UNIVERSITY OF PLYMOUTH
ESTATES & FACILITIES

Reader Information

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1.0	March 2017	Head of Building & Engineering	Re-numbered/versioned to support revised E&F Document Control
2.0	April 2020	B&E Maintenance Manager	Review & Revision
3.0	June 2022	B&E Maintenance Manager	Update Duty Holder name added names of Deputy Responsible Persons. Updated legislation, guidance and standards references. Changed Independent Advisor reference to Authorising Engineer (Water) Referenced the Written Scheme and Water Safety Plan / Procedures
4.0	August 2024	B&E Maintenance Manager	Technical / Legal review and the addition of Scalding RA (Changes in red)

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PART A: SCOPE & POLICY STATEMENT

1.0 General Scope

The aim of this Policy and Code of Practice is to assist the University in understanding and managing the health risks associated with water hygiene in general and Legionella in particular. It explains in general terms how to control the risks and is designed to complement and not supersede the Health and Safety Executives approved code of practice (ACOP) and Health & Safety guidance documents "Legionnaires' Disease": The control of Legionella bacteria in water systems (referred to as 'L8' in this Code of Practice) and associated HSE guidance in HSG 274. It also considers the provision of drinking water and water used for purposes other than drinking, washing and sanitation.

This Policy and Code of Practice is intended for staff and contractors who manage areas with hot/cold water services and/or other water systems, for example humidifiers, engineering machines using water for lubrication, cooling or cutting and the wave tanks.

The Policy is supported by a procedure / written scheme document, which adds more detail to several aspects. Every contractor working on the University domestic water systems must have completed a suitable externally recognised Legionella / water safety course and shall be registered with one of the seven approved plumbing schemes listed in HTM 04-01. Copies of certification must be provided to your Tech Rep.

All work will be completed in accordance with the University Legionella / Water Safety Policy, Water Safety Plan (WSP) (Procedures) and local Written Schemes of Control and in accordance with L8, HSG274, HTM 04-01 (if relevant), or any other relevant standard current at the time of work. All work will be completed by competent staff members using only WRAS (Water Regulations Advisory Scheme) / Water Regulations Council-approved materials and techniques, any dead-legs and non-compliant arrangements will not be permitted. Any such discrepancies will be rectified as soon as possible by the contractor to the required standard at their cost.

This applies to all hot & cold-water systems owned, operated or leased by UoP, including Drake's Reservoir and Faculty owned and operated assets

The CoP is in place to manage the risks posed by the use/misuse water systems relating to:

- Legionella bacteria
- Scalding
- Pseudomonas bacteria
- Wound Infection
- Gastroenteritis

1.1 Policy Statement

The University will:

- Ensure the safety and welfare of our students, employees and any other parties affected by our activities from water-related hazards and risks, so far as is reasonably practicable.
- Support the allocation of adequate management time and resources to ensure that the risks from water-borne pathogens such as Legionella, Pseudomonas etc. are controlled at all times.
- Promote the co-operation of all our employees through clear senior management commitment, staff consultation, and by the provision of awareness and training programmes.
- Monitor this policy and the supporting procedures, written scheme, and action plan to ensure that objectives are being achieved. It will be reviewed, and if necessary, amended in light of legislative or organisational change.
- Monitor and continually seek improved performance and provide evidence of the control of water hygiene risk. We will set and review progress against KPIs and assurance reports will be issued to the Water Safety Group (WSG).
- Ensure that a suitable and sufficient risk assessments are carried out and reviewed in accordance with L8, HSG274, (HTM 04-01 where appropriate), BS8580, and any other provision that may be relevant, arise or supersede these requirements that may be relevant at the date of the start of the on-site part of the assessment. The risk assessment will be representative of the site, systems and services present at each site and will clearly identify all hazards, risks and recommended actions in a prioritised fashion.
- Appoint an independent Authorising Engineer (Water) to audit and give strategic advice to the University Estates Services. This individual will be a Legionella Control Association (LCA) member and will complete an annual audit of water safety management compliance.
- Ensure that any service providers and contractors adhere to this policy & code of practice, the supporting procedures, legislation and guidance, and are approved plumber scheme members using only WRAS / WRC-approved materials.
- Ensure that a water action plan and written scheme/ procedures are developed and implemented, and progress monitored. The plan will be periodically reviewed and updated with the guidance of the Authorising Engineer (Water) appointed by the Responsible Person.
- Ensure that sufficient funds are allocated to complete the action tracker, Master Legionella Action Plans.xlsx and written scheme in accordance with the specified timescales.
- Appoint formally the designations stated in this document and ensure that they are suitably trained and competent. Effectiveness will be monitored and reviewed formally at WHAC.
- Ensure that the performance of the water systems adheres strictly to best practice, and that this is monitored and reviewed strictly. Ensure that clear records with an adequate audit trail are in place and maintained as appropriate. Ensure that individuals are appointed to manage and review the process.

- Ensure that where appointed, any Service Provider will deliver the required service as specified in any contract, this policy and any relevant statutory and non-statutory requirements and will provide formal assurance of compliance and performance in the form of assurance reports.
- Ensure that there are competent internal and external staff members, and that adequate training is provided.

2.0 Legal Requirements

The Health and Safety at Work Act (1974) is the primary legislation, but there are a number of regulations, approved codes of practice and guidance which also apply, the current versions of which are listed below:

- Health and Safety at Work etc. Act 1974
- Management of Health and Safety Regulations 1999
- Control of Substances Hazardous to Health Regulations 2002
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995
- Safety Representatives and Safety Committees Regulations 1977
- Health and Safety (Consultation with Employees) Regulations 1996
- The Control of Legionella Bacteria in Water Systems Approved Code of Practice and guidance (L8) 2013
- British Standard 8580:2019 Risk Assessments for Legionella Control – Code of Practice.
- British Standard BS8680:2020 Water Safety Plans – Code of Practice.
- British Standard BS8580:2022 Risk Assessment for Pseudomonas – Code of Practice (deemed to be not applicable as there is no augmented care areas).
- European Bathing Water Directive 2006/7/EC

3.0 Organisation - Roles & Responsibilities

3.1.1 Duty Holder – Named in Appendix A

The Duty Holder has overall responsibility for the management and the control of the Legionella in the University. The Duty Holder will appoint a Responsible Person to co-ordinate and implement the requirements of the HSE Approved Code of Practice (L8).

3.1.2 Responsible Person – Named in Appendix A

The Responsible Person will take day to day responsibility for controlling any identified risk from Legionella bacteria. This person shall be a line manager, supervisor or have similar status and sufficient authority, competence and knowledge in order to carry out operational procedures competently. The Responsible Person will be familiar with the University's 'Safety Management System' and have a clear understanding of their responsibilities. The duties of the Responsible Person are set out in Section 3.2.

Deputy Responsible Person(s) – Named in Appendix A

The Deputy Responsible Person will assume control in the absence of the responsible person, who will assume management control of the requirements outlined in this Code of Practice.

Technical and Safety Managers

Technical and Safety Managers will take day to day responsibility for controlling any identified risk other than Legionella. These individuals will have sufficient status, authority, competence and knowledge to carry out operational procedures effectively and competently; where they do not have the necessary competence and knowledge, they will either undertake training to obtain it or engage competent help. Technical and Safety Managers will be familiar with the University's 'Building Water Safety Plan" and have a clear understanding of their responsibilities.

Other Staff

All staff who undertake any work at, or for, the University will be suitably trained, enabling them to be technically competent and safe.

External contractors

All contractors will:

- Refer to and comply with the 'Site Management Guidelines' for contractors.
- Provide evidence of competence and training regarding Legionella Awareness, they must have refresher training by an accredited training body a minimum of two yearly.
- Refer to University Risk Assessments and apply the controls specified.
- Comply with this Code of Practice.
- All work will be completed in accordance with the University Legionella / Water Safety Policy, Procedures / Written Scheme and in accordance with L8, HSG274, HTM 04-01 (if relevant), or any other relevant standard current at the time of work. All work will be completed by competent staff members using only WRAS / WRC approved materials and techniques, any dead-legs and non-compliant arrangements will not be permitted. Any such discrepancies will be rectified as soon as possible by the contractor to the required standard at their cost.

Responsibilities

The duties of the Responsible Person in implementing this policy & code of practice are:

- To endeavour to ensure that sources of risk have been identified and a suitable and sufficient risk assessment carried out in accordance with the latest versions of BS8580, L8 and HSG274 or any superseding document at time of application.
- To prepare a scheme of control (or course of action) for preventing or controlling the risk.
- Implement and manage the scheme of control and any water safety action plans.
- Appoint an Authorising Engineer (Water) to complete an annual audit of compliance and provide strategic advice and guidance.
- To keep records and check that what has been done is effective and monitor KPIs.
- To be responsible for the fixed and permanent hot and cold water systems up to and including the outlet/tap.
- To be involved in the plan to design out risks in new and existing installations.
- Following each risk assessment, produce an action plan, to log and deal with any risks that are identified. This is to record all actions taken, why and by whom.
- To produce and maintain training records and evidence of competence for all staff/contractors.
- To prepare an annual report on the Water Hygiene status and Compliance for the Water Hygiene Assurance Committee.
- In the event of a suspected Legionella outbreak the Responsible Person will be contacted and will attend site to assist in any investigation.

The duties of Maintenance & Project staff in implementing this policy and code of practice are:

Manage the general Estates projects, internal orders, and the University Capital Programme and in doing so ensure that:

- All new buildings & installations meet the latest legal and technical standards.
- Use only approved plumbers, techniques, and materials (WRAS, WRC etc.).
- Ensure that contamination of water services is avoided.
- Ensure that the maintenance team have appropriate input regarding the design and maintainability of all new installations.
- Ensure that maintenance teams have comprehensive operations and maintenance manuals handed over on a minimum on four weeks prior to completion of schemes.
- All assets have been ‘bar coded’ and the asset information recorded on the asset and location uploader template and handed over to maintenance a minimum of four weeks prior to completion.
- Ensure that appropriate training and familiarisation is provided to in-house maintenance teams upon scheme handover.
- Maintenance schedules are agreed and implemented when any new asset is brought into service by the University.
- Management arrangements are adequate and followed as described in this Code of Practice.

- A new Legionella risk assessment is provided where one does not exist, or the present one is updated and issued to the Responsible Person.
- Ensure that systems are cleaned and disinfected following any work as reasonably practicable.
- Carry out a scalding risk assessment, only fitting Thermostatic Mixing valves (TMVs) where required.

The Duties of the Technical and Safety Managers in implementing this policy are:

Technical and/ or Safety Managers must make the Responsible Person aware of any systems/ equipment etc. that are, or will be connected to, the water system. The Responsible Person must then arrange for a Legionella risk assessment to be actioned.

Other equipment not connected to the water services, but which utilises water or water-based material, and which can sustain microbial life (such as cutting fluids and the wave tanks), must also be risk assessed in the same way.

The Duties of the Authorising Engineer (Water):

Provide strategic Legionella / water hygiene advice and guidance and complete an annual audit of compliance and progress, including a review of key documents.

4.0 Legionella

Putting the Legal Duties into Practice

The University has to consider the risks from Legionella that may affect staff, students or members of the public and take suitable precautions; an equivalent strategy is required for each source of risk. As a university in control of premises, we will:

- Identify and assess sources of risk.
- Prepare a written scheme / procedures (or course of action) for preventing or controlling the risk (see separate document for details).
- Implement and manage the scheme.
- Keep records and check that what has been done is effective.
- Notify the local authority of any cooling towers or condensers, if applicable.

4.1 Assessing Risks

Legionella

The Responsible Person is responsible for ensuring that Legionella risk assessments for all hot and cold-water systems are completed where necessary.

Technical and Safety Managers must make the RP aware of any systems that require a risk assessment, who will arrange for these to be completed. Other equipment not connected to the water services at all, but which utilises water or water-based material, which can sustain microbial life (such as cutting fluids and the wave tanks), must also be risk assessed in the same way.

In this respect, the University of Plymouth Responsible Person will provide advice, training, and access to specialist contractors for Technical and Safety Managers. It is the responsibility of the Technical and Safety Managers to identify equipment that uses water and therefore requires risk assessing and notify the University's Responsible Person.

A competent person from an independent specialist practice will carry out risk assessments in accordance with BS8580, L8 and HSG274, and must be registered with the Legionella Control Association and their certificate of registration forwarded to the Responsible Person.

4.1.2 Other Risks

Scalding/ use of TMVs

The risk of scalding will be derived from analysis of temperature monitoring which is carried out as part of the Legionella control scheme and any significant risks will be controlled. This is the responsibility of the Responsible Person.

The University does not permit the installation of flexible connections after any blending or mixing device on a domestic water system.

Gastroenteritis

The risk of gastroenteritis is deemed to be low where water is derived from the mains and suitably protected against contamination in storage. Confirmation that stored water is protected will be derived from Legionella risk assessments and inspections carried out as part of the Legionella control scheme and any significant risks will be controlled. This is the responsibility of the Responsible Person.

The risk of gastroenteritis is deemed to be low in the wave tanks and where sea water is used as swallowing is unlikely, but specific tasks involving contact with these waters require gastroenteritis risk assessment. This is the responsibility of the Technical and Safety Managers.

Pseudomonas aeruginosa

The risk of *Pseudomonas aeruginosa* infection is deemed to be low, other than for individuals with specific risk factors such as impaired immune systems or cystic fibrosis, for whom a *P. aeruginosa* infection risk assessment is required. This is the responsibility of Technical and Safety Managers.

Wound infection

The risk of wound infection is deemed to be low, but significant in the context of some maintenance tasks on the cold and hot water systems, the wave tanks and when using sea water, where tasks involving contact with these waters require specific risk assessment. For cold and hot water systems, this is the responsibility of the Responsible Person and for the wave tanks and sea water systems it is the responsibility of Technical and Safety Managers.

5.0 Reducing or Controlling Risks

The Responsible Person will action the results of the risk assessments. Where it is reasonably practicable to eliminate the risk, it should be eliminated; however, in most instances this will not be possible so appropriate controls will be introduced to control the risk.

Written Scheme and Water Safety Plan / Procedures

A separate water safety plan / procedures document (in accordance with BS8680) and supporting written schemes (for each site) have been developed to add further detailed guidance and standards for the safe operation and maintenance of the University water services.

6.0 Record Keeping

It is essential to keep an up to date and accurate record of all water hygiene checks, tests, inspections and tasks. A detailed maintenance plan must also be in place for each building as defined in their specific scheme of control.

Each building has a schematic drawing for all hot and cold water systems, including Faculty, School and Departments this will be held centrally in the Estates Department.

All systems and buildings will have completed risk assessments and action plans.

All buildings or systems, which require a risk assessment, will have a scheduled review date for the risk assessment. This review date will be indicated in the risk assessment and recorded on the Legionella Risk Assessment schedule.

An e-system (Zetasafe) is employed to manage Legionella / water hygiene data and monitor performance.

An annual audit of compliance will be completed by our Authorising Engineer (Water).

Minutes of quarterly water safety group (WSG) meetings will be maintained and escalated as appropriate. The group has a clear terms of reference (ToR).

PART B: CODE OF PRACTICE

7.0 Management of Hot and Cold-Water Systems

The management of hot and cold-water systems shall be undertaken as outlined in HSG 274 part 2, including the following:

- Commissioning and recommissioning
- Operation of hot and cold-water systems
- Maintenance
- Regular flushing of showers and taps
- Design and construction
- Temperature control

The principal control measures are summarised below; where these controls are not in place precautions will be applied to compensate for the resulting increase in risk:

- Systems should be designed, installed, and commissioned correctly.
- Systems should be of the appropriate type and size for their use.
- Systems should be used appropriately; ideally daily, but at least once per week.
- Systems should be kept clean; this includes but not limited to tanks, calorifiers and showers.
- Cold water should be kept cold; less than 20°C or within 2°C of the supply temperature within 2 minutes.
- Hot water should be kept hot; 60°C in storage, at least 50°C at all outlets within 1 minute.
- All water should be kept fresh; storage should not exceed one day's usage.

This will be adjusted as required by individual risk assessments and the results of checks carried out.

Chlorine Dioxide

The Portland Square Building's hot water services system is treated and controlled via a dedicated chlorine dioxide system. In this system, chlorine dioxide is a substitute for high hot water temperature treatment and concentrations will be maintained between a minimum of 0.1 ppm chlorine dioxide and a maximum of 0.5 ppm total oxygen-chlorine compounds expressed as chlorine dioxide.

8.0 Wave Tanks

The wave tanks were installed with swimming pool treatment plant which has proved not to be compatible with the wave research requirements, so an alternative scheme of control has been implemented in the following stages:

Weekly temperature measurements will be taken of the water to establish whether it remains below 20°C.

Filtration and ultraviolet irradiation will continue, as will monthly Legionella sampling and analysis.

Monthly sampling and analysis for enterococci and *E. coli* is carried out.

Bathing Water Directive standards for coastal waters classified as excellent (≤ 100 cfu/100ml for intestinal enterococci, ≤ 250 cfu/100ml for *Escherichia coli*) and a Legionella concentration classified as under control in L8 (< 100 cfu/litre) is the target water quality standard, but Bathing Water Directive standards for inland waters classified as good (≤ 400 cfu/100ml intestinal enterococci, ≤ 1000 cfu/100ml *E. coli*) and a Legionella concentration classified as requiring review in L8 (100 - 1000 cfu/litre) are deemed acceptable.

Subject to maintaining the water at target or acceptable quality, circulation and filtration will be reduced by introducing periods with the pumps switched off, but all pumps will operate at least once in every 24 hours.to provide adequate circulation.

9.0 Emergency Procedures

Any situation involving possible or known exposure to Legionella bacteria will involve investigation and possible isolation or shutdown of the system. Water samples will be taken and the systems chlorinated before being restored, as described below.

If an outbreak of Legionnaires' Disease occurs within the University or due to its activities, then the guidelines outlined in HSG 274 Part 2 will be followed. These actions will include, but will not be limited to:

- Shutting down any water systems capable of generating an aerosol as required
- Taking water samples from the system by a competent individual
- Carrying out an emergency disinfection
- Providing health records as requested.
- Cooperating fully with any investigation.

The follow up investigation may involve:

- Tracing of pipework runs.
- Detailed scrutiny of all operational records.
- Statements from plant operatives and managers.
- Statements from contractors or consultants.

Isolated or unconfirmed cases of legionellosis (Diseases attributed to Legionella)

If an isolated case of legionellosis or an unconfirmed case of legionellosis is notified to the University of Plymouth, whereby the person may be suspected to have contracted the disease through contact with a water system(s) at the University, either by working at or residing in a University controlled premise or by visiting such a premises, then the University will be instructed to carry out a programme of emergency legionella sampling of the system(s) involved in accordance with the written scheme for legionella sampling.

Use of the water system(s) under investigation should be suspended until an emergency clean and disinfection of the system has taken place which would be carried out as soon as possible.

In the case of persons working directly with water systems at the University, then cases of legionellosis would be reportable under RIDDOR, if a doctor notifies the employer.

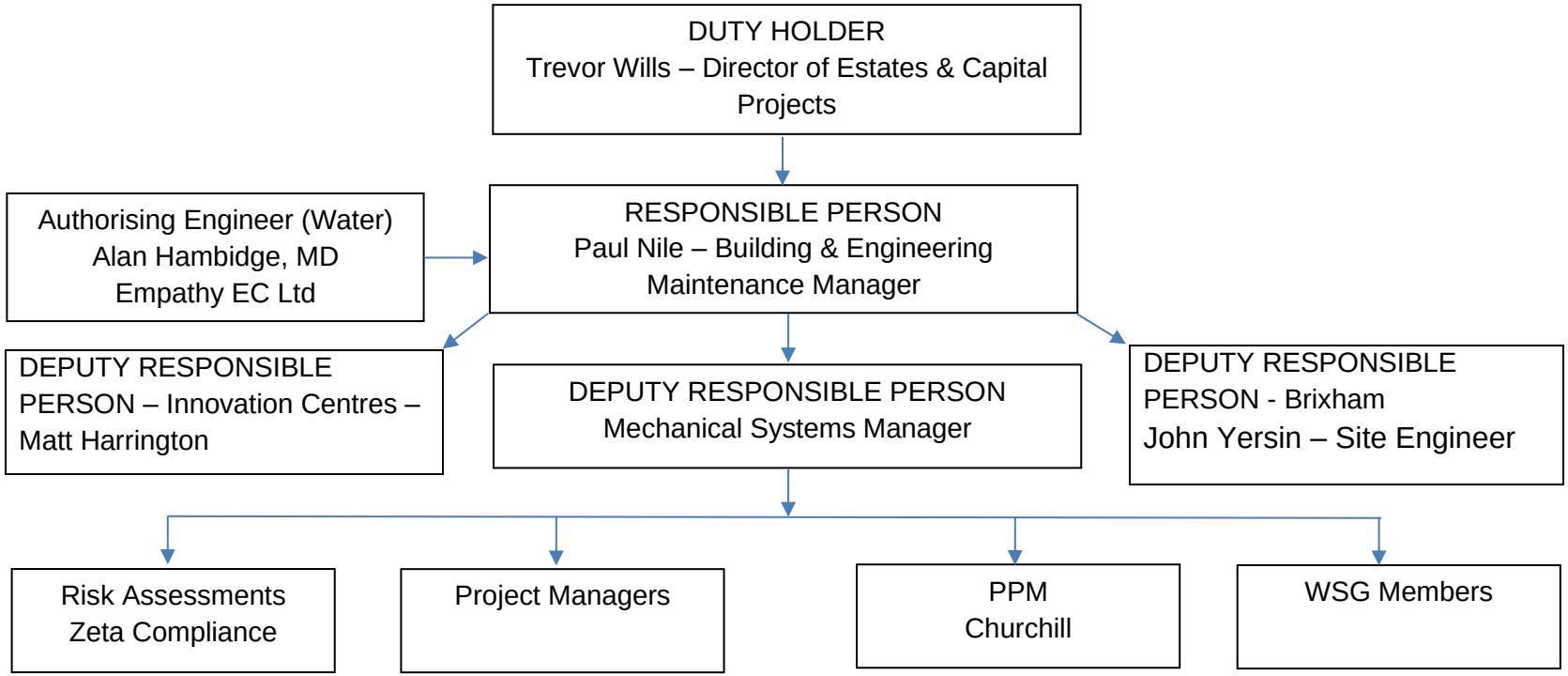
If there is an outbreak of Legionellosis in the surrounding areas, the UK Health Security Agency will investigate any confirmed case. Wherever appropriate, the UK Health Security Agency will contact the University and investigate any risk.

Local Authorities have established plans in place to investigate major outbreaks of infectious diseases including legionellosis.

APPENDIX A

UNIVERSITY OF PLYMOUTH

LEGIONELLA MANAGEMENT STRUCTURE



APPENDIX B

PLYMOUTH UNIVERSITY

Hot & Cold-Water Monitoring Procedures

All hot and cold-water services should be operated and maintained carefully; advice must be taken if you are uncertain as to the regulations or appropriate procedures.

Outbreaks have been associated with irregularly used showers, humidification, and spray devices.

The programme of treatment, monitoring, and cleaning for each system at the University site is outlined on the following pages.

Weekly				
Item	Day	Task	Responsible	Record Location
1	Not Specified	Flush all showers not used within the last week.	Building User	**Faculty Logbook**
2	Not Specified	Flush all irregularly used outlets and those not used within the last week.	Building User	**Faculty Logbook**
3	Not Specified	Check UV irradiation systems are operational where appropriate.	Faculty Technical Manager	**Faculty Logbook**
4	Not Specified	UV irradiation system pre-strainers should be inspected and cleaned.	Faculty Technical Manager	**Faculty Logbook**
Monthly				
5		Check all hot water calorifiers, cylinders, large hot water heaters (>15 litres) and gas fired hot water heaters are storing water above 60^{o}C.	Churchill Environmental Services	**Zetasafe**
6		Where hot water services are circulated check the flow and return temperatures are above 60 and 50^{o}C respectively	Churchill Environmental Services	**Zetasafe**
7		Check all hot and cold-water sentinel outlets (as defined by the Zetasafe system) temperatures	Churchill Environmental Services	**Zetasafe**

Quarterly				
8		Clean and disinfect shower heads and hoses.	Churchill Environmental Services	**Zetasafe**
Bi-annual				
9		Service UV irradiation systems where appropriate.	Faculty Technical Manager	**Faculty Logbook**
10		Check all cold-water storage tanks (cisterns) are storing water below 20^{o}C	Churchill Environmental Services	**Zetasafe**
11		Check incoming ball valve temperature is below 20^{o}C and check that temperature of furthest area of tank from the ball valve (outlet) and ensure no greater than a 2^{o}C raise in temperature.	Churchill Environmental Services	**Zetasafe**
12		Flush calorifier drain valves until water runs clear and avoid creating an aerosol	Churchill Environmental Services	**Zetasafe**

Note all records will be kept for 5 years before destroying, in either ZetaSafe or the Faculty Logbook.

APPENDIX C

PLYMOUTH UNIVERSITY

Hot & Cold-Water Control Parameters

Item	Parameter Details	Unit of Measurement	Action Level	Actions to be instigated in the case of out of specification results
1	Incoming Mains Water Temperature	°C	>20	Record ambient temperature. Continue to monitor temperature until it returns to normal. Ensure hot water services operate at correct temperatures and that all flushing tasks are undertaken. Contact water provider if necessary to determine whether all water being supplied is at an elevated temperature. Record all discussions.
2	Cold Water Temperature (outlets and tanks)	°C	>20	Where outlets exceed this temperature, flush for at least 5 minutes after 20°C has been reached, avoid creating aerosols and record all actions. Where water is stored, ensure make up water is below 20°C (see item 1 above), ensure all insulation is in place/secure and ensure that no hot water is venting back to the tank. Drain the tank to reduce temperature, reduce stored water volume permanently if flow is too low. Continue to monitor.
3	Hot Water Temperature (outlets and flow / returns)	°C	<50	Increase storage hot water system thermostat setting to ensure water is distributed at 50°C to the furthest outlets. Check pipe work insulation is intact. Where temperatures cannot be achieved, contact a specialist risk assessor.
4	Calorifier Temperature	°C	<60	Increase storage hot water system thermostat setting to ensure water is stored at 60^{o}C. Check insulation is intact.

				Where temperatures cannot be achieved, contact a specialist Risk Assessor.
5	Calorifier Temperature	°C	>65	Reduce storage hot water system thermostat setting to ensure water is stored at 60^{o}C.
6	Total Viable Counts (TVCs) or Incubated Dipslide Counts	cfu (colony forming units)/ ml	>10^2 at 37°C >10^3 at 22°C > 10^4 actions	1. If the result is from a hot or a cold-water system, 2. Re-test. 3 If another poor result is obtained arrange for a system chemical clean. Review risk assessment. Ensure no changes to the system have been undertaken.
7	Legionella counts (any species/ strains/ serotypes)	cfu / l	>100-1000 resample >1000 action	1. If the result is from a hot or a cold-water system. 2. Close all showers and other spray related outlets. 3. Re-test immediately and again two weeks later to obtain a second negative result. 4 If either retest result is poor arrange for a system chemical clean. Review risk assessment. Ensure no changes to the system have been undertaken. Inform the WSG. .

9	Legionella pneumophila sero groups 1-14	cfus / l	>1-100 resample. >100	1. If the result is from a hot or a cold-water system. 2. Close all showers and other spray related outlets. 3. Re-test immediately and again two weeks later to obtain a second negative result. 4 If either retest result is poor arrange for a system chemical clean. Review risk assessment. Ensure no changes to the system have been undertaken. Inform the WSG.

10	Chlorine dioxide (ClO_2)	ppm (parts per million)	>0.1 <0.2	Record ClO_2 residual levels to ensure minimum level on a monthly basis, if level below 0.1ppm increase dosage rate.
11	Chlorine dioxide	ppm	>0.5	Record ClO_2 reserves to ensure maximum level on monthly basis, if greater than 0.5ppm reduce dosage and re-test