

Management Plan for the Control of Legionella Bacteria in Water Systems

TAMWORTH Borough Council



Contents

<u>Section</u>	<u>Page</u>
Legionella Policy	2
Introduction	3
Legionella Management	4
Legionella Risk Assessment	31
Legionella Operational Procedures	38
Appendices	68

Legionella Policy

The policy of Tamworth Borough Council is to provide and maintain safe working conditions, equipment and systems of work for all staff, visitors and contractors, and to provide such resources, information, training and supervision as required for this purpose.

The Council will provide resource and maintain appropriate management systems, systems of work and equipment to ensure that legionella risks to all staff, visitors and contractors are controlled. Suitable information, instruction, training and supervision will be provided to all those involved in the control of legionella.

The council will adopt the principles of control set out in the HSC publication *'Legionnaires' disease: The control of legionella bacteria in water systems- Approved Code of Practice and Guidance (L8)*

The management of legionella risk will be a continual commitment by the organisation involving regular management and progress meetings, a risk assessment program, monitoring, inspection and record keeping.

The Director (Assets and Environment) has been appointed by the Organisation as the Responsible Person (Legionella).

This policy is formally accepted by the organisation. The Council will do all that is reasonably practicable to comply with its requirements, and will make all necessary resources available.

Signed: _____

Chief Executive of Tamworth Borough Council

1.0 Introduction

1.1 This Management and Procedures Manual has been prepared for TAMWORTH Borough Council and sets out a framework for ensuring water systems are installed, operated and maintained in a manner which both reduces the risk of a Legionellae outbreak and ensures an appropriate water quality. This Manual forms the first part of a three part framework which comprises the following elements:

i. Management Policy

Outlines the overall responsibilities of the organization, details responsibilities of individuals, and defines outline operational duties which must be implemented, defines record keeping requirements.

ii. Risk Assessment

Outlines the requirement to identify and assess the risk of Legionellosis from work activities and water sources within the councils estate and the identification of any remedial or precautionary measures that need to be undertaken.

iii. Operational Policy

Details the specific operational criteria that must be achieved for all systems identified in the Risk Assessment as being susceptible to colonising Legionella.

Details the specific maintenance criteria that must be achieved to minimise the risk as identified in the Risk Assessment.

Details of testing protocols, frequencies, record keeping etc.

1.2 The Council has both a moral and legal responsibility to ensure that the risk to employees, visitors and contractors etc. is reduced so far as is reasonably practicable. The staff detailed in this manual, are required to implement the procedures, works, etc. necessary to ensure the Councils obligations and statutory requirements are fulfilled.

Legionella Management Policy

1.0	WHAT IS LEGIONNAIRES DISEASE?	6
2.0	LEGISLATION, STANDARDS, GUIDANCE AND CODES OF PRACTICE	8
3.0	ARRANGEMENTS FOR MANAGING LEGIONELLOSIS	10
4.0	LEGIONELLOSIS MANAGEMENT PLAN/ RISK MINIMISATION PLAN	16
5.0	RISK ASSESSMENTS	17
6.0	OPERATIONAL CONTROL MEASURES	18
7.0	MONITORING AND ROUTINE INSPECTION	20
8.0	RECORD KEEPING	21
9.0	TRAINING AND COMPETENCE	23
10.0	THE COURSE OF ACTION IF AN OUTBREAK OF LEGIONNAIRES DISEASE IS SUSPECTED	25
11.0	THE COURSE OF ACTION IN THE EVENT OF AN OUTBREAK	26
12.0	THE COURSE OF ACTION IN THE EVENT OF A LEGIONELLA POSITIVE TEST RESULT	28
13.0	SPECIFIC HEALTH AND SAFETY ISSUES	29

1.0 What is Legionnaires Disease?

1.1 Background

Legionnaires disease is a potentially fatal form of pneumonia which can affect anybody, but which principally affects those who are susceptible because of age, illness, immunosuppression, smoking etc. It is caused by the bacterium *Legionella pneumophila* and related bacteria. Legionella bacteria can also cause less serious illnesses which are not fatal or permanently debilitating e.g. Pontiac Fever and Lochgoilhead Fever.

Legionnaires Disease was first recognised in July 1976, when an outbreak occurred amongst delegates attending an American Legion Convention in Philadelphia. The cause eluded scientists for several months, but in January 1977 the Centre for Disease Control, Atlanta, reported the isolation of the causative agent, which they named Legionella Pneumophila.

1.2 Risk of Infection

On average there are approximately 200-250 reported cases of Legionnaire's disease each year in the UK. It is thought, however, that the total number of cases may be generally underestimated. About half of cases are associated with travel abroad. Infections which originate in the UK are often sporadic, for which no source of infection is often traced. However, clusters of cases also occur and outbreaks have been associated with cooling tower systems and hot and cold water systems in factories, hotels, hospitals and other establishments.

Mortality rates from confirmed cases are, on average 10 – 12%. Since 1980 there have been a number of major outbreaks of Legionnaires Disease in the UK.

1.3 Susceptibility of Individuals

While previously healthy people may develop Legionnaires Disease, there are a number of factors which increase susceptibility:

- increasing age, particularly above 50 years (children are rarely infected)
- sex: males are three times more likely to be infected than females
- existing respiratory disease which makes the lungs more vulnerable to infection or anything that may suppress the immune system
- smoking, particularly heavy cigarette smoking, because of the probability of impaired lung function

1.4 Reducing the Risk

As legionella bacteria are commonly encountered in environmental sources they may eventually colonise manufactured water systems and be found in cooling tower systems, hot and cold water systems and other plant which use or store water. To reduce the possibility of creating conditions in which risk from

exposure from legionella bacteria is increased, it is important to control the risk by introducing measures which:

- (a) Do not allow proliferation of the organisms in the water system; and
- (b) Reduce, so far as is reasonably practicable, exposure to water droplets and aerosol.

The risk of infection depends upon the ability of these organisms to multiply to significant levels, to be then dispersed into the air as an aerosol and to be inhaled in sufficient numbers by susceptible individuals.

By knowing the ideal conditions for the bacteria's growth and taking all reasonable precautions to avoid them we can reduce the risk of sufficient numbers of bacteria being present to cause a health hazard.

Although the bacterium is relatively easily killed it is important to avoid the conditions under which it likes to grow.

Most water systems can provide a potential habitat for the organism. The optimum temperature required is 37°C. At temperatures above 37°C the rate of multiplication of Legionella, in laboratory tests, decreases and at 46°C falls to zero. Bacteria will survive at higher temperatures but the survival time decreases from a matter of hours at 50°C to one of minutes at 60°C and practically zero at 70°C.

Below 37°C the multiplication rate decreases and can be considered insignificant below 20°C. The organism can remain dormant at much lower temperatures and return to active multiplication whenever more favourable temperatures occur.

It is this temperature dependence which gives us the main mechanism of prevention of Legionnaires Disease in hot and cold water systems. If we can keep the cold water cold (below 20°C) and the hot water hot (above 50°C) then the bacteria will either not be able to multiply or will be killed.

However, even with good day to day control of temperature or scale, corrosion and fouling, and the use of effective biocides, it is essential to clean and sterilise all parts of a water system on a regular basis. The recommended times between this process vary dependent upon the type of system, but the objectives remain the same. The essentials of control are to keep any water system as clean as possible.

2.0 Legislation, Standards, Guidance and Codes of Practice

2.1 Introduction

An approved Code of Practice and Guidance L8 (ACOP) "The Control of Legionella Bacteria in Water Systems" became effective on 8 January 2001 and employers (and others as defined) are expected to follow the ACOP guidance in controlling Legionellosis in all circumstances where the Health and Safety at Work Act 1974 (HSW) applies. The ACOP provides practical guidance for compliance with certain provisions under HSW and the Control of Substances Hazardous to Health Regulations 1999 (COSHH).

In addition to the ACOP a number of other sources of legislation, guidance, codes of practice, etc. are available and are listed below:

- Health and Safety Executive – The Control of Legionellosis including Legionnaires Disease
- Control of Substances Hazardous to Health Regulations 2002
- Cold Water Services Water Supply (Water Fittings) Regulations 1999
- "Safe" Hot Water and Surface Temperatures – Health Guidance Note 1998
- British Standard Specification BS 6700: 1997 for design, installation and maintenance of services supplying water for domestic use within buildings and their curtilages
- Health and Safety Executive – Guidance Note EH48 Legionnaires Disease
- The Chartered Institution of Building Services Engineers TM13 2002 COP Minimising the Risk of Legionellosis

The above documents provide a useful source of data for site staff to manage the control of Legionellosis and should be consulted whenever further information on the subject is required.

2.2 Required Standards at TAMWORTH Borough Council

Our policy is to follow the guidance in the ACoP (L8) as a means of complying with the Control of Substances Hazardous to Health (COSHH) Regulations 2002.

Although failure to comply with any provision of the ACOP is not in itself an offence, that failure may be taken by a court in criminal proceedings as proof that a person has contravened the legal requirement to which the provision relates. In such cases, however, it will be open to that person to satisfy a court that he has complied with the requirements in some other way.

Therefore, in order to minimise the potential for an outbreak of Legionella and ensure appropriate water quality standards are maintained, **the responsible persons as detailed in Section shall implement all requirements of the ACOP and, where applicable, adopt the procedures and practices detailed in the supporting documents listed above.**

2.3 ACoP L8: The Key Requirements

The key requirements of the ACOP are listed below and a more detailed copy is included in the Operational Policy Document:

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

The Operational Policy Manual (Section 3 of this Manual) provides specific detail on the maintenance regimes that must be implemented on the systems on the council's estate.

2.4 TAMWORTH Borough Council Policy Statement

The policy of the Council is to provide and maintain safe working conditions, equipment and systems of work for all staff, visitors and contractors, and to provide such resources, information, training and supervision as required for this purpose.

The Council will provide resource and maintain appropriate management systems, systems of work and equipment to ensure that legionella risks to all staff, visitors and contractors are controlled. Suitable information, instruction, training and supervision will be provided to all those involved in the control of legionella.

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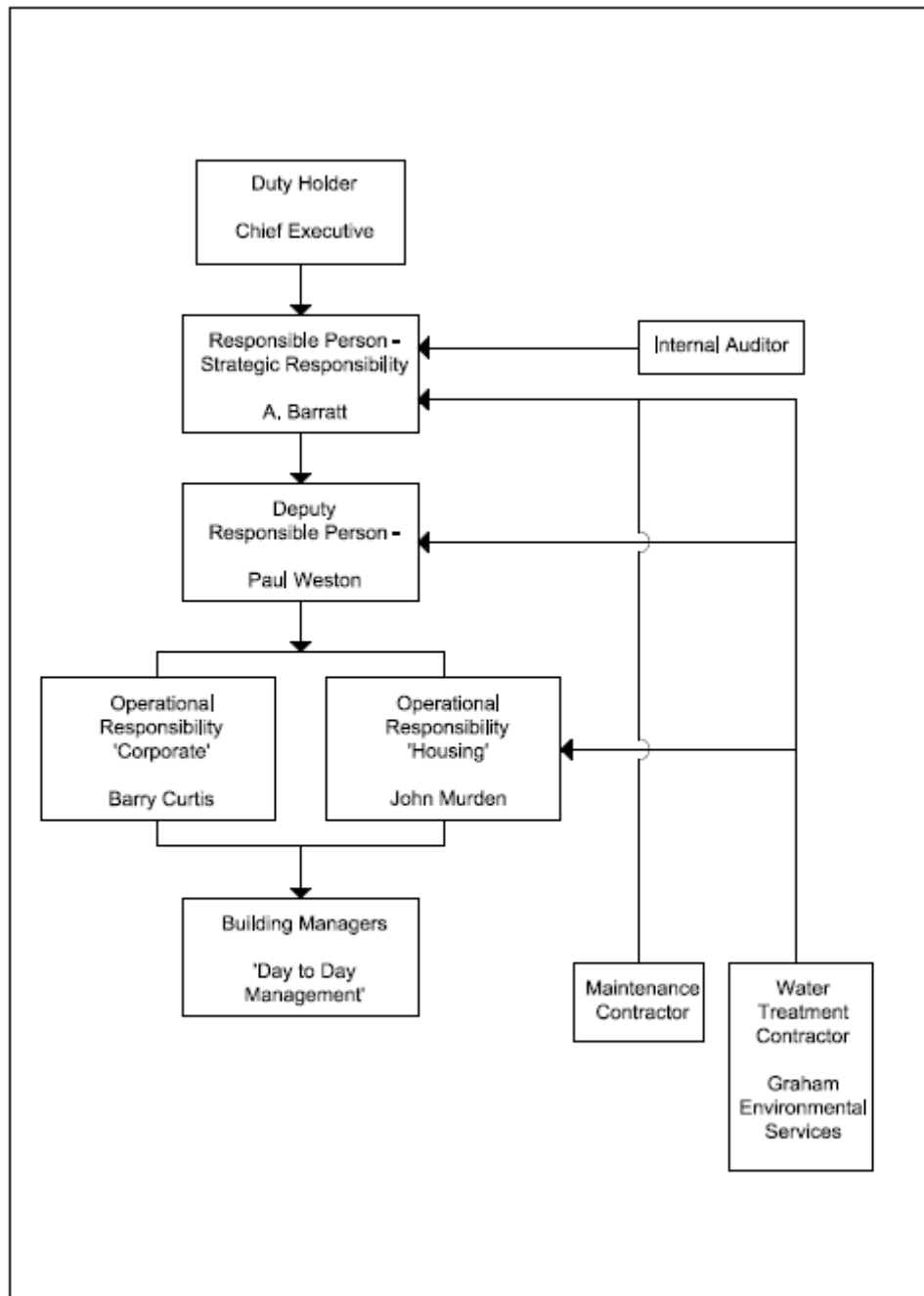
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This policy is formally accepted by the organisation. The Council will do all that is reasonably practicable to comply with its requirements, and will make all necessary resources available.

3.0 Arrangements for Managing Legionellosis

The following organisational structure diagram summarises the Councils arrangements for managing legionella.



3.1 **Specific Duties and Responsibilities**

The ACoP identifies two distinct roles, each having specific responsibilities for the management of legionella bacteria, namely

- (a) The Duty Holder
- (b) The Responsible Person

3.1.1 The Duty Holder: Chief Executive

The duty holder must appoint in writing a responsible person to take managerial responsibility for controlling legionella in Council premises and must ensure that the Council meets its statutory obligations. The Chief Executive is ultimately responsible for Health and Safety and the safe operation of the water systems within the council premises.

3.1.2 The Responsible Person

The responsible person shall accept managerial responsibility for the control of legionella bacteria within all council premises. They will be responsible for the implementation and management of the Legionella Control Plan and all the procedures for control as set out in this policy and operational manual.

The Responsible Persons duties include but are not limited to the following

- Act as a focal point for all Legionellae / Legionellosis related issues within Council.
- Arranging for all premises to be risk assessed by a competent specialist water treatment contractor, no less frequently than bi-annually, in sufficient detail so as to identify and assess the risk of Legionella.
- Arranging for a competent specialist water treatment contractor to undertake inspection and monitoring regime to meet the requirements of the risk assessment and statutory legislation.
- Maintain Council's Legionellae Written Scheme (Management Plan).
- Ensuring up to date schematic drawings / diagrams of the hot and cold water systems are prepared, updated and made available to Maintenance Contractors, Building Maintenance Operatives and Building Managers as necessary.
- Providing an asset register of all associated plant, pumps etc. to Maintenance Contractors, Building Maintenance and Building Managers (or equivalent) as necessary.
- Providing adequate information to the Building Managers/users/Building Maintenance etc. on any risks and measures necessary to ensure that water systems will be safe and without risks to health.
- Ensuring hot and cold water systems are designed and constructed in compliance with relevant water regulations.
- Notifying the Building Maintenance Supervisor, Contracts Manager and the Health & Safety Advisor of any cooling towers and evaporative condensers.

- Develop and implement action plans in relation to identified or potential Legionellae presence.
- Assess Safe Systems of Work / Method Statements and / or Permit to Work systems in relation to any work where there is a risk of Legionellosis.
- Convene meetings of relevant personnel and groups prior to and, where necessary during any work with the potential for a release of Legionnellae, to ensure appropriate procedures and safe systems of work are being applied.
- Liaise with other relevant agencies and personnel, including surveyors, analysts, HSENI, EMAS, Occupational Health / Hygiene professionals, project managers, and emergency services, as appropriate.
- Coordinate any significant Legionellae related works including, so far is as reasonably practicable, compliance monitoring.
- Ensure that relevant employees and / or contractors are provided with appropriate information, including the results of site-specific risk assessments as applicable.
- Ensure that, in the event of a serious Legionellosis related incident, the appropriate senior managers and the HSENI are informed as soon as possible.
- Being accountable to the Chief Executive for the effective management of Legionellae within Council.

The Property Services Team are responsible for the selection of suitable systems. The design, maintenance and operation of the system is crucial to controlling the risk from Legionella bacteria and employees should avoid procuring systems that give rise to a reasonably foreseeable risk of Legionellosis. Competent advice should be sought from sources such as manufactures, suppliers, British Standards and / or their European / International equivalents where necessary.

3.1.3 Deputy Responsible Persons

The Deputy Responsible Persons will, in the absence of the Responsible Person, assume the role of 'Acting Responsible Person'. They will also be responsible for assisting in the implementation, management and operation of the Legionella Control Plan and all the procedures for control as set out in this policy and operation manual. They may also be delegated specific responsibilities as directed by the Responsible Person.

3.1.4 Facilities Manager / Building Manager

Those Building Managers who are responsible for the day-to-day management of the risk from Legionella bacteria on-site must:

- Allow reasonable access to enable the risk assessment and any remedial works to take place.
- Ensure that no repair, maintenance or alteration work takes place on hot and cold water systems within the building(s) they are responsible for without notifying Property Services Team of the planned changes so an assessment can be made as to the potential water hygiene impact on the system.
- Appoint and identify any individuals(s) who will be responsible for completing the routine water hygiene tasks and checks on the premises, i.e. weekly flushing tasks
- Regular maintenance of showers and water systems (with direction from Building Maintenance and following the recommendations of the assessment carried out by the Maintenance Contractor as appropriate), this may include:
 - a. Flushing / running showers for a set time at the hottest setting at least once a week;
 - b. Flushing / running little used taps, WCs and water sources weekly;
 - c. Instigating suitable closedown and reopening procedures where a facility or part thereof, is to be removed from use for any period of time greater than seven consecutive days.
- Facilitating Building Maintenance as necessary.
- Facilitating Maintenance Contractors as necessary.
- Recording such flushing procedures in log sheets and managing / monitoring maintenance records contained within the log book such as regular maintenance, Chlorination records and remedial works.
- Reporting any concerns to Responsible Person (the Responsible Person), such as inappropriate temperatures, in a timely and appropriate manner.
- Ensuring that problems or concerns are followed up with the Responsible Person, in a timely and appropriate manner.
- Ensure that they are aware of the work being undertaken by the contractors and maintenance staff, the risks being introduced and how the work may affect the working environment;

- Maintaining a Contractors Log for their department.
- Report any damage, deterioration or changes in the use of the building, use of the of water systems and / or air conditioning plant within their area of operational responsibility to the Responsible Person.
- Ensure that they inform the contractors and maintenance staff of all relevant emergency procedures within their department / area as appropriate.
- Account for contractors and maintenance staff working within their department in the event of an emergency.
- Ensuring only modifications, approved and authorised by the Responsible Person, are made to any system that utilises hot or cold water.

Each building will have its own Legionella Survey / Risk Assessment and particular recommendations, which must strictly implemented and followed. Building Managers should seek advice from the Facilities Management Team and the Responsible Person. Building Managers should also seek advice where there is a concern that exposure to Legionella might present a risk to health.

3.1.5 Water treatment contractor

The Water Treatment Contractor, were employed, will be responsible for undertaking any of the legionella control tasks/procedures as delegated to by the Responsible Person. These responsibilities will be defined in writing in the contract documentation. Any deviation from the initial contract documents shall be mutually agreed and documented as part of the contract review process. It is the council's policy that a specialist water treatment contractor will undertake the following tasks as identified in the Risk Assessment and Operational Policy & Procedure Manual

The appointed specialist water management contractor is responsible for carrying out control schemes measures as directed by the tender specification. A detailed list of the current contractors responsibilities are provided in Appendix A. The duties may include, but are not be limited to:

- Carrying out Legionella Surveys and Risk Assessments.
- Provide a log to record details of all monitoring, inspections and remedial work undertaken.
- Monitoring and inspecting all accessible parts of systems for damage or contamination.
- Disinfecting systems and ensuring treatment regimes are appropriate.
- Legionella and TVC Sampling.

- Recording all such inspections, assessments and maintenance regimes and providing any necessary documentation to enable responsible persons to update log books accordingly.
- Advising Responsible Person and / or Facilities Managers of the outcome of inspections and areas of concern in a timely fashion so that recommended preventative work can be implemented to maintain appropriate standards.
- Providing Legionella Awareness training to TAMWORTH Borough Council staff as appropriate.
- Advising TAMWORTH Borough Council as to the adequacy of its legionella management plan and control procedures
- All work carried out by the contractor must be carried out in accordance with relevant legislation and industry best practice.
- All contractors must comply with the Councils policy on the control of the contractors.

3.1.6 Independent Auditor

An independent Auditor, external to the Council is responsible for auditing the building water systems operation and control and providing independent advice from time to time, as necessary

3.2. Appointments for the Management of Legionellosis

- 3.2.1** The Duty Holder is the Council Chief Executive.
- 3.2.2** The Responsible Person (Legionella) shall be the Director (Assets & Environment)
- 3.2.3** The Deputy Responsible Person (Legionella) will be the Head of Asset Management.
- 3.2.4** The appointments of the Responsible Persons (Legionella) and the Deputy Responsible Persons (Legionella) shall be confirmed in writing by the Duty Holder, a copy of which is held in Appendix B.
- 3.2.5** The details of the current Water Treatment Contractor shall be held in Appendix B.

4.0 Legionellosis Management Plan/ Risk Minimisation Plan

4.1 The Responsible Person and Property Services Team will be responsible for the implementation and arrangement of the written management plan for the control of legionella bacteria in council properties in accordance with this Policy and Procedure Manual and the HSE ACoP L8, COSHH regulations and all other statutory and advisory provisions afore mentioned. The Legionellosis Management Plan/ Risk Minimisation Plan will take the form of a Legionella Action Plan and will encompass the following key elements

- Risk Assessment
- Risk Control Measures
- Routine Monitoring
- Record Keeping
- Review

4.2 The Legionella Management Plan/Risk Minimisation Plan and arrangements will be reviewed annually on a formal basis by the Responsible Person. This annual legionellosis risk management audit will be undertaken in order to ascertain the effectiveness of the broad management arrangements. The methodology for audit may vary from year-to-year in order to ensure a fresh outlook on each occasion. The audit report will include recommendations for improvement and forms part of the legionellosis risk management system. A quarterly audit of site log books will also be undertaken.

5.0 Risk Assessments

(See section 2 of this Policy and Procedures Manual)

5.1 A suitable and sufficient assessment is required to identify and assess the risk of exposure to Legionella Bacteria from work activities and the water systems on the premises and any necessary precautionary measures. The assessment should include identification and evaluation of potential sources of risk and:

- The particular means by which exposure to legionella is to be prevented; or
- If prevention is not reasonable practicable, the particular means by which the risk from exposure to legionella bacteria is controlled.

5.2 Prior to the conduct of on-site risk assessments, a risk screen will be performed in order to prioritise the water systems for detailed risk assessment, in order that the potentially highest risk building are assessed first.

Where the assessment demonstrates that there is no reasonably foreseeable risk or that risks are insignificant and unlikely to increase, no further assessments or measures are necessary. All risk assessments should be reviewed annually.

5.3 The risk assessment shall form the basis of the Legionella Management/ Risk Minimisation Scheme describing the particular means by which the risk from exposure to Legionella bacteria is to be controlled. The remedial actions within the Legionella Management Plan/ Risk Minimisation Scheme shall be reasonably practicable and prioritised on the basis of risk, cost and difficulty.

6.0 **Operational Control Measures**

(See section 3 of this Policy and Procedures Manual)

6.1 Where the risk assessment shows that there is a reasonable foreseeable risk and this cannot be totally eliminated, there should be a written scheme for controlling the risk from exposure. This scheme should specify measures to be taken to ensure that it remains effective and should include:

- An up-to-date plan showing layout of the plant or system, including any part temporarily out of use;
- A description of the correct and safe operation of the system;
- The precautions to be taken;
- Checks to be carried out to ensure efficacy of the scheme and the frequency of such checks;
- Remedial action to be taken in the event that the scheme is shown not to be effective.

6.2 General Statement of Control

There are many ways in which exposure to legionella bacteria can be controlled and the complexity of controls will vary depending on the risks posed by any one system. The risk from exposure will normally be controlled by measures, which do not allow the proliferation of legionella bacteria in the system and reduce exposure to water droplets and aerosol. Control measures will generally include the following precautions where appropriate:

- Controlling the release of water spray;
- Avoidance of water with temperatures between 20°C and 45°C;
- Avoiding water stagnation, which may encourage the growth of bio film;
- Avoiding the possibility of materials which provide a harbour for nutrients which encourages the multiplication of bacteria e.g. dead animals, wood etc., which can fall into open water tanks;
- Avoid use of materials in systems that can harbour or provide nutrients for bacteria and other organisms;
- Keeping systems clean to avoid the build-up of sediments which may harbour bacteria
- The use of suitable and safe water treatment programmes;
- Effective monitoring and management systems, which ensure correct and safe operation together with effective maintenance of the water system.

6.3 Any written scheme, which includes the use of chemicals, must contain manufactures details on the effectiveness, the required concentrations and contact time required for effective treatment. They should also contain the health and safety information for the storage, handling, use and disposal of the chemical.

6.4 The cleaning and disinfection procedures should be clearly stated. Where monitoring procedures are required the scheme must clearly state the required frequency, sampling locations and procedures to ensure consistency. It must make clear the acceptable physical and chemical parameters together with allowable tolerances. There must also be guidance on the remedial action to be taken in case the control limits are exceed,

including lines of communication, which should include all appropriate appointed persons.

- 6.5** It is essential that the risks are adequately controlled therefore written schemes must state what arrangements have been made to ensure they are properly implemented and managed. Anyone who is responsible for managing the scheme or undertaking monitoring of the control measures needs to be identified in the written scheme by name. All written schemes must also contain a Normal Operating Procedure together with an Emergency Action Plan. The primary objective should be to avoid conditions, which permit Legionella Bacteria to proliferate and to avoid creating a spray or aerosol.

7.0 Monitoring and routine inspection

7.1 Where there is a significant risk there is a need to ensure that the control measures remain effective. This should be the duty of the responsible person or where appropriate, a Council appointed external contractor and should involve:

- Checking the performance of the system and it's component parts:
- Inspecting the accessible parts of the system for damage and signs of contamination; and
- Monitoring to ensure that the treatment regime continues to control to the required standard

7.2 The frequency and extent of the routine monitoring will depend on the operating characteristics of the system and shall be set out in the site specific risk assessment (see Appendix C).

8.0 Record Keeping

(See section 3 of this Policy and Procedure Manual)

8.1 Records of risk assessments and surveys of water systems carried out in accordance with the Approved Code of Practice will be documented. The resulting information is to be held electronically.

8.2 Electronic web based legionella log book

8.2.1 The council will use a Web Based Electronic Logbook System to hold all records pertaining to the control and management of legionella relating to the tasks undertaken by the Water Treatment Contractor. The system will be specified by the Property Services Section. It will be the responsibility of the council to act upon any non conformances reported and to appoint a competent person to undertake all necessary remedial action to mitigate the risk of exposure to legionella bacteria.

8.2.2 The system should fully integrate the key stages of the Legionella management process into one user friendly and secure web page. The system must be able to provide the following information as a minimum electronically and with a delay from site to web page of less than one hour; using GPRS enabled PDA hand held technology. Each water system asset will be allocated a unique Asset Identification Number, in the form of a barcode or similar.

8.2.3 The system must include demonstrable, robust security (minimum 1024Bit SSL Certificate) to protect any and all data relevant to the Contract Administrator and the council such as property names, addresses, contact details and information recorded, during the contact period and beyond. The system must fully comply with the Data Protection Act 1998.

8.2.4 Access to the Electronic Web Based System will be via a secure and unique user name and password. The key personnel involved in the management of the control scheme will have full editable access to the system while other users such as Building Managers will have a read only facility.

8.3 Water Hygiene Logbook (Held on each site where practically possible)

8.3.1 A hard copy log book will be held on each site and will hold the following information;

- A log to be signed by all contractors carrying out work on the buildings water systems and a description of their work.
- A register for weekly flushing of infrequently used outlets. This will also include a procedure detailing how and why outlets should be flushed.

See Appendix I for an example log book.

8.3.2 To ensure that precautions continue to be carried out and that adequate information is available, 'current' records will be required to be kept for at least two years after that period. All records should be signed by those performing the various tasks assigned to them. These records shall be retained for five years.

8.4 Information for Employees

All staff involved in the operation of the Legionellosis Management must be given information to ensure they are aware of the risks associated with the water and other risk systems within the council estate. They should have access to the written scheme, all monitoring records and risk assessments. Poor communication has been indicated in previous outbreaks as a contributory factor, therefore all lines of communication should be clear, unambiguous and audited regularly to ensure they are and remain effective.

9.0 **Training and Competence**

9.1 Only competent persons will be authorised to carry out legionella management and control works. A person shall be deemed competent to carry out the appropriate operation only if they have satisfactorily completed a Council approved course on Legionella control, as well as having other appropriate qualifications, sufficient knowledge and experience relevant to the Legionella control, testing or management operations that they propose to undertake.

9.2 **Council Employees**

All council employees involved in the control of legionella will be given suitable and sufficient training to enable them to competently carry out all tasks that they are responsible for. The Responsible Person will identify all employees training requirements and co-ordinate the delivery of that training. Typically legionella training will be required as follows

1. Responsible/ Deputy Responsible Persons

City & Guilds Management of Legionella Bacteria BS0004 or equivalent/similar

2. Building Managers/ Maintenance Operatives

Legionella Awareness Training, City & Guilds BS0006 or equivalent/similar

9.3 **Water Treatment Contractor**

Contractors appointed to undertake legionella control operations will be required to conform in full with the requirements of this Policy and Procedure Manual. Additionally contractors shall comply with the following

- Hold current Grade 1 membership of the 'Legionella Control Association' (LCA) as set up jointly by the Health and Safety Executive (HSE) and Water Management Society (WMS). Contractors must comply with in full the LCA ' Code of Conduct for Service Providers'
- All contractor employees undertaking Legionella control operations shall hold the relevant City and Guilds/ Water Management Society accredited qualifications. In exceptional cases, employees who have undertaken alternative training courses and are able to demonstrate competency to the satisfaction of the Responsible Person may be permitted to undertake Legionella control operations.

9.4 Water Analysis Services

Water samples taken for analysis as part of the legionella control program should be submitted only to laboratories that are UKAS accredited for the analysis suites in question. A copy of the laboratories relevant UKAS accreditation certificate/s must be submitted to the Responsible Person for approval prior to any analysis being undertaken.

10.0 The Course of Action if an Outbreak of Legionnaires Disease is suspected

- 10.1** The nominated responsible person will be informed of a suspected case of Legionnaires 'disease. If a case is suspected then the responsible person will notify the councils corporate safety unit. The responsible person, the relevant FM and the independent partner will normally work in association with the Public Health Laboratory Service and the local CCDC to search for the source of the causative organism. It is essential that systems are not drained or disinfected before samples have been taken. The Property Services Teams role is an important one – identifying the various water systems within the building and, in particular, to the points from which samples can be taken. Easy access to these sampling points is essential.
- 10.2** An investigating team will be established under the guidance of the Duty Holder, this will normally comprise of the staff listed in Appendix D
- 10.3** The investigation will concentrate upon all potential sources of Legionella infection, including:
- the domestic hot and cold water distribution system
 - showers or spray washing equipment
 - drainage system and traps
 - humidifiers in ventilation systems
 - cooling coils in air-conditioning systems
 - any other water based system
- 10.4** To assist in such investigations, the Building Manager must be able to provide details of all associated equipment, including all documentation. He must assist by advising the investigating team on the extent of servicing on the site, and by locating taps and sample points.
- 10.5** Information will also be required, such as whether there have been any local excavation or earthmoving works, alterations to water supply systems or drainage systems or any other factors which may have a bearing on the site.
- 10.6** The team is responsible for identifying the cause of infection, and will advise on cleaning, disinfection, any modifications, and long-term control measures.

11.0 The Course of Action in the Event of an Outbreak

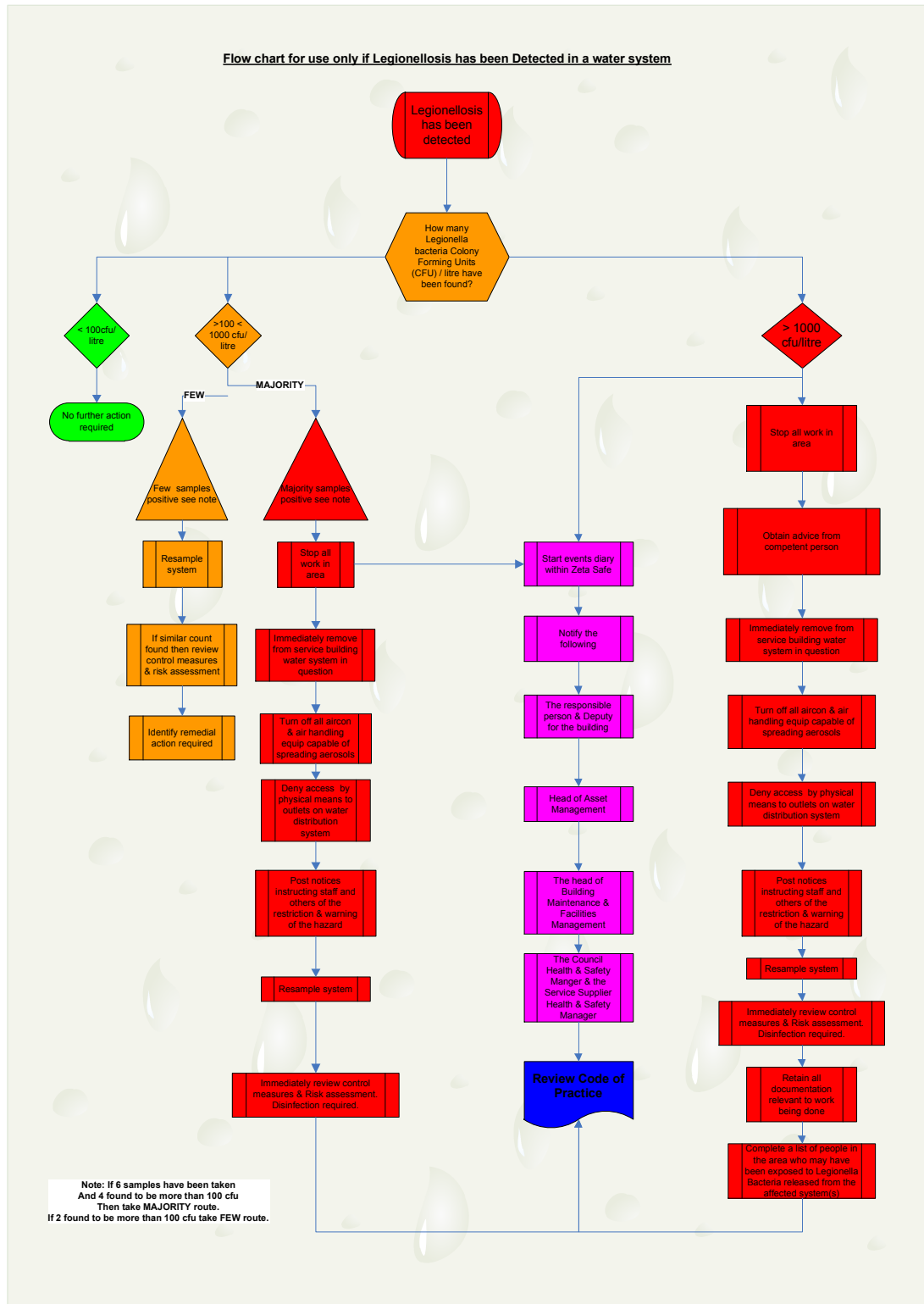
- 11.1** Legionnaires Disease is not notifiable under public health legislation in England.
- 11.2** An outbreak is defined by the Public Health Laboratory Service (PHLS) as two or more confirmed cases of Legionellosis occurring in the same locality within a 6 month period. Location is defined in terms of geographical proximity of the cases and requires a degree of judgement. It is the responsibility of the Proper Officer for the declaration of an outbreak. The Proper Officer is appointed by the local authority under public health legislation and is usually a Consultant in Communicable Disease Control (CCDC).
- 11.3** Local authorities will have established incident plans to investigate major outbreaks of infectious disease including Legionellosis. These are activated by the Proper Officer who invokes an Outbreak Committee, whose primary purpose is to protect public health and prevent further infection. This will normally be set up to manage the incident and will involve representatives of all the agencies involved. HSE or the local authority EHO may be involved in the investigation of outbreaks, their aim being to pursue compliance with health and safety legislation.
- 11.4** The local authority, or EHO acting on their behalf (often with the relevant officer from the enforcing authorities – either HSE or the local authority) will make a site visit.
- 11.5** As part of the outbreak investigation and control, the following requests and recommendations may be made by the enforcing authority:
- (a) To shut down any processes which are capable of generating and disseminating airborne water droplets and keep them shut down until sampling procedures and any remedial cleaning or other works has been done. Final clearance to restart the system may be required.
 - (b) To take water samples from the system before any emergency disinfection being undertaken. This will help the investigation of the cause of the illness. The investigating officers from the local authorities may take samples or require them to be taken.
 - (c) To provide staff health records to discern whether there are any further undiagnosed cases of illness and to help prepare case histories of the people affected.
 - (d) To co-operate fully in an investigation of any plant that may be suspected of being involved in the cause of the outbreak. This may involve for example
 - a. Tracing of all pipe work runs
 - b. Detailed scrutiny of all operational records
 - c. Statements from plant operatives and managers
 - d. Statements from water treatment contractors or consultants

- 11.6** Any infringements of relevant legislation may be suspect to a formal investigation by the appropriate enforcing authority.

- 11.7** If a water system other is implicated in an outbreak of Legionnaire's Disease, emergency treatment of that system should be carried out as soon as possible.

12.0 The Course of Action in the Event of a Legionella Positive Test Result

12.1 Summary of procedures for Action to be undertaken following the confirmation of a legionella positive test result.



13.0 Specific Health and Safety Issues

13.1 Work in Confined Spaces

If plant is located in confined spaces, reference on entry into confined spaces can be sought from Safe Work in Confined Spaces Approved Code of Practice, Regulations and Guidance [L101]. A Confined Spaces Risk Assessment should be completed and returned to the Responsible Person prior to any work commencing.

13.2 Water Treatment

Because water treatment chemicals, including chlorine-containing chemicals and solutions, are often toxic or corrosive they should be used cautiously to ensure that they do not endanger the users or other occupants of the building. Caustic resistant gauntlet type gloves will be required. Water treatment should be carried out by, or under the direction of, people who are suitably qualified and experienced.

13.3 COSHH

The use of water treatment chemicals should be subject to a COSHH assessment and permission would be required from the water authority prior to any discharge to sewers, storm water drains and watercourses. The Local Water Authority should be contacted prior to direct discharge to water courses.

13.4 Scalding

With regards to scalding risk the council will ensure that all that is reasonably practicable will be done to follow the requirements for the protection of hot water system users.

13.5 Contaminated Aerosols

13.5.1 The disinfection procedures presented for cold water storage tanks, domestic hot water vessels and water systems are designed to minimise the risk to staff and others that may come into contact with water which may have been contaminated with *Legionella sp.* In all instances of draining, water should be drained in such a way as to avoid the creation of an aerosol. This also applies for the safe purging of stagnant water e.g. from unused outlets.

13.5.2 The appropriate protective clothing should be worn during such procedures. This can be a powered filter and hood, European Class TH3 [assigned protection factor of 40] or a power assisted filter and close fitting full face mask TM3 [assigned protection factor 40]. It should be borne in mind that the filter on these systems is liable to get wet and subsequent resistance to air can increase with consequent discomfort to the operator.

13.5.3 Where possible, cleaning methods which create an aerosol [e.g. high pressure water jets] should be avoided. If this is not possible, the operation should be executed when the building is unoccupied, or in the case of permanently occupied building, windows in the vicinity should be closed and air inlets temporarily blanked off. As systems requiring cleaning will have high

organic load the operator and others closely involved should wear suitable respiratory protective equipment.

Risk Assessment Policy and Procedures

Section 2 Contents

1.0	INTRODUCTION	33
2.0	PERSONS AT RISK	33
3.0	BUILDINGS AND SYSTEMS AT RISK	34
4.0	REVIEW OF RISK ASSESSMENT	35
5.0	RISK ASSESSMENT	36

1.0 Introduction

Identification and assessment of the risk

A suitable and sufficient assessment is required to identify and assess the risk of exposure to legionella bacteria from work activities and water systems and any necessary precautionary measures on all TAMWORTH Borough Council premises. The council will comply with its requirements under the Control of Substances Hazardous to Health Regulations 1999, Regulation 6 Management of Health and Safety at Work Regulations 1999, Regulation 3 Health and Safety at Work Act 1974, Sections 2, 3 in undertaking a Legionella/ Water Hygiene Risk Assessment at all premises within the councils estate.

The risk assessment will form the basis of the Legionella Management Plan/ Risk Minimization Scheme, as set out in section 1 of this Policy and Procedure Manual.

2.0 Persons at Risk

The Council have identified that all building users, including employees, contractors, visitors and the general public are at risk from the potential exposure to legionella bacteria. However, the council recognizes that due to the nature of legionellosis certain individuals may be at greater risk, these include;

- Smokers/ drinkers
- Individuals with existing respiratory conditions
- Males over the age of 50yrs
- Immune-suppressed individuals e.g. the aged or the young

The council will identify any specific groups of building users at significant risk or susceptibility and will fully inform the individual/s undertaking the risk assessment.

3.0 **Buildings and Systems at Risk**

It is generally considered that all buildings that contain a water system of any description are at risk from the potential proliferation of legionella bacteria which may result in the potential exposure to building users.

The following types of water systems are considered to present a reasonably foreseeable risk of causing an exposure to legionella bacteria and should be prioritised for assessment as part of the Legionella Management Plan/Risk Minimisation Scheme;

- Water systems incorporating a cooling tower
- Water systems incorporating an evaporative condenser
- Hot and cold water systems
- Other plant and systems containing water that is likely to exceed 20°C but not 60°C, and which may release a spray or aerosol during operation or when being maintained.

Risk Categorisation

For the purpose of risk prioritisation and management, Council buildings and plant are considered to fall into five categories, these are

Class A: Buildings with cooling towers

Class B: Complex buildings with spray outlets/showers

Class C: Simple buildings with spray outlets/showers

Class D: Complex buildings without spray outlets/ showers

Class E: Mains fed buildings with point of use water heaters

4.0 **Review of Risk Assessment**

- 4.1 It is the council's policy that all risk assessments are reviewed annually by a competent person. The purpose of this review is to assess the effectiveness of the control scheme, its management and to identify any changes to the water systems or the building use.

Additionally the risk assessments shall be reviewed in the following circumstances, where there are

- changes to the water system or its use;
- changes to the use of the building in which the water system is installed;
- the availability of new information about risks or control measures;
- the results of checks indicating that control measures are no longer effective;
- a case of Legionnaires' disease/legionellosis is associated with the system.

4.2 **High Risk Buildings and Systems**

Buildings that are identified and categorised as High Risk (Class A and B) will undergo a desktop risk assessment review, every 3 months and undertaken by the Responsible Person. This will involve an audit of all records held including the on site hard copy logbook and the electronic web based system.

4.3 **Internal Auditor**

The Council has an Internal Auditor to audit and assess the effectiveness of the Risk Minimisation Scheme, including the risk assessments, internal audit procedures, and record keeping.

5.0 Risk Assessment

Competency

Risk Assessments will only be undertaken by individuals who are suitably and sufficiently trained, qualified and competent. It is the council's policy that a specialist Water Treatment Contractor is employed to undertake these risk assessments.

The Responsible Person (Legionella) should assess the competency of any contractor or individual prior to any legionella works being undertaken in accordance with section 1 of this Policy and Procedure Manual.

5.2 Carrying out a risk assessment

A number of factors are required to create a risk of acquiring legionellosis, such as:

- (a) the presence of legionella bacteria;
- b) conditions suitable for multiplication of the organisms e.g. suitable temperature (20°C-45°C) and a source of nutrients e.g. sludge, scale, rust, algae and other organic matter;
- (c) a means of creating and disseminating breathable droplets e.g. the aerosol generated by a cooling tower or shower; and the presence (and numbers) of people who may be exposed, especially in premises where occupants are particularly vulnerable, e.g. healthcare.

While there will inevitably be common factors associated with the many and varied types of premises being assessed, the individual nature of each site should be taken into account. In complex systems or premises, a site survey of all the water systems should be carried out and should include an asset register of all associated plant, pumps, strainers and other relevant items. This should include an up-to-date drawing/diagram showing the layout of the plant or system, including parts temporarily out of use. A schematic diagram would be sufficient. It should then be decided which parts of the water system, for example, which specific equipment and services, may pose a risk to those at work or other people.

5.3 The following list contains some of the factors which should be considered, as appropriate, when carrying out the assessment:

- (a) the source of system supply water, for example, whether from a mains supply or not;
- (b) possible sources of contamination of the supply water within the premises before it reaches the cold water storage cistern, calorifier, cooling tower or any other system using water that may present a risk of exposure to legionella bacteria;
- (c) the normal plant operating characteristics; and
- (d) unusual, but reasonably foreseeable operating conditions, for example breakdowns.

5.4 Specification for the Risk Assessment

The following sets out the specification for all risk assessments and risk assessment reviews that are undertaken on council buildings or water systems.

5.4.1 The risk assessment is to be carried out by a fully trained surveyor who has been trained in accordance with the City and Guilds accredited course BS4, Legionellosis: Hazard Identification and Risk Assessment of Water Systems within Buildings or equivalent. Copies of the surveyors training records will be required to be submitted to the Authorized Officer before any work commences.

5.4.2 The risk assessment is required to be carried out in accordance with the section identification and assessment of the risk, detailed within part 1: The Approved Code of Practice within HSE document Approved Code of practice and Guidance, L8 "Legionnaires Disease" The Control of Legionella Bacteria in Water Systems.

5.4.3 The Risk assessment is to be supplied in 1 No. PDF copy on a secure web page. The risk assessment is to be provided in the following section for the ease of identification and contain the information as listed as a minimum in a logical format enabling ease of use to the end user.

The Risk Assessment documentation should conform to the requirements outlined in ACoP L8 and BS 8580. Refer to Appendix F for further information.

Operational Policy and Procedures

Section 3 Contents

1.0	INTRODUCTION	40
2.0	DOMESTIC COLD WATER SYSTEMS	41
3.0	DOMESTIC HOT WATER SYSTEMS	42
4.0	AIR CONDITIONING PLANT	44
5.0	OTHER RISK SYSTEMS	46
6.0	MANAGEMENT REVIEW	48
7.0	RECORDS	52
8.0	SCHEMATICS	53
9.0	TECHNICAL PROCEDURES	54
10.0	INFREQUENTLY USED BUILDINGS	74

1.0 Introduction

The following policy and procedures set out the specific operational requirements for hot and cold water and other risk systems and associated plant within the TAMWORTH Borough Council estate. These operational procedures are designed to mitigate the risk of the potential proliferation of legionella bacteria in water and other associated systems by reducing the risk, so far as is reasonably possible. These operational procedures set out the basis for the written scheme for the control of legionella bacteria. In all cases reference should be made to the specific site Risk Assessment and the recommendations for the control scheme and the water systems contained within.

2.0 Domestic Cold Water Systems

2.1 Non-Mains Water Supplies

Natural water sources such as borehole supplies may be contaminated with legionellae. Sampling for Legionella testing shall be undertaken where such supplies are used.

2.2 Cold Water Cisterns and Cold Feed Tanks

All new domestic cold water storage cisterns and tanks shall comply with the requirements of the Water Byelaws 2000 for cold water storage [heating system header tanks - F&E are excluded]. The organisation is subject to a risk assessment programme as required by the HSE L8 ACoP. The findings of the risk assessments include prioritised recommendations. The actions necessary to bring existing tanks to the standards required by the Water Byelaws, and timescales appropriate are tabled in the legionellosis risk minimisation scheme, and are reviewed as part of legionellosis risk re-assessment.

All cold water storage tanks with a water storage capacity of greater than 1000 litres containing potable water are to be examined and the temperature tested on a regular six monthly cycles and cleaned on an annual basis as required.

All other domestic cold water storage tanks are to be examined on an annual basis [where possible to coincide with the annual legionellosis risk re-assessment exercise], and cleaned and disinfected as detailed in the Tank Cleaning Procedure as required.

2.3 Connections to Outside Services

The existence of these connections and their necessity is checked on an annual basis.

2.4 Pressurisation / Supply Pumps

Where two or more pumps have been fitted for pressurisation systems, the lead pump shall be changed over at least weekly in order to avoid water stagnation.

Dates and times of the manual pump change-over shall be recorded in the plant room log book. Print-outs of regimes for automatic systems will be adequate.

Where pumps have not been in service for a period of four weeks or greater, or have been removed for any reason, the pump and associated pipe work shall be thoroughly washed out and disinfected before being brought back into service. Disinfection of pumps shall be to 50ppm free residual chlorine for 1 hour and pumps shall be totally submerged during this period. An incident report record sheet shall be completed giving details of why the pump was out of use.

3.0 **Domestic Hot Water Systems**

3.1 Calorifiers and hot water cylinders are all a means of producing domestic hot water and are subject to the procedures below. Hereinafter the term "calorifier[s]" is used to describe any domestic hot water storage vessels.

3.2 **Hot Water Storage and Distribution Temperatures**

The storage of domestic hot water should be arranged to ensure that a water outflow temperature of at least 60°C is achieved. It is important to maintain temperatures at above this figure [Legionellae organisms will survive for only a short period of time above this temperature - approximately two [2] minutes].

Permanent continuous monitoring of water temperatures via a building management system or data logger is recommended for higher risk premises in order to demonstrate performance.

The outflow water temperature, under prolonged maximum continuous demand [at least 20 minutes] from calorifiers should not be less than 60°C.

While it is accepted that occasionally under peak instantaneous or prolonged demand that the water outflow temperature will fall, it is not acceptable if this occurs frequently [more than twice in any 24 hour period] and / or for long periods [exceeding 20 minutes].

Under no circumstances shall the domestic hot water flow temperature fall below 50°C.

It is recommended that disinfection by pasteurisation is undertaken if the water temperature of the calorifier falls below 45°C.

A minimum domestic hot water circulation temperature of 50°C shall be maintained.

3.3 **Calorifier Operation**

Calorifiers in high risk premises are to be run 24 hours per day, 7 days per week, and the domestic hot water circulation pump kept running. Should it be necessary for interrupted operation or shut-down, then the calorifier should be allowed to maintain its water storage temperature and the domestic hot water pump should be started up to ensure full temperature through-out the distribution system for at least one hour prior to occupation of the premises.

3.4 **DHW Circulation Pumps**

Domestic hot water circulation pumps should perform in such a way to ensure a minimum water circulation temperature of 50°C.

Only one domestic hot water distribution pump should be installed near the calorifier, and a spare pump kept for immediate replacement in the event of pump failure.

In circumstances where it is impracticable to remove pumps, the pumps shall be switched daily to ensure that all pumps are regularly brought into service, thus avoiding stagnation. It may be more effective to utilise an auto-changeover system.

Shut down of the pumped circulation system should be avoided. To do so will result in a loss of the required distribution temperatures.

4.0 Air Conditioning Plant

4.1 General

Air conditioning and ventilation plant and duct-work should be inspected at the access point[s] on an annual basis in order to check cleanliness and general condition. After several years of service, even a correctly filtered system may contain dirt accumulation. It may be necessary to consider cleaning of the system. However, accumulation of dirt in a relatively short period of time is indicative of either:

- Poor filter arrangement and design;
- The use of incorrect filters; or
- Failure of the filtration system.

In particularly polluted areas, it may be necessary to consider the installation of high grade final and pre-filters. The quality of filter housing design and in particular the seals are a critical factor in maintaining the efficiency of the filtration system by ensuring that air does not bypass the filter panels.

All information on condition, cleanliness etc to be recorded in the plant room log book, with any non-compliance or incidents being identified to the Responsible Person [*Legionella*] immediately on identification, and an incident report record form completed.

4.2 Draining Traps and Pipe work

A drainage drip tray should be provided, to collect condensation collecting on cooling coils [including the return bends and headers], and for humidifiers, eliminators and, if necessary, heat recovery devices. The drainage drip tray should be constructed of a corrosion resistant material and be so arranged that it will completely drain - i.e. the drain connection should have no up stand in order to prevent 'pooling'. The drainage tray should be large enough to collect all the water produced by the device it serves. Provision should be made to allow for inspection of the drainage tray [i.e. viewing window / access panel]. Any jointing materials used to seal the drainage tray to the duct must be listed in the Water Fittings Directory and must not be capable of supporting bacterial growth. A slope of 1:20 in all directions towards the drain outlet position should be incorporated.

Drainage drip trays should be connected to a drainage trap assembly which should discharge via a type A air gap as laid down in BS 6281:Part1:1988.

The depth of any trap should be at least twice the static pressure head generated by the fan so that the water seal is not 'blown out' during plant start up.

A trap need not be directly under the drainage drip tray which it serves, provided that the connecting pipe work has a continuous fall. Each trap shall be made of the clear [borosilicate] glass or transparent plastic type in order to show clearly the integral water seal level, and should be fitted with a screw top

cap to permit re-filling. The water seal level shall be permanently marked on the trap, to indicate the water seal levels when the fan is operational at its design duty. Each installation should incorporate quick release couplings to facilitate easy removal of the traps.

Traps fitted to plant located outside or in unheated plant rooms may require trace heating to prevent freezing damage during the winter period. The trace heating system employed should not raise the temperature of the water in the trap to greater than 5°C. Similarly, it may be necessary to shield the trap from the direct sunlight of mid-summer in order to prevent heat gain and algal growth.

The pipe work from each trap should be constructed of thermoplastic, copper or stainless steel tube. Stainless steel may be particularly useful in instances where greater mechanical strength is required. The pipe work shall have a minimum fall of 1 in 60 in the direction of water flow.

Water from each trap should discharge over an open tundish connected to a drainage stack via a second trap, or a floor gully.

Where the drainage pipe work from the tundish outlet, which should be ventilated, discharges to a surface water drainage stack or a dedicated plant drainage stack, then the connection shall be in the form of an easy sweep tee.

It may be necessary to employ chlorine or other chemicals in order to clean humidifiers and cooling coils etc. Under such circumstances it is necessary to discharge the plant effluent produced to the foul drainage system.

Individual drainage systems should be separate wherever possible.

4.3 Humidifiers

The steam supply connections to the humidifier should be provided with a dirt pocket and trap set installed as close as practicable to the humidifier.

The water supply to the steam generating unit shall be designed as if potable supply right up to the device.

The humidifier chamber should be inspected on an annual basis and specified in the plant PPM schedule. Particular attention should be given to any pooling of water. The chamber interior should be clean, and free from any scale or other build-up on the walls. It may on occasion for cleaning and / or re-lining to be carried out by a specialist.

4.4 Heater Batteries

Inspection of the heater batteries is necessary in order to ensure free air flow and no build up of dirt, scale or other debris. Cooling coils should be examined regularly in order to ensure that correct drainage is being achieved, and that there is no pooling of water or development of slime, algae or other deposit. Drainage drip trays should be removed [if possible] and cleaned on a regular basis.

4.5 Air Handling Plant Inspection

Plant inspection is to be on an annual basis, and the record form completed.

5.0 Other Risk Systems

Monitoring requirements for other risk systems should be based on the attached table [which is based on a similar table in the HSE ACoP L8] See Appendix E.

5.1 Water Conditioning

The hot water treatment method used by the Council is that of full temperature control. Should an alternative water treatment regime be sought the onus shall be on the organisation to establish the efficacy of the system in its control of Legionella for each site, this shall be in the form of a trial to establish:

- A control level;
- The ability to achieve that control level, and;
- The assurance that the control level will be maintained.

Regular Legionella sampling will be required if biocidal treatments are used as an alternative to temperature.

5.2 Cleaning and Disinfection

Water systems will be cleaned and disinfected under the following circumstances as part of a planned maintenance program or reactive works:-

System/ Service	Circumstance Requiring Cleaning and Disinfection	Frequency
Domestic cold water tank	New installations. Empty tank re-commissioning. Tank temperature exceeds 20°C. Tank contains moderate sediment, i.e. a complete covering of the tank base. Tank contains moderate corrosion. Contamination of tank by vermin or vermin faeces. Gross organic contamination e.g. large number of dead insects. Regular programme for high risk category. Regular programme for significant risk category. Regular programme for moderate/low risk systems [excluding small tenanted residential properties]. controls-assurance.co.uk advice - interpretation of microbiological results – drinking water tanks	As required As required As required As required As required As required Annually 2 yearly 5 yearly As required
Domestic cold water distribution system	New installations and small modification/ additions. Contamination of tank by vermin or vermin faeces. Gross organic contamination e.g. large number of dead insects. Controls-assurance.co.uk advice - interpretation of microbiological results.	As required As required As required As required
Domestic hot water calorifer	New installations and modifications / additions. Calorifier falls below 45°C. Empty calorifier recommissioning. Contamination of header tank by vermin or vermin faeces. Regular programme [excluding small tenanted residential properties], where access panels are fitted. Consultant advice - interpretation of microbiological results.	As required As required As required As required Annually As required
Domestic hot water distribution system	New installations and modifications / additions. Contamination of header tank by vermin or vermin faeces. Controls-assurance.co.uk advice - interpretation of microbiological results.	As required As required As required
Air handling unit	Contamination by vermin or vermin faeces. Gross organic contamination e.g. large number of dead insects. Chiller battery, drip trays and drainage pipe work.	As required As required 6 monthly

6.0 **MANAGEMENT REVIEW**

6.1 **Review**

Quarterly management review meetings shall be held in order to assess the progress with respect to management issues and the Legionella Management Plan/ Risk Minimisation Scheme.

These meetings will also assess progress against the action plan in order to identify any problems with the implementation of specific remedial measures.

6.2 **Sampling and monitoring**

The table below summarises the temperature sampling and monitoring frequencies which are to be applied as part of the control scheme were applicable and in accordance with HSE ACoP L8.

System/Service	Task	Frequency
Domestic cold water tank	Incoming mains cold water temperature	Six monthly
	Tank water temperature	Six monthly
Domestic cold water outlets	Sentinel tap temperatures	Monthly
	Temperature at representative number of taps on a rotational basis	Annually
Domestic hot water calorifiers	Flow and return temperature	Monthly
Domestic hot water outlets	Sentinel tap temperatures	Monthly
	Temperature at representative number of taps on a rotational basis	Annually
Thermostatic mixing valves	Inlet temperature	Six monthly
	Outlet temperature	Six monthly

6.2.1 **Water Temperature Checks**

Temperature checks on the calorifier and distribution system should be carried out as detailed below on a monthly, six monthly and annual basis. In the event of a non-compliance, the Responsible Person [*Legionella*] shall be informed immediately. Use of a digital thermometer with a touch and immersion probe is recommended.

Although the HSE recommends spot temperature checks, continuous monitoring will be necessary in certain circumstances, dependent on the risk assessment findings.

Cold water storage tank temperatures should be checked during periods of high ambient temperatures [e.g. afternoons between June and August], water temperatures should be no greater than 20°C. At the same time, the furthest and nearest draw off points in the system should be checked to ensure that the water distribution temperatures no greater than 20°C within 1 minute of running the water [at full flow]. A similar temperature check regime should be undertaken during the winter months to identify the performance of cold water distribution systems and the impact of heat gain from heating systems.

6.2.2 Hot and cold water distribution temperatures from sentinel taps:

For domestic hot water services, these are the first and last taps on a recirculating system. For cold water systems or non-recirculating hot water systems this is the nearest and furthest taps from the storage tank.

For cold water outlets, the temperature should be no greater than **20°C** after two minutes of running the water. For hot water outlets, the temperature should reach **50°C** within a minute of running the water.

6.2.3 Calorifier flow and return temperatures:

Outgoing water from the calorifier should be at least **60°C**, and water returning to the calorifier should be at least **50°C**. These temperatures can be taken from adequately calibrated temperature gauges fitted to the vessel and return pipe work. If temperature gauges are not fitted, then suitable surface temperature probes may be used.

6.2.4 Input temperature to thermostatic mixer valves:

Where fitted, the input temperatures to thermostatic mixer valves should be at least **50°C** within a minute of running the water. Outlets with TMV's should be monitored on a sentinel basis as detailed above.

6.2.5 Incoming mains cold water:

Where there is a cold water storage tank, this should be measured at the ball valve outlet. The water should preferably be no greater than **20°C**. However, during a prolonged hot summer the incoming water may rise above this temperature. Under the Water Supply [Water Quality] Regulations, water utilities are permitted to supply water to premises at temperatures up to **25°C**. If incoming water temperatures are above **20°C**, the water undertaker should be advised to see if the cause of the high temperature can be found and removed.

Monitoring should ideally be carried out so that one check takes place in the summer months and the other in the winter months.

6.2.6 Representative number of taps on a rotational basis:

In order to ensure that the whole system is reaching satisfactory temperatures for Legionella control, the outlet temperatures should be taken from a representative number of outlets other than sentinel taps.

For cold water outlets, the temperature should be no greater than 20°C within one minute of running the water. For hot water outlets, the temperature should reach 50°C within a minute of running the water.

Where water temperatures fail to satisfy the criteria described, the Responsible Person [*Legionella*] shall be informed, and a full investigation must follow.

6.2.7 General Microbiological/Legionella Sampling in Hot/Cold Water Systems

Circumstances under Which Samples are Taken

Samples for general microbiological testing i.e. total aerobic bacterial counts at 22°C and 37°C, coli forms and E.Coli are taken:-

- One week following handover of a new building or water system;
- As part of the routine monitoring of drinking water tanks;
- In response to taste or odour or sustained discoloured water complaints.

When such samples are taken, a mains supply sample should be taken as a control, to verify whether the supply could be the source of any identified problems. The water supplier is also contacted for distribution zone water quality data, for the same reason.

6.2.8 Samples for Legionella testing are taken

- Monthly from hot water systems treated with biocides where storage and distribution temperatures are reduced from those recommended in the HSE's ACOP/Guidance Document L8. At the time of preparation of these procedures, there is only one such system within the organisation;
- Weekly from hot water systems where control levels of the treatment regime, i.e. temperature in this case, are not consistently achieved – these samples should be taken until the system is brought back under control;
- When an outbreak is suspected or has been identified;
- Regularly where a department specialises in services for “high vulnerability” healthcare patients.

6.2.9 Action Levels for Legionella in Hot and Cold Water Systems

Legionella Bacteria [cfu/litre]	Action Required
More than 100 but less than 1000	<p>Either:</p> <p>If only one or two samples are positive, system should be re-sampled. If a similar count is found again, a review of the control measures and risk assessment should be carried out to identify any remedial actions. If the majority of samples are positive, the system may be colonised, albeit at a low level, with Legionella. Disinfection of the system should be considered but an immediate review of control measures and risk assessment should be carried out to identify any other remedial action required.</p>
More than 1000	<p>The system should be re-sampled and an immediate review of the control measures and risk assessment carried out to identify any remedial actions including possible disinfection of the system.</p>

6.2.10 Laboratory competence

Samples for Legionella shall be tested by a UKAS accredited laboratory that takes part in the PHLS Water Microbiology External Quality Assessment Scheme for the isolation of Legionella from water.

7.0 Records

7.1 Retention Period

The following types of records are kept.

Record	Retention Period
This policy and procedures document	Throughout the period for which they remain current and for at least two further years.
Risk assessments	
Risk minimisation scheme and details of its implementation	
Monitoring, inspection, test and check results, including details of the state of operation of the system	At least five years

7.2 Record Keeping

Monthly monitoring records are stored on the electronic web based log book system ZetaSafe.

Via the use of a PDA GES Water Hygiene Technicians are responsible for populating the electronic database with temperature results and inspections during monthly monitoring site visits.

Non conformances identified during the monitoring visit are categorised as High (Priority 1), Medium (Priority 2) or Low (Priority 3) as Per ES 040 Guidelines Non Conformance Reporting ACoP L8 Monitoring- Appendix.

Any Priority 1 high risk non conformances are emailed at the time of the site visit directly to the TAMWORTH Facilities Team and to the GES Helpdesk.

It is the responsibility of the GES Account Manager to follow up all Priority 1 non conformances with a phone call to the TAMWORTH Facilities Team to ensure they are aware of the situation and offer remedial advice.

It is the responsibility of the Property Services Team to routinely log onto the zetasafe database (every two weeks) and address all non conformances.

It is the responsibility of the Account Manager to routinely log onto the zetasafe database and review the performance of the management of the database and identify any areas/asset where there are consistent non conformances. This is communicated back to the TAMWORTH Facilities Team.

8.0 Schematics

8.1 Water system schematics are produced for all hot and cold water systems, with the exception of point of use water heaters and small tenanted domestic premises served by individual single-pipe water systems. The schematics show the storage systems in plant rooms and tank rooms. Distribution schematics show sentinel outlets on block plans [where available].

8.2 For each water system that presents a risk from Legionella bacteria, a schematic or drawing shall be held, showing:-

- Origin of water supply;
- General layout of the system;
- How the system operates;
- All associated storage and header tanks;
- All standby equipment;
- Any parts of the system that may be out of use temporarily;
- Any problem areas such as dead legs;
- Regular operation and test points e.g. sentinel outlets and major plant

These schematics/drawings may also show:-

- All system plant, e.g. water softeners, filters, strainers, pumps, non-return valves and all outlets, for example showers, wash hand basins etc;
- All associated pipe work and piping routes.

8.3 Drawings/schematics shall be checked to coincide with risk re-assessment, to ensure that they are up to date.

The degree of complexity of schematics will be as follows:-

Risk	Drawing/Schematic Type
High	As-fitted drawing, water storage system schematic and simple distribution schematic
Significant	Water storage system schematic and simple distribution schematic
Moderate	Water storage system schematic
Low	None

9.0 **TECHNICAL PROCEDURES**

Cleaning of CWSTs

Members of staff either of the organisation, or contract staff shall not be permitted to enter any water storage system [i.e. tank, calorifier, AHU] if they are suffering or have recently suffered from any gastric or other communicable illness, or a condition which may result in their increased susceptibility to legionellosis. It is the responsibility of the individual to inform their supervisor immediately if applicable.

All tanks are classified as potable water tanks.

The Responsible Person/ Building Manager shall notify all users of the proposed line of action, and of any disruption or modification to service. The Building Manager being the individual responsible for the management of the task in question.

All equipment and tools to be employed during the cleaning and disinfection process must be dedicated only to this task - this will include hire equipment. All equipment should be disinfected in a high concentration of chlorine solution prior to commencement of the process.

Refer to Appendix H.1 for the procedure of tank clean and disinfection.

Cold Water Tanks with Water Temperature Greater Than 20°C

This procedure is to be implemented when cold water tanks [domestic hot water header tanks or cold down service tanks] are found to contain water with a temperature of greater than 20°C. This may sometimes be suggested initially, when water at greater than 20°C is supplied by cold water outlets, which normally supply water at a temperature of no greater than 20°C. The temperature of the relevant storage tank should be taken, and the following procedure followed if necessary.

Examples of failures which may be responsible for tepid cold water [greater than 20°C]:

- High ambient temperature and heat gain - may be accentuated by poor ventilation, glass windows above tanks, lack of or poor insulation.
- Mixing valve failure causing back feeding - non return valves are recommended.
- Domestic hot water system venting over the tank.
- Failure of the primary heating coil.

Refer to Appendix H.2 for procedure for dealing with CWST with temperatures greater than 20°C.

Calorifier Flushing

Each calorifier should be flushed quarterly through its drain valve by opening the drain valve three [3] times, each time for a three [3] minute period. The hose from the drain valve is to discharge to a container filled with clean water as described in the section dealing with the safe discharge of stagnant water.

Calorifier flushing should be carried out after temperature checks on the calorifier and system have been completed. The calorifier maintenance record form should be completed.

Refer to Appendix H.3 for procedure for calorifier maintenance.

Stratification Checks

Domestic hot water storage vessels should be subject to water temperature stratification checks on a bi-annual basis [i.e. every two years] for each calorifier. These checks should extend over a period of seven [7] days. Checks should also be made where de-stratification pumps have been fitted to establish that such a pump will ensure that the water temperature at the base of the vessel achieves 50°C.

The sophistication of the temperature checking process depends on the water system legionellosis risk:-

Water system / AHU risk	Type of temperature check
High	BMS
Significant	Portable logger
Moderate	Spot checks
Low	None

Calorifier temperature stratification checks are not undertaken in small tenanted domestic properties with individual single pipe water systems.

Showers

Showers which are rarely used should preferably be removed, or run at least weekly for a 3 [three] minute period.

A memo is to be issued to all Building Managers indicating this requirement, and requesting notification of showers for removal. Label all showers "**THIS SHOWER MUST BE RUN WEEKLY**". A memo should be issued to all users / managers with showers indicating their responsibility to ensure that showers are run on a weekly basis.

Shower heads are cleaned and de-scaled where necessary, on a quarterly basis.

Domestic Hot Water Temperature Less Than 45°C

This procedure must be employed following a reduction of domestic hot water temperature to below 45°C for any reason.

Such temperature reductions can result from system failures such as:

- Primary heat source failure;
- Calorifier water temperature controls failure;
- Domestic hot water distribution pump failure;
- System shut down for modification or repairs.

Refer to Appendix H.4 for procedure for dealing with DHW temperatures less than 45°C.

Cleaning Water Systems within Buildings

Installations within buildings

All visible debris and scale shall be removed from the cistern. The cistern and distribution pipe work shall be filled with clean water and then drained until empty of all water. The cistern shall then be filled with water again and the supply closed. A measured quantity of Sodium Hypochlorite solution of known strength shall be added to the water in the tank in order to give a free residual chlorine concentration of 50mg/l [ppm] in the water. The cistern shall be left to stand for one [1] hour. After this time period, each draw-off point shall be successively opened working progressively away from the cistern. Each tap and draw-off point shall be closed when the water discharge begins to smell of chlorine. The cistern shall not be allowed to become empty during this exercise. If necessary it shall be refilled and chlorinated as above. The cistern and pipes shall remain charged with chlorinated water for a further one [1] hour.

On completion of this period, the tap furthest from the tank shall be opened and the level of free residual chlorine in the water discharged from this tap shall be measured. If the concentration of free residual chlorine is less than 30 mg/l [30ppm] the disinfection process shall be repeated.

The tank and pipe work shall remain charged with chlorinated water for one [1] hour [for existing installations], sixteen [16] hours [for new installations]. Systems fed directly off the mains water supply shall have a chemical injection point fitted by others, and then thoroughly flushed out with clean water until the free residual chlorine concentrations measured at the taps are no greater than that present in the supplier's mains water.

On completion of the cleaning exercise, a certificate of cleaning and chlorination shall be issued stating that the system has been cleaned and chlorinated in accordance.

Safe Purging Of Stagnant Water

Stagnant water may potentially contain large numbers of legionellae. In order to avoid the risk of legionellosis, precautions are taken to avoid the creation of aerosols and to avoid the exposure of people to any unavoidable aerosols.

The specific precautions may vary according to the particular circumstances, but typically include:-

- Running a hose from the outlet into a container of clean water;
- Running hoses directly into a drain cover;
- Running fire hoses at a distance from occupied buildings;
- Closing windows and air conditioning intakes where aerosols are created outdoors;
- Wearing respiratory protective equipment [remember this does not protect nearby members of the public and others who are not wearing masks].

Care should be taken to avoid the possibility of back siphon age into mains water supplies.

Flushing of Infrequently Used Outlets

In order to avoid the risk of stagnation of water in outlets that are not used regularly it is recommended that such outlets are flushed on a weekly basis and that this action is documented in a site specific log book.

Flushing should be performed in line with the following procedure:-

- Identify any outlets that may be infrequently used
- Flush through each tap at the outlet for at least 3 minutes
- Record the flushing in a site specific log book

Any outlets that may have remained unused for a significant period of time should be purged

Management of Sprinkler Systems

A detailed survey of the grounds maintenance sprinkler systems will be conducted and appropriate inspection and control measures will be implemented.

Inspection and maintenance will take account of the manufacturer's recommendations and will address issues around water storage, stagnation and potential issues arising from misting of water.

Management of Infrequently Used Buildings

This procedure describes how the Council controls and manages the risks associated with the proliferation of and exposure to legionella bacteria in buildings that are classified as infrequently occupied,

- Part closed or unoccupied,
- Under temporary closure
- Under indefinite closure
- Residential or leased buildings
- New or refurbished buildings

10.1 Definition:

An infrequently occupied building can be defined as one where the water systems contained within that building are not used or maintained to a frequency where the minimum operating control measures as set out in HSE ACoP L8 are not met on at least 5 out of 7 days per week.

A full risk assessment should be carried out on all buildings on a minimum of a two yearly cycle, in accordance with the council's Risk Assessment Policy and Procedures Manual to determine whether or not a building should be classified as infrequently occupied.

This procedure may typically, but not exclusively apply to the following buildings within the council's estate

- Pavilions
- Community Centres
- Halls

10.2 Responsibility

It is the responsibility of the nominated Responsible Person for each building to co-ordinate, monitor and measurement activity. It is also the responsibility of all individuals to undertake the works they are involved in accordance with these procedures, control documents, relevant legislation, guidance documents and recognized best industry practice. This will include all,

- Contractors
- Council Staff
- Visitors

10.3 Occupation of New Premises

Procedure until Occupation

This procedure is designed to prevent the risk of legionellosis developing in a new building / department through the interim period following construction, commissioning and hand over to occupancy.

Design and Build Contracts - outbreaks of Legionnaires 'disease has been associated with 'design and build' type contracts. It is vital that Development and Factoring staff who projects manage such projects ensure that immediately before occupation that cleaning and disinfection of water systems is undertaken.

Once the system is in use and has been cleaned and chlorinated prior to hand over, a Responsible Person shall be nominated to monitor and observe the system, and ensure that the system is operated in accordance with the Organisation's 'Procedure for Temporary Closure' and the relevant record sheets completed.

At the point of hand over all relevant information on system performance together with as-fitted drawings and design criteria of the domestic hot water systems and cold water services shall be submitted to the relevant Officer who will be responsible for the premises.

Occupancy of the new property should be as soon after hand over as possible to prevent further costs being incurred due to the need for re-chlorination of the water systems

10.4 Residential Accommodation/ Leased and Buildings

This sub-section applies to domestic properties served by individual water systems. Where domestic properties share a common water system, the procedures for the larger premises apply.

The organisation recognises its obligations as a provider of residential accommodation. In practical terms it fulfils these by routine maintenance checks/actions immediately prior to the occupation of a domestic dwelling by a new tenant and by provision of information to the new tenant.

Maintenance Actions/Checks Prior to Occupation by a New Tenant

Whenever the expected time delay between vacation of accommodation by one tenant and occupation by the next is greater than one week, the following actions should be taken.

The accommodation unit is visited within one week prior to occupation. The following actions are taken, in the order stated:-

- The hot water system is switched on;
- All WCs are flushed twice [on full flush where dual flush type];
- The cold water storage tank, where present, is checked for gross contamination e.g. microbiological growth, the presence of organic

debris or live organisms such as insects – in the event of discovering such contamination the Property Services Team is informed to arrange tank cleaning and disinfection. The remaining actions below are not undertaken until the cleaning and disinfection of the tank is complete;

- Each hot and each cold water outlet is run for three minutes, creating as little aerosol as possible;
- The shower head is removed and the shower hose run underwater for three minutes;
- The hot water system is left switched on;
- Any defects are reported and wherever possible, rectified prior to tenant occupation.

These actions apply to accommodation served by either a conventional hot water system or a combination boiler.

10.5 Provision of Information for New Tenants

The organization can influence but not control the actions of its domestic tenants. It exerts its influence by the provision of the following guidance as part of the general information pack provided to new tenants.

“The water systems in this accommodation have been prepared by the Property Services Team in such a way as to protect water hygiene. You can protect your own health and safety by:-

- Ensuring that all outlets are used regularly [preferably once per week] or run for a couple of minutes per week to keep the water fresh;
- Reporting any water system defects, such as hot water temperature failure or dirty drinking water, to the Council as soon as possible”.

10.6 Procedure in the Event of Closure of Part or All of a Building

Background

Where part or all of a building is going to close for a period of greater than one week, the relevant manager must notify the Responsible Person [*Legionella*] of the details.

Following a closure decision, negotiations between the relevant manager and the Responsible Person [*Legionella*] must take place to ensure that the following procedure is established and documented, and to clearly define what actions named individuals shall perform.

Period of Closure

The period of closure should be established at the earliest point in negotiations. The period for which an area is closed can play an important part on the cost implication and involvement of a closure.

10.7 Temporary Closure

Where a closure is expected to not exceed 60 days a nominated individual shall be identified to run every tap for 3 minutes and flush every toilet weekly. The nominated individual should then complete the record sheet, signed by themselves and their relevant manager, the completed form being forwarded to the Responsible Person [*Legionella*].

Before the closed area is re-occupied the Property Services Team shall carry out an inspection and test of the water systems and report its condition to the Responsible Person [*Legionella*] for any remedial works that may be required.

It is the responsibility of the relevant manager to notify the Property Services Team of their intention to re-open a temporarily closed area.

10.8 Indefinite Closure

In the instance that part or all of a building is to close with no planned re-opening date, or where the closure period exceeds 60 days, negotiations must be held as detailed in the “background” subsection above, and funding made available to the Property Services Team by the manager of the department that is closing, in order to disconnect and drain the water services within the affected area. The relevant manager should be aware that considerable cost for modifications could be needed to achieve this requirement in some large properties.

10.9 Detail of Works for an Indefinite Closure

Where relevant - all water tanks associated with the affected area shall be drained, cleaned and dried out.

All pipe work and devices shall be drained and where applicable domestic hot water calorifiers [or other storage vessels] shall be opened up, cleaned and left open to the atmosphere.

Pipe work shall be disconnected from the mains services and capped off, mains cold water services shall be isolated and capped off from the system and all relevant pipe work drained.

Notices shall be posted throughout the affected area stating that all water services are disconnected.

The Property Services Team shall be responsible to ensure that an adequate water seal exists in unused toilets to prevent odours from the foul drain system entering the premises.

Adequate records of actions, and amended water service schematic diagrams shall be produced by the Property Services Team showing the relevant

modifications and disconnections made to the water systems. The Indefinite Closure Form shall be used for record keeping purposes.

10.10 Re-occupation of an Indefinitely Closed Area

In the event of re-occupation of an indefinitely closed area, full negotiations must take place between the relevant manager and the Property Services Team prior to the re-occupation exercise.

The Property Services Team will require the following information: -

- The planned re-opening date;
- Any proposed changes of use of the area;
- Any areas which will not be used.

Before the water system is put back into service, any necessary modifications and maintenance shall be carried out prior to the cleaning of the system.

Appendices

Duties of Water Treatment Contractor

The Contractor

The contractor is responsible for all aspects of the Legionella monitoring and management regime as outlined in ACOP L8, excluding:-

- Weekly Flushing of outlets

The Contractor will, on receipt of an order from the client (TAMWORTH Borough Council) undertake remedial works identified in the Legionella risk assessments and through regular monitoring works.

The contractor will also provide on site log books as well as an electronic log book in the form of zetasafe, www.zetasafe.co.uk. Responsibilities for the online log are outlined below. During the contract mobilization stage, the contractor will set up and populate the electronic logbook system, while running a paper reporting system in tandem, until such time as the Zeta Safe system is rolled out to all council departments. The contractor will be responsible for adjusting thermostatic control settings where applicable, to regulate the hot water systems on the councils estate.

The contractor must report all faults to the site responsible person as per their procedure GAMMP 09 Site Operations. All low/medium risk faults will be dealt with locally by the relevant site responsible person. The contractor must also compile a weekly summary report of all major/high risk faults observed to be submitted to the council Building Safety Team.

The Client (TAMWORTH Borough Council)

The client is responsible for the weekly flushing of infrequently used outlets as identified in the Legionella risk assessment. This must be documented in the site specific log book. The client is responsible for the provision and maintenance of the hard copy site log book. The client is also responsible for the ordering of remedial works as identified and reported to the client through the Legionella risk assessment and through ongoing monitoring works, reported via the zetasafe on-line log book and the weekly action summary reports.

ZetaSafe

Responsibilities for the Client

The council will identify a person or series of persons who will be appointed as authorised users for the system. Each user will be assigned accessibility and editable rights dependant and relevant to their responsibilities under the Legionella Management Plan. The council will be ultimately responsible for the management and use of the test data stored on the database, this includes

- Appointing relevant authorised users
- Providing the contractor with one main point of contact, in the form of an email address, for the reporting of high risk or emergency situations
- The updating and 'signing off' of system 'notes'
- Periodic or continual checking of the test data, non conformance 'notes' and recommendations stored
- Proactively using the information stored to assist in management and control of Legionella

Responsibilities of the Contractor

The contractor will be responsible for the provision and set up of the system. This includes all technical service management, maintenance and security issues associated with the system. The contractor is required to undertake periodic inspections and other works in accordance with the contract specification, relevant legislation and guidance documents. The contractor will be responsible for the reporting of test results and for providing adequate and relevant supporting recommendations for remedial action. The contractor will specifically be responsible for the following

1. Setting up and providing access to a web based and unique secure log in of all identified council users
2. Setting up specific access/ editable rights for those identified council users dependant on and appropriate to their role in the Legionella Management Plan
3. Setting up of appropriate test suites and asset types on the system, relevant to those on the councils estate
4. Setting up and maintaining periodic inspection schedules for all sites and identified assets in line with HSE ACoP L8
5. Fixing and maintaining a unique asset identification numbers on all major plant/ assets in the form of a barcode sticker
6. Undertaking periodic inspection of buildings and assets as per the inspection schedule/control program set up as they fall due
7. Providing a facility/ procedure for the prompt and timely reporting of high risk occurrences to the appropriate council representative
8. Providing training in the use of the system for authorised council users
9. Providing adequate information regarding recommended remedial action associated with 'notes'
10. Keeping the system operation up to date in line with industry good practice and any relevant changes in legislation of guidance
11. Providing the client with a monthly 'outstanding Note/Non Conformance' report

Appointments of Responsibility for Control of Legionella Bacteria

RESPONSIBLE PERSONS (MANAGEMENT)

Overall Responsibility:	Nominated Technical Responsibility:
Appointment: <i>Duty Holder</i>	Appointment: <i>Responsible Person</i>
Name:	Name:
Position:	Position:
Tel:	Tel:
Mob:	Mob:
Fax:	Fax:
E-mail:	E-mail:
Signed:	Signed:
Date:	Date:

Delegated Operational Responsibility and co-ordination of all council staff to ensure operational procedures are undertaken:

Name:

Position:

Tel:

Mob:

Fax:

E-mail:

Signed:

Date:

General Health and Safety advice:

Name:

Position:

Tel:

Mob:

Fax:

E-mail:

Signed:

Date:

Appendix C

Schedule of Monitoring Inspections HSC ACoP L8

TASK	Weekly	Monthly	Quarterly	6 Monthly	Annually
• Flush Calorifier drain for 2 Minutes					X
• Measure temperature of All Sentinel outlets cold/hot		X			
• Measure temperature from representative taps on a rotational basis					X
• Measure temperature of calorifier flow and return		X			
• Measure temperature of incoming main and storage tanks				X	
• Check CWS cistern closed and secure					X
• Inspect CWS cistern interior					X
• Check installation of tanks, cistern, calorifier and pipes					X
• Check labelling of tank and valves					X
• Clean and disinfect storage cistern					If required
• Disinfect hot and cold system (Remedial Action)					If required
• Clean and disinfect calorifier (Remedial Action)					If required
• Pasteurisation of hot system (Remedial Action)					If required
• Dismantle, clean and descale shower heads and hoses			X		If required
• Flush dead legs (if applicable) without release of aerosol	X				
• Dip slide cold water storage					If required
• Dip slide hot and cold outlet					If required
• TVC cold water storage					If required
• TVC hot and cold outlet					If required
• Legionella tests					If required
• Review results					If required
• Review risk assessment					X
• Review meeting with customer					X

Legionella Detection Investigatory Team

To be appointed

Appendix E

Appendix E: Schedule of Monitoring Inspections for 'other' Risk Systems HSC ACoP L8

Maintenance Checks for Other Water Systems

System/Service	Task	Frequency
Ultrasonic humidifiers / foggers and water misting systems	If equipment fitted with UV lights, check to ensure effectiveness of lamp [check to see if within working life] and clean filters	Six monthly or according to manufacturer's instructions
	Ensure automatic purging of residual water is functioning	As part of machinery shut down
	Clean and disinfect all wetted parts	As indicated by risk assessment
	Sampling for Legionella	As indicated by risk assessment
Spray humidifiers, air washers and wet scrubbers	Clean and disinfect spray humidifiers / air washers and make-up tanks including all wetted surfaces, de-scaling as necessary	Six monthly
	Confirm the operation of non-chemical water treatment [if present]	Weekly
Water softeners	Clean and disinfect resin and brine tank – check with manufacturer what chemicals can be used to disinfect resin bed	As recommended by manufacturer
Emergency showers and eye wash sprays	Flush through and purge to drain	Six monthly or more frequently if recommended by manufacturers
Sprinkler, wet riser and hose reel systems	When witnessing tests of sprinkler blowdown, wet risers and hose reels ensure that there is minimum risk of exposure to aerosols	As directed
Lathe and machine tool coolant systems	Clean and disinfect storage and distribution system	Six monthly
Spa baths	Check filters – sand filters should be backwashed daily	Daily
	Check water treatment – pools should be continuously treated with an oxidising biocide	Three times daily
	Clean and disinfect entire system	Weekly
Horticultural misting systems	Clean and disinfect distribution pipe work, spray heads and make-up tanks including all wetted surfaces, de-scaling as necessary	Annually
Dental equipment	Drain down and clean	At the end of each working day
Car/bus washers	Check filtration and treatment system, clean and disinfect system	See manufacturers' instructions
Indoor fountains and water features	Clean and disinfect ponds, spray heads and make-up tanks including all wetted surfaces, de-scaling as necessary	Interval depending on condition

Appendix F: Risk Assessment

Specification for the Risk Assessment Report

Front Page

- Client Name and address
- Site Name and address
- Site Contact and telephone No
- Surveyors Name
- Date of Assessment
- Contractor Contact Details

An Executive Summary

- Category of risk
- Matters of evident concern
- Recommendations for actions

A Policy statement

The contractor is to provide a policy statement signed by a Director / Senior Manager containing important information about the risk assessment document.

Introduction to the risk assessment – For Example:-

- Legal requirements and implications
- Overview of other relevant regulations
- General guidance on the requirements of ACOP/L8 guidance for system contained within document
- Additional considerations, e.g. scalding risk, asbestos, access.
- Summary checklist of ACOP/L8 recommendations
- Any Other useful information

Site Information/ Building Information

- Property type and size
- Property description
- Details of buildings/rooms on site

System Information

- Quantity and location of cold water storage tanks
- Quantity and location of calorifiers/water heaters
- Quantity and location of other systems, e.g. spas, swimming pools, water features
- Site management system and control measures

The Risk Assessment

Key risks identified in the following categories:-

1. Cold water services
2. Hot water services
3. Other water services

4. Overall Building risk factor

Each of the items 1-4 listed above is to be risk rated into one of the following risk categories as follows

- No foreseeable risk
- Low
- Medium
- High
- Very High

The contractor is required to provide the following information for each cold water storage tank, calorifier, and water heater identified on site:

Assessment of Calorifier / Water Heaters.

Details should include the following:-

- Dimensions, capacity and construction
- Does the quantity of hot water stored meet normal operational demand without falling below 60°C?
- Heat Source
- Anti – stratification pump and timer
- System pumped/gravity
- Insulation type and condition
- Drain valve installed/operational
- Flow return and base temp
- Corrosion
- Supplied from mains and cistern
- Supply pipe work material and size
- Flow pipe work material and size
- Return pipe work material and size
- Condition of supply, flow and return pipe work valves
- Type and condition of installation to supply, flow and return pipe work
- Labelling
- Power, lighting and access
- Any other significant details

Assessment of cold water storage tanks

- Dimensions and capacity
- Does the tank have less than 24 hrs usage?
- Material and construction
- Supply, stored and ambient temperature
- Insulation type, thickness and conditions
- Close fitting lid, ball valve hatch and air vent installed
- Cistern configuration e.g. single, linked, series, parallel
- Overflow pipe – size, material, screened
- Warning pipe – size, material, screened
- Internal tank condition
 - Sludge/slime

- Corrosion
- Stagnation
- Contamination
- Water flow
- Supply pipe – size and material
- Outlet pipe – size and material
- Type and condition of insulation to supply and outlet pipe work
- Type and condition of valves o supply and outlet pipe work
- Return pipes – quantity and size
- Power, lighting and access

Asset register

The contractor must include an asset register for every asset associated with the water system. Each asset must be given a unique asset no. The assets are to be included within two sections – plant assets and outlet assets and include the following

Plant asset register

- Asset No
- Description
- Location
- Comments
- Supply Temperature
- Stored temperature

Outlet Asset registers

- Asset no
- Location
- Description
- Type
- Quantity
- Supplied from
- Aerosol potential – yes/no
- Comments
- Temperatures – hot, cold, mixed
- Sentinel – yes/no

Actions / recommendations

The contractor must include a full list of recommendations for items required to be carried out to the cold water storage tanks, calorifiers, water heaters and associated system to meet the requirements of ACOP/L8 guidance. The recommendations must be recorded in asset no order and include the following information

- Asset no
- Recommendation
- Priority
- Section for signature and date on completion of remedial action

System Schematics

The Contractor must include a schematic drawing of each building on site showing the complete water systems. The schematic must show each room containing a water system asset and the supplies to the rooms. The drawing must include a legend and the water services within the building, colour coded to show:-

- Mains cold water
- Cold water down services
- Hot water flow
- Hot water return
- Plant with asset number
- Sentinel outlets identified

Appendix G

Appendix G - ES 040 Guidelines Non Conformance Reporting ACoP L8 Monitoring						
Asset Type	Test	Control Limit	Result	Contributing Risk Factor	Priority Rating	
HWSV	Storage Temperature	>60 °C	<48°C >48<55°C >55<60°C >20 <50°C	If switched ON and thermostat set	1 2 3 2	
	Return Temperature Visual inspection of drain water	>50 °C	Fail	If storage/return temperature >20 <48 °C	1	
	Visual inspection of internal surfaces	Accumulation of scale Accumulation of sediment Accumulation of sediment	Present Heavy Moderate		1 1 2	
	Storage WH	Outlet Temperature Visual inspection of drain water/internal	>50 °C within 1 minute Free from organic matter		2 2	
Limited Storage WH	Outlet Temperature Visual inspection of drain water/internal	>50 °C within 1 minute Free from organic matter	>20 <50°C Fail		3 3	
Combi Boiler/PHE	Flow Temperature	>60 °C	>20 <48°C >48<60°C		2 3	
Domestic CWST	Incoming Main Temperature	<20 °C	>25°C		1	
	Storage Temperature	<20 °C	>20°C		1	
	Visual Internal Inspection	Stagnation or bio films		Present		1
		Presence of corrosion		Heavy		1
		Presence of corrosion		Moderate		2
		Presence of corrosion		Light		3
		Sediment accumulation		Heavy		1
Sediment accumulation		Moderate		3		
Compliant with Water Regulations		No			2	
Potable CWST	Visual Design/Condition Inspection	Presence of corrosion Sediment accumulation Compliant with Water Regulations	Yes Yes No		1 1 1	
	Sentinel Cold Water Outlets	Temperature	>20°C >20°C	After flushing if still out of spec inspect CWST	2	
	Sentinel Hot Water Outlets	Temperature	>20<50 >60°C	Scald risk if vulnerable adults/children present	2 1	
TMVs	Mixed Outlet Temperature	Not exceeding 43°C Fail Safe Check	>50°C Fail	Scald risk if vulnerable adults/children present	2 1	

Appendix H – Technical Procedures

Tank Cleaning Procedure – Appendix H.1

The Process Steps [Free Residual Chlorine]:

[a] Isolate and shut down the cold water storage tank and remove the cover or inspection hatch. The operator shall display warning labels in and around the plant room stating chlorination in progress;

[b] The tank shall be examined visually for signs of corrosion [if applicable], debris and biological growth. The water storage temperature and any such defects identified are recorded for reporting to the Property Services Team.

[c] Permission must be obtained from the relevant water authority before dumping the tank contents. The relevant water authority will need to be informed of the volume to be discharged, any further quantities of chlorinated water are to be dumped as a result of tank cleaning should be included. It may be necessary to neutralise the chlorine with sodium thiosulphate before dumping.

[d] Tank cleaning shall be performed using non-abrasive cleaning materials;

[e] Protective clothing, footwear, face goggles and masks are to be employed. These items must be specific to the task of cleaning and chlorination, and must not have been used for other activities;

[f] Where tanks are to be painted, only paints or coatings and materials that are recognised and approved by the WRC and detailed in "The Water Fittings and Materials Directory" shall be employed. The specification for any such product must be submitted to the Responsible Person or their nominated deputies for their approval prior to use;

[g] Details of all cleaning and painting materials shall be listed on the cold water tank inspection record sheet;

[h] On completion of the cleaning / painting exercise, and after the necessary paint maturing period [if required], the tank shall be thoroughly flushed and washed out with water, refilled to the tanks normal working level and dosed to a level of 50 ppm free residual chlorine. The tank shall be left to stand for a minimum period of one [1] hour. During this period the level of free chlorine shall be monitored and maintained at 50 ppm;

[i] On completion of the tank chlorination period, the tank contents shall be discharged as previously detailed in section [c]. The tank is then refilled to its normal operating level with fresh water. The free chlorine level in the tank water shall be monitored until it matches that of the incoming water supply;

[j] On completion of this exercise the tank shall be put back into service immediately.

[k] On completion of the tank cleaning or inspection exercise, it is recommended that details should be entered onto a tank cleaning record label to be posted on or adjacent to the tank. Such a label must be robust, and able to withstand contact with water;

[l] Details of findings, actions taken and test results are to be entered onto the Cold Water Storage Tank Maintenance Record Form. Chlorination certificates are to be obtained and held within the onsite hard copy logbook and on the web based electronic system.

Any defects shall be reported immediately to the responsible person or nominated deputies.

Once a system has been filled, the Council and / or their Contractors will not drain that system unless full disinfection is to be undertaken before the system is brought into use again. The only exception is in the case of an emergency and with the consent of the Responsible Person. However there should be a regular flushing programme if the system is not brought into service within one week. Records of such flushing should be kept.

Cold Water Tanks with Water Temperature Greater Than 20°C – Appendix H.2

[a]The person identifying, or receiving report of a tepid cold water occurrence must notify the Facilities Manager [*Legionella*] as soon as the problem is identified, and an appropriate Property Services Team representative should be identified to be responsible for dealing with the occurrence;

[b]The individual shall verify the problem by taking the water temperature of the appropriate cold water storage tank. If the cold water storage temperature is greater than 20°C, the temperature of the incoming mains cold water should be taken;

If the incoming water is 19°C or greater, and the tank water is no greater than 2°C higher, no actions are necessary unless the incoming water exceeds 25°C [in which case the Facilities Manager [*Legionella*] will contact the Water provider];

If the water temperature in the tank is greater than 2°C higher than the incoming water supply, the following actions should be implemented [see [c] to [f]];

[c]The reason for failure must be identified and rectified as soon as possible;

[d]If the cause of the warm water is identified as heat gain to the tank, drain the tank contents and clean if necessary. A permanent solution, such as ventilation for the plant room or reducing the water storage volume must be implemented;

[e]If the reason for warm water is found to be due to ingress of hot water [i.e. from the DHW system or similar source], the Facilities Management representative department shall:

[i] Inform the users of the failed system that they must not draw off any cold water [and hot water if a single domestic hot water header] from the affected system until further notice;

[ii] Chlorine disinfection of the tank and distribution system shall be carried out in accordance with the tank cleaning/disinfection procedure;

[iii] The tank shall be brought back into service, as detailed in the tank cleaning/disinfection procedure;

[iv] The users shall be informed that the system is back in operation;

[f] The Property Services Team Representative shall complete an Incident Report Sheet.

Calorifier Maintenance – Appendix H.3

The cleaning procedure for calorifiers is as follows:

- [a] The calorifier shall be taken off line by isolating the service valves;

- [b] The calorifier shall be heated up until the contents have reached 70°C and held at this temperature for a period of at least one [1] hour;

- [c] The calorifier is drained [with consideration of the Water Authority as before]. The inspection hatch is removed. The drain down time is recorded and a photo of the internal condition is to be taken and held with the record sheet;

The calorifier should be drained with the hose pipe outlet discharging below water level i.e.: into a container of clean water.

- [d] The calorifier should then be hosed out to remove any debris, scale or other deposit. Care will be taken to ensure that aerosols are kept to a minimum;

If the calorifier does not have an inspection hatch, the pipe work at the top of the vessel should be disconnected to allow the insertion of a high pressure water hose to allow debris to be washed down off internal surfaces;

- [e] The internal and external condition of the calorifier and pipe work should be examined; any defects should be reported immediately to the Supervisor. The safety valve should be checked, overhauled and re-set as necessary including temperature, altitude and pressure gauges to be checked;

- [f] The calorifier can then be re-constructed, ensuring that only materials and compounds approved in the Water Fittings and Materials Directory are employed;

- [g] On completion of calorifier assembly, the following sequence must be undertaken:

- [i] Refill with cold water;
- [ii] Drain the calorifier [advice should be sought from the local Water Authority prior to any discharge];
- [iii] Refill with cold water, leave cold feed valve open;
- [iv] Run calorifier at a temperature of 70°C for at least one [1] hour. Test the operation of a high limit cut out system if fitted. Check the temperature of the calorifier top and bottom with a touch thermometer;

- [v] Allow the system to cool down to the operating temperature and put the system back on line immediately.
- [vi] Adjust any controls as necessary;
- [h] Undertake sterile bacteriological sampling for the parameters identified in the cold water tank cleaning procedure. Samples to be taken from the calorifier drainage tap [if possible], and nearest and furthest outlet.
- [i] Complete calorifier maintenance record form.

Domestic Hot Water Temperature Less Than 45°C – Appendix H.4

[a] In the event of a reduction in domestic hot water temperature to less than 45°C, the Responsible Person [*Legionella*] or nominated deputies and the appropriate Property Services Team representative should be notified immediately. It may be wise to fit calorifiers with an alarm system. This will be relatively easy to achieve for vessels on a BMS system. The reason for failure must be identified and rectified as soon as possible;

[b] The Property Services Team representative shall notify the users on the failed system that they must not draw off any hot water from the affected services until further notice;

[c] The user shall ensure that their staff members are aware of the situation, and that in turn shall prevent patients from using affected services;

[d] Thermal disinfection shall be carried out by raising the domestic hot water temperature of the contents of the calorifier to 60°C, and then circulating this water throughout the affected distribution system for at least one [1] hour. Each tap or appliance should be run in sequence until full temperature is achieved [this should be measured]. To be effective the temperature in the calorifier should be high enough to ensure that all distribution outlets receive water at a temperature of greater than 60°C. Ensure the return flow to the calorifier is a minimum of 50°C;

Care must be taken not to exhaust the calorifier during this operation;

[g] The users shall be informed that the system is back in operation;

[h] Legionella samples are to be taken;

[i] The Property Services Team representative shall complete an Incident Report Record.

Management of Water Features Appendix H.5

Daily

1. Check water treatment – if not continual.
2. Check water clarity.
3. Check disinfectant levels in reservoirs.
4. Check temperatures

Weekly

1. Dip slide supply pond (if applicable)

Monthly

1. Bacteriological water sampling
2. Filter inspections and changes
3. Clean pumps

Quarterly

1. Legionella sample(best practice)

Annually

1. Check Written procedures are up to date

Operational Temperature Checks

If the stored water temperature within any supply water storage cistern is recorded at a temperature above 20°C it is recommended that to avoid bacteria proliferation within the cistern, that disinfection remedial action be undertaken as soon as possible.

Management of Sprinkler Systems – Appendix H.8

Recommendations for Control

Weekly

- The system should be flushed at regular intervals at a time when there is minimal risk of exposure to prevent the potential stagnation of water. This is of particular importance during periods of low usage (i.e. winter months).

Monthly

- It is recommended that temperature testing is undertaken on a monthly basis when the system is operational to ensure that temperatures of <20°C are maintained.

Quarterly

- The sprinkler heads should be subject to regular inspections and cleaned as required.
- Filters should be cleaned and disinfected.
- Consideration should be given to sampling the system for Legionella Sp. on a monthly basis during periods

As Required

- The pump and filters should be serviced in accordance with manufacturer's instructions.

Procedure for flushing of Infrequently Used Outlets

Outlets and showers that are not frequently used can present conditions that favour the proliferation of legionella bacteria. Therefore it is important that **ALL** infrequently used outlets and showers are identified and flushed weekly.

TAPS

- Run both the hot and cold tap(s) for a period of five minutes. This should be carried out with minimal production of aerosol.
- If an outlet has not been used in more than seven days then this outlet should be purged to a drain.
- This action **MUST** be recorded on the '*infrequently used outlets*' log sheet.

SHOWERS

- Run both the hot and cold water supplies, or warm if on a single mixer tap, through the showerhead for five minutes.
- Remove the shower head. If this is not possible, then run the shower into a bucket of water or wrap a black bag (with a hole in the bottom) round the head fixture to avoid creating an aerosol.
- This action **MUST** be recorded on the '*infrequently used outlets*' log sheet.

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