Technical, Managerial, Financial (TMF) Capacity for Advanced Water Purification (AWP) Regulations

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TMF Capacity

Technical Capacity: Technical capacity demonstrates the performance and operation of the AWTF. This means the water system has the right equipment, properly trained staff, and necessary skills to treat and deliver safe drinking water.

Managerial Capacity: Managerial capacity demonstration pertains to the realm of governance. This refers to having effective leadership and organization with managers who can plan, operate, and maintain the water system properly.

Financial Capacity: Financial capacity signifies a utility's financial ability in maintaining and operating its current infrastructure, alongside its financial planning for future necessities. This involves having enough money and sound financial practices to support the water systems operation, maintenance and improvements.

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Main References

- *ADEQ Capacity Development Application for a New Public Water System (PWS)*
- *Advanced Water Purification Proposed Program Roadmap*
- *Title 18, Chapter 4 Ariz. Admin. Code ADEQ's Safe Drinking Water Regulations. (§§ 18-4)*
- *§§ 18-5 A.A.C. ADEQ's Environmental Reviews and Certification*
- *§§ 18-9 A.A.C. ADEQ's Water Pollution Control*
- *Guidance Framework for Direct Potable Reuse in Arizona (National Water Research Institute, 2018)*

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General Element

- Evaluation takes place every six years, aligning with the renewal of AWP permits

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1 Technical Capacity Elements

a. Demonstration of the availability of an existing water source or contingency plans for an alternative source in the event of AWTF failure.

b. Comprehensive technical and engineering specifications for the AWTF including design and treatment capacity, information on storage, and distribution processes, manufacturer specifications showing life span of components. This information shall be included in the design/engineering report.

c. Documentation of monitoring plan of finished water.

d. Demonstrate ability to respond to emergency situations including water quality excursions.

e. Documentation that the AWTF will be operated by a certified AWT operator as outlined in Section Operator Certification.

f. Operations plan including maintenance requirements per manufacturer's specification, repair, and replacement protocols, as described in Operational requirements.

1a Technical Capacity Element – Contingency Plan for Alternative Water Supply

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AWP Technical Capacity Requirements	Rationale
<u>Contingency Plan for Alternative Water Supply</u>: Demonstration of the availability of an existing water source or contingency plans for an alternative source in the event of AWP failure. (*Roadmap 1a.*)	• Demonstrating adequacy of a continuous and reliable drinking water supply. • Risk mitigation for unforeseen events. • Comparing to conventional water sources, AWP projects are more complex and therefore require robust contingency planning.

AWP Technical Capacity Requirements	Rationale
<u>Comprehensive Technical and Engineering Specs:</u> For the AWP including design and treatment capacity, information on storage, and distribution process, manufacturer specifications showing life span of components. This information shall be included in the design/engineering report. (*Roadmap 1b.*) **1). Sufficient AWP Source Water Quantity and Quality:** Demonstration of sufficient source water availability and quality for AWP, in compliance with the ADEQ's Water Reclamation Facility Guidance for AWP. **2). Enhanced Source Control Program:** AWPRA shall implement the Enhanced Source Control Program (ESCP) as defined in the ADEQ's Enhanced Source Control Guidelines.	• Consistent flow and water quality is critical for AWP performance. • Flow equalization and post-equalization treatment could be considered. • Due to the use of wastewater as a source for drinking water, controlling, eliminating, or minimizing contaminants of concern (COCs) discharges from non-domestic sources into the wastewater collection system is necessary.

AWP Technical Capacity Requirements	Rationale
3) Cross-Connection Control Plan: Including plans for cross-connection evaluation during design, construction, and operation, and ongoing annual surveys for all facilities included in the AWP project.	• High risk of cross-connections between WWTP, AWP, and public water supply. • Prevention of backflow incidents and source contamination is essential. • Control Program helps avoid costs associated with contamination incidents.
4) Corrosion Control Plan: Corrosion control and stabilization plan to identify potential corrosion sources, develop mitigation strategies, and prevent corrosion through continuous monitoring and adjustment of water chemistry.	• New water source and treatment changes may cause corrosion, destabilize scales, and promote metal release.

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AWP Technical Capacity Requirements	Rationale
Monitoring Plan: Documentation of monitoring plan of finished water. (*Roadmap 1c*) **1). Monitoring plan addressing AWP Critical Control Points (CCPs)** in accordance with the ADEQ's AWP Design Guidelines and Operations Guidelines and AWP Regulations. - including initial source water characteristics - online compliance monitoring - performance monitoring	• CCPs are control points specifically designed for AWP to ensure treatment performance, source water quality, and compliance of the finished water. • Effluent from the Water Reclamation Facility is used as source water to produce drinking water directly, monitoring and control are essential to safeguard public health and ensure the reliability of the treated water.

AWP Technical Capacity Requirements	Rationale
Emergency Situations: Demonstrate ability to respond to emergency situations including water quality excursions. (*Roadmap 1d.*) **1) Failure Response and Peak Attenuation Plans:** Documentation in accordance with the ADEQ's AWP Design Guidelines, including one of the following: • An engineered storage buffer (ESB) sized to hold water for at least the failure response time. • An alternative approach to address operational barriers for pathogen and chemical peak attenuation.	• To ensure treated water meets all required standards before distribution and to provide monitoring/control for chemical and pathogen peaks

AWP Technical Capacity Requirements	Rationale
Certified AWTO Operator Certification: Documentation that the AWP will be operated by a certified Advanced Water Treatment Operator (AWTO) as outlined in AWP Operation Guidance. (*Roadmap 1e.)*	AWP involves complex treatment technology requiring specific O&M expertise to respond to system failure and unexpected challenges. The AWT operator should be proficient in source water risk management, CCP methodologies, and AWP regulatory requirements.

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AWP Technical Capacity Requirements	Rationale
Operations Plan: Including maintenance requirements per manufacture's specification, repair, and replacement protocols, as described in AWP Operation Guidance. (*Roadmap 1f.*)	AWP involves complex treatment technology requiring specific O&M expertise to respond to system failure and unexpected challenges.

2 Managerial Capacity Elements

a Documentation for ownership, management, and organization information with organizational chart, job description, and responsibilities.

b Information on contractual agreement for rights on purified water from the AWTF. The agreement includes the sale prices of source water, quality of source water, duration of agreement, and compliance and reporting responsibilities.

c Management of the groundwater or surface water discharge permit or recycled water permit to discharge water during upset conditions, as applicable

d Information on operations including certified operator credentials, training for staff, technical competency, technical knowledge and implementation, and operations plan.

e An outline of tools and procedures employed in the realms of management and accounting, encompassing essentials like a strategic asset management plan and a computerized maintenance management system (California State Water Resources Control Board, 2023)

Managerial Capacity Element – Ownership, Management, and Organization

AWP Managerial Capacity Requirements	Rationale
Ownership: Documentation for ownership, management, and organization information with organizational chart, job description, and responsibilities. (*Roadmap 2a.)*	To ensure clear accountability, operational continuity, and regulatory compliance among multiple entities involved in an AWP project.

AWP Managerial Capacity Requirements	Rationale
Contractual Agreements: Information on contractual agreement for rights on purified water from the AWP. The agreement includes the sale prices of source water, quality of source water, duration of agreement, and compliance and reporting responsibilities. (*Roadmap 2b.)* 1). If all aspects of an AWP project are operated and owned by more than one entity, there must be contractual agreements in place, including but not limited to the following: • Sewer Collection System • Water Reclamation Facility • Source Water Conveyance System • Advanced Water Purification Facility • Water Distribution System • Blending Facilities • Treatment Residuals Handling System • Sale price of source water • Quality of the source water • Compliance and reporting requirements if quality does not meet	• To ensure clear accountability, operational continuity, and regulatory compliance among multiple entities involved in an AWP project.

2c Managerial Capacity Element – Backup Discharge Permit

AWP Managerial Capacity Requirements	Rationale
<u>Groundwater/Surface Water Discharge Permit:</u> Management of the groundwater or surface water discharge permit or recycled water permit to discharge water during upset conditions, as applicable. (*Roadmap 2c.*) 1). Manage Arizona's Aquifer Protection Permit (APP) or Arizona Pollutant Discharge Elimination system (AZPDES) permit to use as back-up options during upset conditions.	• For Failure response and risk mitigation

2d Managerial Capacity Element – Operator, Staff and Operation Plan

AWP Managerial Capacity Requirements	Rationale
Operations: Information on operations, including: • Operated by a certified Advanced Water Treatment Operator (AWTO) • Number of available operators • Training for staff • Technical competency • Technical knowledge implementation • Operations Plan (*Roadmap 2d.)*	AWP involves complex treatment technology requiring specific O&M expertise to respond to system failure and unexpected challenges. The AWT operator should be proficient in source water risk management, CCP methodologies, and AWP regulatory requirements.

Managerial Capacity Element – Asset Management Plan

AWP Managerial Capacity Requirements	Rationale
Asset Management Plan: An outline of tools and procedures employed in the realms of management and accounting, encompassing essentials like a Strategic Asset Management Plan (SAMP) and a Computerized Maintenance Management System (CMMS). (*Roadmap 2e.)*	Asset reliability and safety are paramount for any AWP project. SAMP ensures long-term asset viability, while CMMS facilitates efficient maintenance. Together, they enhance water quality, minimize downtime, and optimize resource utilization.

Managerial Capacity Element – Public Communication

AWP Managerial Capacity Requirements	Rationale
Communication and Outreach Plan: • Efforts to build and maintain public trust and confidence • Improve public acceptance and awareness: Educate the public, stakeholders, and decision-makers about the safety, benefits, and necessity of AWP	Foster understanding and acceptance by dispelling misconceptions and concerns. Agencies demonstrate transparency and build trust with the community, essential for successful implementation and long-term support.
Emergency Response Plan: For public notification, addressing potential issues identified in the vulnerability assessment of the AWP project.	Emergency response plan will address safety assurance, public awareness, risk communication, transparency and trust, agency coordination, and alternative water supply.

3 Financial Capacity Elements

a. Capital cost of the project.

b. Identification of ongoing cost which includes operation and maintenance costs, capital replacement costs, energy cost, personnel cost and 20-year lifecycle cost of equipment.

c. Identification of 5-year financial projection, planning and management and continuing funding sources to cover the costs.

d. Financial audits and bond rating

e. Perform rate studies or assessment of impact fees need to be in place for AWP project

Financial Capacity Element – Capital and Ongoing Costs

AWP Financial Capacity Requirements	Rationale
Capital Cost of the Project: (Roadmap 3a.)	Enables utilities to make informed decisions, maintain financial stability, and provide reliable potable water through AWP. Helps plan staffing, training, and maintenance, ensures long-term reliability, informs energy-efficient technology decisions, optimizes processes, minimizes expenses, and ensures budgeting for a skilled workforce.
Identify Ongoing Costs: Identification of associated ongoing costs including: • O&M costs (sampling and enhanced source control costs) • Capital replacement costs • Energy costs • Personnel costs • All 20-year cycle costs of equipment (Roadmap 3b.)	

AWP Financial Capacity Requirements	Rationale
<u>Identify Funding Source:</u> Identification of 5-year financial projection, planning and management and continuing funding sources to cover the costs. (Roadmap 3c.) 1). **Financial Support Assistance:** Include Forms of financial support assistance (i.e., recurring revenues, grants and loans). (NWRI) 2). **Available Resources:** Description of available financial, physical, and personnel resources, and how reasonably foreseeable supply chain issues would be resolved.	Long-term planning and financial sustainability

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