Water Risk Management Procedure

1. Purpose

The WA Country Health Service (WACHS) recognises their responsibility and accountability for the delivery of a safe environment for all personnel visiting, working, or staying at all WACHS facilities. WACHS has an obligation to provide a supply of drinking water across its facilities that is safe and fit for its intended purpose.

The WACHS Water Risk Management Framework incorporates this procedure, read in conjunction with the WACHS Water Risk Management and Control Policy (WRM and Control Policy) and supporting Water Risk Management Facility Plan Guideline (WRM Facility Plan Guideline).

Figure 1:WACHS Water Risk Management Framework

A key component of providing a safe environment is the appropriate management and control of water systems within each facility. This Procedure is applicable to the following WACHS buildings:

- health care facilities
- aged care facilities
- renal hostels
- any other facility that requires a Licence and Accreditation Regulatory Unit (LARU) licence.

2. Procedure

This procedure provides mandatory obligations and direction in developing an appropriate and compliant site specific microbial WRM Facility Plans, to ensure all microbial hazards that can be present in the water infrastructure of WACHS facilities are identified, evaluated, and managed in accordance with current standards, policies, and guidelines.

This procedure has been developed to ensure WACHS maintains compliance with relevant legislation and standards regarding microbial hazard management. The Procedure provides standardised direction and guidance to ensure each facility manages its obligations within a consistent and robust framework.

2.1 Oversight and Support

A Water Risk Management Committee (WRM Committee) within each region is to provide local governance and assurance relating to effective management and control of microbial risks, including:

- overseeing the development and ongoing management of Water Risk Management Facility Plan (WRM Facility Plan), including the annual review and endorsement process
- reviewing adverse test results and follow up corrective actions
- reviewing responses to confirmed clinical cases related to water-borne microbial hazards
- acting as the local escalation pathway for issues requiring clarification or escalation.

The WACHS Infrastructure and Environment Directorate, with the support of Infection Prevention and Control (IPC), Safety and Quality and Work Health Safety program expertise, are to provide oversight and support to:

- WRM Committee governance and assurance activities, including review and endorsement of WRM Facility Plans
- be the escalation pathway for WRM Committee regarding water-borne microbial hazards and matters for clarification
- review and update this procedure as required.

2.2 Water Risk Management Facility Plan

A risk-based approach should be taken with consideration to system complexity and age of design, use of cooling towers, and potential for exposure to immune compromised patient cohorts.

A WRM Facility Plan is to be developed in a manner that supports local staff to understand and coordinate responses to incidents of microbial risks/detections in water samples, control of day-to-day management of the water distribution systems, and/or responsibility for the care of patients or residents.

For an indicative list of Facility types refer to Regional Network Model Facility List. The WRM Facility Plan Guideline supports application of this procedure:

- for **low complexity sites** (lower risks and simpler conditions), a WRM Facility Plan aligned with Small Site Template is required at minimum
- for **high complexity facilities and health campuses** (sites that have identified higher risks associated with complexity, age, design, use of cooling towers and potential immune compromised cohorts), is required to have a WRM Facility Plan in line with Scope. It is recommended that region engage with subject matter experts/consultants for initial development at a minimum.

To provide operational assurance, the WRM Facility Plan must have effective and consistent maintenance practices that contribute to risk reduction and i.e., Planned Preventative Maintenance (PPMs) and Agility Work Orders.

2.3 Facility Complexity Risk Analysis

Microbial control distinguishes between water system risk and health risk:

- **Water System Risk** refers to the risk of contamination of water, microbial colonisation of facility water infrastructure, and subsequent proliferation of microbial hazards within the water distribution system of a facility.
- **Health Risk** refers to the risk of a person contracting a microbial disease from a water distribution system.

The assessment of the drinking water supply system is the gateway towards developing effective strategies and preventive measures to control water quality hazards and/or hazardous events. It includes understanding the characteristics of the drinking water system, what hazards may arise, how these hazards create risks, and the processes and practices that affect drinking water quality. Hazards and hazardous events within WACHS facilities can be grouped into:

- those that increase the likelihood, distribution, and severity of microbial colonisation within the facility's water distribution system
- those that increase the likelihood of exposure through inhalation of an aerosol or aspiration of water containing bacteria.

The water service provider is responsible for the provision of safe drinking water to the WACHS meters at the property. WACHS is responsible for the water supply from the property connection point entering and distributing through the allotment area.

When undertaking a complex analysis of a facility, it's crucial to consider and engage the necessary expertise. The Risk Assessment Tables for the WA Health System can also provide guidance and support for conducting effective risk analysis.

Water Distribution System

It is essential that local engineering knowledge, with accurate plans of the water distribution system and as constructed drawings (including any modifications to the original system installed) are captured and held on site where practical to determine site specific risk analysis and management planning.

At Risk Patients

A review of the functions of the relevant WACHS facility should be undertaken to identify areas where there is a higher risk of infection acquisition to patients, residents, or staff based on known risk factors.

Hazards and Risks

It is critical that the WRM Facility Plan identifies key hazards, such as biological, chemical agent, physical property of water, or radiological class hazards that have the potential to cause injury or illness. Including sources of hazards and potential hazardous events associated with the level of risk.

Water Risk Assessment

Water system risk refers to the risk of contamination of water and the colonisation and subsequent proliferation of Legionella and other pathogenic bacteria within the water distribution system of a facility. The system analysis is to form the input to the risk assessment process and consider the water system risks and health risks, inclusive of hazards and hazardous events. The process is to consider the likelihood of microbial

colonisation and infection and the consequences of colonisation or infection (the presence of at-risk patients and the consequences should the at-risk group become infected). Water system risk is wide ranging and considers each component of the water distribution and delivery system. Such as drinking water, chilled/boiler water units, hot water, and fire systems.

The risk assessment of all the facilities drinking water supply systems is essential for planning and implementing effective strategies for prevention and control of hazards from the point of source to each outlet or tap. WACHS has a duty of care to supply water that is safe and fit for purpose, regardless of water supply location, i.e., private suppliers or sourced on site (rain, bore water).

The risk assessment must be reviewed at least every five years or following any major system alterations. The WRM Facility Plan reviews and endorsement must be undertaken annually at minimum by the Regional WRM Committee, revised, and updated if there is any reason to believe that the risk assessment is no longer valid.

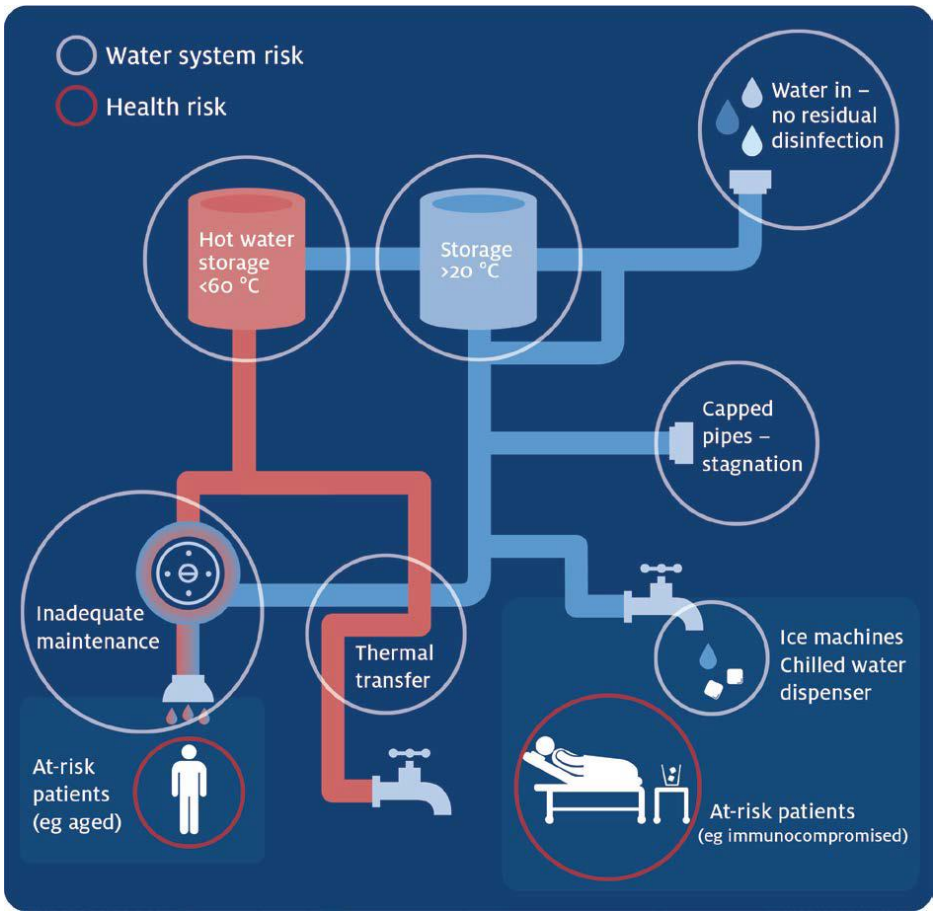

Figure 2: Schematic overview of water distribution system risks and health risks, ref enHealth guidance – Guidelines for Legionella control

Key Water System Risks

Key risks for assessment include:

- water supply risks
- health/clinical risks
- plumbing systems risks
- heated water systems

- cold water systems
- equipment and installations
- HVAC systems (including cooling towers).

2.4 Facility Plan Risk Management Strategies

The focus on identifying risks and appropriate controls is undertaken within the WRM Facility Plan risk assessment, with operational controls captured and measured.

Appropriately skilled and trained staff are to be required to undertake the mandatory duties as outlined in the WRM Facility Plan regarding the implementing and monitoring of risk management strategies.

Refer to WRM Facility Plan Guideline for implementing, monitoring and management strategy considerations.

Implementing Controls

Controlling microbial risks within a facility requires a multibarrier approach, which involves the implementation of numerous controls that collectively reduce the risk of microbial infections. Key control measures include:

- incoming water quality
- plumbing controls
- disinfection systems
- regular maintenance
- exposure controls.

Refer to WRM Facility Plan Guideline for further information: Table 1: Monitoring tasks - Appropriately skilled and trained staff.

Operational Monitoring

Operational monitoring is the sequence of planned activities and measurements that assess the performance of preventive measures used to control hazards in real time. The frequency of operational monitoring shall be proportional to the risk associated with the failure of the process. Tasks may include inspections, flushing, and signage. The outcomes of operational monitoring, through routine standardised sampling and assessments of results, are to provide an immediate indication that the water quality within the system is within the required specifications and can trigger immediate corrective actions. Additionally, it confirms that preventive measures implemented to control hazards are functioning properly and effectively. Key elements of operational monitoring include:

- temperature
- pH
- turbidity
- disinfectant residual
- water stagnation: flush each outlet for a minimum of 5 minutes to reach free chlorine residual (frc).

Refer to WRM Facility Plan Guideline for further information: Table 2: Examples of water system risks, operational monitoring, and controls for Legionella management

Verification Monitoring

Verification monitoring must be undertaken routinely to demonstrate that the water supplied continues to meet the water quality objectives of the site specific WRM Facility Plan and determine whether the existing control measures are effective. To verify that the drinking water quality at each facility meets the health-related guidelines in the Australian Drinking Water Guidelines (ADWG) and any other requirements, the WRM Facility Plans require an established process whereby water quality sampling is undertaken, tested by National Association of Testing Authorities (NATA) accredited analytical laboratories, and the results are reported to and acted on. Samples are analysed in accordance with a NATA certified method of analysis, wherever possible. The exception to this is the field chemistry results for temperature, conductivity, pH, and free chlorine. NATA certified laboratories used for the analysis of samples shall undertake quality assurance in accordance with standard laboratory procedures.

Refer to WRM Facility Plan Guideline for further information: Table 4: Control Strategies for the Presence of Legionella and Table 5: Control Strategies for the Presence of Other Heterotrophic Microorganisms

2.5 Responding to Detections or Cases

Immediate Investigation for Detection

The WRM Facility Plan must provide clear and concise Incident Response (IR) Protocols or corrective actions that are essential in providing a timely and effective response to water quality incidents that may pose an unacceptable level of risk to health in a WACHS facility. In the event microbial contamination is detected in a water sample, the nominated contact lead should immediately investigate whether the control measures are adequate and in line with the sites WRM Facility Plan requirements, and the system control measures should be assessed and checked to identify whether any failures have occurred. If faults are detected, they should be rectified before further sampling to verify the efficacy of the intervention. If verification identifies further positive results, the full system should be reassessed.

In response to a confirmed microbial detection, the elevated water test results are to be highlighted and distributed via email to key identified individuals as per the WRM Facility Plan and WRM Committee protocols. The nominated delegate is to contact local Department of Health (DoH) and IPC representatives to discuss the readings and proposed corrective actions.

Refer to WRM Facility Plan Guideline for further information: Section 2.10 Immediate Investigation for Detection and WRM Committee Terms of Reference (ToR) Example.

Legionella Control Measures

The WRM Facility Plan to detail clear actions if Legionella is detected in a facility's water distribution system, or a case of Legionnaires' disease is shown or suspected to be linked to colonisation of a facility water distribution system, one or more of the following control measures or an alternative suitable decontamination procedure should be undertaken as a matter of priority:

- heat disinfection
- chlorination and hyperchlorination

- cleaning of fittings or replacement with new or cleaned fittings
- implementation of appropriate exposure controls. (2.3.1 implementing controls).

Once appropriate control measures have been implemented or undertaken, normal operation of the system and facility can usually recommence immediately. However, exposure controls should be continued and monitored in high-risk areas and for high-risk patients and residents until further sample results indicate that the control measures have been successful.

Refer to WRM Facility Plan Guideline for further information: Section 2.10 Immediate Investigation for Detection

Response to Suspected/Positive Case of Legionella and/or Other Pathogenic Bacteria

Where a WACHS facility–acquired Legionnaires' disease case is suspected or confirmed, the facility must follow WRM Facility Plan actions. Any suspected/confirmed Legionella related incidents are to also trigger the need for identified key personnel to follow site WRM Facility Plan actions. Any suspected or confirmed case of Legionnaires' disease is considered a public health issue, external reporting to WA DoH is required.

In managing and responding to any drinking water quality related incident, WACHS has committed to working cooperatively with the DoH in relation to any public health related aspects of the incident response. This includes providing the DoH with any information it reasonably requires in facilitating such an investigation and to protect public health and agreeing to coordinate any public announcement in relation to the incident with the DoH.

2.6 Review

The WRM Facility Plan should be a living document that is reviewed regularly by the WRM Committee, especially following incidents, or cases, to assess the effectiveness of the response. A full review of the plan should be conducted annually or more frequently, based on the risk assessment, after a detection of microbial hazards in the water distribution system or a case of Legionnaires' disease, or after significant system modifications or changes of use. The frequency of, and triggers for, plan reviews should be documented in the WRM Facility Plan.

2.7 Supporting Requirements

Appropriate documentation and record keeping provides the foundation for the establishment and maintenance of an effective quality management system. Tied in with a strong support system is critical in evaluating both the short-term and the long-term management and performance of drinking water quality/Legionella and WRM Facility Plans should consider the following components:

- training and competency
- communication and awareness
- control of documentation
- control of records
- review and auditing
- reporting
- continual improvement.

3. Roles and Responsibilities

Executive Director – Infrastructure and Environment is responsible for ensuring WACHS has appropriate WRM related policies, procedures, and guidelines in place and provide assurance that Regional WRM Committees are effective in managing microbial hazards.

Director – Infrastructure and Environment is overall person accountable for Water Quality Management across WACHS. Providing assurance that WACHS Water Risk Management Plans and related policies are current and relevant. Responsible for overseeing Regional WRM Committee governance and assurance activities. Escalation pathway for WRM Facility Plans issues and clarification. Accountable for updating WACHS WRM and Control Policy and associated documents.

Regional Executive Directors are accountable for ensuring WRM related policies are adhered to, that a WRM Committee is established to oversee planning and assurance activities and that all required facilities have WRM Facility Plans that are current, relevant and operationalised locally.

WRM Committee is responsible for initiating, reviewing, and endorsing all WRM Facility Plans. Monitor systems and trends within WRM and ensure effective WRM planning, and assurance activities are developed and implemented. Accountable for the reporting, implementation and delivery of a drinking water quality program as documented within the WRM and Control Policy and WRM Facility Plans. Accountable for the regular review of the water quality management system performance across the group, including but not limited to risk assessment and water system performance by relevant stakeholders with the appropriate knowledge, skills, and expertise.

Regional Managers of Infrastructure and Support Services are responsible for establishing and maintaining WRM Facility Plans in line with the WRM related policies and Guideline. The WRM Facility Plans require WRM Committee endorsement and oversight.

The **Nominated Responsible Manager** for a facility is responsible for ensuring operational management and response activity aligns to the endorsed WRM Facility Plan with the reporting of activity to WRM Committee.

Maintenance and Facility Managers are to oversee management and control activity and ensure appropriate record keeping as defined WRM Facility Plan.

Infection Prevention and Control Nurses are to support processes in relation to sampling, flushing and other response activities are completed in accordance with the water risk management requirements.

Water Quality Consultant when engaged by the region to provide services such as creation of a WRM Facility Plan in accordance with “Scope” is responsible to undertake actions as specified within the relevant contract. Provides subject matter expertise or consulting, as required.

Other staff identified in the WRM Facility Plan are to undertake sampling, flushing and other response activity as outlined in the WRM Facility Plan.

All staff are required to comply with the directions in WACHS policies and procedures as per their roles and responsibilities. Guidelines are the recommended course of action for WACHS and staff are expected to use this information to guide practice. If staff are unsure which policies procedures and guidelines apply to their role or scope of practice, and/or are unsure of the application of directions they should consult their manager in the first instance.

4. Monitoring and Evaluation

4.1 Monitoring

To ensure the procedure is operationalised effectively the following monitoring activity are to be used for surveillance sampling:

- site WRM Facility Plans are established, reviewed, and endorsed by appointed WRM Committee
- response activity to detection or cases is provided by WRM Committee for quarterly WACHS-wide dashboard reporting
- confirmation that responses to detection or cases are reviewed at the WRM Committee and provided for noting at local Clinical Governance and Work Health and Safety Committee meeting.

4.2 Evaluation

To evaluate the usefulness of this procedure the following are to be considered:

- feedback from WRM Committee meetings to the effectiveness of response activity to detection or cases
- formal reviews of the WRM Facility Plans.

5. References

AS 4775:2007 Emergency eyewash and shower equipment

AS 5369:2023 Reprocessing of reusable medical devices and other in health and non-health related facilities

AS/NZS 3666 SET:2011 Air-handling and water systems of buildings Set

AS 4276.1:2021 - Water microbiology - Water quality - General requirements and guidance for microbiological examinations by culture (ISO 8199:2018, MOD)

AS 4276.2 -1995 - Water microbiology: Culture media, diluents and reagents (Reconfirmed 2013)

AS 4276.3:2021 - Water microbiology: Enumeration of heterotrophic microorganisms – Pour plate, spread plate, membrane filtration and most probable number techniques

AS 4276.4 – 1995 - Water microbiology: Coliforms - Estimation of most probable number (MPN)

AS 4276.5 – 2019 - Water microbiology: Coliforms, Escherichia coli and thermotolerant coliforms –Membrane filtration method

AS 4276.6 – 1995 - Water microbiology: Thermotolerant coliforms and Escherichia coli –Estimation of most probable number (MPN)

AS/NZS 4276.6:2007 - Water microbiology: Coliforms, Escherichia coli and thermotolerant coliforms - Determination of most probable number (MPN)

AS 4276.8 – 1995 - Water microbiology: Faecal streptococci - Estimation of most Probable number (MPN)
AS 4276.9:2019 - Water microbiology: Enterococci in water by membrane filtration using membrane – Enterococcus indoxyl-β-D-glucoside agar (mEI)

AS 4276.12 – 1995 - Water microbiology: Pseudomonas aeruginosa - Estimation of most probable number (MPN)

AS 4276.13:2021 - Water Microbiology: Pseudomonas aeruginosa - Membrane filtration method

AS 4276.14:2014 - Water microbiology: Detection of Salmonella spp. (ISO 19250:2010, MOD)

AS 4276.15:2014 - Water microbiology: Examination for Vibrio cholerae

AS 4276.17.1:2016 - Water microbiology: Spores of Clostridium perfringens - Membrane filtration method

AS 4276.17.2:2016 - Water microbiology: Spores of Clostridium perfringens Estimation of most probable number (MPN) using the multiple tube dilution technique

AS 4276.19:2001 - Water microbiology: Examination for thermophilic Campylobacter spp. Membrane filtration

AS/NZS 4276.20:2003 - Water microbiology: Examination for coagulase positive Staphylococci, including Staphylococcus aureus, by membrane filtration

AS 4276.21:2019 - Water microbiology: Examination for coliforms and Escherichia coli –Determination of most probable number (MPN) using enzyme hydrolysable substrates (ISO 9308-2:2012, MOD)

AS 4276.22:2019 - Water microbiology: Water quality - Enumeration of Escherichia coli and coliform bacteria - Membrane filtration method for waters with low bacterial background flora (ISO 9308-1:2014/Amd 1:2016, MOD)

AS 4276.23:2016 Water microbiology: Soils, sediments, sludges, slurries and bio-solid. Procedures for sample preparation

The National Safety and Quality Health Service (NSQHS) Standards. 3.01; 3.02; 3.08; 3.10; 3.11; 3.12; 3.14; 3.17 [Accessed 7 August 2024]

Devereaux BM, Jones D, Wardle E, on behalf of the Infection Control in Endoscopy Committee. Infection Prevention and Control in Endoscopy 2021. Melbourne: Gastroenterological Society of Australia (GESA), 2021. [Accessed 7 August 2024]

National Health and Medical Research Council – National Water Quality Management Strategy. Australian Drinking Water Guidelines 6 2011

Environmental Health Standing Committee Guidelines for Legionella control in the operation and maintenance of water distribution systems in health and aged care facilities (2016)

Department of Commerce, Department of Mines and Petroleum, Code of Practice Prevention and control of Legionnaires' Disease (2010)

Environmental Protection Act (1986)

Australian Building Codes Board, Handbook Warm Water Systems (2020)

Health (Miscellaneous Provisions) Act 1911, Health (Air-handling and Water Systems) Regulations (1994)

Office of the Auditor General, Regulation of Air-handling and Water Systems Report (2023)

Australian Building Codes Board Plumbing Code Research (Nd)
*Public Health Act 20*16

Department of Health, Licence and Accreditation Regulatory Unit WA Health Facility Guidelines, Engineering Services (Nd)

Work Health and Safety Act 2020

Work Health and Safety (General) Regulations (2022)

6. Definitions

Term	Definition
Water Risk Management and Control Policy	The Water Risk Management and Control Policy (WRM and Control Policy) provides standardised direction in relation to water systems in a consistent manner that complies with all Legislative, Australian New Zealand Standards and Policy requirements.
Water Risk Management Committee– region specific	The Water Risk Management Committee (WRM Committee) – region specific, ensures that operational, clinical, and engineering matters are considered in a coordinated, cohesive, cooperative, and holistic way during the process of the development and implementation of WRM Facility Plans and ongoing response to microbial risk.
Water Risk Management Facility Plan	The Water Risk Management Facility Plan (WRM Facility Plan) is required by any facility bound by the WRM and Control Policy that details water risk analysis, management, and response in line with the WACHS WRM Procedure

Water Risk Management Facility Plan Guideline	The Water Risk Management Facility Plan Guideline (WRM Facility Plan Guideline) supports the application of the WRM and Control Policy, and WRM Procedure providing direction for the development and management of site-specific WRM Facility Plans.
Water Risk Management Procedure	The Water Risk Management Procedure (WRM Procedure) provides direction on how facilities are to develop and maintain a WRM Facility Plan and what sites require an endorsed WRM Facility Plan

7. Document Summary

Coverage	WACHS Health Care Facilities, Aged Care Facilities, Renal Hostels or any facility that requires a LARU licence
Audience	Any positions identified that have accountability to water management and/or control in above mentioned facilities.
Records Management	Non-Clinical: Corporate Recordkeeping Compliance Policy
Related Legislation	*Health (Miscellaneous Provisions) Act 1911* (WA) Health (Air-handling and Water Systems) Regulations 1994 (WA) *Public Health Act 2016* (WA) *Work Health and Safety Act 2020* (WA) Work Health and Safety (General) Regulations 2022 (WA)
Related Mandatory Policies / Frameworks	• Infrastructure (Asset Management) Policy Framework • Public Health Policy Framework • Risk, Compliance and Audit Policy Framework
Related WACHS Policy Documents	• Aseptic Technique Policy • Hand Hygiene Policy • Infection Prevention and Control Policy • Specimen Collection Procedure • Waste Management Policy • Water Risk Management and Control Policy • Water Risk Management Facility Plan Guideline • Work Health and Safety Policy
Other Related Documents	• ABCB Plumbing Code Development Research Report Warm Water Systems (2015) • ABCB Handbook Warm Water Systems (2020) • CDOC, DMP Code of Practice – Prevention and Control of Legionnaires' Disease (2010) • DoH Western Australian Health Facility Guidelines for Engineering Services (2021) • enHealth Guidelines for Legionella control in the operation and maintenance of water distribution systems in health and aged care facilities (2015) • NHMRC, NRMMC National Water Quality Management Strategy, Australian Drinking Water Guidelines 6 (2011) • OAG Regulation of Air-handling and Water Systems Performance Audit (2023) • Regional Network Model Facility List • Risk Assessment Tables for the WA Health System • Water Risk Management - Scope • Water Risk Management - Small Site Template
Related Forms	Nil

Related Training	Nil
Aboriginal Health Impact Statement Declaration (ISD)	ISD Record ID: 3135
National Safety and Quality Health Service (NSQHS) Standards	3.6, 3.12
Aged Care Quality Standards	Nil
Chief Psychiatrist's Standards for Clinical Care	Nil
Other Standards	Below standards available via the WACHS Library: • AS 2031: 2012 Water Quality – Sampling for Microbiological Analysis (ISO 19458:2006, MOD) • AS 4032.3 Water Quality –Valves for the Control of Heated Water Supply Temperatures – Requirements for Field Testing, Maintenance or Replacement of Thermostatic Mixing Valves, Tempering Valves and End of Line Temperature Control Devices • AS/NZS 3500 Set (Parts 0-4):2021 Plumbing and drainage set • AS/NZS 3896:2017 Waters – Examination for Legionella spp. Including Legionella pneumophila • AS/NZS 5667.5:2022 Water quality – Sampling

8. Document Control

Version	Published date	Current from	Summary of changes
2.00	7 August 2024	7 August 2024	• Change of title to encompass microbial water risks in lieu of only legionella, previously Legionella Management Procedure • New contemporary procedure required to provide stronger compliance and guidance to water risk management and control, in response to Office of the Auditor General 2022 report findings. • Establishes Water Risk Management Committees • Ensures maintaining effective systems through appropriate and compliant site specific microbial Facility Plans • List of WACHS sites requiring a Facility Plan
2.01	20 August 2024	7 August 2024	• Updated references and links

9. Approval

Policy Owner	Executive Director Infrastructure and Environment
Co-approver	Nil
Contact	Asset Manager Infrastructure and Environment
Business Unit	Infrastructure and Environment
EDRMS #	ED-CO-21-491686

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