

# BACTERIAL TESTING OF COOLING TOWERS PROCEDURE

## SCOPE

This procedure applies to all buildings owned and/or under the control of Monash University within Australia. Instances whereby buildings fall outside the scope of this procedure should be referred to Monash Occupational Health & Safety (OH&S) for consideration.

## PROCEDURE STATEMENT

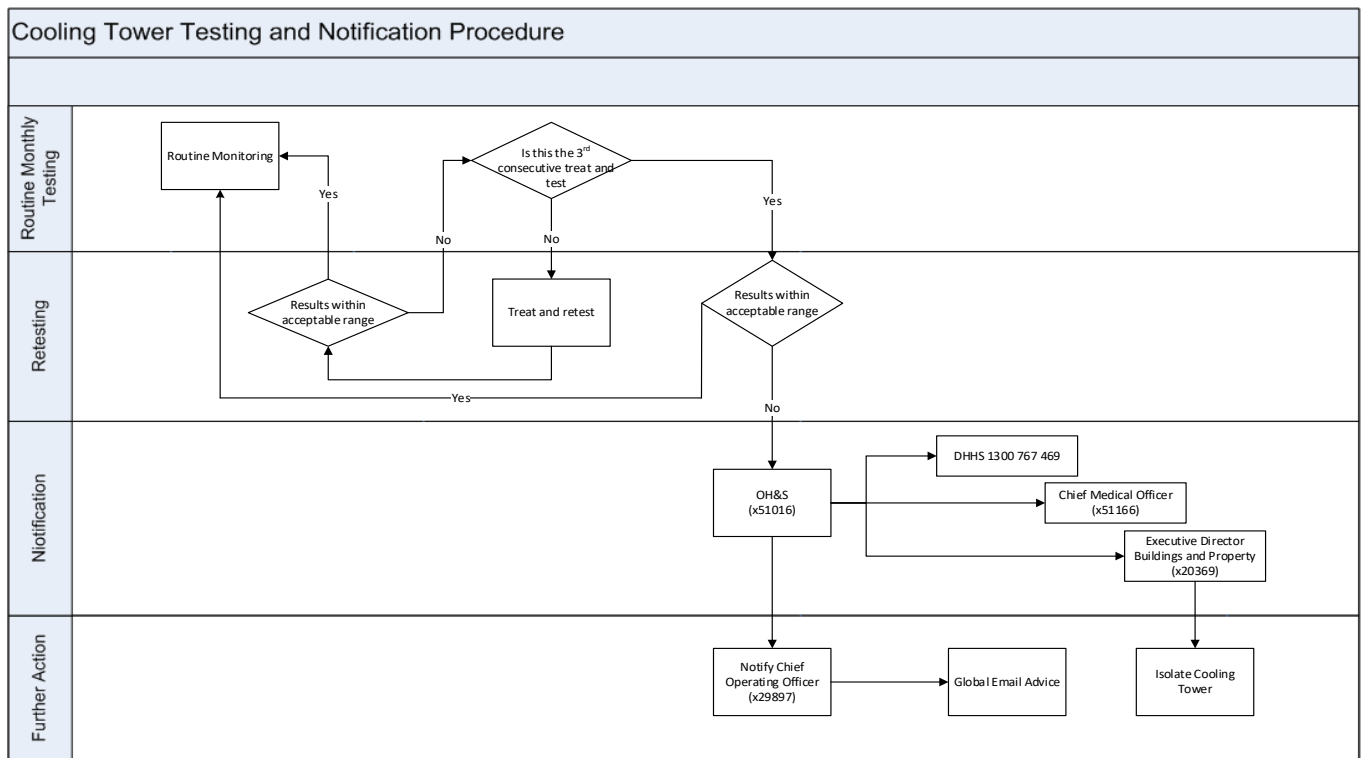
This procedure set out the requirements for the treatment and notification of Legionella bacteria and elevated bacterial levels in cooling tower water and confirmed cases of Legionnaires disease at Monash University.

### 1. Abbreviations

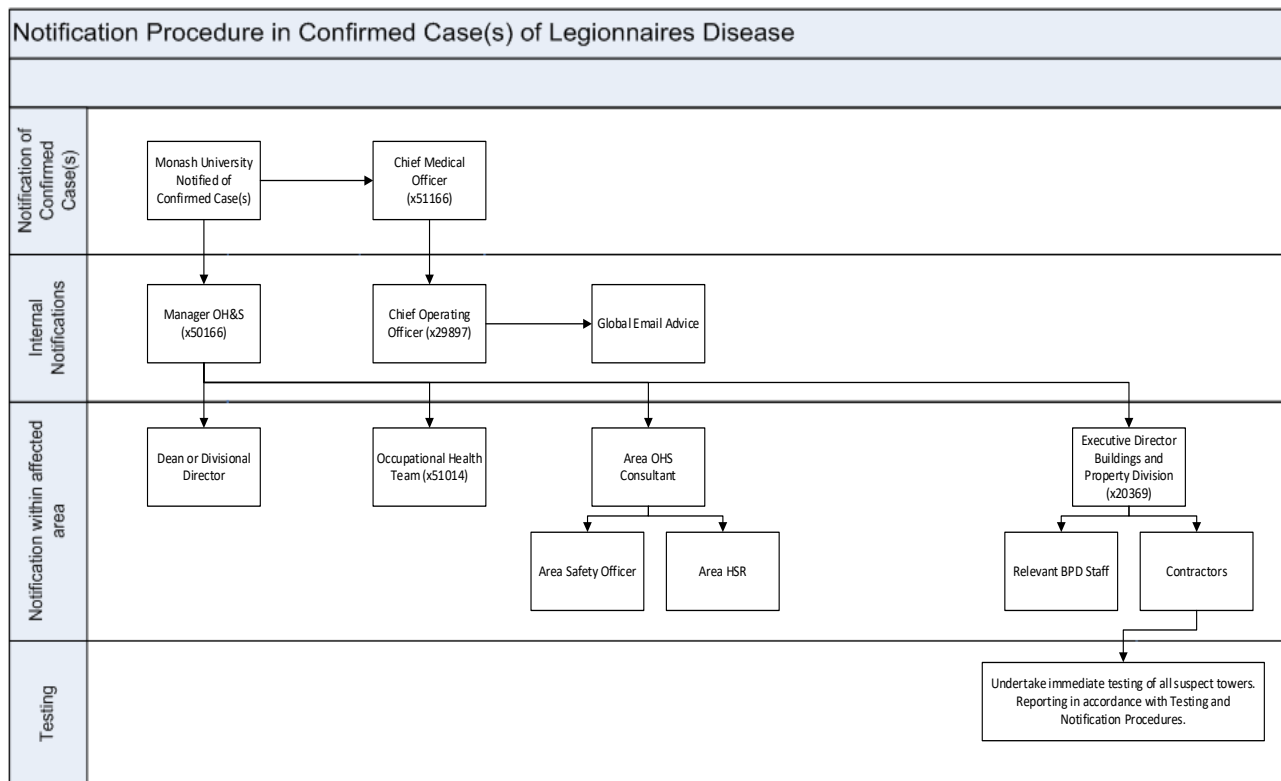
|                 |   |
|-----------------|---|
| <b>CFU/mL</b>   | Colony forming unit per millilitre of sample    |
| <b>DHHS</b>     | Department of Health and Human Services         |
| <b>BPD</b>      | Buildings and Property Division                 |
| <b>OHS</b>      | Occupational Health and Safety                  |
| <b>OH&amp;S</b> | Monash Occupational Health & Safety             |
| <b>M&amp;MW</b> | Maintenance and Minor Works                     |
| <b>TBC/HCC</b>  | Total bacteria count/heterotrophic colony count |

## 2. Notification Procedures

### 2.1 Prescribed Action Levels for Bacteria/Legionella Testing of Cooling Tower Water



### 2.2 Confirmed Case(s) of Legionnaires Disease



### 3. Responsibility for Implementation

3.1 A comprehensive list of OHS responsibilities is provided in the [OHS Roles, Responsibilities and Committees Procedure](#). A summary of the specific responsibilities with respect to bacterial testing of cooling towers is provided below.

3.1.1 **Services (Building Maintenance), BPD:** Services staff must:

- Manage the testing of HCC in the cooling tower water in order to detect the levels of Legionella species and HCC;
- Notify Monash Occupational Health & Safety (OH&S) if:
  - 3 consecutive detections of Legionella species ( $\geq 10$ CFU/mL); or
  - 3 consecutive elevated HCC ( $\geq 100,000$ CFU/mL) are detected in cooling tower water (from the same tower);
- Advise OH&S of the need to re-test cooling tower/s water following notification from the Department of Health and Human Services (DHHS) of confirmed case/s of Legionnaires disease.

3.1.2 **Monash Occupational Health & Safety (OH&S):** OH&S must:

- When notified by Services staff of Legionella detection and/or elevated HCC in cooling tower water, communicate with all relevant parties within the university as detailed in these procedures;
- When notified by Services staff of three consecutive detections of Legionella species ( $\geq 10$ CFU/mL), communicate with DHHS, as detailed in these procedures;
- Send notification reports of three consecutive detections of Legionella bacteria in cooling tower water to DHHS;
- When notified by DHHS of confirmed case(s) of Legionnaires disease, communicate with the relevant department, and Dean of faculty, if multiple cases are reported;
- Update these notification procedures, as required.

### 4. Records

4.1 For OHS Records document retention please refer to:

[Monash University OHS Records Management Procedure](#).

## DEFINITIONS

A comprehensive list of definitions is provided in the [Definitions tool](#). Definitions specific to this procedure are provided below.

| Key word  | Definition   |
|---|--|
| Total Bacteria Count/Heterotrophic Colony Count | Heterotrophic colony count is an estimate of the number of viable units of bacteria per millilitre of water made using the pour plate, spread plate or membrane filter test. It is used as an indicator of water quality in cooling water systems. HCC is also known as total bacteria count (TBC), total plate count or viable bacteria count test. It is reported as the number of colony forming units per millilitre of sample (CFU/mL).<br>For the remainder of these procedures, bacteria levels will be referred to as HCC. |

## GOVERNANCE

|                       |  |
|-----------------------|--|
| Parent policy         | <a href="#">OHS&amp;W Policy</a>   |
| Supporting schedules  | N/A  |
| Associated procedures | <b>Australian and International Standards</b> <ul style="list-style-type: none"><li>• ISO 45001:2018 Occupational Health and Safety Management Systems</li><li>• AS/NZS 3666 Air-handling and water systems of buildings - Microbial Growth</li><li>• 3666.1: 2011 Design, installation and commissioning</li><li>• 3666.2: 2011 Operation and maintenance</li></ul> |



|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• 3666.3: 2011 Performance-based maintenance of cooling water systems</li> <li>• AS/NZS 4276.1: 2007 Water microbiology - General information and procedures</li> <li>• AS/NZS 3896: 2017 Waters-Examination for legionellae including Legionella pneumophila</li> <li>• AS/NZS 2031.2: 2001 Selection of containers and preservation of water samples for microbiological analysis</li> </ul> <p><b>Monash University OHS Documents</b></p> <p><a href="#">Legionella and cooling towers OHS information sheet</a></p> <p><b>Other Documents</b></p> <p>Guide to Developing Risk Management Plans for Cooling Tower Systems, Public Health Division, Department of Health and Human Services, Victoria, 2015</p> <p>Template for cooling tower system Risk Management Plans, Public Health Division, Department of Health and Human Services, Victoria, 2015</p> |
| <b>Legislation mandating compliance</b> | <p>Public Health and Wellbeing Act 2008</p> <p>Public Health and Wellbeing Regulations 2009</p> <p>Building (Legionella) Act 2020</p> <p>Building (Legionella Risk Management) Regulations 2001</p> <p>Building (Legionella Risk Management) (Amendment) Regulations 2002</p> <p>Public Health and Wellbeing Act 2008</p> <p>Health (Legionella) Regulations 2001</p> <p>Occupational Health and Safety Act 2004</p> <p>Occupational Health and Safety Regulations 2017</p>  |
| <b>Category</b>                         | Operational  |
| <b>Endorsement</b>                      | <p>Monash University OHS Committee</p> <p>8 September 2020</p>   |
| <b>Approval</b>                         | <p>Office of the Chief Operating Officer &amp; Senior Vice-President (a delegate of the President &amp; Vice-Chancellor)</p> <p>29 September 2020</p>  |
| <b>Procedure owner</b>                  | Manager, OH&S  |
| <b>Date effective</b>                   | September 2020   |
| <b>Review date</b>                      | 2023   |
| <b>Version</b>                          | 5.3  |
| <b>Content enquiries</b>                | <a href="mailto:ohshelpline@monash.edu">ohshelpline@monash.edu</a>   |

## DOCUMENT HISTORY

| Version    | Date Approved | Changes made to document   |
|------------|---------------|--|
| <b>3</b>   | April 2009    | Notification procedures for prescribed action levels for bacterial/legionella testing of cooling tower water, and confirmed case/s of Legionella Disease, v3   |
| <b>4</b>   | June 2014     | <ol style="list-style-type: none"> <li>1. Changed title to Bacterial Testing of Cooling Towers Procedure</li> <li>2. Added link to definitions document</li> <li>3. Updated responsibilities section to name maintenance and minor work as the responsible section of FSD for testing.</li> <li>4. Added tools associated with this document.</li> </ol> |
| <b>4.1</b> | May 2016      | <ol style="list-style-type: none"> <li>1. Updated flowchart with contact details</li> <li>2. Changed names to reflect changes in organisational structure</li> </ol>   |

|            |                |   |
|------------|----------------|---|
| <b>5</b>   | May 2017       | <ol style="list-style-type: none"> <li>1. Updated to reflect changed organisational structure in Buildings and Property Division</li> <li>2. Updated flowchart to clarify triggering of additional actions after 3rd positive test.</li> <li>3. Updated Records, Compliance and References sections</li> </ol>  |
| <b>5.1</b> | August 2017    | <ol style="list-style-type: none"> <li>1. Updated logos in header</li> <li>2. Updated OHS Regulations to 2017</li> </ol>  |
| <b>5.2</b> | September 2020 | <ol style="list-style-type: none"> <li>1. Added references to Building (Legionella) Act and Building (Legionella Risk Management) (Amendment) Regulations 2002</li> <li>2. Reference to superseded Health Act 1958 replaced with Public Health and Wellbeing Act 2008</li> <li>3. Removed references to AS/NZS 2243.1: 2005 Safety in Laboratories Part 1 - Planning and operational aspects and 2243.2: 2006 Safety in Laboratories Part 2 - Chemical aspects as irrelevant</li> <li>4. Updated reference to AS/NZS 3896: 2008 to AS/NZ 3896: 2017</li> <li>5. Removed reference to deleted information sheet Risk management of cooling towers OHS information sheet</li> </ol> |
| <b>5.3</b> | July 21        | <ol style="list-style-type: none"> <li>1. Updated certification logo to ISO 45001 in the footer</li> <li>2. Added the Standard ISO 45001 under "Associated procedures" in the Governance table</li> <li>3. Updated OHS Policy under 'Parent Policy' to OHS&amp;W Policy</li> </ol>  |