

Cessnock City Council Legionella Management Plan

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1. Introduction

1.1 Background

Legionnaires' disease is an infection of the lungs caused by bacteria of the *Legionella* family. It is an acute form of pneumonia which can cause significant illness; most people recover but the disease is occasionally fatal. The elderly and immunocompromised are at particular risk.

Infection occurs when a person breathes in bacteria that are commonly found in the environment. Both cooling water and warm water systems have been associated with Legionella bacteria.

Cooling water systems are devices that lower the temperature of water by evaporative cooling. Water is cooled in one or more cooling towers and delivered to an interface with air-handling system, allowing the water to cool the air. The air handling system then delivers cold air towards, and hot air away from, the building interior.

A warm water system is a reticulated water system that distributes or recirculates warm water through the majority of its branches at a nominal temperature of 45°C by means of a temperature controlling device.

Preventative measures focus on minimising the risk of the growth of Legionella (especially *L. pneumophila*) in cooling towers and warm water sources through management of the environments in which Legionella are likely to proliferate. Management processes include maintenance, water quality and education of building operators and compliance with relevant legislation, national standards and codes of practice.

2. Objectives, Aims and Scope

2.1 Objectives

In partnership with NSW Health, Council aims to minimise the risks associated with regulated systems, through enforcement and education.

This Legionella Management Plan applies to all buildings utilising cooling water systems and hospitals and nursing homes utilising warm water systems. Exemptions apply to dwellings.

2.2 Aims

The aims of the Legionella Management Plan are to ensure that:

- all water cooling and hospital warm water systems are registered in accordance with the Regulation;
- all water cooling and warm water systems comply with legislation in respect to installation, commissioning, operation and maintenance;
- building owners and occupiers are aware of their responsibilities and understand the requirements of the Act and Regulations;
- all water cooling systems are annually audited by an independent suitably qualified person; and
- all water cooling systems are sampled and tested monthly with Legionella count ≥ 1000 cfu/mL and heterotrophic colony count $\geq 5,000,000$ cfu/mL to be forwarded to Council.

2.3 Scope

This document will assist the following persons to ensure compliance with the regulatory requirements in order to minimise the potential for outbreaks of Legionnaires' disease:

- developers;

- architects;
- building owners and managers;
- council officers; and
- other stakeholders.

3. Legislation

The Public Health Act and Regulations define the roles, responsibilities and basis for managing cooling water systems and other regulated systems in NSW:

- Public Health Act 2010
- Public Health Regulation 2012
- Public Health Amendment (Legionella Control) Regulation 2018

NSW Public Health Regulation reference Australian/New Zealand Standard 3666:

- AS/NZS 3666.1: 2011 Air-handling and water systems of buildings—Microbial control—Design, installation and commissioning;
- AS/NZS 3666.2: 2011 Air-handling and water systems of buildings—Microbial control—Operation and maintenance; and
- AS/NZS 3666.3 2011 Air-handling and water systems of buildings—Microbial control—Performance-based maintenance of cooling water systems.

Under the Act, regulated systems include:

- air-handling systems;
- hot water systems;
- humidifying systems;
- warm water systems; and
- cooling water systems (including cooling towers).

All regulated systems are required to be equipped with an operating and maintenance manual. The manuals must include all details of inspections and servicing performed and are to be kept on site.

4. Warm Water Systems

Council is required to keep a register of warm water systems at public hospitals, declared mental health facilities, private health facilities and nursing homes within the Local Government Area. The Regulation requires the owner/occupiers to notify Council of the installation of a warm water system within 1 month of installation and any change in particulars (such as change in occupier) within 7 days. The NSW Health *Notification of Installation or Change in Particulars*, Approved Form 6, can be found at:

<http://www.health.nsw.gov.au/environment/legionellacontrol/Pages/legionella-protocols.aspx>

It is recommended that owner/occupiers of buildings with warm water systems reference the following document, *Water – Requirements for the Provision of Cold and Heated Water*. This document details requirements for the provision of cold and heated water to be observed by hospitals, as defined in the *Public Health Act 2010*, to manage the risk of Legionella (and to prevent scalding).

https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2015_008.pdf

5. Cooling Water Systems

The following documentation refers only to the management of cooling water systems and not the other regulated systems, as mentioned above.

The Regulation takes a risk management approach for cooling water systems under AS/NZS 3666 Part 3.

Six regulatory safeguards for cooling tower systems have been identified and in response to this, occupiers of premises that contains a water cooling system must now ensure:

- the development of a Risk Management Plan (RMP) for each premises;
- an annual independent audit is conducted in order to assess compliance to the RMP;
- certificate of RMP completion and audit completion lodged with Council;
- all water cooling systems undergo monthly testing for Legionella count and heterotrophic colony count;
- reportable test results of Legionella count ≥ 1000 cfu/mL and heterotrophic colony count $\geq 5,000,000$ cfu/mL are notified to the Council; and
- installation of a unique identification number on each cooling tower of a cooling tower system.

5.1 Roles and Responsibilities of Occupiers

The occupier is ultimately responsible for ensuring that the water cooling system/s on their premises are managed (installed, operated and maintained) in accordance with the Act and Regulation. They may engage a duly qualified person (DQP) to manage the system on a routine basis on their behalf, and a competent person to undertake a risk assessment on their behalf. The Regulation allows the occupier to carry out the role of both the DQP and competent person, if they meet the definition of those roles. However, the occupier cannot audit their own water cooling system.

The occupier must ensure for their water cooling system, that:

- a competent person undertakes a risk assessment every five years (or more frequently if required), with all identified risks and their control strategies documented in a Risk Management Plan;
- an independent auditor performs an audit of compliance every year;
- a DQP performs inspection, maintenance (including servicing), chemical analysis and laboratory testing for Legionella count and heterotrophic colony count (HCC) every month (see 'Note' below);
- Council is notified of reportable results for Legionella count ≥ 1000 cfu/mL and heterotrophic colony count $\geq 5,000,000$ cfu/mL;
- a certificate of RMP completion (every five years or more frequently if required) and certificate of audit completion (every year) is provided to Council;
- Council is notified of the installation of the system and any change in particulars, including decommissioning;
- a unique identification number is displayed on each cooling tower in their system; and
- required documents and information are readily available.

Note: Approved Form 3 at the following link has been developed to assist the person preparing the monthly report:

<http://www.health.nsw.gov.au/environment/legionellacontrol/Pages/legionella-protocols.aspx>

The monthly report form is used to demonstrate compliance to the independent auditor. The different sections of this form may need to be completed by different persons or organisations; however, the occupier is ultimately responsible for ensuring this form is completed every month, and provided to the auditor at the end of the 12 month audit period.

5.2 Risk Management Plan (RMP)

The purpose of the Risk Management Plan (RMP) is to apply and document best practices to effectively control the growth and transmission of Legionella bacteria while considering the risks that are unique to the water cooling system being assessed. It is an important safeguard in preventing Legionnaires' disease and the basis for managing water cooling systems in NSW.

A Risk Management Plan is designed to identify and control unique risk factors for Legionella in each water cooling system. Each water cooling system will be given a risk classification by Council based on the following categories:

- stagnant water;
- nutrient availability & growth;
- poor water quality;
- deficiencies in the cooling water system; and
- location and access to cooling towers.

The RMP document is an approved form under clause 13N of the Regulation. It must be provided to Council within 7 days of completion. Generally, a RMP should have a number of basic components, including:

- site and contact details;
- assessment of each of the critical risks;
- summary of the overall risk classification;
- details of the system (collected during the risk assessment process); and
- attachments or references to other documents, such as operational plans and shut-down procedures.

An RMP must be developed for every cooling tower system on the site. It must be made available to an authorised officer of Council upon request. There is no prescribed format for an RMP, however, NSW Health has developed a RMP template – see Approved Form 1 at <http://www.health.nsw.gov.au/environment/legionellacontrol/Pages/legionella-protocols.aspx>

RMPs are required to be reviewed up to every five years for low to medium-risk systems and every year for high-risk systems. Annual third party audits are also required to ensure the plan is appropriately implemented.

5.3 Annual Independent Audit

An independent third party audit of RMPs by a skilled and competent person improves compliance with implementation of the RMP

The role of the auditor is to:

- evaluate the adequacy of the RMP in meeting the requirements of AS/NZS 3666.3:2011;
- assess whether the RMP is properly implemented; and
- recommend changes to the RMP where necessary with reasonable justification.

An audit will involve a review of all relevant documents including:

- the RMP;

- all maintenance activities undertaken in relation to the system; this includes records of any services, cleans, inspections and repairs to the system;
- all microbiological test results of samples taken from the system; and
- all notices/orders/warning letters or other correspondence issued to the occupier.

The auditor must be independent of the occupier and the person employed to maintain the water cooling system on their behalf. The auditor must be a suitably qualified and accredited auditor by the Health Secretary.

The auditor must be satisfied that the risk factors outlined in AS/NZS 3666.3:2011 (including stagnant water, nutrient growth, poor water quality, deficiencies in the cooling tower system, location and access to cooling towers) have been considered and addressed as required, based on the risk assessment and that the RMP is being implemented through review of maintenance logbooks and other documents referred to in the RMP.

If the auditor believes that the RMP has not been implemented or complied with they must notify Council who can assess whether regulatory action is required.

Occupiers are required to provide certification that the audit has been completed to the Council. Penalties apply for non-compliance.

NSW Health has developed a template for an audit report designed to assist the independent auditor in carrying out the audit. See Approved Form 2 at <http://www.health.nsw.gov.au/environment/legionellacontrol/Pages/legionella-protocols.aspx>

5.4 Evidence of RMP Compliance to Council

The occupier is required to provide evidence to Council that an RMP has been developed and that it has been satisfactorily audited, with a penalty provided for non-compliance. The RMP or audit reports are not *required* to be provided to Council, however, the certification that they have been done is required to be provided to Council. Council will maintain a register of these records and make them available to NSW Health where required.

The RMP and audit report must be made available immediately to Council authorised officers as part of an outbreak investigation, or for the purpose of quality assurance surveys, and to allow regulatory enforcement activities.

Council can charge a fee to receive certifications, and investigate and carry out any regulatory action.

Council will include the information that the RMP and audit reports have been received in their register of water cooling towers.

5.5 Monthly Testing

Monthly water testing of water cooling systems for Legionella and total bacteria (or heterotrophic colony count) is required. This is an important way to prevent outbreaks of Legionnaires' disease.

5.5.1 Why is monthly testing required?

Setting a minimum standard provides a failsafe mechanism to help identify when systems are not functioning appropriately and remedial action is required before bacteria rise to levels that may pose a significant risk to public health.

This minimum standard is consistent with the monitoring and control strategies set out in AS/NZ 3666.3:2011. The control strategy details graded responses to levels of Legionella bacteria and HPC detected in the system. This facilitates investigation of exceeded thresholds, review of the water treatment program and steps to take necessary remedial action including immediate on-line disinfection.

5.5.2 Who is responsible for monthly testing?

The occupier of premises that contain a water cooling system is responsible for ensuring that the monthly sampling takes place. An accredited laboratory is also involved in testing the samples which are required to be collected by the DQP.

5.6 Who is the Occupier?

The occupier is ultimately responsible for managing their water cooling system. The occupier is defined in the Act as:

- the owner of the premises that contains the water cooling system; or
- the person entitled to occupy the premises (such as a leaseholder); or
- the owners' corporation under a strata scheme.

5.7 Who is the Duly Qualified Person (DQP)?

A DQP is defined in the Act as a person who might reasonably be expected to be competent to install, operate or maintain a water cooling system. This person would more likely work for water treatment companies, mechanical services companies, and other industry organisations that manage water cooling systems on a day to day basis. The occupier may have contractual agreements with more than one DQP to manage different aspects of their water cooling system.

Samples collected by the DQP are tested by laboratories. Under the Regulation laboratories must be accredited by the National Association of Testing Authorities (NATA). Laboratories may provide test results to the DQP on behalf of the occupier, and may provide reportable test results directly to local government authorities based on contractual arrangements with the occupier or DQP.

5.8 Reportable Test Results

5.8.1. What is a Reportable Test Result?

The Regulation requires the occupier and DQP to operate the water cooling system to ensure Legionella count <10 cfu/mL and heterotrophic colony count <100,000 cfu/mL. Any increase over these levels must be corrected as a priority.

Reportable test results are high levels which must be notified to Council. A Legionella count ≥ 1000 cfu/mL and heterotrophic colony count $\geq 5,000,000$ cfu/mL indicates that the management of the water cooling system needs to be reviewed urgently in order to prevent an outbreak of Legionnaires' disease.

5.8.2. Who should notify Council of a Reportable Test Result?

The occupier is ultimately responsible for notifying Council of any reportable test results. The occupier may engage a DQP to perform this role on their behalf. The occupier or DQP may also have a contractual arrangement with a laboratory to directly notify Council of any reportable test results.

5.8.3. When and how should a Reportable Test result be notified?

Occupiers must notify Council within 24 hours of receiving a reportable test result of *Legionella* count $\geq 1,000$ colony forming units per millilitre (cfu/mL) or HCC $\geq 5,000,000$ cfu/mL.

Notification to Council should be provided in writing. NSW Health has developed a template for the notification of reportable test results– see Approved Form 4 at <http://www.health.nsw.gov.au/environment/legionellacontrol/Pages/legionella-protocols.aspx>

It is recommended that the laboratory report showing the test results is attached to the notification form.

It is good practice for the occupier or DQP to also notify Council over the phone. Council will provide emergency phone/email contact information when required.

Following the receipt of adverse high HCC/Legionella result/s the occupier of the premises must within 4 hours of the request being made provide to an authorised officer 5 years of reports and results plus the name and contact details of any person who worked on the system in the previous 5 years.

5.8.4. Responding to a Reportable Test Result

Australian Standard 3666 Part 3 contains practical guidance on managing high levels of Legionella count and heterotrophic colony count. In particular, the occupier and DQP should follow the control strategies provided in Table 3.1 and Table 3.2 of Australian Standard 3666 Part 3.

5.8.5. How will Council respond to a Reportable Test Result?

Council will respond to a reportable test result by confirming that control strategies have been put in place by the DQP in control of the system. At Council's discretion, an inspection of the system and documentation may be undertaken.

Where necessary, Council may issue improvement notices or prohibition orders.

Unique Identification Number (UID)

To ensure that the investigation processes of Legionella cases are efficiently undertaken and the source of the contamination is easily identified, unique identification of individual cooling towers are required. The introduction of clear labelling of water cooling systems and their locations allows authorised officers and contractors to easily identify water cooling systems for inspections and emergency response, especially during outbreak investigations.

The UID will take the form of:

- Local government acronym (Cessnock City Council's acronym is CKC),
- cooling water system number (4 digit) and
- cooling tower number (2 digit).

For example: **CKC 0001 01**

Disease Management and Outbreak Responses

6.1 Responsibility

NSW Health and its Public Health Units are responsible for coordinating case investigation and outbreak responses under relevant notifiable disease protocols.

6.2 Legionnaires' Disease Reporting

Notification is effected by laboratories and medical practitioners to the Director General of the NSW Health.

6.3 Definition of an Outbreak of Legionnaires' Disease

An outbreak of Legionnaires' disease is an event whereby:

- Two or more probable notifications are linked in time and place; and
- They have a history consistent with Legionnaires' disease.

6.4 Environmental Investigation

Council may be requested to assist NSW Health or the Public Health Unit(s) with environmental investigation and other local responses in the event of a single case and/or an outbreak.

6.5 Symptoms of Legionnaires' Disease

Legionnaires' disease usually causes fever, chills, a cough and shortness of breath. Some people also have muscle aches, headache, tiredness, loss of appetite and diarrhoea. People can become very sick with pneumonia; most people recover but the disease can be fatal to vulnerable people.

6.6 Who is at risk?

The disease often affects middle-aged and older people, particularly those who smoke or who have chronic lung disease. Also at increased risk are people whose immune systems are suppressed by medications or diseases such as cancer, kidney failure, diabetes or HIV.

6.7 Mode of Transmission

Cooling towers usually sit on top of large buildings as part of the cooling water system. They include a pool of water that is sprayed over pipes to cool the air inside the building. Depending on the weather conditions, the water droplets from cooling towers can drift over the roof of the building and down into the street adjacent to the building, or may be blown some distance away. This pathway can result in the infection of people with Legionella bacteria.

Although it has been shown that approximately 10% or more of cooling towers may be contaminated with various species of Legionella bacteria at any one time, most are never found to cause outbreaks of the disease. The reason why some cooling towers are associated with outbreaks is unclear, but may include the level of contamination, weather conditions that promote Legionella growth and survival in droplets (such as the level of humidity, sunlight, temperature and wind direction), and the proximity of susceptible people.

7. Further Information and Support

Please refer to Council's website for detail or alternatively, contact Council's Environmental Health Section on 4993 4100.

Further information and guidance on public health matters is available from NSW Health through its local Public Health Unit on 1300 066 055. Further information and guidance is also provided on the Legionella control webpage:

<https://www.health.nsw.gov.au/environment/legionellacontrol/Pages/default.aspx>

The following NSW Health link contains factsheets which summarise the new requirements for occupiers of water cooling systems:

<https://www.health.nsw.gov.au/environment/legionellacontrol/Pages/fact-sheets.aspx>

Management Plan Definitions

Act	Public Health Act 2010
AS 3666	Standards Australia publication for Air Handling and Water Systems of Buildings – Microbial Control, Parts 1,2 and 3 of 2011
Code	The code of practice for the control of Legionnaires’ Disease, 2nd Edition 2004
Competent Person	Is defined in the Regulation as a person who is a tertiary qualified chemist, chemical engineer, engineer, microbiologist and who has relevant expertise
Colony Forming Unit	Colony-forming unit (CFU or cfu) is a measure of viable bacterial or fungal cells. CFU measures only viable cells. For convenience the results are given as CFU/mL (colony-forming units per milliliter) for liquids, and CFU/g (colony-forming units per gram) for solids.
Cooling Tower	a device for lowering the temperature of water by evaporative cooling in which atmospheric air is in contact with falling water thereby exchanging heat. An evaporative condenser is a heat exchanger in which refrigerant is cooled by a combination of air movement and water spraying.
Cooling Water System (CWS)	A heat exchange system that consists of a heat generating plant, a heat rejection plant, interconnecting water recirculating pipe work and associated pumps, valves and controls, and includes a cooling tower or evaporative condenser
Council	Cessnock City Council
Duly Qualified Person (DQP)	A person who installs, operates or maintains a regulated system
Hot Water System (HWS)	A reticulated water system that distributes or recirculates hot water (>60°C) through the majority of its branches. A hot water system (HWS) may include temperature control devices located near outlets to regulate the delivery temperature.
Independent Auditor	Is a person approved by the NSW Health Secretary as an auditor <ul style="list-style-type: none"> - Not the risk assessor - Not the occupier - Not the duly qualified person - Not the laboratory that carried out the monthly testing
Legionnaires’ Disease	Is any pulmonary (lung) infection in patients caused by Legionella species
Occupier	The owner of the premises or part of the premises; or the person entitled to occupy the premises (or part of the premises); or the owner’s corporation under a strata scheme

Outbreak	Means two or more disease cases linked in time and place
Premises	A building or other structure on land, vacant land, vessel or air craft
Process of Disinfection	A process designed to control microbial growth in a system
Regulation	Public Health Regulation 2012
Regulation Amendment	Public Health Amendment (Legionella Control) Regulation 2018
Regulated Systems	Include water cooling systems, hot-water systems, warm water systems and air-handling systems
Reportable Result	Reportable test results are high levels which must be notified to Council. A Legionella count ≥ 1000 cfu/mL and heterotrophic colony count $\geq 5,000,000$ cfu/mL indicates that the management of the water cooling system needs to be reviewed urgently in order to prevent an outbreak of Legionnaires' disease.
Risk Assessor (Competent person)	A person with appropriate training, practical experience in the subject that is sufficient to provide safe and satisfactory performance.
Risk Management Plan	Is a prescribed document that sets out a process by which risk factors are systematically identified, assessed, and where necessary responded to. A risk management plan concentrates on identifying and controlling equipment and processes that have a potential of causing unwanted change or risk to human health.
Thermostatic Mixing Valve	A type of warm water system that mixes hot and cold water to a pre-determined temperature by the use of a thermostat
Unique Identification (UID) No.	An individual number assigned to each cooling tower within the Local Government area that follows a set format provided by NSW Health
Warm Water System (WWS)	A reticulated water system that distributes or recirculates warm water through the majority of its branches at a nominal temperature of 45°C by means of a temperature controlling device.

Management Plan Administration

Business Group:	Planning and Environment
Responsible Officer:	Health and Building Manager
Protocol Review Date:	Three (3) years from date of adoption unless legislated otherwise
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Protocol Number:	
Relevant Legislation:	<ul style="list-style-type: none"> • Public Health Act 2010 • Public Health Regulation 2012 • Public Health Amendment (Legionella Control) Regulation 2018
Related Policies / Protocols / Procedures	

Management Plan History

Revision	Date Approved / Authority	Description of Changes
1	17 November 2015 / ELT	New protocol adopted
2	9 November 2018 / ELT	Protocol amendment adopted
3	12 November 2021 / ELT	Periodic review and revised document adopted.