



Reed College
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LEGIONELLA EXPOSURE CONTROL PLAN

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I. PURPOSE

It is the policy of Reed College to take precautions to eliminate potential hazards in the workplace. The purpose of this Legionella Exposure Control Plan is to specify the standard practices to be used by Reed College to prevent legionellosis associated with building water systems. Legionellosis refers to two illnesses associated with legionella bacterium. When the bacterium Legionella causes pneumonia, the disease is referred to as Legionnaires' disease. Legionella can also cause a less severe influenza-like illness known as Pontiac Fever. Most all cases of legionellosis are the result of exposure to Legionella associated with building water systems.

The presence alone of Legionella bacteria in building water systems is not sufficient to cause legionellosis. Other factors including environmental conditions, water temperatures, biofilms, etc. and a means of transmitting the bacteria to people in the building via aerosol generation are necessary to cause outbreak of disease as a result of exposure. Legionellosis is contracted via inhalation of Legionella bacteria. Disease is not transmitted person-to-person and susceptible persons are more at risk for legionellosis including, but not limited to, the elderly, dialysis patients, and persons with weakened immune systems.

II. SCOPE

The scope of this program outlines the following:

- Potential risks and preventative measures associated with building water systems.
- Responding to a legionellosis case/outbreak through environmental sampling and water treatment.
- Disinfection methods for the various types of building water systems within a facility.

III. RESPONSIBILITIES

A. REED COLLEGE ADMINISTRATION

The President and other Officers of Reed College have the ultimate responsibility to provide support for measures taken to reduce contaminants in Reed's building water systems.

B. ENVIRONMENTAL HEALTH AND SAFETY (EHS):

The Environmental Health and Safety department is responsible for:

- Developing and maintaining of the Legionella Exposure Control Plan.
- Keeping records of test results and remedial steps taken.
- Advising in remedial steps for the presence of excess Legionella bacteria in the building water systems above OSHA guidance.

C. FACILITIES SERVICES

Facilities Services is responsible for:

- Scheduling quarterly building water system testing.

- Advising in remedial steps for the presence of Legionella bacteria in the building water systems.
- Making necessary repairs or corrective action measures if Legionella bacteria is detected.
- Providing preventative maintenance to the buildings water systems and treatment.

IV. QUARTERLY BUILDING WATER SYSTEM TESTING

Reed College performs quarterly water system testing of the Chemistry cooling tower for the presence of Legionella bacteria. Water samples are taken and sent to a laboratory in Portland to test for the presence of Legionella bacteria. If Legionella is found, corrective actions steps are taken and the cooling tower is re-tested. Corrective action measures include a heavy shock to the system with an oxidizing biocide such as bleach. Follow-up testing is done approximately five days after heavy shock.

V. INTERPRETATION OF WATER SYSTEM TESTING RESULTS

Analytical results are reported as colony forming units (CFU) of *Legionella* per milliliter of sample if *Legionella* are detected. If no *Legionella* are cultured, results are reported as “Not Detected.” The following table provides a brief explanation.

| <i>Legionella</i> Not Detected (No Remedial Action Required) | <i>Legionella</i> Detected (Remedial Action Recommended) |
|--|--|
| <p>Continue regular monitoring of the systems to verify system mechanical and operational conditions do not favor <i>Legionella</i> growth. A result of “Not Detected” may refer to one of the following scenarios:</p> <ul style="list-style-type: none"> • No <i>Legionella</i> were present in the sample, however, <i>Legionella</i> maybe present elsewhere in the system. • <i>Legionella</i> may have been present but detection was impaired due to inhibiting organisms or masked by high levels of contamination (non- legionella organisms). • <i>Legionella</i> died in transit. » <i>Legionella</i> was undetected via culture procedure (viable but non-culturable; VBNC). <p>A “Not Detected” culture result does not mean there are “zero” <i>Legionella</i> present in the sample or that the system is absent of <i>Legionella</i>.</p> | <p>The presence of any species of <i>Legionella</i> warrants corrective action. Refer to OSHA Guidance and Supplemental Action described below for further guidance.</p> <p>Analytical results are reported as:</p> <ul style="list-style-type: none"> • Total Legionella (includes all detected species) • Legionella pneumophila Serogroup1(onlySG1) • Legionella pneumophila Serogroups2-14 (combined) • Other Legionella species (total non-pneumophila species) • Fluorescent Legionella (reported if detected) <p>The reporting of fluorescent or blue-white <i>Legionella</i> is a subgroup of “Other <i>Legionella</i> species” and are rarely associated with human infection. There are about 46 non-pneumophila species of which only a few are fluorescent under UV light at 365-nm. The most common fluorescent species include <i>L. anisa*</i>, <i>L. bozemanii*</i>, <i>L. cherrii</i>, <i>L. dumoffii*</i>, <i>L. gratiana</i>, <i>L. gormanii*</i>, <i>L. parisiensis*</i>, <i>L. steigerwaltii</i>, and <i>L. tucsonensis</i>.</p> <p>* This species has been associated with human infection. Individual species account for less than 3% of infections.¹</p> |

According to Dr. Lauri Hicks of the US Centers for Disease Control and Prevention, “there is not a clear relationship between the amount of *Legionella* in the water and the risk for disease, and therefore there is no safe level of *Legionella* in a water system.”² When the bacterium is identified in a water system, CDC recommends that measures be taken to remove the bacteria from the water, known as remediation.

Absence of *Legionella* are not necessarily equivalent to low risk, and as described by ASHRAE Guideline 12, the presence of *Legionella* cannot be used in isolation to determine the risk of legionellosis. The bacterium is frequently present in water systems without being associated with known cases of disease. In addition, there are multiple factors that can influence risk of illness. These factors include, but are not limited to, strain virulence, host susceptibility, and how efficiently the organisms are aerosolized to the small particle size required to reach the deep portion of the human lung and remain viable. *Legionella* testing should be performed and interpreted within the context of a properly designed *Legionella* Water Management Plan, and testing is not a substitute for sound mechanical and operational maintenance and when necessary chemical treatments.

OSHA GUIDANCE

The presence of any species of *Legionella* warrants remedial action. The AHJ, other company policies, or the site-specific management plan shall supersede where appropriate. Implementation of a full comprehensive hazard assessment and a management plan for the control of health-related risk associated with *Legionella* in building water systems is recommended. **Re-sample for *Legionella*, generally within 2 to 7 days post remediation, to verify and document corrective measures taken were successful.**

Colony Forming Units (CFU) of *Legionella* per Milliliter

| Action Level | Cooling Water | Domestic Water | Humidifier Water | Recommended Action |
|--------------|-------------------------------|----------------------------|--------------------------|--|
| A | 100 or less | 10 or less | 1 or less | Acceptable control. No remedial action required. |
| B | More than 100 and up to 1,000 | More than 10 and up to 100 | More than 1 and up to 10 | Prompt cleaning and/or biocide treatment of the system. |
| C | More than 1,000 | More than 100 | More than 10 | Immediate cleaning and/or biocide treatment. Take prompt steps to prevent employee exposure. |

REFERENCES

1. <https://www.specialpathogenslab.com/blue-white-legionella.php>
2. <https://www.cdc.gov/washington/testimony/2013/t20130205.htm>