

## Water Hygiene & Legionella Safety Policy & Management System



<b>Reference:</b>	POL_ASM_WHL_1.3	<b>Author:</b>	Ben Lancaster
<b>Scope:</b>	Housing Solutions Properties/Staff and Contractors	<b>Approved by:</b>	Executive Team
<b>Legislation:</b>	Health and Safety at work Act 1974 Control of substances Hazardous to health regulations 2002	<b>Date of approval:</b>	12 <sup>th</sup> Dec 2018
		<b>Date of next review:</b>	Dec 2021
<b>Related Policies:</b>	Health and Safety Policy Repairs & Maintenance Policy Planned Maintenance Investment Policy Access Policy Empty Homes Management Policy		

### 1. Policy Statement

- 1.1 This policy provides guidance on the methods by which Housing Solutions will endeavour to control Water hygiene, Legionnaires disease, and safety in the premises or systems it manages and over such systems that it has reasonable control.
- 1.2 Basic information is provided on Legionella and the procedure summarises the methods by which Housing Solutions must address its responsibilities. If you have any doubts or questions about this policy or procedures, please contact your manager who will be able to provide you with advice or further information.
- 1.3 This document has been produced in partnership with H2O Nationwide who have acted as Housing Solutions external health and safety advisers on Water Hygiene and current Legionella prevention provider.
- 1.4 Housing Solutions will take all reasonable steps to manage and establish effective systems to manage the risk of Legionellosis within our properties.

- 1.5 Housing Solutions will maintain an open information policy and will work with tenants, staff groups, contractors and statutory bodies to agree and deliver solutions to Legionellosis issues.
- 1.6 Housing Solutions will implement its Water hygiene & Legionellosis management strategy by empowering designated operational staff with the appropriate training, skills and resources needed to safely manage Legionellosis.
- 1.7 If Legionellosis poses a serious or imminent risk to the health of persons, Housing Solutions will take all practical measures as soon as possible to control the risk of Legionellosis.
- 1.8 If there is a risk of Legionellosis is present, but it is not a serious or imminent risk, Housing Solutions will take all reasonably practical measures to control the risk of Legionellosis.
- 1.9 Whilst the risk of Legionellosis is present Housing Solutions shall ensure that it is managed in such a manner so that the risk to the health of our customers, employees, contractors, visitors and other peoples using our premises is minimised.
- 1.10 All work to prevent or the control risk of Legionellosis shall be carried out in accordance with the current legal standards using the best working practices.
- 1.11 This document is not intended to provide detailed technical guidance on handling and dealing with legionellosis. Staff should refer to the appropriate HSE guidance. Lists of all current HSE publications may be obtained from the HSE Website. Lead staff will be trained to be competent to manage legionellosis in buildings. Copies of all relevant publications will be issued to all staff trained by Housing Solutions.
- 1.12 The Health and Safety Executive has produced a number of Approved Codes of Practice and a number of Technical Guidance Notes. Compliance with all relevant regulations and guidance is necessary so that all work involving legionellosis containing materials can be carried out safely without any risk to any person.

## 2. Scope

- 2.1 The scope of this policy is applicable to all group managed and maintained domestic and non-domestic buildings. The following buildings are deemed to be non-domestic premises.

Non Domestic Premises
Housing Solutions offices & administrative buildings
Registered care homes
Sheltered Housing – communal facilities
Common parts of multi-let buildings

### **3. Definitions**

- ACOP- Approved code of practice
- HSG Health and Safety Guidance
- TMV – thermostatic Mixing Valve

### **4. Legislation**

- 4.1 Criminal liability for a Legionellosis outbreak or individual deaths or illness from Legionellosis would fall under the following laws:
- Health and Safety at Work Act 1974, s2-7
  - Control of substances hazardous to health regulations 2002
- 4.2 The Health and Safety at Work Act 1974 and its supporting regulations do not apply to domestic premises. Failure to comply with these laws is a criminal act that could result in unlimited fines for Housing Solutions and possibly fines and imprisonment for directors and senior managers found to be individually culpable.
- 4.3 To ensure Housing Solutions mitigate the risk, they will follow where as it is reasonably practicable all guidance and regulations provided by the HSE or other governing bodies in relation to Legionella control.
- 4.4 In addition to the criminal liability, there would be potential liability for breach of contract and for negligence. These could result in withdrawal or limitation of insurance cover.
- 4.5 This policy has been developed to allow Housing Solutions to comply with the Control of Substances Hazardous to Health Regulations 2002, and has regard to Approved Code of Practice L8 'Legionnaires' disease: The control of Legionella bacteria in water systems.' And HSG274 (Legionnaires Disease technical Guidance)

### **5. Procedure**

- 5.1 Water hygiene is managed through staff training, risk assessments, inspections and monitoring as well as other remedial actions. The Procedure is detailed in Appendix 1.

### **6. Equality & Diversity**

- 6.1 HS recognises the needs of a diverse population and always acts within the scope of its own Equality and Diversity Policy, the Human Rights Act 1998, and Equalities Act 2010. HS works closely with its partners to ensure it has a clear understanding of its resident community with clear regularly updated service user profiles. HS will record, analyse and monitor information on ethnicity, vulnerability and disability.

## **7. Confidentiality**

- 7.1 Under the Data Protection Act 2018, General Data Protection Regulation (GDPR) and the Human Rights Act 1998, all personal and sensitive organisational information, however received, is treated as confidential. This includes:
- anything of a personal nature that is not a matter of public record about a resident, client, applicant, staff or board member
  - sensitive organisational information.
- 7.2 HS employees will ensure that they only involve other agencies and share information where there is a legal basis for processing the information.

## **8. Review**

- 8.1 This policy will be reviewed on a 3 yearly basis or more frequently in response to changes in legislation, regulatory guidance, good practice or changes in other relevant Housing Solutions' policy.
- 8.2 Our performance in relation to the delivery of the services and activities set out in this policy will be monitored on an ongoing basis through our established reporting mechanisms to our Senior Management Team, Executive Team, Board and associated committees.

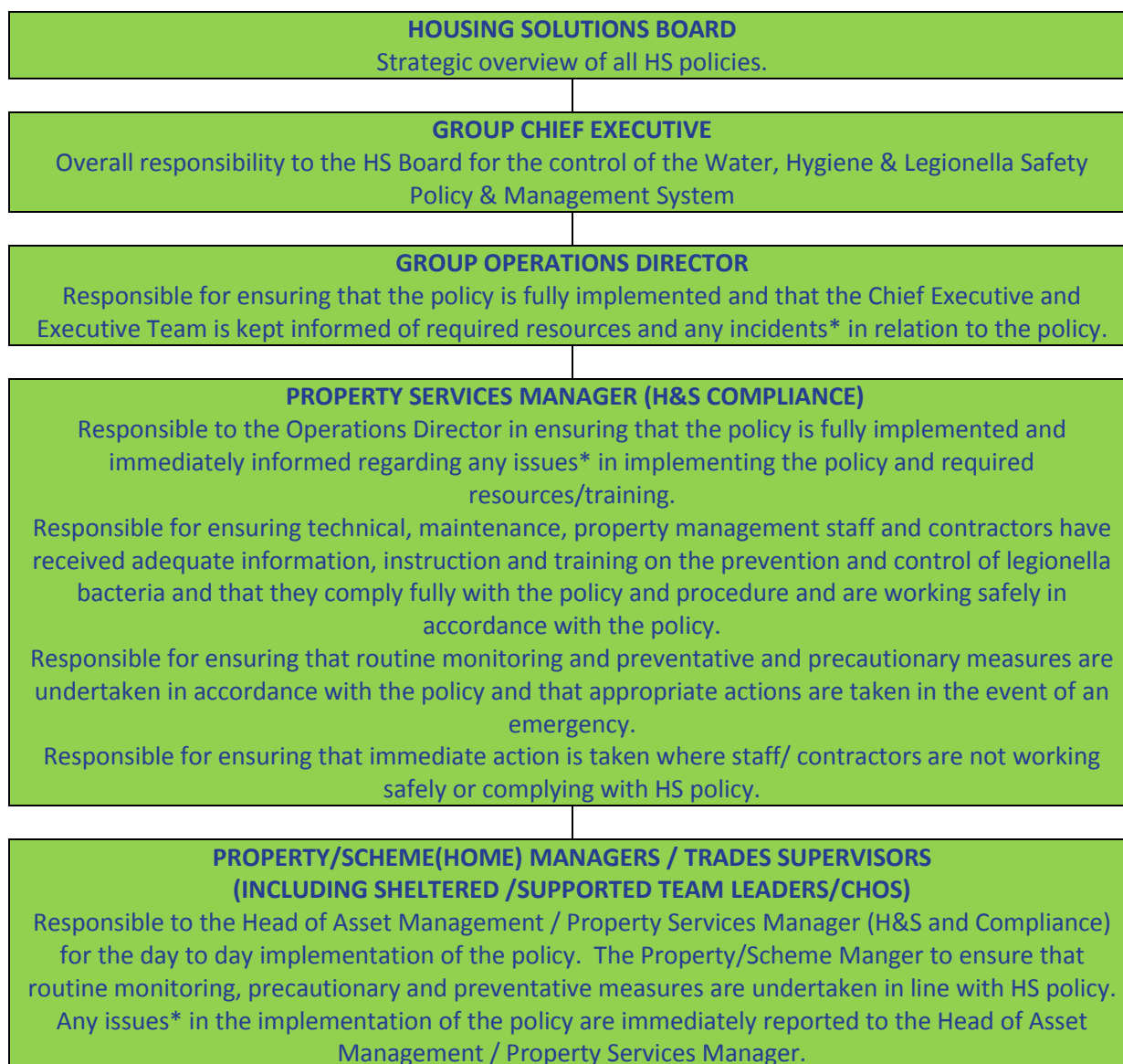
## **9. Appendices**

Appendix 1 – Procedure

Appendix 1 – Legionella Risk Assessments

## Appendix 2 – Procedure

## Responsibilities



*\*Incidents that may affect the image or reputation of Housing Solutions, or may lead to enforcement action, criminal prosecution or civil action being taken against Housing Solutions.*

## 1. Staff Training

- 1.1 The Operations Director is to ensure that all persons are provided with the necessary information, instruction and training to fulfil their roles and responsibilities under this policy and procedures.
- 1.2 All technical staff ( employed and sub contractors) providing technical services to high risk properties are to attend Water hygiene and Legionella awareness training at least once every three years.

- 1.3 Legionella awareness training shall include the following topics in appropriate detail, by means of both written and oral presentation, and by demonstration as necessary:
- the health risk from water borne infections including Legionellosis;
  - the facts affecting the risk of growth and infection by water borne infections including Legionella;
  - the general procedures to be followed to deal with an emergency; and
  - how to avoid the risks from water borne infections including Legionellosis.

## **2. Nominated Competent Persons**

- 2.1 H2O Nationwide, are our current legionella management provider, and provide support and advice along with risk assessments, monitoring and sampling.

## **3. Risk Assessments**

- 3.1 The purpose of risk assessments is to establish the risk of water borne infections including *Legionella* sp. Domestic buildings will under go a written risk assessment at void stage, with a programme for all domestic homes to be risk assessed in the next 10 years. The Buildings classed as Non- Domestic will be Assessed every 2 years

## **4. Site Inspections**

- 4.1 The Property Services Manager (H&S and Compliance) is to arrange for a site inspection of the hot and cold water storage and distribution systems, and for a risk assessment to be produced for all properties, where there is a need for a full site survey and risk assessment.
- 4.2 Site inspections and risk assessments must be carried out by a competent specialist water hygiene consultant or other competent person.
- 4.3 The inspection shall comply with the requirements of L8 - Approved Code of Practice and Guidance: Legionnaires Disease: The control of Legionella bacteria in water systems and BSRIA Guide to Legionellosis - Risk Assessment Application Guide AG 20/2000, along with the requirements outlined in BS8580.
- 4.4 The Property Services Manager (H&S and Compliance) is to instruct the specialist water hygiene consultants to carry out a site inspection of the hot and cold water systems in the non-domestic parts of designated premises to:
- Produce a risk assessment having regard to the occupancy of the premises
  - Prepare a detailed written scheme to manage the water installation at the premises that includes a schematic diagram of the hot and cold water systems

Make recommendations about:

- Measures needed to remedy deficiencies in the hot and cold water systems
- The preventative and precautionary measures needed to prevent legionella bacteria growth and distribution
- The specific monitoring scheme required at the premises

## **5. Written Scheme**

- 5.1 Where the water consultant concludes that the risk of water borne infections

including legionellosis is insignificant and that no further works are required then this shall be recorded in the water hygiene and Legionella register.

- 5.2 Where the water consultant concludes that there is a significant risk of water borne infections including legionellosis, the findings of the inspection and risk assessments are to be recorded in a written scheme for the property. This written scheme is in electronic format and accessible via a secure portal and will include:

- ✓ Details of hot and cold water systems and wet air conditioning systems, including up-to-date plans or schematic diagrams;
- ✓ Details of who is responsible for managing the property and carrying out maintenance works;
- ✓ Details of the safe and correct operation of relevant systems;
- ✓ Details of what control methods and precautionary measures are to be taken; and
- ✓ Details of the frequency and type of checks that are required.

- 5.3 The written scheme is to be available in the property and is to be kept up to date at all times. All persons with any duty in the written scheme including contractors are to be informed of the presence and location of the written scheme.

## **6. Remedial Actions**

- 6.1 The Property Services Manager (H&S and Compliance) is to ensure that the system is maintained in good repair and kept clean. The Scheme/home Manager is to ensure that all routine measures detailed in the written scheme are implemented, in accordance with the required time intervals, and that accurate, complete and up to date records are kept.

- 6.2 If the Scheme/home Manager decides, upon the findings of a site inspection, that the risks are insignificant then this shall be recorded in the legionella register.

- 6.3 If risks are identified then staff must be provided with information, instruction and training to implement the written scheme for that property and resources must be allocated to ensure proper controls are introduced. Specific controls for at risk properties will be detailed in the log book for that property. Controls may include taking any of the following measures to prevent the growth of Legionella within the water system:

- ✓ Carrying out maintenance or remedial works on the system;
- ✓ Disinfecting of the system
- ✓ Keeping water cisterns covered, insulated, clean and free of debris;
- ✓ Ensuring water cannot stagnate anywhere in the system, e.g. remove redundant pipe work, run taps/showers in unoccupied rooms;
- ✓ Insulating pipe work;
- ✓ Maintaining the correct temperature at the hot water cylinder;
- ✓ Advising personnel working on the system about the risks and how to minimise them; and
- ✓ Advising tenants about the risks, the control measures and precautions that can be taken, such as flushing through showers following a period of non-use.

- 6.4 All routine measures detailed in the written scheme are to be implemented, in accordance with the required time intervals. Accurate, complete and up to date records are to be kept, and will be recorded via the online portal.

## **7. Legionella Risk Register**

- 7.1 The Property Services Manager (H&S and Compliance) shall ensure a record of the findings of any site inspection and risk assessment in the Legionella Risk Register.

## **8. Review of Risk Assessments & Written Schemes**

- 8.1 The Property Services Manager (H&S and Compliance) is to ensure that the risk assessment and written scheme are reviewed, and amended every 2 years (non domestic) or when:
- Significant changes are planned or have been made to a system, e.g. remedial works or planned modifications have been implemented
  - Changes have been made to the management and/or maintenance of the system, e.g. 6 months after a new maintenance company has been appointed.
  - Significant changes have occurred in the way a system is being used, e.g. a formerly fully occupied building is now only partially occupied.
  - In the event of any reported water borne infections to persons

## **9. Contractors**

- 9.1 The Operations Director is to ensure that there is a nominated contractor who is capable of competently carrying out:
- Risk assessments and provision of written schemes for the prevention and control of the risks from water borne infections including Legionella;
  - Plumbing and engineering works on air conditioning and hot and cold water systems; and
  - The cleaning of water systems and chemical treatment of water supplies; and
  - Bacterial and chemical water testing and analysis.
- 9.2 Only competent contractors are to be used by The Property Services Manager (H&S and Compliance). The Property Services Manager (H&S and Compliance) is to ensure that contractor's works are regularly inspected and reviewed. Contractors who do not produce works to an acceptable standard are to be removed from the approved list and may not be used for any further works.

## **10. Action to be taken in an event of an outbreak**

- 10.1 In event of being notified of an outbreak (positive contraction of Legionnaires from a Housing Solutions Property the Property Manager is to immediately notify the following persons:
- The Operations Director
  - The Head of Asset Management and
  - Housing Solutions Health and Safety consultant
  - Property Services Manager (H&S and Compliance)
  - Nominated Contractor
- 10.2 Operations Director is to take control to control the outbreak and is responsible for appointing a person to take control and to coordinate activities with the HSE and



other relevant bodies. Housing Solutions' H&S officer/responsible person is to notify the HSE upon receipt of a diagnosis of a water borne infection including Legionellosis.

- 10.3 All other persons are to follow instructions of the Operations Director or their designated representative. No person is to make contact with the press or make any interviews unless authorised by the PR and Marketing Manager.

## **11. Private Water Distribution Networks**

### **11.1 Legislation**

In January 2010, the Private Water Supplies Regulations 1991 were replaced with new Regulations in order to meet the requirements of European Council Directive 98/83/EC in respect of private drinking water supplies. The Private Water Supplies Regulations 2009 have been designed to provide improved health protection for consumers of private water supplies and consumers of food produced or prepared using private water supplies.

- 11.2 A private distribution network (PDN) is classified as a potable water network within the boundary of a private site – a 'network' being a water supply pipe that has rising mains in more than one building, and 'wholesome water' being that used for drinking, cooking and washing. If the supply pipe connected to the water company main feeds a single building then this is not a network however if it goes on to supply additional buildings around a site then the new regulations may apply.

- 11.3 Housing Solutions will work with the Local Authority Environmental Health Team to identify PDN and a list of PDN can be found at Appendix 2. The list will be reviewed annually by the Head of Asset Management.

## **12. Risk Assessment**

- 12.1 The Property Services Manager (H&S and Compliance) or appointed deputy is to work the Local Authority Environmental Health Team to produce a risk assessment for any private water distribution network managed by Housing Solutions.
- 12.2 The results of any risk assessment will be recorded in a register. The outcome of the risk assessment will determine the type and frequency of sampling and analysis required.

## **13. Sampling & Analysis**

- 13.1 The Property services Manager (H&S and Compliance) will implement any sampling and analysis required as the result of any risk assessment. Any difficulties in implementing this will be immediately reported to the Head of Asset Management who will inform the Operations Director.

## **14. Action to be taken in the event of an outbreak**

- 14.1 In event of being notified of a problem with water supply the Property/Scheme Manager is to immediately notify the following persons:
- The Operations Director
  - The Head of Asset Management and;
    - Housing Solutions Health and Safety consultant

- Property Services Manager (H&S and Compliance)
  - Nominated Contractor
- 14.2 The Operations Director is to take control of the situation and is responsible for appointing a person to coordinate activities. Upon instruction from the Operations Director Housing Solutions Group's H&S officer/responsible person is to notify relevant bodies.
- 14.3 All other persons are to follow instructions of the Operations Director or his designated representative. No person is to make contact with the press or make any interviews unless authorised by the press office.

## **15. Hot Water Safety - Scalding**

- 15.1 Background Information  
Housing Solutions, in its role as a reputable landlord, has added this section on Hot Water Safety and Scalding to this policy to provide a framework to reduce the risk of scalding.
- 15.2 Housing Corporation Standards (prior to TSA) recommended the installation of Thermostatic Mixer Valves (TMVs (type 2) to housing association baths outlets in general needs dwellings and to the bath, basin and shower of dwellings for the elderly. NHS Guidance, Care Standards Act 2000 and Care Homes Regulations (2001) recommend installation of TMVs (type 3) to bath, basin and shower outlets in NHS and private nursing homes. It is worth noting that up until April 2010 the only regulatory *requirement* (as opposed to *recommendation*) to install TMVs relates to young person's care homes, schools and NHS hospitals. There is no specific guidance related to supported living dwellings.
- 15.3 With effect from 6 April 2010, a revised Part G (covering sanitation, hot water safety and efficiency in new build properties) of the Building Regulations came into force. Within this update is a requirement to eliminate the risk of scalding in domestic homes by imposing a maximum temperature of 48 degrees on water delivered to baths. In order to achieve this objective, Part G requires that TMVs be installed for all bath taps in new build homes. Whilst Part G does not stipulate the type of TMV required, it states that it must conform to BS EN 1111 and BS EN 1287, or other appropriate device, that cannot be easily altered by the user.
- 15.4 Although separate from the guidance above regarding scalding from hot water outlets the HSE safety alert Scalding risk from domestic hot water systems has been considered in adopting this approach.

## **16. Initial Risk Assessment**

- 16.1 The initial assessment considers the overall risk of scalding from hot water outlets posed in different types of property (Care/Supported/Sheltered/General Needs). This initial high level risk assessment will:
- Consider the need for individual risk assessment for the resident which will highlight where individual management controls (e.g. supervised bathing/manual temperatures checks);
  - Details the need for mechanical controls (e.g. Thermostatic Mixer Valves (TMV)) to manage the risk posed as a safeguard in the event of failure of management controls.

The results of the initial assessment for the risk from hot water outlets are below/overleaf:

	<b>Management Risk Control</b>	<b>Mechanical Risk Control</b>
<b>Care</b>	Individual risk assessment required.	TMV 3 all outlets unless individual assessment identifies otherwise
<b>Supported</b>	Individual risk assessment required.	TMV 3 all outlets unless individual assessment identifies otherwise
<b>Sheltered</b>	Individual risk considered as part of personal support plan.	TMV2 valves to bath/shower facilities only As a minor adaptation (within 31 days) if required by individual assessment
<b>General</b>	Publicity regarding scalding risk and option to request adaption.	TMV2 valves to bath/shower facilities only As a minor adaptation (within 31 days) if required by individual assessment

Where hot water is stored and vented into a plastic cold water storage tank or held under pressure additional risk exists. These risks have also been assessed and are controlled as per the table below:

	<b>Risk Control</b>
Hot water cylinder with part or full electric heating vents into CWST which collapses- greatest risk above a bedroom	CWST base is checked on annual gas check or annual property check Publicity to residents on typical warning signs Thermal cut outs to all immersion heater checked on gas safety or annual property check
Vents for hot water held at pressure	Any discharge pipe should terminate no more than 100mm from any hard standing and if in an area where children play a cage should be provided. checked annually on the gas safety or annual property check.

## 17. Individual Assessments

- 17.1 Individual assessments are highlighted as being required for residents in Care/Supported and Sheltered type properties.
- 17.2 In Care and Supported environments the lease for the property or the service agreements covering support and/or nomination will specify the responsibility for carrying out such an assessment. The Housing Manager will be responsible for auditing the approach to give reasonable assurance that care and support providers are meeting requirements. Where a risk assessment indicates that the mechanical control detailed in the initial risk assessment is not required it will be considered by the Housing Manager and a copy of the risk assessment along with the decision taken as a result will be kept on file.
- 17.3 In Sheltered Housing properties residents will be assessed by the Sheltered Housing Officers as part of the personal support plan at start of tenancy. Changing needs will be considered during ongoing meetings as part of the personal support plan. If a mixer valve need is identified in the risk assessment then the Sheltered Housing Officers will report this to the Asset Management Team where it will be handled as an adaptation request.

- 17.4 In general needs property individual assessments will not be carried out unless a request to complete one is received.

## **18. Monitoring & Servicing**

- 18.1 TMVs require servicing in line with the manufacturers' instructions. The scheme/home Manager is responsible for allowing access for servicing and should inform the Property Services Manager (H&S and Compliance) immediately if they encounter any problem in doing so.
- 18.2 Where annual checks are required to prevent the risk of scalding from stored water these will be organised annually and usually as part of the ongoing gas safety or annual property check. The Scheme/Home Manager is responsible for arranging these checks and should inform the Property Services Manager (H&S and Compliance) immediately if they encounter any problem in doing so.
- 18.3 The Head of Asset Management will inform the Operations Director of any problems in implementing the risk controls.

## **19. Action to be taken in event of a scalding incident**

- 19.1 In event of being notified of a scalding incident the Scheme/home Manager is to immediately notify the following persons:
- The Operations Director
  - The Head of Asset Management and Head of Operations
  - Property Services Manager (H&S and Compliance)
  - Housing Solutions Health and Safety Consultant
- 19.2 Operations Director is to take control of the situation and is responsible for appointing a person to coordinate activities. Upon instruction from the Operations Director Housing Solutions H&S officer/responsible person is to notify relevant bodies.
- 19.3 All other persons are to follow instructions of the Operations Director or his designated representative. No person is to make contact with the press or make any interviews unless authorised by the PR and Marketing Manager.

## **20. Audit**

- 20.1 The Water Hygiene & Legionella safety Management procedures will be audited as per the following table:

Audit Type	Frequency	Responsible Person
Property check*	Quarterly	Property Services Manager (H&S and Compliance)
Internal audit by appointed H&S Consultant	Annually	Operations Director
External audit carried out by external auditors	Bi-annually	Operations Director

\*To ensure that all properties that require a risk assessment are recorded on the master database with a date for re-inspection.

- The Operations Director must record the findings of an audit. The system should be amended to incorporate the findings of an audit.

- All persons are to ensure that proper records are maintained and available on demand for inspection by internal auditors.
- Audits are to be conducted using the current edition of Control of Legionella bacteria in water systems: Audit Checklists. ISBN 0-7176-2198-7

## **21. Records**

- 21.1 The Operations Director is to ensure that all records are to be kept for five years from the date of the last entry.

## **22. Performance Indicators**

- 22.1 The Property Services Manager (H&S and Compliance) will be responsible for reporting the following key performance indicators through the monthly compliance report to the Senior and Executive management teams.
- All sites have a valid legionella Risk Assessment as per the policy - 100%
  - All remedial actions for risk assessments conducted.

## **23. Complaints**

- 23.1 All customer complaints relating to Water Hygiene and Hot Water safety will be logged as per the company's complaints policy and procedures.

### **Additional Information & Links**

The Health and safety executive Website:

<http://www.hse.gov.uk/legionnaires/index.htm>

Public Health Laboratory Service (PHLS) Website:

[http://www.phls.org.uk/topics\\_az/legionella/menu.htm](http://www.phls.org.uk/topics_az/legionella/menu.htm)

## Appendix 2 - Legionella Risk Assessments

Risk assessments are required by law to methodically and systematically identify, evaluate and control risks to health and safety arising from work. Section 3(1) of the Health and Safety etc Act 1974 requires that:

*"It shall be the duty of every employer to conduct his undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in his employment who may be affected thereby are not thereby exposed to risks to their health or safety."*

In *Langridge v Howletts & Port Lympe Estates*<sup>1</sup> it was held that the Act is not seeking to legislate as to what work could or could not be performed, but is properly concerned with the manner of its doing. In *R v Board of Trustees of the Science Museum*<sup>2</sup> it was held that risk is the possibility of danger. In *Paris v Stepney Borough Council*<sup>3</sup> it was held that there are two factors in determining the magnitude of a risk – the seriousness of the injury and the likelihood of the injury being in fact caused. In *Edwards v National Coal Board*<sup>4</sup> it was held that "Reasonably practical" is a computation of risk against time, trouble and expense and only where it can be shown that the risk is insignificant in relation to sacrifice has the burden been met. In *R v Porter*<sup>5</sup> it was held that the prosecution had to prove that the risk was a real risk as opposed to a fanciful or hypothetical risk and that unless it could be said that the person was exposed to a real risk by the conduct of the undertaking no question as to the reasonably practicable measures taken to meet risk arose.

Regulation 3 of the Management of Health and Safety at Work Regulations 1999 requires that:

*Every employer shall make a suitable and sufficient assessment of-*

- (a) the risks to the health and safety of his employees to which they are exposed whilst they are at work; and*
- (b) the risks to the health and safety of persons not in his employment arising out of or in connection with the conduct by him of his undertaking,*

*for the purpose of identifying the measures he needs to take to comply with the requirements and prohibitions imposed upon him by or under the relevant statutory provisions.*

*Where the employer employs five or more employees, he shall record -*

- (a) the significant findings of the assessment; and*
- (b) any group of his employees identified by it as being especially at risk.*

As legionella bacteria are a biological agent that may cause infection, they are classified as a hazardous agent, as defined by the Control of Substances Hazardous to Health Regulations 2002 (as amended). Regulation 6 of these regulations requires that:

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<sup>1</sup> Langridge v Howletts & Port Lympe Estates [1996] EWHC Admin 282  
<sup>2</sup> R v Board of Trustees of the Science Museum [1993] ICR 876  
<sup>3</sup> Paris v Stepney Borough Council [1951] AC 367, HL  
<sup>4</sup> Edwards v National Coal Board [1949] 1 KB 704, CA  
<sup>5</sup> R v Porter (James Godfrey) [2008] EWCA Crim 1271

*The risk assessment shall include consideration of—*

- (a) the hazardous properties of the substance;*
- (b) information on health effects;*
- (c) the level, type and duration of exposure;*
- (d) the circumstances of the work, including the amount of the substance involved;*
- (e) activities, such as maintenance, where there is the potential for a high level of exposure;*
- (f) any relevant occupational exposure standard, maximum exposure limit or similar occupational exposure limit;*
- (g) the effect of preventive and control measures which have been or will be taken;*
- (h) the results of relevant health surveillance;*
- (i) the results of monitoring of exposure;*
- (j) in circumstances where the work will involve exposure to more than one substance hazardous to health, the risk presented by exposure to such substances in combination;*
- (k) the approved classification of any biological agent; and*
- (l) such additional information as the employer may need in order to complete the risk assessment.*

To assess the risks to the health and safety of persons the first stage is to identify events (i.e. exposures to legionella bacteria) that may cause injury; then the second stage is to evaluate the severity and likelihood of injury; and the third stage is to identify the measures required to comply with the regulations.

To cause infection, legionella bacteria normally need to be inhaled or aspirated. The inhaled particles should be small enough to penetrate down to, and be retained in the alveoli but large enough to contain at least one bacterial cell. Particles of 1-3  $\mu\text{m}$  satisfy these criteria. These particles are too small to be seen by eye and can remain suspended in air for prolonged periods of time. It is a common misconception that a water spray is an aerosol and that *legionellae* have to be contained within a wet droplet.

Any mechanical action that causes the surface of a liquid containing bacteria to be broken up may cause the production of small droplets containing bacteria suspended in them. If these droplets are small enough, the water may rapidly evaporate leaving the dry droplet nuclei containing the bacteria, so forming an aerosol. Humidifiers, spa pools, whirlpool baths and evaporative cooling towers can all generate aerosols that may cause infection. There is mixed evidence from epidemiological studies as to whether showers reduce or increase the risk of legionellosis.

It is not known how domestic water systems become contaminated; however it is known that legionella bacteria occur in natural waters such as streams, rivers and lakes. It is probable that contamination by legionella bacteria occurs after water treatment, directly through damaged or defective mains water supplies and by access by birds and rats to open water storage tanks, and indirectly through windblown soil contamination of open water storage tanks.

Legionella bacteria once inside the water system may multiply if there are suitable environmental conditions; there are presence of nutrients, a bio-film and protozoa, a temperature range between

20-45 °C, and time to multiply. The minimum infectious dose for legionella bacteria is unknown.

For infection to occur, legionella bacteria must be inhaled by a susceptible person. Persons at increased risk are predominantly male (75%), over 40 years of age (90%), a heavy smoker or drinker, or have compromised immune system or with an underlying diseases such as diabetes or cancer.

The Health Protection Agency states that in the UK, there were an average of 112 Community acquired confirmed cases, and an estimated average 14 deaths from these exposures, per year for the years between 1980 and 2008. This means that the individual annual risk of death from community acquired legionnaires disease is around 1 in 4,000,000 and the individual annual risk of legionnaire's disease is around 1 in 500,000 given a population of 60,000,000.

Based on the above, the annual risk of legionnaire's disease at 1 in 500,000 (and the risk of death from community acquired legionnaires disease at 1 in 4,000,000) is remote.

It is not recommended that any measures be taken to prevent and control this risk in the general housing stock, other than to ensure that hot water storage water vessels are correctly set up, to store water at above 50 °C, when they annually serviced. This is to be done with the annual gas inspection.

Where persons are at higher risk, because of their age or an underling medical condition, a site-specific risk assessment must be carried out of schemes housing older and vulnerable persons to that considers:

- The activities being carried out that potentially expose persons to aerosols containing legionella bacteria;
- The potential for contamination of the water system and multiplication of legionella bacteria;