Domestic Services Risk Assessment & Written Scheme for the Control and Prevention of Legionellosis

Carried out at

Tendering District Council
Dovercourt Lifestyles Leisure Centre
Wick Lane
Harwich
CO12 3TA

Date of Assessment: **7th December 2021**

Date Review Due: **Regularly and where the existing assessment may no longer be Valid - See page 8. (A formal review is advised after 2 years)**

Assessment No: 12618SI

REPORT	SIGNATURE	NAME	DATE
Prepared & checked by:	S Icke	Soph Icke	09/12/2021
Reviewed by	D Icke	Daniel Icke	09/12/2021
Recommended Review Date: December 2023			

Legionella Risk Assessment Survey Report

This report was carried out in accordance with the Approved Code of Practice issued by the Health & Safety Executive and should be read in conjunction with the Site Logbook and written scheme for the prevention of legionella.

Survey and report carried out by - ***Soph Icke of Beacon Water Treatments Ltd***

This Risk Assessment was carried out by Soph Icke, of Beacon Water Treatments Ltd, who has over 11 years relevant experience with water related building services and who has successfully completed the *W024 Practical Legionella Risk Assessment of Water Systems* course run by The Water Management Society and attended internal training conferences. A copy of the certificates awarded are available on request.

This risk assessment will highlight any significant risks that the consultant feels are relevant for the control of Legionella Bacteria at this site – Namely: **Tendring District Council – Dovercourt Lifestyles Leisure Centre.**

Due to operational circumstances and the design of the water system, not all pipework could be fully traced, however, pipework was seen to be well installed and followed predictable pathways and as such we have confidently presumed some pipework runs.

While carrying out this survey all efforts have been made to identify any deadlegs on site and any low used areas.

All temperatures obtained in this report are relevant only to the date of the survey (7th December 2021). All temperatures obtained during the survey were taken prior to TMV's (where fitted). Temperatures have also obtained from subordinate return loops where found.

A simple asset register has been created to highlight all areas assessed within the survey. any such areas.

Executive Summary		
Site Name	TDC Dovercourt Lifestyles Leisure Centre Wick Lane Harwich CO12 3TA	
Site Contacts	James Prior Sports Facilities Manager	
Period of Use	Daily: 07.00 – 21.00	
Approximate number of occupants	Varies daily	
Site/Building Description	Dovercourt Lifestyles is a two storey leisure centre which comprises a swimming pool, a gym, studios and all weather pitch with changing rooms	
Areas Assessed	Whole building	
Areas Excluded	N/A	
Areas/Items of Concern outside of the scope of the legionella risk assessment	None noted	
Overall Site Risk Rating	**1**	Completion of remedials will reduce the risk significantly

Site Water Systems Overview

Type of System / Component	Present Y/N	Details
Cooling towers / evaporative condensers	N	
Cold water mains supply to site	Y	MCW Inlet 1: Boiler room
Other water supply to site – borehole etc.	N	
Cold water storage tanks (CWST)	Y	CWST 1: Plant room CWST 2: Plant room high level CWST 3: Plant room high level CWST 4: Plant room high level CWST 5: Above changing room 3 & 4 CWST 6: Cleaners cupboard
Calorifiers / Plate Heat Exchangers (PHE)	Y	CAL 1: Plant room CAL 2: Boiler room
Point-of-use / local electric water heaters	Y	EWH 1: Staff room
Showers	Y	Gym female change x 2 Gym male change x 2 Accessible change x 2 Poolside x 7 Changing room 1 & 2 x 8 Changing room 3 & 4 x 8
Taps/outlets incorporating spray fittings	N	
Water softening plant	Y	Pool plant room
Air Handling Units (with cooling coils)	N	
Air humidification plant	N	
Water features	N	
Closed heating systems	Y	Boiler room
Closed chilled systems	N	
Other water systems	N	

Legionella Control Management - Responsibilities

Responsibility	Name/Role	Contact Details
Duty Holder ***Person to whom the statutory duty for legionella falls***	Ian Davidson	01255 686868
Nominated Responsible Person ***Nominated by the Duty Holder with overall responsibility for legionella control***	James Prior	01255 686176
Deputy Responsible Person ***Deputy for the Responsible Person***	Shaun Williams	01255 686176
Engineering Site Maintenance ***Responsible for site weekly checks***		
Deputy Engineering Site Maintenance ***Responsible for site weekly checks***		
Water Treatment Service Engineer	**Beacon Water Treatments Ltd**	**Unit 4 Parsons Hall Industrial Estate High Street Irchester NN29 7AB 01933 410066**
Water Treatment Contractor	**Beacon Water Treatments Ltd**	**Unit 4 Parsons Hall Industrial Estate High Street Irchester NN29 7AB 01933 410066**

Legionella Control Management - Training – Competence Assessment

Are up-to-date training records present for personnel assigned responsibility for Legionella Management and Control?	
Responsible Person	Yes
Deputy Responsible Person	Yes
On-site personnel	Yes
External Contractors	Yes
Is there a training matrix in place to regularly review training requirements?	Yes
Are the competency of external contractors' subject to regular audits?	Yes
Do assigned personnel demonstrate competence in conducting their assigned responsibilities?	
Responsible Person	Yes
Deputy Responsible Person	Yes
On-site personnel	Yes
External Contractors	Yes

Legionella Control Planned Preventative Maintenance (PPM) Tasks - General

Question	Answer	Question	Answer
Is there a legionella control logbook on site	Yes	**Is the logbook site specific and compliant with all legionella control measures on site**	Yes
Are PPM tasks undertaken?	Yes	**Are PPM tasks suitable for controlling the Legionella risk?**	Yes
Responsibility of conducting the PPM tasks.	Yes	**How are PPM tasks recorded / documented?**	Yes
Do PPM task records clearly define when task was conducted & by whom?	Yes	**Are fault management procedures clearly defined?**	Yes
Are equipment calibration certificates present?	Yes	**Are historical PPM task records present (at least the last 5 years)?**	Yes

Legionella Control Planned Preventative Maintenance (PPM) Tasks - General

Water Services System	Task	Current frequency	Records present	Recommended frequency
Distribution	Flushing of infrequently used outlets / dead legs	Weekly	Yes	**Weekly**
Distribution	Temperature monitoring of hot & cold sentinel outlets	Monthly	Yes	**Monthly**
Distribution	Temperature monitoring of hot and cold representative outlets	Monthly	Yes	**Monthly** **Annual Rotational**
Calorifiers (hot water cylinders)	Temperature monitoring of the flow and return (where applicable)	Monthly	Yes	**Monthly**
Calorifiers (hot water cylinders)	General inspection (including internal inspection or drain flush if applicable)	Annual	Yes	**Annually**
Point of Use water Heaters	Temperature monitoring of flow	N/A	N/A	**Monthly**
Cistern Water Heaters	General inspection (including internal inspection of cold feed section)	N/A	N/A	**Annually**

Legionella Control Planned Preventative Maintenance (PPM) Tasks - General

Water Services System	Task	Current frequency	Records present	Recommended frequency
Cold Water storage Tanks	General inspection	6 monthly	Yes	**Annually**
Cold Water storage Tanks	Clean & Disinfection	As required	Yes	**As Required**
Thermostatic Mixing Valves	Temperature monitoring (inlets and blended outlet)	Monthly	Yes	**Monthly**
Thermostatic Mixing Valves	General inspection	Annually	Yes	**Annually**
Thermostatic Mixing Valves	Fail-safe check	Annually	Yes	**Annually**
Thermostatic Mixing Valves	Clean and disinfection	Annually	Yes	**Annually**
Thermostatic Mixing Valves	Strainers	Annually	Yes	**Annually**
Showerheads & Kitchen Pot Spray	General inspection, clean/descale & disinfection	Monthly	Yes	**Quarterly**

Assessment of Risk

RISK potential	Result
Is there a previous legionella risk assessment on site – can it be reviewed	Yes – Dated August 2019
Are there schematic drawings/O&M drawings of the domestic water systems on site – can they be reviewed	Yes – Dated August 2019
Is there a site specific written scheme present	Yes
Have all of the remedial actions from the previous LRA been completed and signed off	Yes
Has an outbreak or case of legionellosis been identified as having been caused by inhalation of water from the system?	No
Is there a history of legionella being found in the system?	Yes
Are susceptible people using services, e.g., hospital, nursing home or accessible to the general public?	Yes
Is there a low turnover of water: excessive storage, vacant areas, and little used outlets?	No. All outlets flushed
Are there complex system(s)?	No
Are there old system(s)?	No
Does the system have history of little or no maintenance?	No
Has a lower risk system been considered	Yes

Remedial Action List

The classification of Risk in this Assessment has been applied using the following criteria illustrated in the table below.

Inherent Risk - The amount of risk that exists in the absence of controls. In other words, before an organization implements any countermeasures at all, the risk they face is inherent risk.

Residual Risk - The risk that remains after controls are accounted for. It's the risk that remains after your organization has taken proper precautions.

	Inherent Risk	Action
0	Advisory	Advisory or no action required
1	Slight risk under exceptional operating conditions	Consider risk reduction methods, provide warning notices if considered feasible. Carry out recommendations within 6 - 12 month period.
2	Slight risk under normal operating conditions	Consider risk reduction methods. 3 - 6-month action plan.
3	Serious risk	Consider more radical reduction measures such as design changes to reduce risk and/or Written Scheme application ASAP
4	Danger to health	System to be closed until completion of risk reduction measures.

	Residual Risk	Action
0	Advisory	Advisory or no further action required
1	Slight risk under exceptional operating conditions	Consider risk reduction methods, provide warning notices if considered feasible. Carry out recommendations within 6 - 12 month period.
2	Slight risk under normal operating conditions	Consider risk reduction methods. 3 - 6-month action plan.
3	Serious risk	Consider more radical reduction measures such as design changes to reduce risk and/or Written Scheme application ASAP
4	Danger to health	System to be closed until completion of risk reduction measures.

Remedial Actions & Recommendations						
No	**Inherent Risk**	**Risk Rating**	**Time Frame**	**Action Required**	**Residual Risk Rating**	**Signed Off Date & Signature**
1	**Cold Water Storage Tanks (Page 33/ 34 refers)** There is no safe access to the cold water storage tanks at high level in the plant room off the pool plant room.	**1**	**6 months**	Install a fixed ladder if possible to the high level tanks to create safer access.	**0**	
2	**Showers (Page 46 refers)** The showers in the outdoor change area in the accessible changing rooms have been isolated and are no longer in use.	**2**	**ASAP**	Ensure the showers have been isolated as close as possible to the nearest live feed to prevent dead legs and stagnation.	**0**	

Risk Items Requiring Immediate Action
None

Risk Assessment Review Interval

The revised L8 / HSG274 guidance states that risk assessments should be reviewed regularly and if they are suspected to no longer be valid; a formal review is advised after 2 years unless the following points have clearly not changed.

- A change to the water system or its use.
- A change to the use of the building where the system is installed.
- New information is available about risks or control measures.
- The results of checks / sample results indicate that control measures are no longer effective.
- Changes to key personnel.
- A case of legionellosis associated with the system.

Scope of The Risk Assessment and Systems to Be Covered

This Risk Assessment covers the domestic water systems on site

This report will not indicate any matters beyond the scope of the legionella risk assessment.

The assessment aims to establish the risk of legionellosis, legionella growth and proliferation within the systems highlighted below using the following guidance documents as points of reference:

HSE Approved Code of Practice & Guidance: Legionnaires' Disease – The control of legionella bacteria in water systems L8.

Legionnaires' Disease: Technical Guidance – HSG274 Part 2: The control of legionella bacteria in hot and cold water systems, Part 3: The control of legionella bacteria in other risk systems.

BS 8580-1:2019 Water quality. Risk assessments for Legionella control. Code of practice British Standards Institution

The Water Regulations Guide. Water Regulations Advisory Scheme (WRAS); 2nd edition (1 Sept. 2000).

Risk Assessment and Written Scheme Index

1.0 Introduction

Legionellosis and Legionella Bacteria

Legionella was the name given to the genus of bacteria that caused the original outbreak of legionnaires disease. The species was named *legionella pneumophila* as the first identified outbreak infected American legionnaires at a conference in a hotel in America. Over 35 other species have been identified since. It has been established that this species is most associated with the outbreaks of the disease and can be considered particularly virulent as a pathogen. Other groups of *legionellae pneumophila* and certain other species of *legionellae* can cause pneumonic disease.

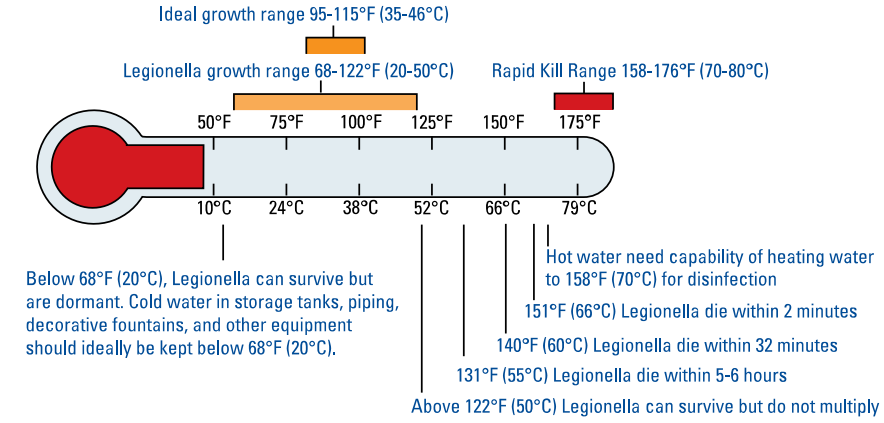
Legionellosis is a collective term for diseases caused by legionella bacteria including the most serious legionnaires' disease, as well as the similar but less serious conditions of Pontiac fever and Lochgoilhead fever. Legionnaires' disease is a potentially fatal form of pneumonia, and everyone is susceptible to infection. The risk increases with age, but some people are at higher risk, e.g., people over 45, smokers and heavy drinkers, people suffering from chronic respiratory or kidney disease, diabetes, lung and heart disease or anyone with an impaired immune system.

The bacterium *Legionella pneumophila* and related bacteria are common in natural water sources such as rivers, lakes and reservoirs, but usually in low numbers. They may also be found in purpose-built water systems, such as cooling towers, evaporative condensers, hot and cold-water systems, and spa pools. If conditions are favourable, the bacteria may multiply, increasing the risks of legionnaires' disease, and it is therefore important to control the risks by introducing appropriate measures.

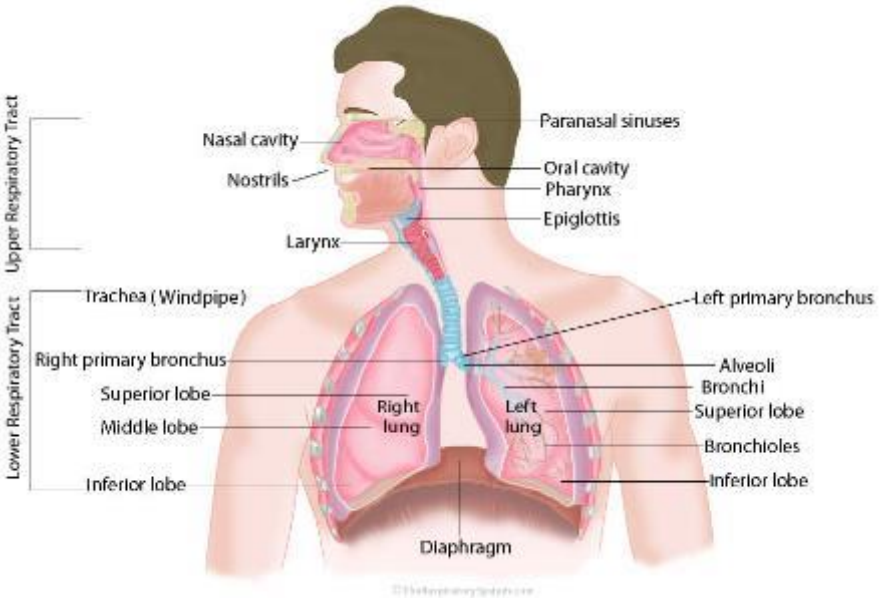
Legionella in Air and Water Systems

The diagram below illustrates the range of temperatures within which Legionella survives and thrives. This chart also indicates the approximate temperature range of several common systems and types of equipment. Spas, showers, and cooling towers happen to fall exactly within the optimum growth range of Legionella. It can also be seen that evaporative coolers, cooling coils and cold-water systems should operate outside the temperature range needed for Legionella proliferation.

Legionella Growth Chart



The typical infection route is via inhalation of infected water droplets containing high levels of legionella pneumophila bacteria.



Therefore, any water system that generates an aerosol spray (e.g., showers, spray taps, spa pools) could pose a transmission risk if it were to be colonised by legionella bacteria.

A typical Legionellosis infection requires the following chain of events to occur:

1. Legionella bacteria enter the water system in low quantities via the mains water supply
2. Water system conditions permit the bacteria to proliferate due to temperatures between 20 & 50°C, stagnation, and nutrients etc.
3. An aerosol spray is produced to facilitate transmission of infected water droplets into the lungs.
4. A susceptible or high-risk person is exposed to and inhales the infected aerosol spray.

1.1 Details of Audit

Site:	TDC Dovercourt
Contact:	James Prior
Tel. No.	01255 686707
Auditor:	Soph Icke
Audit Date:	7th December 2021
Audit No.	12618SI

1.2 Risk Assessment Methodology & Objectives

- **Background to L8**

- **Planning a Legionella Risk Assessment**

- **Methodology**

The following actions are required to comply with the ACOP to identify and assess the risk of legionellosis from systems which are susceptible to colonisation by legionella bacteria and from which infected water droplets can be inhaled by exposed persons (risk systems).

- The risk systems are to be identified
- Previous risk assessments are to be reviewed
- Schematic drawings of these systems are to be available
- The condition of system water and accessible equipment is to be determined
- The contribution to risk made by the design and construction of the system and equipment is to be evaluated
- The maintenance history of the system is to be determined and past problems investigated
- Monitoring records for the systems are to be examined, and significant deviations from acceptable operating conditions investigated
- The ability of management to maintain control of legionellosis is to be assessed
- The competence of staff to control the risk of legionellosis is to be assessed

Figures 1 and 2 provide an overview of the methodology for the creation and review of risk assessments (RA) as described in this report.

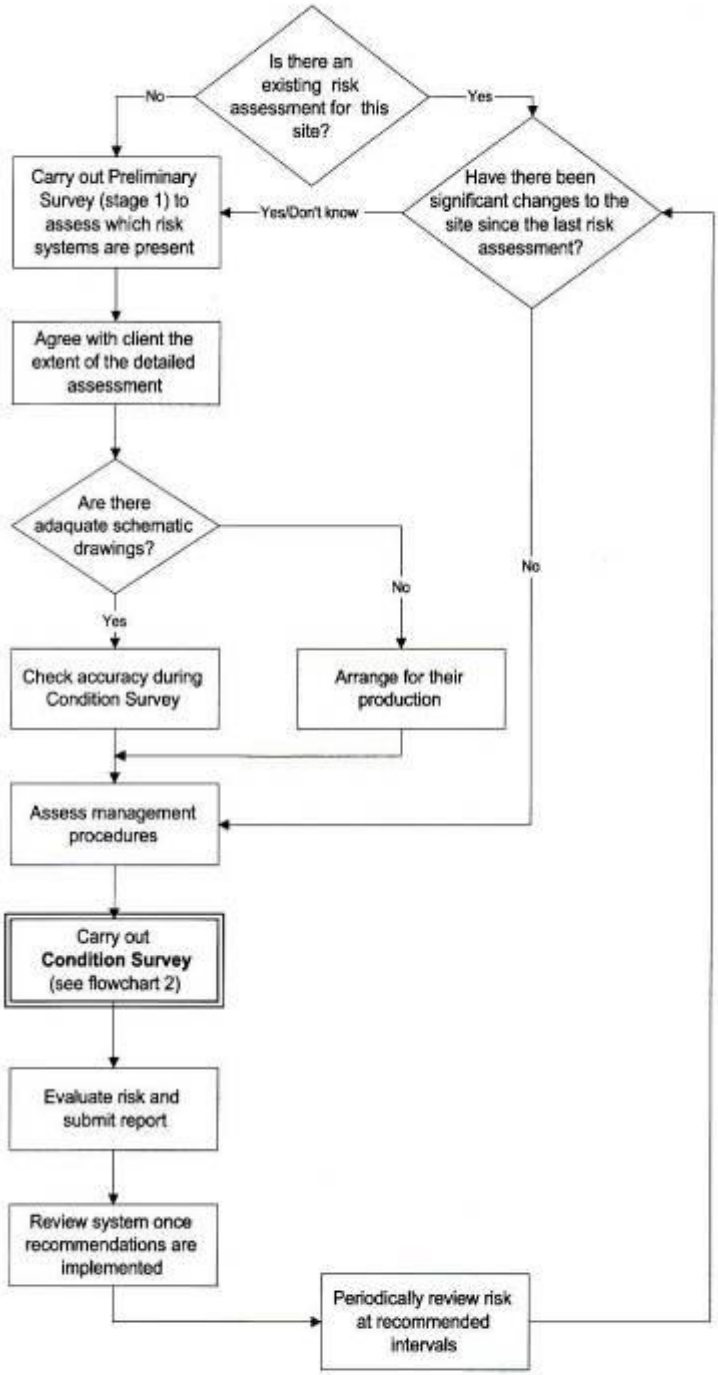

Is there an existing risk assessment for this site?
No
Yes
Carry out Preliminary Survey (stage 1) to assess which risk systems are present
Yes/Don't know
Have there been significant changes to the site since the last risk assessment?
Agree with client the extent of the detailed assessment
Are there adaquate schematic drawings?
No
Yes
No
Check accuracy during Condition Survey
Arrange for their production
Assess management procedures
Carry out **Condition Survey** (see flowchart 2)
Evaluate risk and submit report
Review system once recommendations are implemented
Periodically review risk at recommended intervals

Fig. 1

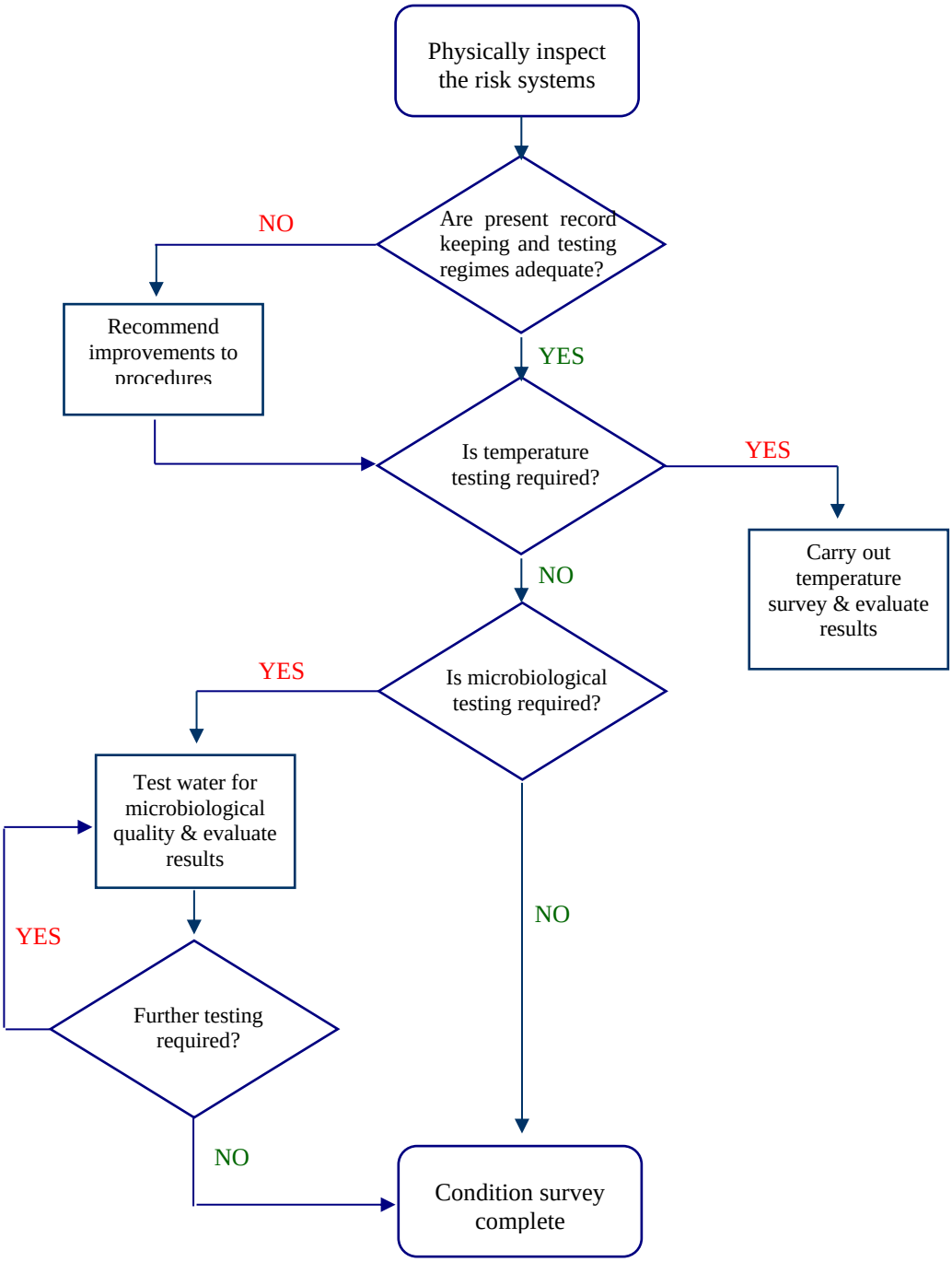

Physically inspect the risk systems
Are present record keeping and testing regimes adequate?
NO
Recommend improvements to procedures
YES
Is temperature testing required?
YES
Carry out temperature survey & evaluate results
NO
Is microbiological testing required?
YES
Test water for microbiological quality & evaluate results
YES
Further testing required?
NO
NO
Condition survey complete

Fig. 2

1.3 Audit Objectives

The objective of this audit is to complete a Risk Assessment in compliance with the Health & Safety Executive *Approved Code of Practice for the control of Legionella bacteria in water systems L8 (2013) and BS 8580-1:2019*

The provision of this assessment does not remove the duties of the client in respect of health and safety as enshrined in the *Health & Safety at Work Act 1974*, or the specific regulations, codes of practice and advisory documents produced by the Health and Safety Executive.

These include:

- *Control of Substances Hazardous to Health Regulations 2002*
- *Workplace (Health, Safety & Welfare) Regulations 1992*
- *Legionnaire's Disease: The control of Legionella bacteria in water systems L8, 2013*
- *Water Regulations 2000*
- *BS8558:2011*
- *BS 8580-1:2019 Water quality. Risk assessments for Legionella control. Code of practice British Standards Institution*

The Secretary of State, Department of Environment, Transport and Regions under the terms of the Water Industry Act 1991 has made Regulations in respect to water installations within premises in England and Wales to prevent the waste, misuse, undue consumption, and contamination of water supplied by a water undertaker. This specifically includes:

The Water Industry Act 1991 Section 73
If any person who is the owner or occupier of any premise to which a supply of water is provided by a water undertaker intentionally or negligently causes or suffers any water fitting for which he is responsible to be or remain so out of order, so in need of repair or so constructed or adapted, or to be so used

(a) that water in a water main or other pipe of a water undertaker, or a pipe connected with such a water main or pipe, is or is likely to be contaminated by the return of any substance from those premises to that main or pipe.

(b) that water that has been supplied by the undertaker to those premises is or is likely to be contaminated before it is used; or

(c) that water so supplied is or is likely to be wasted or, having regard to the purpose for which it is supplied, misused, or unduly consumed,

that person shall be guilty of an offence and liable on summary conviction, to a fine not exceeding level 3 on the standard scale.

This assessment sets out to identify all risks by physical inspection of pipework and fittings, which are accessible without the need to remove ductwork etc. by all practicable means. Information may also be sought from staff working on site.

The aim of this document is to outline and to place on record a descriptive indication of the extent of various water services that may be present on this site, and to assess the risk of proliferation and dissemination of legionella species into the atmosphere.

Every endeavour has been made to locate all sources of risk however we do not guarantee that this has been achieved. Certain parts of water systems, such as pipework, may be difficult to identify in respect of service carried, or access to parts of water systems may be limited.

1.4 The Need to Review Risk Assessments

Periodic Risk Reviews

Risk assessments should be reviewed regularly and when:

- Significant changes have been made to a system, e.g., remedial works have been implemented
- Significant changes have occurred in the way a system is being used, e.g., a formerly fully occupied building is now only partially occupied
- Changes have been made to the management and/or maintenance of the system, e.g. 6 months after a new maintenance company has been appointed
- The results of checks indicate that control measures are no longer effective
- A case of legionnaires' disease or legionellosis is associated with the system
- There is new information about risks or control measures

If there is doubt as to what changes should trigger a risk assessment, a programme of annual reviews or audits should be considered.

Note

The responsible person nominated (see Chain of Responsibility) must ensure that a legionella risk assessment is in place and that it is up to date. ***The assessment must be formally reviewed every two years or when the system has had substantial alterations****. Beacon Water Treatments Ltd can offer this service if required. It is the responsibility of the client to ensure that all relevant risk assessments are up to date and reviewed/renewed as required.*

2.0 Summary

The assessment was carried out at the request of ***James Prior*** and is provided as a requirement for compliance with the Approved Code of Practice: The prevention or control of legionellosis (including legionnaire's disease).

The ACOP applies to the risk of legionellosis in circumstances where the Health and Safety at Work etc. Act 1974 applies and gives guidance on the requirements of this Act and the Control of Substances Hazardous to Health 1994 regarding the risk of legionellosis.

Areas considered within the assessment were:

i) Mains water supply
ii) Cold supply and distribution
iii) Hot water supply and distribution
iv) Miscellaneous water supply and distribution

Photographs were taken as a record of conditions recorded at the time of the assessment and incorporated into the narrative.

The assessment is based upon information gathered from visual inspections at the site, together with inspection of site records and maintenance documentation. Drawings and notes relate only to visible pipework, fittings and equipment and some hidden pipework routes and connections have been assumed.

3.0 Domestic Services Audit and Assessment

3.1 Introduction

Tendering District Council having noted their responsibilities under the Health and Safety at Work Act 1974 have commissioned this audit (Risk Assessment) to comply with the Health & Safety Executive *Approved Code of Practice for the control of Legionella bacteria in water systems L8 2013 & HSG274*.

Soph Icke of **Beacon Water Treatments Ltd** carried out the assessment survey on **7th December 2021.**

This Risk Assessment is coupled with a Written Scheme for the prevention and control of Legionellosis and uses the following documents as points of reference:

- HSE Approved Code of Practice & Guidance: Legionnaire's Disease – The control of legionella bacteria in water systems L8 and HSG274 technical guidance.
- BS 8580-1:2019 Water quality. Risk assessments for Legionella control. Code of practice British Standards Institution
- Chartered Institute of Building Service Engineers (CIBSE) Technical Memorandum TM13
- British Standards Institution BS8558:2011
- Water Supply (Fittings) Regulations 1999
- Workplace (Health, Safety and Welfare) Regulations 1992
- British Association of Chemical Specialities Code of Practice
- Code of Conduct for Service Providers (BACS & WMS)

3.2 Overview of the Approved Code of Practice L8 & HSG274

The Code of Practice (ACOP L8) in conjunction with the new technical guidance HSG 274 gives practical guidance in respect of sections 2,3,4 and 6 of the Health & Safety at Work Act and regulations 6,7,8,9, and 12 of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) regarding the risk from exposure to legionella bacteria and guidance on the relevant parts of the Management of Health & Safety at Work Regulations 1999.

The advice and guidance contained within the ACOP, if followed, provides clarification of responsibilities placed upon owners and operators of water systems which are deemed to present a Legionella risk.

The ACOP document has legal status. It is important that any control measures taken by the operator are AT LEAST as good as those laid down in this document. Compliance with the law is an essential part of management responsibility.

Legionella was the name given to the genus of bacteria that caused the original outbreak of legionnaires disease. The species was named *l. pneumophila,* at least 37 species have been identified since. It has been established that this species is most associated with the outbreaks of the disease and can be considered particularly virulent as a pathogen. Other groups of *legionellae pneumophila* and certain other species of *legionella* can cause pneumonia.

There are a variety of systems available to supply hot and cold-water services. It has been the case in the recent past that legionnaire's disease was more prevalent in such systems than in cooling towers, but this has improved in recent times. However, such systems still present a foreseeable risk.

Most people have a natural defence system against illness, but several factors increase susceptibility to Legionellosis: Age, sex (males over 50), smoking, existing lung problems or other chronic illness.

It is recommended that records of management operations to control the risk including temperature checks, maintenance, repair, and modification are kept and that they are available for periodic inspection.

3.3 Mains Cold Water Service

Mains cold water (MCW) enters the site in the boiler room. It splits to supply five cold water storage tanks, the drinking fountain in the gym, the staff room, a drinking tap in the first aid room and the hot drink machine in reception.

General Information	Risk Comment
Asset number	MCW Inlet 1
Location of source	Boiler room
Source of water	Towns mains
Material of construction	Copper
Insulation type	FFFG
Are dead ends present	No
Is unused equipment connected	No
Is scale present on tap outlets	No
Is there a water softener	Yes
Are spray taps present	No
Are strainers fitted	Yes
Are point of use heaters fitted	Yes
Are unvented water heaters fitted	Yes
Temperatures	
Furthest sentinel point location	Staff room
Furthest sentinel point temperature	10.7℃
Nearest sentinel point location	First aid room tap
Nearest sentinel point temperature	10℃
Comments/Actions Required:	
Overall risk rating	**0**

MCW Inlet 1 – Boiler room

3.4 Cold Water Storage Tanks – General Risk Potential

Cold water storage tanks in themselves, present a low legionella risk in general terms. However, where the tanked water supplies other plant that have a high-risk factor (e.g., cooling towers, showers etc) the potential risk of such tanks is much higher.

Poor control over the water temperature and condition of the stored water plus the condition of the tank itself may lead to very small levels of legionella bacteria colonising the tank and, therefore, producing a possible source for the bacteria to infect other water services downstream.

Basic Tank Requirements

- Tanks should be clean and free from corrosion, scaling, silting and other debris or contamination that may provide a breeding ground for micro-organisms including legionella
- Tanks should be fitted with lids that are vented. These vents should be fitted with rodent/insect screens.
- Where possible, expansion pipes from calorifiers should not be returned to cold water storage tanks (if they are, care should be taken to seal their entrance into the tank to prevent the ingress of dirt or other contamination)
- Overflow and warning pipes should be fitted with rodent screens.
- Tanks should be well insulated to prevent elevated stored water temperatures. Stored water temperatures should ideally be maintained at less than 20°C, to prevent the proliferation of micro-organisms including legionella.
- Locating the tank services and make-up pipes on the same side of the tank should be avoided, as this may lead to water stagnation at the other end of the tank. If there is a possibility of water stagnation occurring, a sparge pipe should be fitted to the services pipe.
- Tanks should be labelled clearly for easy identification.

System Descriptions - Cold Water Storage Tank (Domestic)

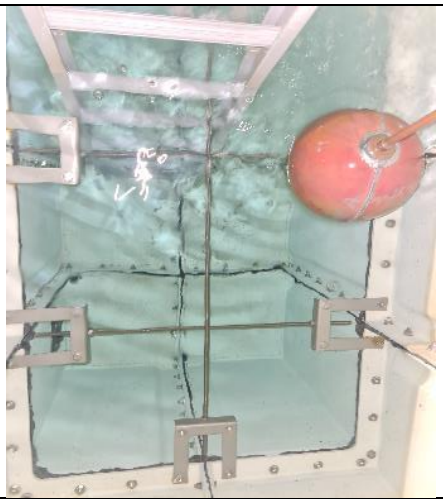
There are six domestic cold water storage tanks located on site.

CWST 1 – There was one cold water storage (CWST) located in the plant room which supplies CAL 1 and the reception toilets, gym changing rooms, and wet side changing area. The tank is fed around the site via two booster pumps situated next to the tank.

The tank is constructed from GRP and has a stored water capacity of 3000 litres. Stored water exits the tank via a 54mm outlet pipe and enters a duplex pump set – from the pump-set water is boosted throughout the site.

The tank has all of the requirements to be ACoP L8/HSG 274 compliant, including; a tight fitting lid, built in thermal insulation, screened overflows and opposing inlets and outlets. At the time of the survey the stored water temperature was at an acceptable 11°C.

Internally the tank was in good clean condition and had been cleaned in November 2021.

General Information	Risk Comment
Tank title/asset number	CWST 1
Location	Plant room
Size (m) / volume (m^3)	3000 Litres
Materials of construction	GRP
External Photograph of Tank	
Internal Photograph of Tank	
Source of water supply to tank	Mains cold water
Process served by tanked water	Reception toilets, gym change & wet side change
Is tank easily and safely accessible	Yes,
Configuration	Single tank
If split or duplex, is flow balanced	N/A
Corrosion of internal surfaces	No
Deposits on internal surfaces	No
Scale	No
Flow patterns correct	Yes
Stagnation evident	No
Tank insulation condition	Integral
Distribution insulation condition	Good

Continuation	
Overflow screen fitted	Yes
If no o/f screen – indicate size required and in line or end of line	N/A
Warning pipe fitted	Yes
Lid condition and fit	Good & tight
If no lid – dimensions required	N/A
Lid vent fitted with screen	Yes
Temperature remote from valve - °C	11℃
Temperature inlet - °C	10.7℃
Ambient temperature tank room - °C	18℃
Date of last clean and disinfection	November 2021
Date of last inspection	December 2021
Inlet & Outlet Opposed	Yes
Hot water services vent returns to cold water storage tank	No
Details for re-routing vent: dimensions, length	N/A
Drain size and location	Not seen
Make-up size and location	54mm – Top
Services size and location	54mm – Base
Tank clearly labelled	Yes
Tank nearest sentinel - location & temp °C	First aid room – 11.8℃
Tank furthest sentinel - location & temp °C	Pool change cleaners – 12.4℃
Non-compliances with Water Fittings (Water Supply) Regulations 1999/Water Bylaws 2000, Scotland	
Comments/actions required	
Overall Risk Rating	**0**

CWST 2 – A second tank was located in the plant room at high level above CWST 1 and supplies CAL 2. The tank is constructed from GRP and has a stored water capacity of 1500 litres. The tank is on a boarded-out area, the tank can be accessed via a long ladder. Access was assessed as being unsafe and as such it is recommended that a fixed vertical ladder is installed to allow safer access (**Remedial action 1 refers**).

General Information	Risk Comment
Tank title/asset number	CWST 2
Location	Plant room – High level
Size (m) / volume (m^3)	1500 Litres
Materials of construction	GRP
External Photograph of Tank	
Internal Photograph of Tank	
Source of water supply to tank	Mains cold water
Process served by tanked water	CAL 2
Is tank easily and safely accessible	Yes
Configuration	Single tank
If split or duplex, is flow balanced	N/A
Corrosion of internal surfaces	No
Deposits on internal surfaces	No
Scale	No
Flow patterns correct	Yes
Stagnation evident	No
Tank insulation condition	Good - FFFG
Distribution insulation condition	Good

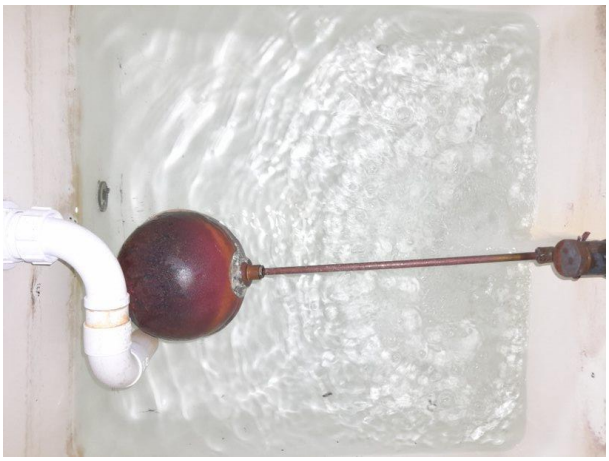
Continuation	
Overflow screen fitted	Yes
If no o/f screen – indicate size required and in line or end of line	N/A
Warning pipe fitted	Yes
Lid condition and fit	Good & tight
If no lid – dimensions required	N/A
Lid vent fitted with screen	Yes
Temperature remote from valve - °C	11℃
Temperature inlet - °C	10.7℃
Ambient temperature tank room - °C	18℃
Date of last clean and disinfection	November 2021
Date of last inspection	December 2021
Inlet & Outlet Opposed	Yes
Hot water services vent returns to cold water storage tank	No
Details for re-routing vent: dimensions, length	N/A
Drain size and location	Not seen
Make-up size and location	28mm – Top
Services size and location	42mm – Base
Tank clearly labelled	Yes
Tank nearest sentinel - location & temp °C	N/A
Tank furthest sentinel - location & temp °C	N/A
Non-compliances with Water Fittings (Water Supply) Regulations 1999/Water Bylaws 2000, Scotland	
Comments/actions required	Provide safer access to the tank, such as a fixed ladder **(Remedial action 1 refers).**
Overall Risk Rating	**1**

There are two further tanks located at high level (near to CWST 2).

CWST 3 – This tank is constructed from GRP and has a stored water capacity of approximately 180 litres. The tank supplies the make up to the pool chemical plant and a single bib tap. At the time of the survey the tank was found to be in good clean condition and had a stored water temperature of 12℃.

CWST 4 – This tank is constructed from GRP and has a stored water capacity of approximately 180 litres. The tank provides the top up to the main pool.

CWST 3 – Internal & external condition



CWST 4 – Internal & external

CWST 5 – A further CWST is located above the outdoor changing rooms in the roof void . Accessed via a hatch in changing room number 4.

The tank is of cylindrical design and is constructed from moulded plastic. The stored water capacity is approximately 400-500 litres. The tank has a tight fitting lid, good insulation and opposing inlet and outlet – the overflows are screened.

The tank provides all cold water in the outdoor changing block including; mixer showers, cold water taps and the toilet cisterns.

At the time of the survey the tank was found to be clean internally and was storing water at 13°C which is sufficient to control legionella growth.

General Information	Risk Comment
Tank title/asset number	CWST 5
Location	Outdoor changing 4 room roof void
Size (m) / volume (m^3)	400 - 500 Litres
Materials of construction	Plastic
External Photograph of Tank	
Internal Photograph of Tank	
Source of water supply to tank	Mains cold water
Process served by tanked water	Outdoor changing rooms
Is tank easily and safely accessible	Yes
Configuration	Single tank
If split or duplex, is flow balanced	N/A
Corrosion of internal surfaces	No
Deposits on internal surfaces	No
Scale	No
Flow patterns correct	Yes
Stagnation evident	No
Tank insulation condition	External jacket – Good
Distribution insulation condition	Good

Continuation	
Overflow screen fitted	Yes
If no o/f screen – indicate size required and in line or end of line	N/A
Warning pipe fitted	Yes
Lid condition and fit	Good & tight
If no lid – dimensions required	N/A
Lid vent fitted with screen	Yes
Temperature remote from valve - °C	13°C
Temperature inlet - °C	11°C
Ambient temperature tank room - °C	15°C
Date of last clean and disinfection	November 2021
Date of last inspection	December 2021
Inlet & Outlet Opposed	Yes
Hot water services vent returns to cold water storage tank	No
Details for re-routing vent: dimensions, length	N/A
Drain size and location	Not seen
Make-up size and location	28mm – Top
Services size and location	28mm – Base
Tank clearly labelled	Yes
Tank nearest sentinel - location & temp °C	Changing room 4 – 13°C
Tank furthest sentinel - location & temp °C	Changing room 1 – 13°C
Non-compliances with Water Fittings (Water Supply) Regulations 1999/Water Bylaws 2000, Scotland	
Comments/actions required	
Overall Risk Rating	**0**

CWST 6 – There was one final CWST located in the pool side cleaners room. The tank supplies the bib taps in the pool side changing area and gym changing rooms. The tank is of GRP construction and supplies the outlets via a booster pump.

The tank had a stored water temperature of 13.8℃. Internally the tank contained light sediment at the base.

CWST 6 – Pool area cleaners room

3.5 Hot Water Services

Hot Water Generators – General Risk Potential

Due to storage temperatures and water usage, calorifiers and water heaters can be a major source of proliferation of legionella bacteria. The temperature and the internal condition of the heater play a significant part in the prevention of bacterial growth.

Many calorifiers have a temperature gradient between the top and the bottom of the calorifier. At the top of the calorifier the temperature of the water may be more than 50^{o}C and at the bottom below 20^{o}C. This means that there will be locations within the calorifier where the water temperature is suitable for the proliferation of many types of micro-organisms, including legionella. In these cases, a de-stratification pump should be fitted between the top and bottom of the calorifier. This pump should be run on a timer for at least one hour each day, at a time of low water usage and in conjunction with the primary heat source.

In locations where hot water is distributed over a large area, a well-designed recirculation system ensures that the temperature of the hot water within the whole system is maintained at a satisfactory temperature. In this type of system, the temperature of the hot water within the calorifier should be high enough to supply water at 60^{o}C with water returning to the calorifier is at a temperature more than 50^{o}C.

Locally mounted electric water heaters and electric instant heat showers are very good alternative ways of providing hot water within a building. As these units store little or no water there is very little risk of the proliferation of legionella, especially when supplied, as in most cases they are, by mains water. However, these units should be maintained according to the manufacturer's recommendations to ensure safe and efficient operation.

System Descriptions - Hot Water Generators

There was one Calorifier (CAL) located in the plant room off the pool plant room. The unit is fed via CWST 1 and supplies all outlets in the building with the exception of the outdoor changing rooms.

There was a secondary circulation pump noted on the return piping, which feeds into the cold water inlet to the CAL. The unit was fitted with temperature gauges on the flow and return piping which were accurate during the survey. The flow and return piping achieved an acceptable 65℃ and 57℃ respectively.

General Information	Risk Comment			
Hot water generator title/asset number	CAL 1			
Location	Plant room off pool plant room			
Stored water Volume	473 litres			
Materials of construction	S/ Steel			
Photograph of Hot Water PHE				
Accessible inspection hatch	Yes			
Vessel supplied from	CWST 1			
Vessel Feeds	Leisure area			
Accessible drain fitted on lowest point	Yes			
Heat source	LTHW – Immersion			
Vessel insulation condition	Good			
Distribution insulation condition	Good			
Expansion type	Open vent to tundish			
If pressure vessel fitted, can diaphragm be cleaned	Yes			
HWS recirculation pump fitted	Yes			
Timed destratification pump fitted	Yes			
Immersion temperature gauges fitted	Flow - Yes	Storage – No	Ret – Yes	
Temperature °C (Digital thermometer with surface probe)	65	65	57	
Nearest Sentinel Point Temperature	First aid room (pre TMV) - 68℃			
Furthest Sentinel Point Temperature	Pool area cleaners - 73℃			
Overall Risk Rating	**0**			

There was on Calorifier (CAL) located in the boiler room. The unit is fed via CWST 2 and supplies all outlets in the outdoor changing rooms.

There was a secondary circulation pump noted on the return piping, which feeds into the cold water inlet to the CAL. The unit was fitted with temperature gauges on the flow and return piping which were accurate during the survey. The flow and return piping achieved an acceptable 65℃ and 58℃ respectively.

General Information	Risk Comment			
Hot water generator title/asset number	CAL 2			
Location	Boiler room			
Stored water Volume	300 litres			
Materials of construction	Copper			
Photograph of Hot Water PHE				
Accessible inspection hatch	Yes			
Vessel supplied from	CWST 2			
Vessel Feeds	Outdoor changing area			
Accessible drain fitted on lowest point	Yes			
Heat source	LTHW			
Vessel insulation condition	Good			
Distribution insulation condition	Good			
Expansion type	Open vent to tundish			
If pressure vessel fitted, can diaphragm be cleaned	Yes			
HWS recirculation pump fitted	Yes			
Timed destratification pump fitted	No			
Immersion temperature gauges fitted	Flow - Yes	Storage – No	Ret – Yes	
Temperature °C (Digital thermometer with surface probe)	65	65	58	
Nearest Sentinel Point Temperature	Changing room 4 (pre TMV) - 62℃			
Furthest Sentinel Point Temperature	Changing room 1 (pre TMV) - 62℃			
Overall Risk Rating	**0**			

There is one instant electric water heater located in the staff room. The unit is mains fed and supplies the sink only. The unit was online and achieved 46℃.

3.6 Domestic Outlets

Hot Water Distribution

All non mixed hot water outlets tested on the day of the survey reached >50˚C within the specified 1 minute of flushing. All return loops accessed were at the specified temperature.

Cold Water Distribution

Cold water temperatures throughout the site were measured at <20˚C and reached this well within the 2 minute specification from the mains and tank fed cold water outlets.

Domestic Outlet Condition

All of the outlets were in good working order. All taps were clean and scale free.

Examples of WHB configuration

TMV's

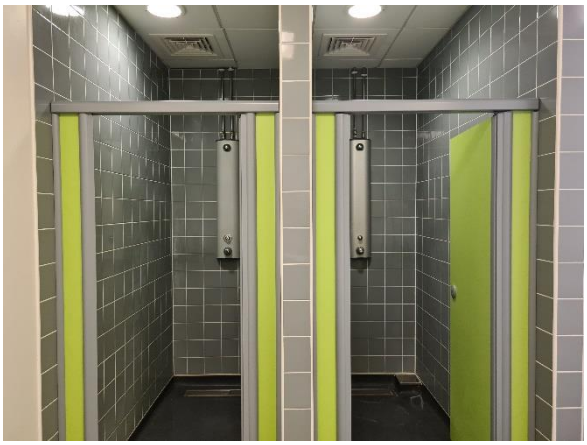
TMV's are installed on all toilet washbasins in the building The recommended temperature for TMV's is between 39-42°C. All TMV's tested achieved between 39 - 42℃. The TMV's are serviced regularly. This action is recorded in the log book.

TMV examples around site

3.7 Showers

Showers were located in all changing rooms. The showers for the gym and pool changing rooms are mixer controlled. The units in the outdoor changing rooms are thermostatic and are of similar construction and appeared to be operating correctly. There showerheads are clean and scale free.

The showers located in the outdoor accessible changing areas have been isolated. Ensure the showers have been isolated to the nearest live feed to prevent any dead legs and stagnation within the piping **(Remedial action item 2 refers).**



Typical shower configuration

General Information	Risk Comment
State the Location of the shower/s	Gym female change
State Number of Showers	2
Is this an emergency shower/s	No
Is the shower/s Electric, Thermostatic or Mixer Controlled?	Mixer controlled
State the cold water supply source to the shower/s	CWST 1
State the hot water supply source to the shower/s	CAL 1
Is the shower-head/s clean & free from scale or mould	Yes
Is the shower/s regularly used	Yes
Is there a single blender control serving several showers	No
Is the showerhead/s regularly cleaned & disinfected	Yes
Mixer Inlet Temp Cold	14
Mixer Inlet Temp Hot	65
Outlet Temperature	42
Overall Risk	**0**

General Information	Risk Comment
State the Location of the shower/s	Gym male change
State Number of Showers	2
Is this an emergency shower/s	No
Is the shower/s Electric, Thermostatic or Mixer Controlled?	Mixer controlled
State the cold water supply source to the shower/s	CWST 1
State the hot water supply source to the shower/s	CAL 1
Is the shower-head/s clean & free from scale or mould	Yes
Is the shower/s regularly used	Yes
Is there a single blender control serving several showers	No
Is the showerhead/s regularly cleaned & disinfected	Yes
Mixer Inlet Temp Cold	14
Mixer Inlet Temp Hot	63
Outlet Temperature	41-43
Overall Risk	**0**

General Information	Risk Comment
State the Location of the shower/s	Poolside
State Number of Showers	7
Is this an emergency shower/s	No
Is the shower/s Electric, Thermostatic or Mixer Controlled?	Mixer controlled
State the cold water supply source to the shower/s	CWST 1
State the hot water supply source to the shower/s	CAL 1
Is the shower-head/s clean & free from scale or mould	Yes
Is the shower/s regularly used	Yes
Is there a single blender control serving several showers	No
Is the showerhead/s regularly cleaned & disinfected	Yes
Mixer Inlet Temp Cold	15
Mixer Inlet Temp Hot	57
Outlet Temperature	41-43
Overall Risk	**0**

General Information	Risk Comment
State the Location of the shower/s	Outdoor changing room 1 & 2
State Number of Showers	7
Is this an emergency shower/s	No
Is the shower/s Electric, Thermostatic or Mixer Controlled?	Thermostatic
State the cold water supply source to the shower/s	CWST 5
State the hot water supply source to the shower/s	CAL 2
Is the shower-head/s clean & free from scale or mould	Yes
Is the shower/s regularly used	Yes
Is there a single blender control serving several showers	Yes
Is the showerhead/s regularly cleaned & disinfected	Yes
Mixer Inlet Temp Cold	13
Mixer Inlet Temp Hot	62
Outlet Temperature	39
Overall Risk	**0**

General Information	Risk Comment
State the Location of the shower/s	Outdoor changing room 3 & 4
State Number of Showers	7
Is this an emergency shower/s	No
Is the shower/s Electric, Thermostatic or Mixer Controlled?	Thermostatic
State the cold water supply source to the shower/s	CWST 5
State the hot water supply source to the shower/s	CAL 2
Is the shower-head/s clean & free from scale or mould	Yes
Is the shower/s regularly used	Yes
Is there a single blender control serving several showers	Yes
Is the showerhead/s regularly cleaned & disinfected	Yes
Mixer Inlet Temp Cold	13
Mixer Inlet Temp Hot	62
Outlet Temperature	40
Overall Risk	**0**

3.8 Deadlegs/Dead-Ends

A deadleg is defined as an outlet that is no longer in use but remains live and as such is flushable. A dead end is defined as pipework that is no longer in use but remains live and is capped off. Deadlegs/Ends will contain stagnant water which will provide ideal conditions for legionella growth. Legionella bacteria can then enter the water system and infect many parts of the water system.

Deadleg/end Location	Description	Photograph
None		

3.9 Low Used Outlets

All known little sued outlets are flushed weekly to prevent stagnation. This action is recorded in the log book.

Swimming Pools

There is an adult pool on site. The swimming pool maintenance and management appears to be satisfactory. The pool dosing and monitoring records were up to date and being completed daily by the pool staff. A well-managed pool with adequate treatment can be considered a low legionella risk. All staff involved in the monitoring of the pools should be well versed in the **'site – Swimming Pool Safety Manual'**. Pool staff members must be acquainted with the 'NOP' and 'EAP' procedures and the pool loading procedures.

There has been one out of spec sample from all pools since Beacon Water Treatments took over the monthly sampling. This may be because of poor hygiene procedures (pre swim showering **REF PWTAG**) or pool control issues.

All failures were rectified on site upon receipt of results – staff have carried out the site specific pool sample failure procedures accordingly. (Shock dose and backwash filters).

Chemical Dosing Plant

The chemical plants consist of **Calcium Hypochlorite** for bacteria control and Acid for PH Control. Both plants were operational at the time of inspection and in good condition.

Chemical dosing plants & unit

Microbiological Monitoring

The pool will be sampled every month for the standard PWTAG suite of organisms. Site will have these results on file for inspection if required. All analyses are completed by a UKAS accredited laboratory.

Remedial action for pool

Legionella	Remedial Action Required	Re-test Required
Count of up to 1000cfu/l	**1. Close the pool immediately and turn off the booster pumps.** Super chlorinate the pool to **10ppm** for a minimum of 4 hours. **2.** Backwash all filters with the failed pool's system. **3.** The free chlorine residual must be lowered to **below 5ppm** prior to the pool being allowed to re-open. **4..** The pool **must remain closed** until a clear set of results have been achieved and provided by Beacon Water Treatment.	**Yes**
Count of >1000 to 10,000cfu/l	**1. Close the pool immediately and turn off the booster pumps.** Super chlorinate the pool to **10ppm** for a minimum of 4 hours. **2.** Backwash all filters with the failed pool's system. **3.** The free chlorine residual must be lowered to **below 5ppm** prior to the pool being allowed to re-open. **4..** The pool **must remain closed** until a clear set of results have been achieved and provided by Beacon Water Treatment.	**Yes**
Count of >10,000cfu/l	**1. Close the pool immediately and turn off the booster pumps.** Super chlorinate the pool to **10ppm** for a minimum of 4 hours. **2.** Backwash all filters with the failed pool's system. **3.** The free chlorine residual must be lowered to **below 5ppm** prior to the pool being allowed to re-open. **4..** The pool **must remain closed** until a clear set of results have been achieved and provided by Beacon Water Treatment.	**Yes**

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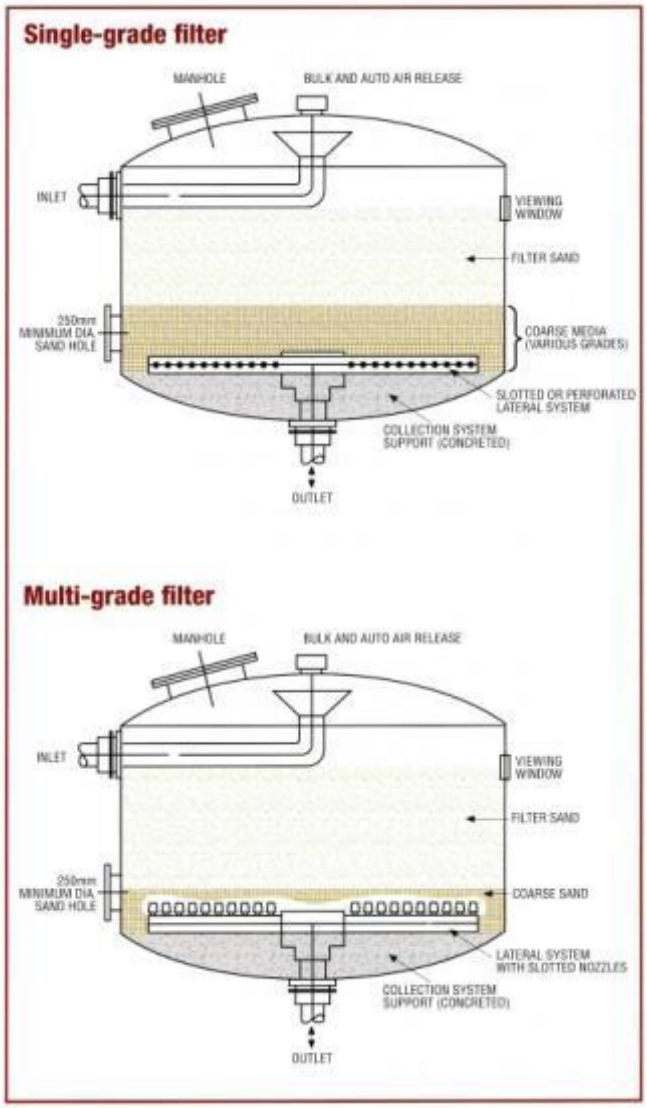
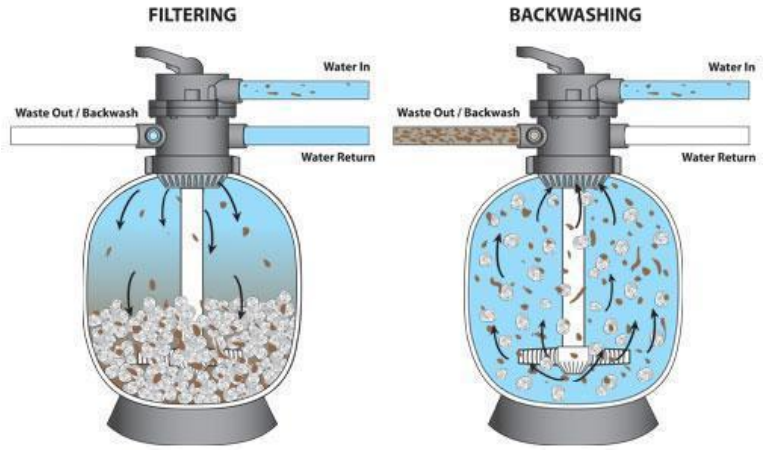
Filtration

The pool has its own filtration system. Pool Management ensures that all filters are inspected and cleaned if necessary, every 5 years to include media replacement.



Backwashing



Operational and Backwash Water Flow.

Adequate backwashing is essential for the maintenance of pool water quality and should be completed and logged in accordance with the pool operating procedure. It can be seen from the above graphic that correct backwashing should have sufficient flow to lift the filter bed and remove all entrained debris.

4.0 ASSET REGISTER & TEMPERATURES

FLOOR	LOCATION	SENTINEL Y/N	COLD WATER SOURCE	HOT WATER SOURCE	SINKS/WHB No.	WC No.	Ur No.	BATH	SHOWERS No.	HOT TAPS No.	COLD TAPS No.	TMV No.	TMV HOT INLET TEMP	TMV COLD INLET TEMP	HOT TAP TEMP	COLD TAP TEMP	TMV TEMP	SCALE?	SPRAY TAPS?	LOW USED?	DEADLEGS?	FLEXI HOSES?	Other Services i.e. Vending, washing machines, dishwashers, chiller units, tea boilers etc.,/ Other Comment
G	First aid room	Y	CWST 1	CAL 1	1					1	1	1	67	11.8			42	N	N	N	N	N	1 x mains tap
G	Reception accessible toilet	N	CWST 1	CAL 1	1	1				1			69	13			39	N	N	N	N	N	
G	Reception toilet 1	N	CWST 1	CAL 1	1	1				1	1	1	65	13			42	N	N	N	N	N	
G	Reception toilet 2	N	CWST 1	CAL 1	1	1				1	1	1	65	13			39	N	N	N	N	N	
G	Gym female change	N	CWST 1	CAL 1					2				65	14			42	N	N	N	N	N	
G	Gym male change	N	CWST 1	CAL 1					2				64	14			41	N	N	N	N	N	
G	Poolside accessible change	N	CWST 1	CAL 1	1	1			2	1	1		60	15			42	N	N	N	N	N	
G	Poolside toilet area	N	CWST 1	CAL 1	5	5				5	5	2	60	12			39 41	N	N	N	N	N	
G	Pool area cleaners	Y	CWST 1	CAL 1	1					1	1				70	12.4		N	N	N	N	N	

Comments:

FLOOR	LOCATION	SENTINEL Y/N	COLD WATER SOURCE	HOT WATER SOURCE	SINKS/WHB No.	WC No.	Ur No.	BATH	SHOWERS No.	HOT TAPS No.	COLD TAPS No.	TMV No.	TMV HOT INLET TEMP	TMV COLD INLET TEMP	HOT TAP TEMP	COLD TAP TEMP	TMV TEMP	SCALE?	SPRAY TAPS?	LOW USED?	DEADLEGS?	FLEXI HOSES?	Other Services i.e. Vending, washing machines, dishwashers, chiller units, tea boilers etc.,/ Other Comment
G	Outdoor change 1 & 2	Y	CWST 2	CAL 2	2	2	2		8	2	2	1	62	13			40	N	N	N	N	N	
G	Outdoor change 3 & 4	Y	CWST 2	CAL 2	2	2	2		8	2	2	1	62	13			39	N	N	N	N	N	
1	Staff room	Y	MCW	EWH	1					1	1				45	10.6		N	N	N	N	N	

Comments:

Appendix 1

Requirements for Maintenance & Monitoring of Risk Systems as per HSG274 technical guidance for Domestic Systems

Service	Action to take	Frequency
Calorifiers	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	Annually, or as indicated by the rate of fouling
	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	Annually, but may be increased as indicated by the risk assessment or result of inspection findings
	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, in healthcare premises not below 55 °C)	Monthly
Hot water services	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)	Monthly
	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	Monthly
	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	Quarterly (ideally on a rolling monthly rota)
	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	Representative selection of other sentinel outlets considered on a rotational basis to ensure the whole system is reaching satisfactory temperatures for legionella control
POU water heaters (no greater than 15 litres)	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	Monthly–six monthly, or as indicated by the risk assessment

Combination water heaters	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 55–60 °C	Monthly
Cold water tanks	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
Cold water services	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
Showers and spray taps	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
POU filters	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
Base exchange softeners	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

Multiple use filters	Backwash and regenerate as specified by the manufacturer	According to manufacturer's guidelines
Infrequently used outlets	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
TMVs	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
Expansion vessels	Where practical, flush through and purge to drain	Monthly–six monthly, as indicated by the risk assessment

Glossary & Abbreviations

Aerosol	A suspension in a gaseous medium of liquid particles with negligible falling velocity
Biofilm	A layer of micro-organisms contained in a matrix (slime layer), which forms on surfaces in contact with water.
Calorifier	Instantaneous Electric Water Heater
Dead Leg	A length of pipe which is closed at one end through which no water passes.
Fire Hose Reels	A permanent water supply for use in the event of a fire.
Legionella	The name given to the genus of bacteria that caused the original outbreak of legionnaires disease.
Legionnaire's Disease	A form of pneumonia caused by legionella bacteria.
L. pneumophila	One of the organisms that cause Legionnaire's Disease.
Legionellosis	Any illness caused by exposure to legionella.
Outlet	Tap (hot, cold or mixer) or shower head.
Sero group	A subgroup of the main species of Legionella
Sentinel	Sentinel taps are nominated outlets that are deemed to give representative temperature readings; these are usually the nearest and the furthest tap from the main water supply.
Vending Machines	Any vending machines referred to within the risk assessment are the type that dispense water (hot or cold) for the purpose of providing drinks for members of staff. These are usually mains fed.
Water Softeners	Generally, a water softener can be used in most applications for the purpose of reducing the hardness of the water supply to prevent the build-up of scale.

ACOP	Approved Code of Practice
CWDS	Cold Water Down Service (fed from domestic cistern/tank)
CWS	Cold Water System, Mains Cold Water
DWS	Domestic Water System
HWS	Hot Water System
HSE	Health and Safety Executive
L8	Approved Code of Practice and Guidance "legionnaires disease – the control of legionella bacteria in water systems" (L8) which came into effect on 8th January 2001 (issued by the HSC)
LRA	Legionella Risk Assessment
LTHW	Low Temperature Hot Water
PPM	Parts per million. This is a measure of dissolved substances and is numerically equivalent to milligrams per litre (mg/l) with respect to water.
TMV	Thermostatic Mixer Valve
TVC's	Total Viable Counts: total number of culturable bacteria in a given water sample (measured in cfu/ml) cultured at 22ºC and/or 37ºC. This test does not specifically identify Legionella.
WHB, WC	Wash Hand Basin, Water Closet