

LONDON BOROUGH'S' LEGIONELLOSIS INCIDENT PROTOCOL

February 2012

Introduction

This document aims to clarify the roles, responsibilities and actions to be taken by the organisations involved in the diagnosis, investigation and control of legionellosis.

Through enhanced co-ordination and clarification of purpose it will contribute to:

- Reducing the incidence of legionellosis acquired in the London Boroughs through more effective risk management, early detection, and reporting of cases
- Improving the consistency and efficiency of investigation and management of risk of legionellosis from environmental sources, including appropriate and proportionate enforcement action
- Developing effective platforms and mechanisms for partnership working
- Efficient management of sporadic cases and incidents (clusters and outbreaks)
- Improving public/community and business awareness of legionellosis and supporting risk management strategies and initiatives

Using the protocol

The document stands as an overarching strategy for relevant organisations within the London Boroughs to adopt the protocol and integrate the principles within their own standard operating procedure or work practices. The protocol links to national strategies for the management and control of legionellosis.

Review

The protocol will be reviewed every two years or in light of new evidence or experience from managing cases/outbreaks.

Acknowledgments

The document has been produced through a multi agency working group representing Local Authority environmental health services, Health and Safety Executive (HSE) and the Health Protection Agency (HPA).

Acknowledgements: South West of England's Legionella Outbreak Protocol.

All London Local Authorities have signed up to follow the principles of the London Boroughs' Legionellosis Incident Protocol

London Borough of Barking and Dagenham
London Borough of Barnet
London Borough of Bexley
London Borough of Brent
London Borough of Bromley
London Borough of Camden
City of London
London Borough of Croydon
London Borough of Ealing
London Borough of Enfield
Royal Borough of Greenwich
London Borough of Hackney
London Borough of Hammersmith and Fulham
London Borough of Haringey
London Borough of Harrow
London Borough of Havering
London Borough of Hillingdon
London Borough of Hounslow
London Borough of Islington
Royal Borough of Kensington and Chelsea
Royal Borough of Kingston upon Thames
London Borough of Lambeth
London Borough of Lewisham
London Borough of Merton
London Borough of Newham
London Borough of Redbridge
London Borough of Richmond
London Borough of Sutton
London Borough of Southwark
London Borough of Tower Hamlets
London Borough of Waltham Forest
London Borough of Wandsworth
London Borough of Westminster

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Section 1: Roles and Responsibilities of Agencies/Organisations

AGENCY	RESPONSIBILITIES
NHS	<ul style="list-style-type: none"> • To provide rapid urinary antigen testing of suspected cases of <i>Legionella</i>. • Health Protection (Notification) Regulations 2010 places a duty on registered medical practitioners to notify the proper officer of the relevant local authority (in London the Consultant in Communicable Disease Control / Consultant in Health Protection (CCDC/CHP) at the relevant HPU) if they have reasonable grounds of suspecting that a patient has Legionnaires' disease. • The Regulations also places a new duty on all human diagnostic laboratories to notify to HPA microbiologically confirmed cases of Legionnaires' disease from clinical samples. • <u>Report results to the HPU immediately by telephone</u> • The diagnosis made in the local laboratory should also be confirmed through submission of the positive sample to the Respiratory and Systemic Infections reference Laboratory at the HPA, Colindale. • Support the HPU in the investigation and management of the case (or incident). • Attend outbreak control meetings as appropriate. • In a hospital outbreak, Consultant in charge of infection control or Consultant Microbiologist to convene and chair Incident Control Team (ICT).

AGENCY	RESPONSIBILITIES
<p>HPA (CCDC/CHP)</p>	<p>CCDC/CHP:</p> <ul style="list-style-type: none"> • Inform the EHO in the area of residence of the patient in order to discuss appropriate investigation of the source of the infection. • <u>Surveillance of Legionella infection and taking detailed case history from the patient (or relative) to establish possible risk factors and identify source(s) of infection.</u> • Inform and liaise with LA/HSE as appropriate • Membership of the incident control team ICT when appropriate. • Convene and chair ICT with liaison with the Local Authority. • Ensure appropriate data are collected in a timely fashion. • Log all cases and maintain records of cases. • Inform the Regional Epidemiologist. • Inform the Director of Public Health and Infection Control Nurse of the relevant PCT. • Inform the Director or Consultant microbiologist at the HPA regional laboratory. • When appropriate, inform and liaise with neighbouring Health Protection Units and PCTs. <p>HPA General</p> <ul style="list-style-type: none"> • Take an overview of the surveillance and control of Legionnaires' disease cases occurring throughout the region. • Receive surveillance data gathered by HPUs during investigations.

AGENCY	RESPONSIBILITIES
HPA (CCDC/CHP) continued	<ul style="list-style-type: none"> • Review the data and advise relevant HPUs on the need to explore any geographical or temporal links between other cases occurring elsewhere in the region. Provide a testing service for clinical specimens from suspected and confirmed cases. • Provide access to a full laboratory service for testing water and environmental samples. • Report all results to the HPU and local authority (as relevant) immediately by telephone and by written report in a timely fashion. • Advise on the technical aspects of sampling and support field sampling activities. • Provide advice to the HPU and the Incident Management Team / ICT. • Membership of the ICT as required • Inform the Regional Microbiologist
Primary Care Trust	<ul style="list-style-type: none"> • Director of Public Health lead on communication with Primary Care Staff. • Will provide incident control room and administration if required. • When appropriate, inform and liaise with neighbouring PCTs. • Provide support to meet the short term and long term health needs of the population affected.
Local Authority	<ul style="list-style-type: none"> • LA may be assuming two roles; the public health investigation to identify the source and enforcement under Health & Safety at Work legislation focusing on compliance with the Control of Substances Hazardous to Health (COSHH) Regulations and associated Approved Code of Practice L8 “Legionnaires’ disease, the control of Legionella bacteria in water systems”. • The Local Authority enforces the Health and Safety at Work Act in premises allocated to them under the Health and Safety (Enforcing Authority) Regulations 1998. Under the Health and Safety at Work Act 1974, inspectors approved under the Act,

AGENCY	RESPONSIBILITIES
Local Authority continued	<p>which includes all HSE inspectors, have powers under the COSHH Regulations to compel occupiers to clean and disinfect plant which is not being maintained to a standard required by 'Legionnaires' disease, the control of Legionella bacteria in water systems - Approved Code of Practice L8.</p> <ul style="list-style-type: none"> • Convene and chair the ICT in liaison with CCDC/CHP • Direct and lead in field investigation, undertake risk assessment and use all local intelligence and knowledge to inform the investigation and to identify potential sources e.g. check the Cooling Tower Register, inspect premises and other environmental sources. Where appropriate working with the HSE. • Visit relevant commercial premises and check risk assessments, water treatment, maintenance and monitoring records of water systems in accordance with the relevant legislation. • Identify location of cooling towers, visit and check maintenance records of water systems in accordance with the relevant legislation with HSE inspectors where appropriate. • Enforce where risks are not controlled and compliance is not being met in accordance with the LA enforcement policy. • In consultation with the CCDC/CHP consider checking relevant domestic water systems. • Check other relevant premises as appropriate. • Arrange for appropriate water samples to be taken. Contact and coordinate with HPA Food, Water and Environmental Microbiology laboratory, Colindale to discuss sampling and testing arrangements. • Inform and liaise with neighbouring local authorities when appropriate. • Consider formal action where appropriate.
Health and Safety Executive	<ul style="list-style-type: none"> • The HSE enforces the Health and Safety at Work Act in premises allocated to them under the Health and Safety (Enforcing Authority) Regulations 1998. HSE officers have the

AGENCY	RESPONSIBILITIES
<p>Health and Safety Executive continued</p>	<p>same powers as Local Authority officers under the Health and Safety at Work Act 1974). They have powers under the COSHH Regulations to compel occupiers to clean and disinfect plant which is not being maintained to a standard required by the Approved Code of Practice L8 'Legionnaires' disease, the control of Legionella bacteria in water system.</p> <ul style="list-style-type: none"> • Examine the risk assessments and water treatment and monitoring programmes of water systems (where the HSE is the lead Health & Safety enforcement agency). • Enforce where risks are not controlled and compliance is not being met in accordance with the HSE enforcement policy • HSE's policy is not to take samples from water systems as it does not need evidence of sampling to support a prosecution or any other enforcement action taken under health and safety legislation. HSE's aim is to assess the degree of compliance with the ACoP and <i>legionella</i> sampling is too unreliable for this purpose. (Ref: OC 255/12). • Membership of the ICT when appropriate.

Section 2 - Dealing with a single case of legionellosis

2.1. This section of the document provides guidance for the management of a single case of legionellosis and is adapted from the national guidelines: <http://www.hpa.org.uk/cdph/issues/CDPHvol5/No2/guidelines1.pdf> [Last accessed 7th September 2011] ^[2] ^[4]. The protocol states the primary focus for action but there may be local and individual circumstances that change the procedures. Any exceptions to the protocol need to be agreed between the relevant stakeholders. All single cases should be dealt with on a case by case basis and the level of investigation will depend on the Local Authority.

Single Case

- 2.2. Usually, a case is reported to the HPU once a provisional diagnosis has been made through a positive legionella urinary antigen test performed in the local laboratory ^[3].
- 2.3. If the case is believed to be community acquired, the Local Authority should instigate a desktop evaluation to identify potential known environmental sources such as:
- Cooling Towers and Evaporative condensers
 - Spas and therapy pools
 - Large water systems such as leisure centres or large hotels
- 2.4. As part of the desktop evaluation Local Authorities may want to examine the previous inspection and action history of environmental sources used by the case and cooling towers within 500 metres of the cases known locations within the onset period. If deemed necessary by the Local Authority they may undertake a field investigation to gather further information.
- 2.5. If a potential source of Legionella is suspected consider the need for environmental sampling (See Environmental Sampling section 4). Local Authorities to adopt safe working practices during wet cooling tower inspections.
- 2.6. If a source of infection is identified or confirmed, ensure that action is taken to isolate and remove the source immediately and that appropriate remedial action is taken.
- 2.7. The Local Authority officer will inform relevant partners such as neighbouring Authorities (see appendix A LA contacts) and the HSE of any significant risk assessments and information gathered during investigations.
- 2.8. In the event of a cross-boundary incident the lead HPU should inform the neighbouring HPU and liaise with relevant PCT and LAs.
- 2.9. On conclusion of any necessary investigation the relevant enforcing authority will decide on the appropriate course of action in line with their enforcement policy.

Clusters

- 2.10. All single cases will be considered against case records held of the preceding 6 months to establish any commonality – *residence, work, visited*.
- 2.11. Consider strength of association of any commonality found in determining need/extent of further work.
- 2.12. If an association to a Cooling Tower/Evaporative Condenser is evident undertake sampling of the device.
- 2.13. Other possible sources of infection should be considered for sampling. *E.g. Water features, Spa baths/pools, showers etc.*
- 2.14. Where the results of analysis establishes a link between cluster cases the investigation will be escalated

Section 3 - Management of an outbreak of legionellosis

- 3.1. When a cluster/outbreak is confirmed or suspected, an Incident Control Team (ICT) will be immediately formed and the London Infectious Disease Management Plan invoked. If they are not already involved the HPU will inform the appropriate Local Authority (LA) officer(s), the Primary Care Trust (PCT) Infection Control nurse and Director of Public Health (DPH) as soon as possible.
- 3.2. Immediate action is essential and will include arrangements for invoking call-out procedures where the incident is reported outside normal office hours. It is envisaged that this will involve operation of some kind of cascade system whereby a senior manager will work in conjunction with the HPU and their staff, calling in other personnel as necessary.
- 3.3. The HPU will ensure that steps are taken to obtain laboratory confirmation of the diagnoses.
- 3.4. The LA will inform neighbouring LA's and the Health & Safety Executive (HSE) if appropriate; contact will be made through the HSE Principal Inspector and LA contacts detailed in the appendices.

Stage 1 Convene a full Incident Control Team.

- 3.5. The HPU will convene an ICT meeting to review all available information and consider the need for further investigation and action. This is described in detail in the London Infectious Disease Management Plan. Clear and strong leadership of the Incident Control Team must be established immediately, leadership must have continuity throughout the incident.
- 3.6. This should include some or all of the following or their representatives for the implicated areas and their roles and responsibilities have been defined earlier on in this document:-
 - Representation from the HPA (including HPUs if other implicated areas)
 - Environmental Health Manager(s) and Environmental Health Officer(s) (EHO)
 - Consultant Microbiologist, Acute or Foundation Trust
 - Director(s) of Public Health of the PCT(s) involved
 - Clinicians as appropriate
 - HSE 's Enforcement Liaison Officer (ELO) (normally the Principal Inspector for the relevant Quadrant)
 - A Consultant Microbiologist from the HPA laboratory at Colindale required for large incidents
 - Other local authorities (see LA contacts appendix A) if incident is cross borough
- 3.7. This is not an exhaustive list. Other members may be invited or co-opted as appropriate. They will determine the course of the investigation of the Incident and decide whether to invoke any Major Incident Plan. Clear documentation from the onset and throughout the investigation will be maintained by this group.
- 3.8. The initial meeting may take place via teleconference or convened at the offices of the local Environmental Health Department (EHD) and will be determined by the circumstances at the time. If the Major Incident Plan has already been invoked a larger Control Room could be required. The procedures for establishing a venue need to be agreed by local authorities and maybe part of more general arrangements for emergency planning.

Stage 2 Initiate response and control strategy

3.9. The following sequence and headings maybe useful in establishing the course of the incident management:-

- Review clinical, epidemiological, microbiological and environmental evidence so far received.
- Seek common links where more than one such case, particularly where other peripatetic workers are involved in same premises.
- Risk to the public and control of that risk.
- Agree and implement a control strategy for the incident (refer to points 3.10 to 3.14)
- Agree an investigation process for the general area.
- Agree a sampling strategy (refer to section 4 sampling).
- Decide when control team meetings will be held and communication links.
- Decide on the dissemination of information to relevant bodies, public and media.
- Decide how progress will be managed and administered and information collection monitored.

Control strategy

3.10. In an incident the emphasis needs to be on:

- control and prevention of further illness;
- the identification of premises where water systems have not been effectively managed;
- epidemiological data gathering; and
- The collection of robust information and evidence for any potential formal action.

One could potentially compromise another but the **first consideration should be on control and prevention of further illness.**

3.11. The ICT should agree a strategy for managing the control program. The committee through Local Authority/HSE inspectors should initially seek to eliminate the risk to people and focus on compliance with the legislation and the L8 ACOP. Where there is significant risk and clear failures to comply with the relevant legislation, enforcement (for example to disinfect the systems) should be taken to control the risk of further cases of legionnaires Disease and allay public concern. This may include stopping processes and/or systems. The balance involves informing duty holders to shut down their systems and ensuring this is done but without compromising any sampling program or unduly delaying possible disinfection (and return to use). The ICT should be aware that if duty holders are informed of an impending visit, it is likely that they will shock dose the system which may reduce the likelihood of locating the source.

3.12. The HSE (2000) 'Legionnaires' disease, the control of Legionella bacteria in water systems - Approved Code of Practice (L8) details an emergency cleaning and disinfection procedure for cooling towers implicated in an outbreak.

3.13. L8 also advises that chemical or thermal disinfection procedures are carried out for other implicated water systems.

3.14. Information from any inspection programme should be collated and added to other environmental information and the microbiological and epidemiological information and any initial control strategy discussed and refined.

Investigation

- 3.15. The ICT will draw up a list of premises for inspection in the vicinity of the home or workplace of each case and places they regularly visit. This may include sports clubs, dental surgeries, residential and commercial premises which have systems known to be associated with Legionella risk or which have the potential to create and release an aerosol which may be contaminated.
- 3.16. They will have regard to potential environmental sources, namely:-
- Cooling Towers and Evaporative condensers
 - Hot & cold water systems
 - Industrial process washing/cleaning systems
 - Spas and therapy pools
 - Humidifiers, humidified display cabinets, fountains and sprinkler systems
 - Spray washing equipment
- 3.17. This list will be allocated to members of the team responsible for inspections. The aim of the inspections will be to check the hot and cold water services and associated processes for conditions where proliferation of legionella could have occurred.
- 3.18. All inspections involve first examining documentation then a visual examination and the conditions which need to be checked are:
- Systems which permit likely aerosol formation
 - The efficacy and management of any water treatment programme
 - Water temperatures
 - Possible stagnation and dead legs. NB Low use and un-occupied areas.
 - System cleanliness, scaled fittings, debris in associated water tanks.
 - Recent breakdown and/or work to services.
 - Locate intake for mechanical ventilation system, if any.
- 3.19. The locations of cooling towers in a given area will need to be considered and a strategy devised for the further investigation of these sources. In areas where there is a large concentration of cooling towers this may take up a significant part of the investigative (and sampling) response.
- 3.20. A target area will be identified centred on the building where the case(s) works. This is most easily done using a GIS mapping system (ideally linked to the premises database or with a cooling tower layer available).
- 3.21. Circles of given radii – normally 250m, 500m, and 1000m - are scribed from the presumed centre of the outbreak, and all the towers within each area should be identified including those which have been closed (and not physically removed from site). Wind data such as that provided by OPSIS (an environmental monitoring software system, to measure weather data), including wind strengths and direction in the period 21 days before onset of first symptoms maybe useful in determining how to prioritise resources for visits.
- 3.22. Premises may be spread across various individual Boroughs boundary. If so the EH Departments or equivalent should be advised that the incident protocol has been set up and that the premises in their area will require inspection. All these authorities need to be familiar with this protocol and the level of response they may be required to give.
- 3.23. An inspection programme should be devised to include all the premises identified. Where there are a large number, an order of inspection priority should be adopted but all sites will need to be visited in the identified area including those enforced by HSE.

- 3.24. If not already done as part of the control strategy, each of the identified premises should be contacted and informed that the Incident Protocol has been invoked and that we will be visiting the premises as soon as possible. The purpose of this is to make available a site engineer who will have sufficient knowledge of the site to provide assistance to the EHO and take any action as may be required e.g. shock dose the system.
- 3.25. Contact with the responsible person for the site is made to ensure the relevant information and/or person capable of taking any action are available. This can be via e-mail, if available and/or fax it should explain what we require following activation of our Incident protocol. The text should be agreed by the ICT as it may put some further Incident details in the public domain.
- 3.26. An essential part of the inspection process is the gathering of appropriate information in a format that the ICT can use. The completion of the London Boroughs Cooling Tower checklist (see Appendices) can act both as an aide-memoir and an effective record through which any anomalies and/or deficiencies in control measures can be communicated to the ICT.
- 3.27. The inspection procedure itself should be clear to all those involved and prior training is considered essential in this respect.
- 3.28. A prime purpose of a proactive inspection program is to help prevent incidents. Officers trained in the inspection procedures for such inspections should be able to complete a similar examination in an incident situation. The same inspection procedure is advocated; that is an examination of the management systems (and associated records) followed by a physical examination of the system to which sampling can be added.
- 3.29. Each of the inspecting officers should check the recent enforcement history of sites they are to visit. The person nominated to manage the Environmental Health response above will have a list of the premises to be inspected and should allocate these to the officers involved. They should keep a check on individual's progress during the day.
- 3.30. Officers should visit each site according to the priorities laid out.
- 3.31. In an Incident situation it is essential that inspecting officers have the requisite experience and competency to make informed decisions (quickly) about the status of the installations and the risk they present. Officers who have been involved in the inspection of cooling towers for at least six months (in the last two years) and who are authorized to serve improvement and prohibition notices (within the meaning of their Borough Enforcement Policy) should meet this criteria.
- 3.32. Other experienced and competent officers from across London may need to be seconded for other duties including water sampling and the collection of other epidemiological data. Boroughs will consider requests from the ICT and are encouraged to release officers if demands on their own services allow.
- 3.33. The inspection is done in two parts, as with all general inspections. The first part is an examination of the procedures the site has to identify, control and manage Legionella risk. This should be verified with a check on the available documentation.

3.34. NO PHYSICAL INSPECTION SHOULD TAKE PLACE UNTIL THE DOCUMENTARY PROCEDURES HAVE BEEN CHECKED AND VERIFIED AND THE WATER IN THE DEVICE HAS SETTLED TO THE POINT WHERE AEROSOLS ARE UNLIKELY.

- 3.35. This normally takes about 20-30 minutes and the device can be switched off whilst you conduct the first part of the inspection. In an Incident situation arguments concerning not being able to turn the cooling towers off because of operational concerns should not be entertained. There is a demonstrable public health need in assessing problems which must override inconvenience (even major inconvenience).
- 3.36. Further sampling procedure should be discussed as results of the inspection programme and other information are received. This should be agreed by the Incident Control Team, all sampling should be carried out with reference to Environment Agency guidance -

3.37. The inspecting officer should consider what additional measures may be required to control immediate risks. If in doubt, refer to the officer in charge of managing the Environmental Health response before initiating any further action.

Closure of the investigation

3.38. Upon completion of the investigation the HPA and LA/HSE will review all the available evidence and at an appropriate time close the investigation, and where appropriate document and share any lessons learned.

3.39. The public health investigation may be completed before any criminal investigation has been concluded. Care will need to be exercised when sharing lessons learned, so as not to prejudice future legal proceedings. It may be necessary to convene an independent panel, made up of personnel not involved in the criminal investigation to review and report on the investigation.

Section 4 - Environmental sampling

4.1 Environmental sampling for Legionella may be considered when investigating single cases, clusters and almost always with outbreaks of legionellosis. Environmental sampling can be used to:

- Assist with the identification of potential sources of Legionella
- Compare results with clinical samples
- Assess the effectiveness of any remedial action

4.2 However, careful consideration of the need for sampling is required before any sampling programme is instigated. The investigation and intelligence may be sufficient alone to identify the source. It is critical once the potential source has been identified to establish the efficacy of the risk management processes used within the premises / environment. Sampling to provide microbiological evidence is not required to support enforcement action under the Health and Safety at Work legislation. It may however, be required if there is consideration of litigation for corporate manslaughter.

4.3 Environmental sampling is recommended in outbreaks and personnel taking the samples are appropriately trained and equipped. Environmental samples may be required from one or more locations, such as domestic dwelling (usually undertaken by a trained Local Authority Officer) or commercial sites, as well as from different water based systems within these premises. Guidance is available to assist samplers and those preparing a sampling strategy^{[1][6][8][9]}. Guidance on sampling for Legionella at a domestic premises:

http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1195733811324 [Last accessed 7th September 2011]

Environment Agency guide on Legionella sampling:

http://www.environment-agency.gov.uk/static/documents/Research/book_200_1028650.pdf [Last accessed 7th September 2011]

4.4 In the event of a large incident or outbreak, HPA Food, Water and Environmental Laboratory HPA can provide support to Local Authority Officer. However, HPA staff do not have specific legal power to enter premises for the purpose of taking environmental samples and therefore rely on the co-operation of authorised officers from the local authority. If samples are required from premises located in different geographical areas it may be necessary to enlist the support and co-operation of a number of local authorities. This may also result in sampling equipment being collected and samples being analysed by more than one laboratory. This might take some time to arrange and co-ordinate and should be factored into any investigation.

- A risk assessment needs to be undertaken before any appropriately trained, experienced and equipped staff should undertake sampling. In some circumstances it may be appropriate for local authority staff that are suitably trained to take the samples. In other circumstances (e.g. if the water system is particularly complex) it will be more appropriate for the HPA or a contracted agency to provide trained samplers. The LA Environmental Health managers/senior officers will take this decision and arrange for the necessary sampling to be undertaken. Contractors would need to be authorised for entry and competency.
- LA officers are authorised under The Environmental Protection Act 1990 to enter premises to determine if there is a statutory nuisance and may take samples for this purpose
- While the HSE will co-operate with sampling, HSE inspectors are instructed not to undertake sampling for Legionella and HSE do not require such sampling as necessary for enforcement action. However, if samples are obtained, HSE will be interested in the results. There is therefore no need for HSE to authorise LA officers to accompany them to take samples. It would be anticipated that Local Authorities would make a joint visit with the HSE to ensure consistency and avoidance of duplication or mixed messages.

4.5 The sampler (local authority or contractor) should obtain samples only after an appropriate sampling strategy has been agreed with the HPA Food, Water and Environmental Laboratory (FW&E) in London. A sampling strategy should consider:

- What plant or equipment is to be sampled
- What type of samples are required
- The number of samples to be processed (to be kept under review)
- In which UKAS accredited laboratory/laboratories will samples be analysed
- How will samples be collected and transported
- When will the laboratory/ laboratories receive them (date and time)
- The contact person for receipt of laboratory reports.
- Collect temperature information from each sampling point.

4.6 The samples must be labelled by site of origin and with the date and time taken. In all medico-legal cases consideration has to be given to maintaining the 'chain of evidence'. This is a legal concept, which requires that the history and origin of any exhibit presented in a court of law must be clearly shown to have followed an unbroken chain from its source to court.

Section 5 - Legionella within the Environment

- 5.1 Technical advice on the control of Legionella in water systems and spa pools is available ^{[6][7]} which provides guidance on the action to be taken if Legionella is found in a water system. NHS Estates have produced very clear guidance for healthcare premises on the monitoring and control of Legionella ^[5].
- 5.2 HPUs may be contacted and asked to advise on the public health risk. The action to be taken depends on a number of factors, which include the level or the count identified in the water system, the proportion of the samples taken which are Legionella positive and whether people are exposed to a colonised water supply.
- 5.3 Specialist advice can be sought from regional and national teams within the HPA, which include the Food, Water & Environmental Microbiology Laboratory Colindale, and the Biological Agents Unit of the HSE, Bootle.

Section 6 - Technical advice

- 6.1. Further technical guidance on management and control of Legionella can be found in the references. Spa pools are also high-risk water systems and have been associated with outbreaks. Further information and guidance on spa pools can be found on: http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1200471665170 [Last accessed 7th September 2011]
- 6.2. Other specialist technical advice is also available from the HPA Food Water & Environmental Microbiology Laboratory, Colindale and the Biological Agents Unit of the HSE.
- Sampling and investigating Water systems: <http://www.hse.gov.uk/pubns/web23.pdf> [Last accessed 7th September 2011]
 - Code of practice for the Control of Legionella in water systems: http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1263812807228 [Last accessed 7th September 2011]
 - Control of Legionella in wet cooling systems <http://www.hse.gov.uk/pubns/web23.pdf> [Last accessed 7th September 2011]

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11. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 <http://books.hse.gov.uk/hse/public/saleproduct.jsf?catalogueCode=9780717662906> [Last accessed 7th September 2011]
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15. National Standard Method. Investigation of Specimens for Legionella species. BSOP47. Issued by Standards Unit, Evaluations and Standards Laboratory Specialist and Reference Microbiology Division.
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<http://www.hpa.org.uk/cdph/issues/CDPHvol5/No2/guidelines1.pdf> [Last accessed 7th September 2011]
17. Health and Safety at Work etc. Act 1974 - <http://www.hse.gov.uk/legislation/hswa.htm> [Last accessed 7th September 2011]
18. Environmental Protection Act 1990
http://www.opsi.gov.uk/ACTS/acts1990/Ukpga_19900043_en_4.htm [Last accessed 7th September 2011]
19. Construction Design and Management Regulations 1994 and Revised 2007
<http://hse.gov.uk/construction/cdm.htm> [Last accessed 7th September 2011]
20. European Guidelines for Control and Prevention of Travel Associated Legionnaires' Disease
http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1274093149925 [Last accessed 7th September 2011]
21. Guidance on the Control and Prevention of Legionnaires' Disease in England Technical Paper 1 - Disease Surveillance http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1279889007321 [Last accessed 7th September 2011]
22. Health and Safety Executive/Local Authorities Enforcement Liaison Committee (HELA). Investigation of outbreaks (and single cases) of legionellosis from water systems incorporating cooling towers and evaporative condensers http://www.hse.gov.uk/foi/internalops/fod/oc/200-299/255_12.pdf [Last accessed 7th September 2011]
23. British Standard risk assessments for Legionella control - BS8580:2010 Water quality - Risk assessments for Legionella control - Code of Practice.
24. Health Protection Legislation (England) Guidance 2010
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_114510 [Last accessed 7th September 2011]
25. Health Protection Agency: London Infectious Disease Outbreak Management Plan V 3.5. June 2011.

Appendix A – Key Contact List (Supplied by the HSE)

LONDON UNITARY AUTHORITIES

London Legionella Contact Details 2011-12

London Borough	Lead	Contact Number	General Contact No.
LB Barking/Dagenham Civic Centre Rainham Rd North Dagenham Essex RM10 7BN	Hope Robinson	020 8227 5708 hope.robinson@lbbd.gov.uk Frances Kelly. 020 82275598 frances.kelly@lbbd.gov.uk	020 8215 3000 FHSTeam@lbbd.gov.uk
LB Barnet North London Business Park Oakleigh Rd South London N11 1NP	Chris Carabine Group Manager	0208 359 7407 chris.carabine@barnet.gov.uk Nilesh Lad, 0208 359 7419 Nilesh.Lad@barnet.gov.uk	0208 359 7995, HealthAndSafety@barnet.gov.uk
LB Bexley 2a Hadlow Road Sidcup Kent DA14 4AF	Bob Ryan	Tel: 0203 045 5658 robert.ryan@bexley.gov.uk Pam Trent 0203 045 5636 pam.trent@bexley.gov.uk (They cover the hours between them)	0203 045 5627 health.safety@bexley.gov.uk
LB Brent Environmental Health Brent House 349-357 High Road Wembley Middx HA9 6BZ	Andreas Kirschner Enforcement Officer	Tel: 020 8937 5174 andreas.kirschner@brent.gov.uk Shamsul Islam, Team manager Tel: 020 8937 5259; Email: Shamsul.islam@brent.gov.uk	020 8937 5362 hsl@brent.gov.uk Tel: 020 8937 5252 env.health@brent.gov.uk
LB Bromley Civic Centre Stockwell Close Bromley Kent BR1 3UH	Rob Clark	Tel 020 8461 7906 rob.clark@bromley.gov.uk	020 8 313 4218 Health.safety@bromley.gov.uk
LB Camden Seventh Floor Town Hall Extension Argyle Street WC1H 8EQ	Winston Labarr Angela Kypriotis	020 7974 6369 Winston.labarr@camden.gov.uk 020 7974 2799 Angela.kypriotis@camden.gov.uk	020 7974 4444 ppp@camden.gov.uk
City of London PO Box 270 Guildhall London EC2P 2EJ	Rachel Sambells Senior Environmental Health Officer	020 7332 3313 Rachel.sambells@cityoflondon.gov.uk	020 7332 3630 ES- GeneralEnquiries@cityoflondon.gov.uk
LB Croydon Community services Department 9th Floor (North) Taberner House Park Lane Croydon	Samy Counder	020 8726 6000 ext 64969 samy.counder@croydon.gov.uk	020 8760 5436 health.safety@croydon.gov.uk

CR9 3BT			
LB Ealing 4 th Floor Perceval House 14-16 Uxbridge Rd Ealing	Richard McHardy Service Manager	0208 825 7224 mchardyr@ealing.gov.uk	0208 825 6666 foodsafety@ealing.gov.uk
LB Enfield Civic Centre Silver Street Enfield Middlesex EN1 3EF	Philip Bray Principal EHO	020 8379 3655 philip.bray@enfield.gov.uk	020 8379 1767 (office hours) environmental.health@enfield.gov.uk 020 8379 1000 (out of hours)
RB Greenwich Town Hall 39 Wellington St London SE18 6PW	Mike Strong Team Manager	0208 921 8184 mike.strong@greenwich.gov.uk	020 8921 8186 health@greenwich.gov.uk 020 8921 4449 Greenwich Emergency Control (Mike Strong)
LB Hackney Town Hall Mare St London E8 1EA	Aleyne Fontenelle EH Manager	020 8356 4918 aleyne.fontenelle@hackney.gov.uk	020 8356 8438 environmentdivisionalsupport@hackney.gov.uk
LB Hammersmith/Fulham Town Hall Extension King Street London W6 9JU	Graham Souster	020 8753 3963 graham.souster@lbhf.gov.uk	020 8 753 1081 commercialservices@lbhf.gov.uk ask for duty officer of Commercial Services team
LB Haringey Civic Centre High Road Wood Green London E8 1EA	Charley Osinaike	Charley.osinaike@haringey.gov.uk 0208 489 5569	0208 489 5518 enforcement@haringey.gov.uk
LB Harrow Civic Center Box 18 Harrow HA1 2UT	Richard Le-Brun Team Leader	(Commercial)020 8736 6267 richard.lebrun@harrow.gov.uk	020 8901 2600 (general contact point) Commercial Safety Team ehealth@harrow.gov.uk
LB Havering Mercury House Mercury Gardens Romford Essex RM1 3SL	Lorraine Moore	01708 432555 Lorraine.moore@havering.gov.uk	01708 433777 daytime 01708 433999 out of hours Environmental.health@havering.gov.uk
LB Hillingdon <u>Heathrow Airport only</u> Civic Centre High Street Uxbridge Middlesex UB8 1UW	Miss Shui Tsoi (PEHO) Gheorghe Nafornita	020 8897 6900, stsoi@hillington.gov.uk Mr Shabeg Nagra Airport Services Manager), snagra@hillington.gov.uk 01895 277399 Mobile 07946675848 gnafornta@hillington.gov.uk Oliver Darius Team Manager 01895 277475 odarius@hillington.gov.uk	Team 01895 250190 Food Health and Safety

LB Hounslow Civic Centre Box 18 Harrow HA1 2UT	William Opere Team Leader	020-8583-5043 william.opere@hounslow.gov.uk Anthony Kasapi 020-8583-5035 anthony.kasapi@hounslow.gov.uk	020-8583-5555.
LB Islington Public Protection 222 Upper Street N1 1XR	Penny Britton Principal EHO	020 7527 7093 penny.britton@islington.gov.uk Jennifer Corr 0207 527 7094 Jennifer.Corr@islington.gov.uk	0207 527 3816 commercial.envh@islington.gov.uk
RB Kensington/Chelsea The Town Hall Hornton Street W8 7NX	Andrew Willis Health & Safety and Trading Standards Team Manager	02073415771 andrew.willis@rbkc.gov.uk	020 7361 3002 environmentalhealth@rbkc.gov.uk
RB Kingston upon Thames Guildhall 2 High Street Kingston upon Thames KT1 1EU	Theresa Fidge , Environmental Health Officer	0208 547 5542, email theresa.fidge@rbk.kingston.gov.uk (works Mon, Weds, Thurs) Helga Jackson Team Leader 020 8547 5539 helga.jackson@rbk.kingston.gov.uk	0208 547 5002 ehadmin@rbk.kingston.gov.uk Out of hours -0208 547 5800 (Agency - emphasise the significance of the contact)
LB Lambeth 5 th Floor Blue Star House 234-244 Stockwell Road London SW9 9SP	Mina Mistry Health and Safety Enforcement Manager	020 7906 6180 MMistry@lambeth.gov.uk	0207 926 6109 healthandsafety@lambeth.gov.uk Out of hours it is 0207 926 9999
LB Lewisham Lewisham Town Hall Rushey Green London SE6 4RU	Peter Adams Manager	020 8314 2069 peter.adams@lewisham.gov.uk	020 8314 6000
LB Merton Civic Centre London Road Morden Surrey SM4 5DX	Andrew Bradley Environmental Health (Commercial) Manager	Wk 020 8545 3947 Mob 0795 6658860 andrew.bradley@merton.gov.uk	020 8545 3024 EHCommercial@merton.gov.uk
LB Newham Newham Dockside 1000 Dockside Road London E16 2QU	Linsey Muchene Public Protection Officer	020 3373 7604 m 07891 436514 linsey.muchene@newham.gov.uk	020 8430 2000 pphealthsafety@newham.gov.uk
LB Redbridge The Town Hall 128-142 High Road Ilford Essex IG1 1LX	Bob Sorrell Food and Safety Manager	020 8708 5870 Bob.Sorrell@redbridge.gov.uk	020 8708 5420 Team Healthandsafety@redbridge.gov.uk
LB Richmond Environment Directorate	Paul Greenop	020 8891 7435 p.greenop@richmond.gov.uk	020 8891 7994 commercialeh@richmond.gov.uk

Civic Centre Twickenham TW1 3BZ			
LB Sutton Civic Offices St Nicholas Way Sutton Surrey SM1 1EA	Kate Nicholls Principal EHP	020 8770 5588 kate.nicholls@sutton.gov.uk Jenny Winslet, Principal EHO 020 8770 5594 jenny.winslet@sutton.gov.uk	020 8770 5070 brs@sutton.gov.uk
LB Southwark Chaplin Centre Thurlow Street London SE17 2DG	Mr Sailesh Chudasama Team Leader	020 7525 5818 sailsh.chudasama@southwark.gov.uk	020 7525 5748 ohs@southwark.gov.uk
LB Tower Hamlets Anchorage House Mulberry Place 5 Clove Crescent E14 1BY	David Tolley Environmental Services Commercial Service Manager	020 7364 6724 david.tolley@towerhamlets.gov.uk	0207 364 5008 healthandsafety@towerhamlets.gov.uk
LB Waltham Forest Sycamore House Town Hall Complex Forest Road E17 4SU	Harry Quinton EHO	0208 496 2203 harry.quinton@walthamforest.gov.uk	0208 496 2249 pip.broad@walthamforest.gov.uk
LB Wandsworth The Town Hall Wandsworth High St London SW18 2PU	Angela Moon	Telephone 020 8871 6941, email amoon@wandsworth.gov.uk	020 8871 6160 licensing@wandsworth.gov.uk
Westminster 5 th Floor, City Hall 64 Victoria St SW1E 6QP	Peter Firth EHEO	020 7641 2818 pfirth@westminster.gov.uk	020 7641 1063
Trim 2011/169584			

Appendix B - Legislation relevant to Legionella control and the powers of officers

1. Health and Safety at Work etc. Act 1974

The most appropriate legislation to use to deal quickly with a source of Legionnaires' disease is the Health and Safety at Work etc. Act 1974; this enables inspectors appointed under the Act to take all the necessary steps immediately to compel an occupier to clean and disinfect plant which is not being maintained to the standard required by the Approved Code of Practice and to prosecute if appropriate.

"According to the officer's appointment and authorisation he or she may, subject to certain criteria:

1. Enter appropriate premises at any reasonable time to carry out duties under the Act and associated statutory provisions
2. Take a police constable
3. Take another appropriately authorised person
4. Take equipment and materials
5. Carry out appropriate examinations and investigations
6. Direct that premises or part of them are not disturbed
7. Take measurements and photographs
8. Take samples of articles or substances
9. Subject any article or substance to test
10. Take possession and detain any article or substance
11. Expect truthful answers to questions
12. Require production and, if appropriate, copies of records
13. Require provision of facilities and assistance

All HSE inspectors possess the above powers."

The duties in sections 2(1) and 3(1) extend to risks from Legionella. Employers and self-employed people are under a duty to conduct their undertaking so far as is reasonably practicable to protect the Health and Safety of people who may be affected by their undertaking (business) (sect2(1) & sect3(1)).

When considering "reasonably practicable", precautions should be considered proportionate to the possible health impacts and risks. As these are significant, costly preventative measures are justified.

2. Environmental Protection Act 1990

The Environmental Protection Act allows properly authorised persons from the LA to enter premises, regardless of Health and Safety responsibilities, to investigate whether the premises are either prejudicial to health or a nuisance.

In those circumstances any remedial work could only be undertaken by following a cumbersome notice procedure but this process does have the advantage of the LA being able to carry out work in default and recover costs.

"Section 79(1)(a) defines 'any premises in such a state as to be prejudicial to health or a nuisance' as a 'statutory nuisance'. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or recur, an abatement notice may be served under Section 80(1). A 21-day appeal period to magistrates' court is allowed, although in the case of an outbreak of Legionnaires' disease it is possible that the notice may not be suspended pending the appeal. The powers of officers are set out in Schedule 3 of the Act. These include entry into non-residential premises at any reasonable time:

- To ascertain whether or not a statutory nuisance exists or to execute works
- To take other persons and equipment as may be necessary

To carry out inspections, measurements and tests as considered necessary to discharge responsibilities under Part III of the Act. For example, to establish the existence of a statutory nuisance prior to service of an abatement notice

To take away any samples or articles considered necessary for that purpose”

Entry into residential properties would require a warrant issued by magistrates:

3. Management of Health and Safety at Work Regulations 1999.

These regulations require all employers and self-employed to carry out risk assessments. Where 5 or more people are employed all significant risks are to be recorded.

The risk assessments should extend to the management and operation of susceptible services (air conditioning units, cooling towers, water systems etc).

4. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995. (RIDDOR).

Cases of Legionnaire's disease are reportable under RIDDOR if a doctor notifies the employer and if the employee's work involves work relevant water systems.

5. Notification of Cooling Towers and evaporative Condensers Regulations 1992.

http://www.opsi.gov.uk/SI/si1992/Uksi_19922225_en_1.htm [Last accessed 7th September 2011]

The Local Authority must be notified of relevant plant.

6. Health Protection (Notification) Regulations 2010

Legionnaires' disease became a notifiable disease on 6 April 2010 in England. There is now a duty upon registered medical practitioners to notify the proper officer of the relevant local authority of any suspected cases of Legionnaires' disease. The notification must be provided in writing within three days from the date of suspicion. From 1 October 2010 the operator of a diagnostic laboratory must notify the Health Protection Agency when legionella species are identified in a human sample.

7. Public Health (Control of Disease) Act 1984

There are measures contained in the Public Health (Control of Disease) Act 1984 (as amended) together with the Health Protection (Local Authority Powers) Regulations 2010 and the Health Protection (Part 2A Orders) Regulations 2010.

Powers that impose restrictions or requirements are conditional on strict criteria being met. Before making use of one of these powers, the local authority or JP must be satisfied that the criteria relating to a particular threat to health are met. The criteria cover evidence of infection or contamination, assessment of the potential for significant harm to human health, risk of spread to others and necessity for action to be taken in order to reduce or remove that risk.

Local authority powers

These powers enable a local authority to request or require action to be taken to prevent, protect against or control a significant risk to human health. They allow local authorities to:

- disinfect/decontaminate premises or articles on request;
- request (but not require) individuals or groups to co-operate for health protection purposes

Part 2A Orders

In other circumstances, a local authority can apply to a JP for an order that imposes restrictions or requirements on a person(s) or in relation to a thing(s), a body or human remains, or premises. Provided the JP is satisfied that relevant criteria are met, an order can be made for the purposes of protecting against infection or contamination that presents, or could present, significant harm to human health. There are safeguards to protect the interests of individuals who may be the subject of an application for an order.

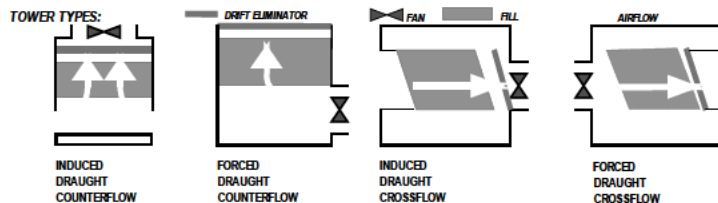
In addition, a JP can make a Part 2A Order requiring that:

- **a thing(s)** is seized or retained; kept in isolation or quarantine; disinfected or decontaminated; or destroyed or disposed of;
- **premises** are closed; premises are disinfected or decontaminated; a conveyance or movable structure is detained, or a building, conveyance or structure is destroyed.

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_114510 [Last accessed 7th September 2011]

Appendix C - London Boroughs COOLING TOWER INSPECTION FORM

Notification and summary data		Yes	No
1.	Is the device notified? If yes are the details on the notification still correct? If no further action is required Note 1: Under the Notification of Cooling Towers and Evaporative Condensers Regulations we must be notified in writing with details of where it is based. If it is taken out of use they also need to tell us.		
Responsible Person: Tel No's:		Position: Company:	
Contact 1: (Specify: FM, Managing Agent, M&E, Water Treatment, Auditor, Risk Assessor). Name: Tel No's:		Position: Company:	
Contact 2: (Specify: FM, Managing Agent, M&E, Water Treatment, Auditor, Risk Assessor). Name: Tel No's:		Position: Company:	
Contact 3: (Specify: FM, Managing Agent, M&E, Water Treatment, Auditor, Risk Assessor). Name: Tel No's:		Position: Company:	
<u>System Summary:</u> Number of towers: Age: Location: Tower Type*: Open Circuit/ with heat exchanger/Closed Circuit/ (True) Evaporative Condenser *Circle type and indicate configuration using the diagrams below. Period(s) of Operation*: <u>Continuous</u> ; 7 day. <u>Timed</u> ; Working week/Week Days. <u>Seasonal</u> ; <u>Intermittent</u> ; <u>Standby</u> Comments: * Delete as appropriate			
Treatment type¹: Dosing system: Bleed Control: Softened water::	Bromine/ Bio-dispersant/ Non-oxidising biocide/ ClO ₂ / Ozone/ UV <u>Automatic</u> : Type: (Feedback i.e. Redox type)/ (Proportional)/ (Timed)/ <u>Manual</u> : Conductivity/ Proportional/ Continuous/ Timer/ Manual Yes/ No/ Blended		



¹ See WMS Code of Practice, Section 6- Techniques for Control of Concentration and Chemical Treatment

Checklist 1: The Risk Assessment				
		Yes	No	Comments- Further action required
Has a risk assessment been completed for the prevention and control of Legionella bacteria				
1.	Did the assessment consider whether the risk could be prevented i.e. eliminated? Note 1: <i>The primary duty under the Control of Substances Hazardous to Health Regulations is to prevent the risks from exposure. This can be done by considering the type of water system needed and a wet cooling system may not be required.</i>			
2.	Did the person carrying out the assessment have access to competent help and advice when carrying out the assessment?			
3.	If there are more than five employees in the organisation, are the significant findings of the assessment recorded?			
4.	Were employees consulted about the assessment and the control measures?			
5.	Does the assessment identify the circumstances which would require a review? Note 2: <i>The assessment should be reviewed regularly -at least every two years, and whenever it is suspected it is no longer valid, for example if there is a significant change to the system.</i>			

Managing the risks: Roles and responsibilities				
		Yes	No	Comments- Further action required
6.	Has a 'responsible person' been identified in writing? Note 3: <i>If risks have been identified, there needs to be someone to take charge of managing the control regime.</i>			
7.	Is there a nominated deputy?			
8.	Are contact details for these people readily available (in the event of an emergency)?			
9.	Are the roles and responsibilities of all the staff involved in the control regime clearly defined in writing?			
10.	Have they all received appropriate training?			
11.	If external contractors are used, are their roles and responsibilities clearly defined in writing? Note 4: <i>The demarcation between contractor and occupier needs to be defined i.e. who does what. But remember that using contractors does not absolve the duty holder of the responsibility for ensuring that the control regime is carried out</i>			
12.	Have they checked the competence of contractors? Note 5: <i>For example, you should ask about experience and qualifications, how their staff are trained and whether they are a member of a professional organisation such as the Water Management Society or the British Association for Chemical Specialities (see also 13. below)</i>			
13.	Are the water treatment company and any auditors/risk assessors members of the Legionella Control Association? Note 5a: <i>By signing the Code of Conduct for Service Providers LCA members are committing themselves to an agreed service standard, see http://www.conduct.org.uk/commitment.htm</i>			

Checklist 2: Cooling towers				
Managing the risks: The written scheme				
		Yes	No	Comments- Further action required
2.	<p>Is there a written scheme for controlling the risk from exposure to legionella bacteria?</p> <p>Note 2: <i>If the assessment has shown that there is a reasonably foreseeable risk of exposure to Legionella bacteria, there needs to be a written scheme in place to control that risk</i></p>			
3.	Does the scheme contain an up-to-date plan of the system (a schematic plan is OK)?			
4.	<p>Does the plan show:</p> <ul style="list-style-type: none"> <input type="checkbox"/> All the cooling towers? <input type="checkbox"/> All system control valves? <input type="checkbox"/> All standby equipment, e.g. spare pumps? <input type="checkbox"/> The locations of system bleed valves? <input type="checkbox"/> All associated storage tanks? <input type="checkbox"/> All associated pipework? <input type="checkbox"/> The location of chemical dosing points and/or injection points? <input type="checkbox"/> The location of the system drain valve? <input type="checkbox"/> The origin of the water supply? <input type="checkbox"/> Any parts that may be temporarily out of use? 			
5.	Does the scheme contain instructions for operating the system (see Q17-21)?			
6.	Does the scheme contain details of the precautions to be taken to control the risk of exposure to legionella bacteria (see Q22-26)?			
7.	Does the scheme contain details of the checks that are to be carried out (and their frequency) to ensure that the scheme is effective (see Q27-38)?			

Cooling systems: Design and construction				
		Yes	No	Comments- Further action required
8.	<p>If a new tower is being installed has the duty holder considered its position in relation to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Air conditioning and ventilation inlets? <input type="checkbox"/> Opening windows? <input type="checkbox"/> Occupied areas (for example consider the population density and the proximity of those who may be more vulnerable to infection, for example in hospitals)? <p>Note 3: Remember that they have a duty to protect those who may be affected by the risks created by their tower(s). Question 1 in Checklist 1 must also have been properly considered.</p>			
9.	<p>Is the tower constructed from impervious materials?</p> <p>Note 4: Preserved timber can be used but it must be impervious and easy to clean and disinfect.</p>			
10.	Are drift eliminators fitted?			
11.	<p>Are they:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fitted correctly? <input type="checkbox"/> Effective? i.e. High efficiency <p>Note 5: Drift eliminators do not eliminate drift but they do reduce it. The site should use those which control the release of small water droplets. Wooden slats don't do this and must be replaced. See L8 para. 81 (a)</p>			
12.	Is the area above the pond as enclosed as possible?			
13.	<p>Are all visible surfaces free from:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Slime <input type="checkbox"/> Scale <input type="checkbox"/> Corrosion 			
14.	Does the water flow evenly across the fill pack or other surfaces?			
15.	<p>Have all the following been removed as far as possible:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Dead legs/blind ends? <input type="checkbox"/> Redundant pipework? <input type="checkbox"/> Redundant plant? 			
16.	Are those parts of the tower that become wet, accessible and/or removable for cleaning?			

Cooling systems (continued): Operation and maintenance				
		Yes	No	Comments- Further action required
17.	Is the system in regular operation (if no, see Q20-21)?			
18.	Are there procedures in place to operate standby equipment on a rotational basis?			
19.	Is there an Operations Manual for the cooling system?			
Non-regular use				
20.	If the tower is used intermittently or is required at short notice, is it run at least once a week, so that water treatment chemicals are circulated to all parts of the system?			
21.	If the tower is out of use for longer than a week, are there procedures in place to bring the tower back into operation safely?			
Water treatment programme				
22.	Is there a water treatment programme in place?			
23.	Are chemicals/biocides used to control: <input type="checkbox"/> Scale? <input type="checkbox"/> Corrosion? <input type="checkbox"/> Fouling? <input type="checkbox"/> Microbiological activity?			If no list methods used.
24.	If non-oxidising biocides are used, are two used alternately?			
25.	Are chemicals dosed automatically?			
26.	If yes to Q25, are the pumps calibrated regularly? Note 5: <i>Although there is no requirement for automatic dosing, you should consider issues associated with manual dosing -the health and safety risks, for example manual handling and exposure to chemicals, to staff who carry out manual dosing, as well as the management of the process to make sure the frequency and rate of application are maintained.</i>			

Monitoring				
		Yes	No	Comments- Further action required
27.	Is there a daily check to make sure that the system is operating as described in the operations manual?			
28.	Is there a daily visual check of the cleanliness of the water in the system?			
29.	Is the physical condition of the system checked at least every week?			
30.	Is the chemical composition of the cooling and make-up water monitored on a regular basis? Note 6: <i>A number of different parameters are given in Table 1 of the ACOP and guidance.' You should be clear what parameters they need to measure and what they are telling you about the operation of the tower. Usual parameters that are monitored include hardness (calcium, magnesium and total hardness), conductivity and the concentration factor.</i>			
31.	Are the safe operating limits for each parameter which is being measured, known and recorded in the operating manual?			
32.	Is the corrective action for out of limit situations known and included in the operations manual?			
33.	Are results of all tests and checks recorded, together with details of any remedial action taken (if required)?			
34.	Are dip slides taken on at least a weekly basis?			
35.	Are slides incubated in an incubator (at 30°C for 48 hours)?			
36.	Are results recorded, so trends over time can be seen?			
37.	Are samples for legionella taken on at least a quarterly basis?			
38.	Have the circumstances when more frequent sampling may be required been identified and recorded?			

Cleaning and disinfection				
		Yes	No	Comments- Further action required
39.	Is there a written procedure for regular cleaning and disinfection of the system?			
40.	Does this take place at least every six months (if not, see Q43)?			
41.	Does the cleaning and disinfection procedure include: <input type="checkbox"/> Initial concentration of oxidising biocide in use for the pre- and post-cleaning disinfection stages? <input type="checkbox"/> Contact time for each disinfection stage? <input type="checkbox"/> Methods for carrying out cleaning, including (where applicable) the removal of packing?			
42.	If packs are present and cannot be removed, are there alternative methods of making sure they remain clean in place? (list methods)			
43.	If the system is not shut down for disinfection and cleaning every six months, list reasons and alternative measures taken to ensure the cleanliness of the system			
44.	Are measures taken to protect staff when carrying out cleaning of the tower -list precautions below?			

Operational health and safety

Aside from Legionella proliferation cooling tower operations can entail other potentially significant risks. The design and layout of some buildings, cooling tower plant and associated equipment can create or contribute to these risks For cooling towers consider the following:

- Is an assessment required of the risk(s)?
- Has such an assessment been completed?
- Is the assessment appropriate?
- Are the appropriate risk control measures in place?

Evaluation can be done using the topic inspection assessment and scoring sheets but examples of risks pertinent to cooling towers are also given below:

MSD	Yes	No	Comments- Further action required
45. <input type="checkbox"/> Maintenance and cleaning operations such as the removal of drift eliminators and where applicable packing occurs in sometimes awkward work positions because of site and plant layout and configuration. Is this an issue? <input type="checkbox"/> Handling of chemicals can involve manual handling on staircases and up ladders depending on the site of the dosing system (drums can be > 25 litres). Is this an issue? <input type="checkbox"/> Handling of salt bags (for water softeners, these can be 25kg). As for the chemical drums there could be extensive manual handling involved in potentially awkward environments. Is this an issue?			
Falls from height	Yes	No	Comments- Further action required
46. <input type="checkbox"/> Safe access for cleaning, maintenance and inspection is required (the frequency is determined by the risk assessment which should consider the type and frequency of access that is required and the hierarchy of control measures). Personnel need to be adequately protected whilst performing such tasks. Is this an issue? <input type="checkbox"/> Is gantry access required and provided? <input type="checkbox"/> Are appropriate access ladders installed, if > 2m are they protected? <input type="checkbox"/> Is roof edge protection required and provided?			

General	Yes	No	Comments- Further action required
47. <ul style="list-style-type: none"> <input type="checkbox"/> Are there emergency procedures in place to cover communication, evacuation and accidents and incidents? <input type="checkbox"/> Is there sufficient space to perform the cleaning and maintenance tasks that are required? <input type="checkbox"/> Is a permit to work required for access to the building and plant rooms? <input type="checkbox"/> Is lighting in plant rooms and on roof areas appropriate? <input type="checkbox"/> Are there procedures in place to cover lone working? <input type="checkbox"/> 			