

All operatives tasked with the servicing and maintenance of hot and cold water distribution systems shall be provided with adequate information about the risks of Legionella and be instructed in how to minimise the risks, on what precautions need to be taken and to understand what are the dangers and consequences of not maintaining water systems.

Training courses shall be provided via specialist consultants, and/or water treatment companies as appropriate, and to ensure that all operatives remain up-to-date with current requirements and legislation.

4.2 Training Records

Records will be maintained of all personnel training indicating their name, the date and duration of training and a description of the training undertaken.

4.3 Tool Box Talks

The Mechanical Services Supervisor shall in addition to formal training, shall arrange for toolbox talks for maintenance staff engaged to undertake works on water systems.

5 Adverse Incident Management

5.1 Definition

An adverse incident shall be defined as:

- Any occurring incident which had the potential to significantly increase the risk of Legionellosis from a water system as a result of system malfunction, i.e. physical damage, contamination, procedural failure etc.
- A microbiological sample result which exceeds the HSG274 guidance levels
- A case, or suspected case of Legionellosis that has been attributed, though not necessarily confirmed, to have been caused by a water system.

5.2 Procedure in event of an Adverse Incident

5.2.1 Action Plan in Cases of a System Malfunction

The Responsible Person shall be informed of the nature of the system malfunction and the affected building, indicating the specific system involved. The Responsible Person will implement a review of the control procedures to identify any remedial actions necessary to prevent the situation reoccurring.

5.2.2 Action Plan in Cases of Exceptional Microbiological Sample

Where sampling and testing of water systems identifies the presence of exceptional levels of microbiological growth, then the Responsible Person shall be informed of the sample result and the affected building indicating the system involved.

In accordance with the HSG274:Part 2, Table 2.2 action levels, the affected part(s) of the water system must be drained, cleaned, flushed and sterilised where advised for by the Specialist Water Treatment Company using Sodium Hypochlorite solution (50 ppm). The Responsible Person will implement an immediate review of the control procedures to identify any remedial actions necessary to prevent the situation reoccurring.

5.2.3 Action Plan in Cases of a Positive Legionella Sample

Where specific sampling and testing of water systems identifies the presence of Legionella Bacteria, then action must be taken immediately by the Responsible Person and the Competent Person.

The Responsible Person will inform the Facilities Duty Holder of the affected building(s) indicating the area(s) where Legionella bacteria was isolated.

The affected outlet(s) shall be isolated from the community they serve by means of physical isolation, warning notices, barriers and/or tape and the affected part(s) of the water system must be flushed and sterilised by the Specialist Water Treatment Company using Sodium Hypochlorite solution (50ppm) in accordance with the HSG274:Part 2, Table 2.2 action levels.

The outlet(s) that sampled positively must be re-sampled and left unused until demonstrated free of Legionella bacteria.

5.2.4 **Action Plan in Case of Suspected/Confirmed Outbreak of Legionnaires Disease**

If QMUL is suspected of being implicated in an outbreak of Legionnaire's Disease, the Responsible Person shall immediately inform the Director or Deputy Director of Estates & Facilities of the suspected/confirmed outbreak of Legionnaires Disease.

Legionnaires Disease is notifiable under the Health Protection (Notification) Regulations 2010 in England. An outbreak is defined as two or more confirmed cases of Legionellosis closely linked in time (weeks rather than months) and where there is evidence of a common source of infection.

A Proper Officer, appointed by the local authority under public health legislation and usually a Consultant in Communicable Disease Control (CCDC) is responsible for the declaration of an outbreak. The Proper Officer would invoke an Outbreak Committee, whose primary purpose is to protect public health and prevent further infection.

If a university water system is implicated in an outbreak of Legionnaire's Disease, emergency treatment of that system should be carried out as soon as possible under the direction of the appointed Outbreak Committee.

Under the direction of the Outbreak Committee, the Director or Deputy Director of Estates & Facilities shall ensure the full co-operation with any investigation of building systems on campus.

6 List of Duty Holders etc.

Senior Duty Holder

Stephen Wells
Director of Estates & Facilities
Email: stephen.wells@qmul.ac.uk
Tel: 0207 882 8901

Duty Holder

Mike Sheppard
Assistant Director of Estates & Facilities
(Infrastructure & Maintenance)
Email: mike.sheppard@qmul.ac.uk
Tel: 0207 882 8383

Responsible Persons

QMUL Campus Maintenance Managers

Charterhouse Square: James Martin
Email: james.martin@qmul.ac.uk
Mobile: 0778 617 1844
Tel: 0207 882 8449

Mile End: Neil Florey
Email: n.florey@qmul.ac.uk
Mobile: 0790 968 8403
Tel: 0207 882 8388

Whitechapel: Anil Gooneratne
Email: a.j.gooneratne@qmul.ac.uk
Mobile: 0790 171 6009
Tel: 0207 882 7231

Residences: Colin Powell (from Oct 2015)
Email: c.powell@qmul.ac.uk
Mobile: (To be advised)
Tel: 0207 882 7271

Deputy Responsible Persons

Head of Maintenance: Steve Metcalfe

Email: s.metcalfe@qmul.ac.uk

Mobile: 0790 171 6010

Tel: 0207 882 8892

Senior Engineer: Ron Hodgson

Email: r.hodgson@qmul.ac.uk

Mobile: 0790 968 8404

Tel: 0207 882 8381

Competent Person

Muskateer Services Limited

Email: helpdesk@musketeers.co.uk

13 Gatwick Metro Centre, Balcombe Road,
Horley, Surrey RH6 9GA

Tel: 08450 675 444

Tel: 01293 824 022

Fax: 01293 771 777

External Specialist Service Provider

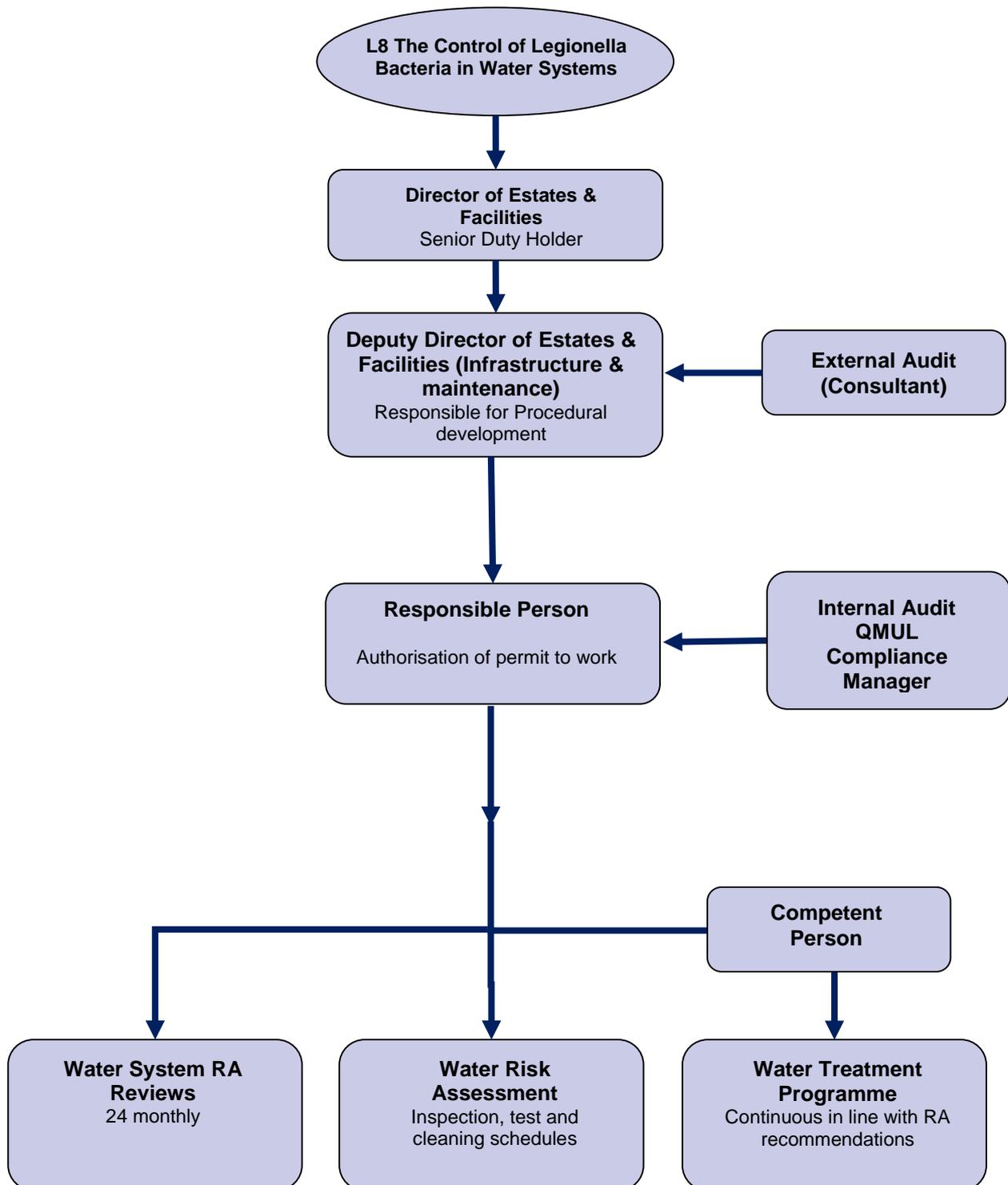
MITIE Water

Tel: 01252 832347

Email: mtfm.water@mitie.com

Flow chart: CONTROL OF LEGIONELLA BACTERIA

The following identifies roles and responsibilities for compliance with
L8 - The Control Of Legionella Bacteria In Water Systems



Project Process Check List for Water Management and Legionella Control

PROJECT LOCATION/REFERENCE	
PROJECT MANAGER	
PRINCIPAL CONTRACTOR	
MECHANICAL SERVICES CONTRACTOR	

1. Before Project Commences

Has the water risk assessment been issued?	YES/NO
If YES to above, please provide reference number, provider and date	
Are recommendations signed off where completed?	YES/NO
Are any outstanding recommendations to be completed within the current project?	YES/NO
If YES to above, please provide recommendation reference numbers	
Have previous water temperature monitoring records been provided?	YES/NO
Are there any temperatures noted out of compliance with L8 recommendations?	YES/NO
Have previous analytical sampling records been provided?	YES/NO
Have any positive results been returned?	YES/NO

2. During Project

Identify locations of rarely used outlets within project area	
If a flushing regime is implemented provide details of frequency and responsibility (Details should be recorded on a separate sheet)	
If temperature monitoring is to be undertaken provide details of frequency and responsibility (Details should be recorded on a separate sheet)	
How are details regarding isolation or draining down of systems to be communicated?	
Confirmation of completion of recommendations	

3. Issue on completion of project

Details of clean and chlorination certificates	
Details of pasteurisation works to hot water system	
Marked up schematics showing all new installations and removed installation pipe work	
Analytical sample sheets	
Sign off of installations	
TAPS certification	

PM Signature	
Issue Date	
Compliance Manager Signature	
Receipt Date	

Insert Name and Title

Queen Mary University of London

Room 223

Queens' Building

Mile End Road

London

E1 4NS

(Insert date)

Ref: *(Insert Reference)*

Dear *(Insert First Name)*,

Responsible Person - Legionella

You are nominated as the Responsible Person - Legionella, as specified under the Health and Safety Executive Approved Code of Practice and guidance document L8 'Legionnaires' Disease - The control of legionella bacteria in water systems' 2013, Fourth Edition, and any subsequent revision.

You must undertake the duties attributed to your role as listed within the enclosed EMAP-35, and any subsequent revision.

Yours sincerely,

Mike Sheppard

Assistant Director Estates & Facilities (Infrastructure & Maintenance)

Cc Personal file

.....

I accept the appointment detailed above and acknowledge receipt of the QMUL Legionella EMAP-35.

..... Date:.....

Name & Title

Insert Name and Title

Queen Mary University of London

Room 223

Queens' Building

Mile End Road

London

E1 4NS

(Insert date)

Ref: *(Insert Reference)*

Dear *(Insert First Name)*,

Deputy Responsible Person - Legionella

The QMUL Responsible Person – Legionella is *(insert name and title)*

You are the nominated deputy Responsible Person – Legionella, as specified under the Health and Safety Executive Approved Code of Practice and guidance document L8 'Legionnaires' Disease - The control of legionella bacteria in water systems' 2013, Fourth Edition, and any subsequent revision.

You should act for the Responsible Person - Legionella on all occasions when the responsible person is unavailable.

You must undertake the duties attributed to the Responsible Person – Legionella as listed within the enclosed QMUL EMAP-35 document, and any subsequent revision.

Yours sincerely,

Mike Sheppard

Assistant Director Estates & Facilities (Infrastructure & Maintenance)

Cc Personal file

.....
I accept the appointment detailed above and acknowledge receipt of the QMUL Legionella EMAP-35.

..... Date:.....

Name & Title