



Managed Water Services  
KEEPING WATER SAFE

MWS: Keeping Water Safe | Water Treatment | Water Hygiene | Water Solutions

# LEGIONELLA RISK ASSESSMENT

FOR



**Stadbroke Health Centre  
Wilby Road  
Stadbroke  
Suffolk  
IP21 5JN**



committed to  
**CSGS**



# RISK ASSESSMENT

<b>Customer</b>	Stadbroke Parish Council
<b>Site Address</b>	Stadbroke Health Centre Wilby Road Stadbroke Suffolk IP21 5JN
<b>Contact Name</b>	Odile Wladon
<b>Site Contact Number</b>	07555 066147
<b>Assistance on site provided by (Competent Person)</b>	Claire Holman
<b>Competent Person's Telephone Number</b>	01379 384220
<b>Assessor</b>	Declan Oddy
<b>Checked by</b>	Keith Smith
<b>Date of survey</b>	22 <sup>nd</sup> May 2019
<b>Next assessment due date</b>	May 2021

Any further information regarding this report should be requested from:

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CM77 8JT

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## Scope Of Survey

### Introduction

1. Building location and description
2. Executive Summary
3. Responsibility Structure
4. Hot Water Calorifiers / Local Water Heaters / Hot Water Vessels: Assessment & Photographs
5. Water Outlets: Assessment & Photographs
6. Site Asset Register
7. Hot & Cold Water Systems : Recommended Testing & Maintenance Programme
8. Water Services: Microbiological Activity Action Levels
9. Schematics
10. Competency Certificate of Assessor
11. Action in the Event of a Suspected Legionella Outbreak
12. Glossary of Terms

## Introduction

### Overview

The regulations in respect of “Reducing the Risk of Legionnaires Disease” are made up of:

- Health & Safety at Work Act 1974.
- ACOP (L8) The Prevention or Control of Legionnaires Disease.
- HSG 274 Parts 1,2 & 3.
- Management of Health & Safety at Work Regulations.
- Notification of Cooling Towers/Evaporative Condensers Regulations.
- COSHH Regulations.

The provisions of these acts are, as far as is reasonably practicable, to ensure health and safety.

Reasonably practicable involves taking precautions proportionate to the risk.

High-risk systems such as cooling towers may require costly preventative measures to reduce the risk of Legionnaires Disease.

### Legal Requirements

- Identify and assess sources of risk. (Risk Assessment)
- Prepare a scheme for preventing or controlling the risk.
- Implement, manage and monitor the precautions.
- Keep records of the precautions.
- Appoint a person to be managerially responsible.

The first step must be to carry out a “suitable and sufficient” risk assessment.

The assessment must include

- An assessment of the risk to health, and identify measures to be taken
- Consideration of replacement/substitution to prevent the risk
- Where prevention is not reasonably practicable, engineering measures to control exposure; e.g.: drift eliminators
- Other measures to reduce the risk; e.g.: water treatment
- A management regime to ensure continual compliance and regular reviews

The Notification of Cooling Towers & Evaporative Condensers Regulations 1992 requires that all towers be registered with the Local Authority.

This document has been produced using the best information available at the time of the assessment. Whilst every effort has been made to ensure its accuracy, Managed Water Services takes no responsibility for any unforeseen omissions, relating to equipment and systems that we were not made aware of at the time of the assessment.

## Risk Assessment Introduction

### Biological Hazards

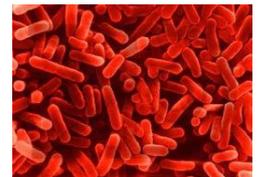
#### **Total Viable Counts (TVC)**

The Total Viable Counts give an indication of the level of living bacteria present in the Pool Water. The test is carried out at two different temperatures; the higher temperature (37°C) will count organisms which may, because of their temperature requirements, emanate from humans or animals. The organisms growing at the lower temperature (22°C) may be mainly environmental organisms.

The presence of a high number of TVCs can be associated with the presence of other more worrying organisms.

#### **Legionella**

Legionella / Legionellosis, the bacterial cause of Legionnaire's Disease is commonly linked with cooling towers and air conditioning units but it can also be found in Spas, due to the aeration and the operating temperature. If the infected particles are inhaled into the lungs, tissue damage can occur leading to a pneumonia type illness, which may be fatal.



#### **Pseudomonas**

Pseudomonas aeruginosa, one of the Pseudomonads, has been implicated in waterborne infection. It may cause ear infection, a skin rash, and possibly urine infections. The infections have been associated mostly with its presence in spas, Jacuzzis and other aerated waters because of the Pseudomonas highly aerobic growth requirement. Pseudomonads, in general, require higher levels of disinfection/ antiseptic than many other species to kill them.



#### **Coliforms**

The term 'Coliform' is a catch-all word for a large group of many different species of bacteria that share a few key characteristics, such as being Gram-negative bacilli and possessing the ability to break down lactose. A large number of the species concerned may be found in the bowel but some are found in the environment, particularly in plant material and soil.



#### **Streptococci**

These bacteria are specific inhabitants of the animal or human gut and are indicators of possible contamination with harmful bacteria. These bacteria tend to occur in large numbers and to survive longer than many harmful bacteria. Streptococci can cause pharyngitis, sinusitis, middle ear infection, food poisoning, puerperal fever, skin and wound infections.



#### **E. coli**

E. coli (full name Escherichia Coli) inhabits the animal bowel, including humans. Some strains of E. coli can cause gastrointestinal disease in themselves but its presence, while indicating faecal contamination, reveals the possibility of contamination of the water by other disease causing organisms excreted from the bowel.



## Site Summary

Stadbroke Health Centre is a two-storey medical practice in the centre of the village of Stadbroke, Eye. Typical surgery facilities are located throughout. Staff welfare facilities are also located on the ground floor. The health centre serves approximately 5700 patients. The surgery is open Monday to Friday.

Cold water services are supplied directly from the town mains. Hot water is supplied via multiple mains fed point of use water heaters.

No parts of the building or systems within were knowingly omitted from this assessment. The population profile of site staff is similar to that of the general public and will not contain a high percentage of people within at risk groups. It is thought that some of the site staff however will fall into at risk groups.

The population profile of visitors to site was not available however it is thought that most visitors to site will fall into high risk groups.

## Risk Assessment Summary

- There were no limitations placed on the execution of the assessment.
- No parts of the building or systems within were knowingly omitted from the assessment.
- Mains water enters the premises on the ground floor and rises up to supply all cold water services. Hot water is supplied by multiple mains fed point of use water heaters.
- A previous assessment was not made available for review and it is believed that this is the first to be carried out at the health centre.
- It has been recommended that this assessment is reviewed in May 2021 or sooner if the following occur:
  - changes to the water system or its use;
  - changes to the use of the building in which the water system is installed;
  - the availability of new information about risks or control measures;
  - the results of checks indicating that control measures are no longer effective;
  - changes to key personnel;
  - a case of legionnaires' disease/legionellosis associated with the system.

## POINTS FOR IMMEDIATE ATTENTION

- **Implementation of a control scheme**
- **Increase of hot water temperatures**
- **Awareness training for personnel involved in monitoring and maintenance of the water systems**
- **Descale all scaled outlets**



# RISK ASSESSMENT

## Water System Identification

System No.	Title / Site Ref.	Type of System	Plant / Equipment Summary & Location Details of Any Supplementary Control i.e. Chlorine Dioxide / UV Details of any Strainers & POU filters	Comments
1	MWS	Mains Water	Incoming mains is located in the old shower room on the ground level.	
2	HWS	POU	Supplied by a 10L water heater in Room 1.	<b>Attention required</b>
3	HWS	POU	Supplied by a 10L water heater in Treatment Room.	<b>Attention required</b>
4	HWS	POU	Supplied by a 10L water heater in Treatment Room.	<b>Attention required</b>
5	HWS	POU	Supplied by a 5L water heater in Room 3.	
6	HWS	POU	Supplied by a 10L water heater in the Reception.	
7	HWS	POU	Supplied by 10L water heater in the Dispensary.	<b>Attention required</b>
8	HWS	POU	Supplied by a 10L water heater in the Cleaner's Cupboard.	
9	HWS	Instantaneous Heater	Supplied by an oversink instantaneous heater in Entrance WC.	
10	HWS	Instantaneous Heater	Supplied by an oversink instantaneous heater in Staff WC.	

# RISK ASSESSMENT

## Management Regime & Nominated Authorities

	NAME	JOB TITLE	ADDRESS	TELEPHONE NUMBER
<b>OVERALL RESPONSIBLE PERSON / DUTY HOLDER</b>	Odile Wladon	Clerk	Stadbroke Parish Council Stradbroke Suffolk	07555 066147
<b>ENGINEERING SITE MAINTENANCE</b>	Contractors as needed organised via Stadbroke Parish Council			
<b>NOMINATED RESPONSIBLE PERSON</b>	Odile Wladon	Clerk	Stadbroke Parish Council Stradbroke Suffolk	07555 066147
<b>LOCAL COUNCIL</b>	Suffolk County Council		Suffolk County Council Endeavour House 8 Russel Road Ipswich IP1 2BX	0345 606 6067
<b>ENVIRONMENTAL HEALTH OFFICER</b>	Suffolk County Council		Suffolk County Council Endeavour House 8 Russel Road Ipswich IP1 2BX	0345 606 6067
<b>WATER TREATMENT CONTRACTOR</b>	<b>None Present</b>			
<b>CLEANING &amp; DISINFECTION CONTRACTOR</b>	<b>None Present</b>			
<b>NEAREST MEDICAL ASSISTANCE</b>	Ipswich Hospital		Heath Road Ipswich Suffolk IP4 5PD	01473 712233

# RISK ASSESSMENT

## Management regime, nominated authorities and current control scheme

### Data

Is a suitable and sufficient management regime in place and have all parties signed to ensure they understand their responsibilities?	<b>Yes but not signed</b>
Is management of the water system adequate?	<b>No</b>
Is an effective control scheme in place?	<b>No</b>
Are method statements available for all procedures in the control scheme?	<b>No</b>
Is the temperature monitoring carried out with a suitably calibrated thermometer?	<b>No</b>
Is the log book reviewed regularly by the responsible people and is this recorded?	<b>No</b>
Are all control measures adequately recorded in the site log book?	<b>No</b>
Are all personnel involved in the management and maintenance of the water systems suitably trained and competent?	<b>No</b>
Are any site water services supplied by a third party? i.e. a landlord?	No
Is there evidence that the water services supplied by the third party has a suitable and sufficient water hygiene programme in place compliant to ACOP L8 (Fourth edition) and HSG274 Part 2?	N/a
Are there adequate emergency procedures in place should a case of legionnaires disease become connected with the water system(s)?	<b>No</b>
Is a suitable escalation procedure in place should an adverse result be obtained?	<b>No</b>

# RISK ASSESSMENT

**If an adverse result has been found in the past:**

Were the correct actions taken and the correct communication chain invoked?	N/a
Were the actions taken within a reasonable time?	N/a
Were the results rechecked (after the action) to confirm conditions were back under control?	N/a
If the actions did not result in better control, was an escalation procedure invoked to help and ensure conditions were eventually controlled?	N/a
Were there lessons learned or a new procedure put in place to prevent recurrence?	N/a
Are all tasks undertaken by each assigned individual or party outlined clearly with the necessary frequency of the tasks?	<b>No</b>

## Management regime, nominated authorities and current control scheme

### Risk Assessment

A suitable and sufficient management regime has been identified but all parties have not signed to ensure that they understand and accept their responsibilities.

There is not an effective control scheme in place. A control scheme should be implemented and meet with the recommendations identified in HSG 274 Part 2.

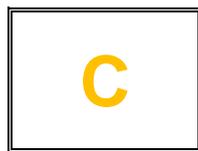
All control measures should be recorded in a site log book.

All personnel involved in the management and maintenance of the site's water systems should be suitably trained and evidence of this placed in the site log book.

Adequate emergency procedures are not in place should a case of legionnaires' disease become associated with the water systems. Emergency procedures should be identified to ensure the correct actions are taken in the event of a case of legionnaires' disease becoming associated with the water system.

Suitable escalation procedures are not in place should an adverse result be obtained. Escalation procedures should be identified to ensure the correct actions are taken should an adverse result be obtained

### Rating



- "A" - The risks are either inherently low, or are under adequate control, and are likely to remain low only if the necessary actions are carried out and maintained.
- "B" - The risks are increased due to system design, condition or operation, or shortcomings in risk control or management. Further action is required to reduce the risk. The risks tend to increase with time to medium risk.
- "C" - The risks are either inherent or are not fully under control, and are likely to increase with time to high risk. Control measures must be improved within an appropriate time-scale to ensure risks are minimised and brought under control.
- "D" - The risks are either inherent or are not under adequate control, leading to a significant risk of exposure to Legionella bacteria. Control measures must be urgently addressed, and maintained with diligence.

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

### Low Volume Local Water Heaters

Low storage volume heaters (ie no greater than 15 litres) such as instantaneous units and POU heaters, may be generally regarded as lower risk.

Low storage volume heaters serving hot water outlets should be able to achieve a peak temperature of 50–60 °C and where the thermostat is set at these temperatures for this purpose, staff and other users should be informed not to adjust the heater. A unit which is not capable of achieving this, eg a preset thermostat, should only be used where there is a very high turnover or an alternative control measure is in place.

Low storage volume heaters, which includes electric showers, often have spray nozzle outlets and these should be inspected, cleaned and descaled as part of the showerhead and hose cleaning regime.

If these units are not regularly used or set to supply warm water, the risk from legionella is likely to increase dramatically and may increase further, where the units are supplied from a cold water storage tank. The risk assessment should take into account the usage of the units, the susceptibility of those using the units and include a suitable monitoring regime where the risk is considered significant.

### Combination Units

Combination water heaters store a volume of cold water (ranging from 10–200 litres) above the hot water storage unit (ranging from 15–150 litres). In these units the cold water header tank feeds the hot water storage vessel as hot water is drawn from the system on demand. The cold water header tank is topped up directly from the cold water supply, usually via a float-operated valve. The combination water heater is usually fitted with an expansion pipe so that any expanding hot water returns into the cold water header tank. Expansion may also occur by the cold feed pipe

The design of a combination water heater may allow hot water to enter the cold water space. The Water Supply (Water Fittings) Regulations 1999,<sup>15</sup> the Scottish Water Byelaws 2004,<sup>16</sup> and BS 3198:1981 *Specification for copper hot water storage combination units for domestic purposes* recognise this and permit a maximum cold water storage temperature of 25°C where it is serving other domestic outlets or 38°C when serving the hot water vessel only. Careful consideration should be given to managing the risks from these types of systems and this should be reflected in the risk assessment. The thermostat should be set to as close to 60 °C as is practicable without exceeding it and hot water at the outlets should be at a minimum of 50 °C; correct setting of the thermostat and regular water usage is necessary to keep the temperature increase in the cold water to a minimum. Where this is not possible, eg during periods of low usage such as overnight or at weekends, fitting a timer which switches off the immersion heater may prove effective. The timer should be set to switch the immersion heater on again in time to ensure the water is heated sufficiently to achieve microbial control before use.

## Combination Boilers

These systems are typically found in smaller buildings such as domestic dwellings and small office buildings where cold water outlets are fed directly from the water supply without storage. Combination boilers or instantaneous water heaters provide hot water directly from the cold water supply by heating the water as it passes through the heater. These units supply continuous hot water at a rate that is usually limited by their power rating. High flow rates through the units can result in warm water leaving the heater before reaching the target temperature.

# RISK ASSESSMENT

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

Name/Asset ID	WH01
Location on site	Room 1
Make & model	Steeple
Access conditions	Accessible
Volume	10 Litres
Cold water supply source	Mains
Outlet temperature	<b>47.5</b>
Are the distribution temperatures from the unit at least 50°C (55°C in healthcare)	<b>No</b>
Is there any expansion vessel(s) associated with the unit?	No
Is the expansion vessel(s) subject to regular flushing where practicable?	N/a
Is it practicable to fit a suitable purge valve to allow flushing to take place?	N/a
Is the expansion vessel in an upright position?	N/a
Does it contain an integral CWST	No
Is the unit still required or relevant or can it be removed or substituted for a lower risk system?	Still Required

# RISK ASSESSMENT

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

Name/Asset ID	WH02
Location on site	Treatment Room
Make & model	Heatstore HS10U
Access conditions	Accessible
Volume	10 Litres
Cold water supply source	Mains
Outlet temperature	<b>50.7</b>
Are the distribution temperatures from the unit at least 50°C (55°C in healthcare)	<b>No</b>
Is there any expansion vessel(s) associated with the unit?	No
Is the expansion vessel(s) subject to regular flushing where practicable?	N/a
Is it practicable to fit a suitable purge valve to allow flushing to take place?	N/a
Is the expansion vessel in an upright position?	N/a
Does it contain an integral CWST	No
Is the unit still required or relevant or can it be removed or substituted for a lower risk system?	Still Required

# RISK ASSESSMENT

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

Name/Asset ID	WH03
Location on site	Treatment Room
Make & model	Steeple
Access conditions	Accessible
Volume	10 Litres
Cold water supply source	Mains
Outlet temperature	<b>50</b>
Are the distribution temperatures from the unit at least 50°C (55°C in healthcare)	<b>No</b>
Is there any expansion vessel(s) associated with the unit?	No
Is the expansion vessel(s) subject to regular flushing where practicable?	N/a
Is it practicable to fit a suitable purge valve to allow flushing to take place?	N/a
Is the expansion vessel in an upright position?	N/a
Does it contain an integral CWST	No
Is the unit still required or relevant or can it be removed or substituted for a lower risk system?	Still Required

# RISK ASSESSMENT

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

Name/Asset ID	WH04
Location on site	Room 3
Make & model	Stiebel Eltron SHU 5 S
Access conditions	Accessible
Volume	5 Litres
Cold water supply source	Mains
Outlet temperature	60 (pre TMV)
Are the distribution temperatures from the unit at least 50°C (55°C in healthcare)	Yes
Is there any expansion vessel(s) associated with the unit?	Yes
Is the expansion vessel(s) subject to regular flushing where practicable?	No
Is it practicable to fit a suitable purge valve to allow flushing to take place?	No
Is the expansion vessel in an upright position?	<b>No</b>
Does it contain an integral CWST	No
Is the unit still required or relevant or can it be removed or substituted for a lower risk system?	Still Required

# RISK ASSESSMENT

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

<b>Name/Asset ID</b>	WH05
<b>Location on site</b>	Reception
<b>Make &amp; model</b>	Steeple
<b>Access conditions</b>	Accessible
<b>Volume</b>	10 Litres
<b>Cold water supply source</b>	Mains
<b>Outlet temperature</b>	60°C
<b>Are the distribution temperatures from the unit at least 50°C (55°C in healthcare)</b>	Yes
<b>Is there any expansion vessel(s) associated with the unit?</b>	No
<b>Is the expansion vessel(s) subject to regular flushing where practicable?</b>	N/a
<b>Is it practicable to fit a suitable purge valve to allow flushing to take place?</b>	N/a
<b>Is the expansion vessel in an upright position?</b>	N/a
<b>Does it contain an integral CWST</b>	No
<b>Is the unit still required or relevant or can it be removed or substituted for a lower risk system?</b>	Still Required

# RISK ASSESSMENT

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

Name/Asset ID	WH06
Location on site	Dispensary
Make & model	Hyco HF05VCM
Access conditions	Accessible
Volume	5 Litres
Cold water supply source	Mains
Outlet temperature	<b>51</b>
Are the distribution temperatures from the unit at least 50°C (55°C in healthcare)	<b>No</b>
Is there any expansion vessel(s) associated with the unit?	No
Is the expansion vessel(s) subject to regular flushing where practicable?	N/a
Is it practicable to fit a suitable purge valve to allow flushing to take place?	N/a
Is the expansion vessel in an upright position?	N/a
Does it contain an integral CWST	No
Is the unit still required or relevant or can it be removed or substituted for a lower risk system?	Still Required

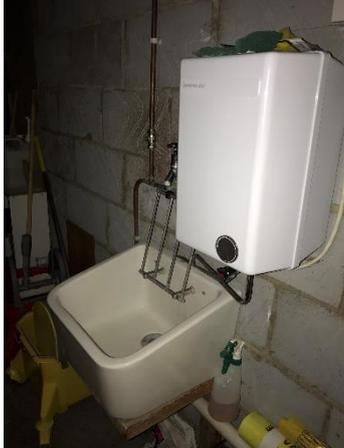
# RISK ASSESSMENT

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

<b>Name/Asset ID</b>	WH07
<b>Location on site</b>	Cleaner's Cupboard
<b>Make &amp; model</b>	Redring WS7
<b>Access conditions</b>	Accessible
<b>Volume</b>	10 Litres
<b>Cold water supply source</b>	Mains
<b>Outlet temperature</b>	61
<b>Are the distribution temperatures from the unit at least 50°C (55°C in healthcare)</b>	Yes
<b>Is there any expansion vessel(s) associated with the unit?</b>	No
<b>Is the expansion vessel(s) subject to regular flushing where practicable?</b>	N/a
<b>Is it practicable to fit a suitable purge valve to allow flushing to take place?</b>	N/a
<b>Is the expansion vessel in an upright position?</b>	N/a
<b>Does it contain an integral CWST</b>	No
<b>Is the unit still required or relevant or can it be removed or substituted for a lower risk system?</b>	Still Required

# RISK ASSESSMENT

## Low Volume Local Water Heaters, Combination Units & Combination Boilers

	
<p>WH01 in Room 1 (WH03 &amp; WH05 Identical Type)</p>	<p>WH02 in Treatment Room</p>
	
<p>WH04 in Room 3</p>	<p>WH06 in Dispensary</p>
	
<p>WH07 in Cleaner's Cupboard</p>	

## Water Services

Plant and water systems should be designed and constructed to be safe and without risks to health when used at work. Such hazards may be of a physical, chemical or microbial nature such as the risks associated with colonisation and growth of legionella bacteria within the water system. The type of system installed depends on the size and configuration of the building and the needs of the occupants, but the water systems should be designed, managed and maintained to comply with:

- the Construction (Design and Management) Regulations 2007 (CDM);<sup>18</sup>
- the Building Regulations 2010 (and associated amendments);<sup>19</sup>
- for systems provided with water from the public supply – for England and Wales, The Water Supply (Water Fittings) Regulations 1999 and for Scotland, the Scottish Water Byelaws 2004;
- for systems provided with water from private sources – The Private Water Supplies Regulations 2009;<sup>20</sup> The Private Water Supplies (Wales) Regulations 2010;<sup>21</sup> or The Private Water Supplies (Scotland) Regulations 2006;<sup>22</sup>
- BS EN 806 (Parts 1–5) *Specifications for installations inside buildings conveying water for human consumption*;<sup>23</sup>
- BS 8558:2011 *Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages*;<sup>24</sup>
- CIBSE Guide G *Public Health and Plumbing Engineering*.<sup>25</sup>

Any subsequent changes within buildings may result in modifications to water systems that incorporate features from different design styles and materials. Any modifications should comply with the requirements and standards in HSG 274 Part 2 paragraph 2.29 as if incorrectly designed, these can present a foreseeable risk of exposure to legionella.

### **Water system design considerations**

The design of the water systems should identify and take into account the following factors:

the source of the water must meet The Water Supply (Water Quality) Regulations 2001<sup>26</sup> or The Private Water Supplies Regulations 2009 and equivalent legislation for Wales and Scotland and must be wholesome at draw-off points;

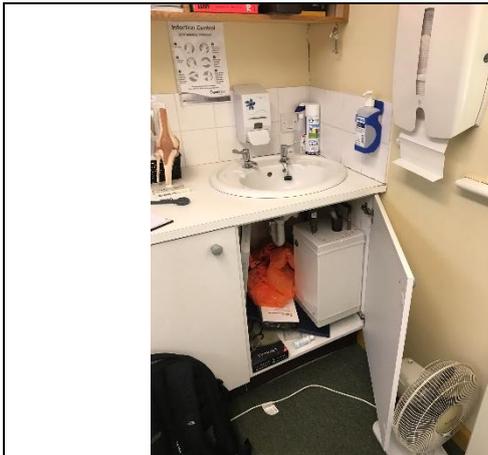
water components that may increase the risk of colonisation, eg blending valves, flexible hoses etc;

the potential for stagnation leading to microbial growth where buildings are not to be fully occupied immediately or where systems are commissioned as occupation occurs, eg infrequently or intermittently used buildings.

A well-designed system should incorporate the following points:

an adequate supply of hot and cold water available, particularly at periods of peak demand, while avoiding excessive storage. In buildings where stored water is not essential, consideration should be given to direct mains systems with local POU water heaters;

## Water Services



Typical Basin in Medical Room



Sink in Treatment Room



Scaled Outlet



Staff WC with Oversink Instantaneous Heater



Patient WC with Oversink Instantaneous Heater



Aerosol Created from Outlet

## Site Asset Register

System No	Floor	Location	Spray Inserts Present / Aerosol Created	No. of cold outlets	No. of hot outlets	Shower & Type	Other items/Comments/Non-conformances or other observations	*Non-WRAS flexi hoses present?	No. of TMV's present	Temperature (°C)							
										Mains Water	Cold Water	Hot Water	TMV Inlet Cold	TMV Inlet Hot	TMV Outlet	Shower Cold	Shower Hot
1 & 9	G	Entrance WC	Y	1	1		Aerosol created	N	0	14		30					
1 & 2	G	Room 1	N	1	1			N	0	13		47.5					
1 & 3	G	Room 2	N	1	1			N	0	14		44.7					
1 & 5	G	Room 3	N	1	1			N	1	14			14	60	37		
1 & 3	G	Treatment Room (Outlet 1)	Y	1	1		Aerosol created	N	0	13		47					
1 & 4	G	Treatment Room (Outlet 2)	N	1	1			N	0	13		50.7					
1 & 3	G	Disabled WC	Y	1	1		TMV Mixer Tap Aerosol created	N	1	16		27					
1 & 10	G	Staff WC	N	1	1			N	0	14		30					
1 & 6	G	Reception	N	1	1			N	0	13		60					
1 & 7	G	Dispensary	N	1	1			Y	0	14		51					
1 & 8	G	Cleaners Cupboard	N	1	1			N	0	14		61					

**Key:**

N: No

Y: Yes

U: Unsatisfactory

S: Satisfactory

TB: Tea Boiler

WM: Washing Machine

DW: Dishwasher

VM: Vending Machine

DF: Drinking Fountain

\* healthcare premises are advised against the use of ethylene propylene diene monomer (EPDM) lined flexible hoses (tails) as these have been shown to be a risk of microbial colonisation

# RISK ASSESSMENT

## Hot and Cold Water Services Recommended Testing & Maintenance Programme

**(Extracted from HSG 274 Part 2**

Service	Action to take	Frequency
<b>Calorifiers</b>	<p>Inspect calorifier internally by removing the inspection hatch or using a boroscope and clean by draining the vessel. The frequency of inspection and cleaning should be subject to the findings and increased or decreased based on conditions recorded</p> <p>Where there is no inspection hatch, purge any debris in the base of the calorifier to a suitable drain Collect the initial flush from the base of hot water heaters to inspect clarity, quantity of debris, and temperature</p> <p>Check calorifier flow temperatures (thermostat settings should modulate as close to 60 °C as practicable without going below 60 °C) Check calorifier return temperatures (not below 50 °C).</p>	<p>Annually, or as indicated by the rate of fouling</p> <p>Annually, but may be increased as indicated by the risk assessment or result of inspection findings</p> <p>Monthly</p>
<b>Hot water services</b>	<p>For non-circulating systems: take temperatures at sentinel points (nearest outlet, furthest outlet and long branches to outlets) to confirm they are at a minimum of 50 °C within one minute (55 °C in healthcare premises)</p> <p>For circulating systems: take temperatures at return legs of principal loops (sentinel points) to confirm they are at a minimum of 50 °C (55 °C in healthcare premises). Temperature measurements may be taken on the surface of metallic pipework</p> <p>For circulating systems: take temperatures at return legs of subordinate loops, temperature measurements can be taken on the surface of pipes, but where this is not practicable, the temperature of water from the last outlet on each loop may be measured and this should be greater than 50 °C within one minute of running (55 °C in healthcare premises). If the temperature rise is slow, it should be confirmed that the outlet is on a long leg and not that the flow and return has failed in that local area</p> <p>All HWS systems: take temperatures at a representative selection of other points (intermediate outlets of single pipe systems and tertiary loops in circulating systems) to confirm they are at a minimum of 50 °C (55 °C in healthcare premises) to create a temperature profile of the whole system over a defined time period</p>	<p>Monthly</p> <p>Monthly</p> <p>Quarterly (ideally on a rolling monthly rota)</p> <p>Representative selection of other sentinel outlets considered on a rotational basis to ensure the whole system is reaching satisfactory temperatures for legionella control</p>
<b>POU water heaters (no greater than 15 litres)</b>	<p>Check water temperatures to confirm the heater operates at 50–60 °C (55 °C in healthcare premises) or check the installation has a high turnover</p>	<p>Monthly–six monthly, or as indicated by the risk assessment</p>

# RISK ASSESSMENT

Service	Action to take	Frequency
<b>Combination water heaters</b>	Inspect the integral cold water header tanks as part of the cold water storage tank inspection regime, clean and disinfect as necessary. If evidence shows that the unit regularly overflows hot water into the integral cold water header tank, instigate a temperature monitoring regime to determine the frequency and take precautionary measures as determined by the findings of this monitoring regime	Annually
	Check water temperatures at an outlet to confirm the heater operates at 50–60 °C	Monthly
<b>Cold water tanks</b>	Inspect cold water storage tanks and carry out remedial work where necessary	Annually
	Check the tank water temperature remote from the ball valve and the incoming mains temperature. Record the maximum temperatures of the stored and supply water recorded by fixed maximum/minimum thermometers where fitted	Annually (Summer) or as indicated by the temperature profiling
<b>Cold water services</b>	Check temperatures at sentinel taps (typically those nearest to and furthest from the cold tank, but may also include other key locations on long branches to zones or floor levels). These outlets should be below 20 °C within two minutes of running the cold tap. To identify any local heat gain, which might not be apparent after one minute, observe the thermometer reading during flushing	Monthly
	Take temperatures at a representative selection of other points to confirm they are below 20 °C to create a temperature profile of the whole system over a defined time period. Peak temperatures or any temperatures that are slow to fall should be an indicator of a localised problem	Representative selection of other sentinel outlets considered on a rotational basis to ensure the whole system is reaching satisfactory temperatures for legionella control
	Check thermal insulation to ensure it is intact and consider weatherproofing where components are exposed to the outdoor environment	Annually
<b>Showers and spray taps</b>	Dismantle, clean and descale removable parts, heads, inserts and hoses where fitted	Quarterly or as indicated by the rate of fouling or other risk factors, eg areas with high risk patients
<b>POU filters</b>	Record the service start date and lifespan or end date and replace filters as recommended by the manufacturer (0.2 µm membrane POU filters should be used primarily as a temporary control measure while a permanent safe engineering solution is developed, although long-term use of such filters may be needed in some healthcare situations)	According to manufacturer's guidelines
<b>Base exchange softeners</b>	Visually check the salt levels and top up salt, if required. Undertake a hardness check to confirm operation of the softener	Weekly, but depends on the size of the vessel and the rate of salt consumption
	Service and disinfect	Annually, or according to manufacturer's guidelines

# RISK ASSESSMENT

Service	Action to take	Frequency
<b>Multiple use filters</b>	Backwash and regenerate as specified by the manufacturer	According to manufacturer's guidelines
<b>Infrequently used outlets</b>	Consideration should be given to removing infrequently used showers, taps and any associated equipment that uses water. If removed, any redundant supply pipework should be cut back as far as possible to a common supply (eg to the recirculating pipework or the pipework supplying a more frequently used upstream fitting) but preferably by removing the feeding 'T' Infrequently used equipment within a water system (ie not used for a period equal to or greater than seven days) should be included on the flushing regime Flush the outlets until the temperature at the outlet stabilises and is comparable to supply water and purge to drain Regularly use the outlets to minimise the risk from microbial growth in the peripheral parts of the water system, sustain and log this procedure once started For high risk populations, eg healthcare and care homes, more frequent flushing may be required as indicated by the risk assessment	Weekly, or as indicated by the risk assessment
<b>TMVs</b>	Risk assess whether the TMV fitting is required, and if not, remove Where needed, inspect, clean, descale and disinfect any strainers or filters associated with TMVs To maintain protection against scald risk, TMVs require regular routine maintenance carried out by competent persons in accordance with the manufacturer's instructions. There is further information in paragraphs 2.152– 2.168	Annually or on a frequency defined by the risk assessment, taking account of any manufacturer's recommendations
<b>Expansion vessels</b>	Where practical, flush through and purge to drain. Bladders should be changed according to the manufacturer's guidelines or as indicated by the risk assessment	Monthly–six monthly, as indicated by the risk assessment

# RISK ASSESSMENT

## Hot and Cold Water Services Microbiological Activity Action Levels (Extracted from HSG 274 Part 2)

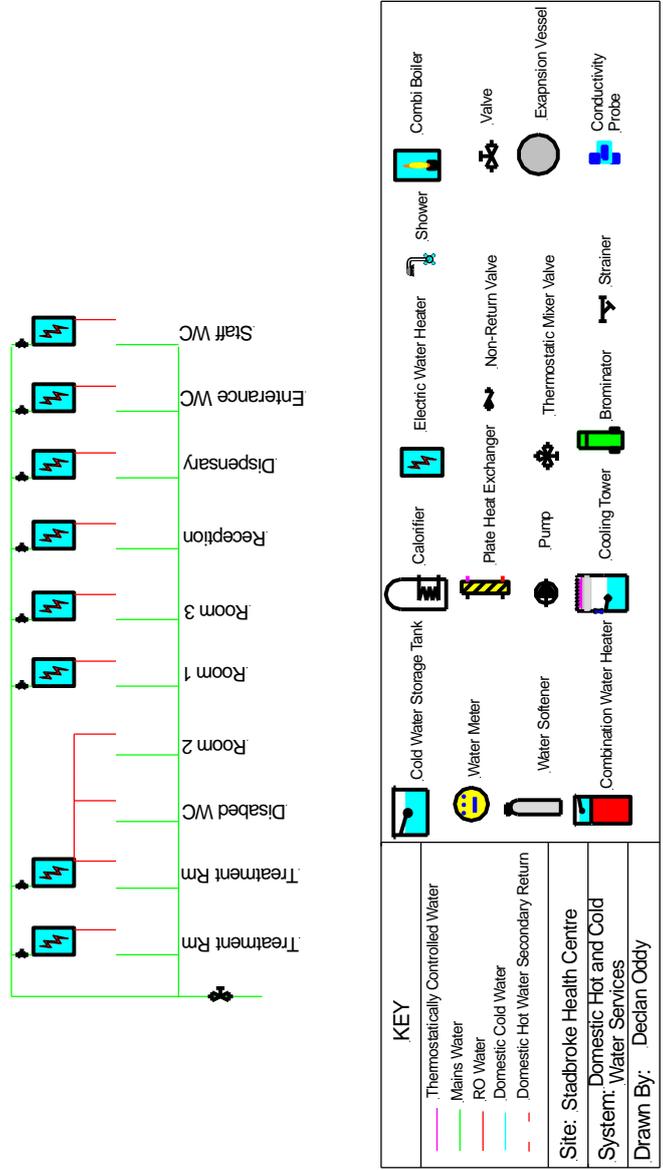
Legionella bacteria (cfu/l)	Recommended actions
>100 cfu/l and up to 1000	<p>Either:</p> <ul style="list-style-type: none"> <li>if the minority of samples are positive, the system should be resampled. If similar results are found again, a review of the control measures and risk assessment should be carried out to identify any remedial actions necessary or</li> <li>if the majority of samples are positive, the system may be colonised, albeit at a low level. An immediate review of the control measures and risk assessment should be carried out to identify any other remedial action required. Disinfection of the system should be considered</li> </ul>
>1000 cfu/l	The system should be resampled and an immediate review of the control measures and risk assessment carried out to identify any remedial actions, including possible disinfection of the system. Retesting should take place a few days after disinfection and at frequent intervals afterwards until a satisfactory level of control is achieved.

Actions to be taken following legionella sampling in hot and cold water systems in healthcare premises with susceptible patients

Legionella bacteria (cfu/l)	Recommended actions
Not detected or up to 100 cfu/l	In healthcare, the primary concern is protecting susceptible patients, so any detection of legionella should be investigated and, if necessary, the system resampled to aid interpretation of the results in line with the monitoring strategy and risk assessment
>100 cfu/l and up to 1000 cfu/l	<p>Either:</p> <ul style="list-style-type: none"> <li>if the minority of samples are positive, the system should be resampled. If similar results are found again, review the control measures and risk assessment to identify any remedial actions necessary or</li> <li>if the majority of samples are positive, the system may be colonised, albeit at a low level. An immediate review of control measures and a risk assessment should be carried out to identify any other remedial action required. Disinfection of the system should be considered</li> </ul>
>1000 cfu/l	The system should be resampled and an immediate review of the control measures and risk assessment carried out to identify any remedial actions, including possible disinfection of the system. Retesting should take place a few days after disinfection and at frequent intervals thereafter until a satisfactory level of control is achieved

# RISK ASSESSMENT

## WATER SERVICES SCHEMATIC



All schematics are drawn using the best information available at the time of the assessment. Whilst every effort has been made to ensure that schematic diagrams are as accurate as possible, Managed Water Services Ltd cannot guarantee their accuracy.



## CERTIFICATE OF TRAINING

This is to certify that

*Declan Oddy*

**Attended the course  
Test Score 78% Pass**

### **Legionella Risk Assessment in Practice**

Course Content:  
Legionella Awareness  
Risk Assessment theory  
Scoping & planning a risk assessment  
Undertaking a risk assessment (BS8580:2010)  
Risk assessment reporting

Course date: 24<sup>th</sup> November 2015

For and on behalf of:  
Axiom Water Consultancy Ltd.

Simon Hughes

A handwritten signature in blue ink, appearing to read 'Simon Hughes', is positioned above the printed name.

Axiom Water Consultancy Registered in England 7048917 Contact Phone: +44 780 164 0139  
Email [simonhughes@axiomwater.com](mailto:simonhughes@axiomwater.com)

WE CAN CONFIRM THAT THE ASSESSOR IS COMPETENT TO UNDERTAKE  
THE TASK

## ACTION TO BE TAKEN IN THE EVENT OF LEGIONELLA CONTAMINATION OR AN OUTBREAK

Extracted from HSG 274 parts 1 & 2:

1. In England and Wales, legionnaires' disease is notifiable under the Health Protection (Notification) Regulations 201036 and in Scotland under the Public Health (Notification of Infectious Diseases) (Scotland) Regulations 1988.37 Under these Regulations, human diagnostic laboratories must notify Public Health England (PHE), Public Health Wales (PHW) or Health Protection Scotland (HPS) (see 'Further sources of advice') of microbiologically confirmed cases of legionnaires' disease.
2. An outbreak is defined as two or more cases where the onset of illness is closely linked in time (weeks rather than months) and where there is epidemiological evidence of a common source of infection, with or without microbiological evidence. An incident/outbreak control team should always be convened to investigate outbreaks. It is the responsibility of the Proper Officer to declare an outbreak. The Proper Officer, appointed by the Local Authority, is usually a Consultant in Communicable Diseases Control (CCDC) in England and Wales, or the Consultant in Public Health Medicine (CPHM) in Scotland. If there are suspected cases of the disease, medical practitioners must notify the Proper Officer in the relevant local authority.
3. Local Authorities will have jointly established incident plans to investigate major outbreaks of infectious diseases, including legionellosis, and it is the Proper Officer who activates these and invokes an Outbreak Committee, whose primary purpose is to protect public health and prevent further infection.
4. HSE or local Environmental Health Officers may be involved in the investigation of outbreaks, their aim being to pursue compliance with health and safety legislation. The local authority, Proper Officer or EHO acting on their behalf will make a visit for public health reasons, often with the relevant officer from the enforcing authorities (ie HSE or the local authority) for health and safety reasons. Any infringements of relevant legislation may be subject to a formal investigation by the appropriate enforcing authority.
5. There are published guidelines (by PHE, PHW and HPS) for the investigation and management of incidents, clusters, and outbreaks of legionnaires' disease in the community.
6. These are, for England and Wales, *Guidance on the Control and Prevention of Legionnaires' Disease in England*<sup>38</sup> and for Scotland, *Guidelines on Management of Legionella Incidents, Outbreaks and Clusters in the Community*.
7. If a water system is implicated in an outbreak of legionnaires' disease, emergency treatment of that system should be carried out as soon as possible. This will usually involve the processes detailed in HSG 274 Part 2 paragraphs 2.124–2.135.
8. If a cooling water system has been implicated in an outbreak of legionnaires' disease, emergency disinfection and cleaning of that system must take place as soon as possible, in accordance with the site incident plan.

# RISK ASSESSMENT

## Legionella in Systems

The following nominated responsible person(s) should be informed of the Serotype and number of bacteria.

Name	Job Title	Telephone No (Work)	Secondary contact (Email/Mob)
Odile Wladon	Clerk	07555 066147	stradbrokepc@outlook.com

Institute clean and disinfection of the vessel and all the down services leading from the vessel. Care must be taken especially to clean and disinfect showerheads.

Re-test the system following cleaning and disinfection.  
Re-assess the routine maintenance regime/system design.

## RISK ASSESSMENT

### Suspected Case of Legionnaires' Disease

The following nominated responsible person(s) should be informed of the Serotype and number of bacteria if known at the time. Also advise of the number of suspect cases where they are.

Name	Job Title	Telephone No (Work)	Secondary contact (Email/Mob)
Odile Wladon	Clerk	07555 066147	stradbrokepc@outlook.com

The nominated responsible person(s) will then inform the Environmental Health Officer/Health and Safety Executive and ask for their immediate advice and assistance. It is normal for them to send in a team to investigate and rectify the problem. It is important for them to be able to trace where the disease has come from. Do not drain any systems until told to do so.

**BUT DO ISOLATE them from service.**

Do not speak to anyone about the problem other than the named contacts. Do not make any comment to the press

## GLOSSARY OF TERMS

*Extracted from ACOP L8*

<b>Aerosol</b>	A suspension in a gaseous medium of solid particles, liquid particles or solid and liquid particles having negligible falling velocity.
<b>Algae</b>	A small, usually aquatic, plant which requires light to grow, often found on exposed areas of <b>cooling towers</b> .
<b>Air-conditioning</b>	A form of air treatment whereby temperature humidity and air cleanliness are all controlled within limits determined by the requirements of the air-conditioned enclosure.
<b>Antibodies</b>	Substances in the blood which destroy or neutralise various toxins or <b>components of bacteria</b> known generally as antigens. The antibodies are formed as a result of the introduction into the body of the antigen to which they are antagonistic, as in all infectious diseases.
<b>Bacteria</b>	(Singular: bacterium) a microscopic, unicellular (or more rarely, multicellular) organism.
<b>Biocide</b>	A substance which kills <b>micro-organisms</b> .
<b>Biofilm</b>	A community of <b>bacteria</b> and other <b>micro-organisms</b> , embedded in a protective layer with entrained debris, attached to a surface.
<b>Blow-down/bleed-off</b>	Water discharged from the system to control the concentration of salts or other impurities in the circulating water, usually expressed as a percentage of recirculating water flow.
<b>Calorifier</b>	An apparatus used for the transfer of heat to water in a vessel by indirect means, the source of heat being contained within a pipe or coil immersed in the water.

## GLOSSARY OF TERMS

*Extracted from ACOP L8*

<b>Chlorine</b>	An element used in <b>disinfection</b> .
<b>Cold water service (CWS)</b>	Installation of plant pipes and fittings in which cold water is stored, distributed and subsequently discharged.
<b>Cooling tower</b>	An apparatus through which warm water is discharged against an air stream; in doing so, part of the water is evaporated to saturate the air and this cools the water. The cooler water is usually pumped to a heat exchanger to be reheated and recycled through the tower.
<b>Concentration factor</b>	Compares the level of dissolved solids in the cooling water with that dissolved in the <b>make-up water</b> (also known as cycle of concentration). Usually determined by comparison of either the chloride or magnesium hardness concentration.
<b>Corrosion inhibitors</b>	Chemicals, which protect metals by: (a) passivating the metal by the promotion of a thin metal oxide film (anodic inhibitors); or (b) physically forming a thin barrier film by controlled deposition (cathodic inhibitors).
<b>Dead end/blind end</b>	A length of pipe closed at one end through which no water passes.
<b>Dead-leg</b>	Pipes leading to a fitting through which water only passes when there is draw-off from the fitting.
<b>Dip slide(s)</b>	A dip slide is a means of testing the microbial content of liquids. It consists of a plastic carrier bearing a sterile culture medium which can be dipped in the liquid to be sampled. It is then incubated to allow microbial growth. The resulting microbial colonies are estimated by reference to a chart.

## GLOSSARY OF TERMS

*Extracted from ACOP L8*

<b>Disinfection</b>	A process which destroys or irreversibly inactivates <b>micro-organisms</b> and reduces their number to a non-hazardous level.
<b>Distribution circuit</b>	Pipework which distributes water from hot or cold water plant to one or more fittings/appliances.
<b>Domestic water services (DWS)</b>	Hot and cold water intended for personal hygiene, culinary, drinking water or other domestic purposes.
<b>Drift</b>	Circulating water lost from the tower as liquid droplets entrained in the exhaust air stream; usually expressed as a percentage of circulating water flow, but for more precise work it is parts of water per million by weight of air for a given liquid to gas ratio.
<b>Drift eliminator</b>	More correctly referred to as drift reducers or minimisers - equipment containing a complex system of baffles designed to remove water droplets from <b>cooling tower</b> air passing through it.
<b>Evaporative condenser</b>	A heat exchanger in which refrigerant is condensed by a combination of air movement and water sprays over its surface.
<b>Evaporative cooling</b>	A process by which a small portion of a circulating body of water is caused to evaporate, thereby taking the required latent heat of vaporisation from the remainder of the water and cooling it.
<b>Fill/Packing</b>	That portion of a <b>cooling tower</b> which constitutes its primary heat transfer surface: sometimes called ' <b>packing</b> ' or ' <b>pack</b> '.

## GLOSSARY OF TERMS

*Extracted from ACOP L8*

<b>Fouling</b>	Organic growth or other deposits on heat transfer surfaces causing loss in efficiency.
<b>Half-life</b>	Ratio of system volume to purge rate.
<b>Hot water service (HWS)</b>	Installation of plant, pipes and fittings in which water is heated, distributed and subsequently discharged (not including cold water feed tank or cistern).
<b>Legionnaires disease</b>	A form of pneumonia caused by <b>legionella</b> bacteria.
<b>Legionellae</b>	The genus <b>legionella</b> belongs to the family legionellaceae, which has over 40 species. These are ubiquitous in the environment and found in a wide spectrum of natural and artificial collections of water.
<b>Legionella</b>	Type of aerobic <b>bacterium which</b> is found predominantly in warm water environments, (singular of <b>legionellae</b> ).
<b>L. pneumophila</b>	One of the causative organisms of <b>Legionnaires</b> disease.
<b>Legionellosis</b>	Any illness caused by exposure to <b>legionella</b> .
<b>Pontiac fever</b>	<b>A</b> disease caused by species of legionella, an upper respiratory illness less severe than <b>Legionnaires disease</b> .
<b>Make-up water</b>	Water, which is added to a cooling water system to compensate for wastage (e.g. via system leaks), evaporative loss and bleed.
<b>Micro-organism</b>	An organism of microscopic size including <b>bacteria</b> , fungi and viruses.

## GLOSSARY OF TERMS

*Extracted from ACOP L8*

<b>Non-oxidising biocide</b>	A non-oxidising biocide is one that functions by mechanisms other than oxidation, including interference with cell metabolism and structure.
<b>Nutrient</b>	A food source for <b>micro-organisms</b> .
<b>Oxidising biocide</b>	Agents capable of oxidising organic matter, e.g. cell material, enzymes or proteins, which are associated with microbiological populations resulting in death of the micro-organisms. The most commonly used oxidising biocides are based on chlorine or bromine (halogens), which liberate hypochlorous or hypobromous acids on hydrolysis in water. The exception is chlorine dioxide, a gas that does not hydrolyse but which functions in the same way.
<b>Pasteurisation</b>	Heat treatment to destroy <b>micro-organism</b> usually at high temperature
<b>Planktonic</b>	Free floating micro-organisms in an aquatic system.
<b>ppm</b>	Parts per million: a measure of dissolved substances given as the number of parts there are in a million parts of solvent. It is numerically equivalent to milligrams per litre mg/l with respect to water.
<b>Pond/Sump</b>	Collection of cooling water at the base of a cooling tower.
<b>Retention time</b>	Time a chemical is retained in the system.
<b>Risk assessment</b>	Identifying and assessing the risk from <b>legionellosis</b> from work activities and water sources on premises and determining any necessary precautionary measures.

## GLOSSARY OF TERMS

*Extracted from ACOP L8*

<b>Scale inhibitors</b>	Chemicals used to control scale. They function by holding up the precipitation process and/or distorting the crystal shape, thus preventing the build-up of a hard adherent scale.
<b>Sero-group</b>	A sub-group of the main species.
<b>Sentinel taps</b>	For a hot water services - the first and last taps on a recirculating system. For cold water systems (or non-recirculating hot water systems), the nearest and furthest taps from the storage tank. The choice of sentinel taps may also include other taps which are considered to represent a particular risk.
<b>Sessile</b>	Aquatic micro-organisms adhering to a surface normally as part of a biofilm.
<b>Sludge</b>	A general term for soft mud-like deposits found on heat transfer surfaces or other important sections of a cooling system. Also found at the base of calorifiers and cold water storage tanks.
<b>Shunt pump</b>	A circulation pump fitted to hot water service/plant to overcome the temperature stratification of the stored water.
<b>Slime</b>	A mucus-like exudate, which covers a surface produced by some <b>micro-organisms</b> .
<b>Stagnation</b>	The condition where water ceases to flow and is therefore liable to microbiological growth.

# RISK ASSESSMENT

## GLOSSARY OF TERMS

*Extracted from ACOP L8*

<b>Strainers</b>	A coarse filter usually positioned upstream of a sensitive component such as a pump control valve or heat exchanger to protect it from debris.
<b>Thermal disinfection</b>	Heat treatment to disinfect a system.
<b>Thermostatic mixing valve</b>	Mixing valve in which the temperature at the outlet is pre-selected and controlled automatically by the valve.
<b>Total viable counts (TVC)</b>	The total number of culturable <b>bacteria</b> (per volume or area) in a given sample (does not include legionella).
<b>Windage</b>	Physical loss of water from a <b>cooling tower</b> caused by draught of air or wind. Water is lost around the base of the cooling tower as a result of cross winds as opposed to <b>drift</b> .