O&M Best Practice

BUILDING WATER QUALITY

A Preventive Maintenance Checklist for Facility Operators

AUDIENCE

Facility maintenance staff, building operators, plumbing and HVAC technicians, chief building engineers, water treatment providers, and facility leaders responsible for the operation and maintenance of domestic water and hydronic systems.

MINDSET

Proactive vs. Reactive. Healthy buildings rely on water systems that are routinely monitored, maintained, and documented. Water quality management is not a one-time

WHY

Building water quality directly impacts occupant safety, system reliability, equipment life, and operational risk. Poorly managed water systems can contribute to pathogen growth, inconsistent temperatures, corrosion, scaling, sediment buildup, odor, discoloration, and premature equipment failure. In most operating buildings, water quality issues are not caused by system design alone, but by gaps in operations and maintenance — including stagnant water conditions, inadequate flushing, failed recirculation, poor temperature control, unmanaged treatment chemistry, fouled strainers, sensor drift, and incomplete documentation. Routine, documented preventive maintenance is one of the most effective tools facility teams can use to protect occupants, improve system performance, extend equipment life, and preserve the long-term value of the building asset.

BACKGROUND & OBJECTIVES

The goals of this water quality preventive-maintenance checklist are to:

- Provide facility staff with a practical schedule of monthly, quarterly, semi-annual, annual, and event-driven water quality checks.
- Maintain domestic water, hydronic, cooling tower, and water treatment systems so that they continue to perform as intended.
- Detect and correct common water quality failure modes such as stagnation, poor temperature control, failed recirculation, inadequate flushing, treatment drift, sediment buildup, corrosion, scaling, and sensor drift.
- Reduce occupant exposure to waterborne pathogens, objectionable taste or odor, discoloration, and other water quality concerns.
- Support water management program practices aligned with ASHRAE Standard 188, CDC water management guidance, ASHRAE Guideline 12, EPA drinking water guidance, and applicable plumbing / backflow requirements.
- Support voluntary programs and rating systems related to building water quality, water safety, and public health, including WELL Water, LEED v5 water-related strategies, CDC Water Management Program guidance, and ASHRAE Standard 188.
- Create a documented, auditable record of readings, findings, corrective actions, and responsible parties to support facility risk management and operational continuity.
- Promote a 'good is better than perfect' culture: complete the basic checks every cycle, capture observations, and escalate abnormal findings

MEASURES OF SUCCESS

- ✓ Hot water temperatures at representative fixtures remain within the facility target range.
- ✓ Cold water temperatures remain within acceptable limits and do not trend toward conditions that increase microbial risk.
- ✓ Time-to-temperature at distal fixtures is measured and trended to identify circulation or balancing issues.
- ✓ Disinfectant residuals are measured at representative points and remain within the facility water management plan target range.
- ✓ Low-use areas are flushed as scheduled; dead legs and low-flow areas are identified and addressed.
- ✓ Recirculation pumps, mixing valves, strainers, filters, treatment equipment, and sensors are inspected and maintained on schedule.
- ✓ Humidifiers, misters, air washers, evaporative coolers, cooling towers and open water systems are inspected, treated, cleaned, and documented
- ✓ Water heaters, storage tanks, piping insulation, backflow devices, and associated components are inspected and maintained.
- ✓ Water management plan, testing records, complaint trends, and corrective actions are reviewed and updated at least annually.
- ✓ Reduction in water quality complaints, unplanned plumbing service calls, and unresolved corrective actions year over year.
- ✓ Hydronic system operates as designed, without premature failure due to corrosion or scaling, and maintains high energy efficiency.

HOW TO USE THIS CHECKLIST

Each frequency tab is a stand-alone inspection form. Complete the required checks, record dates and responsible personnel, and document findings or corrective actions. Use the Observations Log for abnormal readings, complaints, testing results, and follow-up items. This workbook should be used together with the facility Water Management Plan (WMP), manufacturer instructions, adopted codes, and local authority requirements.

PRIMARY SOURCES

- ANSI/ASHRAE Standard 188 — Legionellosis: Risk Management for Building Water Systems.
- ASHRAE Guideline 12 — Managing the Risk of Legionellosis Associated with Building Water Systems.
- CDC — Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings: A Practical Guide to Industry Standards.
- U.S. EPA — National Primary and Secondary Drinking Water Regulations and drinking water monitoring guidance.
- International Plumbing Code (IPC) and applicable local plumbing / cross-connection control requirements.
- ASSE product performance standards and manufacturer O&M requirements for mixing valves, backflow devices, water heaters, treatment

- Facility Water Management Plan (WMP), treatment provider reports, commissioning records, BAS trend logs, and site-specific preventive
- WELL Building Standard — Water concept and performance verification requirements; LEED v5 water-related strategies where applicable.
- Cooling Technology Institute (CTI), AWWA guidance, and treatment-provider recommendations for cooling tower, storage, filtration, and water
- BSRIA BG 50/2021 - Water Treatment for Closed Heating and Cooling Systems
- VDI 2035, Part 1: Guideline for Prevention of Damage in Water Heating Installations

WMP CLARIFICATION

WMP means Water Management Program or Water Management Plan. In this workbook, Facility WMP refers to the site-specific documented program/plan used to identify building-water-system hazards, control measures, monitoring locations, corrective actions, verification, validation, and recordkeeping responsibilities.

Water Quality Preventive Maintenance — Monthly

Walk-through inspections to be performed monthly; document readings, abnormal observations, corrective actions, and follow-up.

Building / Site: _____ **Inspector:** _____ **Period:** _____

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
DOMESTIC WATER TEMPERATURE & CIRCULATION									
1	Hot water	Verify hot water temperatures in hot water heater storage tanks is set at 140 deg F (60 deg C) and thermostatic mixing valves are used to prevent scalding locally at sink and shower fixtures .	Vd	ASHRAE Standard 188-2021; CDC Water Management Program Toolkit; Facility WMP; manufacturer O&M requirements	WMP control measures, monitoring procedures, control limits, corrective actions, and recordkeeping; verify against Facility WMP hot-water temperature limits.				
2	Cold water	Verify cold water temperatures are 68 deg F (20 deg C) or less at the taps and shower heads.	Vd	CDC Water Management Program Toolkit; Facility WMP; domestic water system best practices	Water age, stagnation, and temperature-control considerations; confirm against Facility WMP cold-water temperature targets and trend logs.				
3	Distal fixtures	Check time to hot water at distal fixtures.	Vd	Facility domestic hot water performance criteria; commissioning / recommissioning procedures; Facility WMP	Time-to-temperature verification at distal fixtures; recirculation balancing, return-temperature, and occupant-use considerations.				
4	Disinfectant residual	Measure disinfectant residual at representative points in the building system. If no residual is detectable, contact your water provider.	Vd	EPA drinking water guidance; local utility water-quality information; Facility WMP / water treatment program	Disinfectant residual monitoring at representative points; compare to Facility WMP limits, utility targets, and treatment provider guidance.				
MIXING, STAGNATION & LOW-USE FIXTURES									
5	Recirculation pumps	Confirm recirculation pumps are operating properly.	V	Manufacturer O&M manuals; Facility PM Program; Facility WMP	Pump status, alarm review, operating schedule, control sequence, and confirmation that recirculation is not disabled or overridden.				
6	Mixing valves	Inspect mixing valves for proper function and setpoint stability.	Vd	IPC; ASSE product performance standards; manufacturer O&M requirements; Facility WMP	Thermostatic mixing valve inspection, setpoint stability, scald protection, and downstream temperature verification.				
7	Low-use fixtures / areas	Check for low-use fixtures/areas and perform flushing as needed.	Vd	CDC Water Management Program Toolkit; Facility Flushing Plan; Facility WMP	Water age management, low-use outlet flushing, documentation of locations flushed, and corrective action if abnormal conditions are observed.				
8	Trap seals	Confirm trap seals are intact in infrequently used drains.	V	International Plumbing Code (IPC) Chapter 10; Facility plumbing preventive maintenance program	Trap seal inspection and protection to reduce sewer gas/odor risk; verify infrequently used floor drains and fixtures remain sealed.				
9	Dead legs	Inspect potable water piping changes that may have occurred in the building. Identify and eliminate any dead legs that exist due to plumbing modifications or improper installation.	V	ASHRAE Standard 188-2021; Guide 12-2023 CDC Water Management Program Toolkit; Facility WMP; manufacturer O&M requirements	ASHRAE Guideline 12-2023 §8 and §9 — eliminate dead-end piping, low-flow areas, and stagnant sections that may promote microbial growth.				
WATER QUALITY OBSERVATIONS & WATER USING HVAC&R EQUIPMENT									
10	Taste / odor / discoloration	Inspect for unusual taste, odor, or discoloration complaints.	V	EPA Secondary Drinking Water Standards; occupant complaint tracking procedures; Facility WMP	EPA Secondary Drinking Water Standards — investigate taste, odor, discoloration, turbidity, sediment, and staining complaints; document corrective action.				
11	Evaporative Heat Rejection Equipment	Inspect evaporative heat rejection equipment (cooling towers, evaporative condensers, hybrid or adiabatic coolers or chillers, or other open water systems) for visible condition and treatment levels, if applicable.	V	ASHRAE Standard 188-2021; ASHRAE Guideline 12-2023; Cooling Technology Institute (CTI); water treatment provider guidance, manufacturer O&M guidance	ASHRAE 188-2021 §5.2 / Guideline 12-2023 §8 — open-water system inspection, biological growth, basin condition, drift control, and treatment verification.				
12	Water Chemistry	Monitor pH levels, Conductivity values, dissolved Oxygen, and biocide levels, top up inhibitor and/or biocide and/or pH solution if necessary.	V	BSRIA Guide 50 (for chemically inhibited systems), VDI 2050 (for non-chemically inhibited systems). Or similar in North America.	BSRIA BG 50 — water chemistry control limits for closed-loop systems; VDI 2050 — corrosion, scaling, and conductivity management.				
13	Humidification Equipment	Ensure equipment with automatic drain-down cycles are purging standing water at least once every 24 hours to prevent stagnation. Utilize distilled, demineralized, or reverse osmosis (RO) water to minimize mineral deposits that harbor microbes. Check that water temperatures are maintained outside the 77 deg F - 113 deg F (25 deg C-45 deg C) range to inhibit Legionella bacteria growth.	Vd	ASHRAE Standard 188-2021; Guide 12-2023 CDC Water Management Program Toolkit; Facility WMP; manufacturer O&M requirements	Guideline 12-2023 §9.3 — eliminate dead-end piping, low spots, and areas susceptible to stagnation during shutdown.				
14	Produce and Recreational Misters	For produce misters check integrity of pipe insulation to maintain water temperatures outside the Legionella growth range. Avoid stagnation by running regularly or draining when not in use. Drain and clean the reservoir regularly if recreational misting equipment has one. Use an EPA approved disinfectant appropriate for the system.	Vd	ASHRAE Standard 188-2021; Guide 12-2023 CDC Water Management Program Toolkit; Facility WMP; manufacturer O&M requirements	Guideline 12-2023 §9 — minimize stagnation and maintain water quality in aerosol-generating water systems.				
15	Evaporative Air Coolers, Air Washers	Unit shall have a fully drainable sump with a high level alarm. Sumps shall be sized to hold all returned water when pumps are shut off. No water carry over through sufficient sizing of the system or using a mist eliminator. When mist eliminators are used, the captured water shall be returned to the evaporative cooler sump. Bleed off shall be controlled by conductivity controllers	V	ASHRAE Standard 188-2021; Guide 12-2023; proposed ASHRAE Standard 191	Guideline 12-2023 §8 / proposed ASHRAE 191 — inspect sump condition, drift eliminators, strainers, and visible biological growth.				

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Water Quality Preventive Maintenance — Quarterly

Quarterly tasks add a closer review of treatment data, sensors, trends, backflow observations, and open water systems.

Building / Site: _____ **Inspector:** _____ **Period:** _____

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
TREATMENT PERFORMANCE & WATER QUALITY REVIEW									
1	Treatment provider report	Review quarterly water-treatment service reports, action items, and chemistry trends.	Vd	Water treatment provider reports; Facility WMP; ASHRAE Standard 188-2021; CDC Toolkit	Review control limits, residuals, pH/conductivity trends, treatment recommendations, corrective actions, and open service items.				
2	Sensor verification	Verify calibration or reasonableness of temperature, conductivity, pH, ORP, and related sensors where installed.	Vd	Treatment provider guidance; BAS / controls documentation; sensor manufacturer O&M; Facility WMP	Reasonableness/calibration check for temperature, conductivity, pH, ORP, residual, and related monitoring devices; document drift.				
3	Water quality sample points	Confirm designated sample points remain accessible, labeled, and representative.	V	Facility WMP; CDC Toolkit; ASHRAE Standard 188-2021	Verify representative sample points/control locations remain accessible, labeled, and appropriate for monitoring building-water-system risk.				
4	Trend review	Review three months of temperature, residual, complaints, and corrective-action trends.	Vd	Facility WMP; BAS trend logs; maintenance records; occupant complaint log	Quarterly trend review of temperatures, disinfectant residuals, complaints, microbial data when applicable, and corrective-action closure.				
PUMPS, VALVES & COMPONENTS									
5	Domestic water pumps	Inspect booster, recirculation, and transfer pumps for leaks, abnormal noise, vibration, or alarms.	V	Manufacturer O&M manuals; Facility PM Program	CDC Water Management Program Toolkit — verify monitoring records, flushing activities, and corrective action				
6	Valves and controls	Exercise or inspect representative isolation, balancing, and control valves.	V	Manufacturer O&M manuals; Facility PM Program	Valve inspection, balancing, and operability verification procedures				
7	Backflow devices	Visually inspect accessible backflow preventers for leakage, discharge, missing tags, or obvious damage.	V	International Plumbing Code (IPC) Chapter 6; local AHJ requirements; cross-connection control program	Visual inspection of accessible backflow assemblies; verify certification status is tracked for annual testing by qualified personnel.				
WATER USING HVAC&R EQUIPMENT									
8	Cooling tower basin/Air handler Condensate drain pan	Inspect pan/basin, fill, drift eliminators, strainers, and visible biological growth.	V	ASHRAE Standard 188-2021; ASHRAE Guideline 12-2023; CTI guidance; treatment provider guidance	Cooling tower/open-water inspection: basin, fill, drift eliminators, strainers, biological growth, treatment status, and service recommendations. Air handler condensate drain pans a				
9	Humidification Equipment	Regularly remove mineral buildup, as scale acts as a breeding ground for bacteria. For larger systems, use EPA-registered microbicides to kill mold and bacteria.	Vd	ASHRAE Standard 188-2021; ASHRAE Guideline 12-2023; CDC Water Management Program Toolkit; Facility WMP; manufacturer O&M requirements	Scale build up increases over time. Regular maintenance minimizes effort to maintain safe condition and proper functionality				
10	Microbial testing review	Review bacteria / Legionella results if included in the water management program.	Vd	Facility WMP; ASHRAE Guideline 12-2023; treatment provider guidance; local health department guidance when applicable	Review microbial results, action levels, response procedure, retesting, remediation, and documentation requirements where included in the WMP.				

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Water Quality Preventive Maintenance — Semi-Annual

Semi-annual tasks focus on water quality profiling, treatment adjustment, distribution components, and trend review.

Building / Site: _____ **Inspector:** _____ **Period:** _____

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
WATER QUALITY PROFILE & TREATMENT									
1	Water quality profile	Test and record full water quality profile, such as pH, hardness, turbidity, iron, manganese, and other site-specific parameters.	Vd	EPA drinking water regulations and secondary standards; AWWA water quality guidance; water treatment provider recommendations; Facility WMP	Profile may include pH, hardness, alkalinity, turbidity, iron, manganese, disinfectant residual, conductivity, and other site-specific parameters.				
2	Treatment program	Review and adjust water treatment program, including chemical feed, filtration, softening, or supplemental treatment as applicable.	Vd	Water treatment provider guidance; Facility water-chemistry program; manufacturer O&M requirements; Facility WMP	Review chemical feed, filtration, softening, corrosion/scale control, inhibitor levels, and treatment control ranges/action levels.				
3	Strainers, filters, screens	Inspect and clean strainers, filters, and screens.	Vd	Manufacturer O&M manuals; Facility PM Program; treatment provider recommendations	Inspect and clean strainers, filters, screens, separators, and related components; note pressure drop, debris, fouling, and cleaning frequency.				
DISTRIBUTION SYSTEM COMPONENTS									
4	Water heaters / storage tanks	Inspect water heaters, storage tanks, and associated components.	Vd	Manufacturer O&M requirements; domestic hot-water maintenance program; Facility WMP; ASHRAE Guideline 12-2023	Guideline 12-2023 §8 and §9 — inspect system cleanliness, treatment effectiveness, and areas prone to stagnation.				
5	Piping insulation	Verify insulation condition on hot and cold water piping.	V	ASHRAE energy-efficiency and condensation-control best practices; Facility PM Program; manufacturer insulation requirements	Inspect hot and cold-water piping insulation for damage, missing sections, condensation, heat gain/loss, and impacts on temperature stability.				
6	Dead legs / low-flow areas	Inspect system for dead legs or low-flow areas.	Vd	CDC Toolkit; Facility Water Age Management Plan; Facility WMP; record drawings / renovation closeout documents	Identify dead legs, low-flow branches, abandoned piping, and changed-use areas; update flushing plan and corrective-action list.				
7	Circulation Pump	Inspect propeller and pump chamber for any corrosion residual build up.	Vd	Facility PM Program; manufacturer maintenance requirements	Inspect visually for any corrosion or residual sediment on pump chamber or around the propeller, check pump energy performance as indicator.				
RECORDS & TREND REVIEW									
8	Backflow prevention	Inspect backflow prevention devices visually.	V	International Plumbing Code (IPC) Chapter 6; local AHJ requirements; cross-connection control program	Visual backflow inspection plus certification-status check; annual testing/certification remains per local requirements and qualified tester.				
9	Complaint / maintenance trends	Review trends in occupant complaints or maintenance records.	Vd	Facility complaint tracking process; work order records; Facility WMP; water treatment provider service reports	Review recurring complaints, maintenance events, treatment excursions, sediment/odor/color issues, and corrective-action effectiveness.				

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Water Quality Preventive Maintenance — Annual

Annual tasks validate the overall water management program, domestic water system operation, backflow compliance, and stagnation risk management.

Building / Site: _____ **Inspector:** _____ **Period:** _____

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
WATER MANAGEMENT PROGRAM									
1	Domestic water system review	Perform comprehensive system review of domestic water system design and operation.	Vd	Facility WMP; domestic water system assessment procedures; commissioning / record drawings; CDC Toolkit	Annual operational review of system layout, flow paths, process diagrams, control points, building-use changes, and high-risk areas.				
2	Water management plan	Review and update water management plan, if applicable.	Vd	ASHRAE Standard 188-2021; CDC Water Management Program Toolkit; Facility WMP	Annual review of WMP team, system description, process flow diagrams, hazard analysis, control measures, monitoring, corrective actions, verification, and documentation.				
3	Documentation update	Document findings and update maintenance procedures as needed.	Vd	Facility Preventive Maintenance Documentation Program; Facility WMP; CDC Toolkit	Document annual findings, update PM procedures, revise flushing/testing schedules, assign corrective actions, and close completed items.				
SYSTEM PERFORMANCE VALIDATION									
4	Backflow certification	Test and certify backflow prevention devices, per local requirements.	Vd	International Plumbing Code (IPC) Chapter 6; local AHJ requirements; certified backflow testing requirements	CDC Toolkit / Facility WMP — verify annual review, corrective actions, and validation activities are documented.				
5	Microbial testing	Conduct microbial testing, such as Legionella, where required or appropriate.	Vd	ASHRAE Guideline 12-2023; Facility Legionella response plan; local health department guidance; Facility WMP	Microbial testing where required or appropriate; document action levels, results, notifications, retesting, remediation, and validation.				
6	Water heaters / storage tanks	Clean and inspect water heaters and storage tanks.	Vd	Manufacturer O&M manuals; Facility PM Program; Facility WMP; ASHRAE Guideline 12-2023	Annual cleaning/inspection of heaters and tanks; sediment removal, corrosion review, insulation/access check, valves, and temperature-control components.				
7	Recirculation system	Verify performance of recirculation system, including balancing, controls, and efficiency.	Vd	Domestic hot-water performance verification procedures; controls contractor documentation; Facility WMP	Annual recirculation performance review: balancing, return temperatures, pump schedules, alarms, controls, efficiency, and distal-fixture results.				
INFRASTRUCTURE & STAGNATION RISK									
8	Corrosion / scaling / material degradation	Inspect overall system for corrosion, scaling, or material degradation.	Vd	Facility asset management program; corrosion monitoring guidance; treatment provider reports; AWWA guidance	Annual review for corrosion, scaling, material degradation, discoloration sources, leaks, deposits, and capital renewal needs.				
9	System sizing / usage patterns	Review system sizing and usage patterns to identify opportunities to reduce stagnation.	Vd	Facility operational review; occupancy and usage trend analysis; CDC Toolkit; Facility WMP	Review fixture usage, vacant/low-use areas, sizing versus demand, water age, low-flow branches, and stagnation-reduction opportunities.				

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Water Quality Preventive Maintenance — Multi-Year & As-Required

Multi-year and event-driven tasks that require deeper assessment, recommissioning, response procedures, or specialized water quality review.

Building / Site: _____ **Inspector:** _____ **Period:** _____

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
EVERY 2–3 YEARS									
1	Pipe condition assessment	Assess representative piping for corrosion, scaling, erosion, tuberculation, discoloration sources, or biofilm concerns when age or symptoms indicate risk.	Vd	Facility assessment program; treatment provider guidance; asset management records; AWWA corrosion/scale guidance	Deeper condition assessment for corrosion, scaling, erosion, tuberculation, biofilm concerns, discoloration sources, and capital planning.				
2	Control sequence review	Review domestic hot-water generation, recirculation, mixing, and treatment control sequences.	Vd	Controls contractor documentation; Facility WMP; manufacturer O&M; commissioning / recommissioning procedures	Review hot-water generation, recirculation, mixing, treatment controls, alarms, trend logs, setpoint stability, and sequences of operation.				
AS REQUIRED / EVENT-DRIVEN									
3	Long-term sampling plan review	Reevaluate sampling locations, frequency, and parameters based on building changes and trend data.	V	Facility WMP; CDC Toolkit; ASHRAE Standard 188-2021	ASHRAE 188-2021 §5 and Guideline 12 — reassess system risk following renovations, piping modifications, or operational changes.				
4	Positive Legionella or microbial result	Follow written response plan for notification, retesting, remediation, and documentation.	Vd	Facility WMP; ASHRAE Guideline 12-2023; local health department guidance; treatment provider guidance	Follow written response plan for positive Legionella/microbial results, including notification, risk assessment, remediation, retesting, and documentation.				
5	Major renovation or recommissioning	Flush, clean, disinfect, and document systems affected by construction, outage, or recommissioning.	Vd	CDC Toolkit; Facility WMP; commissioning / closeout procedures; local utility guidance	Return-to-service procedures after renovation, shutdown, outage, or recommissioning: flush, clean, disinfect, verify residuals, and document.				
6	Water service interruption	Implement restart, flushing, and testing procedures after loss of water service or pressure.	Vd	Facility WMP; local utility guidance; public health guidance; water treatment provider guidance	Restart after loss of service/pressure: flushing, residual verification, temperature checks, sampling if required, and corrective-action documentation.				

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Additional Water Quality Observations & Corrective Action Log

Use this log to record water-quality concerns, testing results, abnormal readings, complaints, field observations, corrective actions, and follow-up items discovered outside the routine checklist tasks.

Date	Time	Location / Room	Equipment / System	Observation / Concern	Level of Concern	Tested?	Measurement / Reading	Source / Reference	Action Taken / Next Steps	Owner	Closed Date

Common Observations and Path Forward

This indicates some common issues that can be observed and the potential path forward towards resolution. Please know that this information is captured in the proactive checklists and will be checked accordingly.

Common Negative Observations	Technical Description	Metric(s)	Considerations	Next Steps / Remediation
Water temp is inconsistent	Hot Water delivery / temp control issues - increases pathogen risk	°F (delivery temp), time to temperature, temperature stability	System design (recirculation vs. dead legs), pipe lengths, pipe sizing, insulation, fixture type, control strategy	Evaluate recirculation design and balancing, verify setpoints, insulate piping, assess controls and mixing valves
Hot water is not hot enough or takes a long time to get hot	Temperature control and distribution issues increasing pathogen risk	Hot water temp (°F), time to temperature (sec), stability	Recirculation imbalance, long pipe runs, mixing valves, insulation	Maintain hot water ≥120°F (or per program), balance recirculation, verify mixing valves and controls
Water feels warmer than expected from cold tap	Cold water temperature too high, supporting microbial growth	Cold water temp (°F)	Ambient heat gain, pipe routing, low flow conditions	Maintain cold water ≤77°F, improve insulation, increase turnover
Water has an unusual taste, odor, or color	Chemical or biological degradation of water quality	pH, turbidity (NTU), iron/manganese (ppm), disinfectant residual	Source water variability, corrosion, biofilm, stagnation	Test water quality, flush system, evaluate corrosion control or treatment
Water tastes or smells strongly like chlorine	Elevated or noticeable disinfectant residual in potable water	Free chlorine (mg/L), total chlorine (mg/L)	Recent flushing, proximity to water main, low water age, temperature, occupant sensitivity, source water variability	Test chlorine levels at point of use and compare to acceptable ranges, confirm levels are within utility and health guidelines, adjust flushing practices if needed, consider point-of-use filtration where appropriate
Water appears rusty (brown, red, or orange color)	Particulate, corrosion byproducts, or entrained air	Turbidity (NTU), iron (ppm), particulate presence	Pipe condition, recent disturbances, water chemistry	Flush system, inspect piping, evaluate need for filtration or treatment
Water looks milky or cloudy	Entrained air or elevated turbidity affecting water clarity	Turbidity (NTU), visual observation (clears from bottom up vs. persists), dissolved gases	Recent maintenance or pressure changes, temperature differences, plumbing disturbances, source water conditions	Observe if water clears after standing (indicates air), measure turbidity at point of use, flush system if needed, investigate source or filtration if cloudiness persists
Water pressure seems inconsistent or weak	System imbalance or potential stagnation zones	Flow rate (gpm), pressure (psi)	Fixture demand, system design, partial blockages, low use areas	Evaluate system hydraulics, inspect for obstructions, improve circulation
Musty or sewer-like smells near sinks or drains	Trap seal loss or biological growth in drainage system	Trap seal depth, presence of biofilm, odor complaints	Dry traps, poor venting, infrequent use	Maintain trap seals, add trap primers, clean drains, improve venting
Concerns about “unsafe water” or health risk (especially in healthcare or high-risk settings)	Potential elevated microbial risk (e.g., Legionella)	Legionella testing (CFU/L), HPC	High-risk populations, aerosol-generating systems, water temperature, biofilm	Implement/verify water management plan per ASHRAE 188 and Guideline 12, perform testing and corrective actions

Water Quality Source & Standards Crosswalk

This crosswalk maps the requirements of ASHRAE Standard 188, ASHRAE Guideline 12, CDC guidance, IPC requirements, water treatment best practices, WELL Water concepts, and LEED v5

Standard / Guidance	Section / Credit	Title / Topic	Frequency	Where in this Workbook
ASHRAE STANDARD 188-2021 — LEGIONELLOSIS RISK MANAGEMENT FOR BUILDING WATER SYSTEMS				
ASHRAE 188-2021	§5	Applicability to building water systems	Ongoing	5. Annual
ASHRAE 188-2021	§6	Building survey and hazard analysis	Annually	5. Annual / 6. Multi-Year & As-Required
ASHRAE 188-2021	§7	Water Management Program (WMP) development and implementation	Ongoing / Annual	2. Monthly / 3. Quarterly / 5. Annual
ASHRAE 188-2021	§7.2	Program team identification and responsibilities	Annually	5. Annual
ASHRAE 188-2021	§7.2.1	Development / update of process flow diagrams	Annually	5. Annual / 6. Multi-Year & As-Required
ASHRAE 188-2021	§7.2.2	Hazard analysis and control locations	Annually	5. Annual / 6. Multi-Year & As-Required
ASHRAE 188-2021	§7.2.3	Control measures and monitoring procedures	Monthly / Ongoing	2. Monthly / 3. Quarterly
ASHRAE 188-2021	§7.2.4	Corrective action procedures	As required	5. Annual / 6. Multi-Year & As-Required
ASHRAE 188-2021	§7.2.5	Verification and validation procedures	Annually / As required	5. Annual / 6. Multi-Year & As-Required
ASHRAE 188-2021	§7.2.6	Documentation and recordkeeping	Ongoing	All frequency tabs
ASHRAE 188-2021	§7.3	Building water system monitoring	Monthly / Quarterly	2. Monthly / 3. Quarterly
ASHRAE 188-2021	§7.4	Response procedures for excursions and positive results	Event-driven	5. Annual / 6. Multi-Year & As-Required
ASHRAE 188-2021	§8	Program review following changes to building use or system operation	Event-driven / Annual	5. Annual / 6. Multi-Year & As-Required
ASHRAE GUIDELINE 12-2023 — MANAGING THE RISK OF LEGIONELLOSIS ASSOCIATED WITH BUILDING WATER SYSTEMS				
ASHRAE Guideline 12-2023	Potable water systems guidance	Domestic hot and cold water system management	Monthly / Annual	2. Monthly / 4. Semi-Annual / 5. Annual
ASHRAE Guideline 12-2023	Cooling tower and evaporative condenser guidance	Cooling tower inspection, cleaning, treatment, and aerosol control	Daily / Monthly / Semi-Annual	2. Monthly / 3. Quarterly
ASHRAE Guideline 12-2023	Temperature and operational control guidance	Water temperature management	Monthly / Annual	2. Monthly / 5. Annual
ASHRAE Guideline 12-2023	Water age / stagnation guidance	Water age and stagnation management	Monthly / Semi-Annual / Annual	2. Monthly / 4. Semi-Annual / 5. Annual
ASHRAE Guideline 12-2023	Corrective action and remediation guidance	Corrective action and remediation procedures	As required	6. Multi-Year & As-Required
ASHRAE Guideline 12-2023	Legionella testing and response guidance	Legionella testing and response	Annual / As required	5. Annual / 6. Multi-Year & As-Required
CDC — DEVELOPING A WATER MANAGEMENT PROGRAM TOOLKIT				
CDC Toolkit	Step 1	Establish a WMP team	Annual	5. Annual

CDC Toolkit	Step 2	Describe building water systems using text and process flow diagrams	Annual	5. Annual
CDC Toolkit	Step 3	Identify areas where Legionella could grow and spread	Annual	5. Annual / 6. Multi-Year & As-Required
CDC Toolkit	Step 4	Decide where control measures should be applied and how to monitor them	Ongoing	2. Monthly / 3. Quarterly
CDC Toolkit	Step 5	Establish interventions when control limits are not met	Ongoing / As required	6. Multi-Year & As-Required
CDC Toolkit	Step 6	Ensure the program runs as designed and is effective	Annual / Ongoing	5. Annual / 6. Multi-Year & As-Required
CDC Toolkit	Step 7	Document and communicate all activities	Ongoing	All frequency tabs
CDC Toolkit	Flushing guidance	Low-use fixture flushing and water age management	Monthly	2. Monthly / 4. Semi-Annual
CDC Toolkit	Building reopening / reduced occupancy guidance	Restart procedures after shutdown, reduced occupancy, or water-service interruption	Event-driven	6. Multi-Year & As-Required
EPA / DRINKING WATER QUALITY GUIDANCE				
EPA Drinking Water Regulations	Primary Drinking Water Standards	Regulated contaminant limits	Annual / As required	5. Annual
EPA Secondary Drinking Water Standards	Secondary standards / aesthetic parameters	Aesthetic water quality guidance (taste, odor, color, staining, turbidity, iron, manganese)	Monthly / Semi-Annual / As required	2. Monthly / 4. Semi-Annual
EPA Guidance	Disinfectant residual monitoring	Residual monitoring and distribution-system quality	Monthly	2. Monthly / 3. Quarterly
EPA Guidance	Lead and copper rule considerations	Lead and copper management where applicable	Annual / As required	5. Annual
EPA Guidance	Microbial monitoring considerations	Microbial monitoring where required or appropriate	Annual / As required	5. Annual / 6. Multi-Year & As-Required
INTERNATIONAL PLUMBING CODE (IPC)				
IPC 2024	Chapter 4	Fixture requirements and protection	Ongoing	2. Monthly
IPC 2024	Chapter 5	Water heaters and hot water systems	Monthly / Annual	2. Monthly / 5. Annual
IPC 2024	Chapter 6	Water supply and distribution systems	Ongoing	2. Monthly / 3. Quarterly / 4. Semi-Annual / 5. Annual
IPC 2024	Chapter 6	Backflow prevention and cross-connection control	Quarterly / Semi-Annual / Annual	3. Quarterly / 4. Semi-Annual / 5. Annual
IPC 2024	Chapter 10	Traps, interceptors, and trap seal protection	Monthly	2. Monthly
IPC 2024	Chapter 13 / Non-Potable provisions where adopted	Non-Potable water systems if applicable	Annual / As required	5. Annual / 6. Multi-Year & As-Required
ANSI/ASHRAE/ACCA STANDARD 180-2018 — COMMERCIAL HVAC INSPECTION AND MAINTENANCE				
ASHRAE 180-2018	HVAC water treatment components	Treatment verification and maintenance	Monthly / Semi-Annual	2. Monthly / 4. Semi-Annual
ASHRAE 180-2018	Drain pans and condensate systems	Inspection and cleaning	Semi-Annual / As required	4. Semi-Annual
ASHRAE 180-2018	Cooling towers	Inspection, cleaning, and biological growth prevention	Monthly / Semi-Annual	2. Monthly / 4. Semi-Annual

ASHRAE 180-2018	Heat exchangers	Fouling, scaling, and operational inspection	Semi-Annual / Annual	4. Semi-Annual / 5. Annual
ASHRAE 180-2018	Sensors and controls	Functional verification and calibration	Quarterly / Annual	3. Quarterly / 5. Annual
AWWA / WATER TREATMENT GUIDANCE				
AWWA / Treatment Provider Guidance	Water quality testing procedures	Water quality profile testing and trend review	Semi-Annual / Annual	4. Semi-Annual / 5. Annual
AWWA / Treatment Provider Guidance	Corrosion and scale management	Corrosion, scaling, and material degradation review	Annual	5. Annual / 6. Multi-Year & As-Required
AWWA / Treatment Provider Guidance	Water storage tank inspection and cleaning	Storage tank sediment, corrosion, and cleaning review	Semi-Annual / Annual	4. Semi-Annual / 5. Annual
AWWA / Treatment Provider Guidance	Treatment chemistry review	Chemical treatment, filtration, softening, and inhibitor review	Quarterly / Semi-Annual	3. Quarterly / 4. Semi-Annual
WELL BUILDING STANDARD — WATER CONCEPT				
WELL Water	Water Quality Indicators	Monitoring contaminants and aesthetic quality	Annual / Ongoing	2. Monthly / 4. Semi-Annual / 5. Annual
WELL Water	Drinking Water Promotion	Access to clean drinking water and hydration support	Ongoing	2. Monthly
WELL Water	Water Management	Building water management policies and procedures	Annual	5. Annual
WELL Water	Moisture Management	Moisture and microbial growth prevention	Ongoing	4. Semi-Annual / 5. Annual
WELL Water	Performance Verification	Testing, documentation, and ongoing performance verification	Annual / Multi-Year	5. Annual / 6. Multi-Year & As-Required
LEED v5 — WATER EFFICIENCY / HEALTH & WELLNESS RELATED STRATEGIES				
LEED v5	Water Efficiency / water management policy alignment	Water management, metering, and performance-oriented operations	Ongoing / Annual	5. Annual
LEED v5	Enhanced Building Operations alignment	Preventive maintenance documentation and verification	Ongoing	All frequency tabs
LEED v5	Occupant Health & Wellness alignment	Water quality and occupant comfort support	Ongoing	2. Monthly / 5. Annual
FACILITY WATER MANAGEMENT PROGRAM (WMP)				
Facility WMP	Temperature control procedures	Monthly monitoring and documentation	Monthly	2. Monthly / 3. Quarterly / 5. Annual
Facility WMP	Flushing procedures	Water age management	Monthly	2. Monthly / 4. Semi-Annual
Facility WMP	Corrective action tracking	Excursion response and closure documentation	Ongoing	6. Multi-Year & As-Required
Facility WMP	Treatment program review	Chemical treatment and monitoring review	Quarterly / Semi-Annual	3. Quarterly / 4. Semi-Annual
Facility WMP	Annual review	Program update and management review	Annual	5. Annual
Facility WMP	Event response procedures	Shutdowns, outages, positive tests, recommissioning	Event-driven	6. Multi-Year & As-Required