AI Infrastructure Water Risk Assessment Workbook

A Comprehensive Framework for Evaluating and Mitigating Water-Related Risks in AI Operations

Version 2.0 | August 2025

Executive Overview

This Water Risk Assessment Workbook provides a systematic approach to evaluating your organization's water-related risks associated with AI infrastructure. With AI operations consuming billions of gallons annually and regulatory requirements intensifying, this assessment tool helps organizations:

- **Quantify water risk exposure** across all facilities
- **Identify critical vulnerabilities** before they impact operations
- **Prioritize mitigation investments** based on risk and ROI
- **Ensure regulatory compliance** across jurisdictions
- **Build resilience** for water-constrained futures

How to Use This Workbook:

1. Complete each assessment section for every facility
2. Calculate risk scores using provided frameworks
3. Identify priority areas for intervention
4. Develop targeted mitigation strategies
5. Track progress with quarterly reassessments

Section 1: Organizational Profile

Company Information

Field	Details
Organization Name	_____
Assessment Date	_____
Assessment Lead	_____
Review Cycle	□ Initial □ Quarterly □ Annual

AI Infrastructure Overview

Metric	Current State	2025 Projection
Total Data Centers	_____	_____
Total IT Load (MW)	_____	_____
AI Workload Percentage	_____%	_____%
Annual Water Consumption (gallons)	_____	_____
Water Costs (annual)	$_____	$_____

Strategic Context

Current AI Initiatives:

- ☐ Generative AI deployment
- ☐ Multi-agent systems
- ☐ ML model training
- ☐ Edge AI computing
- ☐ Other: _____

Water Strategy Maturity:

- ☐ Level 1: Reactive (no monitoring)
- ☐ Level 2: Monitoring (basic metrics)
- ☐ Level 3: Optimizing (active management)
- ☐ Level 4: Transforming (advanced solutions)
- ☐ Level 5: Leading (zero-water operations)

Section 2: Facility-Level Risk Assessment

Instructions

Complete this assessment for each data center facility. Aggregate scores will determine enterprise risk profile.

Facility Information

Field	Details
Facility Name/ID	_____
Location	_____
Commissioned Year	_____
IT Capacity (MW)	_____
Current PUE	_____
Current WUE (L/kWh)	_____

Risk Scoring Matrix (100 Points Total)

A. Geographic & Environmental Risk (40 points)

1. Water Stress Level (20 points)

- [ ] Extreme water stress (>80% baseline water depletion) - 20 points
- [ ] High water stress (40-80% depletion) - 15 points
- [ ] Medium-high stress (20-40% depletion) - 10 points
- [ ] Low-medium stress (10-20% depletion) - 5 points
- [ ] Low stress (<10% depletion) - 0 points

2. Climate Projections (10 points)

- [ ] Severe drought risk increasing - 10 points
- [ ] Moderate drought risk - 7 points
- [ ] Stable precipitation patterns - 3 points
- [ ] Improving water availability - 0 points

3. Competing Water Demands (10 points)

- [ ] Critical competition (agriculture, residential) - 10 points
- [ ] High competition - 7 points
- [ ] Moderate competition - 5 points
- [ ] Low competition - 2 points
- [ ] Minimal competition - 0 points

Geographic Risk Subtotal: _____ / 40

B. Infrastructure & Technology Risk (30 points)

4. Cooling Technology Age (15 points)

- [ ] >10 years old, no upgrades - 15 points
- [ ] 5-10 years, minimal updates - 12 points
- [ ] 2-5 years, some optimization - 8 points
- [ ] <2 years, modern systems - 4 points
- [ ] Next-gen liquid cooling - 0 points

5. Water Dependency (15 points)

- [ ] 100% evaporative cooling - 15 points
- [ ] >70% water-based cooling - 12 points
- [ ] 40-70% water cooling - 8 points
- [ ] <40% water cooling - 4 points
- [ ] Zero-water cooling - 0 points

Infrastructure Risk Subtotal: _____ / 30

C. Operational & Compliance Risk (30 points)

6. Regulatory Exposure (10 points)

- [ ] Non-compliant with current regulations - 10 points
- [ ] At risk of non-compliance - 8 points
- [ ] Marginally compliant - 5 points
- [ ] Fully compliant, no buffer - 3 points
- [ ] Exceeds all requirements - 0 points

7. Water Rights & Availability (10 points)

- [ ] No secured water rights - 10 points
- [ ] Limited/contested rights - 8 points
- [ ] Adequate current rights - 5 points
- [ ] Secured long-term rights - 2 points
- [ ] Multiple water sources - 0 points

8. Business Continuity Planning (10 points)

- [ ] No water contingency plan - 10 points
- [ ] Basic plan, untested - 7 points
- [ ] Documented plan, partially tested - 5 points
- [ ] Comprehensive plan, regularly tested - 2 points
- [ ] Proven resilience systems - 0 points

Operational Risk Subtotal: _____ / 30

Total Facility Risk Score: _____ / 100

Risk Level Interpretation

- **70-100**: 🔴 **Critical Risk** - Immediate executive action required
- **50-69**: 🟠 **High Risk** - 6-month mitigation plan essential
- **30-49**: 🟡 **Moderate Risk** - 12-month optimization roadmap
- **10-29**: 🟢 **Low Risk** - Continuous improvement focus
- **0-9**: 🔵 **Leading Practice** - Maintain competitive advantage

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Section 3: Water Consumption Analysis

Current State Metrics

Monthly Water Usage Tracking

Month	Water Usage (gallons)	WUE (L/kWh)	Cost ($)	YoY Change
January	_____	_____	_____	_____%
February	_____	_____	_____	_____%
March	_____	_____	_____	_____%
April	_____	_____	_____	_____%
May	_____	_____	_____	_____%
June	_____	_____	_____	_____%
July	_____	_____	_____	_____%
August	_____	_____	_____	_____%
September	_____	_____	_____	_____%
October	_____	_____	_____	_____%
November	_____	_____	_____	_____%
December	_____	_____	_____	_____%

Water Source Assessment

Source Type	% of Total	Quality Issues	Reliability Risk
Municipal water	_____%	☐ None ☐ Minor ☐ Major	☐ Low ☐ Med ☐ High
Well water	_____%	☐ None ☐ Minor ☐ Major	☐ Low ☐ Med ☐ High
Recycled water	_____%	☐ None ☐ Minor ☐ Major	☐ Low ☐ Med ☐ High
Rainwater harvest	_____%	☐ None ☐ Minor ☐ Major	☐ Low ☐ Med ☐ High
Other: _____	_____%	☐ None ☐ Minor ☐ Major	☐ Low ☐ Med ☐ High

AI Workload Impact Analysis

AI Workload Type	% of Compute	Water Intensity	Monthly Impact (gallons)
Training large models	_____%	☐ High ☐ Med ☐ Low	_____
Inference/production	_____%	☐ High ☐ Med ☐ Low	_____
Multi-agent systems	_____%	☐ High ☐ Med ☐ Low	_____
Edge AI processing	_____%	☐ High ☐ Med ☐ Low	_____
Development/testing	_____%	☐ High ☐ Med ☐ Low	_____

Section 4: Regulatory Compliance Checklist

Global Requirements Status

European Union

- ☐ **Data Collection Ready** (500kW+ facilities)
- ☐ **Annual Reporting Prepared** (Due May 15)

- ☐ **WUE Metrics Tracked** (Required format)
- ☐ **Heat Recovery Documented**
- ☐ **CSRD Compliance** (If applicable)

United States

- ☐ **State Requirements Mapped**
- ☐ **California SB 58 Compliance** (If applicable)
- ☐ **Local Permit Compliance**
- ☐ **Water Rights Documentation**
- ☐ **EPA Reporting** (If required)

Asia-Pacific

- ☐ **Singapore WUE Standards** (≤2.0m³/MWh)
- ☐ **China Efficiency Requirements** (<2.5 L/kWh)
- ☐ **Local Water Authority Compliance**
- ☐ **Environmental Impact Assessments**

Documentation Readiness

Document Type	Status	Last Updated	Next Review
Water usage reports	☐ Complete ☐ Partial ☐ None	_____	_____
Regulatory filings	☐ Complete ☐ Partial ☐ None	_____	_____
Audit documentation	☐ Complete ☐ Partial ☐ None	_____	_____
Sustainability reports	☐ Complete ☐ Partial ☐ None	_____	_____
Emergency response plans	☐ Complete ☐ Partial ☐ None	_____	_____

Section 5: Technology Readiness Assessment

Current Cooling Infrastructure Evaluation

Primary Cooling Systems

System Type	% of Capacity	Age (years)	Efficiency Rating	Upgrade Priority
Air cooling (CRAC/CRAH)	_____%	_____	☐ Poor ☐ Fair ☐ Good	☐ High ☐ Med ☐ Low
Evaporative cooling	_____%	_____	☐ Poor ☐ Fair ☐ Good	☐ High ☐ Med ☐ Low
Direct-to-chip liquid	_____%	_____	☐ Poor ☐ Fair ☐ Good	☐ High ☐ Med ☐ Low
Immersion cooling	_____%	_____	☐ Poor ☐ Fair ☐ Good	☐ High ☐ Med ☐ Low
Other: _____	_____%	_____	☐ Poor ☐ Fair ☐ Good	☐ High ☐ Med ☐ Low

Technology Adoption Readiness

Technical Capabilities:

- [ ] Engineering expertise for liquid cooling
- [ ] Maintenance capabilities for new systems
- [ ] Integration with existing infrastructure
- [ ] Monitoring and control systems
- [ ] Vendor support relationships

Financial Readiness:

- [ ] Capital budget allocated
- [ ] ROI models developed
- [ ] Green financing explored
- [ ] TCO analysis completed
- [ ] Risk mitigation funded

Section 6: Mitigation Strategy Development

Priority Matrix

Based on your assessment scores, identify top priorities:

Risk Area	Score	Priority Rank	Mitigation Strategy	Timeline	Budget
_____	____	____	_____	_____	$_____
_____	____	____	_____	_____	$_____
_____	____	____	_____	_____	$_____
_____	____	____	_____	_____	$_____
_____	____	____	_____	_____	$_____

Technology Transition Roadmap

Phase 1: Quick Wins (0-90 days)

- [ ] Optimize existing cooling parameters
- [ ] Fix leaks and inefficiencies
- [ ] Implement water recycling
- [ ] Enhance monitoring systems
- [ ] Staff training programs

Expected Impact: % water reduction, $___ savings

Phase 2: Infrastructure Upgrades (3-12 months)

- [ ] Deploy hybrid cooling systems
- [ ] Install advanced controls

- [ ] Implement heat recovery
- [ ] Upgrade water treatment
- [ ] Pilot liquid cooling

Expected Impact: % water reduction, $___ savings

Phase 3: Transformation (1-3 years)

- [ ] Full liquid cooling deployment
- [ ] Zero-water cooling systems
- [ ] Alternative water sources
- [ ] AI-driven optimization
- [ ] Industry leadership position

Expected Impact: % water reduction, $___ savings

Section 7: Financial Impact Analysis

Cost-Benefit Calculation Framework

Current State Costs (Annual)

Cost Category	Amount	% of Total
Water purchases	$_____	_____%
Water treatment	$_____	_____%
Wastewater disposal	$_____	_____%
Energy for cooling	$_____	_____%
Maintenance	$_____	_____%
Regulatory compliance	$_____	_____%
Total Annual Cost	**$_____**	**100%**

Mitigation Investment Analysis

Solution	CapEx	OpEx Savings	Payback Period	10-Year NPV
Optimization	$_____	$_____	_____ years	$_____
Hybrid cooling	$_____	$_____	_____ years	$_____
Liquid cooling	$_____	$_____	_____ years	$_____
Zero-water system	$_____	$_____	_____ years	$_____

Risk-Adjusted Returns

Risk Factor	Probability	Impact	Mitigation Value
Water restrictions	____%	$_____	$_____
Price increases	____%	$_____	$_____
Regulatory fines	____%	$_____	$_____
Reputation damage	____%	$_____	$_____
Operational disruption	____%	$_____	$_____

Section 8: Implementation Planning

90-Day Action Plan

Week 1-2: Assessment Phase

- [ ] Complete facility assessments
- [ ] Compile water usage data
- [ ] Map regulatory requirements
- [ ] Identify quick wins
- [ ] Engage stakeholders

Week 3-4: Planning Phase

- [ ] Prioritize interventions
- [ ] Develop business cases
- [ ] Select pilot projects
- [ ] Secure resources
- [ ] Create timeline

Week 5-8: Execution Phase

- [ ] Implement quick wins
- [ ] Launch pilot projects
- [ ] Begin procurement
- [ ] Train teams
- [ ] Establish monitoring

Week 9-12: Optimization Phase

- [ ] Measure results
- [ ] Adjust approaches
- [ ] Scale successes
- [ ] Document learnings
- [ ] Plan next phase

Success Metrics Dashboard

KPI	Baseline	Target	Current	Status
WUE (L/kWh)	_____	_____	_____	☐ On Track ☐ At Risk ☐ Behind
Water consumption	_____	_____	_____	☐ On Track ☐ At Risk ☐ Behind
Cost savings	$_____	$_____	$_____	☐ On Track ☐ At Risk ☐ Behind
System uptime	_____%	_____%	_____%	☐ On Track ☐ At Risk ☐ Behind
Compliance score	_____	_____	_____	☐ On Track ☐ At Risk ☐ Behind

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Section 9: Stakeholder Engagement Tracker

Communication Matrix

Stakeholder Group	Engagement Level	Key Messages	Frequency	Owner
Executive Leadership	☐ High ☐ Med ☐ Low	_____	_____	_____
Board of Directors	☐ High ☐ Med ☐ Low	_____	_____	_____
IT Operations	☐ High ☐ Med ☐ Low	_____	_____	_____
Facilities Team	☐ High ☐ Med ☐ Low	_____	_____	_____
Finance	☐ High ☐ Med ☐ Low	_____	_____	_____
Sustainability	☐ High ☐ Med ☐ Low	_____	_____	_____
Legal/Compliance	☐ High ☐ Med ☐ Low	_____	_____	_____
External Partners	☐ High ☐ Med ☐ Low	_____	_____	_____

Change Readiness Assessment

Factor	Score (1-5)	Notes	Action Required
Leadership commitment	____	_____	_____
Resource availability	____	_____	_____
Technical capability	____	_____	_____
Cultural alignment	____	_____	_____
Risk tolerance	____	_____	_____

Section 10: Progress Tracking & Reporting

Quarterly Review Template

Q[X] 2025 Assessment Summary

Overall Risk Score Change:

- Previous Quarter: _____ / 100

- Current Quarter: _____ / 100
- Change: _____ points (____%)

Key Achievements:

1. _____
2. _____
3. _____

Challenges Encountered:

1. _____
2. _____
3. _____

Next Quarter Priorities:

1. _____
2. _____
3. _____

Annual Reporting Framework

Water Sustainability Report Card

Category	2024 Actual	2025 Target	2025 Actual	Variance
Total water consumption	_____	_____	_____	_____%
Average WUE	_____	_____	_____	_____%
Water costs	$_____	$_____	$_____	_____%
Recycled water %	_____%	_____%	_____%	_____ pts
Compliance score	_____%	_____%	_____%	_____ pts

Appendices

Appendix A: Glossary of Terms

- **WUE (Water Usage Effectiveness)**: Liters of water used per kilowatt-hour of IT energy
- **PUE (Power Usage Effectiveness)**: Total facility power divided by IT equipment power
- **Evaporative Cooling**: Cooling method using water evaporation to remove heat
- **Direct-to-Chip**: Liquid cooling applied directly to processors
- **Immersion Cooling**: Submerging IT equipment in dielectric fluid

Appendix B: Regional Water Stress Maps

[Include regional maps showing water stress levels for facility planning]

Appendix C: Technology Vendor Comparison

[Include detailed vendor evaluation matrix for cooling technologies]

Appendix D: Regulatory Quick Reference

[Include summary of key regulations by jurisdiction]

Appendix E: Emergency Response Procedures

[Include water shortage response protocols]

Certification & Sign-off

Assessment Certification

I certify that this Water Risk Assessment has been completed accurately and comprehensively based on available data and best professional judgment.

Assessment Lead: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Next Assessment Due: _____

Contact & Support

For questions about this assessment:

- Internal Sustainability Team: sustainability@[company].com
- Water Risk Hotline: +1-XXX-XXX-XXXX
- Executive Sponsor: [Name] - [Email]

External Resources:

- EPA Water Sense: www.epa.gov/watersense
- World Resources Institute: www.wri.org/aqueduct
- Green Grid: www.thegreengrid.org

This workbook is proprietary and confidential. Version 2.0 reflects best practices as of August 2025. Regular updates ensure alignment with evolving regulations and technology.