NOTICE OF FINAL RULEMAKING

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 9. DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER POLLUTION CONTROL

PREAMBLE

1. Permission to proceed with this proposed rulemaking was granted under A.R.S. § 41-1039 by the governor on:

March 5, 2024

2. Article, Part, or Section Affected (as applicable)	**Rulemaking Action**
R18-9-B201	Amend
R18-9-A701	Amend
R18-9-B702	Amend
Part E	Repeal
R18-9-E701	Repeal
Article 8	Amend
Part A	New Part
R18-9-A801	New Section
R18-9-A802	New Section
R18-9-A803	New Section
Part B	New Part
R18-9-B804	New Section
R18-9-B805	New Section
R18-9-B806	New Section
R18-9-B807	New Section
R18-9-B808	New Section
R18-9-B809	New Section
R18-9-B810	New Section
R18-9-B811	New Section
Part C	New Part
R18-9-C81	New Section
R18-9-C813	New Section
R18-9-C814	New Section

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R18-9-C815	New Section
R18-9-C816	New Section
R18-9-C817	New Section
R18-9-C818	New Section
Part D	New Part
R18-9-D819	New Section
R18-9-D820	New Section
R18-9-D821	New Section
R18-9-D822	New Section
R18-9-D823	New Section
Part E	New Part
R18-9-E824	New Section
R18-9-E825	New Section
R18-9-E826	New Section
R18-9-E827	New Section
R18-9-E828	New Section
R18-9-E829	New Section
R18-9-E830	New Section
R18-9-E831	New Section
Part F	New Part
R18-9-F832	New Section
R18-9-F833	New Section
R18-9-F834	New Section
R18-9-F835	New Section
R18-9-F836	New Section
R18-9-F837	New Section

3. Citations to the agency's statutory rulemaking authority to include the authorizing statute (general) and the implementing statute (specific):

Authorizing statute: A.R.S. §§ 49-104(A)(1), (7); 49-203(A)(7), (9), (10)

Implementing statute: A.R.S. § 49-211

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4. The effective date of the rule:

This rule shall become effective immediately after a certified original of the rule and preamble are filed with the Office of the Secretary of State pursuant to A.R.S. § 41-1032(A). The effective date is March 4, 2025.

a. If the agency selected a date earlier than the 60-day effective date as specified in A.R.S. § 41-1032(A), include the earlier date and state the reason the agency selected the earlier effective date as provided in A.R.S. § 41-1032(A)(1) through (5):

The rule shall be effective on March 4, 2025. ADEQ selected this date pursuant to A.R.S. § 41-1032(A)(2) in order "to avoid a violation of … state law, if the need for an immediate effective date is not created due to the agency's delay or inaction". A.R.S. § 49-211 requires ADEQ to, "[o]n or before December 31, 2024 … adopt all rules necessary to establish and implement a direct potable reuse of treated wastewater program [A.K.A. - AWP regulatory program], including rules establishing permitting standards and a permit application process."

While an immediate effective date will not avoid a violation of A.R.S. § 49-211, it serves to ameliorate the extent of the violation by establishing an effective date as close in time as possible to the statutory deadline "on or before December 31, 2024". The Legislature charged ADEQ with the adoption of an advanced water purification program in Fall 2022, setting a justifiably aggressive deadline of December 31, 2024. Since that time, ADEQ diligently undertook an extensive program design and rule-writing approach to appropriately design the revolutionary program. Additionally, ADEQ conducted a special stakeholder approach commensurate with the intricacies of the program, itself, with myriad stakeholder efforts outlined in Section 7 of this Notice of Final Rulemaking. This process included engagement at all phases of the project, in the program framework and guiding principle development phase to the draft rule phase, and included multiple opportunities for ADEQ to work with and educate stakeholders, receive feedback on program components, and improve the program. Arizona is one of only a handful of states with a regulatory framework for advanced water purification, and the process was, therefore, carefully conducted to best preserve the interests of the Legislature and the health of Arizonans. While ADEQ worked just as aggressively to achieve the statutory deadline, best efforts nevertheless fell a few months short. For these reasons and pursuant to A.R.S. § 41-1032(A)(2), ADEQ did not delay or fail to act in such a way that led to the need for an immediate effective date.

b. If the agency selected a date later than the 60-day effective date as specified in A.R.S. § 41-1032(A), include the later date and state the reason the agency selected the later effective date as provided in A.R.S. § 41-1032(B):

Not Applicable.

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5. Citations to all related notices published in the *Register* as specified in R1-1-409(A) that pertain to the current record of the final rule:

Notice of Proposed Rulemaking: 30 A.A.R. 3196, Issue Date: November 1, 2024, Issue Number: 44, File Number: R24-211.

Notice of Rulemaking Docket Opening: 30 A.A.R. 2879, Issue Date: September 20, 2024, Issue Number: 38, File Number: R24, 179.

6. The agency's contact person who can answer questions about the rulemaking:

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7. An agency's justification and reason why a rule should be made, amended, repealed or renumbered, to include an explanation about the rulemaking:

***Introduction*:**

The Arizona Department of Environmental Quality ("ADEQ") is mandated by the Arizona Legislature, pursuant to Arizona Revised Statutes (A.R.S.) § 49-211, to "adopt all rules necessary to establish and implement a direct potable reuse of treated wastewater program, including rules establishing permitting standards and a permit application process". The statute, adopted from House Bill 2861, as enacted in the Second Regular Session on June 28, 2022, became effective on September 24, 2022. For purposes of this Notice and the final rule, the term "direct potable reuse" is synonymous with "Advanced Water Purification" (or "AWP"), as the program is now called.

ADEQ, in consideration of Arizona's water supply needs and the Legislative mandate, interpreted A.R.S. § 49-211 as a call to establish an AWP program that is both protective of human health and the environment, as well as imposing minimum burden upon the stakeholder community in achieving that goal. The result of that effort is detailed in the final programmatic requirements

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placed in the Arizona Administrative Code (A.A.C.), Title 18, Chapter 9, Article 8, through this Notice of Final Rulemaking (NFRM) and through the simultaneously filed associated NFRMs, proposing supporting rules and amendments to Title 18, Chapters 1, 5, 9 and 14.

***Background*:**

Arizona faces significant water supply challenges requiring proactive approaches to conservation and stewardship, in anticipation of decreased water availability in the future. Arizona is currently experiencing a severe and sustained drought, persisting since 1994. The state has experienced an average annual precipitation of approximately 12 inches, and climate data reveals a concerning trend: a consistent reduction of 0.9 inches of rainfall per year over the past three decades (Arizona State University, 2023, Climate of Arizona, https://azclimate.asu.edu/climate/). As a result of the continuing mega-drought, a Drought Emergency Declaration has existed since 1999. The impacts can be felt heavily in the rural areas of the state, where alternative water supplies are generally very limited and the economy is strongly affected by drought (e.g., grazing, irrigated agriculture, recreation, forestry). Most of rural Arizona relies exclusively on groundwater as its primary water source and lacks the groundwater regulations and conservation requirements which have been present in the state's active management areas (AMAs) and irrigation non-expansion areas (INAs). In addition to the reduced precipitation within Arizona, the Colorado River Basin is also facing decades-long drought conditions, which have led to historically low water levels in Colorado River system reservoirs. As a result, Arizona has implemented measures to reduce its consumption of Colorado River water. The Lower Colorado River Basin first experienced a Tier 1 Shortage as agreed in the 2007 Interim Guidelines and the Drought Contingency Plan in 2021. In 2022, Bureau of Reclamation Commissioner Camille Touton called on the Colorado River states to conserve between 2-4 million acre feet per year to address the critically low levels in Lake Powell and Lake Mead following a dire water year. Fortunately, voluntary reductions in the Lower Basin and a healthy water year 2022 averted a decline to critically low elevations. However, as the Basin States look ahead, climate projections and historical trends indicate that the Basin is likely to face increasing average temperatures and reduced precipitation in the coming years. Arizonans will likely be called upon to live with further reduced Colorado River supplies for the foreseeable future as the next set of operational guidelines for the Colorado River are finalized.

Beyond the shrinking water supply, economic growth presents water providers with formidable challenges in meeting demand. As water-intensive industries relocate to Arizona, industrial water demands may increase. Furthermore, there may be challenges with maintaining the necessary housing growth due to the release of the new models of groundwater conditions in the Phoenix and Pinal AMAs. The results of the groundwater flow model projections show that over a period of 100 years, the Phoenix AMA will experience 4.86 million acre-feet (maf) of unmet demand for groundwater supplies and the Pinal AMA will experience 8.1 maf of unmet demand for groundwater supplies, given current conditions. In keeping with these findings of unmet demand, the State will not approve new determinations of Assured Water Supply within the Phoenix and Pinal AMAs based on groundwater supplies.

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This will lead to an increased competition for limited alternative water supplies. As growth continues, there will be an increasing need for sustainable and innovative water resource management strategies to accommodate the state's evolving needs.

***What is AWP*?**

Advanced Water Purification (AWP) is defined as the treatment and distribution of a municipal wastewater stream for use as potable water without the use or with limited use of an environmental buffer (US EPA, 2017, Potable Reuse Compendium). AWP has been shown to be a safe and effective source of potable water over decades of implementation in projects that have been installed worldwide at facilities in Big Spring, Texas (2013); Wichita Falls, Texas (2014); Namibia (1968 and 2002); Singapore (2019); and South Africa (2011) (Lahnsteiner, J., Van Rensburg, P., & Esterhuizen, J., 2018, Direct potable reuse–a feasible water management option. Journal of Water Reuse and Desalination, 8(1), 14-28).

AWP applications typically consist of a conventional water reclamation facility (WRF) or wastewater treatment plant (WWTP) that performs solids, carbon, nutrient, and pathogen removal and an advanced water treatment facility (AWTF) that provides additional pathogen and trace chemical removal. An AWTF is a utility or treatment plant where recycled wastewater is treated to produce purified water to meet specific AWP requirements. AWTFs use a multi-barrier approach where several redundant unit processes in series are installed to treat WRF effluent to potable water standards. Depending on the site-specific infrastructure configuration and treatment capabilities, the AWTF effluent may be introduced into several different locations of the potable water treatment and distribution system to be reused: (i) in the intake to the existing drinking water treatment facility (DWTF); (ii) after the DWTF and prior to the potable water distribution system; or (iii) Directly into the potable water distribution system.

***Evolution of AWP in Regulations*:**

A predecessor to the AWP program was adopted in the A.A.C. in 2018 at R18-9-E701, including a definition of "[a]dvanced reclaimed water treatment facility" at R18-9-A701(1). An associated NFRM filed simultaneously with this NFRM will repeal these rules in their entirety to make way for the AWP program. This prior, less detailed, single-ruled program was placed in Title 18, Chapter 9, Article 7 of the A.A.C. Article 7 is entitled "Use of Recycled Water". Part E of Article 7 was entitled "Purified Water for Potable Use" and R18-9-E701 was entitled "Recycled Water Individual Permit for an Advanced Reclaimed Water Treatment Facility". R18-9-E701 detailed basic requirements for an advanced reclaimed water treatment facility and, during the rule's tenure, was used to permit one such facility. The facility was not authorized to, and did not, distribute purified water as drinking water through established conveyances or networks. As was stated above, in recent years, the Arizona Legislature determined a need for a more robust regulatory program for AWP. The Legislature passed House Bill 2861 into law in 2022, effectuating statute A.R.S. § 49-211, which led directly to the establishment of the final AWP program and the repeal of the previous program.

***Associated Rulemakings*:**

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This final rulemaking includes four NFRMs, adding, repealing or amending rules in A.A.C. Title 18. Environmental Quality:

- Chapter 1 (Department of Environmental Quality - Administration),
- Chapter 5 (Department of Environmental Quality - Environmental Reviews and Certification),
- Chapter 9 (Department of Environmental Quality - Water Pollution Control), and
- Chapter 14 (Department of Environmental Quality - Permit and Compliance Fees).

The final changes to Chapter 1 are specific to updating the Licensing Time-Frame requirements in Article 5 to account for the new AWP program. The final changes to Chapter 5 are specific to amending the Minimum Design Criteria in Article 5 to correspond with the rules in the AWP program which outline the interconnection between AWP and the Safe Drinking Water Act, specifically between AWP permitting and design requirements and those in Article 5, applicable to public water systems. The final additions, amendments and repeals to Chapter 9 are all aimed at making way for and establishing the AWP regulatory program. The final changes to Chapter 14 are specific to updating the Water Quality fees in Article 1 to accommodate the AWP program commensurate with other water quality programs.

***Placement, Structure and Design of the Final AWP Programmatic Rules*:**

The AWP regulatory program's central rules are placed in Title 18 (Environmental Quality), Chapter 9, (Department of Environmental Quality - Water Pollution Control), Article 8 (Advanced Water Purification) of the A.A.C. Article 8 was vacant at the time the NPRM and this NFRM was filed, with previous rules in Article 8 repealed since the year 2000.

The immediate subsections below explain the program's primary components and rules, distinguished by the "Parts" within Article 8:

- Part A. General Provisions: R18-9-A801 - R18-9-A803

This Part contains provisions applicable to the entire Article, including definitions and incorporation by reference material. R18-9-A802, "Program Review; Incorporation by Reference; Quality Assurance/Quality Control Methodologies", requires ADEQ to review the AWP program, upon certain triggers, to assess the rules and components for adequacy against currently available data and best available science in order to determine whether any rule should be amended or appealed or any incorporated by reference material updated. These triggers include updated health advisory values and other emerging scientific developments impacting the AWP program. The rule also contains a list of material incorporated by reference, including the version incorporated and where the general public may access the version. Notably, R18-9-A803 is entitled "Applicability of the Safe Drinking Water Act" and details the interconnection between the AWP program and the Safe Drinking Water Act (42 U.S.C. 300f *et seq.*). The AWP regulatory program derives its authority from Arizona state statute, as is detailed above. At the time of this rulemaking, the AWP subject matter had no direct federal regulatory analog. However, due to the flexibility of the AWP program and the multitude of options available to an AWP permittee concerning how to best employ AWP in accordance with the system needs, infrastructure,

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and economic situation, an AWTF may introduce advanced treated water at several locations, including to a public water system as a source (advanced treated water), or directly to distribution for human consumption (finished water). This means that there are potential interconnections between the AWP program and the protections of the Safe Drinking Water Act. Therefore, the content of R18-9-A803 was necessary to outline that intersection. For example, the section presumptively characterizes treated wastewater as surface water under the Safe Drinking Water Act, provides that nothing in the AWP program exempts any AWP facility from applicable Safe Drinking Water Act requirements, and clarifies the connections between A.A.C. Title 18, Chapter 5, Article 5, and the AWP program.

- Part B. General Program Requirements: R18-9-B804 - R18-9-B811

This Part contains foundational requirements of the AWP program. R18-9-B804, entitled "Advanced Water Purification Operator Certification" sets forth the final applicability and requirements for AWTF operators under a new AWP operator certification. The final rule requires an AWP operator to i) pass an AWP validated examination; ii) meet advanced water treatment qualifying experience requirements; and iii) be certified as either a Grade 3 or Grade 4 drinking water or wastewater operator. Under subsection (F) of the final rule the AWP operator examination requirements are established, which will include topics specific to understanding and operation of advanced treatment technologies at an AWTF. In order to ensure that all applicants are knowledgeable of drinking water treatment technologies and operations, the AWP rule requires that applicants with a Grade 3 or Grade 4 wastewater treatment operator certification take a separate version of the AWP operator examination which tests drinking water knowledge equivalent to existing Grade 3 drinking water treatment operator examinations. Types of AWP operators include shift operators, operators in direct responsible charge, and an operator in direct responsible charge proxy. Only applicants with Grade 4 drinking water operator experience are eligible for certification as AWP operator in direct responsible charge. AWP shift operators are eligible for designation as an operator in direct responsible charge proxy.

Subsection (D) sets forth general requirements including the requirement for AWPRA facility owners to ensure proper operation of AWPRA facilities. Under this provision, ADEQ requires a facility receiving pathogen treatment credits under AWP to have at least one full-time AWP operator in direct responsible charge on staff that is onsite for at least two full shifts per day. The Department intends for an operator in direct responsible charge to be onsite, consistently, throughout the year at a frequency and duration that ensures the facility is primarily operated, hands-on, by the most experienced and qualified operator. The subsection, additionally, provides for what must occur when an operator in direct responsible charge is not onsite – the operator in direct responsible charge proxy must be onsite and the operator in direct responsible charge must be available to provide direction, if necessary. Furthermore subsection (D) provides a waiver option that an AWPRA may request at any time, which would supplant the requirement for an operator in direct responsible charge to be onsite for at least two full shifts per day with an alternative operation schedule, as agreed upon and set forth in the AWPRA's operations plan.

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Subsection (K) states additional minimum qualifying experience, requiring all applicants to have at least one year of advanced water treatment qualifying experience. Advanced water treatment qualifying experience may be obtained by operating an AWP pilot facility, operating an AWP demonstration facility that does not distribute finished water, through a demonstration of experiential reciprocity, through an apprenticeship under an AWP operator on-site at an AWP facility, or through any other Department-approved method.

The final rule includes transition provisions in subsection (M), providing a grace period of two years from the effective date of the AWP programmatic rules in Chapter 9, during which time operators of facilities receiving pathogen treatment credits under AWP are exempted from the AWP operator certification requirements in R18-9-B804 in order to allow operators reasonable time to obtain certification under the new program. During this transition period, the final rule requires AWTF operators to be Grade 4 drinking water-certified operators who have completed additional Department-approved training, as appropriate.

R18-9-B805, entitled, "Advanced Water Purification Responsible Agency Formation; Joint Plan", details final requirements for formation of the entity, known as the Advanced Water Purification Responsible Agency (AWPRA), that applies for permitting under the AWP program. R18-9-B806, entitled "General Requirements", details program prohibitions, confidentiality provisions, and the general requirement that treated wastewater used to supply an AWP project must originate as municipal wastewater. R18-9-B807, entitled "Inspections, Violations, and Enforcement", clarifies the applicable enforcement authority related to the AWP program. R18-9-B808, entitled "Recordkeeping", details final requirements for the AWPRA related to certification, collection, and retention of records. R18-9-B809, entitled "Construction and Compliance with Plans", regulates facility modifications prior to permitting. R18-9-B810, entitled "Record Drawings", lists requirements surrounding the recording and certification of project drawings. R18-9-B811, entitled "Outreach; Public Communications Plan", sets forth requirements for an AWPRA's Public Communications Plan.

- Part C. Pre-Permit and Permit Requirements: R18-9-C812 - R18-9-C818

This Part contains requirements in preparation for, and including, permit application. It includes a pre-application conference option in order to facilitate a discussion between the applicant and the Department in the preliminary stages of an application process. The Part also includes details on when a "Project Advisory Committee" may be formed to assist the Department and the applicant in project development and review. R18-9-C813, entitled, "Applicant Pathways Depending on National Pretreatment Program Applicability" details pre-permit application procedural requirements of an applicant depending on their applicability to the Clean Water Act's National Pretreatment Program (NPP). The rule enables two different pre-permit procedural approaches, one for AWPRA applicants that are subject to the NPP, and one for AWPRA applicants that are not subject to the NPP. These two pathways were created due to the importance of, and advantage associated with, NPP experience that an applicant will have in sewershed characterization, knowledge, etc., and is intended to promote application autonomy for more sophisticated facilities

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along with opportunities for Department assistance and review where applicable.

R18-9-C814, entitled, "Initial Source Water Characterization" details chemical and pathogen monitoring of an Advanced Water Treatment Facility's (AWTF) treated wastewater source, which comes from a Water Reclamation Facility (WRF) or Wastewater Treatment Plant (WWTP). Initial Source Water Characterization or "ISWC" is an important step in identifying chemical and pathogen existence and load in the treated wastewater source in order to determine how to address control through treatment, source control, or a combination of the two. Of note, the ISWC Report must be finalized within three years of ISWC monitoring commencement, unless the Director allows otherwise. Such an expectation will be difficult to justify and must be accompanied by robust data.

R18-9-C815, entitled, "Pilot Study" details the requirements of pilot testing which assists in making decisions about the selection of specific advanced water treatment (AWT) processes, verifying the performance of chosen treatment processes, providing the opportunity to evaluate the effectiveness of different types of treatment processes and designing of the full-scale AWP process. Notably, the rule allows an applicant to conduct the Pilot Study and Full-Scale Verification simultaneously if the applicant chooses to build to full-scale during what would otherwise be a pilot facility build. If the applicant chooses this pathway, the rule requires a) a consultation with the Department, b) the development and submission of a "Hybrid Pilot and Full-Scale Verification Plan" to the Department for review and comment, and c) the submission of the "Hybrid Pilot and Full-Scale Verification Plan" and "Hybrid Pilot and Full-Scale Verification Report" to the Department for approval under the permit application. This optionality reflects the additional flexibility incorporated into the rule for various types of planned facilities by providing a reasonable construction pathway for facilities that opt to build full-scale at this stage.

R18-9-C816, entitled, "Permit Application" details the permit application requirements and process. R18-9-C817, entitled, "Demonstration permit" details the demonstration permit application requirements and process. An AWP Demonstration permit may be issued under the AWP program for the purpose of showcasing an AWTF for public outreach, finished water tasting, and other related non-distribution purposes. R18-9-C818, entitled, "Compliance Schedule", prescribes the requirements on the AWPRA regarding compliance schedules established by the Department in the AWP permit. It further prohibits the delivery of advanced treated water from an AWTF, or distribution of finished water, until the Department approves all compliance schedule requirements.

- Part D. General Permit Requirements: R18-9-D819 - R18-9-D823

This Part contains final requirements and conditions of permitting. It includes public notice and participation provisions in R18-9-D819 and R18-9-D820, respectively. Additionally, R18-9-D821, entitled "Permit Amendments" prescribes the final permit amendment process, which includes two amendment categories: significant and minor. R18-9-D822, entitled "Permit Term; Permit Renewal" details the five-year term of an AWP permit and the renewal application process. Lastly, R18-9-D823, entitled "Permit

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Suspension, Revocation, Denial, or Termination" details conditions and factors surrounding ADEQ's decision to revoke, deny, or terminate an AWP permit or AWP demonstration permit.

- Part E. Constituent Control, Monitoring, and Reporting: R18-9-E824 - R18-9-E831

This Part contains the requirements for applicant and permittee constituent control, as well as, monitoring and reporting in preparation for permit application and as a permittee in ongoing permitted operations.

R18-9-E824, entitled, "Enhanced Source Control" details the requirements and process permittees must adhere to in inventorying their sewershed, by, in part, identifying "potentially impactful non-domestic dischargers" and determining a subset therein of "impactful non-domestic dischargers". Additional control measures are required for a permittee's "impactful non-domestic dischargers". The rule also details the general requirements of a permittee's enhanced source control program.

R18-9-E825, entitled, "Tier 1 Chemical Control; Maximum Contaminant Levels" establishes the Safe Drinking Water Act's Primary Drinking Water Maximum Contaminant Levels or (MCLs) as the "Tier 1" chemicals for regulation under the AWP program. Notably, this rule cross-references the drinking water rules in A.A.C. Title 18, Chapter 4, Article 1, R18-4-102, specifically. R18-4-102 incorporates by reference the Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter D, Part 141. By cross-referencing this incorporation by reference, ADEQ intends for that version of the CFR to apply to AWP, and as that version continues to be updated in the future, the cross-reference serves as a living link between the two programs, ensuring that the same version of the CFR applies to both Chapter 4, Article 1 and the AWP program, in Chapter 9, Article 8. ADEQ plans to update the rules in Chapter 4 to incorporate the most up-to-date version of 40 CFR Part 141 by 2026, ensuring that all future AWP projects, with the first permits expected to be issued in 2027, are approved with the most current standards.

R18-9-E826, entitled, "Tier 2 Chemical Control; Advanced Water Purification-Specific Chemicals", details the process for identifying, calculating and determining the "Tier 2" chemicals for regulation under the AWP program. Tier 2 chemicals are contaminants identified under R18-9-E826 that are not regulated in the Safe Drinking Water Act, but may be present in the treated wastewater source and may pose human health concerns. Due to elevated health concerns with the treated wastewater source of AWTFs and likewise protections in similar regulatory programs and facilities around the world, the rule requires applicants and permittees to generate and maintain a Tier 2 chemical list for treatment or source control (regulation). Tier 2 list determination and associated alert and action levels to be generated under the rule will be largely based on the Environmental Protection Agency's (EPA) "2018 Edition of the Drinking Water Standards and Health Advisories Tables" (EPA HA Table).

In the case where a chemical does not have a health advisory in the EPA HA Table, but does have a notification level, or an equivalent value, in another state's drinking water program – if approved and listed by the Department in the rule – the AWPRA must compare the chemical's projected daily concentration in the AWTF's treated wastewater influent with the approved notification level, or equivalent value. Upon the comparison, if the concentration exceeds the approved value, the chemical shall

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become a Tier 2 chemical for the purposes of the program. The only chemical that falls into this category at the time of this rulemaking is Trimethylbenzene (1,2,4-) (CAS No. 95-63-6), which has a notification level established in California's drinking water regulations (*see* Heading No. 7 below for reference) and which has been set using an ADEQ-approved methodology. The rule provides a placeholder for other chemicals which may be added upon due analysis by the Department in the future, as more drinking water standards are established, reviewed, and endorsed by the Department pursuant to R18-9-A802(A).

In the case where a chemical does not have a health advisory in either the EPA HA Table, nor another state's drinking water program, the rule requires the AWPRA to compare the chemical's projected daily concentration with a set of interim, Departmentally-generated health advisories, that may be updated or removed via rulemaking as additional information becomes available. If the concentration exceeds the Departmentally-generated health advisory, the chemical shall become a Tier 2 chemical, but only for ongoing monitoring purposes pursuant to R18-9-E829. Additionally, this subcategory of Tier 2 chemicals is exempt from all compliance requirements under R18-9-E829(D) and are not to be considered part of the Projected Chemical Treatment List in R18-9-E826(F), nor will be required to have action levels. The reason behind the special requirements for this sub-category is that while these chemicals are not yet widely regulated, the Department has determined a need to further examine and monitor them at this time. The EPA HA Table contains eight chemicals without health advisory values. Therefore, the Department generated health advisories for those eight chemicals using the same formulas and assumptions EPA used to develop the EPA HA Table, which can be found in the EPA publication, "Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)" (*see* NFRM Section 8 below for other studies leveraged in generating these health advisories). It should be noted that when the Department endorses another state drinking water program's notification level or equivalent value the methodology used by the other state is compared and held to the standard of the formulas and assumptions used to develop the EPA HA Table as well.

In the case where a chemical does not have a health advisory in the EPA HA Table, in another state's drinking water program, nor one established by the Department, but does have a Reference Dose (RfD) or Cancer Slope Factor (CSF) in credible peer-reviewed literature or state or Federal databases, the rule requires a consultation between the applicant, the Department and/or the Project Advisory Committee (PAC) to determine a health advisory value. Thereafter, the AWPRA would compare the chemical's projected daily concentration with the determined health advisory. If the concentration exceeds the determined health advisory, the chemical shall become a Tier 2 chemical.

Lastly, in the rare case where a chemical does not have a health advisory in the EPA HA Table, in another state's drinking water program, in the Departmentally-established list, nor a RfD or CSF in credible peer-reviewed literature or state or Federal databases, the rule requires the AWPRA to determine the health risk of the chemical through reasonably appropriate bioanalytical studies and/or bioassays and to propose an action level that is reasonably protective of human health.

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R18-9-E827, entitled, "Tier 3 Chemical Control; Performance-Based Indicators" details the requirement of an applicant or permittee to monitor the constituent reduction performance of selected treatment processes at pilot and full-scale treatment trains or to provide an indication of an individual process's failure. Performance-based indicators (pathogens, chemicals or compounds) are selected and proposed by applicants or permittees along with critical control points along the treatment train, all with the purpose of isolating process performance.

R18-9-E828, entitled, "Pathogen Control" details the two options an applicant or permittee has in controlling pathogens. Pathogen control is largely based on standardized reduction of the three "reference pathogens", which are enteric viruses ("enteric"), Giardia lamblia cysts ("Giardia") and Cryptosporidium oocysts ("Crypto"). Studies show that certain reduction of these three reference pathogens can be used as an indicator of general pathogen reduction. The Department implements a "Standard Approach" to pathogen control at a log reduction of the three aforementioned reference pathogens at 13 log for enteric, 10 log for Giardia and 10 log for Crypto. This approach requires no pathogen site-specific sampling. The other option is the "Site-Specific Approach", which includes a program of site-specific pathogen sampling resulting in customized log reduction values for the reference pathogens.

R18-9-E829 and R18-9-E830 detail the ongoing monitoring and reporting requirements, respectively, while R18-9-E831 details the final requirements related to annual reporting.

- Part F. Technical and Operational Requirements: R18-9-F832 - R18-9-F837

This Part contains the technical and operation requirements of the AWP regulatory program. R18-9-F832, entitled, "Minimum Design Criteria" details the basic or minimum, mandatory requirements of an AWP operation's design, mostly pertaining to the AWTF. Minimum requirements in this section address design mandates concerning chemical and pathogen control, Total Organic Carbon removal, corrosion control, nitrogen management, Advanced Oxidation Processes (AOP), failure response time, cross-connection and minimum requirements for WRFs that are a source for the treated wastewater of an AWTF.

R18-9-F833, entitled, "Technical, Managerial, and Financial Demonstration" details the requirements of an applicant or permittee to demonstrate technical, managerial and financial capacity to operate, manage and fund the project, among other relevant considerations.

R18-9-F834, entitled, "Total Organic Carbon Management" details the requirement of an applicant or permittee to manage Total Organic Carbon (TOC) in one of two ways. The first approach ("Standard Approach") requires the applicant or permittee to maintain a limit of 2 mg/L in the advanced treated water. This approach requires no site-specific TOC sampling. The second approach ("Site-Specific Approach") requires the applicant / permittee to conduct two procedures in order to derive two preliminary TOC values, followed by a comparison of the two values to ascertain the lower value, which ultimately becomes the site-specific TOC value. The two procedures are as follows:

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(1) The "Trace Organics Removal Procedure" establishes a preliminary TOC value through the TOC sampling and characterizing of the original drinking water sources that feed water consumption in a service area that is then collected in sewersheds and routed to, and treated by, a WRF that is a source of treated wastewater for an AWTF. A preliminary TOC value for the Trace Organics Removal Procedure is derived through this process and is detailed in the rule at R18-9-F834(C)(1).

(2) The "DBP Precursor Reduction Procedure" establishes a preliminary TOC value through the conducting and then comparing of two DBP and TOC - based sampling methods (*see* (a) and (b) immediately below). Those methods (in and of themselves) result in two TOC values. The lower of those two TOC values becomes the preliminary TOC value for the DBP Precursor Reduction Procedure. This is detailed further in rule at R18-9-F834(C)(2).

(a) Method 5710 C "Simulated Distribution System Trihalomethanes" (SDS-THM) establishes a TOC value in the advanced treated water. The TOC value is derived by both conducting Standard Method 5710 C and sampling for TOC in the advanced treated water monthly for one year. This results in 12 Total Trihalomethane (THM) values and 12 TOC values. The TOC values are then averaged. Likewise, the THM values are averaged. Thereafter, the THM average is compared to the corresponding Safe Drinking Water Act - Maximum Contaminant Level (MCL) for THM. If the average THM is below the THM MCL, then the *average TOC* for that year becomes the TOC value associated with Method 5710 C - SDS-THM. If the average THM is at or above the THM MCL, then the AWPRA may not use the *average TOC* for that year as the TOC value associated with Method 5710 C - SDS-THM. However, the AWPRA may adjust components of their operation and repeat the sampling above until a 12-month average THM concentration in the advanced treated water is below the corresponding THM MCL. This method is detailed further in rule at R18-9-F834(C)(2)(a).

(b) "CCL5 - DBP Sampling Method" also establishes a TOC value in the advanced treated water. The TOC value is derived through monthly sampling of the advanced treated water for one year of both:

- TOC, and
- only the DBPs that exist in both EPA's "Contaminant Candidate List 5 - Exhibit 1b - Unregulated DBPs in the DBP Group on CCL 5" and EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables" (HA Table) (currently, that includes only Formaldehyde (CAS No. 50-00-0) and N-Nitrosodimethylamine (NDMA) (CAS No. 65-75-9)).

If the average sampling results for either DBP (Formaldehyde or NDMA) are lower than the corresponding health advisory in EPA's HA Table, then the *average TOC* for that year becomes the TOC value associated with Method CCL5 - DBP. If the average sampling results for either DBP (Formaldehyde or NDMA) are at or above the

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corresponding health advisory in EPA's HA Table, then the AWPRA may not use the *average TOC* for that year as the TOC Value associated with Method CCL5 - DBP. However, the AWPRA may adjust components of their operation and repeat the sampling above until any one DBP (Formaldehyde or NDMA) is below the corresponding health advisory in EPA's HA Table. This method is detailed further in rule at R18-9-F834(C)(2)(c).

Thereafter, the applicant or permittee determines the lower of the two TOC values associated with Method 5710 C - SDS-THM & Method CCL5 - DBP (listed as "(2)(a)" and "(2)(b)" above, respectively). The lower TOC value becomes the preliminary TOC value for the DBP Precursor Reduction Procedure (listed as "(2)" above) (*See* R18-9-F834(C)(2)(d) for the corresponding rule language).

Then, the permittee determines which of the two preliminary TOC values (from the Trace Organics Removal Procedure and the DBP Precursor Reduction Procedure, listed as "(1)" and "(2)" above) is lower. That value becomes the AWPRA's site-specific TOC Limit (*See* R18-9-F834(C)(3) for the corresponding rule language).

Upon issuance of a permit and AWTF operation, a permittee may switch between the two TOC Management approaches (Standard or Site-Specific) each calendar year (*See* R18-9-F834(A) for the corresponding rule language).

Also of note, ADEQ should in the future update the TOC rule when new versions of "Contaminant Candidate List 5 - Exhibit 1b - Unregulated DBPs in the DBP Group on CCL 5" and EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables" are established (such as the "CCL 6" list or a new version of the Health Advisories Table). At that time, ADEQ should additionally update the DBPs to be sampled pursuant to subsection (C)(2)(c)(i).

R18-9-F835, entitled, "Full Scale Verification" details the requirements of verifying an AWTF's treatment train performance once built. Under the final rules, an applicant or permittee could be issued a limited permit and perform full-scale verification thereafter, through a compliance schedule item (*see* R18-9-C816(E) and R18-9-C818). Notably, the rule allows an applicant to conduct the Pilot Study and Full-Scale Verification simultaneously if the applicant chooses to build to full-scale during what would otherwise be a pilot facility build. If the applicant chooses this pathway, the rule requires a) a consultation with the Department, b) the development and submission of a "Hybrid Pilot and Full-Scale Verification Plan" to the Department for review and comment, and c) the submission of the "Hybrid Pilot and Full-Scale Verification Plan" and "Hybrid Pilot and Full-Scale Verification Report" to the Department for approval under the permit application. This optionality reflects the additional flexibility incorporated into the rule for various types of planned facilities by providing a reasonable construction pathway for facilities that opt to build full-scale at this stage.

R18-9-F836, entitled, "Operations Plan" details the requirements of an operations plan an applicant or permittee must develop for Departmental approval and follow throughout permitted operations.

R18-9-F837, entitled, "Vulnerability Assessment" details the requirements of a vulnerability assessment that must be conducted

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by the applicant for submission and approval by the Department for the AWP project for the purpose of identifying areas and processes with a potential to be vulnerable to attack, sabotage, or disruption.

***Further Explanation*:**

Further explanation on the program can be found in the Department's summary of the final program, known as the "Roadmap", available online at https://static.azdeq.gov/wqd/awp/roadmap.pdf. Also, the Department has responded to and published, online, an assortment of technical questions, addressing stakeholder concerns and clarifying decisions in the design of the regulatory program, under the AWP Rulemaking agency website at https://azdeq.gov/awp-resources. Other explanatory resources are available at the rulemaking's general webpage at https://azdeq.gov/awp-rulemaking.

***Changes to Existing Regulations*:**

This NFRM includes in its scope the removal of R18-9-A701 and R18-9-E701 (*see* "Evolution of AWP in Regulations" subsection above) and the amending of R18-9-B201 and R18-9-B702. R18-9-B201(E) provides that "[a] person shall not create or maintain a connection between any part of a sewage treatment facility and a potable water supply so that sewage or wastewater contaminates a potable or public water supply." In preserving the general prohibition, but excepting AWP projects, the following will be added as a second sentence in R18-9-B201(E), "[a] person may only create and maintain a connection between sewage treatment facilities, advanced water treatment facilities and potable water supply under an Advanced Water Purification permit issued pursuant to Article 8 of this Chapter." R18-9-B702(H) lists prohibited activities for reclaimed water usage under Article 7 (Use of Recycled Water). Under the existing rule, subsection R18-9-B702(H)(2) prohibits "[p]roviding water for human consumption from a reclaimed water source *except as allowed in Part E of this Article*" (emphasis added). Since R18-9-E701, which is the sole rule in "Part E", is removed by this rulemaking, it is appropriate to remove the corresponding language in the prohibition in subsection R18-9-B702(H)(2) for uniformity.

***Stakeholder Engagement*:**

ADEQ embarked on a significant stakeholder engagement process at two informal rulemaking stages: 1) AWP program framework and guiding principle development; and 2) AWP draft rule review and comments.

AWP program framework and guiding principle development:

Immediately following the effective date of A.R.S. § 49-211 in September 2022, ADEQ identified several stakeholder groups for engagement surrounding AWP program development and adoption and convened a Technical Advisory Group (TAG) (*see* ADEQ, Technical Advisory Group, https://azdeq.gov/awp-tag) in October 2022. The TAG consisted of experts and representatives from the following groups: academia; small, medium, and large utilities; regulatory agencies; and consulting engineers and scientists. The TAG routinely met twice per month - 114 meetings - and, on July 14, 2023, delivered to ADEQ the "Advanced Water Purification (AWP): Technical Advisory Group (TAG) Recommendations" (Technical Advisory Group, Advanced Water

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Purification (AWP): Technical Advisory Group (TAG) Recommendations, July 14, 2023, https://static.azdeq.gov/wqd/awp/tag_recommendations.pdf).

In 2023, ADEQ initiated in-depth stakeholder engagement, comprising more foundational data upon which the AWP program was designed. ADEQ, through the assistance of HMA Public Relations and BrandOutlook, conducted an analysis of public perceptions surrounding AWP with the goal of gathering informative data for the development of the program rules. The objectives of the initiative included: understanding perceptions about the urgency of the water situation in Arizona; determining the top concerns and efforts made to alleviate water issues in Arizona; determining what people think about AWP; gathering information about barriers to implementing AWP; understanding best methods of communicating AWP to the public; and gaining feedback on the role of ADEQ in presenting AWP as a viable solution to water needs to municipalities and end users. The initiative included two phases: qualitative stakeholder interviews and a quantitative survey of Arizonans.

Under Phase One, ADEQ engaged with representatives from leading entities and organizations comprising eight key stakeholder groups including: utilities; government; academia; policy; commercial; community; agriculture; and healthcare. A summary of the key findings are as follows:

- Participants agreed that Arizona faces water challenges both now and in the future;
- Participants indicated general awareness of current water initiatives to mitigate the water issues in Arizona;
- Participants indicated disparate knowledge of AWP as a water supply option;
- Key top of mind benefits of AWP included water supply, economics, and the environment;
- Key top of mind drawbacks of AWP included the 'yuck' factor, trust issues, skepticism, and cost.
- There are clear opportunities to shift perceptions;
- The general public should be engaged early in the adoption effort;
- Sophisticated water stakeholders are willing and ready to adopt AWP but recognize the need for flexibility; and
- ADEQ has the responsibility to engage in a holistic adoption approach (*see* ADEQ, Final Report - Understanding Perceptions and Barriers to Direct Potable reuse (DPR) Adoption, Phase 1 - Qualitative Research with Stakeholders, April 10, 2023, https://static.azdeq.gov/wqd/awp/dpr_rpt_23.pdf).

Under Phase Two, ADEQ solicited a blind survey of 1,314 Arizona residents across 13 counties. A summary of the key findings are as follows:

- Residents indicated broad concern about water supply now and in the near future;
- Residents indicated personal water consumption is primarily filtered or bottled;
- Residents were receptive to AWP as a viable option to mitigate water supply concerns, with 70% indicating they were "somewhat" or "very likely" to drink AWP water;

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- Residents indicated such barriers to AWP adoption as skepticism regarding safety, 'yuck' factor, and cost; and
- Residents indicated that educational outreach can overcome barriers to AWP adoption (*see* ADEQ, Final Report - 2024 Quantitative Research Regarding Advanced Water Purification (AWP), May 31, 2024, https://static.azdeq.gov/wqd/awp/rpt_24.pdf).

Further outreach included over a dozen nation-wide presentations, discussions, teaching events, and interviews on AWP program components (*see* ADEQ, Outreach Participation, https://azdeq.gov/awp-outreach). Additionally, ADEQ has developed various public-facing resources such as:

- Fact Sheet (*see* ADEQ, Fact Sheet, What is Advanced Water Purification?, https://static.azdeq.gov/wqd/dpr/fs.pdf);
- Infographic (*see* ADEQ, Advanced Water Purification, https://static.azdeq.gov/wqd/awp/infographic.pdf);
- FAQs related to AWP and public water systems (*see* ADEQ, Public Water Systems FAQs, https://azdeq.gov/awp-faqs-PWS); and
- Comprehensive AWP webpage including information surrounding what AWP is, why it's important for Arizona, how it works, frequently asked questions, and an explainer video (*see* ADEQ, Advanced Water Purification, https://azdeq.gov/awp).

These myriad stakeholder engagement efforts were critical in ADEQ's development and public release of the "Advanced Water Purification: Proposed Program Roadmap" ("Roadmap") in November 2023 (*see* ADEQ, Advanced Water Purification Proposed Program Roadmap, November 2023, https://static.azdeq.gov/wqd/awp/roadmap.pdf). The Roadmap synthesized TAG recommendations and ADEQ's own technical expertise as well as accounted for stakeholder perceptions and feedback. The Roadmap summarized and explained the AWP program's key elements in an effort to assist stakeholders in future planning for AWP implementation, support public education and awareness, and provide transparency on ADEQ's intention and critical pathway to rulemaking on AWP.

Following the release of the Roadmap in November 2023, ADEQ held a 30-day public comment period to gather input and feedback from stakeholders and interested parties. A dozen substantial comments were received during the comment period, including comments from such stakeholders as: City of Flagstaff; City of Phoenix; Scottsdale Water; Tucson Water; and Water Reuse Arizona. ADEQ carefully reviewed and considered all comments received, and issued a cumulative response to comments on July 8, 2024 (*see* ADEQ, Advanced Water Purification Proposed Program Roadmap ADEQ Response to Comments, July 8, 2024, https://static.azdeq.gov/wqd/awp/rtc.pdf).

AWP draft rule review and comments:

ADEQ released the draft rule of the AWP program - including draft programmatic rules in 18 A.A.C. Chapter 9, draft licensing time frame rules in 18 A.A.C. Chapter 1, and draft fee rules in 18 A.A.C. Chapter 14 - on July 9, 2024 (*see* ADEQ, Advanced

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Water Purification, https://azdeq.gov/awp-rulemaking). Following the release of the draft rules, ADEQ held a 30-day public comment period to, once again, gather input and feedback from stakeholders and interested parties. During this period, ADEQ organized and facilitated two meetings, a Tribal Listening Session on July 31, 2024, and a Stakeholder Meeting on August 1, 2024. ADEQ received 28 comments during this period, representing large stakeholder groups as well as interested individuals. All comments were critically analyzed and utilized throughout ADEQ's proposed rule drafting process between July and September 2024. ADEQ published responses to those comments in mid-October on its website.

8. A reference to any study relevant to the rule that the agency reviewed and proposes either to rely on or not to rely on in its evaluation of or justification for the rule, where the public may obtain or review each study, all data underlying each study, and any analysis of each study and other supporting material:

ADEQ reviewed hundreds of studies relevant to the development of the AWP program. Those studies informed and shaped the program and were relied upon to various degrees. ADEQ evaluates and justifies usage of the data in the studies relied upon in its "*Advanced Water Purification Proposed Program Roadmap"* ("Roadmap"). The public may review the Roadmap online at the following website: https://static.azdeq.gov/wqd/awp/roadmap.pdf. The public may review a list of the studies relied upon as cited references in Section 7 of the Roadmap or may obtain copies of any study from the Department by request. Requests can be submitted to the Department by email at reuserulemaking@azdeq.gov or by mail to Arizona Department of Environmental Quality, 1110 W. Washington Ave. Phoenix, AZ 85007.

Since the Roadmap was released, ADEQ has relied upon the following additional studies in further development of the program, which are listed below and on file with the agency:

- ***Standard Methods for the Examination of Water and Wastewater, 24th ed.:***

  Summary: This book of methods is a comprehensive and standard text for water quality analysis used by researchers and regulators to assess properties of water and wastewater samples.

  Study Resource: ADEQ incorporated a number of standard methodologies by reference into the rule requirements for the AWP program. This is the most up-to-date and comprehensive resource for measuring the biological, chemical and physical characteristics of water samples and offers guidance to choose among available methods for specific elements and compounds. In this rulemaking, it is being used to define an approach for TOC analysis and for analysis of water quality samples.

  Public Review: The public may review this study or may obtain copies from the Department by request. Requests can be submitted to the Department by email at awqs@azdeq.gov or by mail to Arizona Department of Environmental Quality, 1110 W. Washington Ave. Phoenix, AZ 85007.

  Reference: American Public Health Association, American Water Works Association, Water Environment Federation.

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Lipps WC, Braun-Howland EB, Baxter TE, eds. Standard Methods for the Examination of Water and Wastewater. 24th ed. Washington DC: APHA Press; 2023.

- ***Fate of Pharmaceuticals and Personal Care Products Through Municipal Wastewater Treatment Processes:***

  Summary: This is a Water Environment Research Foundation book addressing removal of endocrine disrupting compounds, pharmaceuticals, and personal care products by full-scale wastewater treatment plants.

  Study Resource: ADEQ incorporated the study's recommendations about Solids Retention Time (SRT) of 15 days to achieve consistent removal above 80% of endocrine disrupting compounds, pharmaceutical and personal care products typically occurring in wastewater.

  Public Review: The public may review this study or may obtain copies from the Department by request. Requests can be submitted to the Department by email at awqs@azdeq.gov or by mail to Arizona Department of Environmental Quality, 1110 W. Washington Ave. Phoenix, AZ 85007.

  Reference: Stephenson, R. and Oppenheimer, Joan. Fate of Pharmaceuticals and Personal Care Products Through Municipal Wastewater Treatment Processes; 2007.

- ***Chemical Update Worksheet:***

  Summary: This is a study performed by the State of Michigan Department of Environmental Quality for Rule

  Study Resource: ADEQ incorporated the Reference Dose or Oral cancer slope factors (CSF) presented in this study for Benz[a]anthracene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Chrysene, Dimethyl phthalate, Indeno[1,2,3,-c,d]pyrene and Phenanthrene to establish Health Advisories. These compounds don't have a Health Advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables".

  Public Review: The public may review this study or may obtain copies from the Department by request. Requests can be submitted to the Department by email at awqs@azdeq.gov or by mail to Arizona Department of Environmental Quality, 1110 W. Washington Ave. Phoenix, AZ 85007.

  References:

  - Michigan DEQ. Chemical update worksheet for Benz(a)anthracene [CASRN = 56-55-3]. 2015. Accessed 10/07/2024.
  - Michigan DEQ. Chemical update worksheet for Benzo[b]fluoranthene [CASRN = 205-99-2]. 2015. Accessed 10/07/2024.
  - Michigan DEQ. Chemical update worksheet for Benzo[g,h,i]perylene [CASRN = 191-24-2]. 2015. Accessed 10/07/2024.
  - Michigan DEQ. Chemical update worksheet for Chrysene [CASRN = 218-01-9]. 2015. Accessed 10/07/2024.

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- Michigan DEQ. Chemical update worksheet for Dimethyl phthalate [CASRN = 131-11-3]. 2015. Accessed 10/07/2024.
- Michigan DEQ. Chemical update worksheet for Indeno[1,2,3,-c,d]pyrene [CASRN = 193-39-5]. 2015. Accessed 10/07/2024.
- Michigan DEQ. Chemical update worksheet for Phenanthrene [CASRN = 85-01-8]. 2015. Accessed 10/07/2024.

- ***Toxicity criteria on chemicals evaluated by COEHHA*:**

  Summary: This is a study performed by the California Office of Environmental Health Hazard Assessment for Rule (2015). Access date: 10/07/2024

  Study Resource: ADEQ incorporated the Oral cancer slope factors (CSF) calculated in this study for Benzo[k]fluoranthene. This compound does not have a Health Advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables".

  Public Review: The public may review this study or may obtain copies from the Department by request. Requests can be submitted to the Department by email at awqs@azdeq.gov or by mail to Arizona Department of Environmental Quality, 1110 W. Washington Ave. Phoenix, AZ 85007.

  Reference: California Office of Environmental Health Hazard Assessment (1987). Benzo[k]fluoranthene [CASRN = 207-08-9]. Access date: 10/07/2024.

- ***California Division of Drinking Water***:

  Summary: This is a study performed by the California Division for Drinking Water for Rule (2001). Access date: 10/07/2024.

  Study Resource: ADEQ incorporated the Notification Level of 0.33 mg/L established for Trimethylbenzene (1,2,4-). This compound does not have a Health Advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables".

  Public Review: The public may review this study or may obtain copies from the Department by request. Requests can be submitted to the Department by email at awqs@azdeq.gov or by mail to Arizona Department of Environmental Quality, 1110 W. Washington Ave. Phoenix, AZ 85007.

  Reference: California Division of Drinking Water (2001). Trimethylbenzene (1,2,4-) [CASRN = 95-63-6]. Access date: 10/07/2024.

- ***Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health***:

  Summary: This is a methodology published by the EPA for Deriving Ambient Water Quality Criteria for the Protection

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of Human Health (2000). Access date: 01/15/2025.

Study Resource: ADEQ utilizes this methodology in its endorsement of Departmentally-Based health advisories and other state drinking water notification levels or equivalents in the Tier 2 rule.

Public Review: The public may review this study or may obtain copies from the Department by request. Requests can be submitted to the Department by email at awqs@azdeq.gov or by mail to Arizona Department of Environmental Quality, 1110 W. Washington Ave. Phoenix, AZ 85007.

Reference: "Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)". Access date: 01/15/2025.

9. A showing of good cause why the rulemaking is necessary to promote a statewide interest if the rulemaking will diminish a previous grant of authority of a political subdivision of this state:

Not Applicable.

10. The summary of the economic, small business, and consumer impact:

This Economic, Small Business, and Consumer Impact Statement has been prepared by ADEQ in conjunction with contracted economic and AWP technical experts to meet the requirements of A.R.S. § 41-1055.

A. An Identification of the Rulemaking:

The rulemaking addressed by this Economic, Small Business, and Consumer Impact Statement (EIS) consists of a number of new sections, as well as amendments to existing sections, in four (4) chapters in Title 18 of the Arizona Administrative Code (A.A.C.). Those chapters, and the respective articles affected therein, are; Chapter 1, Article 5; Chapter 5, Article 5; Chapter 9, Articles 2, 7 and 8; and Chapter 14, Article 1. The rulemaking is being conducted in order to adopt the Advanced Water Purification (AWP) regulatory program (formerly "Direct Potable Reuse" program) pursuant to statutory mandate at Arizona Revised Statutes (A.R.S.) § 49-211.

Arizona's ongoing issues with water scarcity, combined with real concerns over meeting demand for expanding communities, highlight the need to develop additional sources of water that can meet growing municipal water demands. In response to increasing state water scarcity, the Arizona legislature mandated through A.R.S. § 49-211 that "...the [ADEQ] director shall adopt all rules necessary to establish and implement a direct potable reuse of treated wastewater program, including rules establishing permitting standards and a permit application process." As a result, ADEQ has been charged with developing a program that allows for and regulates the advanced treatment of previously treated municipal wastewater to achieve a drinking-water-quality product, providing a new and convenient water source, known as the AWP program.

AWP is an innovative set of water treatment processes applied at an Advanced Water Treatment Facility (AWTF) that directly purify treated wastewater originating from a community's wastewater treatment plant. This AWTF-treated water can then be either

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delivered to existing Drinking Water Treatment Facilities (DWTFs) for further treatment or blending or distributed directly to a drinking water distribution system. In both cases, the safeguards of the federal Safe Drinking Water Act (SDWA) continue to apply. The AWP program thus offers the potential for a new and sustainable water source that can provide a consistent supply of water for existing users and support Arizona's future population growth and economic development.

B. A summary of the EIS:

General Impacts

The full scope of stakeholders who may incur direct impacts from this rulemaking include ADEQ, Arizona Water Provider Agencies (WPAs), Municipal governments, WPA customers, the general public, and the Arizona environment, identified, generally, here, and in more detail throughout the rest of the Economic Impact Statement (EIS) below. While not all costs and benefits are borne evenly, these are the identified groups generally impacted from the implementation of the AWP regulatory program.

ADEQ is the sole state agency responsible for the implementation and administration of the AWP program. As detailed in this EIS, impacts to ADEQ include the hiring of new staff commensurate with the expanded technical oversight necessary to administer the AWP program. However, the projected future costs to ADEQ will be offset through its fee-for-service model which places the burden for AWP program services on the applicants and permittees through application fees and annual fees, and the overall impact is therefore expected to be moderate. This approach was mandated by the Arizona Legislature through A.R.S. § 49-211, subsection (A), which states, "...[ADEQ] shall establish by rule permit fees sufficient to administer a direct potable reuse of treated wastewater program…" Therefore, the Legislature charged ADEQ with developing and administering the AWP program and required ADEQ to establish fees sufficient to maintain the program. ADEQ's proposed fees, detailed in the Chapter 14 NFRM, were calculated to match the projected costs of the nascent program.

Next, the WPAs that elect to apply for a permit under the AWP program are affected by the capital costs of the AWP investment, increased compliance and monitoring, and ongoing operations and maintenance responsibility. While the expected costs to participating WPAs are expected to be significant, this impact is balanced against both the voluntary and emerging natures of the AWP program. AWP is not mandated for any WPA and financial barriers to entry may be lowered over time as the program becomes more established. Additionally, Municipal governments are not delegated any administration functions of the program but may be impacted given their relationship to the WPAs in their communities. Local governments may be the WPA, and as such, face significant impacts incumbent on any WPA engaged with the AWP program.

Furthermore, WPA customers are directly impacted by the new supply, beneficially through the delivery of the additional water supply to them, and financially through impacts in water rates. Notably, these impacts are only relevant to customers of WPAs that have adopted AWP in their service area. Customers may face higher water rates as a result of AWP, however, the exact costs are not known to ADEQ as the WPA is responsible for setting reasonable rates on a case-by-case basis in consideration of their service

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area. The general public is generally impacted by the option of a new water supply alternative for communities, providing an overall net increase in water availability for beneficial use such as drinking. Finally, the environment is impacted, beneficially through potential decreased reliance on groundwater and surface water supplies from WPAs using AWP water as a source, but also faces impacts from changes in water use as a result of expanded, potentially lucrative use options such as reduced groundwater discharge or reclaimed water delivery.

Specific Impacts

The entity with the largest expected impact as a result of the AWP regulatory program is the WPAs. This impact is specific to capital costs, operations/maintenance cost, and permitting/compliance costs. Fundamentally the AWP program is intended to be flexible, setting minimum requirements in rule necessary for the protection of human health and the environment and in enough detail to facilitate a performance standard that can be consistently achieved by permittees under the program. However, the program leaves many details and specifics up to the discretion of the Advanced Water Purification Responsible Agency (AWPRA) as they determine what technology, treatment train configuration, etc. is best to address their treated wastewater influent, their contributing non-domestic dischargers, their AWPRA partners, etc. Therefore, the EIS cannot determine, with exact specificity, the impacts to each WPA. However, the EIS provides cost evaluations for three representative AWP projects, in an effort to provide a range of potential options. These three projects represent different treatment trains: 1) Ozone-Biologically Activated Carbon (BAC), 2) Ozone-BAC with Side-Stream Reverse Osmosis (RO), and 3) Full-Stream RO.

Upon an evaluation of these representative projects, this EIS provides expected costs related to the implementation of AWP for WPAs, enabling them to make informed decisions about whether AWP is a good option for their communities. For project 1, Ozone-BAC, the estimated costs are as follows: capital costs - $208.0 million; annual operations and maintenance costs - $3.3 million. For project 2, Ozone-BAC with Side-Stream RO, the estimated costs are as follows: capital costs - $229.0 million; annual operations and maintenance costs - $8.5 million. For project 3, Full-Stream RO, the estimated costs are as follows: capital costs - $276.0 million; annual operations and maintenance costs - $10.9 million.

Stakeholder Process

All stakeholders identified as entities impacted under this EIS have been subject to the AWP stakeholder engagement process. This process commenced in 2023 with a survey of the general public, a survey of more specific stakeholders, and the establishment of a Technical Advisory Group (TAG) for development of the AWP rules. The TAG consisted of experts and representatives from academia, utilities, regulatory agencies, and engineers and scientists. In combination with the additional stakeholders and conversations with expected applicants (WPAs), this effort was a comprehensive discussion on all programmatic elements, including economic impacts.

C. Identification of the persons who will be directly affected, bear the costs of, or directly benefit from the rules:

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Recycled water is costly, but for some communities it may be the most cost-effective alternative for new and reliable long-term water supplies. The AWP program will operate uniquely among existing water programs as it will be state-run and has no federal equivalent. This rulemaking establishes rules, including permitting standards and a permit application process, for participating in the AWP program, a voluntary program. The decision to apply for a permit under the AWP program rests entirely with the entity wishing to pursue AWP as an addition to their drinking water portfolio.

While the AWP program is voluntary, there will be costs to each adopting entity for permitting and compliance requirements and infrastructure implementation. There may also be cascading cost impacts to other persons or groups (such as customers), but these costs will be borne throughout the water system and will be discussed in advance with stakeholders by water provider agencies.

ADEQ has identified the following list of affected entities and persons who stand to incur direct impacts and/or costs, but also potentially significant benefits, from this rulemaking:

- Arizona Department of Environmental Quality (ADEQ);
- Arizona Water Provider Agencies (WPAs);
- Municipal governments;
- WPA water customers, both residential and nonresidential;
- General public; and
- Arizona environment.

D. Cost/Benefit Analysis:

Comprehensive assessment of the AWP program requires identification of the program's impacts across affected persons and entities. Future AWP implementation can be expected to result in a range of impacts, both beneficial and adverse, which could include:

- Improvements in water availability throughout the water system;
- Operational changes for WPAs;
- Increased capital and operating and maintenance (O&M) expenses for WPAs;
- Increased rates for water customers;
- Enhanced drought resilience of the water system;
- Potential shifts in water rights allocations; and
- Changes in agricultural water usage.

The nature and magnitude of AWP-related costs and benefits will depend on several key factors related to each entity's AWP technology choice and the approach necessary for its implementation, as well as the context within which future development occurs. As noted previously, the voluntary nature of the AWP program allows entities to choose freely whether to engage with the program

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and thus evaluate potential cost impacts well in advance of adoption.

This EIS is a program-level assessment that evaluates the general impacts from future AWP implementation through the AWP program. As such, it does not estimate specific impacts for any individual project, as those would inherently require consideration of that project's specific circumstances (e.g. water demand, location, and hydrology) and resource conditions. This EIS acknowledges that each AWP project will have cost increase impacts on both a participating WPA and its customers, while advising that project-level assessments and precise quantifications of any specific impacts (e.g., water rate increases to customers, additional permitting fees to ADEQ, potential changes in water usage patterns, changes in infrastructure maintenance costs, possible need for additional staff or training, and potential changes in local ecosystems due to altered water flows) were not evaluated as part of this EIS. Nonetheless, this EIS provides a general assessment of the expected cost effects on WPAs and ADEQ from the AWP program. This section outlines ADEQ's analyses of the expected costs and benefits of this rulemaking, made through consultation with ADEQ staff and AWP subject matter experts (SMEs). Part 1 provides a summary table of the affected stakeholder groups with a description of identified potential AWP program effects, and their corresponding revenue and cost effect findings. Part 2 provides a more detailed discussion of stakeholder impacts, analyses, and findings.

1. Part I - Cost/Benefit Stakeholder Matrix:

Minimal	Moderate	Substantial	Significant
$10,000 or less	$10,001 to $1,000,000	$1,000,001 or more	Cost/Burden cannot be calculated, but the Department expects it to be significant.

Description of Affected Groups	Description of Effect	Increased Cost/Decreased Revenue	Decreased Cost/Increased Revenue
A. State and Local Government Agencies			
Arizona Department of Environmental Quality (ADEQ)	Increased agency responsibilities for administration, oversight, and management of AWP "fee-for-service" program, in which the State will be reimbursed for most AWP-related costs.	Minimal	
	Initial start-up, implementation, and subsequent program oversight activities may result in non-reimbursed costs to the State.	Moderate	
Water Provider Agencies (WPAs)	Increased compliance and monitoring	Moderate	
	Construction of AWTF and O&M responsibilities.	Substantial	
	Revenue changes from expanded customer base and/or deliveries.		Significant
Municipal Governments (non-WPAs)	Coordination with WPA and other agencies.	Moderate	
	Impact on tax revenue from resulting community expansion.		Significant
B. Customers			
WPA Customers	Impact to user water rates.	Minimal	

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	Additional water supply that will allow existing and new business and residential growth.		Moderate
	Impacts upon public health related to water quality.	None identified	None identified
C. General Public			
Arizona Water System	Overall net increase in water availability. Additional water will allow community economic development and growth.		Minimal
	Existing surface water purchases can be diverted to other users or uses.		Moderate
	Groundwater resources can be made available for other users or uses.		Significant
	Diverted wastewater outflow may decrease return flows for downstream users.	Minimal	
Downstream Users	All existing supply commitments will be maintained or renegotiated, however diversion of wastewater outflows for AWP use may impact some downstream users. State environmental and permitting processes will consider and address project-specific cases and conditions. Negative impacts to downstream users are thus expected to be minimal (subject to mitigation if necessary).	Minimal	
D. Arizona Environment/ Ecosystem			
Environmental	Reduced groundwater use and depletion with decreased risks of land subsidence and infrastructure damage.		Significant
	Reduced water outflow from wastewater treatment facilities may result in reduced groundwater recharge.		Minimal
	Reduction in poor quality outflow from wastewater treatment facilities may improve water quality in receiving water body		Minimal

2. Part II - Individual Stakeholder Summaries / Calculations

The following section provides an explanatory discussion of expected AWP costs and benefits to the program's various stakeholders. The section outlines the key factors and analysis used to determine the impact findings reported in Part 1 of Section D, above.

State and Local Government Agencies - ADEQ

ADEQ will incur moderate costs as a result of implementing this rulemaking and administering the program. The rulemaking process itself required significant staff time for technical review, rule composition, facilitation and evaluation of public input and other necessary tasks. Additionally, ADEQ will incur costs for AWP-related staff expansion and performance of new AWP-associated administrative responsibilities needed to implement and operate the AWP program. ADEQ currently anticipates that it will need to hire new staff with the necessary technical expertise for a variety of program implementation and oversight roles. These positions will likely include engineers (for design review and compliance of AWP facilities) and non-engineer staff for administrative tasks (e.g., project management, permit writing, operator certification coordination, other program support needs, etc.).

The AWP program's duties and tasks will vary based on the number, type, and phase of WPA participants and it is expected that

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adequately qualified agency staff may be able to perform several roles. It is expected that the AWP program will grow over time as more utilities seek and implement AWP permits, with permitting and administrative support growing equivalently. Nevertheless, in order to support the administration of the AWP program in the near term, ADEQ plans on hiring 2.5 new full-time employees (FTE). These 2.5 FTEs will be split primarily between permit specialist positions, inspectors, and administrative duties. Funding those positions will incur moderate costs to ADEQ annually which will be offset by permit service fees and annual fees.

There will also be costs associated with meeting requirements during the AWP approval and permitting process, which will adhere to all applicable state laws and aim to serve the regulated community while being protective of public health and the environment. ADEQ envisions that this permitting process will function similarly to other ADEQ permitting processes (such as for obtaining Aquifer Protection Permits). The AWP permitting process was developed and will be adopted into the A.A.C. in accordance with rulemaking requirements in the Arizona Administrative Procedure Act.

ADEQ's management and administration of the AWP approval and permitting process will be performed on a "fee-for-service" basis, under which the State will be reimbursed for most AWP-related costs, and thus future ADEQ responsibilities for the AWP program should be achieved with little fiscal cost to the State of Arizona. Instead, as described below, administrative and oversight costs for AWP deployment will be borne initially by WPAs and then ultimately passed on to customers for cost recovery through rate-setting.

Water Provider Agencies (WPAs)

The decision to participate in the AWP program rests entirely with any WPA wishing to pursue AWP as an addition to their drinking water portfolio. For those WPAs choosing to implement AWP, there will be increases in costs, primarily associated with permitting/compliance/regulation, capital investment, and operations. Participating WPAs will incur program-specific regulatory and compliance costs, capital costs for AWTF construction and system integration with their water systems, and additional operations and maintenance (O&M) costs over the long-term. Other additional program-specific regulatory and compliance costs could include permitting, compliance costs to meet new environmental standards, and expenses for regular inspections and audits. As noted previously, WPA-incurred costs will be largely recouped from customers through adjustments in water rates (subject to Arizona Corporation Commission approvals).

Data collected for this EIS aims to provide a representation of the economic impacts expected from implementing AWP technologies in Arizona and includes information from stakeholders working on various aspects of AWP rulemaking. Analysis for this EIS involved the review of key SME opinions solicited by ADEQ to support its development of high-level estimates for projected permitting, compliance, capital, and O&M costs to participating WPAs.

AWP-related costs have been assessed, estimated, and reported "in toto" in many cases, as appropriate. This approach best meets this EIS's purposes of representing and evaluating the overall net economic effects of the final rulemaking by determining the overall

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total combined costs for the various component cost items. This approach is particularly appropriate for evaluation of O&M and compliance costs, which may be performed by an individual staff person; are likely project-specific; and/or are inter-related or inter-dependent, preventing them from being reliably estimated individually and simply aggregated. Furthermore, a higher-level summary assessment may provide a more appropriate and reasonable valuation given inherent imprecision estimating costs that are project-specific, numerous, relatively small, and difficult to quantify individually.

While there will be cost increases, the potential exists for AWP technology to cost less than other available alternatives. As a result, participating WPAs may realize a benefit (cost savings) from AWP implementation.

Water Provider Agencies (WPAs) - Implementation Costs

Implementation costs for an AWTF could include: land acquisition, site preparation, purchase, and installation of advanced treatment technologies, system integration with existing water systems, and engineering and permitting. System integration could involve infrastructure upgrades, installation of new pipelines, and development of blending facilities. The AWP program includes considerable flexibility for each participating WPA to select the AWP technology and approach most suitable and cost-effective for its specific circumstances.

In general, the technical requirements of AWP deployment will result in facility designs that will require capital costs related to the development and building of all new required AWP infrastructure. The potential costs of implementing technological enhancements related to AWP processes within existing wastewater infrastructure are discussed below. Key WPA technical requirements for AWP development are also summarized, with additional discussion on this EIS's evaluation approach to, and findings on, expected impacts to participating WPAs. While the detailed technical and design requirements incumbent upon the WPA applicant are detailed in the final rule, the following technical and design capital costs for AWP development and installation will predominantly impact the WPAs.

WPA Implementation Costs - Permitting

The permitting process complies with all relevant state laws, with the dual aim of serving the needs of the regulated community and safeguarding public health and the environment. The fees established in this rulemaking are in direct response to a legislative mandate to ensure that the rule establishes "permit fees sufficient to administer a direct potable reuse of treated wastewater program" with all fees deposited in the water quality fee fund (A.R.S. § 49-211(A)). This structure mimics the fee approach for other Water Quality Division programs, which are self-funded, fee-based programs. Therefore, the objective in setting AWP fees for permittees - the Water Provider Agencies (WPAs) (or Advanced Water Purification Responsible Agencies, i.e. "AWPRAs") - is to fund the program from the regulated entities, who voluntarily undertake participation in the AWP program. While ADEQ is guided by its statutory mandate, ADEQ did analyze other direct potable reuse (DPR) programs within other states. However, upon analysis, ADEQ determined that a comparison of these states provides minimal value to comparing the reasonableness or adequacy

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of AWP's fees.

Other states with DPR regulatory programs in development that ADEQ analyzed include Texas and Colorado. According to reports between ADEQ and the Colorado Department of Public Health and the Environment (CDPHE), Colorado's DPR regulations are established, but neither the staff, nor the fees to support the program have been fully determined or installed. Despite the installation of the regulations, CDPHE is not yet administering the program because there are no current permittees. Currently, CDPHE is actively working with stakeholders to determine the best way to derive funding for the program. According to reports between ADEQ and Texas (through the Texas Commission on Environmental Quality (TCEQ)), Texas' DRP regulatory program is funded through a combination of federal and state funds and fees. Therefore, TCEQ is not required to recover its full DPR program cost through DPR program fees alone. In fact, according to reports between ADEQ and TCEQ, Texas' DPR program does not currently have DPR-specific fees.

Considering the comparative analysis above and ADEQ's legislatively required financial structure in A.R.S. § 49-211(A), ADEQ believes the fees contained in the final rule (*see* A.A.C. Title 18, Chapter 14, Article 1) are in line with the Legislative mandate and carefully designed to support the administration of the program (*see* Heading No. 7, subheading "Fees" above).

WPA Implementation Costs - Enhanced Source Control

Traditional source control programs are designed to protect wastewater treatment plant infrastructure, collection systems, and receiving water bodies under an existing regulatory framework through the National Pretreatment Program (NPP) of the federal Clean Water Act. Because AWP projects create potable water, directly, without an environmental buffer, the program requires Enhanced Source Control (ESC).

ESC includes the control, elimination, or minimization of "constituents of concern" discharged from non-domestic dischargers into a wastewater collection system. Such constituents of concern include federally-regulated chemicals, AWP-regulated chemicals, and performance-based indicator compounds, which are necessary to eliminate or minimize discharges of constituents of concern into the wastewater collection system that is providing the source water for the Advanced Water Treatment Facility (AWTF) in the AWP project.

ESC measures may result in capital and/or increased O&M costs for wastewater customers in which constituents of concern have been found. The magnitude of the cost increases will vary, but in many cases it is anticipated that simple technology discharge management measures (such as temporary retention tanks and scheduled releases, sand filtration, coagulation/flocculation, or use of activated charcoal) could be effective and relatively low cost.

Additionally, a Pollutant Reduction and Elimination Plan specific to each ESC implementation will need to be developed to build relationships with non-domestic dischargers, increase participation in pollution prevention methods to control release of constituents of concern in the collection system, and educate the public about protecting source water. Additional information regarding the

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specifics of individual ESC programs can be found in R18-9-E824.

WPA Implementation Costs - Nitrogen Removal

The AWP program recognizes the critical importance of nitrogen removal during the treatment process. Nitrogen, primarily in the forms of nitrate and ammonia, can have significant environmental and health impacts if not adequately managed. The AWP program implements flexible strategies for nitrogen removal, allowing facilities to utilize either wastewater treatment processes at water treatment facilities or advanced treatment technologies at AWTFs. These include: biological nitrogen removal (BNR), which uses bacteria to convert nitrogen from one form to another; membrane bioreactors (MBRs) that combine conventional treatment with membrane filtration; an anaerobic ammonia oxidation process that converts ammonium and nitrite directly into nitrogen gas; ion exchange, which removes nitrogen compounds by exchanging them with other ions; and/or adsorption, where nitrogen-containing compounds adhere to the surface of a solid phase.

The choice of strategy depends on various factors, such as the concentration and form of nitrogen in the wastewater, discharge requirements, available infrastructure and resources, and overall treatment objectives. This dual-pathway approach ensures that the specific needs and capacities of different facilities can be met while still achieving the stringent standards required under AWP.

WPA Implementation Costs - Advanced Oxidation Process

The Advanced Oxidation Process (AOP) is a cornerstone of the AWP program's treatment strategy under the minimum design criteria of the rule, R18-9-F832. AOPs are designed to generate highly reactive hydroxyl radicals, which effectively oxidize and break down a wide range of organic contaminants. This AWP program mandates the inclusion of an AOP treatment process in all AWTF treatment trains, with specific performance benchmarks, achieved through a selection of one of two available methods. This requirement underscores the program's commitment to addressing contaminants of emerging concern and ensuring the safety and quality of the treated water, and the dual-pathway approach ensures that the specific needs and capacities of different facilities can be met while still achieving the stringent standards required under AWP.

WPA Implementation Costs - Other Technical and Design Requirements

In addition to nitrogen removal and advanced oxidation, the AWP program outlines a comprehensive set of technical and design requirements. These include the establishment of multiple barrier treatments, management of total organic carbon (TOC), and the implementation of robust monitoring and reporting systems. The program also emphasizes the need for full-scale verification testing, corrosion control measures, and cross-connection prevention to maintain the integrity of the water supply.

WPA - Operational, Monitoring, and Compliance (OMC) Costs

Once an AWTF has been built, there will be subsequent operating processes and protocols that will increase annual O&M expenditures for a WPA. Additional O&M costs over the long-term could encompass routine system maintenance, replacement of aging equipment, energy costs, personnel costs for system operation, and monitoring, and expenses for ongoing water quality testing

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and reporting. It is not anticipated that AWP adoption will have any impact upon non-participating WPAs.

Operating an AWTF involves a variety of costs. These include the cost of energy required to run the facility, the cost of chemicals used in water treatment processes, and the cost of labor for personnel who operate and maintain the facility. Additionally, there are costs associated with the regular maintenance of equipment and infrastructure, as well as the eventual replacement of aging equipment. These costs can vary depending on the size and complexity of the facility, the quality of the source water, and the specific treatment processes used.

WPA - OMC - Annual Labor, Power, Chemicals, Replacement and Maintenance

The annual costs of operating an AWTF include labor, which refers to salaries and benefits for employees who operate and maintain the facility. Labor may include costs for training and professional development. Annual costs also include power, the cost of the electricity needed to run the facility's pumps, treatment processes, and other equipment. In addition, many water treatment processes require the use of chemicals to remove contaminants from the water. The cost of these chemicals can vary depending on the quality of the source water and the specific treatment processes used. Finally, over time, equipment and infrastructure will need to be repaired or replaced. These costs can be significant, especially for larger facilities or those using more advanced treatment processes. Regular maintenance can help to extend the life of equipment and reduce the need for costly replacements. These costs are ongoing and must be budgeted for each year to ensure the smooth operation of an AWTF.

WPA - OMC - Operator Certification

An additional certification will be required for operators of certain AWPRA facilities, including all AWTFs and some water reclamation facilities. Such additional certification will naturally come with training and implementation costs, but will also provide the benefit of improved understanding of AWP technology and operations at the WPA level. Operator certification standards for AWP systems will be required to encompass the specific knowledge, skills and experience to maintain the reliability, resilience, and continual performance of AWP systems and respond adeptly to any system failure. The new certification process will encompass a range of critical elements, including comprehensive coverage of AWP technologies, a deep exploration of source water risks and risk management strategies, proficiency in critical control point methodologies, in-depth knowledge of specific AWP regulatory requirements, and the capability to manage operational responses effectively.

The certification program for AWP operators is similar to that of the existing water and wastewater certifications from the American Water Works Association (AWWA) - California - Nevada Section. This Advanced Water Purification Operator Certification would also focus on specific advanced treatment technologies required for AWP and include general requirements to define AWP in the broader picture of public health protection, pathogen and pollutant targets, and other issues. WPAs will need to ensure that its operations staff have the necessary knowledge and experience to successfully complete certification.

WPA - OMC - Enhanced Source Control

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As described above, ESC involves strategies to prevent or reduce pollutants in the water supply at the source. The costs associated with ESC processes can include monitoring costs for regular testing of water quality, infrastructure costs for construction or upgrade of facilities to prevent contamination, and regulatory compliance costs for adhering to environmental regulations. Additionally, there are costs for education and outreach to inform the public or specific industries about best practices for preventing water pollution, and maintenance costs for upkeep of infrastructure or equipment used for source control.

While these costs can be significant, the benefits of ESC, such as improved water quality, reduced treatment costs, and better public health outcomes, often outweigh the expenses. Costs can vary depending on local conditions, the specific water source, and the nature of potential pollutants. Therefore, a detailed cost/benefit analysis by an AWPRA is often necessary when considering ESC measures.

WPA - OMC - Chemical Monitoring

ADEQ has established a three-tiered monitoring approach to managing regulated chemicals in the treated wastewater at the water treatment facility under the AWP program. Tier 1 includes monitoring of chemicals currently covered under the Safe Drinking Water Act (SDWA); Tier 2 includes AWP-specific contaminants that are not federally regulated but may pose a health concern; and Tier 3 requires performance-based indicators to establish treatment performance. At each tier, robust monitoring is required, resulting in increased O&M costs, which ensures high standards of water quality are maintained for WPA customers and any downstream users/uses.

WPA - OMC - Monitoring and Reporting

Participating in the AWP program will come with increased monitoring and reporting requirements, and associated costs. Beyond costs, however, there will also be considerable benefits from increased monitoring and reporting. First, increased collection of data and technical information will make WPA staff better informed about, and better able to track and measure, the operations and performance of their facilities. Additional collection of water recycling metrics, for instance, can improve operator and manager understandings of their current performance and assist them with adapting and improving, so that they can achieve higher standards and/or greater efficiencies.

Second, improved tracking of performance data and metrics will facilitate comparisons between different AWP systems, enhancing ADEQ's and each WPA's ability to learn and improve future operations. Data reporting to ADEQ by individual WPAs, for instance, will inform and support ADEQ's monitoring and oversight capabilities.

WPA - OMC - Federal and State Compliance

The AWP rulemaking requires participating WPAs to conform with existing EPA guidelines. There are specific EPA compliance requirements in addition to the required chemical monitoring presented above. These include:

- 1. Laboratory Analysis. Laboratories performing analyses must comply with the Health and Safety Code, known as the

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Environmental Laboratory Accreditation Act. Chemical analysis methods should be approved by the EPA for use in compliance with the SDWA.

- 2. Reporting. AWTFs are required to report analytical results for ongoing compliance monitoring of pathogens and chemicals. Reports must include detail regarding the ESC program, cross-connection incidents, and any other relevant information as per AWP program requirements.

These requirements are part of final program standards that will ensure the protection of public health through the control of both pathogens and chemicals in the AWP process.

WPA - OMC - Additional Agency Compliance

The final regulations for the AWP program require WPAs to adhere to established numerical criteria (such as regulated pollutant concentrations that must not be exceeded to protect water quality and public health, and action level thresholds that necessitate immediate corrective measures). These standards and thresholds, which may include limits on contaminants like nutrients or heavy metals, are set by associated agencies or organizations and are integral to WPA operation.

WPA - OMC - Public Communications

As part of AWP implementation, each WPA and associated partners must develop and implement a "Public Communication Plan" within their service area to notify the public of the possibility of their transition to AWP, address public concerns, build public confidence, and garner public acceptance for AWP (*see* R18-9-B811). Most WPAs already have community relations staff resources allocated for their current water programs, so the level of additional effort required for adequate and successful communication to the public about AWPs will vary between agencies according to their circumstances.

WPA - Cost Evaluation

ADEQ has identified three representative AWP projects for analysis within this EIS, each using a different AWTF treatment train: 1) Ozone-Biologically Activated Carbon (BAC), 2) Ozone-BAC with Side-Stream Reverse Osmosis (RO), and 3) Full-Stream RO. These projects have been selected as they represent a range of treatment options, reflecting the different processes available to meet the diverse needs and capacities of different facilities. This EIS evaluated these representative projects to assess expected costs and benefits of implementing AWP technologies using each of them in Arizona, thereby supporting informed decision-making and strategic planning for water resource management in the state.

WPA - Cost Evaluation - Project 1 Ozone-BAC:

This train is adapted from injection well potable reuse (PR) projects. The Ozone-BAC process involves the use of ozone for oxidation and biofiltration for organic and microbial contaminant removal but does not significantly reduce the concentration of Total Dissolved Solids (TDS). This train is ideal for applications where the primary concern is the removal of targeted bulk and trace organic contaminants, but not for cases where the TDS of the source water is high and/or TDS reduction is needed to meet

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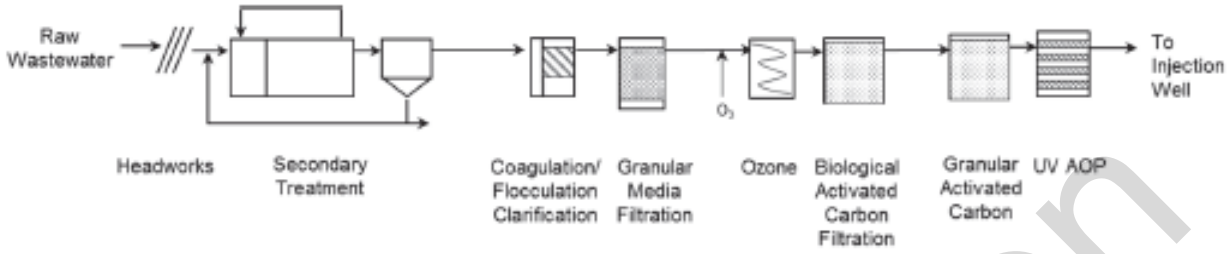
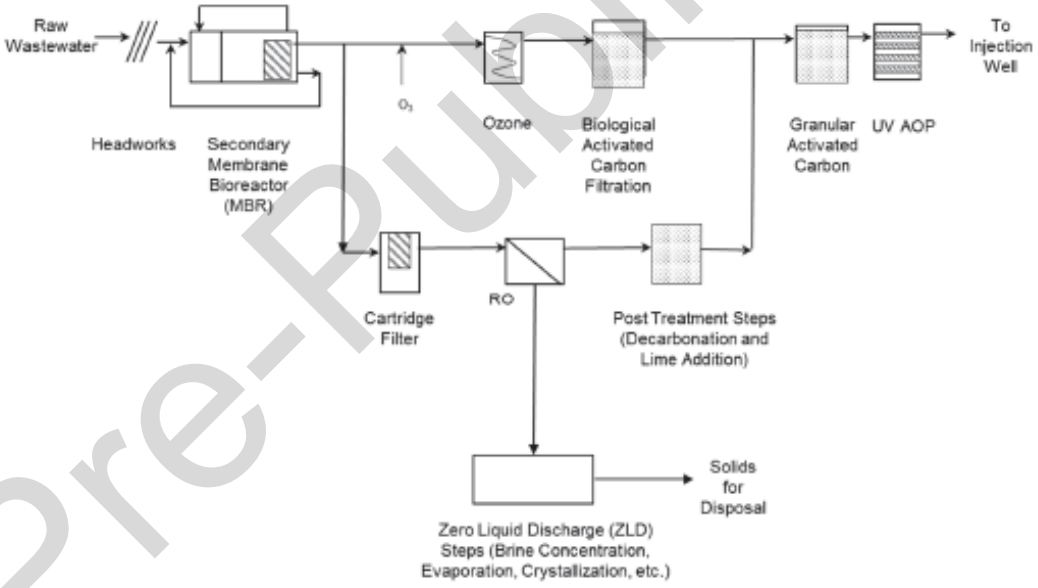
purified water quality targets.



WPA - Cost Evaluation - Project 2 Ozone-BAC with Side-Stream RO:

This train includes a side-stream RO treatment for a portion of the water being treated for enhanced salinity reduction. It is suitable for injection-well PR projects where some salinity must be controlled. The side-stream RO allows for the removal of dissolved solids from a portion of the water, and thus helps to manage overall salinity levels and to reduce project costs by implementing a more targeted approach to RO treatment.



WPA - Cost Evaluation - Project 3 Full-Stream RO:

This train is suitable for injection well PR projects where full-stream reverse osmosis (RO) treatment is required. Full-stream RO treats the entire flow of water, providing comprehensive removal of salts and other dissolved solids. This train is ideal for applications where salinity control is necessary.

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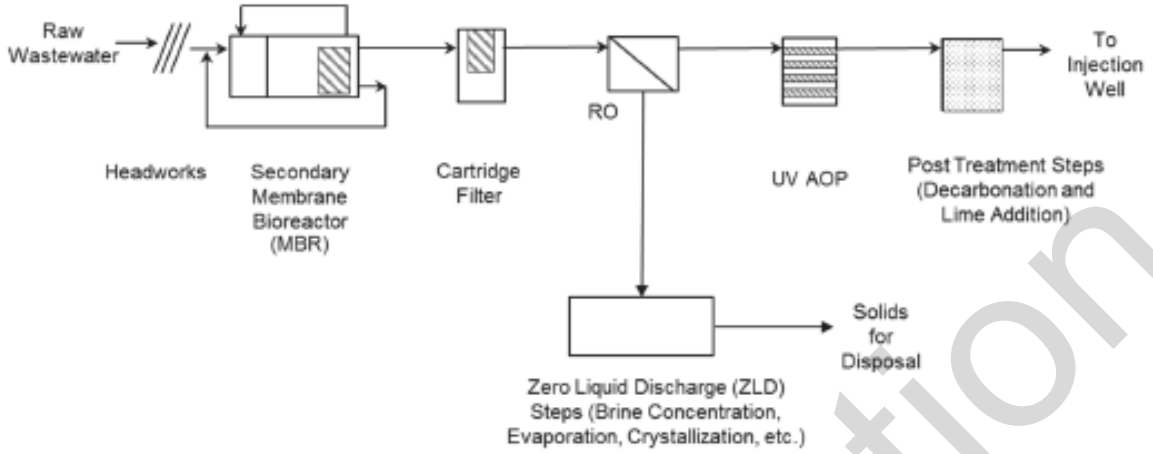

WPA - Cost Evaluation - Capital Cost

Capital and O&M costs have been estimated for each of the three representative AWP projects. These high-level "typical" cost estimates are used to derive approximate unit cost estimates to provide "ball-park" representation of the likely costs for participating WPA and its customers. Unit-supplied water values are derived from these estimates to provide an indication of the AWP's potential customer costs and enable cost comparisons with other water supply alternatives, such as desalination.

The cost data developed for the three representative AWP projects include expenditures for AWTF design and construction, required water recovery facility enhancements, an ESC program, and O&M. Together these demonstrate representative costs that a WPA can be expected to incur to develop and operate a typical 6 million gallon per day (MGD) AWTF with an assumed 30-year useful life. Unit costs are presented in constant 2024 dollars and thus do not include any inflation effects. It is also assumed that an AWTF will be funded with low-interest loans (such as federal Water Infrastructure Finance and Innovation Act programs), which, when applied to current 2024-dollar terms, will approximate to a zero (0) percent real interest rate.

The estimated capital costs for the representative projects are shown in the table below.

Representative Project	Project Type	Capital Costs, $M	Annualized Capital Costs, $/AFY
Project 1	Carbon Based Advanced Treatment (CBAT)	$208.0	$1,000
Project 2	Carbon Based Advanced Treatment (CBAT) with Sidestream Reverse Osmosis (RO) (a)	$229.0	$1,100
Project 3	Full Reverse Osmosis (RO) with Brine Management	$276.0	$1,400

Note: (a) Assumes sidestream RO of 55% of CBAT flow. AFY is acre feet per year.

WPA - Cost Evaluation - O&M and Compliance Costs

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The estimated annual O&M costs for each of the representative projects are provided in the table below. These costs include labor, materials, equipment repair/replacement and power. Staff costs are based on an estimated average labor cost of $80,000 and $0.20 kWh power cost for operations.

Representative Projects	Project Type	Annual O&M Costs, $M/yr	Annualized Capital + O&M Costs, $/AFY
Project 1	Carbon Based Advanced Treatment (CBAT)	$3.3	$1,520
Project 2	Carbon Based Advanced Treatment (CBAT) w/ Sidestream Reverse Osmosis (RO) (a)	$8.5	$2,390
Project 3	Full Reverse Osmosis (RO) w/ Brine Management	$10.9	$2,990

Note: (a) Assumes sidestream RO of 55% of CBAT flow. AFY is acre feet per year.

In addition, as discussed above, participating WPAs will incur additional monitoring and compliance costs. These activities are recognized as distinct and additional to the duties required of the AWP's operations staff. However, the net cost to the WPA is expected to be relatively minor, as these responsibilities are standard and oman periodic. It is estimated that 1 FTE should be able to perform the necessary monitoring and compliance activities.

Regarding ESC, a high-level summary of the estimated costs for implementing a full ESC program range from 1.25 to 1.5 FTEs. In some cases, WPAs have reported an additional analytical cost of 2 to 3 FTEs necessary for monitoring events. At a full-burdened typical wage cost of approximately $139,000 per year, the estimated implementation cost for a full ESC program would be expected to be in the range of $175,000 to $210,000 per year.

As discussed previously, ADEQ's oversight and administration of the AWP program will be provided on a fee-for-service basis charged to the participating WPA.

Municipal Governments

The future planning of communities in Arizona will likely be dictated by the availability of water resources, from planning for and permitting additional residential and nonresidential growth; to planning for public facilities, such as schools, offices, and correctional facilities. Therefore, municipal governments are an integral component in the process of selecting AWP or another water source alternative. As a result, municipal governments will likely be working with / directing the WPAs when determining the amount of water needed to support the current needs of and projected growth within their communities. Municipal governments will also be indirectly impacted by the AWP program as it plans for and permits residential and nonresidential development.

It is likely that municipal governments will be directly impacted by the AWP program as they support the WPA in evaluating alternatives for new sources of water. One of the major components specific to any ESC requirements for AWTF operations will be the establishment of legal authority, regulatory agreements between agencies, and specific enhanced wastewater management

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requirements and compliance. Municipal governments will also likely be responsible for implementing the outreach efforts that will explain the AWP selection process to their communities. In addition, municipal governments as water customers will be impacted by any rate increases that occur from AWP implementation. While there will be impacts to municipal governments from AWP, the impacts are not anticipated to be significantly different from the impacts associated with implementing other water source alternatives. If AWP is more cost-effective than other alternatives, there may even end up being greater demand for residential and nonresidential development in AWP-adopting municipalities because of their more affordable water.

Notably, municipal governments may, in fact, be the WPA in their community. In this scenario, the impacts to the municipal government are best revealed through the WPA impact analysis, above, rather than the impact analysis under this section. If a municipal government is the WPA, their expected impacts are significant.

WPA Customers

AWP is not anticipated to have an impact on water customers served by non-participating WPAs. Only AWP water customers will incur increased costs, as they can expect to face higher water rates once WPAs pass on the costs of AWTF development and operations to them. Customers of participating WPAs will, however, also benefit from the greater availability and reliability of the potable quality water supplied through their community's AWP, as described below, especially if their "willingness to pay and use" value exceeds the price charged to them by the WPA to receive the water. Regardless, all user rate increases are the responsibility of each WPA and as such will vary based on specific circumstances. It is, of course, expected that each participating WPA will do a comprehensive analysis before AWP adoption to ensure that there is adequate customer demand, support, and ability to pay for any new AWTF within their service area.

As discussed, participating in the AWP program is voluntary and it is anticipated that WPAs will select the water supply alternative that is the most cost-effective and best meets the needs of its customers. Therefore, if AWP is selected, the rate impacts will likely be less than the impacts of alternative water supplies, thus customers may experience less of a rate impact than if AWP was not available.

WPA Customers - Water Supply Availability

WPA customers will benefit from greater water supply reliability and availability from the additional potable water supplied through AWPs and will enjoy confidence in their WPA's ability to fully meet its service community's current water needs and future demands. Full representation of an AWP's total impact on local water availability should recognize the following water supply improvements:

- Net increase in supplied water: Unlike water purchases and transfers, wastewater recycling will result in "net new" quantities of potable water, as formerly non-potable water discharges are instead treated for municipal and industrial (M&I)

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consumptive use.

- Increased Supply Reliability: AWP will provide a more sustainable supply option, since its production will not be directly impacted by metrological and/or hydrological conditions.
- Local Control and Supply Flexibility: AWP-served communities will reduce their dependency on imported water and/or existing (often dwindling) groundwater resources. The new water supplies obtained from AWP development should allow many communities to maintain or improve their groundwater levels and availability.

As noted previously, only the above qualitative considerations of impacts for customers of AWP-participant WPAs have been provided, as rate impact estimations will be highly project-specific and were not evaluated as part of this EIS.

WPA Customers - Water Quality

As one of ADEQ's three (3) environmental divisions, the Water Quality Division (WQD) is responsible for administering the Department's water protection and improvement programs. The WQD protects and enhances public health and the environment by ensuring that healthy drinking water is provided by public water systems, and by controlling current and future sources of surface and groundwater pollution. The Division's programs include, among others, the Safe Drinking Water program, the Groundwater Protection program, and the Recycled Water program.

All recycled water delivered by AWP systems is anticipated to be of equal water quality to existing drinking water supplies due to advancements in AWP technology and the high water quality standards of the SDWA. As a result, future AWP customers are not expected to face any increased public health risks or concerns from AWP, and indeed can expect to enjoy clean water of high quality.

General Public

In addition to the direct impacts to WPAs and their customers, AWP deployment can be expected to have broader impacts on the general public. Direct cost impacts from AWP technology adoption are expected to be predominantly experienced by the agencies, businesses, and individuals connected with AWP operations. However, due to the interconnectedness of Arizona's regional and local water systems, and the scarcity and importance of water within the state, future AWP deployment can be expected to have impacts on the broader populations of residents and businesses within the state and state-wide water resources. Key components and constituencies that would potentially be impacted include the Arizona water system, community economies, the environment, and downstream water users, as described below.

General Public - Arizona Water System

The Colorado River system, which supplies 36 percent of Arizona's total water use, has experienced extensive drought conditions for the past 19 years. Furthermore, it can be expected that climate change may result in even greater long-term reductions in Colorado River supplies. Arizona maintains six Active Management Areas (AMAs), designed to sustain the state's economic

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health by preserving groundwater resources and promoting long-term water supply planning. Established in 1980, these AMAs cover those areas of the state where significant groundwater depletion has historically occurred. As Arizona heads into a drier future, it is unlikely that its groundwater safe-yield requirements will be reliably met and thereafter maintained in any of the state's AMAs. Groundwater currently provides 41 percent of the state's water, but recent groundwater modeling has projected that over the next 100 years, unmet groundwater demand within the Phoenix AMA will reach nearly 4.9 million acre-feet (MAF), and unmet demand within the Pinal AMA will exceed 8 MAF. Furthermore, in 2022, the Federal Government called upon Arizona and its neighboring Colorado River states to conserve between 2 to 4 MAF per year to address the critically low levels in Lake Powell and Lake Mead.

AWP may thus represent an important supplemental water supply source that can enhance the AMA regions and their local sub-areas' abilities to operate more sustainably. The Arizona water system at large could see significant benefits from this rulemaking by providing WPAs with another option for providing potable water. All Arizona water customers, whether they be serviced by an AWP system or other municipal water system, could benefit from improved water availability and reliability within the state's water system if AWP implementation adds substantial net new water supplies to the state's water system.

General Public - Community Economic Development and Growth

The Arizona Department of Water Resources (ADWR) created the Assured Water Supply Program and the Adequate Water Supply Program to address the concern of limited groundwater supplies in Arizona. The Assured Water Supply Program operates within Arizona's six AMAs and is designed to sustain the state's economic health by preserving groundwater resources and promoting long-term water supply planning. Conversely, the Adequate Water Supply Program operates outside of the AMAs to ensure that water supply adequacy or inadequacy is disclosed in the public report provided to potential home or land purchasers, and that any water supply limitations are described in promotional or advertising material for new developments. Each program has independently verified that current water supply cannot match pace with current projections of population growth and water supply demand.

According to recent data, Arizona witnessed a substantial 12% population increase between 2010 and 2020. Furthermore, more than another one million new people are predicted to take up residence in Arizona over the next decade. At the state's current average water use rate of 146 gallons per day, this projected one million population growth will result in 164 thousand acre-feet of increased residential water demand. New water supplies to meet demand are therefore critically required, and AWP represents an option with considerable potential for supporting the water demands of such anticipated growth and the requirements of the programs. Indeed, in some areas, growth may not be possible without AWP; while in others, AWP may provide the least-costly option for meeting the increased water demand of Arizona's planned development.

Additionally, AWP sourced water also supports future economic development since it can be readily used for a wide variety of

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purposes and/or locations. In-state surface water supplies, on the other hand, are typically highly location dependent and also subject to water right requirements that may restrict who may use the water where and for what purposes. AWP source water can thus be used to meet Assured Water Supply requirements in sub-basins and areas with insufficient native groundwater to support the future water needs of all proposed development, whether it be residential or commercial. Finally, AWP sourced water may also reduce the demand for future water transfers that reallocate water supplies from agricultural use for urban customers, which will result in land fallowing and lost agricultural activity.

General Public - Downstream Users

WPA applicants to the AWP program will be required to maintain all previous commitments to downstream water users. WPAs will have to demonstrate that they have the necessary water use rights to divert wastewater supplies for their AWP operations. Use terms and conditions for wastewater outflows will vary between locations and specific utilities. In some cases, dependent ecosystems may formally or informally be recognized as committed water users for wastewater outflows; as such, the impacts to adjacent ecosystems may warrant mitigation. This would be evaluated on a project-specific basis during each AWTF's permit approval process.

Except in cases of contracted use commitments (e.g. non-potable deliveries to the Palo Verde nuclear plant), within most of the state's hydrological systems, wastewater discharge return flow effects and downstream uses are typically limited and not well defined. As a result, potential AWP impacts to downstream users will be project-specific. They are also difficult to estimate and likely outside the WPA's jurisdiction and management authority. As a result, such AWP-related effects were not evaluated as part of this EIS.

Arizona Environment

Current state environmental regulations will evaluate project-specific impacts that may be expected from any proposed AWP development and will recommend appropriate mitigation and/or design changes as necessary to minimize any significant adverse environmental effects. However, in general, the incidental effects from WPAs' discretionary (i.e. uncommitted) current wastewater discharges may be considered to represent indirect and secondary outcomes with lesser relevance/importance than the AWP's direct positive impacts on regional water availability and reliability. AWP recycling of wastewater outflows will not directly affect the state's groundwater resources, since AWP will not result in direct groundwater extraction. AWP may result in some potential indirect groundwater reductions from its diversion of current wastewater outflows. Groundwater conditions within the state could be indirectly impacted, to the extent that current wastewater discharges would normally recharge groundwater aquifers though natural percolation will be diverted by AWP reuse of those water quantities.

AWP may also have a net-positive impact on state groundwater resources by reducing the use of groundwater to meet the state's future water supply needs. It is anticipated that AWP-related groundwater depletion will be less than that which would result from

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groundwater extraction water supply options designed for either potable use or as new water supply alternatives (e.g. desalination of brackish groundwater). Improved groundwater sustainability can also be expected to result in environmental benefits from reduced land subsidence risks and/or adverse intrusion effects on other aquifers. The economic costs of any such adverse impacts will vary depending on the specific circumstances but will typically represent substantial economic losses to affected properties, and land uses that will be costly to mitigate.

E. A general description of the probable impact on private and public employment in business agencies, and political subdivisions of this state directly affected by the rulemaking:

ADEQ expects that net direct effect on long-term public or private employment from this rulemaking will result in a minimal or negligible increase. While construction of each new AWTF will result in short-term employment increases for the regional economy, AWP implementation is not anticipated to have direct, long-term impact on local employment. As discussed in Section D, each new AWTF will require a limited increase in operational staff for participating WPAs. Similarly, ADEQ staff necessary for future program oversight and administration will require a relatively small increase in agency staffing. Furthermore, the AWP-related job impacts for both WPAs and ADEQ will likely be similar compared to those that would otherwise be expected from other water supply expansion alternatives (e.g. new brackish desalination).

The extent that any AWP-related increase in employment (both from its construction and subsequent operations) will represent net gains for the region's economy will depend on whether the WPA might otherwise be expected to pursue alternate development of their water system (e.g. new desalination facilities) or would forego system expansion entirely. In either case, the direct net effect on private and public employment within the region's economy would be very small and represent a near negligible change for the region's business sectors and economy.

The potential indirect employment impacts from the AWP, however, could be more substantial if WPAs would otherwise be unwilling or unable to improve their water supplies. Under those circumstances, AWP implementation would be expected to allow future economic growth and development that would otherwise not occur under Arizona's Assured and Adequate Water Supply Programs' requirements. In this case, new employment generated by the increased economic growth and development might be recognized as an "increase to employment" benefit that could, at least in part, be attributed to the AWP.

F. A statement on the probable impact of the rules on small business:

In this EIS, ADEQ uses the term "small business" consistent with A.R.S. § 41-1001(21), which defines a "small business" as "a concern, including its affiliates, which is independently owned and operated; which is not dominant in its field; and which employs fewer than one hundred full-time employees or which had gross annual receipts of less than four million dollars in its last fiscal year." ADEQ has determined that, for the most part, this rulemaking will not generate a significant and/or disproportionate impact on small businesses. As noted previously, the AWP is a voluntary program that will provide each participating WPA with new

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opportunities for increasing and improving local water supplies. As such, each WPA can determine whether an AWP program's benefits to its operations and customers will justify investment costs into the program and potential increases in subsequent annual O&M expenses. AWP costs will most directly affect WPAs, with secondary effects on customers (because of improved water availability and pass-through rate cost impacts). AWP rules are thus anticipated to have only an indirect impact on Arizona small businesses. Furthermore, in the absence of any differentiation in either the distribution of AWP-related water supply changes or rate charges, small business water customers would not be expected to be disproportionately impacted as compared to a WPA's other customers.

1. An identification of the small business subject to the rules:

As discussed above, no small businesses would be directly subject to AWP rulemaking, as it is a voluntary program for WPAs.

2. The administrative and other costs required for compliance with the rules:

All administrative and other compliance costs related to the AWP will be directly applicable to ADEQ and the participating WPAs. Any such costs incurred by participating WPAs will have only an indirect cost effect on its customers (residential, business, municipal, and other nonresidential) as approved by the Utilities Division of Arizona's Corporation Commission. Furthermore, in the absence of any differentiation in either the distribution of AWP-related water supply changes or rate charges, small business water customers are not expected to be disproportionately impacted compared to a water utility's other customers.

3. A description of the methods that the agency may use to reduce the impact on small businesses, as required in A.R.S. § 41-1035:

In the absence of any direct or disproportionate indirect impacts to small businesses from the AWP, no mitigation measures are necessary to reduce any AWP-related future impacts to small businesses.

4. The probable costs and benefits to private persons and consumers who are directly affected by the rules:

See Section D for discussion on ratepayer impacts to AWP customers. Note that probable cost effects from future AWP development and implementation will be limited solely to the WPA customers. Accordingly, no cost impacts from future AWP development and implementation to non-participating WPAs would be expected.

G. A statement of the probable effect on state revenues:

AWP implementation will result in increased oversight and administration by ADEQ, as previously discussed. However, the AWP program will operate under the State's fee-for-service model, so that ADEQ-incurred administrative expenses will be recovered from AWP applicant application and permit fees. As a result, no decrease in state revenues should result directly from the AWP program. The AWP program can be expected to result in future increases in state revenues to the extent that its supplemental increases in water delivery and supply improvements should foster economic growth and development that would otherwise not occur. The tax and other economic benefits from the AWP supported growth would represent future indirect and predominantly

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positive effects on state revenues and economic conditions.

H. A description of any less intrusive or less costly methods of achieving the purpose of the rulemaking:

A.R.S. § 41-1055 requires identification and description of any less intrusive or less costly alternative methods of achieving the AWP regulation's purpose. For any such AWP alternatives, the required description needs to provide: (1) the monetizing of its costs and benefits and (2) the rationale for not using non-selected alternatives. As discussed previously, AWP participation is entirely voluntary and in no way precludes any WPA from instead implementing another approach or water supply resource to meet its water supply needs. This approach thus recognizes that each WPA is the best and most appropriate analyst of, and decision-maker, for its own specific water system needs, resources and alternative supply options.

As such, potential AWP program participants will evaluate their own agency/project-specific circumstances to determine if there are, in fact, less intrusive or less costly alternative methods that would be preferable. Furthermore, the AWP rulemaking's programmatic nature generally precludes any specific project-level determinations of its relative cost or intrusiveness, since any such determination will depend on specific project circumstances as well as implementation approach and design. The cost-effectiveness determination and rationale for any AWTF's development will be the sole responsibility of its WPA and will consequently override and/or negate the applicability of this EIS' alternative methods description requirements.

Generally, brackish groundwater reverse osmosis (BWRO) is considered the primary alternative for obtaining net new water supplies that would match AWP in terms of supply reliability and local control. However, BWRO is likely to be a more expensive alternative, and still comes with its own set of limitations and project-specific circumstances. There is an extensive body of research and analysis on the technical and economic viability of both recycled water and BWRO development. Review of these studies indicates that there is a wide range in the costs of supplied water for these systems, determined by a variety of factors. Several key factors will determine the technical and economic viability of BRWO deployment: (1) groundwater resource conditions, including both supply quantities and salinity levels; (2) pumping depths for extraction; (3) locational proximity to community water systems and conveyance/integration infrastructure requirements; (4) energy consumption; (5) brine by-product waste disposal (either ground injection or treatment for landfill); (6) capital and operational costs; and (7) environmental concerns and impacts from long-term groundwater depletion, subsidence potential and/or effects on neighboring aquifers.

It is also important to note that all else being equal, AWP systems facing salinity issues that require reverse osmosis treatment are likely to have higher supplied water costs, and these may be comparable to those that would be expected for BWRO supplied water.

I. A description of any data on which the rule is based with a detailed explanation of how the data was obtained and why the data is acceptable data:

The purpose of this section of the EIS is to identify the data and analysis previously used to develop the AWP program. As explained throughout this EIS, the AWP program will offer Arizona WPAs new opportunities to develop potable water sources

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through treatment and recycling of its wastewater outflows. Due to the need for additional water supply options, the Arizona legislature mandated pursuit of the AWP program through A.R.S. § 49-211. As discussed in Section D, the AWP program is entirely voluntary, and its regulations will apply solely to participating WPAs. As a result, non-participating WPAs will not be affected by any AWP requirements. ADEQ has chosen to offer AWP as a voluntary and optional program to place decision-making responsibility for needs determination, cost evaluation and participation on the WPAs who will be responsible for implementing the technology and who best understand how it stands to impact their specific circumstances, and customers' needs.

ADEQ has undergone an extensive and detailed process to develop its AWP regulations. The AWP regulation development has to-date included significant planning and analysis for its formulation. In addition to technical analyses, ADEQ has consulted with WPAs that are considering participating in the AWP program.

Please see Section 7 of this NFRM for a comprehensive overview of AWP regulations, as well as the rationales and data used for the AWP program's design and implementation approach. The various AWP regulatory requirements have generally been developed and adopted to ensure that AWP program implementation fulfills the agency's overall mission to protect and enhance public health and the environment of Arizona. Towards this goal, the AWP program has been developed and designed to conform with ADEQ's guiding principles: i. protective of public health and the environment; ii. community-supported; iii. scientifically-based; iv. reasonably affordable; v. transparent, informative, and communicative; vi. specific, practical, flexible, and implementable; and vii. accounts for future conditions and growth.

The protection of public health and the environment, and the development of a program grounded in hydrological science, are the preeminent guiding principles that are most relevant to AWP program requirements and standards. As such, ADEQ has focused extensively and deliberately on AWP regulations that will ensure the water supply system's proposed technical, design, operational, and compliance regulations address public health concerns, and that public safety is maintained. Without ADEQ's rigorous regulatory guidelines and future oversight, there would be an increased risk of potential public health/safety issues and/or incidents. Due to the complexity of the technical issues and the wide variety of WPA circumstances, extensive regulatory guidance, requirements, safeguards and agency oversight are essential to ensuring that AWP can be a safe, sustainable, and effective new

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source of potable water for Arizona's water users.

11. A description of any changes between the proposed rulemaking, to include supplemental notices, and the final rulemaking:

R18-9-A801(25) - Definitions

- In the definition of "Constituent of Concern", removed the words "target chemicals in" and added the word "chemicals" for clarity.

R18-9-A801(76) - Definitions

- In the definition of "Raw wastewater", added the word "centralized" in order to make the distinction between treatment that occurs at a discharger's site (such a pretreatment or in the collection system itself) and the centralized treatment at a Water Reclamation Facility.

R18-9-A801(92) - Definitions

- Updated the definition to match the language in the Tier 1 rule, R18-9-E825, cross-referencing A.A.C. Title 18, Chapter 4, Article 1 which incorporates by reference the Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter D, Part 141.

R18-9-A802(A) - Program Review; Incorporation by Reference; Quality Assurance/Quality Control Methodologies

- Updated the scope of when ADEQ shall review the AWP program to incorporate all significant updates to Tier 2 health advisory values, not just those established by the Department, but the health advisory values established: by EPA; by an ADEQ-approved state drinking water program health advisory notification level or equivalent; or by the Department.

R18-9-A802(B)(10) - Program Review; Incorporation by Reference; Quality Assurance/Quality Control Methodologies

- Removed the incorporation by reference citation for the Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter D, Part 141 because the final rules cross-reference A.A.C. Title 18, Chapter 4, Article 1 - R18-4-102 - which, itself, incorporates by reference 40 CFR 141. Therefore, including a version of it in the AWP material is not necessary and potentially conflicting if one is updated independently of the other.

R18-9-B804(A)(1) - Advanced Water Purification Operator Certification

- Deleted the definition of "Absence" and renumbered (A), accordingly, in order to account for changes in subsection (D) requiring an operator in direct responsible charge to be onsite at least two full shifts per day (see explanation of changes to subsection (D) below), which rendered the definition of "absence" unnecessary.

R18-9-B804(A)(5) - Advanced Water Purification Operator Certification

- Replaced "the person" with "an AWP operator" in the definition of "Direct responsible charge" in order to further clarify

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that an operator in direct responsible charge is an AWP operator.

R18-9-B804(A)(6) - Advanced Water Purification Operator Certification

- Added definition for "Direct responsible charge proxy" in order to address stakeholder concerns (see NFRM Section 12) while preserving the Department's responsibility to protect public health. The definition clarifies who bears responsibility for the operations of the facility when the operator in direct responsible charge is not onsite.

R18-9-B804(A)(8) - Advanced Water Purification Operator Certification

- Updated the definition of "Onsite" to clarify that it means "physically present at" an AWPRA facility. Additionally, the remainder of the definition was cleaned-up to remove passive language and clarify the noun.

R18-9-B804(A)(11) - Advanced Water Purification Operator Certification

- Replaced "the person" with "an AWP operator" in the definition of "shift operator" in order to further clarify that a shift operator is an AWP operator.

R18-9-B804(A)(12) - Advanced Water Purification Operator Certification

- Added definition for "shift" in accordance with new language added to subsection (D) (see changes to subsection (D) below).

R18-9-B804(D)(1) - Advanced Water Purification Operator Certification

- Updated the General Requirements by clarifying the requirements for operators in direct responsible charge and adding new requirements for an operator in direct responsible charge proxy in order to address stakeholder concerns (see NFRM Section 12) while preserving the Department's responsibility to protect public health. First, the Department clarified the scope of the facilities that are required to have AWP operators pursuant to R18-9-B804 and subsection (D), by providing that "[a]ll facilities receiving treatment credit pursuant to R18-9-E828 [shall be] operated by AWP operators" (R18-9-B804(D)(1)(a)). Additionally, the Department added minimum "onsite" requirements for an operator in direct responsible charge in lieu of the "absence" definition which previously achieved the same outcome, i.e. the operator in direct responsible charge onsite for at least two full shifts per day, but did so implicitly instead of explicit, which is more appropriate. Therefore, language was added in (D)(1)(b) to state that "all facilities receiving treatment credit pursuant to R18-9-E828 [must] have a full-time operator in direct responsible charge onsite for at least two full shifts per day". Furthermore, language was added in (D)(1)(c) and (d) pursuant to the addition of an "operator in direct responsible charge proxy" establishing the minimum requirements for a "proxy" and an operator in direct responsible charge when a proxy is onsite in their stead. This ensures that all facilities that receive pathogen credits - which includes all AWTFs and some water reclamation facilities - are

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operated by AWP operators pursuant to the general requirements in subsection (D).

The proposed language reads,

(D) General Requirements.

(1) A facility owner shall ensure that at all times:

(a) A facility has an on-site operator in direct responsible charge who has both a Grade 4 drinking water treatment certification and an AWP operator certification,

(b) An AWP operator makes all decisions about operational process control or system integrity regarding water quality or water quantity that affects public health. An AWPRA administrator who is not an AWP operator may make a planning decision regarding water quality or water quantity if the decision is not a direct operational process control or system integrity decision that affects public health,

(c) In the absence of the AWP operator in direct responsible charge, the AWP operator in charge of the AWTF is the shift operator,

(d) All AWTFs shall have an AWP operator in direct responsible charge,

(e) An AWTF shall be operated by AWP operators,

(f) Operators in direct responsible charge and shift operators operating an AWTF must be certified as AWP operators,

(g) All critical control points shall be operated by an AWP operator, and

(h) The names of all current AWP operators shall be reported to the Department as a component of the Operations Plan submitted pursuant to R18-9-F836.

The final language reads,

(D) General Requirements.

(1) An AWPRA shall ensure all of the following:

(a) All facilities receiving treatment credit pursuant to R18-9-E828 are operated by AWP operators,

(b) All facilities receiving treatment credit pursuant to R18-9-E828 have a full-time operator in direct responsible charge onsite for at least two full shifts per day,

(c) All facilities receiving treatment credit pursuant to R18-9-E828 have an operator in direct responsible charge, or their proxy, onsite at all times during operation,

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(d) When any facilities receiving treatment credit pursuant to R18-9-E828 is operated by a direct responsible charge proxy, an operator in direct responsible charge must be reasonably available to provide immediate direction telephonically, if necessary,

(e) An AWP operator makes all decisions about operational process control or system integrity regarding water quality or water quantity that affects public health,

(f) An AWPRA administrator who is not an AWP operator may make a planning decision regarding water quality or water quantity if the decision is not a direct operational process control or system integrity decision that affects public health,

(g) All critical control points at any facility receiving treatment credit pursuant to R18-9-E828 are operated by an AWP operator, and

(h) The names of all current AWP operators are reported to the Department as a component of the Operations Plan submitted pursuant to R18-9-F836.

R18-9-B804(D)(2) - Advanced Water Purification Operator Certification

- Added new language providing the option for an AWPRA to submit a waiver request to supplant the operations requirement in (D)(1)(b) with an alternative requirement, as approved by the Department and set forth in the operations plan, in order to account for stakeholder concerns surrounding operator requirements (see NFRM Section 12) while upholding the Department's responsibility to protect human health.

R18-9-B804(D)(3) - Advanced Water Purification Operator Certification

- Added new language pursuant to the waiver request in subsection (D)(2) (explained above) setting the standard for the Department's review and grant of the waiver request, which is that the operator in direct responsible charge is not "required to be onsite for at least two full shifts per day, but shall be able to monitor operations over the facility onsite within the period specified in the operations plan". This language enables the Department to grant an alternative operations plan for the operator in direct responsible charge (upon a satisfactory showing in subsection (D)(2)) subjecting the AWPRA to the requirements as agreed upon in the operations plan, in lieu of the requirement in rule.

R18-9-B804(D)(5) - Advanced Water Purification Operator Certification

- Updated language to be more clear, from "ceases operation of a facility" to "ceases to operate a facility".

R18-9-B804(D)(7) - Advanced Water Purification Operator Certification

- Removed the subsection after determination that it was redundant given the updates to subsection (L) of R18-9-B804

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(explained further below).

R18-9-B804(D)(8) - Advanced Water Purification Operator Certification

- Removed the language around the water reclamation facility operation relative to the updates made to subsection (D) which clarify that all water reclamation facilities providing treated wastewater to an AWTF, credited with pathogen removal under R18-9-E828, are required to have AWP operators pursuant to R18-9-B804 and subsection (D). Therefore, the old language in (D)(8) conflicted with the updates and the rule benefits from additional clarity with its removal.

R18-9-B804(K)(5)(d) - Advanced Water Purification Operator Certification

- Updated the language to fix an error which previously had "Grade 3" instead of "Grade 4".

R18-9-B804(K)(6)(e) - Advanced Water Purification Operator Certification

- Added a catch-all provision to the list of options for gaining advanced water treatment qualifying experience in order to provide future deference to the Department in acknowledging experience as situations emerge in the future.

R18-9-B804(L)(1) - Advanced Water Purification Operator Certification

- Updated language to clarify that AWP treatment credits may be received for pathogen removal under R18-9-E828.

R18-9-B804(L)(2) - Advanced Water Purification Operator Certification

- Updated language in subsections (L)(2)(a) and (b) to modify the requirements for the classification of wastewater treatment facilities and collection systems supplying an AWTF in response to stakeholder concerns (see NFRM Section 12) about implementability and in consideration of ADEQ's responsibility to protect human health. The updated language in (a) only requires a wastewater treatment facility that is receiving AWP treatment credits for pathogen removal, that supplies an AWTF, to be operated by an AWP operator and an operator certified at the appropriate grade for the class of facility under Title 49, Chapter 5, Article 1. The language ensures that a wastewater treatment facility receiving AWP credits is properly staffed by the most qualified operators. The updated language in (b) removes the Grade 4 requirement for collection systems and only requires that they be classified in accordance with R18-5-114.

R18-9-C813(D) - Applicant Pathways Depending on National Pretreatment Program Applicability

- Added subsection D in order to allow for submission functionality when an applicant chooses to build a pilot facility to full-scale and develops a Hybrid Pilot and Full-Scale Verification Plan.

R18-9-C815(A) - Pilot Study

- The language in subsection (A) was revised in order to allow necessary components of the Pilot Study and the Full Scale Verification rules to be required when an applicant chooses to build a pilot facility to full-scale and develops a Hybrid Pilot and Full-Scale Verification Plan. The previous language allowed Full-Scale Verification requirements to supplant Pilot

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Study requirements when an applicant chooses to build a pilot facility to full-scale, which is not appropriate.

The proposed language reads,

(A) An AWPRA applicant shall develop a Pilot Study Plan and conduct piloting on a pilot treatment train.

(1) If an AWPRA builds a pilot facility to full-scale, an AWPRA may conduct full-scale verification pursuant to R18-9-F835 in lieu of the piloting requirements in this section. For the purposes of the permit application pursuant to R18-9-C816, the Full-Scale Verification Plan and Report shall be submitted instead of the Pilot Study Plan and Pilot Study Report.

The final language reads,

(A) An AWPRA applicant shall develop a Pilot Study Plan and conduct piloting on a pilot treatment train.

(1) If an AWPRA builds a pilot facility to full-scale, the AWPRA applicant may, instead, opt to conduct piloting and full-scale verification simultaneously. If the AWPRA pursues this option, the AWPRA shall:

(a) Consult with the Department, and

(b) Develop and submit a Hybrid Pilot and Full-Scale Verification Plan to the Department for review and comment prior to conducting piloting and full scale verification under this section, R18-9-F835 and other requirements which are previously determined through consultation with the Department, and

(c) For the purposes of the permit application pursuant to R18-9-C816, submit the Hybrid Pilot and Full-Scale Verification Plan and a Hybrid Pilot and Full-Scale Verification Report in lieu of the submission requirements at R18-9-C816(A)(2)(g) and (h).

R18-9-C815(B)(4) - Pilot Study

- The language in subsection (B)(4) was revised for clarity with respect to the submission requirements of National Pretreatment Program AWPRAs and Non-National Pretreatment Program AWPRAs.

The proposed language reads,

(4) The Pilot Study Plan may include the Initial Source Water Characterization Report prepared pursuant to R18-9-

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C814(E), if finalized prior to piloting.

The final language reads,

(4) The Initial Source Water Characterization Report prepared pursuant to R18-9-C814(E) shall be submitted as follows:

(a) A Non-National Pretreatment Program AWPRA applicant shall submit the Initial Source Water Characterization Report as a component of the Pilot Study Plan, and

(b) A National Pretreatment Program AWPRA applicant may submit the Initial Source Water Characterization Report as a component of the Pilot Study Plan, or otherwise shall submit the Initial Source Water Characterization Report as a component of the AWP permit application prepared pursuant to R18-9-C816.

R18-9-C816(A)(2)(h) - Permit Application

- Updated language to bring clarity to if & when a Pilot Study Report, Full Scale Verification Report or a Hybrid Pilot and Full Scale Verification Report may be submitted as part of a permit application.

R18-9-C817(C)(4) - Demonstration Permit

- Updated language to more clearly align with other demonstration permit requirements in response to a stakeholder comment (see NFRM Section 12).

R18-9-C817(K) - Demonstration Permit

- Added subsection (K) to more clearly align the demonstration permit rule with the AWP permit rule (R18-9-C816(G)).

R18-9-E824(B)(4)(b)(8) - Enhanced Source Control

- Fixed a typo to the word “include”.

R18-9-E824(E) - Enhanced Source Control

- Updated the language by separating out the information into two subsections under (E), further clarifying which representatives shall form the source control committee.

R18-9-E825 - Tier 1 Chemical Control; Maximum Contaminant Levels

- Updated the language to link to A.A.C. Title 18, Chapter 4, Article 1 which incorporates by reference the Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter D, Part 141.

R18-9-E826(D)(5) - Tier 2 Chemical Control; Advanced Water Purification-Specific Chemicals

- Revised language in order to make more clear which “notification levels” are endorsed by ADEQ and how they are endorsed.

The proposed language reads,

(5) For chemicals that do not have an established health advisory pursuant to subsection (D)(4) above but do have a

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drinking water health advisory "notification level" in another state's drinking water program:

(a) Compare the projected daily concentration of each applicable chemical calculated in subsection (D)(3) with the following corresponding state drinking water health advisory notification level: Trimethylbenzene (1,2,4-) (CAS No. 95-63-6): 0.33 mg/L.

(b) If the projected daily concentration exceeds the health advisory notification level, the chemical shall be a Tier 2 chemical.

The final language reads,

(5) For chemicals that do not have an established health advisory pursuant to subsection (D)(4) above but do have a drinking water health advisory notification level or equivalent from a state drinking water program that was developed using a method that ADEQ approves and lists under subsection (a), below:

(a) Compare the projected daily concentration of each applicable chemical calculated in subsection (D)(3) with the following corresponding state drinking water health advisory notification level or equivalent:

(i) Trimethylbenzene (1,2,4-) (CAS No. 95-63-6): 0.33 mg/L),

(ii) Reserved.

(b) If the projected daily concentration exceeds the health advisory notification level, the chemical shall be a Tier 2 chemical.

R18-9-E826(D)(9) - Tier 2 Chemical Control; Advanced Water Purification-Specific Chemicals

- Updated language to include alert levels, explicitly capturing ADEQ's intention for applicants to submit both action levels and alert levels to the Department following the Tier 2 analysis.
- Added subsection (e) to specifically address how an applicant establishes alert levels.

R18-9-F832(E)(4) - Minimum Design Requirements

- Updated language from "off-spec treated wastewater" to "treated off-spec wastewater" for clarification.

R18-9-F833(A)(1)(c) - Technical, Managerial, and Financial Demonstration

- Updated the monitoring plan requirement to an ongoing monitoring plan rather than a monitoring plan for initial source water characterization because the elements prescribed in the plan are requirements of the AWTF's technical capacity, not just relevant to a one-time monitoring effort during the initial source water characterization period.

R18-9-F834(C), (C)(1), (C)(2) and (C)(3) - Total Organic Carbon Management

- Language revised in order to address a lack of clarity reported by stakeholders. Underlined text below represents new language added to R18-9-F834(C), (C)(1), (C)(2) and (C)(3) in the final rule; whereas, ~~stricken~~ language below represents

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language from the proposed rule removed in the final rule.

(C) Site-Specific Approach or Limit. An AWPRA shall perform the two procedures described in subsections (C)(1) and (2) below. The site-specific TOC limit shall be the lower of the two preliminary TOC values obtained from these procedures.

(1) Trace Organics Removal Procedure. The AWPRA shall submit a plan to characterize the TOC of all original drinking water sources that feed the collection system(s) that are used by the AWTF as a treated wastewater source. This plan shall be submitted for approval by the Department as part of the Pilot Study Plan pursuant to R18-9-C815(B)(3) and (D) and again in the permit application as part of the R18-9-C816(A)(2)(d) submittals.

(a) Original Drinking Water TOC Characterization requires, but is not limited to, the following:

(i) Use of Departmentally approved TOC sampling locations,

(ii) Sampling for a minimum of one year,

(iii) Sampling at weekly intervals,

(iv) Calculation of the TOC at the 50^{th} percentile (median), 75^{th} percentile, and 95^{th} percentile,

(v) Establishment of a TOC alert level at the 75^{th} percentile, and

(vi) Establishment of the TOC action level at 1.5×95^{th} percentile.

(b) Upon the characterization of TOC in the original drinking water and approval from the Department, an AWPRA shall monitor for TOC in the advanced treated water using continuous online analyzers.

(c) For the purposes of this subsection, the preliminary TOC value in mg/L for the Trace Organics Removal Procedure is the action level established in subsection (C)(1)(a)(vi) above.

(2) Disinfection Byproducts Precursor Reduction Procedure.

(a) Method 5710 C: "Simulated Distribution System Trihalomethanes (SDS - THM)"

(i) The AWPRA shall apply 5710 C Method "Simulated Distribution System Trihalomethanes (SDS - THM)" to the advanced treated water ~~to establish a TOC value~~ in order to determine the total trihalomethane (THM) concentration.

(ii) Testing and sampling shall be conducted monthly for one year.

(iii) The AWPRA shall simultaneously sample for TOC in mg/L in the advanced treated water monthly for one year.

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(iv) If the average THM concentration is below the corresponding MCL for THM pursuant to R18-9-E825, the average TOC value from subsection (C)(2)(a)(iii) is the Method 5710C TOC value for the purposes of comparison in subsection (C)(2)(d) below.

(v) If the average THM concentration is at or above the corresponding THM MCL pursuant to R18-9-E825, the AWPRA may not use the average TOC value from subsection (C)(2)(a)(iii) as the Method 5710C TOC value. The AWPRA may adjust components of their operation and repeat the steps in subsection (C)(2)(a) until an average THM concentration in the advanced treated water is below the corresponding THM MCL pursuant to R18-9-E825.

(b) The AWPRA shall submit the following information on the conditions at the time Method 5710 C from subsection (C)(2)(a) above was conducted to the Department as part of the Pilot Study Report pursuant to R18-9-C815(D) and again in the permit application as part of the R18-9-C816(A)(2)(d) submittals:

(i) Temperature,

(ii) pH,

(iii) Disinfectant dose,

(iv) Residual and reaction time within the distribution system, and

(v) Other standard conditions as described in Section 5710 B "Trihalomethane Formation Potential (THMFP)".

(c) CCL5 - Disinfectant Byproducts Sampling Method.

(i) The AWPRA shall sample for ~~only~~ the following disinfection byproducts in the advanced treated water, Formaldehyde (CAS No. 50-00-0) and N-Nitrosodimethylamine (NDMA) (CAS No. 65-75-9), which are the only disinfection byproducts that exist in both EPA's "Contaminant Candidate List 5 - Exhibit 1b - Unregulated DBPs in the DBP Group on CCL 5" and EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables" ~~in the advanced treated water~~.

(ii) ~~If the sampling results in a value for any one DBP that is at or below the corresponding health advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables", that value is the TOC value to be used in the comparison in subsection (C)(2)(d) below~~Sampling shall be conducted monthly for one year.

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(iii) ~~Sampling shall be conducted monthly for one year~~The AWPRA shall simultaneously sample for TOC in mg/L in the advanced treated water monthly for one year.

(iv) If the average sampling results in a value for any one DBP is below the corresponding health advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables", the average TOC value from subsection (C)(2)(c)(iii) is the CCL5 DBP TOC value for the purposes of comparison in subsection (C)(2)(d) below.

(v) If the average sampling result for any one DBP is at or above the corresponding health advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables", the AWPRA may not use the average TOC value from subsection (C)(2)(c)(iii) as the CCL5 DBP TOC value. The AWPRA may adjust components of their operation and repeat the steps in subsection (C)(2)(c) until the average sampling results from any one DBP is below the corresponding health advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables".

(d) The lower of the two resultant TOC values in mg/L derived from the methods described in subsections (C)(2)(a) and (C)(2)(c) above is the preliminary TOC value for the Disinfection Byproducts Precursor Reduction Procedure.

(3) AWPRA's Site-Specific TOC Approach or Limit. The lower of the two preliminary TOC values in mg/L derived from the two procedures in (C)(1) and (2) above is the AWPRA's site-specific TOC limit.

R18-9-F835(A)(1) - Full-Scale Verification

- The language was revised in order to allow necessary components of the Pilot Study and the Full Scale Verification rules to be required when an applicant chooses to build a pilot facility to full-scale and develops a Hybrid Pilot and Full-Scale Verification Plan. The previous language allowed Full-Scale Verification requirements to supplant Pilot Study

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requirements when an applicant chooses to build a pilot facility to full-scale, which is not appropriate.

The proposed language reads,

(A) An AWPRA applicant shall conduct Full-Scale Verification of the AWTF. The AWPRA applicant shall develop a Full-Scale Verification Plan for submission to the Department and shall perform full-scale verification testing of the AWTF in compliance with the Plan.

(1) If an AWPRA applicant builds a pilot facility to full-scale, the AWPRA applicant may conduct full-scale verification in lieu of the piloting requirements in R18-9-C816.

(2) If conducting full-scale verification in lieu of the piloting requirements in R18-9-C816:

(a) A Non-National Pretreatment Program AWPRA applicant shall submit the Full-Scale Verification Plan, pursuant to subsection (B) of this section, to the Department for review and comment prior to conducting Full Scale Verification under this section.

(b) A National Pretreatment Program AWPRA applicant may submit the Full-Scale Verification Plan, pursuant to subsection (B) of this section, to the Department for review and comment prior to conducting Full-Scale Verification under this section, an approach recommended by the Department, or otherwise shall submit the Full-Scale Verification Plan and Report to the Department as a component of the AWP permit application pursuant to this section and R18-9-C816.

The final language reads,

(A) An AWPRA applicant shall conduct Full-Scale Verification of the AWTF. The AWPRA applicant shall develop a Full-Scale Verification Plan for submission to the Department and shall perform full-scale verification testing of the AWTF in compliance with the Plan.

(1) If an AWPRA builds a pilot facility to full-scale, the AWPRA applicant may, instead, opt to conduct piloting and full-scale verification simultaneously. If the AWPRA pursues this option, the AWPRA shall:

(a) Consult with the Department, and

(b) Develop and submit a Hybrid Pilot and Full-Scale Verification Plan to the Department for review and comment prior to conducting piloting and full scale verification under this section, R18-9-C815, and other requirements which are previously determined through consultation with the Department, and

(c) For the purposes of the permit application pursuant to R18-9-C816, submit the Hybrid Pilot and Full-Scale Verification Plan and a Hybrid Pilot and Full-Scale Verification Report in lieu of the submission requirements at R18-9-C816(A)(2)(g) and (h).

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12. An agency's summary of the public or stakeholder comments made about the rulemaking and the agency response to the comments:

Comment 1: General Public

Standard methods have become increasingly obsolete in addressing modern water quality concerns, because emerging contaminants are found in reclaimed waters potentially affecting public health. These contaminants include bacterial pathogens (particularly those related to antibiotic-resistant ones), viral pathogens, protozoal hosts for intracellular pathogens, and extracellular DNA (e.g., antibiotic resistance genes [ARGs]). Many of these pathogens are fastidious, slow growing, and difficult to culture for routine monitoring (viable but non-culturable). Any rulemaking must be required to remove and test for these considerations.

ADEQ Response 1:

ADEQ appreciates the comment. The Advanced Water Purification (AWP) regulatory program offers two approaches to pathogen removal, Standard and Site-Specific (*See* R18-9-E828). Both Standard and Site-Specific approaches require constant, nearly comprehensive removal of three "reference pathogens" – Enteric Virus, Giardia and Cryptosporidium. ADEQ's decision to utilize the reference pathogens as the central requirement in rule addressing pathogen removal is based on considerable research indicating that removal of these reference pathogens indicates wider removal of all pathogens to safe levels. Concerning virus removal, the Standard Approach requires a 13 log (99.99999999999%) removal of Enteric Virus, which itself indicates similar removal of viruses such as Hepatitis, HIV, and coronavirus. For Protozoa removal, the Standard Approach requires 10 log removal of Giardia, which is known to indicate wider removal of other protozoa. The Site-Specific Log Reduction approach to pathogen removal at R18-9-E828(C) also requires utilization of the reference pathogens, allowing an applicant to monitor for the reference pathogens and set site-specific log reduction values based on their specific raw wastewater instead of the standard log reduction values. The Site-Specific approach aims to achieve the same protective pathogen removal as the Standard approach. A key difference between the two approaches is that a utility can choose to get credits for some of the treatment or removal that occurs at a providing (and treating) wastewater treatment plant. Beyond the reference pathogens, the AWP program requires protective, continuous monitoring of surrogates like conductivity and turbidity to ensure proper water treatment. Further requirements include permittee cooperation with local county public health departments, as necessary, to track constituent of concern (COC) peaks from disease outbreaks or other impactful health events (*See* R18-9-E824(B)(10)(c)). Additionally, R18-9-E828(C)(9) states that analysis for Giardia lamblia cysts, Cryptosporidium oocysts and Norovirus are done using EPA methods 1623.1 and 1615, not Standard Methods. This proposed rule, as well as the aforementioned EPA methods, cite the use of Standard Methods, Section 9020, for general requirements and recommendations for QA (quality assurance) and QC (quality control) procedures only.

Comment 2: General Public

I would like to know if AWP has been successfully used in other locations, and what the rate of failure is for those systems.

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ADEQ Response 2:

ADEQ appreciates the comment. The Advanced Water Purification (AWP) regulatory program allows for "Direct Potable Reuse" (DPR) to be permitted in Arizona. The EPA defines DPR as the treatment and distribution of a municipal wastewater stream for use as potable water without the use, or with limited use, of an environmental buffer. Through an Arizona State Legislative mandate, enshrined in statute at A.R.S. § 49-211, ADEQ is required to develop and put into rule a DPR regulatory program. DPR facilities have been shown to be a safe and effective source of potable water over decades of implementation through projects that have been installed worldwide, including in localities such as California (2023); Colorado (2022); Texas (2013 and 2014); Namibia (1968 and 2002); Singapore (2019); and South Africa (2011).

Additionally, Minimum Design Requirements, specifically R18-9-F832(D)(7), requires an applicant to address system failure, including the inclusion of mitigation measures like engineered storage buffers, which are typically an on-site storage facility used to provide retention time before advanced treated water is introduced into a drinking water treatment facility or distribution system. An engineered storage buffer must be sized adequately to hold off-spec water for a time period no shorter than the facility's failure response time. This ensures off-spec water will not be delivered off facility until the appropriate standards are met.

Comment 3: General Public

For my entire career, waters treated for potable purposes were never referred to as being "Purified". Purified Water has a very specific definition, quality is measured in resistivity vs. conductivity and, when put on a petri dish, will not show biological activity. While "purified" is used as an adjective in the phrase "purified water", the process of "water purification" is a verb, action word, indicating that the water being treated will eventually result in producing "purified water". Unless these treated waters are measured in megohms (Mohm), that is a very misleading title which may, in fact, result in legal activity in the event any lives are negatively impacted. I realize that "Toilet To Tap" or "Direct Potable Reuse" are unsavory titles for marketing purposes, but that should not open the door to misleading advertising, either. Purified water is not being produced or delivered.

ADEQ Response 3:

ADEQ appreciates the comment. Absent a definition for "purified water" or "purification" in Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Water Pollution Control, generally, or in the Advanced Water Purification (AWP) final rules in Article 8, specifically, ADEQ disagrees with the definition of "purified water" provided by the commenter, and refers the commenter to the definition of "Advanced Water Purification". As defined in this final rule, "Advanced Water Purification" means "the treatment or processing of treated wastewater to advanced treated water standards for the purpose of delivery to a drinking water treatment facility or a drinking water distribution system" (R18-9-A801(6)). The title, therefore, is contextualized to the scope of this program, and is not intended to mislead.

Furthermore, water purification, as recognized in the water treatment industry, is a process of removing harmful contaminants from

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water to ensure its safety for a particular use, such as public consumption. Through the AWP treatment process, potable drinking water is produced by removing harmful contaminants and produces water of such a quality that meets or exceeds the drinking water requirements under the Safe Drinking Water Act (SDWA).

Comment 4: General Public

AWP will impact disinfection byproducts (DBPs). Current disinfection practices will need to be changed and, most likely, be modified on an almost continuous basis given that water qualities can change on a continuous basis. There are health benefits associated with minerals that are naturally occurring in potable water supplies, especially from aquifers. Calcium, magnesium and any variety of trace metals are all beneficial, in certain amounts, to human health. What are the plans for addressing these types of issues?

ADEQ Response 4:

ADEQ appreciates the comment. Re-mineralization is not addressed in the AWP program, but is not prohibited, nor restricted by the program either. A permittee may choose to re-mineralize advanced treated water or finished water based on what's best for the Public Water System (PWS). ADEQ agrees that AWP can impact formation of DBPs, such as N-nitrosodimethylamine (NDMA), which may form after and during treatment processes with wastewater associated DBP precursors. However, monitoring and reporting requirements for TOC management and removal, which correlates with regulated DBP precursor removal, have been established in rule (*See* R18-9-F834). Additionally, permittees are required to maintain up-to-date TOC limits in the advanced treated water. Furthermore, the safeguards against DBP formation in the SDWA will apply to the PWS. Both SDWA and AWP frameworks are designed to control contaminants to levels below the SDWA-MCLs.

Comment 5: General Public

The solution to pollution is dilution. Water is the universal solvent. Let's consider AWP as being the pollutant, i.e., man-made. So, rather than bringing this "pollutant" right to the front door of the potable treatment system, why not put it back into the natural environment, i.e. rivers, aquifers, lakes etc. Once there, Mother Nature can take over, thus yielding a more "natural" product that is relatively benign in terms of water chemistry. All potable water treatment plants already have the means for treating these waters, so there would be little need for changing treatment schemes or practices. It's an easier sell to customers, no need for more pipes in the ground, and there's greater savings for customers.

ADEQ Response 5:

ADEQ appreciates the comment. The process explained by the commenter is indirect potable reuse (IPR), wherein an environmental buffer is utilized prior to the water being treated at a drinking water treatment facility (DWTF). Alternatively, the AWP program allows for "Direct Potable Reuse" (DPR) to be permitted in Arizona as a result of a Legislative mandate, enshrined in statute at A.R.S. § 49-211, which requires ADEQ to develop a DPR regulatory program in rule. The resulting AWP program

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ensures safety through a protective, technological treatment process. Additionally, the program creates flexibility for a permittee to blend the "advanced treated water" product from an Advanced Water Treatment Facility (AWTF) with other sources, if they choose, though it is not necessary to meet treatment standards, since the water will meet drinking water treatment standards before it leaves an AWTF.

Comment 6: General Public

We do not want sewage (a.k.a. – wastewater) mixed into our drinking water. There are too many toxins flushed down the drain and we don't want any of them in our body. We understand the importance of water conservation but this goes too far. The 'toilet to tap' rules you are suggesting should only be used in landscaping. There are too many chemicals and pharmaceuticals that go down the drain/toilet now to make it safe for humans. Can you guarantee 100% removal of all the bad stuff? Because we have no wish to consume someone else's blood thinner medication or diabetes medicine or birth control, etc.

ADEQ Response 6:

ADEQ appreciates the comment. The AWP program does not permit the mixing of wastewater with potable water. AWP involves a robust, multi-step treatment process combining multiple, discrete and proven technologies to treat an already treated wastewater source (i.e. wastewater that has been treated previously by a water reclamation facility) to, and in some cases beyond, drinking water standards. A three-tier approach to chemical control is a key component of the AWP program and is designed to identify, address and control traditionally unregulated or emerging contaminants that can be found in the treated wastewater source for Advanced Water Treatment Facilities. Tier 1 Chemical Control can be found in rule at R18-9-E825 and adopts the Safe Drinking Water Act Maximum Contaminant Levels as baseline standards. Additionally, Tier 2 Chemical Control requirements can be found in rule at R18-9-E826. The rule requires a comprehensive chemical inventory of all non-domestic dischargers in the permittee's collection systems, followed by individual calculations for each chemical to determine a project daily concentration and finally a comparison of that concentration with health advisories to determine a control approach. The regulations require the use of validated treatment technologies which must meet stringent monitoring and performance standards. Tier 3 Chemical Control can be found in rule at R18-9-E827, which involves utilizing, in most cases, existing chemicals or compounds in a treated wastewater to monitor performance of an individual technology or process in an Advanced Water Treatment Facility's treatment train.

Generally, the AWP program is highly protective of human health through a robust regulatory framework which encompasses pre-permitting regulations (*see* R18-9-C812 – C818), constituent control (*see* R18-9-E824 – E828), monitoring and reporting (*see* R18-9-E830 – E831), and technical and operational requirements (*see* R18-9-F832 – F837).

Comment 7: General Public

We demand all fluoride be removed from public drinking water since it has been proved to be dangerous to our health.

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ADEQ Response 7:

ADEQ appreciates the comment. The AWP program adopts all Safe Drinking Water Act - Primary Drinking Water Maximum Contaminant Levels (SDWA-MCLs), including the one for fluoride, which is currently set at 4 mg/L (*See* Tier I Chemical Control; R18-9-E825). This adopted treatment standard for fluoride is derived from and developed by the U.S. Environmental Protection Agency (EPA) in accordance with the Safe Drinking Water Act (SDWA). Furthermore, removing fluoride from public water systems is beyond the scope of this rulemaking. SDWA public water system regulation continues to be applicable to any and all public water systems serving drinking water to the public. The AWP program does not supplant or supersede the requirements under the SDWA, and all AWP facilities must comply with applicable SDWA requirements.

Comment 8: General Public

Please check the Clean Water Act of 1972 which was approved to regulate the discharge of pollutants into U.S. water systems and to set quality standards. Most municipal water has fluoride, radiation, heavy metals, pharmaceuticals drugs, and industrial chemicals therein, each having detrimental health effects on the animals and humans who consume them. Researchers have long established that these and other drugs pass the municipal water filtering system which pose serious health risks.

ADEQ Response 8:

ADEQ appreciates the comment. The Clean Water Act (CWA) regulates water quality standards for protection of surface waters, to ensure navigable waters are fishable and swimmable. The Safe Drinking Water Act (SDWA), alternatively, regulates water quality standards for public drinking water supplies. ADEQ designed the AWP program to comply with all applicable standards under the SDWA and, in fact, goes beyond SDWA standards in some, necessary cases. For example, the AWP program requires control of chemical constituents that are typically found in a Water Reclamation Facility's product water (which is the "treated wastewater" source to an AWTF) that do not have SDWA Maximum Contaminant Levels (MCLs), but do have other, established health advisories (*see* Part E of the AWP program, entitled, "Constituent Control, Monitoring and Reporting"). In sum, the municipal wastewater constituents the commenter refers to are addressed through the AWP program through myriad control mechanisms, including an enhanced source control program and extensive and protective chemical and pathogen control requirements that are customized to the permittee's treated wastewater influent.

Comment 9: General Public

There are healthier alternatives. First and foremost is education. Teach Arizona residents how to conserve water. Use taxpayer dollars to retrofit homes with gray water systems and/or rainwater catchment systems.

ADEQ Response 9:

ADEQ appreciates the comment. While alternative strategies for managing water resources exist, the Arizona Legislature mandated ADEQ to adopt an AWP program (referred to in statute and literature as "direct potable reuse"), enshrining the mandate in statute

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at A.R.S. § 49-211 in 2022. AWP is a key contribution to Arizona's long history of water conservation and stewardship, but as the commenter mentions, is only one tool, amongst many, which must work in conjunction with water conservation, recycling, and other sustainable management practices for a holistic approach to ensuring a safe and adequate drinking water supply for Arizonans.

Comment 10: Interest Group

In our opinion, some aspects of the rules lead to over-regulation and in some aspects the rules are dismissive of the existing processes and requirements administered or regulated by EPA and ADEQ. While we recognize the comprehensive nature of the proposed rules, we are concerned that they may be overly burdensome and not sufficiently aligned with existing EPA and ADEQ requirements regarding source water. If ADEQ determines that further regulation of source water is necessary, such regulations should apply uniformly to all water systems—not just those under AWP permitting—to enhance public health protection across both conventional and advanced wastewater and water treatment systems. Requiring the permittee to monitor for unregulated Tier 2 and some Tier 3 compounds is overly burdensome and we feel does not belong in an AWP permit. The requirement by rule to monitor for Tier 2 and Tier 3 compounds is unnecessarily burdensome to an AWP permittee and establishes de facto water quality regulation outside any CWA or SDWA framework which is a major concern. If ADEQ feels these compounds are a concern then shouldn't this monitoring be required in any other permit administered by ADEQ? The multi-barrier treatment technologies deployed for an AWP facility that purify water are inherently safer than any conventional water treatment system in Arizona. As an alternative, perhaps the framework for selecting Tier 2 chemicals as presented in the Rule could be included as guidance. ADEQ could work with the applicant to develop "performance-based indicators" based on unregulated chemicals unique to each permit and source watershed. The agreed-upon performance-based indicators could include Tier 2 and Tier 3 chemicals.

ADEQ Response 10:

ADEQ appreciates the comment. ADEQ designed the AWP program using seven guiding principles: i. protective of public health and the environment; ii. community-supported; iii. scientifically-based; iv. reasonably affordable; v. transparent, informative, and communicative; vi. specific, practical, flexible, and implementable; and vii. accounts for future conditions and growth. ADEQ aimed to achieve a balance of all these principles, especially i. "the protection of public health and the environment" and vi. "specific, practical, flexible, and implementable." To protect public health, some prescriptive regulation is required. This is especially true due to the nature of the constituents with health advisories in the Tier 2 category. Unlike traditional public water systems regulated under the Safe Drinking Water Act (SDWA) that utilize groundwater or surface water as source water, AWTFs source water from water reclamation facilities. This "treated wastewater" source or influent requires unique control in a way that neither the scopes of the Clean Water Act (CWA), nor the SDWA address. That is why special monitoring, among other requirements, is required as part of the AWP program and is not equally applicable across all water treatment programs. Further regulation of municipal treated wastewater, as a source water, is necessary under AWP because there is no federal equivalent for

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such a source water.

The Tier 2 rule in the AWP program requires inventorying all chemicals in the sewershed and analyzing them using a procedure that takes into account public health protection, dilution, health advisories, and more. Additionally, once a chemical is earmarked as a Tier 2 chemical for a facility, the chemical must be addressed through a controlling mechanism; primarily, through source control or facility treatment. To ensure the requirements are not burdensome, ADEQ is not unilaterally establishing a static list of AWP-specific chemicals to control, but rather requiring a site-specific approach. The Tier 2 rule requires the applicant (an Advanced Water Purification Responsible Agency or "AWPRA") to characterize its own collection system(s) and treated wastewater influent in order to determine the presence of chemicals, which means that chemical control is only required for chemicals that are actually present in that individual AWPRA's source water.

This comprehensive approach meets the mark of public health protection when it comes to this sector of chemical control and is an approach generally supported by stakeholders and the regulated community, as is most clearly indicated through the Technical Advisory Group (TAG) recommendations for the AWP program (*see* Advanced Water Purification (AWP): Technical Advisory Group (TAG) Recommendations, page 12, https://static.azdeq.gov/wqd/awp/tag_recommendations.pdf). That group included core stakeholder representatives such as small, medium, and large Arizona utilities, and regulatory agencies. Furthermore, ADEQ conducted extensive stakeholder engagement throughout the rulemaking process prior to the proposed rule (*see* Heading No. 7, subheading "Stakeholder Engagement" of this NFRM for an in-depth discussion on the stakeholder engagement process in the development of the AWP program, including the Tier 2 framework). While ADEQ recognizes that there is some difference in opinion about the specifics of chemical control regulation, one result of this comprehensive stakeholder engagement effort is general alignment and understanding of these major components, such as the need for regulation of AWP-specific chemicals beyond the federal Maximum Contaminant Levels (MCLs), overall.

Notably, while the Tier 2 process is proposed for codification in rule, it nevertheless allows for unique outcomes customized to each permit and source watershed by factoring in the applicant's non-domestic dischargers in their watershed and the chemicals discharged by those dischargers, and as the commenter recommends, facilitates a dialogue between ADEQ and the applicant in setting design, monitoring, and treatment goals.

Comment 11: Utility

Align ongoing monitoring locations and frequency for Tier 1 and Tier 2 contaminants only at the "finished water" location and on a quarterly basis to mirror drinking water standards.

For Tier 1 contaminants, ongoing monitoring for regulated drinking water chemicals on treated wastewater at the end of the Water Reclamation Facility is burdensome and offers no compliance value. Each utility must decide if this monitoring point will assist in meeting compliance and should add monitoring for process control at locations that the utility decides will provide benefit for

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system operation. However, we support monitoring and reporting for Tier l on a quarterly basis at the finished water compliance point.

For Tier 2 contaminants, we do not support ongoing monitoring of treated wastewater at the end of the Water Reclamation Facility. Ongoing monitoring at this location prior to the AWTF is burdensome and offers no compliance value. Significant treatment for these contaminants occurs in the AWTF where compliance is designed to be met. Understanding new incoming dischargers is part of our Industrial Pretreatment program and if a concern arises, additional monitoring could be conducted as needed. We suggest that Tier 2 monitoring at this location only be required when the chemical is detected in the AWTF finished water in two consecutive quarters.

We will support permit compliance monitoring at the AWTF finished water compliance point on a quarterly basis, however, performing this monitoring at the suggested monthly interval is burdensome and is more stringent than Tier 1 contaminants which are primary drinking water standards. Requiring more stringent monitoring for Tier 2 chemicals over Tier 1 chemicals implies there is more concern about these chemicals than Tier 1. Due to the complex analytical techniques needed for many Tier 2 chemicals, test results are generally received from the lab two or more weeks after sample collection. It should be noted that treatment effectiveness is monitored continuously using online analyzers at Critical Control Points throughout the treatment process.

ADEQ Response 11:

ADEQ appreciates the comment. As the commenter highlights, ADEQ requires monitoring of Tier 1 and Tier 2 chemicals in the AWP program at two locations relative to the Advanced Water Treatment Facility (AWTF): at the finished water (advanced treated water) and at the water reclamation facility effluent (treated wastewater) (*see* R18-9-E829(C) and (D)). Notably, compliance monitoring for Tier 1 and Tier 2 chemicals occurs only at the advanced treated water.

ADEQ disagrees with the commenter that monitoring at the treated wastewater provides “no compliance value”. Monitoring at this location prior to the AWTF helps characterize a highly variable source and provides necessary data to the AWPRA on treated wastewater trends, providing greater understanding to the AWPRA about what data is typical and atypical. For example, this information is necessary for the AWPRA which is required to conduct new Tier 2 analyses upon certain occurrences, including when the “AWPRA is aware of, becomes aware of, or should reasonably be aware of…significant volumetric adjustments to an AWPRA water reclamation facility’s total daily volume of treated wastewater that are likely to impact the expected concentration of any [Tier 2 chemical]” (R18-9-E826(A)(2)(a)(ii)). An AWPRA’s familiarity with the treated wastewater, derived through ongoing monitoring efforts, is a valuable tool in complying with the AWPRA’s requirement to maintain a Tier 2 chemical list. Actual measurement of the highly variable treated wastewater is an important aspect of the AWPRA’s requirement to be a holistic steward of the AWP project by providing insight into changes at a water reclamation facility as well as into non-domestic

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dischargers under the enhanced source control program.

The commenter also expresses disagreement with the ongoing monitoring of Tier 2 chemicals at a monthly interval as required under R18-9-E829(D)(1) and suggests that the heightened monitoring requirement of Tier 2 chemicals indicates ADEQ's concern over these chemicals more than Tier 1. While ADEQ understands the complex analytical needs presented by monitoring Tier 2 chemicals, the more stringent requirement reflects the new, AWP-specific requirement of identifying, controlling, and monitoring Tier 2 chemicals that is not equivalent to Tier 1 chemicals, with which utilities have experience through the Safe Drinking Water Act (SDWA). The rule does, however, balance the commenter's interest in subsection (D)(9) by providing a pathway for reduced monitoring frequency for Tier 2. There are two reductions available, a decrease from monthly to quarterly and a decrease from quarterly to annually based on the amount of data demonstrating that a chemical has not been detected (R18-9-E829(D)(9)). This provision is further evidence that ADEQ is not more "concerned" about Tier 2 chemicals, but rather, intends to carefully introduce the new monitoring regime to utilities and see demonstrable progress in achieving quality standards before relaxing the requirements.

Comment 12: Utility

Though Scottsdale Water appreciates ADEQ including the use of the 2018 EPA Edition of Drinking Water Standards and Health Advisories Tables, the list should be qualified to only require compliance with chemicals that have an indicated human health risk. Many chemicals on this list are classified as "Indicates inadequate or no evidence in humans" or "Not classifiable as to human carcinogenicity", "Not likely to be carcinogenic to humans", etc. Including chemicals that do not pose a human health risk is overburdensome to the permittee.

ADEQ Response 12:

ADEQ appreciates the comment. The 2018 Edition of the Drinking Water Standards and Health Advisories Tables addresses contaminants, known or anticipated to be present in drinking water, that can cause multiple negative effects on human health, including both carcinogenic and non-carcinogenic effects. Because both, cancer and non-cancer effects, pose a threat to human health, they are being considered under the chemical control procedure in R18-9-E826 of the final AWP rule. Per this rule an applicant must generate certain inventories and conduct an analysis in order to determine chemicals that must be monitored, removed, and/or treated. The applicant must understand and list all non-domestic dischargers in the collection system that are direct or indirect sources to the water reclamation facility and generate an inventory of chemicals that are used, stored, or discharged by all of those non-domestic dischargers (or used at the water reclamation facility or advanced water treatment facility). From these lists and inventories, the applicant must conduct a "Tier 2" analysis for every identified chemical, and set action levels accordingly, in one of a variety of ways. One of the methods to set action levels for identified chemicals is to determine whether there is a corresponding health advisory value established in the "2018 Edition of the Drinking Water Standards and Health Advisories

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Tables". ADEQ expects the applicant to reference this table, which contains EPA-established health advisories for known drinking water contaminants.

The 2018 document provides technical information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. These health advisories are well-known and widely utilized in drinking water treatment activities across the country. For this reason, ADEQ does not believe that the requirements related to the 2018 table are overburdensome, because the list has been determined by USEPA to contain contaminants that can cause multiple negative human health effects, including both non-carcinogenic and carcinogenic effects.

Comment 13: Utility

Concerning R18-9-E826, identification of Tier 2 chemical list should not be the function of utilities and requiring such an exercise for all applicants could result in conflicting information, including inconsistent water quality permitted at AWP facilities and across the State of Arizona. It is recommended that ADEQ establish a listing of Tier 2 chemicals. Statewide universal standards for unregulated contaminants would provide the public with a higher level of confidence in ADEQ's safe drinking water oversight.

ADEQ Response 13:

ADEQ appreciates the comment. The Tier 2 chemicals selection is site-specific and should be selected based on each utilities' sewershed and their contributing dischargers. A defined and specific list of chemicals established by ADEQ would be overburdensome for both small and large AWPRAs. Small sewersheds that do not have large industries do not need to monitor for chemicals that are not being discharged. Similarly, large sewersheds may not need to monitor chemicals that do not have significant flows as there will be a dilution effect in large flow systems. Therefore, ADEQ places the onus onto the AWPRA, and equips the AWPRA with the necessary information, to characterize wastewater and identify Tier 2 chemicals based on what is actually present in the source water. Notably, the AWPRA must deliver this list to ADEQ for review and approval, ensuring a high level of oversight.

Comment 14: Utility

The requirement of maintaining a chemical inventory list of each non-domestic dischargers list is excessive and burdensome, particularly for larger urban collection systems. As written, the rule would require the AWPRA to survey every single non-domestic discharger in the collection system. For a large urban area this may include thousands of local businesses, many of which may not hold pretreatment permits with their local sewer authority.

ADEQ Response 14:

ADEQ appreciates the comment. As the commenter notes, a primary requirement under the Tier 2 Chemical Control rule, R18-9-E826 is for the AWPRA to list "all non-domestic dischargers in the collection system that are a direct or indirect source to an AWPRA water reclamation facility" and generate "a list of chemicals that are used, stored, or discharged by all non-domestic

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dischargers" from that list (R18-9-E826(B)-(C)). This chemical inventory list is critical to the identification of Tier 2 chemicals for control and must be extensive in order to ensure that all chemicals in the source water are controlled through treatment or enhanced source control. Therefore, while the requirement is burdensome, it is not overly-burdensome as the responsibility to provide safe drinking water is paramount. As with many other elements of the program, ADEQ had to balance many different interests, exemplified in the guiding principles governing the rulemaking: i. protective of public health and the environment; ii. community-supported; iii. scientifically-based; iv. reasonably affordable; v. transparent, informative, and communicative; vi. specific, practical, flexible, and implementable; and vii. accounts for future conditions and growth. The AWP program and its regulations were designed to achieve a careful balance between all of the principles, including between public health protection and implementability.

While satisfaction of this requirement will be time-consuming and complex, it is implementable, and the program directs AWPRAs on how to generate this list of non-domestic dischargers and chemicals. Under the Enhanced Source Control rule, the AWPRA is required to identify all "potentially impactful non-domestic dischargers" (R18-9-E824(B)(4)) which must be continuously verified and investigated, and which may include site visits and inquiries into the chemicals discharged or projected to be discharged by that discharger. Knowledge and understanding of the potentially impactful non-domestic dischargers and the chemicals they discharge in the enhanced source control program directly feed the generation of the chemical inventory list in the Tier 2 rule.

For the non-domestic dischargers that are not captured in the enhanced source control program, many can be generally identified and their chemicals characterized by an understanding of their industry. For example, ADEQ agrees that for large sewersheds, it may be infeasible to conduct a chemical survey of all entities such as nail salons, dry cleaners , car washes, dentists, and/or restaurants. However, if the AWPRA identifies the type and number of dischargers, many of the chemicals can be known through knowledge of the industry; e.g. - nail salons discharge acetone; dry cleaners discharge Trichloroethylene; car washes discharge heavy metals and volatile organic compounds (VOCs); dentists discharge mercury; and restaurants discharge fats, oils, and greases (FOGs). Therefore, the generation of the chemical inventory list could include a qualitative description of the number of such establishments and the contaminants that are used or stored within these establishments. From here, this data can be used to project total daily loads contrasted with the overall flow, accounting for dilution in larger sewersheds, to project the expected concentration of chemicals and generate a Tier 2 list of chemicals (R18-9-E826(D)).

Comment 15: Utility

The list of AWPRA determined Tier 2 chemicals may include contaminants for which there is no approved analytical methodology. The Clean Water Act and the Safe Drinking Water Act both identify a rigorous process to ensure that an approved and certifiable analytical laboratory method exists for a contaminant prior to issuing a new regulation. The proposed section in the draft AWP rule sidesteps this critical process which ensures laboratories across the region produce data of the same quality.

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ADEQ Response 15:

ADEQ appreciates the comment. ADEQ confirmed that analytical methodologies exist for a majority of Tier 2 contaminants. The Tier 2 rule, R18-9-E826(D), details multiple ways to derive health advisories and the corresponding analytical methodologies for chemicals. The primary option available, the option ADEQ believes will be most often utilized, is for the AWPRA to compare the projected daily concentration of each chemical against the lowest corresponding health advisory value from EPA's 2018 Health Advisory (HA) Table (R18-9-E826(D)(4)). For these chemicals, corresponding, approved analytical methodologies do exist. For chemicals that do not have an established health advisory in EPA's HA table, the AWPRA may look to a notification level or equivalent from another state's drinking water program that has been endorsed by ADEQ under (R18-9-E826(D)(5)). Currently, ADEQ has endorsed a notification level for Trimethylbenzene, and has additionally confirmed that an existing, EPA-approved lab methodology is available (R18-9-E826(D)(5)(a)(i)). For chemicals that do not have an established health advisory or an endorsed notification level from another state, the AWPRA must compare the projected daily concentration of the chemical and compare it to any listed and corresponding ADEQ Departmentally-established health advisories ((R18-9-E826(D)(6)). Here, the Department has established health advisory levels for eight chemicals or chemical compounds in rule. Additionally, the Department has confirmed that existing, EPA-approved lab methodologies are available and appropriate for all health advisories on the list.

For chemicals that do not have corresponding values from any of the aforementioned steps, but do have a Reference Dose (RfD) or Cancer Slope Factor (CSF) available in credible peer-reviewed literature or in a state or Federal database, the AWPRA must consult with ADEQ and/or the Project Advisory Committee to determine a health advisory value and approved analytical methodology (R18-9-E826(D)(7)). Lastly, for chemicals that an AWPRA is unable to derive a health advisory value for utilizing the preceding steps, the AWPRA must consult with ADEQ and the Project Advisory Committee (if necessary) to determine the health risk of the chemical through a reasonably appropriate bioanalytical study and/or bioassay, wherein the consultation would additionally determine a reasonably appropriate and Departmentally-approved analytical methodology to apply.

Additionally, the final rule at R18-9-F832(D)(10) addresses what an applicant or permittee in required to do when no reliable analytical method is available, "[w]hen there is no reliable analytical method that is technically feasible to measure a contaminant at an established health advisory concentration pursuant to R18-9-E826(D), the health advisory value shall be set at the lowest Method Detection Limit of the corresponding and most sensitive EPA-approved method."

Comment 16: Utility

A recommendation of ADEQ's Advisory Panel on Emerging Contaminants, of which Tucson Water and Pima County served as committee chairs, suggested the use of surrogate chemical class categories for use in monitoring unregulated contaminants. This recommendation is still valid and is commonplace throughout the industry and academic literature. Surrogate chemicals can be chosen strategically by ADEQ, such that they are already associated with approved analytical methodology. We strongly encourage

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ADEQ to revisit the vast chemical inventory potential and allow for the use of representative surrogate compounds for Tier 2 reporting.

ADEQ Response 16:

ADEQ appreciates the comment. Under the AWP program, ADEQ requires chemical monitoring, control, and reporting for federally regulated and unregulated chemicals and provides a variety of methods to achieve that requirement. Chemicals for which federal regulations exist must be controlled through Tier 1 chemical control. All other chemicals present in the source water, i.e. site-specific chemicals identified by the AWPRA, must also be identified and controlled. The Tier 2 chemicals are specific to the AWPRA, based on a tailored analysis conducted by the AWPRA utilizing non-domestic discharger and chemical inputs from their collection system. Therefore, it is not feasible, nor practical for ADEQ to generate a list of chemicals applicable to all AWP projects. Similarly, ADEQ may not be able to contemplate all chemicals that may be present in the source water. Also, ADEQ believes that an AWPRA's ability and responsibility to control those chemicals should not be hindered by an inflexible rule.

Tier 2 chemicals must be identified through any of the processes provided for in subsection (D) of R18-9-E826. The AWPRA must compare the projected daily concentration of all inventoried chemicals against a corresponding, established health advisory from a number of recognized sources (including the EPA) before being identified as a Tier 2 chemical for the purposes of the AWP program. Those health advisory sources include EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables", ADEQ approved notification levels from other state's drinking water programs or equivalents, the Department's health advisory list, or a health advisory derived from credible, peer-reviewed literature or state or Federal databases (R18-9-E826(D)(1)-(8)).

Comment 17: Interest Group

One of our primary concerns is the adequacy of water quality standards for potable reuse. The proposed rules must explicitly define baseline requirements to ensure the removal of contaminants of emerging concern, such as pharmaceuticals, personal care products, microplastics, and per- and polyfluoroalkyl substances (PFAS). PFAS, often called "forever chemicals," are particularly concerning due to their persistence in the environment and potential health impacts. While we recognize that the Arizona Department of Environmental Quality (ADEQ) is conducting a parallel process to address PFAS contamination more broadly, it is critical that these chemicals be specifically addressed in the context of AWP systems. Current documents suggest a focus on tiered chemical control measures but lack sufficient emphasis on PFAS removal within AWP-specific regulations. Additionally, monitoring and reporting requirements should include provisions for real-time public disclosure of water quality data to build public trust and accountability.

ADEQ Response 17:

ADEQ appreciates the comment. An AWPRA must comply with Tier 1 chemical control limits, which are chemical contaminants

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with federally-assigned Maximum Contaminant Levels (MCLs) or treatment techniques. The language in R18-9-E825, the Tier 1 rule, has been updated to cross-reference Title 18, Chapter 4, Article 1 - R18-4-102 - which incorporates by reference the July 1, 2014 version of 40 CFR 141. ADEQ plans in the near future to update this CFR reference in the rule to the most recent version that includes the PFAS MCLs. When this is finalized, that version will automatically apply to the AWP program, and the PFAS MCLs will qualify as Tier 1 chemicals at that time, and PFAS must be monitored and controlled accordingly. For PFAS not regulated under Tier 1, Tier 2 chemical identification and treatment-based control is effective. Many treatment processes that are likely to be utilized in Advanced Water Treatment Facilities (AWTFs) are effective in the removal of microplastics like PFAS. Perhaps the most predominant example is the Reverse Osmosis process.

Synthetic organics, including pharmaceuticals and personal care products will be controlled through source control measures (*see* R18-9-E824), as well as treatment-based approaches. An Advanced Oxidation Process (AOP) is a required component of all AWP treatment trains under the AWP program, which includes a required performance benchmark for the removal of synthetic organics utilizing 1,4-Dioxane or an equivalent (*see* R18-9-F832(D)(4)). Additionally, Ozone/BAC processes must be designed to provide no less than 1.0 log reduction for pharmaceuticals such as carbamazepine and sulfamethoxazole (*see* R18-9-F832(C)(3)).

Furthermore, public disclosure of water quality data is a requirement in the Ongoing Monitoring rule (*see* R18-9-E829(D)(8)), which specifies that an AWPRA is required to report certain violations in the applicable public water system's annual consumer confidence report.

Comment 18: Interest Group

We urge ADEQ to prioritize public education and outreach in communities where AWP projects are planned. The rules currently acknowledge the need to engage the public to overcome skepticism surrounding advanced water reuse, often referred to as the "yuck factor." However, more robust community involvement and transparent communication strategies are necessary to address the public's legitimate concerns about health and safety. This includes providing clear, accessible information about treatment processes, safeguards, and monitoring results.

ADEQ Response 18:

ADEQ appreciates the comment. The AWP program rules require every AWPRA applicant/permittee to engage in a community outreach effort. As each AWPRA will be required to identify and then address the unique properties and characteristics of their treated wastewater influent or source, they are better suited to address outreach in their service area than ADEQ. Rather than ADEQ engaging in enhanced community involvement and communication strategies, the onus is therefore placed on the applicant/permittee, themselves. The rule requires the applicant to develop a Public Communications Plan in order to provide customers in the relevant service areas with "education, awareness, and transparency related to the AWP project" (R18-9-B811). Central to that rule are requirements for the AWPRA to provide consumer notification and community engagement. The AWPRA

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must notify all drinking water consumers within its service area of both its intention to apply for an AWP permit, and maintain that communication throughout the pre-application and all other major program phases, through post-operation. This requirement includes, but is not limited to, providing public forums by way of public meetings to educate and inform the interested public.

The community engagement requirements incumbent upon the AWPRA include, but are not limited to, involving local government throughout the AWP project phases, as well as relevant stakeholders such as local health authorities and medical professionals. These requirements set the floor for such engagement and education, and enable and encourage the AWPRA to go further than the minimum requirements in rule by establishing additional community involvement through enhanced communication strategies.

Comment 19: Utility

In the proposed rule, "Tier 1 chemicals" are defined under R18-9-A801 with a reference to 40 CFR Part 141. There is no reference in the definition to an approval date for the MCL list. However, R18-9-E825 states "40 CFR Part 141 (published July 1, 2023)." How will the AWP program incorporate new MCLs, post-July 1, 2023?

ADEQ Response 19:

ADEQ appreciates the comment. The language in R18-9-E825 (the Tier 1 Chemical Control rule) has been updated to cross-reference R18-4-102, which incorporates by reference 40 CFR 141. That rule currently incorporates a July 1, 2014 version of the CFR. However, ADEQ is currently working on a rulemaking to update that reference in Chapter 4, Article 1 to the most up-to-date version of the CFR. Once that rule is updated, it will automatically reflect in the AWP program through that cross-reference. For new Maximum Contaminant Levels (MCLs) established in 40 CFR 141 after that date, ADEQ will incorporate those standards into Title 18, Chapter 4, Article 1 through rulemakings subject to the Arizona Administrative Procedure Act. ADEQ is responsible for administering the drinking water program (under Chapter 4) and the AWP program and will ensure those two programs are subject to the most up-to-date version of the MCLs.

Comment 20: Utility

MCLs for PFOA, PFOS, PFHxS, PHNA, HFPO-DA, and mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS were published in April 2024. Therefore, please verify these PFAS would not qualify as "Tier 1 chemicals" under R18-9-E825 even though they meet the definition in R18-9-A801?

ADEQ Response 20:

ADEQ appreciates the comment. The language in R18-9-E825, the Tier 1 rule, has been updated to reference Title 18, Chapter 4, Article 1 - R18-4-102 - which incorporates by reference the July 1, 2014 version of 40 CFR 141. ADEQ plans in the near future to update this CFR reference in the rule to the most recent version that includes the PFAS MCLs. When this is finalized, that version will automatically apply to the AWP program, and the PFAS MCLs will qualify as Tier 1 chemicals at that time.

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Comment 21: Utility

Revise R18-9-E826(B) to be consistent with R18-9-E824(C).

ADEQ Response 21:

ADEQ appreciates the comment. These lists mentioned by the commenter are not meant to be the same and, in fact, serve different purposes. The list in the Tier 2 Chemical Control rule (R18-9-E826(B)) is the "Non-Domestic Dischargers List". The list in the Enhanced Source Control rule (R18-9-E824(C)) is the "Impactful Non-Domestic Dischargers List". The Non-Domestic Dischargers List in the Tier 2 rule is intended to be an initial characterization of all non-domestic dischargers in an AWPRA's collection system that may be direct or indirect sources to the Advanced Water Treatment Facility (AWTF). This list is meant to be broad in order for the AWPRA to adequately characterize the scope of dischargers and chemicals present in their collection system with impacts on AWP source water. The goal of the Tier 2 rule is to generate a holistic understanding of the sources feeding the AWTF, in order to properly address chemical control, whether it be through treatment or control at the source. Alternatively, the Enhanced Source Control rule's "Impactful Non-Domestic Dischargers List" is a subset of the "Potentially Impactful Non-Domestic Dischargers List". The "Potentially List" includes entities subject to control measures such as outreach, facility visits, frequent communications, investigations, and other non-treatment tools that the AWPRA is required to utilize in order to demonstrate control over the treated wastewater source at the discharger level (*see* R18-9-E824(B)(4)). The "Impactful List" includes entities subject to control measures such as locally established discharge limits, monitoring, and targeted outreach (*see* R18-9-E824(C)).

Comment 22: Utility

Please clarify the following in R18-9-E826(C) - "List of chemicals" - Is it ADEQ's intention that the applicant/permittee list all ingredients (chemical composition)? For example, would a fuel station's inventory list "gasoline" or would it list benzene, toluene, xylene, etc.?

ADEQ Response 22:

ADEQ appreciates the comment. The purpose is to generate a list of chemical substances that are used, stored, or discharged, including chemicals used at the Water Reclamation Facility (WRF) and the Advanced Water Treatment Facility (AWTF), not to track the chemical composition of each chemical.

Comment 23: Utility

Please clarify the following in R18-9-E826(C) - "used, stored, or discharged" - It does not make sense to list all chemicals used or stored at a site if the use or storage area is not connected to the wastewater collection system. This requirement should be limited to chemicals discharged to, or with a potential to be discharged to, the wastewater collection system.

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ADEQ Response 23:

ADEQ appreciates the comment. Generating a list of chemicals used or stored at a site is required because these chemicals have the potential to indirectly enter the wastewater collection system. One example is a facility that keeps raw materials/chemicals in a storage room that experiences accidental spills while transferring the chemicals from the storage room to a facility for use. This spill can cause dust, containing the chemical(s), to infiltrate the air and settle on the floor which could then be washed down a drain as the spill is cleaned, or directly down the drain from the spill itself, if not cleaned properly. This drain may feed to a pipe leading to the wastewater collection system. Therefore, it is necessary to document chemicals stored and used on site, whether they reach the collection system directly or indirectly in order to best protect human health.

Comment 24: Utility (Glendale)

Please clarify the following in R18-9-E826(C) - "all non-domestic dischargers" - This should be limited to all impactful non-domestic dischargers as described in R18-9-E824(C).

ADEQ Response 24:

ADEQ appreciates the comment. R18-9-E826(C), the Tier 2 rule, requires an AWPRA to generate a list of chemicals that are used, stored, or discharged by all non-domestic dischargers in the "Non-Domestic Dischargers List" generated in subsection (B) of the rule. The generation of this list is a critical requirement of the Tier 2 chemical control analysis conducted by the AWPRA and results in a list of industrial and/or commercial establishments that are present in the collection system that are a direct or indirect source to a Water Reclamation Facility (WRF) in an AWPRA. Therefore, the phrase "all non-domestic dischargers" in R18-9-E826(C) is not limited to the "Impactful Non-Domestic Dischargers List" generated under R18-9-E824. Rather, it is intended to be a separate and broader list. For more explanation on why the scope of these two rules is different, please see ADEQ Response 21.

Comment 25: Utility

Please clarify the following from R18-9-E826(D): How does an applicant/permittee find the latest health advisory notification levels in other states' drinking water programs or find the latest "reference dose or cancer slope factor in credible peer-reviewed literature or state or federal databases"? Will ADEQ have a database on their website that has up-to-date drinking water health advisories from EPA and from other states as well as reference doses and cancer slope factors?

ADEQ Response 25:

ADEQ appreciates the comment. The Tier 2 analysis in R18-9-E826(D) details the requirement for an AWPRA to identify Tier 2 chemicals for control and for setting corresponding health advisory values. The rule provides a variety of methods for achieving this requirement, including, as the commenter highlights, subsections (D)(5) and (D)(7).

Subsection (D)(5) requires the AWPRA to compare the projected daily concentration of a chemical against a corresponding state

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drinking water health advisory notification level or equivalent from a state drinking water program "that was developed using a method that ADEQ approves and lists". This subsection includes a list of ADEQ-approved health advisory notification levels from other states and currently includes only Trimethylbenzene. As ADEQ becomes aware of and vets other state drinking water health advisories or equivalents, it may update the list in subsection (D)(5)(a).

Subsection (D)(7) requires the AWPRA to compare the projected daily concentration of a chemical (that cannot be established through any process in (D)(4)-(6)) to consult with ADEQ and/or the Project Advisory Committee to determine a health advisory value on a case-by-case basis by utilizing a Reference Dose (RfD) or Cancer Slope Factor (CSF) from credible peer-reviewed literature or state or federal databases. ADEQ does not intend to post a database of drinking water health advisories from EPA, from other states, nor peer-reviewed literature with reference doses and cancer slope factors online. R18-9-E826(D) provides the necessary information for an applicant / permittee to identify health advisories for any chemicals identified. The rule specifies that in some cases, the responsibility will rest with the AWPRA to find resources and present them to ADEQ for review during the consultation process provided for in the rule.

Comment 26: Local Government

We are supportive of the requirement in R18-9-E826(A)(2)(c) to conduct a Tier 2 chemical contaminant analysis at every permit renewal.

ADEQ Response 26:

ADEQ appreciates the comment.

Comment 27: Local Government

We are supportive of the requirement in R18-9-E826(C) to maintain a chemical inventory list.

ADEQ Response 27:

ADEQ appreciates the comment.

Comment 28: Local Government

The equation for "expected daily concentration", in R18-9-E826(D)(3), which is derived from total (chemical) contaminant load divided by total influent flow rate, will result in an underestimate of the maximum concentration. Such a calculation, which is intended for comparison to health advisories, will introduce bias in the form of concentrations appearing to be lower. This equation should not be the sole method to determine the maximum design concentration for processes to remove chemical contaminants.

ADEQ Response 28:

ADEQ appreciates the comment. The Tier 2 Analysis in R18-9-E826 is designed to derive the projected daily concentration of each chemical. That projected daily concentration is calculated from the projected load of each contaminant which is based on what is used, stored, and/or discharged by the non-domestic dischargers in the collection system (*see* R18-9-E826(D)(1)). The

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mass loading of contaminants (or projected load) will be derived using the maximum concentration for each chemical (*see* R18-9-E826(D)(1)). The Department believes a peaking factor is not explicitly required in the Tier 2 rule.

Comment 29: Local Government

Toxic chemicals, or potentially toxic chemicals, should be prohibited from being introduced into full-scale or operating AWP facilities to determine process efficacy. This practice is not allowed in drinking water facilities even for short periods of time. The appropriate procedure would be to perform bench or pilot testing with toxic or potentially toxic chemical contaminants.

ADEQ Response 29:

ADEQ appreciates the comment. As specified in R18-9-E827(C)(1) and (2), the performance based indicators (PBI) can be selected from the pre-existing chemicals identified in treated wastewater or introduced as a new chemical if no pre-existing chemicals are relevant as a PBI. During pilot study, verification will be done for the initially chosen PBIs to evaluate the treatment train performance. This will be repeated at full scale as well. All newly introduced chemicals for a PBI purpose are unlikely to be toxic; for example, sucralose does not have any known health impacts and is a useful PBI for RO. However, for other PBIs that are problematic, such as the introduction of 1,4-Dioxane, Tier 2 requirements would apply, such as monitoring, associated action levels. Diversion of the chemical would also be required, should any treatment processes fail. Action levels or health advisory limits will be imposed to ensure compliance at the finished water location to keep the concentration below any health-related limits.

Comment 30: Utility

As a basic tenet, when establishing new rules and regulations, the regulating agency should be fair, equitable, consistent, and predictable and should consider the technological and economic cost-benefit in the development and application of rules that impact the public. Under the proposed Tier 2 requirements set out in A.A.C. R18-9-E826, the lack of equitable, consistent, and predictable standards is concerning. Specifically, each Advanced Water Purification Responsible Agency (AWPRA) could be held to a different set of chemicals controls, monitoring, and reporting requirements. Under the proposed rule, these chemical controls, monitoring, and reporting requirements may vary from AWPRA to AWPRA, depending arbitrarily on when an AWPRA submits its AWP application, the AWPRA's source water, and the subjective decisions (current and future) of other state regulators, individual ADEQ staff members assigned to a particular AWPRA project, and members of the Project Advisory Committee.

Under the SDWA, the Environmental Protection Agency (EPA) is required to establish health-based water quality standards using a 3-step process (EPA 816-F-04-030 - June, 2004) that includes the following:

1) Identify contaminants that present a risk to public health,
2) Determine a maximum contaminant level goal below which there is no known health-risk, and
3) Specify a feasible maximum contaminant level (MCL) based on health-risk. When it is not feasible (e.g., economically or technically) to specify an MCL, a treatment technique in lieu of an MCL will be established to ensure control of the contaminant.

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We support the MCLs established in R18-9-E825 for Tier 1 Chemical Control. However, the proposed alert levels, action levels, and chemical control requirements set forth in R18-9-E826 for Tier 2 Chemical Control fail to meet the basic tenets of the SDWA and its 3-step process for establishing health-based water quality standards. We have previously commented to ADEQ that the constituents discussed in R18-9-E826 are, by definition, "not regulated in the SDWA" and thus have not been identified by EPA as a risk to public health. Thus, R18-9-E826 should be removed from the draft rule along with all other references to control, monitoring, and reporting of Tier 2 chemicals.

The proposed Tier 1 and Tier 3 chemical control requirements provide robust safeguards to protect public health. Furthermore, consistent with EPA's third tenet to establish treatment techniques in lieu of water quality standards, ADEQ has established in the rule robust chemical treatment techniques and barriers, beyond that of the SDWA, which forcefully protects public health. The Tier 2 requirements, which address only constituents not regulated in the SDWA and which have not been found by the EPA to pose a risk to public health, add little, if any safeguards, while adding significant costs that will be passed on to customers.

We are committed to working collaboratively with ADEQ on the development and eventual approval of Advanced Water Purification rules.

We strive to achieve a regulatory framework that provides ADEQ with the appropriate level of oversight, while also affording utilities the flexibility to design and operate facilities in a manner that aligns with the health-risk based requirements of the SDWA and offers economically viable options for our ratepayers.

ADEQ Response 30:

ADEQ appreciates the comment. The Department designed the AWP program, including the Tier 2 rule, using seven guiding principles: i. protective of public health and the environment; ii. community-supported; iii. scientifically-based; iv. reasonably affordable; v. transparent, informative, and communicative; vi. specific, practical, flexible, and implementable; and vii. accounts for future conditions and growth. While those principles guided the development of the rules, ADEQ appreciates and endorses the commenter's goal of making regulation "fair, equitable, consistent, and predictable", as well. Additionally, ADEQ recognizes that other factors play into the balance of a regulatory program's (and an individual rule's) development.

The commenter points out that chemical controls, monitoring, and reporting requirements may vary from AWPRA to AWPRA. This customization or individualistic approach to AWP regulation was designed intentionally in order to properly address unique-to-the-facility challenges each AWPRA will face in controlling constituents in their AWTF source water or "treated wastewater" influent. In fact, the approach in the Tier 2 rule identifies constituents of concern beyond the MCLs in Tier 1 and adjacent to the performance-based indicators in Tier 3, in such a way where an AWPRA will have to address only those Tier 2 chemicals that are pertinent to their facility and none more. The Tier 2 rule requires inventorying of all chemicals in the collection system and analyzing them using a procedure that takes into account public health protection, dilution, health advisories, and more.

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Additionally, once a chemical is earmarked as a Tier 2 chemical for a facility, the chemical must be addressed through a control approach: primarily, through source control or facility treatment. This comprehensive approach, while challenging for permittees and ADEQ administration alike, meets the high bar necessary to adequately protect public health in the AWP context.

Also, unlike traditional public water systems regulated under the Safe Drinking Water Act (SDWA) that utilize groundwater or surface water as source water, Advanced Water Treatment Facility (AWTF) source water will come from water reclamation facilities. This "treated wastewater" source or influent requires unique control in a way that neither the scopes of the Clean Water Act (CWA), nor the SDWA address. That is why special monitoring, among other requirements, is required under the AWP program.

The commenter also voices concern over potential regulatory variance due to expected subjective decisions (current and future) of other state regulators, individual ADEQ staff members assigned to a particular AWPRA project, and members of the Project Advisory Committee. ADEQ responds to this comment by reminding the commenter that the agency is required to administer all of its programs impartially and has no intentions of deviating from this requirement in the administration of the AWP program.

Additionally, the commenter states that "...the proposed alert levels, action levels, and chemical control requirements set forth in the [Tier 2 rule] fail to meet the basic tenets of the SDWA and its 3-step process for establishing health-based water quality standards. We have previously commented to ADEQ that the constituents discussed in R18-9-E826 are, by definition, 'not regulated in the SDWA' and thus have not been identified by EPA as a risk to public health. Thus, R18-9-E826 should be removed from the draft rule along with all other references to control, monitoring, and reporting of Tier 2 chemicals." ADEQ disagrees with the commenter's position that when a chemical is not regulated under the SDWA that means the EPA has not identified it as a risk to public health or that the chemical is not a risk to public health outside of SDWA regulation or identification. On the contrary, the Tier 2 rule requires all inventoried chemicals to have their projected daily concentration (PDC) in the treated wastewater influent to the AWTF be calculated, followed by a comparison of that PDC against a corresponding, established health advisory from a number of recognized sources (including the EPA) before becoming a Tier 2 chemical for the purposes of the AWP program. Those health advisory sources include EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables", ADEQ approved notification levels or equivalents derived and endorsed by ADEQ coming from other states' drinking water programs, the Department's health advisory list, or a health advisory derived from credible, peer-reviewed literature or state or Federal databases.

Comment 31: General Public

Ever heard of Flint, Michigan? Of course, everyone in the water sector has. And what was the root cause? A new potable water source that was less scaling (not more corrosive) than the previous source. Proper treatment adjustments were not made and previously scaled pipes were cleaned, thus leading to metals leaching, including lead. With the proposed rules coming on line,

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what precautions are being made so as to prevent this phenomenon from happening? Most well waters here in Arizona are extremely hard; lots of water softeners in place. And municipalities, currently, do a decent job of controlling hardness via blending (when surface waters are also available) and chemical treatments. Now this new water source is going to be devoid of various ions that cause scaling; how is that to be controlled? Again, the waters do not have to be more corrosive, just less scaling, such that the saturation index is impacted and minerals are adsorbed back into solution.

ADEQ Response 31:

ADEQ appreciates the comment. The AWP program relies on the SDWA for corrosion control evaluation. However, R18-9-F832(D)(2) has specific requirements for ADEQ to ensure that the AWP program complies with corrosion. In addition, a guidance document is being developed to further address corrosion control issues and concerns. The AWP program is not designed to supplant the safeguards built into the Safe Drinking Water Act (SDWA), including those addressing corrosivity, lead and copper and others.

Comment 32: General Public

We strongly support the inclusion of a digital early warning system in the direct potable reuse regulations, as mentioned in Page 3228, Section 10 of the proposed rule. These systems are vital for real-time monitoring and quick responses to contaminants, ensuring public health and safety. In the Phoenix region, reusing wastewater is essential for our city's growth and financial success. As citizens in the Phoenix region, we strongly support a digital early warning system in our wastewater. It will enhance the reliability of treated water, reduce the risk of pollutants, and increase our confidence in water reuse. We commend ADEQ for prioritizing this requirement and encouraging its adoption in the final regulation.

ADEQ Response 32:

ADEQ appreciates the comment. Early warning requirements are retained in the AWP regulations and can be found in the final rule in R18-9-E824(B)(10) and R18-9-E831(B)(6)(j).

Comment 33: Interest Group

Requiring a wastewater system to deploy early-warning monitoring of the collections system does not fit with running an AWP. A wastewater utility may elect to conduct this step to assist with process control in operating its wastewater treatment process. However, the technology for early-warning systems relies on surrogate parameters and algorithms to correlate measured parameters to chemicals of concern. The technology is still relatively new to the industry and not what we would consider to be at a technological readiness level to be a requirement under rule.

ADEQ Response 33:

ADEQ appreciates the comment. The AWP Enhanced Source Control rule, at R18-9-E824, requires a form of early warning system and sets minimum standards for the system, but does not go so far as to prescribe a specific method, technology, or process. As

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the AWP Roadmap explains, a utility can develop its own early warning system by deploying the required sensors, configuring software to detect events, and creating response rules, and additionally, emerging technology is available to provide real-time or near-real-time monitoring to detect and respond to chemical peak events. This flexibility reflects the nascent state of the technology by not restricting permittees in this effort. The Department is in the process of developing guidance documents that will provide more detail on the establishment of an early warning system.

Based on ADEQ's collaboration with direct potable reuse facilities in Singapore, Texas, and elsewhere – the Department believes that early warning systems are a necessary element of the program, and critical for protecting public health. While this requirement is a component of the final AWP rule, it was first proposed to ADEQ by the Technical Advisory Group (TAG) in their recommendations early in the design phase of the AWP program (*see* Heading No. 7, subheading "Stakeholder Engagement" of this NFRM for an in-depth discussion on the stakeholder engagement process in the development of the AWP program, including enhanced monitoring and early warning system requirements).

Because an effective early warning system is collection system-specific, ADEQ will work with the applicant during the application review process to ensure that the proposed system is adequate to meet the intent of the rule while remaining practical and implementable.

Comment 34: Utility

Concerning Enhanced Source Control at R18-9-E824, the existing technologies for early warning of discharges in collection systems are not sophisticated nor reliable enough to be able to detect and differentiate chemicals of concern from other wastewater parameters. Furthermore, online monitoring instrumentation and rapid test kits do not have the capability of detecting all constituents of concern.

ADEQ Response 34:

ADEQ appreciates the comment. The AWP rule, at R18-9-E824, requires a form of early warning system and sets minimum standards for the system, but does not go so far as to prescribe a specific method, technology, or process. This flexibility reflects the nascent state of the technology by not restricting permittees in this effort. However, based on ADEQ's collaboration with Direct Potable Reuse facilities in Singapore, Texas, and others – the Department believes that early warning systems are a necessary element of the program, and critical for protecting public health. Because an effective early warning system is collection system-specific, ADEQ will work with the applicant during the application review process to ensure that the proposed system is adequate to meet the intent of the rule while remaining practical and implementable. The Department is in the process of developing guidance documents that will provide more detail on the establishment of an early warning system.

Comment 35: Utility

Some large-scale systems collect wastewater from multiple agencies, several of which are not participants in the AWP program.

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The AWPRA will not have jurisdiction to force agencies that contribute wastewater to the system but are not participants in the Advanced Water Purification Responsible Agency (AWPRA) program from more stringent requirements than currently exist. As an example, a utility that discharges wastewater to another utility's collection system that is connected to the main collection system under the AWPRA's jurisdiction will not have an obligation to maintain a list of non-domestic dischargers or inventories of chemicals used by commercial and industrial customers.

ADEQ Response 35:

ADEQ appreciates the comment. While the Advanced Water Purification Responsible Agency (AWPRA) is the applicant or permittee, it is made up of one or more partners which are all responsible for maintaining compliance with the requirements of the AWP program. Any agency, district, or wastewater treatment plant that contributes wastewater to the 'system' are considered to be "AWPRA Partners". The definition for an "AWPRA Partner" can be found at R18-9-A801, meaning "any entity that collects or provides treated wastewater to the AWP project, performs wastewater source control or treatment pursuant to this Article, or utilizes AWP project water as a source for delivery to a drinking water distribution system" (*see also* R18-9-B805 describing the AWPRA formation and the joint plan requirements). Therefore, the AWPRA is an entity composed of its AWPRA Partners, which, through a Joint Plan, must coordinate all procedures in compliance with the AWP program. The Joint Plan must include all AWPRA Partner responsibilities under the program and all enforcement and corrective actions taken should any AWPRA Partner violate the Joint Plan or a requirement of the AWP program.

Comment 36: Utility

Under R18-9-E824(B)(11), there is a requirement that the enhanced source control program be audited at least every five years. Will ADEQ provide guidance on components of the audit?

ADEQ Response 36:

ADEQ appreciates the comment. ADEQ will provide recommendations on conducting an audit in the guidance document addressing the Enhanced Source Control Program, which will be developed pursuant to R18-9-E824(D)(1); however, ADEQ will not develop specific requirements in rule or in the forthcoming guidance document on how an audit should be conducted. The Enhanced Source Control Program is specific to each AWPRA and an audit should take into account the program approved by ADEQ and the specific elements within that program.

Comment 37: Utility

Add the following language (in italics) to R18-9-E824(D)(1), "ADEQ shall develop and make available guidance on developing, conducting, and maintaining an enhanced source control program *and guidance on performing an audit of the enhanced source control program*."

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ADEQ Response 37:

ADEQ appreciates the comment. ADEQ does not believe it is necessary to develop a separate guidance document on performing audits of the enhanced source control program. The rule, R18-9-E824, effectively serves as a checklist for the enhanced source control program. Additionally, the rule, in conjunction with the guidance document, provides details on developing, conducting, and maintaining an enhanced source control program (*see* R18-9-E824(D)(1)). For those reasons, ADEQ declines to adopt the recommendation by the commenter and believes that rule and guidance document will be sufficiently clear to demonstrate to the permittee the ongoing enhanced source control requirements.

Comment 38: Utility

Add the following language (in italics) to R18-9-E824(E), "An AWPRA shall form and maintain a source control committee that includes representatives *from each AWPRA partner that is required to implement an enhanced source control program*, that supplies treated wastewater to the AWP project or that owns and/or operates a water reclamation facility…"

ADEQ Response 38:

ADEQ appreciates the comment. Under R18-9-E824(B), an AWPRA applicant/permittee is the entity required to develop and maintain a locally authorized enhanced source control program. The definition of "AWPRA" is an "applicant or permittee, comprising one or more AWPRA partners, responsible for compliance with the requirements of the AWP program for a particular AWP project…" (*see* R18-9-A801(7)). Therefore, the AWPRA, itself, is the entity responsible for administering the enhanced source control program and "AWPRA partners" do not have separate programs, but are subject to the requirements under the program administered by the AWPRA entity they are a partner of.

ADEQ does agree with the commenter that the language in the proposed rule at R18-9-E824(E) can be modified to clarify that a source control committee shall include representatives from "each AWPRA partner that is part of the AWPRA's enhanced source control program". The language has been modified accordingly.

Comment 39: Interest Group

We are concerned with the strict requirement that the Direct Responsible Charge (DRC) be on-site at all times. We recommend that the language be adjusted to state that the DRC 'or their designee' must be available at all times. Additionally, the rule references that all collection and water reclamation facilities are operated by a grade 4 operator. We recommend Reclamation and Collections operations should be modified to apply in practical terms. Modifying the language to "operational oversight and management" could provide the necessary flexibility, ensuring that operations are managed effectively without mandating continuous hands-on control by highly certified personnel.

ADEQ Response 39:

ADEQ appreciates the comment. As with every component of the AWP program, ADEQ strives to balance optimal protectiveness

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with reasonable practicality for permittees in order to ensure that the program is safe and implementable. ADEQ understands the interest of the commenter and critically re-examined the rule, determining that a change could, in fact, be made to the Advanced Water Purification Operator Certification rule, R18-9-B804, which better achieves a balance of ADEQ's overarching goal. Based on the recommendation, the rule language is changed in the following ways.

ADEQ added a definition for "Direct responsible charge proxy" as "an AWP shift operator who is designated by, and acts on behalf of, the operator in direct responsible charge when the operator in direct responsible charge is not onsite" (R18-9-B804(A)(6)). ADEQ made corresponding updates to subsection D, General Requirements, providing that "[a]n AWPRA shall ensure that…[a]ll facilities receiving treatment credit pursuant to R18-9-E828 have a full-time operator in direct responsible charge, or their proxy, onsite at all times during operation" (R18-9-B804(D)(1)(c)) and "...[w]hen any facility receiving treatment credit pursuant to R18-9-E828 is operated by a direct responsible charge proxy, the operator in direct responsible charge must be reasonably available to provide immediate direction telephonically, if necessary" (R18-9-B804(D)(1)(d)). The definition addition and corresponding updates to subsection D are intended to provide a practical pathway for operation of the AWP facility when the operator in direct responsible charge is unavailable – namely, the operator in direct responsible charge may delegate a proxy to perform functions in their stead so long as the operator in direct responsible charge makes themselves available, telephonically, if necessary to provide direction and guidance to the proxy.

Additionally, ADEQ believed it necessary to further clarify the requirements of the operator in direct responsible charge, given the proxy pathway provided for in the final rule. The language in subsection D is further updated to state that "[a]n AWPRA shall ensure…[a]ll facilities receiving treatment credit pursuant to R18-9-E828 have a full time operator in direct responsible charge onsite for at least two full shifts per day" (R18-9-B804(D)(1)(b)). This language clarifies ADEQ's intention for a facility to have employed, as a full-time operator, at least one operator in direct responsible charge who is primarily onsite performing the hands-on functions of their position, while accounting for the practicalities of other duties/training off-site that may be incumbent upon the operator in direct responsible charge.

The commenter also refers to the proposed rule's requirement that wastewater collection systems and wastewater treatment facilities are operated by a grade 4 operator. The commenter recommends modifying this requirement "to apply in practical terms". In response to this comment, and others exhibiting similar sentiments, ADEQ re-examined the language in the proposed rule and modified it as follows. Under the final rule, a wastewater treatment facility receiving AWP treatment credits "shall be operated by an AWP operator and an operator certified at the appropriate grade, and no grade lower, for the class of the facility pursuant to Chapter 5, Article 1 of this Title" (R18-9-B804(L)(2)(a)). Furthermore, a wastewater collection system that collects and conveys water to a wastewater treatment facility that is ultimately used as a treated wastewater supply to an Advanced Water Treatment Facility (AWTF) "shall be classified pursuant to R18-5-114 of this Title" (R18-9-B804(L)(2)(b)). These updates to subsection L

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remove the outright requirement for a grade 4 operator for wastewater treatment facilities and wastewater collection systems, and instead link their operator requirements to those already established under A.A.C. Title 18, Chapter 5, Article 1. This update addresses the commenter's concern to modify these requirements "to apply in practical terms".

Comment 40: Utility

Additional water examination requirements for Grade 3 and 4 wastewater operators are too restrictive. With the qualifying experience and AWP certificate, a Wastewater Operator will have the full understanding of operator responsibility, training and response protocols for AWTF facility, the mere possession of an additional water certification is irrelevant.

ADEQ Response 40:

ADEQ appreciates the comment. R18-9-B804(K)(5) requires, among other experience requirements, all AWP certified operator applicants pass the advanced water treatment examination in order to be eligible for certification as an AWP operator. Subsection (F)(6), however, establishes an additional requirement for Grade 3 and Grade 4 wastewater treatment operator applicants, "For applicants with a Grade 3 or Grade 4 wastewater treatment operator certification, the examination shall include an additional component which tests knowledge equivalent to the Grade 3 drinking water treatment operator examination." ADEQ respectfully disagrees with the commenter in two ways. First, the commenter incorrectly states that this requirement is for an "additional water certification". The Grade 3 and Grade 4 wastewater operators are not required to possess additional drinking water treatment certification, but are required to take a separate version of the AWP operator's exam which includes an additional component that tests knowledge *equivalent* to that which is tested on a Grade 3 drinking water treatment operator examination (emphasis added). Therefore, there is no need or requirement in the AWP rule for these applicants to possess an additional certification.

Second, ADEQ disagrees that a demonstration of knowledge equivalent to a Grade 3 drinking water treatment operator is "irrelevant". AWP produces water of drinking water quality, which may be blended or distributed directly to customers. Because of this, knowledge of drinking water treatment is paramount for all operators at an advanced water treatment facility. The AWP program incorporates flexibility with operator certification by prescribing a pathway for Grade 3 and Grade 4 wastewater operators to become certified as AWP operators. However, ADEQ acknowledges that the wastewater treatment examination does not include all critical components relevant to drinking water treatment. The AWP examination, also, does not include all of these critical components, as they would be duplicative for Grade 3 and Grade 4 drinking water treatment operators. Therefore, the rule, in R18-9-B804(F)(6), prescribes an additional examination requirement in order to ensure that operators of AWP facilities possess the necessary expertise and qualifications to operate an advanced water treatment facility.

Comment 41: Utility

Requiring a Direct Responsible Charge (DRC) to be on-site at all times is impractical and does not provide enough flexibility to the utility in managing operations. The Proposed Rule implies that the DRC must be onsite for potentially 16 hours per day. If the

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DRC is intended to be one person, that is not practical and creates redundancy with the shift operator. If the DRC is intended to be "multiple people" with a Grade 4 Drinking Water plus AWT certification, this puts a strain on utilities due to a statewide shortage of qualified operators and increased labor costs. It would better-serve the industry and workforce if the proposed rule language be amended to state that a DRC, or their designee, must be "available" at all times. The existing language will contribute to increased operational costs and operator fatigue.

ADEQ Response 41:

ADEQ appreciates the comment. Please see ADEQ Response 39.

Comment 42: Utility

The Rule references that all collection systems and water reclamation facilities are 'operated' by a grade 4 operator. We recommend Reclamation and Collections operations should be modified to apply in practical terms. Modifying the language to "operational oversight and management" could provide the necessary flexibility, ensuring that operations are managed effectively without mandating continuous hands-on control by highly certified personnel.

ADEQ Response 42:

ADEQ appreciates the comment. R18-9-B804(L) of the AWP program sets forth class and grade requirements relevant to AWP. This section has been updated following the release of the proposed rule. Previously subsection (L)(2) required that both a wastewater treatment plant supplying treated wastewater to an advanced water treatment facility (AWTF) and a wastewater collection system that collects and conveys wastewater as a supply to an AWTF be Grade 4 facilities for the purposes of Arizona Administrative Code (A.A.C.) Title 18, Chapter 5, Article 1. The final rule contains the following changes to this subsection: only a wastewater treatment facility "receiving AWP treatment credits under R18-9-E828 that supplies treated wastewater to an AWTF shall be a Grade 4 facility"; and wastewater collection systems that collect and convey wastewater as a supply to an AWTF shall only be classified "pursuant to R18-5-114". In accordance with A.A.C. R18-5-104(A), facilities must have an operator certified at or above the grade of the facility. Modifying the language to "operational oversight and management", as the commenter suggests, is contradictory to this requirement in 18 A.A.C. 5, Article 1.

Comment 43: Utility

The Draft Rule does not clearly align with the established Arizona Administrative Code requirements for treatment facility rating and operator for staffing. A Grade 4 Collections or Grade 4 Water Reclamation Plant (WRP) is allowed to be operated by one level below the grading of the plant, i.e. a Grade 3 operator.

ADEQ Response 43:

ADEQ appreciates the comment. ADEQ disagrees with the commenter that the Arizona Administrative Code (A.A.C.) allows a Grade 4 wastewater collection system or wastewater treatment plant to be operated by a Grade 3 operator. Without reference to a

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specific citation in the code, ADEQ can only presume the commenter is referring to A.A.C. R18-5-104(A)(5) which permits the operator in charge of the facility to be certified at a grade no lower than one grade below the grade of the facility "in the absence of the operator in direct responsible charge". Therefore, the comment lacks the proper context for the provision, which does not allow for indefinite operation of a Grade 4 facility by a Grade 3 operator, but rather permits the operation only upon an "absence" of a Grade 4 operator.

The AWP program is distinct and separate from the requirements in Chapter 5, Article 1, except where expressly indicated otherwise. AWP is guided by the programmatic rules in 18 A.A.C. Chapter 9, Article 8. Under the AWP rule, a wastewater treatment facility receiving AWP treatment credits is required to be a Grade 4 facility (R18-9-B804(L)). Pursuant to R18-5-104(A)(5), a Grade 4 operator must operate that facility. The rule has been updated for collections systems, however, such that wastewater collection systems within an AWP project are not required to be Grade 4, but shall be classified pursuant to R18-5-114, and have an assigned operator according to the classification of the facility. Please note, too, that the rule has been updated since the proposed rule to provide an option for an "operator in direct responsible charge proxy" to operate the facility in the operator in direct responsible charge's stead, for a specific period of time defined in the rule (R18-9-B804(D)). The "proxy" is defined as an AWP shift operator "who is designated by, and acts on behalf of, the operator in direct responsible charge when the operator in direct responsible charge is not onsite" (R18-9-B804(A)(6)). Therefore, similar to the language in Chapter 5, a facility subject to the operations requirements under R18-9-B804 and subsection D, specifically, may be operated by one level below the operator in direct responsible charge in some circumstances, but not indefinitely.

Comment 44: Utility

The wastewater treatment operator examination, with the additional drinking water component on the test, is an overly restrictive pre-qualification requirement. This type of exam does not offer standardized ISO 17024 metrics that ensure validity, reliability, and legal defensibility of the certification exam process.

ADEQ Response 44:

ADEQ appreciates the comment. Generally, please see ADEQ Response 40 above. The Advanced Water Treatment Operator examination is being developed and designed by ADEQ to the same standard as existing Drinking Water and Wastewater examinations, including ensuring validity, reliability and legal defensibility.

Comment 45: Utility

At issue with Operator Certification at R18-9-B804, is the significant shortage of operators currently certified at the appropriate level to operate existing water treatment facilities. Increased requirements, although necessary, will continue to shrink that pool and may decrease interest. Many portions of the state do not have Grade 4 water or wastewater facilities currently which prevents candidates from obtaining qualifying experience. Modifying the prerequisites found in R18-9-B804(K) for advanced water

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treatment operator candidates to allow those with a Grade 3 Wastewater Treatment operator certification would increase the potential candidate pool.

ADEQ Response 45:

ADEQ appreciates the comment and acknowledges the challenges of hiring certified operators. The Operator Certification rule provides a pathway for a Grade 3 wastewater treatment operator to achieve certification for an Advanced Water Purification Operator (AWPO) certification. Section (K)(4) of the Operator Certification rule sets forth requirements for an applicant to sit for admission to an AWPO examination, specifying that a Grade 3 wastewater treatment operator "shall have at least two years' experience operating a Grade 3 wastewater treatment facility" (R18-9-B804(K)(4)(c)). Subsection (K)(5) establishes the prerequisites for certification, upon passage of the AWPO examination, and provides that "[a]n applicant with Grade 3 wastewater treatment certification with at least one year of advanced water treatment qualifying experience shall receive certification as AWP shift operator". A Grade 3 wastewater treatment applicant may earn "advanced water treatment qualifying experience" subject to subsection (K)(6) which provides options for demonstrating such experience. These options include operating a pilot facility, operating an AWP demonstration facility that is not distributing finished water for human consumption, experiential reciprocity, an apprenticeship under an AWP operator, or other experience as approved by the Department (R18-9-B804(K)(6)). This last option was added by ADEQ in response to comments received in the NPRM and intends to provide ADEQ with further flexibility in crediting qualifying experience that may not be fully contemplated in rule at this time, and acknowledges the commenter's concern surrounding implementability.

Comment 46: Utility

Additionally at issue with Operator Certification at R18-9-B804, please revise the language to state that the operator in direct responsible charge (DRC) or their designee shall be available at all times. As written, the language implies the DRC is on-site at all times (24/7).

ADEQ Response 46:

ADEQ appreciates the comment. Please see ADEQ Response 39.

Comment 47: Utility

Should R18-9-B804(K)(5)(d) list "Grade 4" wastewater treatment certification, not Grade 3? Grade 3 is already included in R18-9-B804(K)(5)(c).

ADEQ Response 47:

ADEQ appreciates the comment. Yes, the language in the final rule has been updated accordingly. R18-9-B804(K)(5)(d) now reads, "[a]n applicant with Grade 4 wastewater treatment certification with at least one year of advanced water treatment qualifying experience shall receive certification as AWP shift operator".

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Comment 48: Utility

ADEQ and permittees have made tremendous efforts to protect water supplies through Arizona's Aquifer Protection Permit (APP) compliance program and pretreatment including implementation of Best Available Demonstrated Control Technology (BADCT). The proposed increased requirements in the new rule considerably downplays and undermines any earned trust built with this program and the current delivery of high-quality reclaimed water delivered to schools, parks, golf courses, and numerous recharge facilities where it replenishes our aquifer. Much of this water makes its way back to the aquifer, where it is eventually reused as drinking water once again.

ADEQ Response 48:

ADEQ appreciates the comment. ADEQ's implementation of the AWP program is commensurate with the intention of the Arizona State Legislature, acting on behalf of Arizonans, when it mandated ADEQ to adopt all rules necessary to establish and implement an AWP program (A.R.S. § 49-211). AWP authority derives separately from ADEQ's authority to implement and administer the Aquifer Protection and Use of Recycled Water programs, which are found in A.R.S. Title 49, Chapter 2, Articles 1 and 3. Therefore, the establishment of the AWP program does not undermine the efforts under these programs and they, in fact, have different objectives. The APP program is designed to protect aquifer water quality through discharge control, while the Use of Recycled Water programs provide permitting for certain classes and uses of recycled water. AWP is designed to take a treated wastewater source and further treat that source water to a drinking water standard for the purpose of expanding and diversifying a community's source water portfolio. Furthermore, the AWP program is implemented in the Arizona Administrative Code (A.A.C.) in Title 18, Chapter 9, Article 8. Existing programs in Chapter 9 remain in force such as the Aquifer Protection and the Use of Recycled Water regulatory programs in Chapter 9 which provide a permitting framework for distribution and use of reclaimed water at schools, parks, golf courses, and elsewhere. Reclaimed water can still be utilized in accordance with Article 7, however, pursuant to the Legislative directive regarding AWP, ADEQ developed another option for water reuse which a community may decide to undertake depending on what best fits the needs and interests of a community. The ability for a water provider agency to make thoughtful determinations about the use of water in their service area will not be encumbered by ADEQ in this rulemaking, rather, ADEQ has, as the legislature intended, presented a viable, voluntary, new drinking water source for Arizonans. Therefore, under the AWP program, each applicant must be a responsible, holistic steward of the water resources in their portfolio and make decisions that are best for consumers and ecological areas, alike, within their service area.

Comment 49: Interest Group

We are particularly concerned about the potential dewatering of rivers and streams that currently receive treated effluent. Effluent discharge often serves as a critical source of water for riparian habitats, supporting biodiversity and maintaining ecosystem services. Advanced water purification could divert these flows, leaving rivers like the Santa Cruz and the San Pedro and wetlands like the

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Gilbert Riparian Preserve and the Tres Rios Wetlands, among others, vulnerable to reduced volumes, which would harm aquatic and riparian ecosystems. While these ecological impacts may be beyond the scope of this rulemaking, none of these parallel processes will be implemented in a vacuum, and it is reasonable to at least acknowledge potential impacts and point to processes through which they will be addressed. The rules could account for these unintended consequences and provide strategies to mitigate impacts on environmental water needs.

ADEQ Response 49:

ADEQ appreciates the comment. The Department believes the implementation of the AWP program is commensurate with the intention of the Arizona State Legislature (acting on behalf of Arizonans) when it mandated ADEQ to adopt all rules necessary to establish and implement an AWP program (A.R.S. § 49-211). The Department designed the AWP program using seven guiding principles: i. protective of public health and the environment; ii. community-supported; iii. scientifically-based; iv. reasonably affordable; v. transparent, informative, and communicative; vi. specific, practical, flexible, and implementable; and vii. accounts for future conditions and growth. This careful balancing led to a rule that provides for, and encourages, flexibility in implementation, based on the understanding that ADEQ is not the proper entity to determine what individual water portfolios look like for water provider agencies across the State. The Department believes that the ability for a water provider agency to make thoughtful determinations about the use of water in their service area should not be encumbered by ADEQ in this rulemaking. Instead, ADEQ should, as the legislature intended, develop and present a viable, voluntary and new drinking water source for Arizonans, derived from the careful processing of treated wastewater. Therefore, under the AWP program, each applicant must be a responsible, holistic steward of the water resources in their portfolio and make decisions that are best for consumers and ecological areas, alike, within their service area and greater community.

Additionally, under the outreach requirements of the rule, there are multiple pathways and opportunities provided to the public to express their concerns and interests to a prospective or actual AWP permittee. ADEQ mandates each applicant/permittee provide the public with adequate and frequent communication and transparent opportunities to engage through easily accessible forums, including a publicly-accessible repository with public questions, comments, and responses, which shall be maintained for the lifetime of the AWP project (R18-9-B811(B)(1)(c)). Additionally, ADEQ mandates that every AWPRA applicant involve relevant stakeholders, and suggests that the stakeholder list include local environmental groups. The purpose of the outreach requirements in the AWP program are to provide myriad opportunities to engage, on a project-by-project basis, with the AWPRA, on the impact and effects of adopting AWP in a specific service area and greater community.

Comment 50: Interest Group

An issue is the management of waste byproducts generated during the purification process. Concentrate streams often contain high levels of salts, heavy metals, PFAS, and other pollutants. While the rules include some guidance on source control and treatment,

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clear and enforceable guidelines for the safe disposal or reuse of these byproducts remain underdeveloped. Without robust waste management plans, the risks of secondary contamination to the environment are substantial.

ADEQ Response 50:

ADEQ appreciates the comment. The AWP rule does not modify or weaken existing requirements surrounding the management of waste byproducts, which are currently regulated by the state or Federal administrators under regulatory programs such as the Arizona Pollutant Discharge Elimination System (AZPDES) program and ADEQ's Solid and Hazardous Waste regulatory programs. In order for an applicant / permittee to properly dispose of any waste generated during the treatment process, it (including all respective partner entities) must comply with all existing regulations and processes established under the facility's waste management plan.

Comment 51: General Public

How many billions of taxpayer money are you going to waste on this project?

ADEQ Response 51:

ADEQ appreciates the comment. AWP is a voluntary program in which water provider agencies may choose to participate in after outreach and collaboration with their customers. Applicants must develop a Public Communications Plan which, among other requirements, ensures the applicant notifies all drinking water consumers of its intention to apply for an AWP permit and maintains communication with consumers throughout all major program phases (*see* R18-9-B811). ADEQ expects water provider agencies to determine whether AWP fits the needs of water customers in their respective service areas and to ensure that there is adequate customer demand, support, and ability to pay for any new Advanced Water Treatment Facility (AWTF).

The AWP program follows a fee-for-service model, deriving funding from applicants and permittees via hourly review rates for permit applications and related components as well as from annual fees. The costs charged through the program are commensurate with projected costs necessary to adequately support the program. The proposed fees are designed and calculated to be fairly assessed, imposing the least burden possible to parties subject to the fees.

Comment 52: Interest Group

We are concerned that some requirements of AWP are overly-burdensome and have the potential to make AWP unaffordable and infeasible for some communities. Our concern is from the perspective that the process of establishing new rules and regulations be fair, equitable, consistent, predictable, and consider the technological and economic cost-benefit in the development and application of rules that impact the public.

ADEQ Response 52:

ADEQ appreciates the comment. The guiding principles that governed this rulemaking take into account the need for balancing public health protection while, at the same time, making potable water affordable. The seven guiding principles are: i. protective

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of public health and the environment; ii. community-supported; iii. scientifically-based; iv. reasonably affordable; v. transparent, informative, and communicative; vi. specific, practical, flexible, and implementable; and vii. accounts for future conditions and growth. Beyond the consideration and balancing of all the principles above, including public health protection and affordability, ADEQ further based its design of the AWP program on the best available science and consensus recommendation provided to the Department by stakeholders such as the Arizona utilities represented in the Technical Advisory Group (TAG), and other stakeholder engagement efforts (*see* Heading No. 7, subheading "Stakeholder Engagement" of this NFRM for an in-depth discussion on the stakeholder engagement process in the development of the AWP program). The holistic review of these sources, along with consultation and development with ADEQ's own subject matter experts yielded the program as it exists in the final rule. With that stated, ADEQ disagrees with the opinion that some program components are "overly-burdensome". ADEQ believes that all program components are tailored to balance the principles listed above, while ultimately providing a safe pathway for advanced water purification in Arizona.

Despite ADEQ's efforts, it is true that some Arizona communities may not be able to afford to participate in the AWP program at this time. The necessary requirements of the AWP program are accompanied by higher price tags than other less demanding and complex regulatory programs. ADEQ expects water provider agencies to determine whether AWP fits the needs of their constituents and to ensure that there is adequate customer demand, support, and ability to pay for any new advanced water treatment facility. However, looking forward, ADEQ anticipates the costs of the AWP program to decrease over time - or at least become more feasible - as key technologies become more affordable, additional funding sources become available, and there are continuous improvements in innovation, efficiency in operation, treatment, and beyond.

Comment 53: Interest Group

The proposed rules refer to AWP as a voluntary decision for a water provider. AWP could very well become an essential component of meeting a community's water demands. AWP being "voluntary" is an unacceptable basis for these over-reaching requirements that remain in the proposed rule.

ADEQ Response 53:

ADEQ appreciates the comment. The requirements in the final AWP rules are based on a variety of inputs including the Technical Advisory Group (TAG) recommendations, internal and external subject matter expertise, and extensive stakeholder engagement (*see* Heading No. 7, subheading "Stakeholder Engagement" of this NFRM for an in-depth discussion on the stakeholder engagement process in the development of the AWP program). The rule development process spans many years and the recommendation and feedback from hundreds of stakeholders, experts, practitioners, and regulators. This robust process forms the basis for the requirements in the final rule, not the fact that AWP is a voluntary program. AWP's voluntary nature has no bearing on ADEQ's development of a safe and reliable regulatory program.

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Comment 54: Utility

The increased source control efforts come with additional financial burdens that may have an impact on future economic development where AWP will be used, either voluntarily or by necessity. These costs, in addition to the cost of constructing AWP infrastructure, will be passed on to customers. Much like the development of a maximum contaminant level (MCL) by the Environmental Protection Agency, financial impacts should be a consideration.

ADEQ Response 54:

ADEQ appreciates the comment. The guiding principles that governed this rulemaking take into account the need for balancing public health protection while, at the same time, making potable water affordable to customers. The seven guiding principles are: i. protective of public health and the environment; ii. community-supported; iii. scientifically-based; iv. reasonably affordable; v. transparent, informative, and communicative; vi. specific, practical, flexible, and implementable; and vii. accounts for future conditions and growth. The AWP program and its regulations were designed to achieve a careful balance between all of the principles, including between public health protection and affordability. The source control efforts outlined in the rule are a necessary element of the AWP program. Some Arizona communities may not be able to afford to participate in the AWP program at this time. ADEQ expects water provider agencies to determine whether AWP fits the needs of water customers in their respective service areas and ensure that there is adequate customer demand, support, and ability to pay for any new advanced water treatment facility and all adjacent requirements. However, ADEQ anticipates the costs of the program to decrease over time as key technologies become more affordable and there are continuous improvements in innovation, efficiency in operation, treatment, and beyond.

Comment 55: General Public

How will the costs described impact the cost of water for customers of utilities transitioning to AWP?

ADEQ Response 55:

ADEQ appreciates the comment. Constituents of a service area under a utility that has diversified their water portfolio through an AWP permit can expect the utility to communicate with them about any price adjustments due to AWP. AWP is a voluntary program in which water provider agencies may choose to participate in outreach and collaboration with their customers. AWP applicants must develop a Public Communications Plan which, among other requirements, ensures the applicant notifies all drinking water consumers of its intention to apply for an AWP permit and to maintain communication with consumers throughout all major program phases (*see* R18-9-B811). ADEQ expects water provider agencies to determine whether AWP fits the needs of water customers in their respective service areas and to ensure that there is adequate customer demand, support, and ability to pay for a new Advanced Water Treatment Facility (AWTF). Technologies typically used in AWP or direct potable reuse settings are in many cases, state-of-the-art and expensive. However, sourcing, buying, and conveying water to a service area's facilities can also

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be expensive. Weighing those and other factors will be a part of any utility's calculations when considering AWP.

Comment 56: General Public

R18-9-A804(K)(5)(c) & (d) are exactly the same. I believe subsection (d) should be related to a Grade 4 Wastewater similar to (b).

ADEQ Response 56:

ADEQ appreciates the comment and the language in the final R18-9-B804(K)(5)(d) has been updated accordingly. Subsection (K)(5)(d) now reads, "[a]n applicant with Grade 4 wastewater treatment certification with at least one year of advanced water treatment qualifying experience shall receive certification as AWP shift operator".

Comment 57: Utility

To be consistent with the definition of AWP, revise the definition of "Advanced Water Purification Responsible Agency Partner" to include the italicized words shown here: "…*delivery to a drinking water treatment facility* or a drinking water distribution system."

ADEQ Response 57:

ADEQ appreciates the comment. The definition of "Advanced Water Purification Responsible Agency Partner" already contemplates the recommended language from the commenter, "delivery to a drinking water treatment facility". A facility that delivers to a drinking water treatment facility under the AWP program would be the Advanced Water Treatment Facility (AWTF), which is already incorporated into the Advanced Water Purification Responsible Agency Partner definition as, "...any entity that…performs wastewater source control or treatment pursuant to this Article, or utilizes AWP project water as a source for delivery to a drinking water distribution system". Therefore, no additional language is necessary.

Comment 58: Utility

Based on the definition of "treated water augmentation," delete "directly to the distribution system" from the definition of "Blending."

ADEQ Response 58:

ADEQ appreciates the comment. ADEQ retains the language in the definition of "blending" in R18-9-A801(20) to maintain the additional clarification provided from the statement.

Comment 59: Utility

It is incorrect to state that raw wastewater "has not undergone any treatment." There are numerous wastewater pretreatment devices within Glendale's sewershed to minimize discharges of oil, grease, and/or sand into the municipal wastewater collection system. The definition should be revised (in italics): "…wastewater that is entering a Water Reclamation Facility *or Wastewater Treatment Plant* via a sewage collection system and which has not undergone any treatment…"

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ADEQ Response 59:

ADEQ appreciates the comment. ADEQ has added the word "centralized" to the definition of "raw wastewater" (R18-9-A801(76)) in order to distinguish between pretreatment measures and those traditionally applied at a centralized Water Reclamation Facility. ADEQ notes that "Water Reclamation Facility" and "Wastewater Treatment Plant" hold the same definition (R18-9-A801(106)) and are used interchangeably throughout the rule. Therefore, there is no meaningful distinction between the two terms for the purposes of the AWP program.

Comment 60: Interest Group

We believe that no other local or county government should have the ability to create a rule that could restrict the reuse activity permissible by the State. We recommend adding a provision in the rule related to: "No local or county governments are allowed to create a rule that prevents a community or water provider from implementing AWP."

ADEQ Response 60:

ADEQ appreciates the comment. The Arizona Revised Statutes (A.R.S.) at section § 49-106 provides that the rules adopted by ADEQ "apply and shall be observed throughout this state" and local governing bodies may adopt ordinances and rules only insofar as those ordinances and rules "do not conflict with state law and are equal to or more restrictive than the rules of the department". Pursuant to the authority of this statute, the AWP program applies throughout the state and no local governing body may pass an ordinance or rule that conflicts with AWP or "restricts" its use, as the commenter states. A de facto prohibition on AWP would be considered a conflict of state law and therefore unenforceable. Because this provision exists in statute, ADEQ does not believe it is necessary to include the provision into the rule itself.

Comment 61: Utility

Will a new source approval (as specified in R18-5-505(B)(1)(d)) be required for AWTF effluent? Or is it "presumptively considered surface water" (as written in the proposed R18-9-A803)?

ADEQ Response 61:

ADEQ appreciates the comment. Yes, a new source approval will be required for the product water of an AWTF. The rule allows Advanced Water Treatment facilities (AWTFs) to produce two types of product water, "advanced treated water" or "finished water". "Advanced treated water" is defined at R18-9-A801(5), as the product of an AWTF which can then be delivered to an existing Public Water System (PWS) or Drinking Water Treatment Facility (DWTF) as a source water for further treatment under SDWA regulation. "Finished water" is defined at R18-9-A801(45), which can be introduced directly into a distribution system or served for human consumption without additional treatment, except for measures required to uphold water quality within the distribution system and all applicable SDWA requirements. In the "finished water" case, the AWTF would be considered a Public Water System under SDWA regulation, subject to all of the protections thereunder, including source water analysis. In the previous

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case, “advanced treated water” would be considered a source water for an existing PWS / DWTF, where the SDWA safeguards would, likewise, apply. Additionally, “advanced treated water” and “finished water” are presumptively considered a “surface water” per R18-9-A803.

Comment 62: Utility

Will an Approval to Construct (R18-5-505) and Approval of Construction (R18-5-507) be required when an existing drinking water system is modified to receive AWTF effluent? This may include connection at or prior to the intake to an existing drinking water treatment facility or connection directly into a potable water distribution system.

ADEQ Response 62:

ADEQ appreciates the comment. The AWP program does not supplant or supersede the requirements under the Safe Drinking Water Act (SDWA), and all AWP facilities must comply with SDWA requirements. Any modification to an existing treatment process will require approval from the Department pursuant to A.A.C. R18-5-509. Additionally, please take note of a new rule to be added to Arizona Administrative Code (A.A.C.) Title 18, Chapter 5, Article 5, which will be entitled “Applicability of Advanced Water Purification Program” and placed at R18-5-510. This rule clarifies the inapplicability of R18-5-505 and R18-5-507 to AWPRAs, amongst other clarifications.

Comment 63: Local Government

We are concerned that the final AWP rules will be substantially weakened before publication based on the previously unpublished statement of achieving parity with drinking water rules. It is stated at 30 AAR 3186, under subtitle “Associated Rulemakings” that changes to Chapter 5 of Title 18 are based on the aim of achieving parity between drinking water regulations and AWP regulations. Considering all the constituents that are known to be or that could exist in wastewater and all the constituents not regulated by the SDWA, this is aiming substantially below the published Draft rules developed by a large number of stakeholders which were stricter than the drinking water rules.

ADEQ Response 63:

ADEQ appreciates the comment. The language in the Notice of Proposed Rulemaking (NPRM) referred to by the commenter above is as follows, “[t]he proposed changes to Chapter 5 are specific to amending the Minimum Design Criteria in Article 5 to correspond with the rules in the AWP program which outline the interconnection between AWP and the Safe Drinking Water Act, specifically between AWP permitting and design requirements and those in Article 5, applicable to public water systems. The proposed changes in Chapter 5 aim to achieve parity between the two programs by clarifying, in each, how and where the program components are applicable.” The “Department” concedes that the use of the word “parity” is misleading. Put another way, the addition of R18-5-510 to Chapter 5, Article 5 clarifies which part(s) of, and when, the SDWA is applicable to AWP facilities and when AWP permitting and design requirements apply. These clarifying changes to the language in Chapter 5 will not weaken the

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safeguards developed in the AWP program. On the contrary, the language addressing AWP in Chapter 5 requires AWTFs to be regulated by robust permitting and design requirements specific to AWP. It is also important to note that no changes to proposed language in R18-5-510 in Chapter 5, Article 5 have been made between the proposed and the final rule.

Comment 64: Local Government

We are concerned that Region 9 of the EPA may not have specifically commented or opined on the State's creative way to implement AWP regulations by superseding drinking water design criteria and permitting regulations and leaving detail to unpublished guidance. Please confirm that the EPA's opinion has been solicited, especially on paragraphs R18-9-803(A) and (B). Please share the EPA's opinions and comments on the proposed rules if any have been received. Please confirm if any of the EPA's concerns have been incorporated.

ADEQ Response 64:

ADEQ appreciates the comment. EPA has not been directly solicited to comment on the proposed rules. ADEQ is required to develop an AWP regulatory program pursuant to an Arizona State Legislative mandate, A.R.S. § 49-211, signed into state law in 2022. Therefore, the authority to develop the program is derived from state law, not Federal. The AWP program's rules provide guidance on how the program works in conjunction with the Safe Drinking Water Act (SDWA). It is important to note that nothing in the AWP program rules would negate or replace SDWA requirements. In the multi-year development of the AWP program, ADEQ conducted many stakeholder events, including a series of meetings with a Technical Advisory Group (TAG), consisting of industry and regulatory leaders in the wastewater, reuse, and drinking water fields, many of whom frequently work with the EPA and intimately understand the SDWA. Additionally, the Department had many conversations with the EPA regarding the draft program requirements and the progress of the rule development.

The AWP program is not designed to supplant the safeguards built into the SDWA. The rule allows Advanced Water Treatment Facilities (AWTFs) to create two types of product water, "advanced treated water" or "finished water". Advanced treated water is "water produced by an [AWTF]" (R18-9-A801(5)). Advanced treated water may be delivered to a public water system as a source, where it's blended with other sources such as groundwater and surface water and undergoes additional treatment prior to being distributed as drinking water to customers. The advanced treated water is only subject to regulation under the AWP program, but once it is delivered to a public water system, it becomes subject to the SDWA. Alternatively, finished water is defined as "water produced by an AWTF, or a drinking water treatment facility, and which is introduced into a distribution system or served for human consumption" (R18-9-A801(45)). Finished water can only be distributed to customers by the AWTF if the AWTF is, in addition to AWP, permitted as a public water system under the SDWA. Under this scenario, the finished water is subject to regulation under both AWP and the SDWA at the AWTF.

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Comment 65: Local Government

"Raw Water" and “Treated Water" Augmentation are expressly defined. The document remains silent as to whether ATW water would be allowed to be introduced into the finished water reservoir of a groundwater treatment plant or surface water treatment plant. The response to Draft Rule Comment #88 indicated that ATW could enter the finished water reservoir and that traditional new source approval data would need to be obtained, and that additional guidance will be forthcoming, and that it would be treated as a blending situation.

Please confirm our interpretation of the meaning of this response. We believe that this would require a re-evaluation of the existing DWTF disinfection adequacy and lead and copper control strategies due to water quality of the combined streams being different in the magnitude and quality of TOC and other aspects, and potentially more flow within the same detention volume. It would also require a blending evaluation (between sources and AWP treated water) or a re--evaluation if blending for MCL compliance (arsenic or nitrate) was already in practice.

ADEQ Response 65:

ADEQ appreciates the comment. Additional clarity will be added in the guidance documents as the rule can not reasonably account for every possible situation and delivery/distribution scenario. The program has been created to be flexible to this end and the definitions contemplate the scenario described by the commenter. The rule allows Advanced Water Treatment Facilities (AWTFs) to create two types of product water, “advanced treated water” or “finished water”. While both of these types of product water are of the same quality, the types are determined by how an AWPRA utilizes the water and subject to different regulatory authority under the SDWA. Advanced treated water is “water produced by an [AWTF]” (R18-9-A801(5)). Advanced treated water may be delivered to a public water system as a source, where it’s blended with other sources such as groundwater and surface water and undergoes additional treatment prior to being distributed as drinking water through a distribution system. The advanced treated water is only subject to regulation under the AWP program, but once it is delivered to a public water system, it is regulated as drinking water under the SDWA. Alternatively, “finished water” is defined as “water produced by an AWTF, or a drinking water treatment facility, and which is introduced into a distribution system or served for human consumption” (R18-9-A801(45)). Finished water can only be distributed by the AWTF if the AWTF is permitted as a public water system under the SDWA. Under this scenario, the finished water is subject to regulation under both AWP and the SDWA at the AWTF. Put another way, “finished water” may be introduced at any location within the distribution system with proper consideration of the distribution system. Also, introducing ATW to a finished water reservoir would require a traditional new source analysis and approval. Lastly, other aspects mentioned in the comment above would also need to be re-evaluated in accordance with the SDWA.

Comment 66: Local Government

Arizona Revised Statutes 49-205 does not mention Local Authority (LA). When AWP facilities are overseen and regulated by

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ADEQ, such confidential data should be available to the LA if the LA is involved with the administration of the drinking water program for other portions of the water distribution system. Local authorities should be specifically allowed to access wastewater quality, treated wastewater quality, water quality, or treatment process performance information marked "confidential business information". Information which deals with the existence, absence, or concentration of constituents and contaminants detected in treated wastewater used as a source for an AWP facility should be made exempt from confidentiality provisions and available to the public or LA upon request.

ADEQ Response 66:

ADEQ appreciates the comment. ADEQ has no plans to delegate administration of the AWP program. While some counties may continue to have delegation for their drinking water facilities, ADEQ will continue to regulate the AWP portion of the project. If a county operating a Drinking Water Treatment Facility (DWTF) is an AWPRA partner, there is an expectation that necessary (and in some cases, required) information would flow freely between the AWPRA partners. The "[a]vailability of information to the public" statute at A.R.S. § 49-205 is currently in place and applies to the AWP program. The statute does allow for "...[t]he existence or level of a concentration of a pollutant in drinking water…" to be public information, while also sealing any information that would "divulge the trade secrets of the person…".

Comment 67: Utility

The beneficial use of this water will be regulated by the Safe Drinking Water Act (SDWA), and as such, new rules proposed by ADEQ should not intentionally or unintentionally create standards or requirements that exceed the scope of the SDWA.

ADEQ Response 67:

ADEQ appreciates the comment. Due to the character and nature of the "treated wastewater" source or influent of the Advanced Water Treatment Facilities (AWTFs) regulated under the AWP program, standards and requirements that are outside the scope of the Safe Drinking Water Act (SDWA) are necessary and justified. Unlike traditional public water systems regulated under the SDWA that utilize groundwater or surface water as a source, AWTF source water is treated wastewater from water reclamation facilities. This source requires unique control in a way that neither the scopes of the Clean Water Act (CWA) nor the SDWA contemplate or address. Therefore, ADEQ disagrees that the new rules "exceed the scope of the SDWA" because AWP is a fundamentally different regulatory program from the SDWA, to which its own standards and requirements rightfully apply.

Comment 68: Utility

The process for obtaining a Demonstration Permit should be streamlined to allow parallel tracks for performing and submitting permit elements. This will encourage utilities and the public to interact on the subject of ATW and facilitate operator education and training on an operating system. According to R18-9-C817, an Advanced Water Purification Responsible Agency (AWPRA) applying for a Demonstration Permit must meet all the requirements of a full- scale permit, except for full-scale verification. While

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the intent of this approach is to ensure thorough evaluation, the approach mandates the completion of both a one-year Initial Source Water Characterization (ISWC) and a Pilot study before granting a Demonstration Permit. This sequential approach (requiring the ISWC to be completed prior to final design and the one-year pilot) could delay entities seeking a Demonstration Permit by up to two years. This delay is particularly concerning given that a public outreach program with taste testing is the most effective path toward public acceptance. The two-year delay would mean the demonstrations might not commence until just before the full-scale facility comes online. Utilizing a robust pilot "skid" for the Demonstration Permit is a prudent way to fulfill the pilot's intent, while building trust and acceptance with the public and elected officials. A shorter timeline for obtaining the Demonstration Permit would be beneficial. Risk assessments should consider that the volume of water used for taste testing is small and each person is drinking the water only one-time.

ADEQ Response 68:

ADEQ appreciates the comment. Due to the sentiment in this comment and discussions with stakeholders and members of the Technical Advisory Group (TAG), ADEQ reduced the piloting requirement for Demonstration permits by adding the following language at (R18-9-C817(C)(1)(a)), "[t]he piloting requirements in R18-9-C815 may be abbreviated at the Director's discretion, but may not be of a period of less than 6 months." This occurred in the interim period between the draft rule and the proposed rule. While ADEQ does see value in engaging the public early, such engagement must be balanced with rigor to ensure the process is robust and safe. Demonstration permits in the proposed rule will allow a utility to serve water to the public as quickly as possible and create those opportunities while still being safe. Prior to serving the public, the demonstration facility must demonstrate an ability to successfully achieve water quality goals reliably. While that approach may increase the testing time period, the facility can simultaneously conduct the initial source water characterization and design/build the demonstration facility using the initial data without following a sequential approach.

Comment 69: Utility

As written, R18-9-C817(C)(4) conflicts with both R18-9-C817(A) which states a demonstration permit is for "non-distribution purposes" and R18-9-C817(B) which prohibits the introduction of advanced treated water into a drinking water distribution system. Change the language at subsection (C)(4) to: "The AWP operator shall operate the demonstration facility for public outreach, finished water tasting, and other related non-distribution purposes."

ADEQ Response 69:

ADEQ appreciates the comment. ADEQ acknowledges the rule could benefit from additional clarity. As such, the language in the final rule, R18-9-C817(C)(4), has been updated to the following: "An AWP operator shall operate the demonstration facility if the facility is utilized for the purpose of showcasing the AWTF for public outreach, finished water tasting, and other related non-distribution purposes."

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Comment 70: Utility

To be consistent with the licensing timeframes and R18-9-C817(H), demonstration permits should be referred to in this section. For example: "The Department shall publish a notice of preliminary decision regarding the issuance or denial of a significant amendment, demonstration permit, or a final permit determination…"

ADEQ Response 70:

ADEQ appreciates the comment. The language in R18-9-C817(H) makes clear that demonstration permits are subject to the public participation requirements of R18-9-D820. However, ADEQ agrees that the language in R18-9-D820 can benefit from the addition of a reciprocal requirement. Therefore, the language in the final rule, R18-9-D820(A)(1), has been updated to refer to an AWP permit or AWP demonstration permit, explicitly: "The Department shall publish a notice of preliminary decision regarding the issuance or denial of a significant amendment or a final permit determination related to an AWP permit or AWP demonstration permit on its website."

Comment 71: Local Government

We support comprehensive initial and on-going (periodic) source water (wastewater) characterization. We do not support allowing pilot or full-scale demonstrations to commence before initial source water characterizations have been completed and before comprehensive and complete testing objectives have been identified and accepted by ADEQ. Wording at R18-9-C815(B)(4) implies that pilot or full scale demonstration may commence before the initial source water characterization is complete which is equivalent to having an improperly conducted test, and/or a situation with insufficient oversight, and/or has the potential for allowing inappropriate design criteria to be implemented. We support the language at R18-9-C815(E) which allows the director to deny AWP permits where piloting was improperly conducted or insufficient to demonstrate compliance.

ADEQ Response 71:

ADEQ appreciates the comment. The language in R18-9-C815(B)(4) has been updated between the proposed rules and the final rules for clarity. Under no circumstances does the AWP program allow for delivery of advanced treated water or distribution of finished water before permitting pursuant to R18-9-C816. R18-9-C815(B)(4)(a) requires the Initial Source Water Characterization (ISWC) Report be submitted for review & comment as a component of the Pilot Study Plan by Non-National Pretreatment Program AWPRA applicants due to limited experience with the source water. Whereas, R18-9-C815(B)(4)(b) provides an allowance for National Pretreatment Program AWPRA applicants to forgo submission of the ISWC Report until submitting a permit application prepared pursuant to R18-9-C816, later in the process.

Credit to the experience National Pretreatment Program AWPRAs have with their source water is the reason for this disparity. Ultimately, both categories of applicants will have to submit the ISWC Report, the Pilot Study Plan and Report, and all permit application requirements for review. AWPRAs who elect to forgo submitting an ISWC report as part of the Pilot Study Plan or

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who elect to conduct the pilot and full scale verification at the same time build their facilities at risk of permit application denial, should the application information show a failure to meet standards, faulty treatment train design, or any other inadequacy.

Comment 72: Local Government

We support language allowing the ADEQ director to deny an AWP permit based on non-compliance with the ISWC requirement, or improperly conducted, or in cases of insufficient data.

ADEQ Response 72:

ADEQ appreciates the comment.

Comment 73: Local Government

We support language in R18-9-804(I)(3)(F) and R18-9-823(B)(3) and (C)(2) that the ADEQ director may terminate an AWP permit in cases of false information or misleading reports.

ADEQ Response 73:

ADEQ appreciates the comment.

Comment 74: Local Government

We are supportive of the R18-9-E826(F) requirement for AWP permit applicants to select optimized demonstration (pilot) and full-scale AWTF treatment trains based on Tier 1 MCLs, a generated Tier 2 list, and a pass-through interference list.

ADEQ Response 74:

ADEQ appreciates the comment.

Comment 75: Local Government

We are supportive of the requirement in R18-9-E826(F)(2) for AWP permit applicants to control chemicals at the source which are not sufficiently treatable in the selected AWT treatment train.

ADEQ Response 75:

ADEQ appreciates the comment.

Comment 76: Local Government

We support demonstration-scale and full-scale verification requirements proposed in the rules.

ADEQ Response 76:

ADEQ appreciates the comment.

Comment 77: Local Government

We previously commented on the definition of "Pilot", which has now changed in a manner that warrants additional comment. Pilot also means full-scale [R18-9-C815(A)(1)] and full-scale can now occur in lieu of piloting. The response to Draft Rule Comment #89 is "'Full scale' means the complete implementation and operation of an AWP system that is designed to treat

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wastewater to finished water standards and to meet the potable water demand of the community." This wording, along with other Initial Source Water Characterization (ISWC) provisions [R18-9-C815(B)(4)], appears to allow the permitting of a full-scale system before all chemicals of concern are identified in a ISWC and before all pilot objectives are known or before process capabilities have been verified over sufficient time. Such definitions and approach, made in the name of flexibility, would be an abdication of the responsibility to assure public health objectives and would be especially so if Tier 2 and Tier 3 chemical contaminant provisions of the Draft and Pre-publication rules were minimized or eliminated.

ADEQ Response 77:

ADEQ appreciates the comment. While the AWP program is designed to allow flexibility where appropriate, the program protects public health where appropriate as well. Under no circumstances does the AWP program allow for delivery of advanced treated water or distribution of finished water before an AWP permit is issued pursuant to R18-9-C816. Concerning Piloting and Full Scale Verification, the final rule language under both the pilot rule, R18-9-C815, and the full-scale verification rule, R18-9-F835, provide a pathway for an AWPRA applicant that builds their pilot facility to full-scale to submit a "Hybrid Pilot and Full-Scale Verification Plan" to the Department, following a consultation. Under the "Hybrid Pilot and Full-Scale Verification Plan", the AWPRA and ADEQ will work collaboratively to create a combined approach which fulfills the intention and purpose of both piloting and full-scale verification. Additionally, please note that the definition of "full scale" at R18-9-A801(46) does not, in and of itself, constitute permitted authority. Also, the language in R18-9-C815(B)(4) has been updated between the proposed rules and the final rules for clarity. Please note that the Tier 2 and 3 chemical controls continue to be in place in the final rule and are required for all AWP permits.

Comment 78: Utility

Full scale verification should follow current commissioning timelines used for treatment plants. Requiring a one-year Full Scale Verification is impractical and not the best use of highly treated water. The industry standard for bringing a full-scale drinking water plant online, including treatment plants for Superfund sites, is generally 60-90 days. The required one-year Pilot Study already covers the seasonal water quality variations in source water. The primary goal of commissioning time for full-scale is to prove the equipment is functioning as designed as the treatment has already been validated in the pilot. In addition, not applying this very expensive highly treated water to the best beneficial use would be a poor public message especially considering the drought and shortage conditions.

ADEQ Response 78:

ADEQ appreciates the comment. There are many places in the AWP rule where the requirements are more stringent than existing federal requirements. The commissioning timeline is one such instance in which the current requirements are insufficient to adequately protect human health, under the rigorous standards of performance within the AWP program. Current commissioning

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timelines within the Safe Drinking Water Act (SDWA), as the commenter refers to here, assume a surface water or groundwater source. The federal framework does not contemplate the use of treated wastewater as a source. The AWP requirement was determined upon critical consideration of this particular source. The one-year requirement in the rule intends to account for seasonal variability throughout a full year of facility operation, with the understanding that drinking water demand and treatment fluctuate over time and treated wastewater presents unique source water challenges not present at other drinking water treatment facilities.

Furthermore, the commenter alludes to redundant requirements in the program due to the piloting and the full-scale verification. This redundancy is no longer the only pathway for an AWP applicant (*See* R18-9-C815(A) and R18-9-F835(A)). The final rule language under both the pilot rule, R18-9-C815, and full-scale verification rule, R18-9-F835, provides a pathway for an AWPRA applicant that builds their pilot facility to full-scale to submit a "Hybrid Pilot and Full-Scale Verification Plan" to the Department, following a consultation. Under the "Hybrid Pilot and Full-Scale Verification Plan", the AWPRA and ADEQ will work collaboratively to create a combined approach which fulfills the intention and purpose of both piloting and full-scale verification, while acknowledging the need to avoid costly and repetitive work. There is no requirement mandating an applicant to perform both piloting and full-scale verification on the same treatment train, and the rule, in fact, accounts for flexibility in this area.

Finally, the rule does not preclude an applicant from beneficially using the advanced treated water produced at either the pilot or full-scale verification stage. An AWPRA can determine the best use for that water, including recharge or replenishment of water sources. The restriction in the rule is for delivering or distributing the water for public consumption. All other methods remain available for the AWPRA.

Comment 79: Local Government

We understand that counties will not be delegated authority with regard to the AWP program and that this separation is clear with regard to future AWTF facilities. Based on the response to Draft Rule Comment #136, we understand that WRFs that deliver treated wastewater to AWP facilities may be subject to future delegation agreements. Based on the response to Draft Rule Comment #123, it is not clear from the proposed rules whether existing, nor proposed drinking water treatment facilities that receive AWP treated water would remain delegated to certain Arizona counties or be addressed in a future delegation agreement. Based on the response to Draft Rule Comment #103, AWPRA facilities deemed part of a PWS and are defined as a DWTF in the proposed rules may remain delegated or will be addressed in a future delegation agreement.

ADEQ Response 79:

ADEQ appreciates the comment. Delegation agreements will be reviewed at the same time an AWPRA applicant begins pursuing an AWP permit. This will likely occur starting with the pre-application meeting under R18-9-C812 and will continue throughout the process, culminating in the permit issuance itself under R18-9-C816.

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Comment 80: Local Government

We are in full support of the definition of "Treatment Barrier" as proposed. Our understanding is that current definition, if applied to a UV/AOP process, would require constant operation at the design dose in order to receive credit for contaminant removal. It is our further understanding that vendor algorithms or features that enable power reduction based on flow rate or contaminant concentration or surrogates such as UV transmittance or TOC would not meet this definition, and that this type of feature is inappropriate to meet the concept of a constant operation. The unacceptability of this vendor promoted feature should be addressed in rule and/or a guidance document. The response to Draft Rule Comment #77 indicated that R18-9-C816(G)(4) was modified to that end - thank you. However, this response does not fully address the issue. UV/AOP processes operating at less than full power will be in constant operation but will not produce maximum pathogen LRV or design levels of chemical contaminant removal. How will ADEQ assign treatment performance credits to UV/AOP when systems are operated at less than full power and when contaminant destruction rate constants are kept proprietary?

ADEQ Response 80:

ADEQ appreciates the comment. All operational conditions for AOP will be verified during validation (*see* R18-9-F832(D)(5)). Based on that study, credits will be assigned or not assigned, accordingly. Also, contaminant destruction rate constants are required in the application for permit. Proprietary information may be requested to be kept confidential in accordance with R18-9-B806(D).

Comment 81: Local Government

We understand that seven (7) guidance documents pertaining to design, implementation and maintenance of AWP systems are being prepared. We request that stakeholders and the public be allowed to comment on these guidance documents. It is not clear whether guidance documents will have additional process criteria. Minimum requirements need to be established in rule. Based on the proposed rules, there is a great need for additional and specific design criteria. The proposed rules are silent on unit process redundancy and reliability requirements. The public would benefit from published unit process criteria for each type of treatment plant situation; raw water augmentation, treated water augmentation, entry into finished water reservoirs (if permissible), scalping scenarios, etc.

ADEQ Response 81:

ADEQ appreciates the comment. ADEQ plans to involve the public in the development of the guidance documents, as is typical for ADEQ's development and publication of guidance outside of rule. The AWP regulations are designed to provide the necessary, minimum requirements under the program, while leaving flexibility to the AWPRA where possible. The Minimum Design Criteria rule states, "[i]n addition to the requirements of this section, treatment process configurations shall be designed using good engineering practices. Treatment process configurations shall be approved if the AWPRA applicant can demonstrate that the treatment process configuration meets or exceeds the minimum design criteria in this section" (R18-9-F832(F)) and "ADEQ shall

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develop and make available guidance on designing treatment process configurations…[additionally,]treatment process configurations designed in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices" (R18-9-F832(F)(1)-(2)).

Pursuant to the rule, all AWPRAs must follow the minimum requirements in rule, and shall additionally design treatment process configurations using "good engineering practices", defined as "a set of principles, guidelines, and standards that engineers follow to ensure their work meets high levels of quality, safety, efficiency and reliability. The principles, guidelines, and standards in an ADEQ-issued AWP guidance document constitute good engineering practice" (R18-9-A801(47)).

Therefore, the guidance documents, once released, will present more information on one possible pathway to achieving "good engineering practices" in the design of treatment process configurations, but is not the only way an AWPRA may do so. This same concept applies to other elements under the AWP program such as enhanced source control, piloting, etc. Because the elements in the guidance documents will not be requirements, it is not necessary to incorporate voluminous detail in the rule. Instead, ADEQ elects to enable AWPRAs to make site-specific decisions that best meets the needs of their projects.

Comment 82: Local Government

Previously, we commented that the AWP annual report in R18-9-E831 should be attached to the Public Water System Consumer Confidence Report (CCR). The response to Draft Rule Comment #128 indicated that a change to the proposed rules was unnecessary and that CCR requirements require "all these components to be included". We are requesting that clarity be added to the proposed rules since all that would be required is for someone to report "treated wastewater", or AWP product water as a source. Specifically, the public reporting requirement should say more than "an AWP source is being introduced". Ideally, the constituents analyzed for and constituents remaining should be reported for the AWP product water regardless if introduced as a source, or introduced to an existing DWTF finished water reservoir, or introduced directly to a distribution system. Each AWPRA agency member should be required to publicly report since the AWPRA agency is not a public water system subject to SDWA requirements.

ADEQ Response 82:

ADEQ appreciates the comment. It is important to understand that the AWP program is not designed to supplant the safeguards built into the Safe Drinking Water Act (SDWA). The AWP Annual Report, as defined in R18-9-E831, is designed to be a report between the AWPRA and ADEQ, not the AWPRA and the public. The AWP program rules allow Advanced Water Treatment Facilities (AWTFs) to create two types of product water, "advanced treated water" or "finished water". "Advanced treated water" is defined at proposed rule R18-9-A801(5). It is the product of an AWTF which can then be delivered to an existing Public Water System (PWS) or Drinking Water Treatment Facility (DWTF) as a source water under SDWA regulation. AWP "Finished water" is defined at R18-9-A801(45), which can be introduced directly into a distribution system or served for human consumption without

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additional treatment, except for measures required to uphold water quality within the distribution system. SDWA - CCR reporting is required in both cases. Due to this fact, the AWP program does not have a requirement for AWPRAs to create an AWP-specific CCR, as this would be redundant. SDWA - CCRs are required to be published annually for systems under 10,000 people and a future CCR rule will require these be published twice a year for systems over 10,000 people. A water system must include a discussion of source water and water sourced from an AWPRA should be included in the CCRs as a source water. An AWPRA may choose to report the characterization of the treated wastewater influent or the advanced treated water but is not required to do so under this program.

Comment 83: Local Government

The requirement to have three diverse and separate treatment processes, including AOP and one (undefined) physical separation process, is presented in rule at R18-9-F832(C). Please identify the physical separation processes that would satisfy this requirement.

ADEQ Response 83:

ADEQ appreciates the comment. Acceptable physical separation processes in an AWP treatment train could include reverse osmosis, microfiltration, ultrafiltration, nanofiltration, coagulation, flocculation and others. A decision on which physical separation process is best left for the AWPRA and may be made in consultation with ADEQ during the application process. Additionally, please note AWP rule R18-9-C812 which provides for a pre-application conference with ADEQ at the request of the AWPRA applicant.

Comment 84: Local Government

Consider adding a requirement under the Minimum Design Requirements rule (R18-9-F832(D)(5)) that destruction rate constants specific to the reactor being proposed are documented in the AOP validation report. Without such reporting, it is not possible for a regulatory oversight agency to properly evaluate an AOP process for conditions other than that of the test conditions.

ADEQ Response 84:

ADEQ appreciates the comment. The Advanced Oxidation Process (AOP) approach presented in the rule is based on sound literature reviews that are accepted in three other states with direct potable reuse programs. The rule requires all AOPs achieve the 0.5-log reduction for 1,4-dioxane as a performance benchmark (i.e., action level) unless an alternative is used. This specific 1,4-dioxane target is based on current findings that demonstrated quality and quantity of specific trace organics removal when 0.5-log reduction of 1,4-dioxane performance is achieved. An alternative approach to demonstrating AOP functionality may be used as long as the approach shows the removal of constituents of concern similar to the initial 1,4-dioxane benchmark study (*see* R18-9-F832(D)(4)(b)).

In addition to performance demonstration, all AOP designs must address the major challenges of AOP processes such as scavenging of hydroxyl radicals by carbonates, bicarbonates, nitrites, nitrate, bromides and NOM, pH, and UV light absorption. The AOP's

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efficacy in significantly reducing an approved indicator compound must be validated through pilot tests. These indicators should be ADEQ-approved and resistant to elimination through other treatment methods, including biological degradation, adsorption processes, RO/NF, and conventional oxidation techniques such as hypochlorite, chloramines, permanganate, or chlorine dioxide (e.g., 1,4-Dioxane). Each pilot study should involve spiking and measuring indicator compound removal (*see* R18-9-F832(D)(4)(b)(ii)). ADEQ expects spiking 1,4-Dioxane (i.e., reference compound) and calculating removal percentages to compare with other widely accepted advanced oxidation standards.

Comment 85: Local Government

R18-9-F832(D)(9)(d), pertaining to SCADA communications, appears out of place and is not related to subsections (9)(a), (9)(b), or (9)(c), which pertain to cross connection control.

ADEQ Response 85:

ADEQ appreciates the comment. The placement of the SCADA subsection at R18-9-F832(D)(9)(d) is not out of place as the requirement of the subsection (to develop and implement cross-connection control measures properly) includes a plan describing how the Advanced Water Treatment Facility (AWTF) SCADA system communicates and interoperates with the SCADA systems of all of the AWPRA's relevant facilities. In other words, a requirement to have all relevant AWPRA SCADA systems interconnect is, generally, a cross connection control measure.

Comment 86: Local Government

Total Organic Carbon (TOC) Management: R18-9-F834 proposes two approaches for management of TOC in AWTF product water and appear to establish a TOC limit of 2 mg/L or a site-specific value to control unregulated candidate (CCL5) disinfection by-products but makes no specific mention of whether compliance with existing DBP regulations is required. Assuming that compliance with all current and future DBP regulations is required, this approach seems to create less stringent alternatives to the conventional DWTF approach that TOC and other constituents must be removed (to an appropriate degree) so that all applicable current and future DBP regulations are complied with to the degree necessary for the water ages occurring.

a. Please confirm that DWTFs receiving Advanced Treated Water (ATW) as a source (raw water augmentation) would still need to demonstrate TOC reduction (for any combination of sources) to comply with the Stage 1 DBP rule in the SDWA that requires 15% to 50% TOC reduction, depending on alkalinity.

b. Please confirm that DWTFs receiving ATW into an existing finished water reservoir are exempt from TOC reduction requirements of the stage 1 DBP rules but must still comply with Stage 2 and future DBP regulations.

c. Please confirm that AWTFs contributing "finished water" directly to the distribution system (treated water augmentation) are allowed to have TOC levels at any concentration that does not cause DBP non-compliance, current or future, in the distribution system.

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ADEQ Response 86:

ADEQ appreciates the comment. The commenter mentions that the Total Organic Carbon (TOC) Management rule or TOC rule "...makes no specific mention of whether compliance with existing DBP regulations is required…". Addressing that statement, and the rest of the comment first, it is important to understand that the TOC rule in the AWP program is program-specific and a separate, stand-alone requirement to any existing disinfection byproduct (DBP) regulations in the Safe Drinking Water Act (SDWA). In the AWP setting, DBP regulations in the SDWA will continue to be required alongside the AWP TOC regulations. In fact, mention and utilization of DBPs in the TOC rule is only in regards to the site-specific approach procedures that are, in and of themselves, only proposed to derive TOC values. Please note that the TOC rule has been updated for clarity between the proposed and the final rules. Below is an explanation of the TOC rule:

This rule requires an applicant or a permittee to manage TOC in one of two ways. The first approach ("Standard Approach") requires the applicant or permittee to maintain a limit of 2 mg/L in the advanced treated water. This approach requires no site-specific TOC sampling. The second approach ("Site-Specific Approach") requires the applicant / permittee conduct two procedures, deriving two preliminary TOC values, followed by a comparison of those values to, ascertaining the lower value of the two. This value becomes the site-specific TOC value. The two procedures are as follows:

(1) The "Trace Organics Removal Procedure" establishes a preliminary TOC value through the TOC sampling and characterizing of the original drinking water sources that feed water consumption in a service area that is then collected in sewersheds and routed to, and treated by, a WRF that is a source of treated wastewater for an AWTF. A preliminary TOC value for the Trace Organics Removal Procedure is derived through this process and is detailed in rule at R18-9-F834(C)(1).

(2) The "DBP Precursor Reduction Procedure" establishes a preliminary TOC value through conducting and then comparing two DBP and TOC - based sampling methods (*see* (a) and (b) below). Those methods (in and of themselves) result in two TOC values. The lower of the two values becomes the preliminary TOC value for the DBP Precursor Reduction Procedure. This is detailed further in rule at R18-9-F834(C)(2).

(a) Method 5710 C "Simulated Distribution System Trihalomethanes" (SDS-THM) establishes a TOC value in the advanced treated water. The TOC value is derived by both conducting Standard Method 5710 C and sampling for TOC in the advanced treated water monthly for one year. This results in 12 Total Trihalomethane (THM) values and 12 TOC values. The TOC values are then averaged. Likewise, the THM values are averaged. Thereafter, the THM average is compared to the corresponding Safe Drinking Water Act - Maximum Contaminant Level (MCL) for THM. If the average THM is below the THM MCL, then the *average TOC* for that year becomes the TOC value associated with Method 5710 C - SDS-THM. If the average THM is at or above the THM MCL, then the AWPRA may not use the *average TOC* for that year as the TOC value associated with Method 5710 C - SDS-THM. However, the AWPRA may adjust components of their operation and repeat the sampling above

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until a 12-month average THM concentration in the advanced treated water is below the corresponding THM MCL. This method is detailed further in rule at R18-9-F834(C)(2)(a).

(b) "CCL5 - DBP Sampling Method" also establishes a TOC value in the advanced treated water. The TOC value is derived through monthly sampling of the advanced treated water for one year of both:

- TOC, and
- only the DBPs that exist in both EPA's "Contaminant Candidate List 5 - Exhibit 1b - Unregulated DBPs in the DBP Group on CCL 5" and EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables" (HA Table) (currently, that includes only Formaldehyde (CAS No. 50-00-0) and N-Nitrosodimethylamine (NDMA) (CAS No. 65-75-9)).

If the average sampling results for either DBP (Formaldehyde or NDMA) are lower than the corresponding health advisory in EPA's HA Table, then the *average TOC* for that year becomes the TOC value associated with Method CCL5 - DBP. If the average sampling results for either DBP (Formaldehyde or NDMA) are at or above the corresponding health advisory in EPA's HA Table, then the AWPRA may not use the *average TOC* for that year as the TOC value associated with Method CCL5 - DBP. However, the AWPRA may adjust components of their operation and repeat the sampling above until any one DBP (Formaldehyde or NDMA) is below the corresponding health advisory in EPA's HA Table. This method is detailed further in rule at R18-9-F834(C)(2)(c).

Thereafter, the applicant or permittee determines the lower of the two TOC values associated with Method 5710 C - SDS-THM & Method CCL5 - DBP (listed as "(2)(a)" and "(2)(b)" above, respectively). The lower TOC value becomes the preliminary TOC value for the DBP Precursor Reduction Procedure (listed as "(2)" above) (*See* R18-9-F834(C)(2)(d) for the corresponding rule language).

Then, the applicant \ permittee determines which of the two preliminary TOC values (from the Trace Organics Removal Procedure and the DBP Precursor Reduction Procedure, listed as "(1)" and "(2)" above) is lower. That value becomes the AWPRA's site-specific TOC Limit (*See* R18-9-F834(C)(3) for the corresponding rule language).

Upon issuance of a permit and AWTF operation, a permittee may switch between the two TOC Management approaches (Standard or Site-Specific) each calendar year (*see* R18-9-F834(A) for the corresponding rule language).

Also of note, ADEQ plans to, in the future, update the TOC rule when new versions of "Contaminant Candidate List 5 - Exhibit 1b - Unregulated DBPs in the DBP Group on CCL 5" and EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables" are established. At that time, ADEQ would simultaneously update the DBPs to be sampled pursuant to R18-9-F834(C)(2)(c)(i).

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13. All agencies shall list other matters prescribed by statute applicable to the specific agency or to any specific rule or class of rules. Additionally, an agency subject to Council review under A.R.S. §§ 41-1052 and 41-1055 shall respond to the following questions:

There are no other matters prescribed by statute applicable specifically to ADEQ or this specific rulemaking.

a. Whether the rule requires a permit, whether a general permit is used and if not, the reasons why a general permit is not used:

Yes, this rulemaking establishes the Advanced Water Purification regulatory program, which includes issuing individual permits, pursuant to A.R.S. § 49-211. While the product (advanced treated water or finished water) of an Advanced Water Purification regulatory program facility is substantially the same, the facilities, activities and practices regulated by the program will be substantially different in nature due to the treated wastewater source, a multitude of viable technological process configurations, a swift pace of technological progress in the field and the custom nature of the regulated parties and their circumstances. Moreover, general permits are not "technically feasible" for the Advanced Water Purification regulatory program under A.R.S. § 41-1037(A)(3), and not used in the program.

b. Whether a federal law is applicable to the subject of the rule, whether the rule is more stringent than federal law and if so, citation to the statutory authority to exceed the requirements of federal law:

While the Safe Drinking Water Act (SDWA) (40 USC § 300f *et seq.*) does regulate the treatment and delivery of drinking water from public water systems across the United States, it does not explicitly regulate the treatment of "treated wastewater" (*see* R18-9-A801) as a source, which is the subject of this final rule. In fact, SDWA only contemplates surface and ground water as sources for public water systems. Some Advanced Water Purification facilities will be considered public water systems for the purposes of the SDWA and regulated in accordance with the SDWA in addition to the final AWP program.

c. Whether a person submitted an analysis to the agency that compares the rule's impact of the competitiveness of business in this state to the impact on business in other states:

Not Applicable.

14. A list of any incorporated by reference material as specified in A.R.S. § 41-1028 and its location in the rules:

"Method 5710B"	R18-9-A802(B)(1); R18-9-F834(C)(2)(b)(v)
"Method 5710C"	R18-9-A802(B)(2); R18-9-F834(C)(2)(a) & (b)
"Analytical and Data Quality Systems"	R18-9-A802(B)(3); R18-9-A802(C)(1)
"Quality System"	R18-9-A802(B)(4); R18-9-A802(C)(2)
"Quality Assurance and Quality Control in Laboratory Toxicity Tests"	R18-9-A802(B)(5); R18-9-A802(C)(3)

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"Quality Assurance/Quality Control"	R18-9-A802(B)(6); R18-9-A802(C)(4)
"Standard Test Methods for Operating Characteristics of Reverse Osmosis and Nanofiltration Devices"	R18-9-A802(B)(7); R18-9-F832(C)(4)
"Contaminant Candidate List 5 - Exhibit 1b - Unregulated DBPs in the DBP Group on CCL 5"	R18-9-A802(B)(8); R18-9-F834(C)(2)(c)(i) & (ii)
"2018 Edition of the Drinking Water Standards and Health Advisories"	R18-9-A802(B)(9); R18-9-E826(D)(4), (5), (6) & (7); R18-9-F834(C)(2)(c)(ii)
"Method 1623.1: Cryptosporidium and Giardia in Water by Filtration/IMS/FA"	R18-9-A802(B)(11); R18-9-E828(C)(9)
"Method 1615: Measurement of Enterovirus and Norovirus Occurrence in Water by Culture and RT-qPCR"	R18-9-A802(B)(12); R18-9-E828(C)(9)
"Characteristic of ignitability"	R18-9-A802(B)(13); R18-9-E824(B)(13)(a)
"Considerations for Direct Potable Reuse Downstream of the Groundwater Recharge Advanced Water Treatment Facility"	R18-9-A802(B)(14); R18-9-F832(D)(4)(b)(viii)

15. Whether the rule was previously made, amended or repealed as an emergency rule. If so, cite the notice published in the *Register* as specified in R1-1-409(A). Also, the agency shall state where the text was changed between the emergency and the final rulemaking packages:

Not Applicable.

16. The full text of the rule follows:

Rule text begins on the next page.

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TITLE 18. DEPARTMENT OF ENVIRONMENTAL QUALITY

CHAPTER 9. DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER POLLUTION CONTROL

ARTICLE 2. AQUIFER PROTECTION PERMITS - INDIVIDUAL PERMITS

PART B. BADCT FOR SEWAGE TREATMENT FACILITIES

Section

ARTICLE 7. USE OF RECYCLED WATER

PART A. GENERAL PROVISIONS

Section

PART B. RECLAIMED WATER

Section

~~PART E. PURIFIED WATER FOR POTABLE USE~~

Section

ARTICLE 8. ~~REPEALED~~ ADVANCED WATER PURIFICATION

PART A. GENERAL PROVISIONS

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Section

PART B. GENERAL PROGRAM REQUIREMENTS

PART C. PRE-PERMIT AND PERMIT REQUIREMENTS

PART D. GENERAL PERMIT REQUIREMENTS

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PART E. CONSTITUENT CONTROL, MONITORING, AND REPORTING

PART F. TECHNICAL AND OPERATIONAL REQUIREMENTS

ARTICLE 2. AQUIFER PROTECTION PERMITS - INDIVIDUAL PERMITS

PART B. BADCT FOR SEWAGE TREATMENT FACILITIES

Section

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A. No change

B. No change

C. No change

D. No change

E. A person shall not create or maintain a connection between any part of a sewage treatment facility and a potable water supply so that sewage or wastewater contaminates a potable or public water supply. A person may only create and maintain a connection between sewage treatment facilities, advanced water treatment facilities, and a potable water supply under an Advanced Water Purification permit issued pursuant to Article 8 of this Chapter.

F. No change

G. No change

H. No change

I. No change

J. No change

ARTICLE 7. USE OF RECYCLED WATER

PART A. GENERAL PROVISIONS

Section

R18-9-A701. Definitions

~~1. "Advanced reclaimed water treatment facility" means a facility that treats and purifies Class A+ or Class B+ reclaimed water to produce potable water suitable for distribution for human consumption. R18-9-B702(B) does not apply to an advanced reclaimed water treatment facility. Potable water produced by an advanced reclaimed water treatment facility is not reclaimed water.~~

~~2~~1. "Direct reuse" means the beneficial use of reclaimed water for a purpose allowed by this Article. The following is not a direct reuse of reclaimed water:

a. The use of water subsequent to its discharge under the conditions of a National or Arizona Pollutant Discharge Elimination System permit;

b. The use of water subsequent to discharge under the conditions of an Aquifer Protection Permit issued under 18 A.A.C. 9, Articles 1 through 3;

Pre-Publication

c. The use of industrial wastewater, reclaimed water, or both, in a workplace subject to a federal program that protects workers from workplace exposures~~; or~~

~~d. The use of potable water produced by an advanced reclaimed water treatment facility~~.

~~3~~2. "Direct reuse site" means an area permitted for the application or impoundment of reclaimed water. An impoundment operated for disposal under an Aquifer Protection Permit is not a direct reuse site.

4~~3~~. "End user" means a person who directly reuses reclaimed water meeting the standards for Classes A+, A, B+, B, and C, established under 18 A.A.C. 11, Article 3.

~~5~~4. "Gray water" means wastewater that has been collected separately from a sewage flow and that originates from a clothes washer or a bathroom tub, shower or sink but that does not include wastewater from a kitchen sink, dishwasher or toilet. A.R.S. § 49-201(18).

~~6~~5. "Industrial wastewater" means wastewater generated from an industrial process.

~~7~~6. "Irrigation" means the beneficial use of water or reclaimed water, or both, for growing crops, turf, or silviculture, or for landscaping.

~~8~~7. "Open access" means access to reclaimed water by the general public is uncontrolled.

~~9~~8. "Open water conveyance" means any constructed open waterway, including canals and laterals, that transports reclaimed water from a sewage treatment facility to a reclaimed water blending facility or from a sewage treatment facility or reclaimed water blending facility to the point of land application or end use. An open water conveyance does not include waters of the United States.

~~10~~9. "Pipeline conveyance" means any system of pipelines that transports reclaimed water from a sewage treatment facility to a reclaimed water blending facility or from a sewage treatment facility or reclaimed water blending facility to the point of land application or end use.

~~11~~10."Reclaimed water" means water that has been treated or processed by a wastewater treatment plant or an on-site wastewater treatment facility. A.R.S. § 49-201(32).

~~12~~11."Reclaimed water agent" means a person who holds a permit to distribute reclaimed water to more than one end user.

~~13~~12."Reclaimed water blending facility" means an installation or method of operation that receives reclaimed water from a sewage treatment facility or other reclaimed water blending facility classified to produce Class C or better reclaimed water and blends it with other water so that the produced water may be used for a higher-class purpose listed in 18 A.A.C. 11, Article 3, Table A.

~~14~~13."Recycled water" means a processed water that originated as a waste or discarded water, including reclaimed water and gray water, for which the Department has designated water quality specifications to allow the water to be used as a supply.

Pre-Publication

~~15~~14."Restricted access" means that access to reclaimed water by the general public is controlled.

~~16~~15."Sewage Treatment Facility" means a sewage treatment facility as defined in 18 A.A.C. 9, Article 1.

PART B. RECLAIMED WATER

Section

R18-9-B702. General Requirements for Reclaimed Water

A. No Change.

B. No Change.

C. No Change.

D. No Change.

E. No Change.

F. No Change.

G. No Change.

H. Prohibited activities.

1. Irrigating with untreated sewage;
2. Providing water for human consumption from a reclaimed water source ~~except as allowed in Part E of this Article~~, except as permitted under Article 8 of this Chapter.
3. Providing or using reclaimed water for any of the following activities:
   a. Direct reuse for swimming, wind surfing, water skiing, or other full-immersion water activity with a potential of ingestion; or
   b. Direct reuse for evaporative cooling or misting.
4. Misapplying reclaimed water for any of the following reasons:
   a. Application of a stated class of reclaimed water of lesser quality than allowed by this Article for the type of direct reuse application;
   b. Application of reclaimed water to any area other than a direct reuse site; or
   c. Allowing runoff of reclaimed water or reclaimed water mixed with stormwater from a direct reuse site, except for:
      i. ~~agricultural~~ Agricultural return flow directed onto an adjacent field or returned to an open water conveyance; or
      ii. ~~a~~ A discharge authorized by an individual or general NPDES or AZPDES permit.

I. No Change.

Pre-Publication

J. No Change.

K. No Change.

~~PART E. PURIFIED WATER FOR POTABLE USE~~

Section

~~**R18-9-E701. Recycled Water Individual Permit For An Advanced Reclaimed Water Treatment Facility**~~

~~**A.** An application for a Recycled Water Individual Permit for an Advanced Reclaimed Water Treatment Facility must be submitted to the Department according to the requirements in R18-9-A703, as applicable.~~

~~**B.** Safe Drinking Water Act. For purposes of Safe Drinking Water Act requirements, water produced by an Advanced Reclaimed Water Treatment Facility shall be considered surface water for purposes of compliance with Title 18, Chapter 4 of the Arizona Administrative Code. Nothing in this Section exempts an applicable facility from Safe Drinking Water Act requirements.~~

~~**C.** Design Report. In addition to the information required by subsection (A), the applicant shall submit a design report for the Advanced Reclaimed Water Treatment Facility according to a form prescribed by the Department and certified by an Arizona-registered professional engineer. The design report must include the following information:~~

~~1. Characterization of source water quantity and quality, including:~~

~~a. Average and anticipated minimum and maximum source water flows to the facility;~~

~~b. Concentrations of the source water's physical, microbiological, and chemical constituents regulated for drinking water Maximum Contaminant Levels under the Safe Drinking Water Act and which the Department determines are appropriate for the particular facility and source water;~~

~~c. Description and concentrations of constituents in the source water used for unit treatment process monitoring and assessment of unit treatment process efficacy, and~~

~~d. A list of unregulated microbial and chemical constituents and corresponding concentrations in the source water a facility proposes to monitor in order to assess the treatment effectiveness of the overall treatment train. The particular constituents will depend on consideration of factors, such as:~~

~~i. Occurrence of the constituent in source and local waters,~~

~~ii. Availability of standardized laboratory methods for quantification of the constituent,~~

~~iii. Usefulness as representatives of or surrogates for larger classes of constituents, and~~

~~iv. Availability of toxicity data for the constituent.~~

Pre-Publication

~~2. Description of, and results from, the pilot water treatment system for the facility or of analogous systems where comparable treatment components are demonstrated as appropriate for treating the particular characteristics of the applicant's proposed source water;~~

~~3. Identification and description of the technologies, processes, methodologies, and process control monitoring to be employed for microbial control;~~

~~4. Logarithmic reduction targets for microbial control, to ensure the product water is free of pathogens and suitable for potable use;~~

~~5. Identification and description of technologies, processes, methodologies and process control monitoring for chemical control;~~

~~6. Plan for monitoring the product water for public health protection;~~

~~7. Commissioning and startup plan, including preoperational and startup testing and monitoring, expected timeframe for meeting full operational performance, and any other special startup condition meriting consideration in the individual permit;~~

~~8. Operation and maintenance plan including corrective actions for out-of-range monitoring results and contingencies for non-compliant water;~~

~~9. Operator training plan; and~~

~~10. Documentation of technical, financial, and management capability.~~

ARTICLE 8. ~~REPEALED~~ ADVANCED WATER PURIFICATION

PART A. GENERAL PROVISIONS

R18-9-A801. Definitions

In addition to the definitions in A.R.S. § 49-201, the following terms apply to this Article:

1. "Action level" means a value or criterion established in an Advanced Water Purification (AWP) permit at a critical control point that, when exceeded, triggers a required response or action to prevent a potentially hazardous event and will involve actions or responses such as additional monitoring, treatment adjustments, public notification or other corrective responses or actions.
2. "Acute exposure threats" means the increased imminent risk of adverse health effects, including infectious diseases and toxic effects from short-term exposures to contaminants in water which triggers public notice pursuant to A.A.C. R18-4-119, which incorporates 40 CFR §141.201 by reference.
3. "ADEQ" or "Department" means Arizona Department of Environmental Quality.

Pre-Publication

4. "Advanced Oxidation Process" or "AOP" means a set of chemical treatment processes whereby oxidation of organic contaminants occurs on a molecular level through reactions with hydroxyl radicals or similarly aggressive radical oxidant species.
5. "Advanced treated water" means water produced by an advanced water treatment facility (AWTF) and can be from one or more AWTFs.
6. "Advanced Water Purification" or "AWP" means the treatment or processing of treated wastewater to advanced treated water standards for the purpose of delivery to a drinking water treatment facility or a drinking water distribution system.
7. "Advanced Water Purification Responsible Agency" or "AWPRA" means the applicant or permittee, comprising one or more AWPRA Partners, responsible for compliance with the requirements of the AWP program for a particular AWP project and formed pursuant to R18-9-B805. An AWPRA must be a "person" under A.R.S. § 49-201(33).
8. "Advanced Water Purification Responsible Agency Partner" or "AWPRA Partner" means any entity that collects or provides treated wastewater to the AWP project, performs wastewater source control or treatment pursuant to this Article, or utilizes AWP project water as a source for delivery to a drinking water distribution system.
9. "Advanced Water Purification project" or "AWP project" means all facilities related to the advanced treatment of treated wastewater to drinking water standards operating under an AWP permit or demonstration permit.
10. "AWP project treatment train" means a treatment train designed to meet the requirements contained in this Article. In addition to the advanced water treatment facility (AWTF), portions of the water reclamation facility or drinking water treatment facility can be part of an AWP project treatment train.
11. "AWPRA facility" or "facility" means a drinking water treatment facility, advanced water treatment facility (AWTF), collection system, or wastewater treatment plant involved in the production of advanced treated water or finished water under this Article.
12. "Advanced Water Treatment Facility" or "AWTF" means a facility where treated wastewater is treated pursuant to the requirements of this article.
13. "Alert level" means a value or criterion established in an AWP permit at a critical control point that, when exceeded, alerts an operator that a potential problem may require a response.
14. "Amendment" means a change to the permit language resulting from a modification event.
15. "Aquifer Protection Permit" or "APP" means an individual permit or a general permit issued under A.R.S. §§ 49-203, 49-241 through 49-252, and Articles 1, 2, and 3 of this Chapter.
16. "AWP" means Advanced Water Purification (*See* R18-9-A801(6)).

Pre-Publication

17. "Barrier" means a measure (technical, operational or managerial) implemented to control microbial or chemical constituents in advanced treated water.
18. "Best Management Practices" or "Best Practices" means a set of principles, guidelines and standards that an AWPRA follows to ensure high levels of quality, safety, efficiency and reliability. The principles, guidelines and standards in an AWP guidance document constitute Best Management Practice or Best Practice.
19. "Bioassay" means tests performed using live cell cultures or mixtures of cellular components in which the potency of a chemical or water concentrate is tested based on its effect on a measurable constituent, such as inhibition or the induction of a response (including carcinogenicity and mutagenicity). Bioassays can be used to measure synergistic, additive, and antagonistic interactions between compounds that may be present in a mixture.
20. "Blending" means the mixing of advanced treated water with another water source that will result in raw water augmentation or treated water augmentation directly to the distribution system. Blending does not apply to an Engineered Storage Buffer where storage of only advanced treated water takes place.
21. "Challenge test" means a study comparing a pathogen, surrogate parameter, or indicator compound concentration between the influent and effluent of a treatment process to determine the removal capacity of the treatment process. The concentration in the influent must be high enough to ensure that a measurable concentration is detected in the effluent (i.e., filtrate detection limit).
22. "Chemical" means any substance, used in or produced by a reaction involving changes to atoms or molecules, that has a defined composition and which is either naturally occurring or manufactured.
23. "Chemical peak" means an abnormal increase in the level of a chemical that represents a potential human health hazard that is the result of intentional or unintentional illicit discharges of chemicals to the sewershed. Chemical peaks are different from normal facility variation in water quality.
24. "Compliance schedule" means a list of required items assigned by the Department to the Permittee to be completed in the AWP permit.
25. "Constituent of Concern" means a potentially harmful or difficult to treat substance that could cause treatment interference, pass-through, or a violation of a treatment technique requirement, action level or Maximum Contaminant Level in the advanced treated water or finished water. Constituents of concern include Tiers 1, 2, and 3 chemicals.
26. "Constituent" means any physical, chemical, biological, or radiological substance or matter found in water and/or wastewater.
27. "Continuous online analyzers" means a monitoring sensor or device that monitors continuously or in real time (intervals of 15 minutes or less) and is positioned directly in the process flow or sample line to measure treatment performance.

Pre-Publication

28. “Critical Control Point” means a point in the treatment train that is specifically designed to reduce, prevent, or eliminate process failure, and for which controls exist to ensure the proper performance of that process, verified via monitoring.
29. “Demonstration permit” means an AWP permit that does not include distribution of finished water to drinking water consumers.
30. “Department” means the Arizona Department of Environmental Quality.
31. “Direct integrity test” means a physical test applied to a membrane unit in order to identify and isolate integrity breaches, such as leaks that could result in contamination of the filtrate.
32. “Director” means the Director of the Arizona Department of Environmental Quality.
33. “Disinfection treatment process” means a treatment process that either physically or chemically eliminates or inactivates pathogenic microorganisms.
34. “Distribution” means the act of delivering finished water through a network of pipes or other constructed conveyances from a facility to a consumer for human consumption.
35. "Distribution system" means the infrastructure used to carry out distribution.
36. “Draft permit” means a preliminary draft of a permit upon which the Director has not yet made a final permit determination.
37. “Drinking Water Treatment Facility” means a water treatment facility that is designed and operated to meet the requirements of the Safe Drinking Water Act.
38. “Engineered Storage Buffer” means a storage facility used to provide retention time before advanced treated water is introduced into a drinking water treatment facility or distribution system.
39. “Enhanced Source Control” means a program that enables the AWPRA to prevent constituents of concern, including target chemicals, from negatively impacting the AWTF, or the water it produces, by controlling them at their source.
40. “Exceedance” means an increase in the concentration of a constituent of concern beyond an established level such as an MCL, alert level, or action level.
41. “Excursion” means a deviation from established water quality boundaries for a process or at any point in a treatment train.
42. “Failure” means a condition in which an excursion or loss of performance occurs in one or more of the unit processes that results in a treatment train to not meet a performance metric or deviate from an approved operational range for parameters, necessitating a shutdown of a specific train or the entire plant for compliance.
43. “Failure Response Time” means the maximum possible time from when a failure occurs in the treatment system to when the quality of the final product water is no longer affected by the failure. Failure response time is calculated as a sum of the sampling interval, sample turnaround time and system reaction time, with overall failure response time based on the treatment process with the highest individual failure response time.

Pre-Publication

44. "Filtration treatment process" means a treatment process that physically separates a constituent of concern from water.

45. "Finished water" or "finished drinking water" means water produced by an AWTF, or a drinking water treatment facility, and which is introduced into a distribution system or served for human consumption without additional treatment, except for measures required to uphold water quality within the distribution system.

46. "Full scale" means the complete implementation and operation of an AWP system that is designed to treat treated wastewater to advanced treated water or finished water standards and to meet the finished water demand of the community.

47. "Good engineering practice" means a set of principles, guidelines, and standards that engineers follow to ensure their work meets high levels of quality, safety, efficiency and reliability. The principles, guidelines, and standards in an ADEQ-issued AWP guidance document constitute good engineering practice.

48. "Health Advisory" or "HA" means an estimate of acceptable levels for a chemical substance in drinking water based on health effects information that is:

    a. Published by EPA;

    b. Established in credible peer-reviewed literature or state or Federal databases;

    c. Established by the Department; or

    d. Established by another state's drinking water program as a "notification level".

49. "Impactful non-domestic dischargers" means a non-domestic discharger that has been determined by the AWPRA to discharge in such a way that will or does significantly impact the AWPRA's treatment processes and may or does significantly impact public health. Such determinations are made through a significant impact analysis pursuant to R18-9-E824(C).

50. "Indicator compound" or "Indicator" or "Performance Based Indicator" means a chemical found in treated wastewater that serves as a representative substance for a particular group of trace organic compounds, embodying their physical, chemical, and biodegradation properties.

51. "Initial Source Water Characterization" or "ISWC" means baseline monitoring of chemicals and pathogens performed on the treated wastewater effluent of a Water Reclamation Facility pursuant to R18-9-C814.

52. "Interference" means a discharge which alone, or in conjunction with a discharge or discharges from other sources, both:

    a. inhibits or disrupts the Water Reclamation Facility or the Advanced Water Treatment Facility, and

    b. is the cause of a violation of any requirement of the AWP permit.

53. "Local limit" means a set of specific, local, relevant, and enforceable limits, control measures, and best management practices established to protect AWPRA Facilities from pass-through or interference that could result in a threat to public health.

Pre-Publication

54. "Log reduction value" means the measure of a treatment train's or a treatment process's ability to remove or inactivate microorganisms such as bacteria, protozoa and viruses. A log reduction value is the log reduction validated or credited for a treatment process or treatment train.
55. "Log reduction" means the logarithm base 10 of the ratio of the levels of a pathogenic organism or other contaminant before and after treatment or a reduction in the concentration of a contaminant or microorganism by a factor of 10. One log reduction corresponds to a 90-percent reduction from the original concentration.
56. "Maximum Contaminant Level" or "MCL" has the same meaning set forth in Title 18, Chapter 4, Article 1 of this Title.
57. "Modification" means a change or changes to the treatment train or operations or any other component that will result in a change in the water quality of any process, unit of operation or to the advanced treated water or finished water.
58. "Municipal wastewater" means wastewater that contains predominantly domestic waste and may include commercial and industrial waste.
59. "Non-domestic sources" means both industrial and commercial sources.
60. "National Pretreatment Program" or "NPP" means the federal program referred to by this name under the Clean Water Act that is meant to protect infrastructure and receiving waters to a fishable and swimmable standard. The NPP is designed to reduce conventional and toxic pollutant levels discharged by industries and other nondomestic wastewater sources into municipal sewer systems and into the environment. The National Pretreatment Program's implementing regulations are found at Title 40 of the Code of Federal Regulations, Parts 122, 123, 124, and 403 and chapter I, subchapter N.
61. "National Pretreatment Program AWPRA" or "NPP AWPRA" means an AWPRA subject to R18-9-C813(B).
62. "Non-National Pretreatment Program AWPRA" or "Non-NPP AWPRA" means an AWPRA subject to R18-9-C813(C).
63. "Off-specification water" or "off-spec water" means water that has a quality that does not meet standards such as drinking water MCLs or other AWP programmatic requirements such as standards associated with surrogates or indicators.
64. "Operational barrier" means a barrier in the form of measures, including operations and monitoring plans, failure and response plans, as well as operator training and certification.
65. "Operational parameter" means a measurable property used to characterize or partially characterize the operation of a treatment process and must confirm the treatment barriers are intact to ensure the process is meeting the water quality and pathogen/chemical removal goals.
66. "Original drinking water" means drinking water that was being distributed prior to the introduction of advanced treated water or finished water.
67. "Oxidized wastewater" means wastewater that is treated to a level beyond simple removal of floating and suspended solids and meets the secondary treatment levels as described in R18-9-B204(B)(1).

Pre-Publication

68. "Ozone with biologically active filtration" or "Ozone/BAC" means an ozonation process immediately followed by biologically activated carbon.
69. "Pass-through" means the occurrence of a constituent of concern exiting Water Reclamation Facilities or Advanced Water Treatment Facilities in quantities or concentrations that have a significant potential to have serious adverse public health effects or to cause a violation of a treatment technique requirement, an action level or an MCL in the advanced treated water or finished water.
70. "Pathogen" means a microorganism such as bacteria, virus, or protozoa that can cause human illness.
71. "Pilot Study" or "Pilot train" or "Pilot" means a preliminary study and treatment train, of any scale representative to the full-scale facility, which is conducted to evaluate the feasibility, duration, cost, adverse events, and to improve upon the study design prior to performance of a full-scale project.
72. "Potentially impactful non-domestic discharger" means a non-domestic discharger that has been determined by the AWPRA to pose a potential to adversely impact treatment processes or the public health or which otherwise must be identified and tracked by the AWPRA pursuant to R18-9-E824(B)(4).
73. "Product water" means water exiting a specific treatment process or a combination of treatment processes.
74. "Public water system" has the same definition as the one incorporated by reference at A.A.C. R18-4-103 (40 CFR 141.2).
75. "Quantitative Polymerase Chain Reaction" or "qPCR" means a PCR-based technique that couples amplification of a target DNA sequence with quantification of the concentration of that DNA species in the reaction.
76. "Raw wastewater" means wastewater that is entering a Water Reclamation Facility via a sewage collection system and which has not undergone any centralized treatment. For the purposes of pathogen log removal, raw wastewater means wastewater prior to any point in a wastewater treatment process that may be credited for disinfection.
77. "Raw water augmentation" means introducing advanced treated water into the raw water supply upstream of a drinking water treatment facility.
78. "Real time monitoring" or "online monitoring" means treatment performance monitoring using instruments directly in the process flow or sample line that occurs continuously or semi-continuously in intervals of 15 minutes or less.
79. "Recalcitrant Total Organic Carbon" or "rTOC" means the Total Organic Carbon (TOC) found in finished water, which once used or consumed becomes wastewater. rTOC is unlike anthropogenic TOC present in wastewater because it may not be effectively eliminated by the Water Reclamation Facility, which leaves it as a constituent of the TOC in the treated wastewater.
80. "Redundancy" means the use of multiple treatment barriers to attenuate the same type of constituent, so that if one barrier fails, performs inadequately, or is taken offline for maintenance, the overall system will still perform effectively, reducing risk.

Pre-Publication

81. "Reference Dose" or "RfD" means an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.
82. "Reference pathogens" means Enteric viruses (specifically norovirus), Giardia lamblia cysts, and Cryptosporidium oocysts.
83. "Reliability" means the ability of a treatment process or treatment train to consistently achieve the desired degree of treatment, based on its inherent redundancy, robustness, and resilience.
84. "Resilience" means the ability of a treatment train to adapt successfully and restore performance rapidly when failure occurs.
85. "Robustness" means the ability of an AWP system to address a broad variety of constituents and changes in the concentrations of the constituents in the source water and resist a failure.
86. "Safe Drinking Water Act" means the Safe Drinking Water Act (Pub. L. 93-523, as amended; 42 U.S.C. 300f et seq.).
87. "SCADA" or "SCADA System" means Supervisory Control and Data Acquisition system.
88. "Secondary treatment" means treated wastewater that meets the following treatment levels:
    a. Five-day biochemical oxygen demand (BOD5) less than 30 mg/l (30-day average) and 45 mg/l (seven-day average), or carbonaceous biochemical oxygen demand (CBOD5) less than 25 mg/l (30-day average) or 40 mg/l (seven-day average);
    b. Total suspended solids (TSS) less than 30 mg/l (30-day average) and 45 mg/l (seven-day average);
    c. pH maintained between 6.0 and 9.0 standard units; and
    d. A removal efficiency of 85 percent for BOD5, CBOD5, and TSS.
89. "Source water" means water that is characterized for chemical constituents and pathogens based on which treatment or source control is designed.
90. "Surrogate parameter" or "Surrogate" means a measurable chemical or physical property, microorganism, or chemical that has been demonstrated to provide a direct correlation with the concentration of an indicator compound or pathogen; that may be used to monitor the efficacy of constituent reduction by a treatment process; and/or that provides an indication of a treatment process failure.
91. "Target chemical" means any unregulated chemical causing a potential human health concern that may be present in the treated wastewater.
92. "Tier 1 chemicals" means contaminants regulated as Primary Drinking Water Maximum Contaminant Levels (MCLs) under 40 CFR Part 141 of the Safe Drinking Water Act, as incorporated by reference in R18-4-102, including MCLs and treatment techniques.

Pre-Publication

93. "Tier 2 chemicals" means AWP-specific contaminants pursuant to R18-9-E826 that are not regulated in the Safe Drinking Water Act, but may be present in treated wastewater and may pose human health concerns.
94. "Tier 3 chemicals" means Performance Based Indicators that are used to monitor the performance of AWP treatment trains.
95. "Total Organic Carbon" or "TOC" means the amount of organic carbon in a sample.
96. "Trace Organic Compounds" or "TOrCs" means a category of compounds such as pharmaceuticals, personal care products, and hormones.
97. "Treated wastewater" means any water or wastewater source of predominantly municipal origin coming from a Water Reclamation Facility and going to an Advanced Water Treatment Facility that has undergone treated wastewater characterization for either enhanced wastewater treatment or secondary wastewater treatment. For the purposes of the AWP program, treated wastewater originates from a Water Reclamation Facility that has liquid stream treatment processes that, at a minimum, are designed and operated to produce oxidized wastewater that achieves a defined source water quality for the purpose of additional treatment by an Advanced Water Treatment Facility.
98. "Treated water augmentation" means finished drinking water from an AWTF, permitted as a drinking water treatment facility, which is directly introduced into a distribution system for human consumption.
99. "Treatment barrier" means a barrier in constant operation, such as a physical barrier, that can be credited with treatment performance.
100. "Treatment interference" or "interference" means a discharge from a non-domestic source which, alone or in conjunction with a discharge or discharges from other sources, inhibits or disrupts the AWPRA's treatment processes or operations and has significant potential for adverse public health consequences or significant potential to cause a violation of an action level, treatment technique or an MCL in advanced treated water or finished water.
101. "Treatment mechanism" means a physical, chemical, or biological action within each treatment process that reduces the concentration of a pathogen or a chemical contaminant.
102. "Treatment process" means a sequence of physical, chemical, or biological procedures applied to municipal wastewater or treated wastewater to remove pathogens and/or chemical constituents.
103. "Treatment technique" means a required process intended to reduce the level of a contaminant in water and/or drinking water.
104. "Treatment train" means a grouping of physical, chemical, and biological treatment technologies or processes that conditions or treats water to achieve a specific water quality goal.
105. "Upset" means unintentional and temporary noncompliance with a performance metric resulting in an excursion or loss of performance in one or more of the unit processes.

Pre-Publication

106. "Water Reclamation Facility" or "Wastewater Treatment Plant" means an arrangement of devices and structures for collecting, treating, neutralizing, stabilizing, or disposing of domestic wastewater, industrial wastes, and biosolids. For the purposes of the AWP program, a wastewater treatment plant does not include industrial wastewater treatment plants or complexes whose primary function is the treatment of industrial wastes.

107. "10^{-4} cancer risk" means the concentration of a chemical in drinking water corresponding to an excess estimated lifetime cancer risk of 1 in 10,000.

R18-9-A802. Program Review; Incorporation by Reference; Quality Assurance/Quality Control Methodologies

A. The Department shall review the AWP program upon any significant update to the incorporated by reference material in the rule, any significant update to Tier 2 health advisory values, any emerging scientific developments impacting AWP treatment mechanisms, or otherwise at the Director's discretion.

1. During its review, the Department shall assess the program rules and components for adequacy against currently available data and best available science.
2. As a result of its review, the Department shall determine whether any rule should be amended or repealed, and whether any material incorporated by reference should be updated.

B. The following materials are incorporated by reference and applicable in this Article unless specifically stated otherwise. The materials include no future editions or amendments, and are on file with the Department and as indicated below:

1. Standard Methods for the Examination of Water and Wastewater, Section 5710 B, "Trihalomethane Formation Potential (THMFP)", 24th ed. 2023, available at https://www.standardmethods.org.
2. Standard Methods for the Examination of Water and Wastewater, Section 5710 C, "Simulated Distribution System Trihalomethanes (SDS-THM)", 24th ed. 2023, available at https://www.standardmethods.org.
3. Standard Methods for the Examination of Water and Wastewater, Part 1000, "Analytical and Data Quality Systems", 24th ed. 2023, available at https://www.standardmethods.org.
4. Standard Methods for the Examination of Water and Wastewater, Section 7020, "Quality System", 24th ed. 2023, available at https://www.standardmethods.org.
5. Standard Methods for the Examination of Water and Wastewater, Section 8020, "Quality Assurance and Quality Control in Laboratory Toxicity Tests", 24th ed. 2023, available at https://www.standardmethods.org.
6. Standard Methods for the Examination of Water and Wastewater, Section 9020, "Quality Assurance/Quality Control", 24th ed. 2023, available at https://www.standardmethods.org.

Pre-Publication

7. ASTM International, Designation D4194-23, "Standard Test Methods for Operating Characteristics of Reverse Osmosis and Nanofiltration Devices", February 16, 2023, available at https://www.astm.org.
8. Federal Register, 87 FR 68066, "Contaminant Candidate List 5 - Exhibit 1b - Unregulated DBPs in the DBP Group on CCL 5", available at https://www.federalregister.gov.
9. 2018 Edition of the Drinking Water Standards and Health Advisories, U.S. EPA, available at https://www.epa.gov.
10. Method 1623.1: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, published January 2012, available at https://www.nepis.epa.gov.
11. Method 1615: Measurement of Enterovirus and Norovirus Occurrence in Water by Culture and RT-qPCR, published 2014, available at https://cfpub.epa.gov.
12. 40 CFR 261.21, "Characteristic of ignitability, published July 7, 2020, available at https://www.ecfr.gov.
13. "Considerations for Direct Potable Reuse Downstream of the Groundwater Recharge Advanced Water Treatment Facility". Brian Pecson, Shane Trussell, Elise Chen, Anya Kaufmann, & Rhodes Trussell. (2020).

C. Data collection, analysis, sampling, monitoring, reporting, and other related data quality assurance and quality control methodologies in this Article shall be conducted in accordance with the following applicable procedures in Standard Methods for the Examination of Water and Wastewater, 24th ed. 2023, available at standardmethods.org:

1. Part 1000, "Analytical and Data Quality Systems";
2. Section 7020, "Quality Control for Wastewater Samples";
3. Section 8020, "Quality Assurance and Quality Control in Laboratory Toxicity Tests"; and
4. Section 9020, "Interlaboratory Quality Control Guidelines".

R18-9-A803. Applicability of the Safe Drinking Water Act

A. For the purposes of the Safe Drinking Water Act, treated wastewater is presumptively considered surface water. Nothing in this section exempts a facility from applicable Safe Drinking Water Act requirements in Chapter 4 of this Title.

B. An AWTF that treats treated wastewater to advanced treated water standards for raw water augmentation may, at the Director's discretion, be considered part of a public water system for the purposes of compliance with the Safe Drinking Water Act and all applicable requirements of this Title.

C. An AWTF that treats treated wastewater to finished water standards for human consumption and distribution through pipes or other constructed conveyances is, or is part of, a public water system for the purposes of compliance with the Safe Drinking Water Act and all applicable requirements of this Title.

D. If the AWTF is considered a public water system under either subsections (B) or (C):

Pre-Publication

1. Permitting processes of this Article supersede the public water system permitting requirements in Chapter 5, Article 5, where they conflict, and
2. Design requirements of this Article supersede the public water system design requirements in Chapter 5, Article 5 where they conflict.

PART B. GENERAL PROGRAM REQUIREMENTS

R18-9-B804. Advanced Water Purification Operator Certification

A. Definitions. In addition to the definitions for this Article, the following terms apply to this section:

1. "Advanced Water Purification Responsible Agency administrator" or "AWPRA administrator" means an individual appointed or authorized to exercise managerial control over a designated AWP project.
2. "Advanced Water Purification certified operator" or "AWP operator" means an individual who has passed the AWP validated examination, meets the advanced water treatment qualifying experience requirements of this section, and holds a current certificate, issued by the Department, in either:
   a. The field of drinking water treatment with at least a Grade 3 or Grade 4 drinking water treatment certification; or
   b. The field of wastewater treatment with at least a Grade 3 or Grade 4 wastewater treatment certification.
3. "Advanced water treatment qualifying experience" means at least one year of hands-on experience in the operation of a minimum of three advanced water treatment processes, all within a single advanced water treatment train.
4. "AWP validated examination" means an examination that is approved by the Department after being reviewed to ensure that the examination is based on the knowledge, skills, and abilities needed to operate an AWTF.
5. "Direct responsible charge" means an AWP operator who has overall responsibility for the day-to-day, hands-on operation of an AWTF.
6. "Direct responsible charge proxy" or "proxy" means an AWP shift operator who is designated by, and acts on behalf of, the operator in direct responsible charge when the operator in direct responsible charge is not onsite.
7. "AWPRA facility" or "facility" means a drinking water treatment facility, AWTF, collection system, or wastewater treatment plant involved in the production of advanced treated water.
8. "Onsite" means physically present at any AWPRA facility where a critical control point is operated and any AWPRA facility assigned treatment credits.
9. "Professional development hour" means one hour of participation in an organized educational activity related to engineering, biological or chemical sciences, a closely related technical or scientific discipline, or operations management.

Pre-Publication

10. "Qualifying experience" means experience, skill, or knowledge obtained through employment that is applicable to the technical or operational control of all or part of a facility (A.A.C. R18-5-101).

11. "Shift operator" means an AWP operator who is in direct charge of the operation of a treatment facility for a specified period of the day and must be present at the site during the duration of the shift.

12. "Shift" means an eight-hour period of time in one day.

B. Applicability. The rules in this subsection apply to owners and operators of AWPRA facilities in Arizona.

C. Certification Committee.

1. Upon the effective date of this rule, the Director shall establish a certification committee which may, at the Department's request, make recommendations and provide the Department with technical advice and assistance related to the AWP operator certification.

2. The AWP operator certification committee shall consist of eleven members, appointed by the Director as follows:

   a. An employee of the Department who shall serve as the executive secretary and who is responsible for maintaining records of all meetings,

   b. A currently employed operator with both Grade 4 water treatment certification and AWP operator certification,

   c. A currently employed operator with both Grade 3 water treatment certification and AWP operator certification,

   d. A currently employed operator with both Grade 4 wastewater treatment certification and AWP operator certification,

   e. A currently employed operator with both Grade 3 wastewater treatment certification and AWP operator certification,

   f. A currently employed wastewater collection system operator with Grade 4 certification,

   g. A currently employed water distribution system operator with Grade 4 certification,

   h. A faculty member teaching environmental engineering in the water or wastewater fields at an Arizona university or community college,

   i. A professional engineer, registered and residing in Arizona, engaged in consulting in the field of environmental engineering,

   j. An elected or appointed municipal official,

   k. A representative of a wastewater treatment facility with a design flow of greater than 5 million gallons per day (MGD) and which participates in the National Pretreatment Program, and

   l. A representative of a wastewater treatment facility with a design flow of less than 5 MGD, which is not a participant in the National Pretreatment Program.

3. The certification committee shall meet at least twice a year. At the first meeting of each calendar year, the certification committee shall select, from among its members, a chairperson and other officers as necessary.

Pre-Publication

4. A certification committee member shall serve a term of three years.

5. A certification committee member may be reappointed, but a member shall not serve more than three consecutive terms.

6. A meeting quorum consists of the chairperson or the chairperson's designated representative, the executive secretary or the executive secretary's designated representative, and three other members of the committee.

7. In the event of a vacancy caused by death, resignation, or removal for cause, the Director shall appoint a successor for the unexpired term.

D. General Requirements.

1. An AWPRA shall ensure all of the following:

   a. All facilities receiving treatment credit pursuant to R18-9-E828 are operated by AWP operators,

   b. All facilities receiving treatment credit pursuant to R18-9-E828 have a full-time operator in direct responsible charge onsite for at least two full shifts per day,

   c. All facilities receiving treatment credit pursuant to R18-9-E828 have an operator in direct responsible charge, or their proxy, onsite at all times during operation,

   d. When any facilities receiving treatment credit pursuant to R18-9-E828 is operated by a direct responsible charge proxy, an operator in direct responsible charge must be reasonably available to provide immediate direction telephonically, if necessary,

   e. An AWP operator makes all decisions about operational process control or system integrity regarding water quality or water quantity that affects public health,

   f. An AWPRA administrator who is not an AWP operator may make a planning decision regarding water quality or water quantity if the decision is not a direct operational process control or system integrity decision that affects public health,

   g. All critical control points at any facility receiving treatment credit pursuant to R18-9-E828 are operated by an AWP operator, and

   h. The names of all current AWP operators are reported to the Department as a component of the Operations Plan submitted pursuant to R18-9-F836.

2. During the application period, or at any point thereafter, an AWPRA may submit a request to waive the requirement in subsection (1)(b) of this section if an operations plan, or amended operations plan, submitted to ADEQ pursuant to R18-9-F836 demonstrates that alternative oversight by an operator in direct responsible charge nevertheless achieves an equivalent degree of operational oversight and treatment reliability.

Pre-Publication

3. If ADEQ grants the waiver request in subsection (D)(2) above, the operator in direct responsible charge is not required to be onsite for at least two full shifts per day, but shall be able to monitor operations over the facility onsite within the period specified in the operations plan.

4. If the owner of a facility replaces an AWP operator in direct responsible charge with another AWP operator, the facility owner shall notify the Department in writing within 10 days of the replacement.

5. An AWP operator shall notify the Department in writing within 10 days of the date the AWP operator either ceases to operate a facility or commences operation of another facility.

6. An AWP operator shall operate each facility in compliance with applicable state and federal law.

E. Certification.

1. The Department shall issue an AWP operator certificate to an applicant if the applicant:

   a. Meets the experience requirements in subsection (K) for the applicable class and grade as outlined in this section,

   b. Passes a written advanced water treatment examination, and

   c. Has not had an operator's certificate revoked in Arizona or permanently revoked in another jurisdiction.

2. To apply for AWP operator certification, an applicant shall submit to the Department the following information, as applicable, on a form approved by the Director:

   a. The applicant's full name, Social Security number, and operator number(s),

   b. The applicant's current mailing address, home and work telephone numbers and e-mail address,

   c. The applicant's place of employment, including the facility identification number,

   d. The class and grade of the facility where the applicant is employed,

   e. Proof of successful completion of the advanced water treatment examination and other applicable certificates, and

   f. Documentation of the applicant's experience required under this section.

F. Examination.

1. The Department shall provide examinations for certification of AWP operators. The Department may contract with third party examiners for administration of examinations. The Department shall ensure that a list of approved examiners is available upon request.

2. The Department shall validate all examinations before administration. Each examination shall include topics such as advanced treatment technologies, system maintenance, regulatory protocols, safety, mathematics, and general system management.

3. The examiner shall grade the examination and make the results available to the applicant and the Department within seven days of the date of the examination.

4. An applicant shall not be admitted to an examination without a valid picture I.D.

Pre-Publication

5. An individual must achieve a score of at least seventy percent on the examination in order to attain a passing grade.

6. For applicants with a Grade 3 or Grade 4 wastewater treatment operator certification, the examination shall include an additional component which tests knowledge equivalent to the Grade 3 drinking water treatment operator examination.

G. Certificate Renewal.

1. If the Department renews a certificate, the certificate is renewed for a three-year period, unless the AWP operator requests a shorter renewal term in writing.

2. An AWP operator may renew their certificate without retaking the exam in accordance with the following:

   a. Prior to the end of their certificate period by submitting a renewal form; or

   b. Following the expiration of the certification period, if the AWP operator submits a completed renewal form to the Department within 90 days of the expiration date.

3. To renew a certificate, an AWP operator shall complete and submit to the Department an AWP operator certificate renewal, on a form approved by the Director.

4. An AWP operator shall provide the following documentation to the Department, upon request, if necessary to verify:

   a. Completion of at least 30 professional development hours accumulated during the certification period, of which at least 10 professional development hours directly relate to the specific job functions of the AWP operator, and

   b. Verification, in writing, by the AWP operator's supervisor, or the entity that provides the education or training, of the AWP operator's completion of each professional development hour.

5. An AWP operator shall maintain documentation of completion of professional development hours for a minimum of five years.

6. As an alternative to the requirements of subsection (G)(2), an AWP operator may renew a certificate by taking and passing an AWP operator examination.

H. Certificate Expiration.

1. A certification is valid for three years and shall expire on the expiration date, which is the end of the certification period.

2. An expired certification may be reinstated if the renewal is submitted within 90 days of expiration date, in accordance with subsection (G)(2)(b).

3. A person with an expired certificate shall re-apply in accordance with subsections (F) and (G) in order to be certified as an AWP operator.

4. An AWP operator certificate is considered expired if the supporting certificate has been denied, expired, suspended, or revoked.

I. AWP Operator Certificate Denial, Suspension, Probation, and Revocation.

Pre-Publication

1. The Department may deny, suspend, or revoke an AWP operator certificate, and may place an AWP operator on probation.
2. The Department shall deny a certificate if the application is deficient, the applicant fails to obtain a passing score on the examination, or upon any other determination that the applicant has not met the requirements of this section.
3. The Department may revoke or suspend a certificate, or place an AWP operator on probation, if the Department determines that the AWP operator:
   a. Operates a facility in a manner that violates federal or state law;
   b. Negligently operates a facility or negligently supervises the operation of a facility;
   c. Fails to comply with a Department order or court order;
   d. Obtains, or attempts to obtain, a certificate by fraud, deceit, or misrepresentation;
   e. Engages in fraud, deceit, or misrepresentation in the operation or supervision of a facility;
   f. Knowingly or negligently prepares a false or fraudulent report or record regarding the operation or supervision of a facility;
   g. Endangers the public health, safety, or welfare;
   h. Fails to comply with the terms or conditions of probation or suspension; or
   i. Fails to cooperate with an investigation by the Department including failing or refusing to provide information required by this section.
4. The action the Department takes under subsection (I)(3) may be made at the Department's discretion upon an examination of the individual facts and circumstances, the number of findings the Department makes under (I)(3), and upon consideration of other factors, such as but not limited to, additional aggravating circumstances not considered under (I)(3).
5. In performing any action under this subsection, the Department shall comply with the requirements in A.R.S. Title 41, Chapter 6, Article 10 and A.A.C. Title 18, Chapter 1, Article 2.

J. Reciprocity. The Department shall issue a certificate to an applicant who holds a valid certificate from another jurisdiction, if the applicant:
1. Passes a written, validated AWP operator examination in Arizona or in another jurisdiction that administers an AWP examination that is substantially equivalent to the examination in Arizona and validated by the Department, and
2. Submits written evidence of the experience required under subsection (K).

K. Experience.
1. The Department shall consider the following criteria to determine whether an applicant has the qualifying experience required for AWP operator certification:
   a. The type of operator certification held by the applicant, and

Pre-Publication

b. Years of qualifying experience as a certified operator for a specific grade of facility.

2. An applicant shall provide evidence of certification as one of the following:

a. A Grade 3 drinking water operator;

b. A Grade 4 drinking water operator;

c. A Grade 3 wastewater operator; or

d. A Grade 4 wastewater operator.

3. An applicant shall provide evidence of qualifying experience in the applicable facility class.

4. An applicant shall meet the following requirements for admission to an AWP operator certification examination:

a. A Grade 3 drinking water operator shall have at least two years' experience operating a Grade 3 drinking water treatment facility.

b. A Grade 4 drinking water operator shall have at least one year of experience operating a Grade 4 drinking water treatment facility.

c. A Grade 3 wastewater operator shall have at least two years' experience operating a Grade 3 wastewater treatment facility.

d. A Grade 4 wastewater operator shall have at least two years' experience operating a Grade 3 or Grade 4 wastewater treatment facility.

5. An applicant that meets the requirements of this section and has passed the advanced water treatment examination shall be certified in accordance with the following:

a. An applicant with Grade 3 drinking water treatment certification with at least one year of advanced water treatment qualifying experience shall receive certification as AWP shift operator.

b. An applicant with Grade 4 drinking water treatment certification with at least one year of advanced water treatment qualifying experience shall receive certification as AWP operator in direct responsible charge.

c. An applicant with Grade 3 wastewater treatment certification with at least one year of advanced water treatment qualifying experience shall receive certification as AWP shift operator.

d. An applicant with Grade 4 wastewater treatment certification with at least one year of advanced water treatment qualifying experience shall receive certification as AWP shift operator.

6. Advanced water treatment qualifying experience may be obtained through any of the following:

a. Operating a pilot facility;

b. Operating an AWP demonstration facility that is not distributing finished water for human consumption;

c. Experiential reciprocity pursuant to subsection (J) of this section;

Pre-Publication

d. An apprenticeship under an AWP operator on-site at an AWP facility including a pilot facility, demonstration facility, or AWTF; or

e. Other experience approved by the Department.

7. Experience working at an AWTF shall count towards qualified experience at a Grade 4 drinking water plant.

L. Class and Grade Requirements.

1. Drinking Water Treatment and Distribution Systems.

a. The Department shall classify a drinking water treatment facility receiving AWP treatment credits under R18-9-E828 as an AWTF.

b. The Department shall grade water distribution system AWPRA partners pursuant to A.A.C. R18-5-115(B).

2. Wastewater Treatment and Collection Systems.

a. A wastewater treatment facility receiving AWP treatment credits under R18-9-E828 shall be operated by an AWP operator and an operator certified at the appropriate grade, and no grade lower, for the class of the facility pursuant to Chapter 5, Article 1 of this Title. These operation requirements may be met by the same operator.

b. Wastewater collection systems that collect and convey wastewater to a wastewater treatment facility that is ultimately used as a treated wastewater supply to an AWTF shall be classified pursuant to R18-5-114 of this Title.

c. For a multi-facility system, the Department shall grade each facility in accordance with this subsection.

M. Transition.

1. Beginning two years from the effective date of the AWP programmatic rules in A.A.C. Title 18, Chapter 9, Article 8, all facilities receiving treatment credit pursuant to R18-9-E828 shall be operated by AWP operators certified in accordance with this section.

2. During the two-year transition period, all AWTFs shall be operated by a Grade 4 certified drinking water operator who has completed appropriate training, approved by the Department.

R18-9-B805. Advanced Water Purification Responsible Agency Formation; Joint Plan

A. An AWPRA shall be the entity responsible for complying with the requirements of this Article.

1. Only one AWPRA shall be designated for an AWP project.

2. An AWPRA must be a person under A.R.S. § 49-201(33).

B. Joint Plan. An AWPRA shall develop a Joint Plan describing all partner coordination procedures, including but not limited to, the following:

1. Partner Details.

a. Identification of each partner associated with the AWP project throughout the project's expected operational life,

Pre-Publication

b. A description of the roles and responsibilities of each partner, including designation of a lead partner responsible for fulfilling the requirements under the communication plan established in accordance with subsection (B)(4), and

c. The legal authority of each partner to fulfill its roles and responsibilities.

2. Procedures to ensure that the AWPRA will have knowledge of the current treatment and water quality monitoring status of any water reclamation facility delivering treated wastewater as a source to the AWP project,

3. Procedures to ensure the enhanced source control program complies with the requirements in this Article, pursuant to R18-9-E824,

4. A communication plan ensuring the timely dissemination of information regarding both treated wastewater and advanced treated water or finished water quality status and monitoring among all partners,

5. Procedures to provide access to the AWPRA and all partner facilities, operations, and records for inspection at any time by the Department,

6. Procedures to execute cross-connection control requirements, pursuant to Chapter 4, Article 2 and R18-9-F832 of this Article,

7. Procedures to execute corrosion control requirements, pursuant to Chapter 4, Article 1 and R18-9-F832,

8. Procedures to notify partners and the Department of treatment failure incidents and all corresponding corrective actions taken,

9. A plan outlining all enforcement and corrective actions taken should a partner fail to meet the requirements of this Article or violate the Joint Plan, and

10. Procedures to address changes to the AWPRA partners, including the addition of new partners and the removal of existing partners, in accordance with the requirements of the AWP program.

C. The AWPRA and all partners shall sign the Joint Plan.

D. The Joint Plan shall include copies of all necessary agreements executed to facilitate the operation of the AWP project, including but not limited to, copies of permits, memorandums of understanding, joint powers agreements, or intergovernmental agreements.

R18-9-B806. General Requirements

A. Delivery of advanced treated water or distribution of finished water is prohibited unless delivery or distribution approval is explicitly given to the AWPRA, either:

1. Through issuance of the AWP permit, if full-scale certification was completed and approved as part of the application; or

2. After satisfaction of the compliance schedule requirements pursuant to R18-9-C816(E).

Pre-Publication

B. Construction materials used at the AWTF, including materials used at AWPRA partner facilities, except for water reclamation facilities, that collect, treat, store, or distribute water for human consumption through pipes or other constructed conveyances, shall be lead-free as prescribed in A.R.S. § 49-353(B). This subsection shall not apply to leaded joints necessary for the repair of cast iron pipes.

C. Treated wastewater used to supply an AWP project shall be municipal wastewater in origin.

D. Confidentiality of Information. In accordance with A.R.S. § 49-205, any information submitted to the Director pursuant to this Article may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, the Director may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in A.R.S. § 49-205.

R18-9-B807. Inspections, Violations, and Enforcement

A. The Department shall conduct inspections of a permitted AWPRA facility as specified under A.R.S. § 41-1009 and according to sanitary survey requirements in A.A.C. Title 18, Chapter 4, if applicable.

B. Any person who violates a provision of Article 8 of this Chapter, applicable provisions in Chapters 4 and 5 of this Chapter, or a condition of an AWP permit or AWP demonstration permit is subject to the applicable enforcement actions established under A.R.S. Title 49.

R18-9-B808. Recordkeeping

A. The AWPRA shall collect and retain the following information for at least ten years:

1. Copies of laboratory analyses and chain of custody forms,
2. The results of all analyses of chemicals and pathogens, including laboratory data, and
3. Copies of all plans and technical components prepared and submitted to the Department under the AWP permit application.

B. For the records described in subsections (A)(1) through (A)(3), a responsible agent of the AWPRA shall sign the following certification statement "I certify, under penalty of law, that the activities conducted pursuant to the requirements of Title 18, Chapter 9, Article 8 have been made under my direction and supervision and under a system designed to ensure that qualified personnel properly gather and evaluate the information to determine whether the applicable requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

Pre-Publication

R18-9-B809. Construction and Compliance with Plans

A. An AWPRA shall conform to all proposed plans and specifications when constructing any part of their pilot facility such that the facility accurately reflects the proposal as recorded.

1. Prior to issuance of an AWP permit or demonstration permit and when the pilot facility is the same as the proposed full-scale facility, any change in a proposed design that will affect advanced treated water or finished water quality, capacity, flow, or performance, shall be documented by the AWPRA applicant and submitted to the Department for review and approval in the form of revised plans and specifications, record drawings and a written statement regarding the reasons for the change.
2. The record drawings shall be drafted pursuant to R18-9-B810.

B. An AWPRA shall conform to all approved plans and specifications when constructing any part of their full-scale facility.

1. Following issuance of an AWP permit, any change in an approved design that will affect advanced treated water or finished water quality, capacity, flow, or performance, shall be submitted by the AWPRA to the Department for review and approval through a permit amendment.
2. Upon a change to an approved design, the AWPRA shall notify the Department and shall not proceed with any construction related to the design change without written approval from the Department, except in cases of emergency in which the AWPRA must act promptly to respond to an immediate and significant threat to human health and approval from the Department would unduly delay or prevent the AWPRA from addressing the threat. In instances of emergency, the AWPRA shall at the first available and safe moment, but not exceeding 30 days after the emergency:
   a. Notify the Department of the emergency,
   b. Detail the change made from the approved design, and
   c. Describe all response methods utilized during the emergency to protect advanced treated water quality.
3. An AWPRA's failure to notify and obtain the Department's approval of a change in an approved design is subject to enforcement as a permit violation pursuant to R18-9-B807.

R18-9-B810. Record Drawings

A. An Arizona-registered professional engineer shall clearly and accurately record or mark, on a complete set of working project drawings, each deviation from the original plan, and a written summary of each deviation which shall include, but is not limited to:

1. A description of the deviation,
2. The reason for the deviation, and

Pre-Publication

3. The projected impact the deviation will have on advanced treated water quality. If an impact is identified, the description shall be accompanied by an explanation on how the AWPRA will address the impact to maintain compliance with advanced treated water quality standards.

B. The set of marked drawings and written summary of deviations becomes the record drawings, reflecting the project as actually built.

C. The professional engineer registered in Arizona shall sign, date, and place their engineer's seal on each sheet of the record drawings and written summary of deviations and submit them to the Department as part of the permit application. The record drawings shall be accompanied by an engineer's certificate of completion, signed by the professional engineer.

D. Quality control testing results and calculations shall be submitted with the engineer's certificate of completion together with field notes and the name of the individual witnessing the tests.

R18-9-B811. Outreach; Public Communications Plan

A. An AWPRA applicant/permittee shall develop a Public Communications Plan for the purpose of providing drinking water consumers in the service area with education, awareness, and transparency related to the AWP project.

B. Public Communications Plan. The Plan shall include, but is not limited to, the following:

1. Consumer Notification.
   a. An AWPRA applicant shall notify all drinking water consumers of its intention to apply for an AWP permit for treatment and delivery of advanced treated water or distribution of finished water as a drinking water source.
   b. An AWPRA applicant/permittee shall maintain communication with the consumers throughout all major program phases, including planning, application, operations, and post-operations.
   c. Throughout the planning phase, the AWPRA applicant shall:
      i. Communicate to the public through the use of a local, publicly-accessible repository in which the AWPRA posts information about the AWP project, contains a forum for public question and comment, and a place for responses. Such a repository shall be active at the time the AWPRA applicant submits an AWP project permit application to the Department, and shall be maintained for the lifetime of the project,
      ii. Provide at least one notification by mail or by another Department-approved method to all of its consumers prior to a public meeting related to the AWP project,
      iii. Schedule and hold at least one public meeting during the planning stage of the AWP project,
      iv. Communicate to the public through at least one additional Department-approved method in accordance with subsection (B)(2) of this section, and

Pre-Publication

v. Provide all relevant information in all appropriate languages, as necessary, and provide contact information to the public on how a consumer may obtain translated written communications or request language assistance for written and oral communications.

d. During the application phase, the AWPRA applicant shall schedule and hold at least one public meeting no less than six months prior to distributing finished water from the AWP project.

2. Acceptable Methods of Communication. Department-approved methods of communication include the following:

a. Coverage through a local news outlet (e.g. television, newspaper, social media);

b. Community event(s) (e.g. setting up table/booth);

c. Local school(s) and school events;

d. Providing opt-in email or text notifications to customers;

e. Consumer confidence reports, water bill inserts, or other mail notification;

f. Neighborhood association meeting(s) and civic organizations; or

g. Other methods may be accepted at the Director's discretion.

3. Community Engagement.

a. An AWPRA applicant shall involve local government(s) throughout the AWP project phases, as necessary.

b. An AWPRA applicant shall develop a list of all relevant stakeholders and interest-holders that they intend to communicate with. Such a list shall, at a minimum, include local health authorities and medical professionals, and may additionally include:

i. City/town councils and boards;

ii. Local elected officials;

iii. Community organizations that represent disproportionately impacted communities,

iv. Local environmental groups;

v. Industry groups; or

vi. Schools/school boards.

c. An AWPRA applicant may conduct surveys, focus groups, or other means of collecting local information for the purpose of demonstrating community perception and opinion of the prospective AWP project introduction, and throughout all succeeding project phases.

4. Certification.

a. An AWPRA applicant shall certify the Plan meets the minimum requirements in this section.

Pre-Publication

b. The certified Plan shall include details demonstrating compliance with the requirements of this section, including, but not limited to:

i. Access to the publicly-accessible repository, such as a web address,

ii. Description of the methodology selected for communication,

iii. The numbers of mailers sent to the public,

iv. The number of government entities and other leaders engaged with,

v. A description of the public meetings held including dates, times, and methods of notice, and

vi. A description of any outreach conducted in other languages.

c. An AWPRA applicant shall submit a draft Plan as a component of the AWP permit application pursuant to R18-9-C816.

d. After being issued the AWP permit, and at least 30 days prior to distributing advanced treated water or delivering finished water, an AWPRA shall submit a certified final Plan to the Department pursuant to the compliance schedule set forth in their AWP permit.

PART C. PRE-PERMIT AND PERMIT REQUIREMENTS

R18-9-C812. Pre-Application Conference; Project Advisory Committee

A. Upon request of the AWPRA applicant, the Department shall schedule and hold pre-application conference(s) with the AWPRA applicant to discuss the requirements of this Article.

B. The Department may assemble a project advisory committee for the purpose of providing project-specific technical consultation to the Department throughout the application process.

1. The project advisory committee may be composed of appropriate experts selected by the Department to assist in review as necessary.
2. Experts may include, but are not limited to, toxicologists, State of Arizona licensed engineers, epidemiologists, microbiologists, chemists, and utility representatives.
3. Project advisory committee recommendations are advisory only.
4. Reviews by the project advisory committee shall be conducted within the applicable Licensing Time Frames in Chapter 1, Article 5 of this Title.

R18-9-C813. Applicant Pathways Depending on National Pretreatment Program Applicability

Pre-Publication

A. An AWPRA applicant shall submit the application components in the order and format set forth in this section, in addition to the order and format prescribed by the applicable rules within this Article.

B. National Pretreatment Program AWPRA. An AWPRA with all water reclamation facility partner(s) subject to the National Pretreatment Program may elect to either:

1. Submit the Initial Source Water Characterization Plan and the Pilot Study Plan to the Department for review and comment prior to the AWP permit application in the order and format set forth in R18-9-C814 and R18-9-C815; or
2. Submit the Initial Source Water Characterization Report and Piloting Report to the Department for approval as components of the AWP permit application pursuant to R18-9-C816.

C. Non-National Pretreatment Program AWPRA. An AWPRA with at least one water reclamation facility partner not subject to the National Pretreatment Program shall, throughout the pre-application period and in the order and format set forth in R18-9-C814 and R18-9-C815:

1. Submit the Initial Source Water Characterization Plan and the Pilot Study Plan to the Department for review and comment, and
2. Submit the Initial Source Water Characterization Report and Pilot Report to the Department for approval pursuant to R18-9-C816.

D. An AWPRA applicant that builds a pilot facility to full-scale and develops a Hybrid Pilot and Full-Scale Verification Plan, shall follow the submission requirements pursuant to R18-9-C815(A)(1)(c) and R18-9-F835(A)(1)(c) in lieu of the submission requirements in subsections B and C of this section.

R18-9-C814. Initial Source Water Characterization

A. An AWPRA applicant shall develop an Initial Source Water Characterization Plan and shall conduct initial monitoring of any treated wastewater proposed to be used as a source for an AWTF.

B. Initial Source Water Characterization Plan. An initial source water characterization monitoring plan, or Initial Source Water Characterization Plan, shall be developed and followed when conducting initial monitoring in accordance with this section.

1. A Non-National Pretreatment Program AWPRA applicant shall submit the Initial Source Water Characterization Plan to the Department for review and comment prior to conducting initial source water monitoring under this section. Along with the Initial Source Water Characterization Plan, the AWPRA applicant shall submit the following additional preliminary components to the Department for review and comment:
   a. A draft Enhanced Source Control Plan prepared pursuant to R18-9-E824,
   b. A draft technical, managerial, and financial, or Technical, Managerial, and Financial Capacity Plan, prepared pursuant to R18-9-F833,

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c. A proposed pilot train designed pursuant to R18-9-C815, and

d. A draft Public Communications Plan prepared pursuant to R18-9-B811.

2. A National Pretreatment Program AWPRA applicant may submit the Initial Source Water Characterization Plan to the Department for review and comment prior to conducting initial source water monitoring under this section, or otherwise shall submit the Initial Source Water Characterization Plan and Report to the Department as a component of the AWP permit application prepared pursuant to R18-9-C816. An AWPRA applicant that elects to submit the Initial Source Water Characterization Plan to the Department for review and comment prior to conducting initial source water monitoring under this section may also elect whether or not to submit the additional preliminary components listed in subsection (B)(1) to the Department for contemporaneous review and comment.

C. Monitoring. An AWPRA applicant shall conduct initial source water monitoring at all water reclamation facilities delivering treated wastewater as a source to an AWTF as applicable under R18-9-A802(C).

1. Monitoring shall be conducted at a location before any treatment process that will be used for a treatment credit in the AWP project and before the point of diversion to the AWTF.

2. Chemical Monitoring.

a. The AWPRA applicant shall collect a minimum of twelve monthly composite samples representative of seasonal variability.

b. If there is wide variability in a chemical concentration, meaning the coefficient of variation is greater than fifty percent, the AWPRA applicant shall reasonably increase the sampling interval in order to evidence this variability.

c. The AWPRA applicant shall sample for the following chemicals, excluding those identified on the projected chemical treatment list developed in R18-9-E826:

i. Tier 1 chemicals,

ii. Tier 2 chemicals pursuant R18-9-E826(D), and

iii. Any projected Tier 3 chemicals.

3. Pathogen Monitoring.

a. The AWPRA applicant shall utilize reference pathogens to monitor pathogen treatment within the AWP project and establish log reduction requirements consistent with either a standard log reduction approach or a site-specific log reduction approach pursuant to R18-9-E828.

b. Standard Log Reduction. If the AWPRA applicant selects the standard log reduction approach to pathogen control, no initial pathogen monitoring is required as part of initial source water characterization.

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c. Site-Specific Log Reduction. If the AWPRA applicant selects the site-specific log reduction approach to pathogen control, the AWPRA applicant shall perform initial pathogen monitoring as part of initial source water characterization by following the prescribed sampling protocol pursuant to R18-9-E828(C).

D. In addition to the requirements of this section, initial source water monitoring under an Initial Source Water Characterization Plan shall be conducted using good engineering practices. Methods for initial source water monitoring shall be approved if the AWPRA applicant can demonstrate that the methods are sufficiently detailed and robust for the purpose of characterizing the treated wastewater used as a source for an AWTF in such a manner that informs the proposed pilot and full-scale treatment train design and serves as an accurate representation of the collection system.

1. ADEQ shall develop and make available guidance on conducting initial source water monitoring under an Initial Source Water Characterization Plan.
2. An Initial Source Water Characterization Plan developed in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

E. Report. An Initial Source Water Characterization Report shall be finalized within three years of the commencement of initial source water monitoring or at the Director's discretion. The Initial Source Water Characterization Report shall be prepared pursuant to R18-9-A802(C) and shall include, but is not limited to, the following:

1. The date, time, frequency and exact place of sampling,
2. The name of each individual who performed the sampling,
3. The procedures used to collect the samples,
4. The dates the sample analyses were completed,
5. The name of each individual or laboratory performing sample analysis,
6. The analytical techniques or methods used to perform the sampling and analysis,
7. The chain of custody records,
8. Any field notes relating to the information described under this subsection,
9. The sampling results which account for seasonal variability,
10. Corresponding laboratory data for all samples, and
11. A copy of the Initial Source Water Characterization Plan developed in subsection (B).

F. Report Submission.

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1. A Non-National Pretreatment Program AWPRA applicant shall submit the Initial Source Water Characterization Report in subsection (E) to the Department for review and comment as a component of the Pilot Study Plan prepared pursuant to R18-9-C815. Additionally, a Non-National Pretreatment Program AWPRA applicant shall submit the Initial Source Water Characterization Report as a component of the AWP permit application prepared pursuant to R18-9-C816.
2. A National Pretreatment Program AWPRA applicant, if electing to submit a Pilot Study Plan to the Department for review and comment, may include the Initial Source Water Characterization Report in subsection (E) as a component, or otherwise shall submit the Initial Source Water Characterization Report as a component of the AWP permit application prepared pursuant to R18-9-C816.

G. The Department shall consider an AWPRA applicant's conformance with the initial source water characterization requirements in this Article as a component of the AWP permit application. The Director shall deny an AWP permit application if a determination is made that, under the Initial Source Water Characterization Plan, monitoring was improperly conducted or is otherwise insufficient to achieve the objectives of chemical and pathogen characterization, or if the Initial Source Water Characterization Report is incomplete or otherwise insufficient to demonstrate compliance with the Plan.

R18-9-C815. Pilot Study

A. An AWPRA applicant shall develop a Pilot Study Plan and conduct piloting on a pilot treatment train.

1. If an AWPRA builds a pilot facility to full-scale, the AWPRA applicant may, instead, opt to conduct piloting and full-scale verification simultaneously. If the AWPRA pursues this option, the AWPRA shall:
   a. Consult with the Department, and
   b. Develop and submit a Hybrid Pilot and Full-Scale Verification Plan to the Department for review and comment prior to conducting piloting and full scale verification under this section, R18-9-F835 and other requirements which are previously determined through consultation with the Department, and
   c. For the purposes of the permit application pursuant to R18-9-C816, submit the Hybrid Pilot and Full-Scale Verification Plan and a Hybrid Pilot and Full-Scale Verification Report in lieu of the submission requirements at R18-9-C816(A)(2)(g) and (h).
2. An operator of a pilot facility may be credited with advanced water treatment qualifying experience under R18-9-B804.

B. Pilot Study Plan. A Pilot Study Plan shall be followed when constructing the pilot treatment train and piloting in accordance with this section.

1. A Non-National Pretreatment Program AWPRA applicant shall submit the Pilot Study Plan to the Department for review and comment prior to conducting piloting under this section.

Pre-Publication

2. A National Pretreatment Program AWPRA applicant may submit the Pilot Study Plan to the Department for review and comment prior to conducting piloting under this section, an approach recommended by the Department, or otherwise shall submit the Pilot Study Plan to the Department as a component of the AWP permit application prepared pursuant to R18-9-C816.

3. The Plan shall include, but is not limited to, the following:

   a. The pilot study objectives,

   b. A description of the proposed pilot treatment train,

   c. The design criteria for each treatment component pursuant to R18-9-F832,

   d. A design report and drawing,

   e. An explanation of the pilot train's representation of the scale and the performance of the proposed full-scale AWTF and the selected treatment components therein,

   f. A time period for which the pilot study will be conducted of no less than one year of continuous operation,

   g. A monitoring plan which shall include, but is not limited to, the following:

      i. The proposed monitoring, instrumentation, and any additional requirements pursuant to R18-9-A802(C).

      ii. The proposed chemical critical control points designated pursuant to R18-9-E827(D),

      iii. The proposed pathogen critical control points designated pursuant to R18-9-E828(D), and

      iv. An advanced treated water sampling plan, and

   h. The proposed Tier 3 chemical list and associated critical control points prepared pursuant to R18-9-E827,

   i. The projected chemical treatment list prepared pursuant to R18-9-E826(F), and

   j. A TOC Characterization Plan of all original drinking water sources, pursuant to the Trace Organics Removal Procedure under R18-9-F834(C)(1), if the AWPRA selects the Site-Specific TOC Management Approach.

4. The Initial Source Water Characterization Report prepared pursuant to R18-9-C814(E) shall be submitted as follows:

   a. A Non-National Pretreatment Program AWPRA applicant shall submit the Initial Source Water Characterization Report as a component of the Pilot Study Plan, and

   b. A National Pretreatment Program AWPRA applicant may submit the Initial Source Water Characterization Report as a component of the Pilot Study Plan, or otherwise shall submit the Initial Source Water Characterization Report as a component of the AWP permit application prepared pursuant to R18-9-C816.

5. The pilot treatment train shall be selected from, and optimized in accordance with, the projected chemical treatment list developed pursuant to R18-9-E826(F) and pathogen log reduction values established pursuant to R18-9-E828.

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6. If a Pilot Study Plan includes the discharge of effluent and the facility is subject to the APP program, an APP application for permit coverage shall be submitted and effective before pilot train operation.

C. Piloting.

1. Pathogen and chemical removal shall be demonstrated during the pilot study by conducting sampling in accordance with the established monitoring plan developed in subsection (B)(3)(g).
2. Sampling shall be conducted at a minimum of two locations, the influent and effluent of the pilot treatment train, in accordance with the proposed critical control points.

D. Report. At the conclusion of piloting a Pilot Study Report shall be prepared and submitted to the Department as a component of the AWP permit application pursuant to R18-9-C816. The Pilot Study Report shall include, but is not limited to, the following:

1. A demonstration of the effectiveness, reliability, and consistency of the treatment components in achieving pathogen and chemical removal, as well as TOC management in accordance with the Pilot Study Plan under subsection (B),
2. A list of water reclamation facility operational parameters and ranges that produced the AWTF treated wastewater influent water quality.

E. The Department shall consider an AWPRA applicant's conformance with the pilot study requirements in this Article as a component of the AWP permit application. The Director shall deny an AWP permit application if a determination is made that, under the Pilot Study Plan, piloting was improperly conducted or is otherwise insufficient to achieve the objectives of the pilot study, or if the Pilot Study Report is incomplete or otherwise insufficient to demonstrate compliance with the Pilot Study Plan.

F. In addition to the requirements of this section, the pilot study shall be conducted using good engineering practices. Methods for conducting the pilot study shall be approved if the AWPRA applicant can demonstrate that the methods sufficiently and consistently verify the performance of the chosen treatment components, provide the opportunity to evaluate the effectiveness of different types of treatment components, and inform the design of the full-scale AWP treatment train.

1. ADEQ shall develop and make available guidance on conducting an AWP pilot study.
2. An AWP pilot study conducted in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

R18-9-C816. Permit Application

A. An AWPRA applicant for an AWP permit shall provide the Department with the following information on an application form prescribed by the Director:

1. Application: Administrative Requirements.
   a. The names and mailing addresses of all AWPRA partners,

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b. The names and mailing addresses of the representative of the AWPRA and owners and operators of all AWPRA partner facilities,

c. The legal description, including latitude and longitude, of the location of all AWPRA partner facilities,

d. The expected operational life of the AWPRA partner facilities,

e. The permit number for any other federal or state environmental permit issued to any AWPRA partner for that facility or site,

f. A copy of the AWPRA's Joint Plan and corresponding agreements pursuant to R18-9-B805,

g. A copy of the certificate of disclosure required by A.R.S. § 49-109,

h. Evidence that the AWTF complies with applicable municipal or county zoning ordinances, codes, and regulations,

i. Certification in writing that the information submitted in the application is true and accurate to the best of the AWPRA applicant's knowledge, and

j. All applicable fees established in 18 A.A.C. 14.

2. Application: Technical Requirements.

a. Detailed completed or prospective construction plans of the site, presented in legible form and of sufficient scale and detail to establish construction requirements and to facilitate effective review,

b. Record drawings pursuant to R18-9-B810,

c. Complete specifications to supplement the completed or prospective construction plans in subsection (A)(2)(a), including vendor data demonstrating validation information,

d. A design report which:

i. Describes the completed or prospective construction and the basis of design,

ii. Provides design data and other pertinent information that defines the work, and

iii. Establishes the adequacy of the design to meet the system demand and comply with the requirements of this Article, and

e. A Full-Scale Verification Plan, including data demonstrating scaling feasibility, prepared pursuant to R18-9-F835,

f. A draft Operations Plan prepared pursuant to R18-9-F836,

g. The Pilot Study Plan and Report prepared pursuant to R18-9-C815, if applicable under R18-9-C815(A)(1),

h. The Full-Scale Verification Report prepared pursuant to R18-9-F835, if applicable under R18-9-C835(A)(1),

i. A list of construction material used pursuant to R18-9-B806,

j. A demonstration of technical, managerial, and financial capacity pursuant to R18-9-F833,

k. An initial Enhanced Source Control Plan pursuant to the program developed in R18-9-E824,

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l. The Initial Source Water Characterization Plan and Initial Source Water Characterization Report prepared pursuant to R18-9-C814,

m. A demonstration of compliance with all minimum design requirements pursuant to R18-9-F832,

n. The proposed pathogen and chemical action levels for ongoing monitoring pursuant to R18-9-A802(C),

o. The draft Public Communications Plan pursuant to R18-9-B811,

p. A Tier 2 analysis pursuant to R18-9-E826,

q. A Tier 3 Chemical list, associated critical control points and explanation pursuant to R18-9-E827,

r. Evidence of an APP authorizing any discharge from an AWTF that occurred, occurs or will occur during piloting, full-scale verification, operation or otherwise,

s. Demonstration that the AWPRA meets applicable A.A.C. Title 18, Chapter 4 and Chapter 5 requirements, and

t. Any other relevant information required by the Department to determine whether to issue a permit.

B. Draft Permit. The Department shall provide the AWPRA applicant with a draft of the AWP permit prior to publication of the Notice of Preliminary Decision pursuant to R18-9-D820.

C. Permit Issuance or Denial. The following requirements apply in addition to the requirements in R18-9-D823:

1. The Director shall issue an AWP permit, based upon the information obtained by or made available to the Department, if the Director determines that the AWPRA applicant is in compliance with this Article, and the applicable requirements in Chapter 4, Articles 1 and 2, and Chapter 5, Article 5.
2. The Director shall provide the AWPRA applicant with written notification of the final determination to issue or deny the permit within the overall licensing time-frame requirements under 18 A.A.C. 1, Article 5, Table 10 and the following:
   a. The AWPRA applicant's right to appeal the final permit determination, including the number of days the applicant has to file a protest and the name and telephone number of the Department contact person who can answer questions regarding the appeals process,
   b. If the AWP permit is denied under R18-9-D823, the reason for the denial with reference to the statute or rule on which the denial is based, and
   c. The AWPRA applicant's right to request an informal settlement conference under A.R.S. §§ 41-1092.03(A) and 41-1092.06.

D. The Department shall only approve an AWP permit for an AWPRA applicant when all AWPRA partners are in compliance with this Chapter and applicable Chapter 4 and Chapter 5 requirements, or are making satisfactory progress towards compliance under a schedule previously approved by the Department.

E. Post-Permit Issuance Compliance Schedule.

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1. The technical components listed in subsection (E)(2) below are not required as part of the application in subsections (A) and (B) but are required prior to delivery of advanced treated water or distribution of finished water.
2. The following technical components shall be submitted in the time and manner set forth in a compliance schedule which shall be established by the Department under the AWP permit:
    a. The final design documents including as-built construction and configuration reports of all engineered elements of the facility prepared pursuant to R18-9-B810 and any document changes from what was proposed in the pre-construction application requirements.
    b. An Operations Plan prepared pursuant to R18-9-F836, including, but not limited to, a list of operators who are certified by the Department appropriately for all facilities within an AWP project, including any finished water distribution systems,
    c. The Full-Scale Verification Report prepared pursuant to R18-9-F835,
    d. A vulnerability assessment prepared pursuant to R18-9-F837,
    e. Compliance with approved plans pursuant to R18-9-B809,
    f. The final Public Communications Plan pursuant to R18-9-B811,
    g. The final Enhanced Source Control Plan pursuant to the program developed in R18-9-E824,
    h. An engineer's certificate of completion of the final inspection of the AWTF, signed, dated, and sealed by an Arizona-registered professional engineer in a format approved by the Department, and
    i. Any other relevant information required by the Department.
3. Compliance schedule items under subsection (E)(2) may require a permit amendment.

F. If a compliance schedule is included as part of an AWP permit, delivery of advanced treated water or distribution of finished water is prohibited until all delivery or distribution-critical post-permit compliance schedule items pursuant to subsection (E) are met and any associated permit amendments are in effect.

G. All design plans, specifications, and design reports submitted under this section shall be signed, dated, and sealed by an Arizona-registered professional engineer. The Arizona-registered professional engineer shall demonstrate the following information to the Department for each person principally responsible for designing the facility:

1. Pertinent licenses or certifications held by the person,
2. Professional training relevant to the design of an AWTF, water reclamation facility, or drinking water treatment facility,
3. Work experience relevant to the design of AWTF, water reclamation facilities, or drinking water treatment facilities, and
4. A verification letter from an independent party certifying the performance of a manufacturer's equipment or a product that the professional engineer is relying upon for treatment credits, along with the information required under subsections (G)(1), (2), and (3) of this section, for the independent party certifying the product.

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R18-9-C817. Demonstration Permit

A. An AWPRA may apply for an AWP demonstration permit for the purpose of showcasing the AWTF for public outreach, finished water tasting, and other related non-distribution purposes.

B. Introduction of advanced treated water into a drinking water distribution system for human consumption is prohibited under an AWP demonstration permit.

C. Demonstration Permit Application.

1. An AWPRA applying for an AWP demonstration permit shall comply with all requirements of this Article, and all application requirements pursuant to R18-9-C816, excluding the requirement to demonstrate full-scale verification.
    a. The piloting requirements in R18-9-C815 may be abbreviated at the Director's discretion, but may not be of a period of less than 6 months.
    b. If an applicant reports significant failures at a critical control point during abbreviated piloting, the Director may require other measures.
2. The AWPRA applicant applying for an AWP demonstration permit shall submit a preliminary application containing the information required in subsection (C)(1) to the Department on an application form prescribed by the Director.
3. The Department shall, based on the preliminary application and in consultation with the AWPRA applicant, provide the AWPRA applicant notice of any additional information that is necessary to complete the application.
4. An AWP operator shall operate the demonstration facility if the facility is utilized for the purpose of showcasing the AWTF for public outreach, finished water tasting, and other related non-distribution purposes.

D. All design plans, specifications, and design reports submitted under this section shall be signed, dated, and sealed by an Arizona-registered professional engineer. The Arizona-registered professional engineer shall make the following demonstration to the Department for each person principally responsible for designing the facility:

1. Pertinent licenses or certifications held by the person,
2. Professional training relevant to the design of an AWTF, water reclamation facility, or drinking water treatment facility, and
3. Work experience relevant to the design of AWTF, water reclamation facilities, or drinking water treatment facilities.

E. Demonstration AWTFs shall only be built to pilot or full-scale.

F. Bench scale demonstration AWTFs are prohibited.

G. An operator of an AWP demonstration facility may be credited with advanced water treatment qualifying experience under R18-9-B804.

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H. The public notice and public participation requirements in R18-9-D819 and R18-9-D820 apply to demonstration permits issued under this section.

I. The permit suspension, revocation, denial, and termination requirements in R18-9-D823 apply to demonstration permits issued under this section.

J. The permit term and permit renewal requirements in R18-9-D822 apply to demonstration permits issued under this section.

K. All design plans, specifications, and design reports submitted under this section shall be signed, dated, and sealed by an Arizona-registered professional engineer. The Arizona-registered professional engineer shall demonstrate the following information to the Department for each person principally responsible for designing the facility:

1. Pertinent licenses or certifications held by the person,
2. Professional training relevant to the design of an AWTF, water reclamation facility, or drinking water treatment facility,
3. Work experience relevant to the design of AWTF, water reclamation facilities, or drinking water treatment facilities, and
4. A verification letter from an independent party certifying the performance of a manufacturer's equipment or a product that the professional engineer is relying upon for treatment credits, along with the information required under subsections (K)(1), (2), and (3) of this section, for the independent party certifying the product.

R18-9-C818. Compliance Schedule

A. An AWPRA shall follow the compliance schedule established in the AWP permit.

1. If a compliance schedule provides that an action is required more than one year after the date of permit issuance, the schedule shall establish interim requirements and dates for their achievement.
2. If the time necessary for completion of an interim requirement is more than one year and is not readily divisible into stages for completion, the permit shall contain interim dates for submission of reports on progress toward completion of the interim requirements and shall indicate a projected completion date.
3. An AWPRA shall submit to the Department a compliance schedule item report documenting that the required action was taken within the time period specified in the compliance schedule of the AWP permit.
4. After reviewing the compliance schedule activity, the Director may amend the AWP permit, based on changed circumstances relating to the required action.

B. Distribution of advanced treated water is prohibited until the Department approves all compliance schedule items established under the AWP permit pursuant to R18-9-C816(E).

C. The Department shall consider all of the following factors when setting any additional compliance schedule requirements not prescribed under R18-9-C816(E):

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1. The impact on advanced treated water quality,
2. The impact on drinking water customers,
3. The requirements for permit amendment, and
4. Any other factors determined at the Director's discretion.

PART D. GENERAL PERMIT REQUIREMENTS

R18-9-D819. Public Notice

A. AWP Permits.

1. The Department shall provide the entities specified in subsection (A)(2) with monthly written notification, by regular mail or electronically, upon the occurrence of any of the following:
   a. Receipt of AWP permit or demonstration permit applications;
   b. Preliminary and final determinations by the Director related to issuance or denial of an AWP permit or demonstration permit;
   c. Issuance of significant permit amendments;
   d. A determination made by the Director to revoke a permit; or
   e. Issuance of a permit renewal.
2. Entities.
   a. Each county department of health, environmental service department, or comparable department,
   b. A federal, state, local agency, or council of government, that may be affected by the permit action, and
   c. A person who requested, in writing, notification of the activities described in subsection (A)(1).

B. The Department shall additionally post the information referenced in subsections (A)(1) and (2) on the Department website: www.azdeq.gov.

R18-9-D820. Public Participation

A. Notice of Preliminary Decision.

1. The Department shall publish a notice of preliminary decision regarding the issuance or denial of a significant amendment or a final permit determination related to an AWP project on its website.
   a. Along with the public notice, the Department shall provide a copy of the draft permit along with a fact sheet for the AWP project.

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b. The AWPRA applicant or permittee of the AWP project shall publish the notice of preliminary decision regarding the issuance or denial of a significant amendment or a final permit determination in a mailer sent to all drinking water customers within their service area.

2. The Department shall accept written comments from the public before a significant amendment or a final permit determination is made. Written public comment is limited to the scope of the issuance or denial of a significant amendment or a final permit determination under subsection (A)(1) of this section.

3. The written public comment period begins on the publication date of the notice of preliminary decision and extends for a minimum of 30 days.

B. Public hearing.

1. The Department shall provide, at minimum, a 30-day notice and shall conduct a public hearing to address a notice of preliminary decision regarding a significant amendment or final permit determination if:

a. Significant public interest in a public hearing exists; or

b. Significant issues or information has been brought to the attention of the Department that have not been considered previously in the permitting process.

2. If, after publication of the notice of preliminary decision, the Department determines that a public hearing is necessary, the Department shall schedule a public hearing and publish notice of the public hearing on its website and the AWPRA applicant or permittee of the AWP project shall publish the notice of public hearing in a mailer sent to all drinking water customers within their service area.

3. The Department shall accept written public comment until the close of the hearing record.

C. The Department shall respond in writing to all comments submitted during the public comment period.

D. The Department shall notify an AWPRA applicant or permittee of a significant amendment or final permit determination through regular or electronic mail.

1. Simultaneously, and in the same manner, the Department shall provide a notice of the amendment or determination along with the summary of response to comments to any person who submitted comments or attended a public hearing on the significant amendment or final permit determination.

2. The AWPRA applicant or permittee of the AWP project shall publish the final determination regarding the issuance or denial of a significant amendment or a final permit determination in a mailer sent to all drinking water customers within their service area.

R18-9-D821. Permit Amendments

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A. The Director may amend an AWP permit based upon a request or upon the Director's initiative.

1. A permittee shall submit a request for permit amendment in writing on a form prescribed by the Director with the applicable fee established in A.A.C. Title 18, Chapter 14, explaining the facts and reasons justifying the request.
2. The Department shall process amendment requests following the licensing time-frames established under A.A.C. Title 18, Chapter 1, Article 5, Table 10.
3. An amended permit supersedes the previous permit upon the effective date of the amendment.

B. Significant Amendment.

1. Significant AWP permit amendments may include, but are not limited to:
   a. Changes to the enhanced source control program that will result in a change in the water quality of any unit of operation or the advanced treated water,
   b. Any modification to the facility that will result in a change in the water quality of any unit of operation or the advanced treated water,
   c. Any change to the critical control points,
   d. Reductions to monitoring,
   e. Changes to any approved blending plans,
   f. Significant source water quality changes that will result in a change in the water quality of any unit of operation or the advanced treated water,
   g. The addition or removal of an AWPRA partner from the AWPRA, and
   h. Authorization to deliver advanced treated water or distribute finished water following completion of post-permit compliance schedule items.
2. An AWPRA shall submit, along with the detailed permit amendment request in subsection (A)(1), an explanation of the proposed modifications as well as the safeguards that the AWTF will implement to ensure that the quality of the water served will not be adversely affected by any modification.

C. Minor Amendment. Minor AWP permit amendments may include, but are not limited to:

1. Correcting typographical errors,
2. Changing non-technical administrative information,
3. Correcting minor technical errors, such as locational information and citations of law,
4. Increasing the frequency of monitoring or reporting,
5 Making changes in a recordkeeping retention requirement, and

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6. Changes to the treatment train, monitoring equipment, or any other component that is not a replacement of, or substantially similar to the approved components, but will not result in a change in the advanced treated water.

D. The public notice and public participation requirements in R18-9-D819 and R18-9-D820 apply to a significant amendment. A minor amendment does not require public notice or public participation.

R18-9-D822. Permit Term; Permit Renewal

A. An AWP permit and demonstration permit are valid for five years from the date the permit is issued pursuant to R18-9-C816.

B. An AWPRA authorized under an AWP permit or demonstration permit shall submit an application for renewal on a form prescribed by the Director with the applicable fee established in A.A.C. Title 18, Chapter 14 at least 180 calendar days before the end of the permit term.

1. If an administratively complete application for renewal of an AWP permit or demonstration permit is not received by the Department prior to the end of the permit term, the AWP permit or demonstration permit expires.
2. If an administratively complete application for renewal of an AWP permit or demonstration permit is received by the Department prior to the end of the permit term, the AWP permit or demonstration permit term extends until a renewal determination is made.

C. The AWPRA shall demonstrate the following requirements to the Department in a renewal application submitted on a form prescribed by the Director:

1. Continued compliance throughout the most recent AWP permit term, or otherwise documentation of data related to any excursion from approved advanced treated water quality parameters,
   a. Excursions shall be monitored at all AWP project components including, but not limited to:
      i. The treatment process at the AWTF,
      ii. The treatment process at the WRF,
      iii. The collection system, and
      iv. Any non-domestic discharger regulated under the enhanced source control program, and
   b. If excursions are detected, the AWPRA shall demonstrate evidence of corrective actions taken in response to the excursion and data confirming that those corrective actions did not impact advanced treated water quality.
2. Facility design documents and as-built construction and configuration reports of all engineered elements of the facility which accurately represent the most current facility, pursuant to R18-9-B810, along with documentation of any compliance challenges with the approved facility design within the most recent AWP permit term,

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3. Any proposed modification to an operation, treatment process, treatment configuration, or water quality parameter from the facility design most recently approved under an AWP permit shall result in preparation and submission the applicable, following documents to the Department:
    a. Detailed construction plans of the site and work to be done, presented in legible form and of sufficient scale, to establish construction requirements to facilitate effective review,
    b. Complete specifications to supplement the construction plans in subsection (C)(3)(a), including vendor data demonstrating validation information,
    c. A design plan that describes the proposed construction and basis of design, provides design data and other pertinent information that defines the work to be done, and establishes the adequacy of the design to meet the system demand and the requirements of this Article,
    d. A certificate of completion of a final inspection of the AWTF signed, dated, and sealed by an Arizona-registered professional engineer in a format approved by the Department,
    e. A Pilot Study Plan and report prepared pursuant to R18-9-C815,
    f. A list of construction material used pursuant to R18-9-B806, and
4. An updated Operations Plan, prepared pursuant to R18-9-F836, and revised, as necessary, which includes, but is not limited to:
    a. An updated list of operators who are certified by the Department appropriately for all facilities within an AWP project, including any finished water distribution systems, and
    b. Documentation of any periods of operator absence within the most recent AWP permit term, and
5. An updated vulnerability assessment, prepared pursuant to R18-9-F837, along with documentation of any compliance challenges with the vulnerability mitigation approach previously adopted within the most recent AWP permit term,
6. An updated Public Communications Plan, prepared pursuant to R18-9-B811, along with documentation of any changes to the AWPRA's service area during the most recent AWP permit term that affected plan implementation,
7. An updated Enhanced Source Control Plan, prepared pursuant to the program developed in R18-9-E824, with documentation of any changes to the Plan within the most recent AWP permit term,
8. An updated technical, managerial, and financial demonstration, prepared pursuant to R18-9-F833, with documentation of any changes made to the previously approved demonstration in effect during the most recent AWP permit term,
9. Documentation of source water characterization in compliance with the approach under initial source water characterization pursuant to R18-9-C814, as applicable if changes to the sewershed occur which impact the source water characterization report in effect during the most recent AWP permit term,

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10. A renewed demonstration of compliance with all minimum design requirements pursuant to R18-9-F832, and

11. An updated Monitoring Plan, prepared pursuant to R18-9-E829, including the proposed pathogen and chemical action levels.

R18-9-D823. Permit Suspension, Revocation, Denial, or Termination

A. The Director may, after notice and opportunity for hearing, suspend or revoke an AWP permit or demonstration permit upon a determination of any of the following:

1. The AWPRA failed to comply with any applicable provision of this Title or any permit condition;
2. The AWPRA misrepresented or omitted a fact, information, or data related to an AWP permit application or permit condition;
3. A permitted activity is causing or will cause a violation of the Safe Drinking Water Act or any requirement of this Article at the entry point to a distribution system for delivery to drinking water consumers;
4. A permitted AWP facility is causing or will cause imminent and substantial endangerment to public health or the environment;
5. The AWPRA failed to maintain the financial capability pursuant to R18-9-F833; or
6. The AWPRA failed to construct a facility within five years of permit issuance.

B. The Director may deny an AWP permit or demonstration permit upon a determination that the AWPRA applicant has:

1. Failed or refused to correct a deficiency in the permit application;
2. Failed to demonstrate that the facility and the operation will comply with the requirements of this Article and all applicable requirements in Chapter 4 and Chapter 5 of this Title. The Director shall base this determination on:
   a. The information submitted in the AWP permit application;
   b. Any information submitted to the Department following a public hearing; or
   c. Any relevant information that is developed or acquired by the Department; or
3. Provided false or misleading information.

C. The Director may terminate an AWP permit or AWP demonstration permit if the AWP project covered under the permit:

1. Is in substantial non-compliance with this Article or the Safe Drinking Water Act such that the continued operation of the facility presents a risk to public health or public safety that cannot be sufficiently abated or addressed through other enforcement mechanisms available to the Department under this Article;
2. Is determined to have provided false information to the Department, or certified false or misleading reports;
3. Is abandoned or no longer actively distributing or producing water under an AWP permit or demonstration permit; or
4. At the permit holder's request upon prior notification to the Department.

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PART E. CONSTITUENT CONTROL, MONITORING, AND REPORTING

R18-9-E824. Enhanced Source Control

A. Treated wastewater used to supply an AWP project shall originate from a water reclamation facility that has local authority to implement an enhanced source control program, including authority for oversight, enforcement, and inspection.

B. An AWPRA applicant shall develop, and an AWPRA permittee shall maintain, a locally authorized enhanced source control program which shall:

1. Operate pursuant to specific legal authority enforceable in State or local courts, including the ability to file civil and/or criminal complaints for program violations,
2. Identify, control, or eliminate constituents of concern discharged into the collection systems through the use of constituents of concern control methods including local ordinances and local limits,
3. Include a summary of local limits and other discharge control methods,
4. Include a list of potentially impactful non-domestic dischargers in the service area,
    a. A potentially impactful non-domestic discharger is a source that meets one or more of the following:
        i. The source is subject to the National Pretreatment Program pretreatment standards;
        ii. The source may adversely affect the AWTF operation including pass-through or interference;
        iii. The source has a potential to have serious adverse effects on public health;
        iv. The source has a potential to prevent the AWPRA from achieving requisite treatment standards for any contaminant regulated under this Article;
        v. The source has a potential to cause a violation of a Tier 1 standard; or
        vi. The source has otherwise been designated as potentially impactful by the water reclamation facility.
    b. The potentially impactful non-domestic discharger list shall be:
        i. Utilized to generate a list of impactful non-domestic dischargers, subject to additional control measures, in accordance with subsection (C) of this section,
        ii. Reported to ADEQ every year through the annual report prepared pursuant to R18-9-E831,
        iii. Continuously updated with newly introduced chemicals or new potentially impactful non-domestic dischargers, or as a result of any other event that causes a change within the collection systems impacting the advanced treated water quality,

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iv. Verified through open and ongoing communication, as well as routine site visits with the identified potentially impactful non-domestic discharger. Verification may include inquiry into chemical use, potential discharges, and any potential or planned changes in operation that could impact the advanced treated water quality, and

v. Accompanied by collection system investigations to identify sources of Tier 1 or Tier 2 chemical peaks that have a significant impact on advanced treated water quality. These investigations shall occur at all necessary sewer lines, manholes, force mains, lift stations, and other collection system components.

5. Include a map of the collection system components, which shall be submitted to the Department and shall include locations of the potentially impactful non-domestic discharges in the collection system,

6. Include a list of all water reclamation facilities in the collection system that provide treated wastewater to the AWPRA as a source under the AWP program along with a description or map of their respective boundaries,

7. Include activities that protect the water reclamation facility(s) and AWTF(s) from pass-through or interference from constituents of concern which may include, but are not limited to, the creation of additional local limits or addressing routine monitoring activities,

8. Include a pollutant reduction and elimination plan that addresses both non-domestic and domestic dischargers with the goal of mitigating or eliminating constituents of concern prior to entry into the collection system. The plan shall include, at a minimum, the following:

   a. A determination of whether targeted outreach is necessary. If necessary, targeted outreach shall include the development of targeted outreach programs for non-domestic dischargers determined to be impactful in accordance with subsection (C)(2) of this section,

   b. Education and encouragement of non-domestic dischargers determined to not be impactful in accordance with subsection (C)(2) of this section to participate in pollution prevention programs or environmental stewardship programs that reduce or eliminate the discharge of constituents of concern into the collection system, including the requirement to consider alternatives to constituent of concern usage,

   c. A public outreach program for domestic dischargers, and

   d. Notification and public hearings on the AWP program and significant program developments,

9. Include a septage hauler control program that tracks and monitors loads and includes a load sampling program which shall retain all load sampling results for a minimum of five years,

10. Implement a program to receive early warning for the purpose of attaining advanced notice of an incoming constituents of concern peak. An early warning system shall include, at a minimum, the following:

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a. Online monitoring instrumentation that evaluate data in real time located either in the influent to the water reclamation facility, in the collection system, or at the discharging entity that measures constituents of concern or surrogate parameter(s) and that indicates potential treatment interference, pass-through, or a violation of an AWP action level,

b. A process for notification to the AWPRA of any discharge that can potentially result in the release of contaminants above local limits established pursuant to subsection (B)(3) of this section,

c. Cooperation with local county public health departments, as necessary, to track constituents of concern peaks from disease outbreaks or other impactful health events,

d. A response plan developed pursuant to subsection (B)(12) of this section,

e. A plan for routine calibration of early warning system equipment with the goal of reliable performance,

f. A plan for rapid response and addressing of equipment failure, and

g. Other early warning measures required by the Department, which are necessary to protect the operations of the AWPRA project treatment or prevent contamination of the advanced treated water, based on a review of application components submitted to the Department for review, and on the availability of such measures,

11. Be audited at least every five years by an independent party to assess the effectiveness of the enhanced source control program in controlling the discharge of contaminants,

12. Include a clear and comprehensive response plan to address constituents of concern exceedances. The response plan shall be created in partnership with all relevant AWPRA partners. The plan shall include, at a minimum, the following:

a. A procedure for addressing constituents of concern peaks with the potential to impact advanced treated water quality,

b. An investigation and identification of the exceedance source, or if no source is identified, the initiation of a collection system sampling program,

c. The designation of the leading facility responsible for communication with the AWPRA partners,

d. A procedure for when and how to notify the Department upon a constituent of concern exceedance,

e. A procedure for the bypass and/or shutdown of the AWTF, if necessary,

f. An effective training program ensuring the understanding of the response plan by the responsible personnel,

g. A review of the operation and calibration records for online meters and any relevant analytical methods upon the detection of a constituent of concern exceedance, and

h. Submission of a memorandum of understanding or other contractual agreement between all entities necessary to effectuate the response plan, and

13. Prohibit the discharge of any of the following to the water reclamation facility:

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a. Pollutants which create a fire or explosion hazard, including, but not limited to, waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR Part 261.21,

b. Pollutants which will cause corrosive structural damage including discharges with a pH lower than 5.0, unless the treatment works are designed to accommodate such discharges.

c. Solid or viscous pollutants in amounts which will cause obstruction to the flow resulting in interference,

d. Any pollutant, including oxygen demanding pollutants (biochemical oxygen demand, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause Interference,

e. Heat in amounts which will inhibit biological activity resulting in interference including heat in such quantities that the temperature at the water reclamation facility exceeds 40 °C (104 °F), unless the approval authority, upon request of the water reclamation facility, approves alternate temperature limits,

f. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass-through,

g. Pollutants which result in the presence of toxic gas, vapors, or fumes in a quantity that may cause acute worker health and safety problems, and

h. Any trucked or hauled pollutants, except at discharge points designated by the water reclamation facility, and

14. Include local authority for the AWPRA to take the following actions to determine compliance of a potentially impactful non-domestic discharger with a local ordinance:

a. Receive and analyze all self-monitoring reports and notices submitted by potentially impactful non-domestic dischargers,

b. Randomly sample and analyze effluent from potentially impactful non-domestic dischargers and conduct surveillance and inspection activities needed to identify, independent of any information supplied by such users, occasional or continuing noncompliance with any local limit or requirement, and

c. Investigate instances of noncompliance with any enhanced source control ordinance when notice of any actual or probable noncompliance has been received by the AWPRA, and

15. Report all program elements in this subsection to the Department annually, pursuant to R18-9-E831, and

16. Include any other relevant information required by the Department.

C. Impactful Non-Domestic Dischargers List.

1. From the potentially impactful non-domestic dischargers list developed in subsection (B)(4) of this section, the AWPRA applicant shall develop a list of impactful non-domestic dischargers by conducting a significant impact analysis for each potentially impactful non-domestic discharger that considers, but is not limited to, the following factors:

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a. Average wastewater discharged into the collection system,

b. Dilution of discharge within the collection system,

c. The nature of the discharge and its constituents,

d. The ability of downstream treatment processes to address the discharge, and

e. The effect the discharge will have on treatment processes and advanced treated water.

2. The AWPRA permittee shall subject the identified impactful non-domestic dischargers in the collection system to additional control measures including, but not limited to:

a. Locally established discharge limits,

b. Locally established monitoring, and

c. Targeted outreach.

3. The list shall be reported to ADEQ every year through the annual report prepared pursuant to R18-9-E831.

D. In addition to the requirements of this section, an enhanced source control program shall be developed, conducted, and maintained using good engineering practices. Methods for developing, conducting, and maintaining an enhanced source control program shall be approved if the AWPRA applicant can demonstrate that the methods are sufficiently detailed and robust for the purpose of enhanced source control, pursuant to this Article.

1. ADEQ shall develop and make available guidance on developing, conducting, and maintaining an enhanced source control program.

2. An enhanced source control program developed, conducted, and maintained in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

E. An AWPRA shall form and maintain a source control committee that includes representatives from:

1. Each AWPRA partner that is part of the AWPRA's enhanced source control program, including each AWPRA partner that supplies treated wastewater to the AWP project or that owns and/or operates a water reclamation facility that provides treatment, and

2. Key non-domestic dischargers and others that discharge to the collection system chemicals that may pose a risk to public health.

R18-9-E825. Tier 1 Chemical Control; Maximum Contaminant Levels

For the purposes of this Article, Tier 1 chemicals are the chemical contaminants that have "Primary Drinking Water Standards" under 40 CFR Part 141 as incorporated by reference in R18-4-102, including those with Safe Drinking Water Act-required Maximum Contaminant Levels or Treatment Techniques.

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R18-9-E826. Tier 2 Chemical Control; Advanced Water Purification-Specific Chemicals

A. An AWPRA shall conduct a Tier 2 analysis under this section in order to determine Tier 2 chemicals, propose alert and action levels for Tier 2 chemicals at the AWTF, and to identify the chemical controls necessary to be implemented by the AWPRA in the following manner:

1. An AWPRA applicant shall conduct the analysis as a required technical component of their permit application for an AWP permit or an AWP demonstration permit, pursuant to R18-9-C816 and R18-9-C817, respectively.
2. Once permitted, an AWPRA shall conduct a new Tier 2 analysis under this section:
   a. If the AWPRA is aware of, becomes aware of, or should reasonably be aware of:
      i. The identification of additional potentially impactful non-domestic dischargers pursuant to R18-9-E824(B)(4); or
      ii. Significant volumetric adjustments to an AWPRA water reclamation facility's total daily volume of treated wastewater that are likely to impact the expected concentration of any chemical pursuant to subsection (D) of this section; or
   b. If changes to any component of the permitted AWP project occur that will result in an exceedance of an action level; or
   c. At a minimum, every five years as a component of a permit renewal application pursuant to R18-9-D822.

B. Non-Domestic Dischargers List. The AWPRA applicant shall list all non-domestic dischargers in the collection system that are a direct or indirect source to an AWPRA water reclamation facility.

C. Chemical Inventory List. The AWPRA applicant shall generate a list of chemicals that are used, stored, or discharged by all non-domestic dischargers in the list from subsection (B) above. The AWPRA applicant shall add chemicals used at the water reclamation facility and the AWTF to the chemical inventory list.

D. Tier 2 Analysis. The AWPRA applicant shall conduct the following analysis for each chemical identified in the Chemical Inventory List in subsection (C) above:

1. Calculate the projected daily load for each chemical in the inventory list generated in subsection (C) for each non-domestic discharger in the list generated in subsection (B) as follows: Mass loading of contaminant (lb/day) = Flow (MGD) x Maximum Concentration (mg/L) x 8.34 (for unit conversion);
2. Calculate the projected total daily load of each chemical in the inventory list generated in subsection (C) for all non-domestic dischargers in the list generated in subsection (B), cumulatively, as follows: Total Contaminant Load (lb/day) = ∑ Mass loading (lb/day) for all dischargers;

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3. Calculate the projected daily concentration of each chemical in the chemical inventory list in the treated wastewater by comparing the collection system's projected total daily load from subsection (D)(2) for each chemical in the chemical inventory list against the total influent flow of treated wastewater at the headworks of the proposed AWTF using the following formula:

$$Expected\ concentration\ (mg/L) = \frac{Total\ Contaminant\ Load\ (\frac{lb}{day})}{Total\ Influent\ Flow\ (MGD) \times 8.34}$$

4. For chemicals with one or more of the corresponding health advisory values in subsections (a)(i) through (v) below established in the "2018 Edition of the Drinking Water Standards and Health Advisories Tables":
   a. Compare the projected daily concentration of each applicable chemical calculated in subsection (D)(3) with the lowest health advisory value, from the following available values:
      i. One-day (mg/L)
      ii. Ten-day (mg/L)
      iii. DWEL (mg/L)
      iv. Life-time (mg/L)
      v. mg/L at 10^{-4} Cancer Risk.
   b. If the projected daily concentration exceeds the health advisory value, the chemical shall be a Tier 2 chemical.
5. For chemicals that do not have an established health advisory pursuant to subsection (D)(4) above but do have a drinking water health advisory notification level or equivalent from a state drinking water program that was developed using a method that ADEQ approves and lists under subsection (a), below:
   a. Compare the projected daily concentration of each applicable chemical calculated in subsection (D)(3) with the following corresponding state drinking water health advisory notification level or equivalent:
      i. Trimethylbenzene (1,2,4-) (CAS No. 95-63-6): 0.33 mg/L,
      ii. *Reserved*.
   b. If the projected daily concentration exceeds the health advisory notification level, the chemical shall be a Tier 2 chemical.
6. For chemicals that do not have an established health advisory pursuant to subsection (D)(4) above, nor a notification level in another state's drinking water program pursuant to subsection (D)(5) above:
   a. Compare the projected daily concentration of each applicable chemical calculated in subsection (D)(3) with the corresponding Departmental health advisory value listed below:
      i. Benz[a]anthracene (CAS No. 56-55-3): 0.06 mg/L
      ii. Benzo[b]fluoranthene (CAS No. 205-99-2): 0.06 mg/L

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iii. Benzo[g,h,i]perylene (CAS No. 191-24-2): 0.00001 mg/L

iv. Benzo[k]fluoranthene (CAS No. 205-99-2): 0.005 mg/L

v. Chrysene (CAS No. 218-01-9): 6 mg/L

vi. Dimethyl phthalate (CAS No. 131-11-3): 0.001 mg/L

vii. Indeno[1,2,3,-c,d]pyrene (CAS No. 193-39-5): 0.06 mg/L

viii. Phenanthrene (CAS No. 85-01-8): 0.0002 mg/L.

b. If the projected daily concentration exceeds the Departmental health advisory value, the chemical shall be a Tier 2 chemical for ongoing monitoring purposes pursuant to R18-9-E829, but shall be exempt from all compliance requirements under R18-9-E829(D) and the Projected Chemical Treatment List in subsection (F) below.

7. For chemicals that do not have an established health advisory pursuant to subsection (D)(4) above, nor a notification level in another state's drinking water program pursuant to subsection (D)(5) above, nor a Departmental health advisory value pursuant to subsection (D)(6) above, but do have a Reference Dose (RfD) or Cancer Slope Factor (CSF) in credible peer-reviewed literature or state or Federal databases:

a. Consult with the Department and/or the Project Advisory Committee to determine a health advisory value.

b. Compare the projected daily concentration of each applicable chemical calculated in subsection (D)(3) with the corresponding health advisory determined in subsection (D)(7)(a) above.

c. If the projected daily concentration exceeds the health advisory determined in subsection (D)(7)(a), the chemical shall be a Tier 2 chemical.

8. For chemicals that do not have an established health advisory pursuant to subsection (D)(4) above, nor a notification level in another state's drinking water program pursuant to subsection (D)(5) above, nor a Departmental health advisory value pursuant to subsection (D)(6) above, nor a health advisory determined pursuant to subsection (D)(7) above:

a. An AWPRA applicant shall consult with the Department and/or the Project Advisory Committee to determine the health risk of the chemical through reasonably appropriate bioanalytical studies and/or bioassays.

b. If the health risk in subsection (D)(8)(a) above is determined to be significant, the chemical shall be a Tier 2 chemical.

c. If the bioanalytical studies and/or bioassays conducted in subsection (D)(8)(a) above are indeterminate, the chemical shall be removed through measures adopted by the AWPRA in its enhanced source control program pursuant to R18-9-E824.

9. Action and Alert Levels. An AWPRA applicant shall calculate and submit to the Department an action level and an alert level for each Tier 2 chemical.

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a. The action level for the Tier 2 chemicals established under subsection (D)(4) shall be set at the same value as the lowest applicable health advisory value in the "2018 Edition of the Drinking Water Standards and Health Advisories Tables", below:

i. One-day (mg/L)

ii. Ten-day (mg/L)

iii. DWEL (mg/L)

iv. Life-time (mg/L)

v. mg/L at 10-4 Cancer Risk.

b. The action level for the Tier 2 chemicals established under subsection (D)(5) shall be set at the same value as the corresponding health advisory notification level in subsection (D)(5)(a).

c. The action level for the Tier 2 chemicals established under subsection (D)(7) shall be set at the same value as the corresponding health advisory determined in subsection (D)(7)(a).

d. The action level for the Tier 2 chemicals established under subsection (D)(8) shall be set at a value that is reasonably protective of human health, reasonably utilizing the results of the bioanalytical studies or bioassays.

e. The alert level shall be set reasonably below the action level.

E. Pass-Through or Interference Chemical List. The AWPRA applicant shall analyze the chemical inventory list in subsection (C) in order to identify chemicals that are known to or expected to pass-through or interfere with AWTF treatment processes. The AWPRA applicant shall generate a list to be used in subsection (F).

F. Projected Chemical Treatment List. Based on the Tier 1 MCLs, the Tier 2 chemicals identified in subsection (D)(4), (5), (7) and (8), and the pass-through or interference chemical list generated in subsection (E), the AWPRA applicant shall select an optimized pilot and full-scale AWTF treatment train and compile a list of chemicals that are projected to be treated by the selected treatment train.

1. During the pilot study, pursuant to R18-9-C815, the AWPRA applicant shall demonstrate chemical control of all chemicals on the Projected Chemical Treatment List through treatment at the pilot treatment train.
2. All chemicals that are not able to be controlled through treatment at the pilot or full-scale AWTF shall be controlled through measures adopted by the AWPRA in its enhanced source control program pursuant to R18-9-E824. The selected control measures shall be submitted to the Department along with the Enhanced Source Control Plan pursuant to R18-9-C816 and R18-9-C817.

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G. An AWPRA shall maintain the lists of chemicals identified under subsections (C) and (E) and, if a new Tier 2 analysis conducted under subsection (D) results in a modification to any component of the AWP project, the AWPRA shall request an amendment to their AWP permit pursuant to R18-9-D821.

R18-9-E827. Tier 3 Chemical Control; Performance-Based Indicators

A. An AWPRA applicant shall identify Tier 3 chemicals for the purpose of monitoring the efficacy of reduction by a treatment component at the pilot and full-scale treatment trains or to provide an indication of a process's failure.

B. Tier 3 chemicals are composed of performance-based indicators which the AWPRA applicant shall select based on the requirements of this section.

1. The AWPRA applicant shall monitor each performance-based indicator and demonstrate chemical removal for all selected treatment components in the treatment train.
2. Performance based indicators may be grouped under a surrogate such that the AWPRA applicant may monitor removal of that surrogate in place of performance-based indicators if the following requirements are met:
   a. All performance-based indicators in the group share similar properties such that removal of the surrogate is adequately representative of every performance-based indicator in that group, and
   b. The AWPRA applicant demonstrates that the surrogate is directly correlated to the concentration of a performance-based indicator.

C. Performance based indicators. Each performance-based indicator shall be selected from pre-existing chemicals identified in the treated wastewater either through the Initial Source Water Characterization report pursuant to R18-9-C814(E) or shall otherwise be introduced by the AWPRA applicant.

1. Pre-Existing. Performance based indicators selected from pre-existing chemicals identified in the treated wastewater shall be selected in accordance with, but not limited to, the following criteria:
   a. Concentration. To demonstrate adequate percentage of removal, a performance-based indicator shall have a median concentration at least five times greater than its method reporting limit, measured as the detection ratio.
   b. Prevalence. To adequately reflect treatment efficacy, the performance-based indicator shall have a consistent detection frequency of greater than 80% in the treated wastewater.
   c. Measurability. Measurements demonstrating concentration and prevalence pursuant to subsections (C)(1)(a) and (b) of this section shall be made in accordance with established and appropriate analytical methods that are sufficiently precise and sensitive.

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d. Specificity. The performance-based indicator shall be removable by the targeted treatment process(es) it is intended to monitor and shall meet the prevalence and concentration criteria at the influent of the targeted treatment process pursuant to subsections (C)(1)(a) and (b) of this section.

e. Sensitivity. The performance-based indicator shall be sufficiently sensitive such that the targeted treatment process achieves at least 75% removal when functioning as designed.

f. Diversity. For all performance-based indicators selected from pre-existing chemicals, the AWPRA applicant shall demonstrate the following:

i. Each chemical treatment process is monitored by at least one performance-based indicator, and

ii. The treatment train as a whole is monitored by at least one performance-based indicator which is partially removed by each treatment process, but only removed to at least 75% if all treatment processes are functioning as intended.

2. Introduced. If no pre-existing chemicals are relevant as a performance-based indicator for a specific treatment process, the AWPRA applicant shall introduce a performance-based indicator for the purpose of testing the selected treatment process for requisite chemical removal in compliance with this section. For each introduced performance-based indicator an AWPRA applicant shall:

a. Reasonably demonstrate the selected treatment process performance, and

b. Include an established procedure for introduction into the treatment train.

D. Critical Control Points. For each performance-based indicator, the AWPRA applicant shall designate critical control points where monitoring will occur in the pilot treatment train to indicate individual process performance. The AWPRA applicant may propose critical control points at only the treatment train influent and effluent points if all performance-based indicators are demonstrated to be sufficiently recalcitrant to upstream and downstream processes.

E. An AWPRA applicant shall include an initial Tier 3 chemical list along with proposed critical control points as a component of the Pilot Study Plan prepared pursuant to R18-9-C815.

F. In addition to the requirements of this section, the Tier 3 chemical list compilation and monitoring shall be conducted using good engineering practices. Other methods for generating, designing, and conducting Tier 3 chemicals and monitoring shall be approved if the AWPRA applicant can demonstrate that the alternative methods are sufficiently detailed and robust for the purpose of monitoring the efficacy of reduction by a treatment process at the pilot or full-scale treatment train, or providing an indication of process failure.

1. ADEQ shall develop and make available guidance on Tier 3 chemical list compilation and monitoring.

2. A Tier 3 chemical list compiled and monitored in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

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R18-9-E828. Pathogen Control

A. The AWP project shall be designed and constructed to achieve pathogen reduction by following the prescribed methods to determine log reduction values for enteric viruses, Giardia lamblia cysts, and Cryptosporidium oocysts, also referred to collectively as reference pathogens, as outlined in either subsection (B) or (C) of this section.

B. Standard Log Reduction. An AWPRA applicant choosing the standard log reduction approach shall design the AWP project to achieve the following cumulative validated treatment values from raw wastewater to finished water:

1. 13 log reduction for enteric viruses,
2. 10 log reduction for Giardia lamblia cysts, and
3. 10 log reduction for Cryptosporidium oocysts.

C. Site-Specific Log Reduction. An AWPRA applicant choosing a site-specific log reduction approach shall design the AWP project based on cumulative validated treatment values determined through reference pathogen monitoring pursuant to R18-9-C814(C)(3)(c) and the following:

1. Site-specific pathogen monitoring for the reference pathogens shall be conducted over a period of at least 24 months and shall include, at a minimum:
   a. One month of initial composite sampling consistent with the following requirements:
      i. One sample taken daily, and
      ii. The samples obtained in subsection (C)(1)(a)(i) shall be used, at the end of the first month, to identify the day of the week that yields the highest pathogen density.
   b. At least 23 months of pathogen monitoring consistent with the following requirements:
      i. One sample taken per month at the same day of the week throughout the sampling period as established in subsection (C)(1)(a), and
      ii. The sample obtained in subsection (C)(1)(b)(i) shall be taken consistently during the same week each month.
2. Any missed sample collected under subsections (C)(1)(a) or (b) of this section shall result in an extension of the sampling period by another week or month as appropriate pursuant to R18-9-A802(C), and cannot be replaced with a sample from a different day,
3. Sampling shall occur at a location in the water reclamation facility treatment train before the first disinfection treatment process and before treated wastewater transference to the AWTF,
4. Sample results below method reporting limit shall be reported at the method reporting limit of the analytical instrument for characterization calculations and be flagged as such,

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5. Non-detects from laboratory analysis must be demonstrated with a large sample volume analysis,

6. An AWPRA applicant shall have a cumulative validated treatment of not less than 8 log for enteric viruses, 6 log for Giardia lamblia cysts, and 5.5 log for Cryptosporidium oocysts even if non-detects are demonstrated by the sampling program,

7. The highest sample concentration for each reference pathogen shall be used to calculate the required log removal targets,

8. Norovirus shall be used as the representative enteric virus for baseline virus enumeration.

   a. The AWPRA applicant shall utilize either qPCR or culture methods for analysis,

   b. All corresponding recovery-corrected data shall be documented for review, and

   c. The results shall be documented for review with accompanying quality assurance and quality control, and

9. Laboratory analysis of samples collected pursuant to this section shall follow EPA qPCR or Culture Methods 1623.1, "Cryptosporidium and Giardia in Water by Filtration/IMS/FA" and 1615 "Measurement of Enterovirus and Norovirus Occurrence in Water by Culture and RT-qPCR" for Giardia lamblia cysts, Cryptosporidium oocysts and Norovirus. In addition, laboratories using these methods are required to follow general requirements and recommendations for quality assurance and quality control procedures in Section 9020, "Quality Assurance/Quality Control" of the Standard Methods For The Examination of Water and Wastewater, 24th Edition.

D. Critical Control Points. For each reference pathogen, the AWPRA applicant shall designate critical control points where monitoring will occur in the pilot plant and the full-scale plant in order to assess individual process performance.

1. Critical control point designation shall be accompanied by a comprehensive plan for monitoring and reporting, including, but not limited to, the following elements:

   a. Type of monitoring (i.e. online monitoring, continuous monitoring, grab samples, etc.),

   b. Frequency of monitoring (i.e. 15-minute, hourly, daily, weekly, etc.),

   c. Instantaneous flow rate and flow totalizing capability for the purpose of calculating residence times and responses,

   d. Demonstrated operational parameters confirming the treatment barriers are intact such as to ensure the process is meeting the water quality parameters and pathogen removal goals, and

   e. A list of the identified action levels and alert limits, accompanied by the corresponding responses for all critical control points, pursuant to R18-9-F836.

2. Critical control point monitoring shall occur at all validated treatment process locations.

3. The AWPRA applicant shall document the critical control point methods and the following elements as components of the Operations Plan prepared pursuant to R18-9-F836:

   a. All delay times from the pathogen sampling time, instrument analysis time, operator response time, as well as anticipated time to respond to a failure, and

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b. Automated shutdown procedures based on pathogen critical control point failure, along with a description of shutdown sequences, procedures, and timing.

E. In addition to the requirements of this section, the pathogen monitoring shall be designed and conducted using good engineering practices. Methods for designing and conducting pathogen monitoring shall be approved if the AWPRA applicant can demonstrate they are sufficiently detailed and robust for the purpose of characterizing pathogens in a treated wastewater source.

1. ADEQ shall develop and make available guidance on designing and conducting pathogen monitoring.
2. Pathogen monitoring designed and conducted in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

R18-9-E829. Ongoing Monitoring Requirements

A. The AWPRA shall perform ongoing monitoring in compliance with the requirements of this section, and shall:

1. Assure compliance with both pathogen control log reduction targets and chemical control limits for Tier 1, Tier 2, and Tier 3 at the AWTF treated wastewater influent and the advanced treated water effluent,
2. Assure continued process performance at critical control points,
3. Perform sampling on the advanced treated water prior to delivery pursuant to this section, and
4. Perform additional sampling as necessary on the finished water prior to distribution pursuant to the requirements of the Safe Drinking Water Act.

B. Pathogen Control Monitoring. An AWPRA shall monitor in a manner proposed by the AWPRA and approved by the Director pursuant to R18-9-E828(D).

C. Tier 1 Chemical Control Monitoring.

1. The AWPRA shall monitor for all Tier 1 chemicals at a quarterly interval, except for Nitrite and Nitrate as Nitrogen and TOC, which shall be monitored pursuant to subsection (F) and R18-9-F834, respectively.
2. The AWPRA shall conduct Tier 1 monitoring at two locations relative to the AWTF:
   a. The treated wastewater, and
   b. The advanced treated water.
3. Violations of Tier 1 chemicals, except for TOC and Nitrogen, are the corresponding Safe Drinking Water Act-MCL values in the advanced treated water.
4. Nothing in this section exempts the AWPRA from applicable Safe Drinking Water Act monitoring requirements.

D. Tier 2 Chemical Control Monitoring.

1. The AWPRA shall monitor for all Tier 2 chemicals monthly.

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2. The AWPRA shall conduct Tier 2 monitoring at two locations relative to the AWTF:
   a. The treated wastewater, and
   b. The advanced treated water.
3. Compliance monitoring for Tier 2 chemicals occurs at the advanced treated water.
4. If a monitoring result for a Tier 2 chemical indicates an exceedance of an action level, the AWPRA shall collect a confirmation sample within 24 hours of the exceedance.
5. A Tier 2 action level is violated when the average of the initial sample and the confirmation sample exceeds the action level. Upon a violation, an AWPRA shall notify the Department and conduct any required response procedures pursuant to reporting under R18-9-E830, the Operations Plan under R18-9-F836 and subsections (D)(6) - (D)(9) of this section.
6. Basic Response Procedure. Upon a violation as described in subsection (D)(5), and with the goal of reducing the concentration of the exceeded chemical to a level below the action level, the AWPRA shall:
   a. Increase the monitoring frequency of the chemical to weekly, and
   b. Initiate an investigation of the source of the chemical, the cause of the elevated result, and the efficacy of the treatment process(es).
7. An AWPRA shall conduct the corresponding advanced response procedure in subsection (D)(8) of this section if either of the following two results occur:
   a. A Tier 2 chemical with a non-cancer toxicological endpoint has a violation value of 10 times the action level; or
   b. A Tier 2 chemical considered to pose a cancer risk (corresponding to a lifetime cancer risk of $1x10^{-4}$) has a violation value of 100 times the action level.
8. Advanced Response Procedure.
   a. Under subsection (D)(7)(a) of this section, an AWPRA shall:
      i. Notify ADEQ within 24 hours of the notification of the result, and
      ii. Report the detection in the applicable public water system's annual consumer confidence report.
   b. Under subsection (D)(7)(b) of this section, an AWPRA shall:
      i. Cease delivery of advanced treated water immediately,
      ii. Notify ADEQ within 24 hours of the notification of the result,
      iii. Provide public notification if advanced treated water with those exceedances was distributed (if diverted, public notice is not required),
      iv. Report the result in the applicable public water system's annual consumer confidence report,

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v. Upon returning the advanced treated water to distribution, utilize treatment or blending to meet the chemical's action level, and

vi. Propose corrective actions, such as rectifying changes to the treatment and operations of the AWTF, or installing new control measures for the treated wastewater source.

9. Reduced Monitoring Frequency Criteria. ADEQ may allow a decrease in the Tier 2 sampling frequency from monthly to quarterly, based on a review of the most recent two years of monthly analytical results showing that a chemical has not been detected.

a. The monitoring frequency may be decreased from quarterly to annually following ADEQ approval, based on a review of the most recent three years of quarterly analytical results showing the chemical has not been detected.

b. The monitoring frequency may be reverted to prior intervals at the Department's discretion.

E. Tier 3 Chemical Control Monitoring. The AWPRA shall monitor for all Tier 3 chemicals at the designated critical control points in the manner and timeframes proposed by AWPRA and approved by the Director pursuant to R18-9-E827 and R18-9-F836.

F. Ammonia and Nitrite and Nitrate as Nitrogen.

1. The AWPRA shall monitor for Ammonia and Nitrite and Nitrate as Nitrogen using continuous online analyzers.

2. The AWPRA shall conduct Ammonia, Nitrite and Nitrate monitoring at two locations relative to the AWTF:

a. The treated wastewater influent, and

b. The advanced treated water effluent.

3. The AWPRA shall demonstrate that all Ammonia has been removed at the advanced treated water effluent.

4. The AWPRA shall operate the facility in such a manner that:

a. Nitrite measured as nitrogen does not exceed 1 mg/L at the advanced treated water location daily on an absolute basis, and

b. Nitrate measured as nitrogen does not exceed 10 mg/L at the advanced treated water location daily on an absolute basis.

5. Any exceedance of 1 mg/L of nitrite and 10 mg/L of nitrate on an absolute basis, measured as Nitrogen daily, requires a public notification pursuant to A.A.C. R18-4-119.

G. Total Organic Carbon Monitoring. The AWPRA shall follow all TOC monitoring requirements established pursuant to R18-9-F834.

H. Water Reclamation Facility Operational Parameters.

1. The AWPRA applicant shall provide a list of water reclamation facility operational parameters and ranges that produced the AWTF treated wastewater influent water quality as components of:

a. The Pilot Study Plan pursuant to R18-9-C815, and

b. The AWP permit application pursuant to R18-9-C816.

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2. At the water reclamation facility, the AWPRA shall monitor for the parameters identified in subsection (F) of this section and process control parameters.

3. Any significant change in the operational parameters or their ranges must be approved through a permit amendment pursuant to R18-9-D821. For the purposes of this subsection, "significant change" means any operational change that will result in a change to the treated wastewater.

I. In addition to the requirements of this section, ongoing monitoring shall be developed, proposed and conducted using best practices, proper sampling procedures, and reliable equipment. Similar monitoring program components shall be approved if the AWPRA can demonstrate that the method is sufficiently detailed and robust for the purpose of AWP ongoing monitoring pursuant to this Article.

1. ADEQ shall develop and make available guidance on AWP ongoing monitoring.

2. AWP ongoing monitoring conducted in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using best practices.

R18-9-E830. Reporting Requirements

A. An AWPRA shall conduct reporting pursuant to the applicable general reporting requirements throughout this Article and the specific reporting requirements in this section. The AWPRA shall submit reports to the Department, on a form prescribed by the Director and pursuant to relevant specifications in the permit, through an AWP online portal on the Department's website.

B. Pathogen Reporting.

1. An AWPRA shall report ongoing pathogen monitoring results monthly.

2. An ongoing pathogen monitoring report shall include, but is not limited to, the following:

a. A summary of the overall treatment train pathogen log reduction value performance,

b. A summary of the individual treatment process performance monitoring data,

c. The date, duration, and cause of each occurrence of log reduction value performance below the selected reference pathogen approach log reduction values in either R18-9-E828(B) or (C),

d. A summary of excursions of operational parameters outside the Department approved operating envelope,

e. Submission of calibration records for instruments that monitor pathogen critical control points quarterly,

f. Dates and descriptions of major equipment and process failures and corrective actions, along with data confirming that the corrective actions did not impact the approved product water quality,

g. A summary of any water quality complaints and reports of gastrointestinal illness received from customers,

h. A summary of activities of the wastewater source control program to control pathogens, and

i. Investigation or incident reports regarding cross-connection.

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3. An AWPRA shall report other applicable pathogen monitoring requirements in the time and manner set forth in the AWP permit and R18-9-E828.

C. Tier 1 Reporting.

1. An AWPRA shall report ongoing Tier 1 chemical monitoring results quarterly.
2. An ongoing Tier 1 Chemical report shall include, but is not limited to, the following:
   a. A summary of the overall treatment train chemical control performance,
   b. A summary of chemicals detected as a result of monitoring conducted pursuant to R18-9-E829,
   c. Investigation or incident reports regarding cross-connection,
   d. A summary of activities of the wastewater source control program to control chemicals,
   e. Dates and descriptions of any major equipment and process failures and corrective actions, along with data confirming that the corrective actions did not impact the approved product water quality, and
   f. A summary of individual treatment process performance monitoring data.
3. An AWPRA shall report other applicable Tier 1 chemical monitoring requirements in the time and manner set forth in the AWP permit and R18-9-E829.
4. Nothing in this section exempts the AWPRA from applicable Safe Drinking Water Act reporting requirements.

D. Tier 2 Reporting.

1. An AWPRA shall report Tier 2 chemical monitoring results monthly.
2. An ongoing Tier 2 chemical report shall include, but is not limited to, the following:
   a. A summary of overall treatment train chemical control performance,
   b. A summary of chemicals detected as a result of monitoring conducted pursuant to R18-9-E829,
   c. Investigation or incident reports regarding cross-connection,
   d. A summary of enhanced source control activities,
   e. Dates and descriptions of major equipment and process failures and corrective actions, along with data confirming that the corrective actions did not impact the approved product water quality, and
   f. A summary of individual treatment process performance monitoring data.
3. An AWPRA shall report other applicable Tier 2 chemical monitoring requirements in the time and manner set forth in the AWP permit and R18-9-E826.

E. Tier 3 Reporting. An AWPRA shall report Tier 3 chemical monitoring results in the time and manner set forth in the AWP permit and R18-9-E827.

F. Ammonia and Nitrite and Nitrate as Nitrogen Reporting.

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1. An AWPRA shall report Ammonia and Nitrite and Nitrate as Nitrogen chemical monitoring results quarterly.
2. An ongoing Ammonia and Nitrite and Nitrate as Nitrogen report shall include, but is not limited to, the following:
    a. A summary of overall treatment train nitrogen species control performance,
    b. A summary of nitrogen species detected as a result of monitoring conducted pursuant to R18-9-E829,
    c. Investigation or incident reports regarding cross-connection,
    d. Dates and descriptions of major equipment and process failures and corrective actions, along with data confirming that the corrective actions did not impact the approved product water quality, and
    e. A summary of individual treatment process performance monitoring data.

G. TOC Reporting. An AWPRA shall report TOC monitoring results quarterly in accordance with the selected TOC management approach pursuant to R18-9-F834.

H. Water Reclamation Facility Operational Parameters Reporting. An AWPRA shall report the water reclamation facility operational parameter monitoring results monthly pursuant to R18-9-F832.

R18-9-E831. Annual Report

A. An AWPRA shall submit an annual report to the Department, postmarked no later than March 30th.

B. The report shall include the following information from the previous calendar year:

1. A summary of the compliance status of the AWP permit and/or demonstration permit including:
    a. A list of violation(s),
    b. Any off-spec water diversions, shutdowns, or corrective action(s) taken along with data confirming that the corrective actions did not impact the approved product water quality,
    c. Required sampling and monitoring activities at critical control points, and
    d. All other related AWP permit or regulation compliance items.
2. Any expected change(s) in quantity and quality of the treated wastewater,
3. A summary of any operational or technical challenges in meeting advanced treated water quality standards,
4. Any expected treatment changes and the impact on subsequent unit processes in the treatment train and the advanced treated water,
5. A verification of all required maintenance performed at each critical control point and any other process equipment, including evidence of instrumentation calibration,
6. Enhanced source control components, pursuant to R18-9-E824, including:
    a. A summary of all sampling activities conducted at the AWPRA facilities,

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b. A summary of any event resulting in upset, interference, or pass-through at any AWPRA facility,

c. A report documenting a review of established local limits along with any subsequent updates or changes by the AWPRA,

d. An update of the potentially impactful non-domestic discharger list and the impactful non-domestic discharger lists,

e. A description of any challenges under the enhanced source control program, and any proposed program changes,

f. A list of impactful non-domestic dischargers in non-compliance and any corrective actions taken, along with data confirming that the corrective actions did not impact the approved product water quality,

g. All outreach activities conducted,

h. All completed staff training related to enhanced source control, the National Pretreatment Program, or operation or maintenance of an AWPRA facility,

i. A list of any corrective or enforcement actions taken by the AWPRA against an AWPRA partner, and

j. A list of events identified through the early warning system and the actions taken to mitigate those events, and

7. The AWTF's TOC management annual approach. This includes, if applicable, the results of the annual site-specific TOC approach, including the lower value of the two site-specific procedures, and the reestablished alert and action levels pursuant to R18-9-F834, and

8. Any other information necessary to assist the Department in assessing challenges to program implementation.

PART F. TECHNICAL AND OPERATIONAL REQUIREMENTS

R18-9-F832. Minimum Design Requirements

A. An AWPRA shall meet the minimum design criteria in this section in designing and constructing a pilot treatment train and a full-scale treatment train under an AWP project.

B. Pathogen Control.

1. Under an AWP project, treated wastewater shall receive continuous pathogen treatment prior to delivery or distribution.
2. Pathogen log reduction credits will only be assigned for treatment barriers.
3. A treatment train shall contain at least one validated filtration treatment process and one validated disinfection treatment process targeting each of the three reference pathogens.
4. Each treatment process shall be credited with a minimum validated pathogen log reduction of 0.5 log reduction value.
5. Each treatment process shall not be credited with more than 6 validated pathogen log reduction credits.
6. Each treatment process may receive pathogen log reduction credits for one or more pathogens.

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7. The treatment train, cumulatively, shall meet or exceed either the standard or site-specific log reduction targets for each reference pathogen pursuant to R18-9-E828.

8. An AWPRA shall maintain a pathogen monitoring strategy, which includes approved performance monitoring for surrogates, in order to receive log reduction values for a treatment process.

9. Each treatment process used to meet the requirements in this section shall have the pathogen log reduction values validated for each reference pathogen.

    a. An AWPRA may use a validation study or a previously-approved validation study report, in accordance with the protocol elements in subsection (B)(10) of this section.

    b. A validation study protocol shall be prepared by a licensed Arizona engineer with experience in drinking water or wastewater treatment, specifically in evaluating pathogen control in public water supplies.

10. The validation study protocol shall:

    a. Identify the treatment mechanism(s) of pathogen reduction by each treatment process,

    b. Identify the pathogen(s) being addressed by the treatment process, or appropriate surrogate(s) for the pathogen(s), that are used in the validation study, which shall be the one(s) most resistant to the treatment mechanism(s),

    c. Ensure that the pathogen(s) or surrogate(s) for the pathogen(s) are present in the test water in concentrations sufficient to demonstrate a pathogen log reduction,

    d. Identify the factors that influence the pathogen reduction efficiency for the treatment mechanism(s) and includes at least:

        i. Feed water characteristics such as temperature and pH,

        ii. Hydraulic loading,

        iii. Deterioration of components, and

        iv. Integrity failure, and

    e. Identify the surrogate and/or operational parameters that can be measured continuously and that will correlate with the reduction of the pathogen(s) or surrogate(s) for the pathogen(s),

    f. Identify the validation methodology to demonstrate the pathogen log removal capability of the treatment process, which shall involve a challenge test to quantify the reduction of the target pathogen or appropriate surrogate while concurrently monitoring the operational parameters to determine an operating envelope,

    g. Describe the method to collect and analyze data to formulate evidence-based conclusions,

    h. Describe the method to determine the alert and action levels and the operational monitoring and control strategy,

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i. Describe the method to be used to calculate the log reduction value for the treatment process for each pathogen such that the validated log reduction value shall not exceed that achieved by 95 percent of the challenge test results when the treatment process is operating in compliance with the alert and action levels, and

j. Identify the circumstances that would require a re-validation or additional on-site validation.

11. The treatment train shall be continuously operated to achieve the log reduction value targets using validated treatment log reduction values and must conform to the Operations Plan pursuant to R18-9-F836.

12. The treatment train shall include UV disinfection with a dose of at least 300 mJ per cm2.

13. The SCADA system shall identify process failure to meet the alert and action levels and shall automatically discontinue the delivery of water to any distribution system if the treatment train does not meet the minimum design log reduction value target.

14. Treatment processes that are credited with pathogen log reductions must be continuously tracked with a SCADA system utilizing online monitoring for surrogates and/or operational parameters.

15. The treatment train shall be operated continuously in accordance with the Operations Plan pursuant to R18-9-F836 to achieve either the standard or site-specific pathogen reduction approaches pursuant to R18-9-E828.

16. Blending is not eligible to receive pathogen log reduction credit, nor validated treatment log reduction values.

C. Chemical Control.

1. Under an AWP project, treated wastewater shall receive continuous chemical treatment prior to delivery or distribution.

2. All treatment trains shall have at least three diverse and separate treatment processes, including, but not limited to:

a. An AOP that meets the requirements set forth in subsection (D)(4) of this section, and

b. A physical separation process.

3. Ozone/BAC processes shall be designed to provide no less than 1.0 log reduction of each of the following indicators: formaldehyde, acetone, carbamazepine, and sulfamethoxazole.

a. The ozonation process shall be designed to provide a ratio of the applied ozone dose to the design feed water TOC concentration greater than 1.0. Alternative design ratios may be used if reduction of 1.0 log for the indicators carbamazepine, and sulfamethoxazole is demonstrated during the pilot as part of the design of the ozonation process.

b. BAC shall be designed with an empty bed contact time of at least 15 minutes. Alternative times may be used if reduction of 1.0 log for the indicators formaldehyde and acetone is demonstrated during pilot scale as part of the design of the ozonation process.

c. Both Ozone and the BAC processes must be individually validated at full-scale with the same level of removal for the four indicators listed in this subsection.

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d. At full-scale, the ozone/BAC process shall continually be monitored and recorded using surrogate and/or operational parameters with alert and action levels as approved under the Operations Plan, pursuant to R18-9-F836.

4. Each reverse osmosis membrane selected shall meet the criteria set forth in ASTM International, Designation D4194-23, "Standard Test Methods for Operating Characteristics of Reverse Osmosis and Nanofiltration Devices",

a. For a reverse osmosis treatment process, an AWPRA shall propose the following elements in a plan submitted to the Department for approval in the permit application pursuant to R18-9-C816(A)(2)(d):

i. Ongoing performance monitoring using at least one surrogate and/or operational parameter that is capable of being monitored and recorded continuously, and

ii. Alarms indicating when the integrity of the reverse osmosis membrane has been compromised.

b. The proposal shall identify:

i. The chemical control point,

ii. The surrogate(s) and/or operational parameter(s), and

iii. The alert and action levels for the surrogate(s) and/or operational parameter(s) that indicate when the integrity has been compromised.

5. During full-scale operation of a reverse osmosis treatment process, the AWPRA shall:

a. Continuously monitor and record the surrogate and/or operational parameter(s) that indicate when the integrity of the process has been compromised, and

b. Record when the alert and action levels established are exceeded pursuant to R18-9-F836.

D. Other Requirements.

1. TOC Removal. An AWPRA shall select, achieve, and maintain an up-to-date TOC limit in the advanced treated water, along with the associated alert and action levels, pursuant to R18-9-F834(B) or (C).

2. Corrosion Control. An AWPRA shall establish corrosion control provisions in the design and operation of the AWTF in accordance with, but not limited to, the following requirements:

a. Within six months of the introduction of advanced treated water as a new water source, or following any treatment changes at the AWTF affecting advanced treated water quality, an AWPRA shall control lead and copper pursuant to the requirements of A.A.C. R18-4-111,

b. An AWPRA shall evaluate any anticipated corrosivity effects through corrosivity tests or evaluations which shall include, but are not limited to:

i. Developing an understanding of factors affecting internal corrosion,

ii. Determining the extent and magnitude of corrosion,

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iii. Assessing corrosion control alternatives,

iv. Selecting a corrosion control strategy,

v. Implementing a corrosion control program,

vi. Monitoring the effectiveness of the corrosion control program, and

vii. Optimizing the control program, if necessary, and

c. The Department may require an AWPRA to conduct additional corrosivity-related water quality monitoring.

d. In addition to the requirements of this section, corrosion control shall be conducted using good engineering practices. Methods for corrosion control shall be approved if the AWPRA can demonstrate that the measures meet or exceed the criteria in this subsection.

i. ADEQ shall develop and make available guidance on conducting corrosion control.

ii. Corrosion control conducted in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

3. Nitrogen Management. An AWPRA shall choose one of the following three denitrification approaches:

a. Water Reclamation Facility Approach. An AWPRA applicant reliably denitrifying at the water reclamation facility(s) shall include at least two critical control points to monitor ammonia, nitrate and nitrite:

i. A critical control point at a designated, off-spec diversion point which is monitored using continuous online analyzers, and

ii. A critical control point for monitoring the advanced treated water in order to verify compliance with the Nitrite and Nitrate as Nitrogen Tier 1 MCL pursuant to R18-9-E829.

b. AWTF Approach. An AWPRA applicant removing nitrogen species at the AWTF shall demonstrate nitrogen removal to the Nitrite and Nitrate as Nitrogen Tier 1 MCL pursuant to R18-9-E829 through an AWTF treatment process configuration, and shall include multiple critical control points:

i. A critical control point for monitoring ammonia, nitrite, and nitrate at the treated wastewater influent in order to assess the ongoing treatability within the treatment train,

ii. A critical control point located at each treatment barrier in the design responsible for the removal of ammonia (if applicable), nitrite, and nitrate, and

iii. A critical control point for monitoring the advanced treated water in order to verify compliance with the Nitrite and Nitrate as Nitrogen Tier 1 MCL pursuant to R18-9-E829.

c. Alternative Approach. An AWPRA applicant shall demonstrate a design approach that effectively and reliably removes nitrogen species for the purposes of treatment train viability and water quality compliance with applicable MCLs.

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4. AOP Treatment Process. An AWPRA applicant shall include an AOP treatment process in their pilot and full-scale treatment trains. Demonstration of AOP performance shall be achieved through one of the following two methods:
   a. 1,4-Dioxane Indicator. AOP shall be validated to demonstrate that AOP can reliably achieve no less than 0.5 log reduction of the 1,4-dioxane indicator. If 1,4-dioxane is used as the AOP performance benchmark, it shall be monitored as a Tier 3 performance based indicator with an associated action level pursuant to R18-9-E827; or
   b. Alternative Compound Indicator. An AWPRA applicant may propose an alternative compound to 1,4-dioxane for AOP performance if the following criteria are met:
      i. Alternative indicators shall demonstrate resistance to elimination through other treatment methods, including biological degradation, adsorption processes, Reverse Osmosis/Nanofiltration, and conventional oxidation techniques such as hypochlorite, chloramines, permanganate, or chlorine dioxide (e.g., 1,4-Dioxane),
      ii. Each pilot study should involve spiking and measuring indicator compound removal. Spiking 1,4-Dioxane (i.e., reference compound) and calculating removal percentages to compare with other widely accepted compounds,
      iii. In pilot testing, the final concentration of any indicator compound (post-AOP treatment) should exceed the minimum reporting limit,
      iv. Operating conditions and critical monitoring parameter ranges from pilot testing shall be reported for Departmental verification and setting of monitoring parameter ranges,
      v. An AWPRA applicant must identify AWTF-specific AOP challenges, such as the scavenging of hydroxyl radicals by carbonates, bicarbonates, nitrites, nitrate, bromides, Natural Organic Matter (NOM), pH and UV light absorption,
      vi. If comprehensive pilot testing is not conducted (e.g., shorter timelines or limited scope), an AOP treatment process shall be demonstrated to achieve at least 0.5 log removal of 1,4-dioxane,
      vii. Any process sequence proposed must be validated with a rigorous study, and
      viii. Correlation with other trace organics that were considered in the study, “Considerations for Direct Potable Reuse Downstream of the Groundwater Recharge Advanced Water Treatment Facility”, along with a demonstration of an equivalent removal value for each of the trace organics.
5. AOP Validation Study Report. An AWPRA shall compile an AOP Validation Study Report which identifies:
   a. The critical control points and/or surrogate(s) and/or operational parameter(s), and
   b. Alert and action levels for the surrogate(s) and/or operational parameter(s) that indicate whether the minimum 0.5 log 1,4-dioxane reduction design criterion is being met.
6. At least one surrogate and/or operational parameter shall be capable of being monitored and recorded continuously and have associated alarms that indicate when the AOP is not operating as designed.

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7. Failure Response Time. An AWPRA applicant must provide detailed design calculations identifying failure response time and specific means used to address failure response time.
    a. Factors include, but are not limited to:
        i. Level and redundancy of online instrumentation,
        ii. Sophistication and speed of automated alarm responses, and
        iii. Availability of operators and their response time.
    b. Mitigation measures include, but are not limited to, engineered storage buffers which, when used, must be sized adequately to hold off-spec water for a time period no shorter than the failure response time.
    c. If an AWPRA applicant proposes a treatment train configuration that is not followed by an engineered storage buffer, the following is required:
        i. Appropriate process control for water quality assurance,
        ii. Managerial control for demand is present,
        iii. An operational barrier for pathogen control and chemical peaks attenuation.
    d. If an engineered storage buffer is proposed, an AWPRA applicant shall justify the volume selected and account for short circuiting.
8. A treatment process configuration shall be designed to meet the Tier 1 limits utilizing, as a source, either:
    a. The Tier 1 chemicals and concentrations pursuant to R18-9-C814(C)(2); or
    b. The treated wastewater.
9. Cross-Connection. An AWPRA applicant shall develop, and the AWPRA permittee shall implement, cross-connection control measures which include, but are not limited to:
    a. Cross-connection evaluations during design, construction, and operation of the AWTF,
    b. Cross-connection control surveys, initially within one year of commencing full-scale operation, and ongoing annually thereafter,
    c. Reporting of any cross-connection incidents identified during the cross-connection control surveys to the Department in the manner prescribed by the AWP permit, along with a detailed summary of the nature and cause of the problem, the resulting corrective actions taken, and data confirming that those corrective actions will not impact advanced treated water, and
    d. A plan describing how the SCADA system communicates and interoperates with the SCADA systems of all AWPRA facilities in the AWP project.

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10. Method Detection Limit. When there is no reliable analytical method that is technically feasible to measure a contaminant at an established health advisory concentration pursuant to R18-9-E826(D), the health advisory value shall be set at the lowest Method Detection Limit of the corresponding and most sensitive EPA-approved method.

E. An AWPRA shall meet the following minimum design criteria in designing and operating a full-scale water reclamation facility that delivers treated wastewater to an AWTF:

1. An AWPRA water reclamation facility shall have secondary treatment that utilizes oxidation processes that remove biodegradable organic matter and suspended solids,
2. An AWPRA water reclamation facility shall meet discharge limit requirements for:
   a. Biological Oxygen Demand (BOD),
   b. Total Suspended Solids (TSS), and
   c. pH pursuant to subsection (B)(1) of R18-9-B204, and
3. An AWPRA water reclamation facility shall meet a minimum solids retention time (SRT) of 15 days. A reduction in SRT may be requested and approved by the Department if wastewater characterization demonstrates that over all seasons (represented by 12 monthly values) the proposed SRT is consistent with nitrogen reduction and COCs.
4. An AWPRA water reclamation facility shall meet the requirements for Total Nitrogen (TN) in the APP program. The TN requirements in R18-9-B204 shall be followed in order to discharge any treated wastewater or treated off-spec wastewater which cannot be supplied to the AWTF,
5. An AWPRA water reclamation facility shall be operated to produce treated wastewater of consistent quality in accordance with approved engineering design reports and the water reclamation facility operations plan. The AWPRA shall provide to the water reclamation facility a list of operational parameters, such pH, SRT, Hydraulic retention time (HRT), Dissolved Oxygen (DO), BOD, cBOD and others for the water reclamation facility.

F. In addition to the requirements of this section, treatment process configurations shall be designed using good engineering practices. Treatment process configurations shall be approved if the AWPRA applicant can demonstrate that the treatment process configuration meets or exceeds the minimum design criteria in this section.

1. ADEQ shall develop and make available guidance on designing treatment process configurations.
2. Treatment process configurations designed in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

R18-9-F833. Technical, Managerial, and Financial Demonstration

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A. An AWPRA applicant shall submit the following to the Department as a demonstration of technical, managerial, and financial capacity:

1. Technical Capacity. An AWPRA applicant's technical demonstration shall include, but is not limited to:
    a. 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, but not limited to, the following:
        i. Design and treatment capacity,
        ii. Demonstration of sufficient AWP source water quantity and quality,
        iii. Demonstration of technical capability to implement an enhanced source control program,
        iv. Information on storage and distribution processes,
        v. A cross-connection control plan,
        vi. A corrosion control plan, and
        vii. Manufacturer specifications showing the life span of AWTF components, and
    c. An ongoing monitoring plan, including, but not limited to, the following:
        i. Online compliance monitoring for critical control points, and
        ii. Performance monitoring and compliance monitoring for advanced treated water, and
    d. A demonstration of the ability to respond to emergency situations including water quality excursions,
    e. Documentation that the AWTF will be operated by a certified AWP operator pursuant to R18-9-B804, and
    f. An operations plan, pursuant to R18-9-F836, including, but not limited to:
        i. Maintenance requirements per the manufacturer's specification, and
        ii. Repair and replacement protocols.
2. Managerial Capacity. An AWPRA applicant's managerial demonstration shall include, but is not limited to:
    a. Documentation of ownership, management, and organization information, including, but not limited to:
        i. An organizational chart, and
        ii. Job descriptions and responsibilities, and
    b. Information or copies of contractual agreements between AWPRA partners or any other entity associated with an AWP Project, including but not limited to:
        i. Sewer collection systems,
        ii. Water Reclamation Facilities,
        iii. Source water conveyance systems,

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iv. Advanced Water Treatment Facilities,

v. Water distribution systems,

vi. Blending Facilities,

vii. Sale prices of source water,

viii. Quality of source water,

ix. Duration of agreement, and

x. Compliance and reporting responsibilities, and

c. Documentation of groundwater or surface water discharge permits or recycled water permits addressing potential discharges from an AWTF in contingency situations, including, but not limited to, off-spec water disposal,

d. Operational information, including, but not limited to:

i. Certified operator credentials,

ii. The number of available operators,

iii. A training plan for staff,

iv. Technical competency,

v. Technical knowledge and implementation, and

vi. An Operations Plan, pursuant to R18-9-F836, and

e. An outline of tools and procedures employed in the management of the facility, including, but not limited to:

i. An asset management and maintenance plan, and

ii. A computerized maintenance management system.

3. Financial Capacity. An AWPRA applicant's financial demonstration shall include, but is not limited to:

a. Projecting the capital cost of the project,

b. Identifying ongoing cost, including, but not limited to:

i. Operation and maintenance costs,

ii. Capital replacement costs,

iii. Energy costs,

iv. Personnel costs, and

v. 20-year lifecycle cost of equipment, and

c. A five-year financial projection, including, but not limited to, planning and management of continuous funding sources to cover the costs of the AWP project,

d. Performing financial audits and bond rating, and

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e. Performing rate studies or assessment of impact fees.

B. In addition to the requirements of this section, technical, managerial, and financial capacity shall be demonstrated using best practices. Similar technical, managerial, and financial demonstration approaches shall be approved if the Department determines that the alternate technical, managerial, and financial demonstration meets or exceeds the technical, managerial, and financial criteria listed above.

1. ADEQ shall develop and make available guidance on developing a technical, managerial, and financial demonstration.
2. A technical, managerial, and financial demonstration developed in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using best practices.

R18-9-F834. Total Organic Carbon Management

A. An AWPRA shall select, achieve, and maintain an up-to-date TOC limit in the advanced treated water using one of the two approaches described in subsections (B) and (C) below.

1. Upon AWTF operation, an AWPRA may switch between the two approaches each calendar year.
2. The TOC management annual approach shall be reported as part of the annual report pursuant to R18-9-E831.

B. Standard Approach or Limit.

1. An AWTF shall not exceed 2 mg/L of TOC in the advanced treated water.
2. The AWPRA shall monitor TOC using continuous online analyzers in the advanced treated water.

C. Site-Specific Approach or Limit. An AWPRA shall perform the two procedures described in subsections (C)(1) and (2) below. The site-specific TOC limit shall be the lower of the two preliminary TOC values obtained from these procedures.

1. Trace Organics Removal Procedure. The AWPRA shall submit a plan to characterize the TOC of all original drinking water sources that feed the collection system(s) that are used by the AWTF as a treated wastewater source. This plan shall be submitted for approval by the Department as part of the Pilot Study Plan pursuant to R18-9-C815(B)(3) and (D) and again in the permit application as part of the R18-9-C816(A)(2)(d) submittals.
   a. Original Drinking Water TOC Characterization requires, but is not limited to, the following:
      i. Use of Departmentally approved TOC sampling locations,
      ii. Sampling for a minimum of one year,
      iii. Sampling at weekly intervals,
      iv. Calculation of the TOC at the 50^{th} percentile (median), 75^{th} percentile, and 95^{th} percentile,
      v. Establishment of a TOC alert level at the 75^{th} percentile, and
      vi. Establishment of the TOC action level at 1.5×95^{th} percentile.

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b. Upon the characterization of TOC in the original drinking water and approval from the Department, an AWPRA shall monitor for TOC in the advanced treated water using continuous online analyzers.

c. For the purposes of this subsection, the preliminary TOC value in mg/L for the Trace Organics Removal Procedure is the action level established in subsection (C)(1)(a)(vi) above.

2. Disinfection Byproducts Precursor Reduction Procedure.

a. Method 5710 C: "Simulated Distribution System Trihalomethanes (SDS - THM)"

i. The AWPRA shall apply 5710 C Method "Simulated Distribution System Trihalomethanes (SDS - THM)" to the advanced treated water in order to determine the total trihalomethane (THM) concentration.

ii. Testing and sampling shall be conducted monthly for one year.

iii. The AWPRA shall simultaneously sample for TOC in mg/L in the advanced treated water monthly for one year.

iv. If the average THM concentration is below the corresponding MCL for THM pursuant to R18-9-E825, the average TOC value from subsection (C)(2)(a)(iii) is the Method 5710C TOC value for the purposes of comparison in subsection (C)(2)(d) below.

v. If the average THM concentration is at or above the corresponding THM MCL pursuant to R18-9-E825, the AWPRA may not use the average TOC value from subsection (C)(2)(a)(iii) as the Method 5710C TOC value. The AWPRA may adjust components of their operation and repeat the steps in subsection (C)(2)(a) until an average THM concentration in the advanced treated water is below the corresponding THM MCL pursuant to R18-9-E825.

b. The AWPRA shall submit the following information on the conditions at the time Method 5710 C from subsection (C)(2)(a) above was conducted to the Department as part of the Pilot Study Report pursuant to R18-9-C815(D) and again in the permit application as part of the R18-9-C816(A)(2)(d) submittals:

i. Temperature,

ii. pH,

iii. Disinfectant dose,

iv. Residual and reaction time within the distribution system, and

v. Other standard conditions as described in Section 5710 B "Trihalomethane Formation Potential (THMFP)".

c. CCL5 - Disinfectant Byproducts Sampling Method.

i. The AWPRA shall sample for the following disinfection byproducts in the advanced treated water, Formaldehyde (CAS No. 50-00-0) and N-Nitrosodimethylamine (NDMA) (CAS No. 65-75-9), which are the only disinfection byproducts that exist in both EPA's "Contaminant Candidate List 5 - Exhibit 1b - Unregulated DBPs in the DBP Group on CCL 5" and EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables".

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ii. Sampling shall be conducted monthly for one year.

iii. The AWPRA shall simultaneously sample for TOC in mg/L in the advanced treated water monthly for one year.

iv. If the average sampling result for any one DBP is below the corresponding health advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables", the average TOC value from subsection (C)(2)(c)(iii) is the CCL5 DBP TOC value for the purposes of comparison in subsection (C)(2)(d) below.

v. If the average sampling result for any one DBP is at or above the corresponding health advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables", the AWPRA may not use the average TOC value from subsection (C)(2)(c)(iii) as the CCL5 DBP TOC value. The AWPRA may adjust components of their operation and repeat the steps in subsection (C)(2)(c) until the average sampling results from any one DBP is below the corresponding health advisory in EPA's "2018 Edition of the Drinking Water Standards and Health Advisories Tables".

d. The lower of the two resultant TOC values in mg/L derived from the methods described in subsections (C)(2)(a) and (C)(2)(c) above is the preliminary TOC value for the Disinfection Byproducts Precursor Reduction Procedure.

3. AWPRA's Site-Specific TOC Approach or Limit. The lower of the two preliminary TOC values in mg/L derived from the two procedures in (C)(1) and (2) above is the AWPRA's site-specific TOC limit.

4. Once a site-specific TOC approach or limit is ascertained, an AWPRA shall establish a TOC action level and alert level based on that approach or limit, using the lower of the two values derived from subsections (C)(1) and (2). Upon the exceedance of a TOC action level, the AWPRA shall conduct one of the following two actions within 72 hours of becoming aware of the exceedance:

a. Stop conveying advanced treated water, investigate, identify, and correct the issue; or

b. Correct the issue with confirmation that advanced treated water TOC does not exceed the action level, and identify the issue.

5. Frequency of Site-Specific Procedures. AWPRA's re-selecting the site-specific TOC approach to begin a new calendar year shall repeat the two procedures in subsections (C)(1) and (2) in order to reestablish an up-to-date TOC action level and TOC alert level.

R18-9-F835. Full Scale Verification

A. An AWPRA applicant shall conduct Full-Scale Verification of the AWTF. The AWPRA applicant shall develop a Full-Scale Verification Plan for submission to the Department and shall perform full-scale verification testing of the AWTF in compliance with the Plan.

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1. If an AWPRA builds a pilot facility to full-scale, the AWPRA applicant may, instead, opt to conduct piloting and full-scale verification simultaneously. If the AWPRA pursues this option, the AWPRA shall:
    a. Consult with the Department, and
    b. Develop and submit a Hybrid Pilot and Full-Scale Verification Plan to the Department for review and comment prior to conducting piloting and full scale verification under this section, R18-9-C815, and other requirements which are previously determined through consultation with the Department, and
    c. For the purposes of the permit application pursuant to R18-9-C816, submit the Hybrid Pilot and Full-Scale Verification Plan and a Hybrid Pilot and Full-Scale Verification Report in lieu of the submission requirements at R18-9-C816(A)(2)(g) and (h).
2. An AWPRA applicant shall provide evidence of an APP authorizing any discharge from an AWTF that occurred, occurs or will occur during piloting, full-scale verification, operation or otherwise.

B. Full-Scale Verification Plan. A Full-Scale Verification Testing Plan shall be developed and shall include, but is not limited to, the following requirements:

1. Detailed Testing Plan. The AWPRA applicant shall outline the verification testing procedure for each process within the AWTF, including, but not limited to:
    a. Treatment technologies and processes,
    b. Continuous online analyzers,
    c. Critical control points,
    d. Alarm systems, and
    e. Data recording instruments.
2. Monitoring Plan. The AWPRA applicant shall develop a Monitoring Plan pursuant to R18-9-E829.
3. Alarm System and Shutdown Testing Plan. The AWPRA applicant shall develop a plan to test and verify the functionality of all alarms, shutdown mechanisms, and processes proposed to be utilized in the Operations Plan developed pursuant to R18-9-F836.
4. Advanced Treated Water Diversion Plan. The AWPRA applicant shall develop a plan to obtain all necessary permits and approvals from the Department or other authorities for the purpose of diverting advanced treated water during the full-scale verification testing period.

C. Testing. Full-scale verification testing shall be conducted in accordance with the Plan established in subsection (B) as well as the requirements in this subsection:

1. The minimum testing period for AWPRAs conducting full-scale verification shall be one year,

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2. An AWPRA shall, throughout the testing period, divert all advanced treated water in a manner approved by the Department pursuant to the AWP permit,

3. Before testing occurs, an AWPRA applicant shall confirm with the Department that any water reclamation facility providing treated wastewater to the AWTF has been issued an amendment to their APP(s) for provision of treated wastewater to an AWTF, and shall confirm that copies of the amended permit(s) are recorded in the AWPRA's Joint Plan pursuant to R18-9-B805.

D. Report. At the conclusion of the full-scale verification testing period, the AWPRA shall prepare and submit, in accordance with the compliance schedule established in the AWP permit, a final Full-Scale Verification Report to the Department for approval. The Report shall, at a minimum, include all information related to full-scale verification testing performed pursuant to this section, such as, but not limited to, the following components:

1. The date, time, frequency and exact place of sampling,
2. The name of each individual who performed the sampling,
3. The procedures used to collect the samples,
4. The dates the sample analyses were completed,
5. The name of each individual or laboratory performing sample analysis,
6. The analytical techniques or methods used to perform the sampling and analysis,
7. The chain of custody records,
8. Any field notes relating to the information described under this subsection,
9. The sampling results, and
10. Corresponding laboratory data for all samples.

E. An AWPRA shall not distribute advanced treated water to consumers until Departmental authorization is obtained.

R18-9-F836. Operations Plan

A. An AWPRA shall develop an Operations Plan in accordance with the compliance schedule established in the AWP permit which shall be followed throughout operation of the AWTF.

B. The Operations Plan shall include, but is not limited to, the following criteria:

1. A description of the operation of each treatment process and standard operating procedure,
2. Process schematics showing pathogen and chemical removal critical control points, alarms, and online analyzers, including all requirements pursuant to R18-9-E828(D),
3. A list of established alert levels and action levels at each critical control point,

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4. A description of all inspection and maintenance protocols, schedules and other requirements for treatment process equipment,

5. A description of the ongoing monitoring requirements pursuant to R18-9-E829 and the reporting requirements pursuant to R18-9-E830,

6. The development of an emergency operations and response plan to identify and address upsets, failures, or emergency situations arising in the treatment train in an AWPRA facility that is responsible for producing advanced treated water. The emergency operations and response plan shall include, but is not limited to, the following requirements:

   a. Identification of upset conditions or emergency situations triggering a response under this subsection, including, but not limited to:

      i. Failure of critical control points,

      ii. Diversion of off-spec water,

      iii. Loss of source water to the AWTF,

      iv. Any exceedances of the alert levels and action levels, and

      v. Failures which constitute an acute exposure threat, including failure to meet pathogen log reduction values pursuant to R18-9-E828, and failure to meet Nitrite and Nitrate as Nitrogen MCLs pursuant to R18-9-E829,

   b. A decision-making procedure and the development of an off-spec water response to divert AWP process water or advanced treated water as a result of any treatment process failure or water quality deviation,

   c. Any failure to achieve the minimum target log reduction must be documented and a summary of the causes and corrective action must be reported to the Department, and

      i. The AWPRA shall take immediate action to discontinue the delivery of advanced treated water to the distribution system.

      ii. The AWPRA shall notify the Department and any public water system that is receiving the AWP project water within 60 minutes.

   d. Development of a timely response procedure in the event that advanced treated water violates a requirement of this Article, including, but not limited to:

      i. Identification and investigation of the points of failure within the treatment train and at the AWTF,

      ii. A procedure to resolve identified failures,

      iii. Clear specifications regarding the time required for response to failures or exceedances, and

      iv. A procedure for the utilization of automated systems equipped with triggers and alarms, as necessary,

      v. Consideration of alternative water sources, as necessary, to ensure delivery of a continuous water supply, and

      vi. Compliance with all applicable public notice requirements of the Safe Drinking Water Act, and

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e. Development of a shutdown plan establishing shutdown and post-shutdown protocols, including, but not limited to:

i. A procedure for draining piping and tanks, as necessary, to prevent freezing or the accumulation of stagnant non-compliant water, and

ii. A procedure for managing post-shutdown conditions, and

7. A description of staffing requirements at the AWTF including, but not limited to, the following criteria:

a. The roles and responsibilities of all staff,

b. The status of, and requirements for, certified operators,

c. A description of the annual training and continuous education requirements for all staff, and

d. A description of any provisions for training new personnel, and

8. A description of the SCADA system utilized at the AWTF along with, but not limited to, the following additional SCADA requirements:

a. A description of how the system will assist the AWTF in achieving compliance, when necessary,

b. A description of how the SCADA system will communicate and interoperate with the SCADA systems of all AWPRA facilities that provide treatment pursuant to this Article,

c. Information on how the system acquires and utilizes monitoring data to inform operators, identify failures at critical control points, and respond to failures,

d. A procedure for testing the system,

e. A protocol/procedure to secure and protect the SCADA system from unauthorized access and cyberattack, and

f. Establishment of a SCADA system testing schedule, and

9. A description of the communication procedures between the AWPRA and all relevant treatment plant operators for situations including, but not limited to:

a. Normal operations, and

b. Upset conditions and emergency response protocols.

C. In addition to the requirements of this section, an Operations Plan shall be developed using good engineering practices and best management practices. Similar Operations Plan criteria shall be approved if the AWPRA applicant can demonstrate that the Operations Plan components meet or exceed the criteria listed above.

1. ADEQ shall develop and make available guidance on developing an AWP Operations Plan.

2. An AWP Operations Plan developed in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

D. An AWPRA shall submit the Operations Plan to the Department for approval as a compliance schedule item under the AWP permit.

Pre-Publication

E. An AWPRA shall update the Operations Plan as necessary following any modifications to the treatment process that affect the operational procedures of the AWTF. The updated Operations Plan shall be submitted to the Department for approval as a component of a permit amendment application.

R18-9-F837. Vulnerability Assessment

A. An AWPRA shall conduct a vulnerability assessment for the AWP project for the purpose of identifying areas and processes with a potential to be vulnerable to attack, sabotage, or disruption.

B. The AWPRA shall consider and assess all potential hazards associated with contaminants in the municipal wastewater source.

C. The AWPRA shall develop an emergency response plan for identified hazards the AWP project may face.

D. The SCADA systems of all AWPRA facilities included in the AWP project that provide treatment pursuant to this Article shall be designed and operated such that they are secured and protected, both physically and electronically, from unauthorized access and cyberattack.

E. The AWPRA shall periodically review the vulnerability assessment along with the permit renewal pursuant to R18-9-D822, at a minimum, or at the Director's discretion. A vulnerability assessment update shall include the identification of any new hazards and the corresponding risk management controls the AWPRA will establish.

F. In addition to the requirements of this section, a vulnerability assessment shall be conducted using Best Management Practices. Methods for conducting the vulnerability assessment shall be approved if the AWPRA applicant can demonstrate that the method is sufficiently detailed and robust for the purpose of conducting a protective vulnerability assessment.

1. ADEQ shall develop and make available guidance on conducting an AWP vulnerability assessment.
2. An AWP vulnerability assessment conducted in a manner consistent with the criteria contained in an applicable ADEQ guidance document shall be considered to have been conducted using good engineering practices.

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