Advanced Water Purification Proposed Program Roadmap
ADEQ Response to Comments

Arizona Department of Environmental Quality (ADEQ) values our Advanced Water Purification (AWP) stakeholders and acknowledges their time and effort for the constructive feedback we received on the AWP Roadmap document. Throughout the last few months, the ADEQ AWP team and leadership have been meeting with stakeholders to discuss their technical comments and have collaboratively developed the following responses to the comments and updates to ADEQ's planned rules:

Comment 1: Enhanced Source Control Program (ESCP)

ADEQ received many public comments regarding the proposed Enhanced Source Control Program. The comments are summarized and are listed below.

1. Undue economic burden on taxpayers.
2. Unsupported requirement for reporting, monitoring, and treatment of non-regulated Safe Drinking Water Act (SWDA) constituents not on the United States Environmental Protection Agency (US EPA) rigorous health-risk-based evaluations.
3. Recommend that the utility develop an ESCP to monitor and control wastewater pollutants that are discharged from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986.
4. Early warning real-time collection system monitoring should be left up to the particular utility and community, and not a requirement in rule. Early warning real-time collection system monitoring is expensive and not ready to be a requirement nor are quantifiable limits feasible or appropriate at this time. Utilities should be encouraged to trial these systems as technology develops and improves.
5. Use the National Pretreatment Program (NPP) as a foundation for the ESCP since most treatment plants are already in the program, by re-evaluating the program and considering delivery of water.
6. Control of commercial discharges should be through community involvement and not through regulation.
7. No regulation of all commercial dischargers, only to the commercial dischargers identified through the NPP program (not practical for larger sewersheds) - Do not believe need exists to inventory every commercial establishment and chemical discharged. No legal practical mechanism to know all chemicals used by commercial establishments that are not 'Categorical Industrial Users' or 'Significant Industrial Users' as defined by NPP. NPP type of regulations should apply to smaller plants < 5 Million Gallons Per Day (MGD) - Not require the need to inventory each and every chemical and commercial establishment - instead inventory sources that may reasonably foreseeably adversely affect the wastewater's operation or has significant potential to have serious adverse effect on public health or the violation to finished drinking water.
8. The Response Plan for the ESCP is unrealistic. Wastewater samples can only be obtained through a manhole and there are no sampling means unless a vault is installed which is unlikely.
9. Categorize influent wastewater with a full spread analysis instead of categorizing industrial and/or commercial discharges within the sewershed with a 3-year evaluation period.

ADEQ Response:

Response to Comment 1: ADEQ is aware that the implementation of the voluntary AWP program will require considerable economic investment from a utility. The ESCP is critical in ensuring compliance with the health-based water quality standards required to produce potable water and for ensuring the costs of treatment is minimized through effective proactive management of the sewershed.

Response to Comment 2: All Tier II contaminants (i.e., AWP specific contaminants that are not currently regulated in drinking water by the US EPA or ADEQ, but have been identified as potential risks relevant to AWP) determined by the Advanced Water Purification Responsible Agency (AWPRA) are specific to the sewershed and have specific health advisories listed in the 2018 Edition of the Drinking Water Standards and Health Advisories Tables. In addition, treated

wastewater has elevated concentrations of Tier II contaminants and to produce water similar to current drinking water, it is essential to monitor and control these chemicals.

Response to Comment 3: Monitoring and controlling wastewater pollutants discharged from municipal landfills, hazardous waste treatment, disposal, and recovery facilities subject to Section 313 of the Superfund Amendment and Reauthorization Act (SARA) must be included in the ESCP if they are present in the sewershed to comply with the AWP program water quality goals. While certain elements of the ESCP may be covered by other programs such as National PDES, the water quality end goals may not align with the AWP program. Hence, it is necessary that these components are covered by ESCP. An AWPRA may choose to demonstrate compliance or applicability of other programs towards the AWP program. In addition, (i) most of WWTPs in the state are separate sewer systems, (ii) impacts from other discharges such as from landfill leachates into the collection systems are uncommon), and (iii) most importantly framework proposed in the AWP Roadmap is flexible and if there is any concern it must be addressed on a case by case basis. Finally, industrial facilities must first meet the reporting thresholds of Section 313 of SARA, otherwise known as the Toxics Release Inventory Program. Covered facilities must meet the thresholds related to chemical releases to the land, water, and air and are based on chemical activities and employee count. While the TRI program provides public information on chemical releases under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA), the end goals of the program do not align with the AWP program. As noted above, an AWPRA can utilize any other information from other programs it participates in for the establishment of an ESCP.

Response to Comment 4: The proposed early warning system requirements are flexible and allow the participating utility to propose their method, technology, or process. ADEQ has not prescribed a specific method, technology, or process for the establishment of an early warning system. As an early warning system is specific to the sewershed, ADEQ will work with the utility during the review process to ensure that it is adequate to meet the intent of the rule while being practical and implementable.

Response to Comment 5: ADEQ has used theNPP as a foundation for the development of the ESCP. However, participation in the NPP will not be a requirement for any utility that wants to pursue AWP. The AWP program is structured such that it allows any interested utility to participate in the AWP program as long as they can meet the requirements of the AWP rules (i.e., no barriers to entry into the program, such as the requirement of complying with NPP).

Response to Comment 6 and 7: AWP is designed to address both industrial and commercial establishments, i.e., non-domestic dischargers, through the ESCP. The utility participating in AWP will analyze and identify the non-domestic dischargers to determine the impact, if any. As ADEQ has not established a barrier to entry, small sewersheds with lower flows can be impacted by commercial establishments such as dry cleaners, hospitals, dental offices among others. Hence, there is a need for a quantification of these dischargers.

Response to comment 8: The response plan is a necessary component of the ESCP and a guidance document is currently being developed to assist utilities build an effective plan. The response plan will be used as a tool for the participating utilities to assist in making decisions such as identifying and communicating exceedances between utilities, diverting water, or shutting down the plant. The AWPRA will determine the appropriate components and actions in the response plan necessary for their community including any necessary sampling and monitoring which may require non-domestic dischargers to take additional actions such as the development of sampling locations. ADEQ has established flexibility in the program to allow the AWP participant to develop their own Response Plans.

Response to Comment 9: ADEQ has developed a method to establish Tier 2 chemicals to identify chemicals of concern (COC) for monitoring, treatment, or control. This method, in conjunction with the ESCP, will help delineate COC from all non-domestic sources that have a health-based water quality standard.

A full spread analysis will add unnecessary burden to all AWP participants. The proposed approach offers a uniform standard for all participants to identify and address non-domestic sources that may pose a risk to the AWP plants. Wastewater from sewersheds composed of domestic sources do not have the potential to impact AWP water quality goals like wastewater from sewersheds composed of non-domestic sources. Different industries may use chemicals that are likely not present in a domestic sewershed and which need to be assessed and monitored. ADEQ believes the proposed approach is a comprehensive method to address potential risks to the AWP community.

Comment 2: Public Communication

ADEQ received comments regarding the public communication standards. The comments are summarized as following:

1. There is a need for the State to educate the public about AWP.
2. Financial and human resources are lacking in some communities and they may not be able to implement an effective outreach campaign.
3. Need to get ahead of negative perceptions about AWP.

ADEQ Response:

ADEQ has been engaging with the public and communities across the state and will continue to do so. For more information please refer to the following web page: azdeq.gov/awp-outreach.

Additionally, ADEQ is developing a Public Communication toolkit that will be available to all utilities wishing to participate in the AWP program. The goal of the toolkit is to provide the information required to educate the public on AWP while minimizing the financial and human resources burden on interested utilities. This toolkit will provide information on approaches to engage the public and guidance to develop a communication plan specific to a community interested in pursuing AWP. In addition, templates, examples, and infographics will be available for use. The utility can use the provided product or develop its own.

Comment 3: Operator Certification

ADEQ received comments regarding operator certification for Advanced Water Treatment Facility (AWTF) which are summarized as shown below:

1. The AWP program should not adopt Advanced Water Treatment Operator (AWTO) certification assembled by California - Nevada (CA-NV) section of American Water Works Association (AWWA) and California Water Environment Association (CWEA) or should ADEQ require only drinking water (DW) operators with AWTO certification to operate AWTFs.
2. AWP should have plant-specific training and targeted AWP test for the Arizona AWP program, but should not adopt CA-NV AWWA - CWEA Certification, and should not require a Grade 4 operator for wastewater treatment plant/ wastewater (WWTP/ WW) collection system.
3. AWP has excessive requirements for operators to have Grade 4 DW, WW, and collection system certification.
4. Recommendation to publish 'Need to know criteria' and training and study material for AWP operator certification.
5. ADEQ should offer AWT Operator Certification reciprocity.
6. The AWP program should allow Wastewater Treatment Operators to obtain AWT Operator Certification.

ADEQ Response:

Response to Comment 1: ADEQ is not adopting AWTO certification by CA-NV AWWA – CWEA. ADEQ is developing a new certification for AWTFs that is specific to Arizona and has questions based on the CA-NV AWWA-CWEA Grade 3 AWTO exam and curriculum. ADEQ may update the test in the future. ADEQ will not be developing plant-specific training, however, treatment processes at these plants will be covered in the curriculum and the tests.

Response to Comment 2: AWP program will not require an individual to carry a Grade 4 drinking water treatment, a Grade 4 wastewater treatment and Grade 4 collection system certification. The program will require a Grade 4 collection system operator (for ESCP) and a Grade 4 wastewater treatment plant operator for the WWTP supplying treated wastewater to an AWTF. These certified operators are not required to have the AWTF certification. For WRFs that are

receiving pathogen log removal credits, nearly 50 percent of pathogen treatment can occur at the WWTP or for facilities that use for example, membrane bioreactor (MBR) and receive pathogen credits, an AWT operator certification is required.

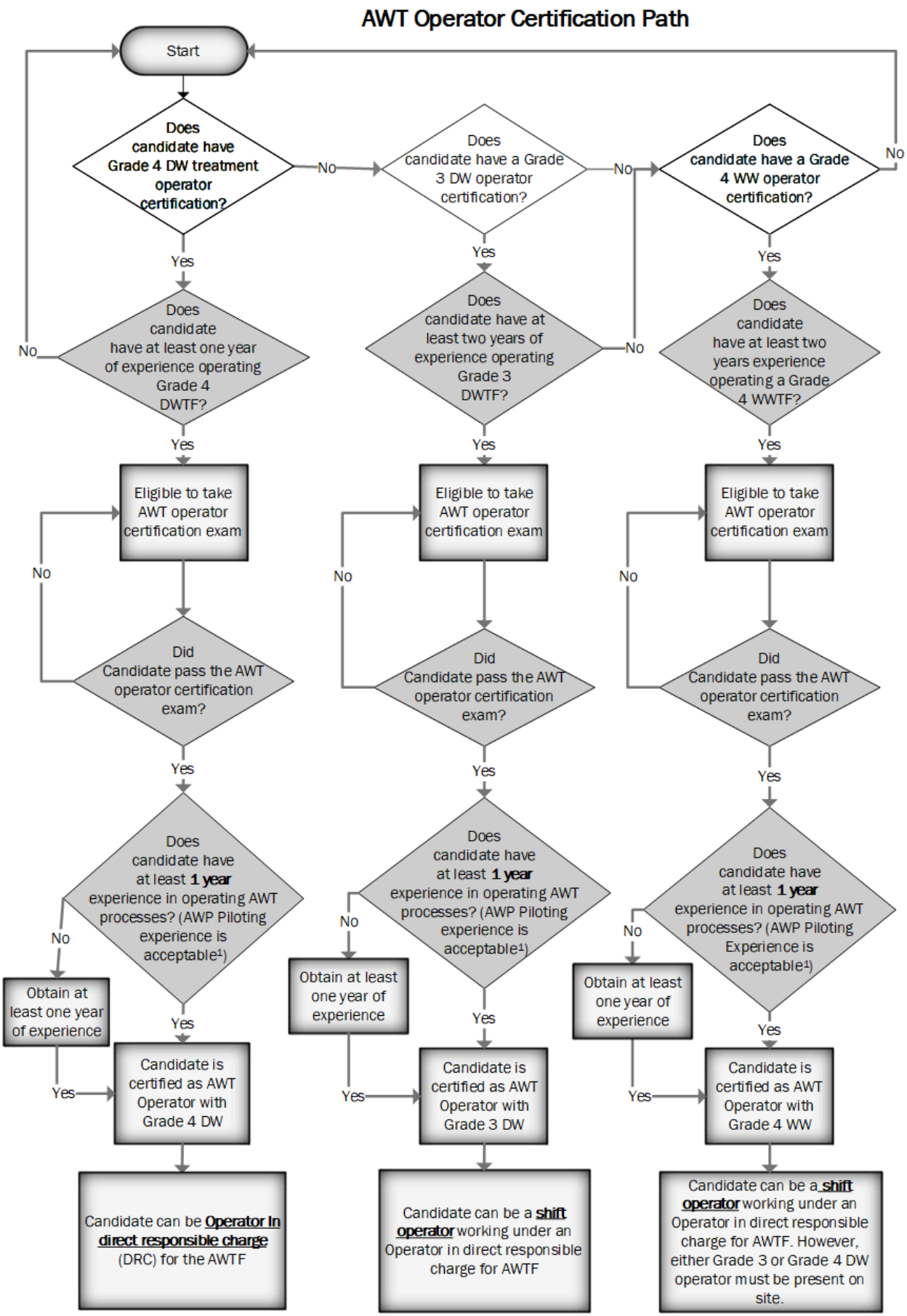
Response to Comment 3: The AWP program will require all AWTFs to be operated by operators with an AWT operator certification. *ADEQ is proposing only <u>one</u> grade of AWT operator certification for AWTFs.*

Response to Comment 4: ADEQ is developing the program for AWT operator certification and the 'Need to Know Criteria' will be published in addition to the development of the training material.

Response to Comment 5: ADEQ has updated the AWT Operator Certification process to include reciprocity with other States who issue AWT Operator Certifications.

Response to Comment 6: ADEQ has updated the AWT Operator Certification process to include the addition of Grade 4 Wastewater Treatment Operators. The following flow chart shows the qualification of those requirements including the eligibility to take the AWT operator exam and experience requirements for operators who want to obtain the AWT operator certification.
Definitions for the terms used in the flow chart and additional information:

- "Direct Responsible Charge" means the person who has overall responsibility for the day-to-day, hands-on, operation of an AWTF.
- "Shift operator" means a person in direct charge of the operation of a treatment facility for a specified period of the day.
- Operators in Direct Responsible Charge and Shift Operators operating an AWTF must be certified as AWT Operators.
- Critical Control Points (CCPs) should be operated under the supervision of an AWT operator.


AWT Operator Certification Path
Start
Does candidate have Grade 4 DW treatment operator certification?
No
Does candidate have a Grade 3 DW operator certification?
No
Does candidate have a Grade 4 WW operator certification?
No
Yes
Yes
Yes
Does candidate have at least one year of experience operating Grade 4 DWTF?
No
Does candidate have at least two years of experience operating Grade 3 DWTF?
No
Does candidate have at least two years experience operating a Grade 4 WWTF?
Yes
Yes
Yes
Eligible to take AWT operator certification exam
Eligible to take AWT operator certification exam
Eligible to take AWT operator certification exam
No
No
No
Did Candidate pass the AWT operator certification exam?
Did Candidate pass the AWT operator certification exam?
Did Candidate pass the AWT operator certification exam?
Yes
Yes
Yes
Does candidate have at least 1 year experience in operating AWT processes? (AWP Piloting experience is acceptable[1])
Does candidate have at least 1 year experience in operating AWT processes? (AWP Piloting experience is acceptable[1])
Does candidate have at least 1 year experience in operating AWT processes? (AWP Piloting Experience is acceptable[1])
No
No
No
Obtain at least one year of experience
Obtain at least one year of experience
Obtain at least one year of experience
Yes
Yes
Yes
Yes
Yes
Yes
Candidate is certified as AWT Operator with Grade 4 DW
Candidate is certified as AWT Operator with Grade 3 DW
Candidate is certified as AWT Operator with Grade 4 WW
Candidate can be Operator In direct responsible charge (DRC) for the AWTF
Candidate can be a shift operator working under an Operator in direct responsible charge for AWTF
Candidate can be a shift operator working under an Operator in direct responsible charge for AWTF. However, either Grade 3 or Grade 4 DW operator must be present on site.

Comment 4. Chemical Removal Standards: Tier I and II

ADEQ received comments regarding chemical monitoring and removal standards. The comments are summarized as following:

1) **Tier I: AWP program should** not require the monitoring of Tier I chemicals (i.e., chemicals that have PWSs must comply with MCL or treatment technique under the current requirements contained in the US EPA SDWA) in treated wastewater (i.e., prior to it being subjected to treatment in an AWTF) as it does not add value.
2) **Tier II: AWP program should not regulate** Tier II chemicals as these chemicals are not regulated under the SDWA. Other considerations/rationale for not regulating Tier II chemicals are cost associated with Tier II chemical monitoring, assumption of arbitrary monitoring protocol, and assumption of endless list of chemicals. Inventories of dischargers and their chemical management practices should be limited to a manageable number of industrial and major commercial dischargers that could significantly impact water quality. A specific list of Tier II chemicals should be maintained by ADEQ as documenting thousands of synthetic organic chemicals resulting from modern society, an impossible task for individual communities, especially mid-size and smaller communities.
3) The roadmap should be amended to remove the public notice requirement for points before the Entry Point to the Distribution System (EPDS) so public notice only is required if an exceedance occurs and the water is distributed to the public.

ADEQ Response:

Response to Comment 1: Tier 1 chemical monitoring is required at the treated wastewater location before its introduction to AWTF to appropriately characterize the source water. There is considerable variability in treatment that cannot be otherwise captured without actual measurements of this highly variable source.

Response to Comment 2: Tier 2 chemical monitoring is required under the AWP program as these chemicals have adverse impact on public health. While not currently regulated under the SDWA, contaminants such as N-Nitrosodimethylami (NDMA), 1,4-Dioxane are classified as carcinogenic with US EPA health advisory levels. Published articles report higher concentrations of Tier II chemicals in treated wastewater than traditional drinking water sources (surface water or groundwater). For AWP projects, without any environmental buffer, pulses of low molecular weight compounds may pose chronic and subchronic threats to public health. In addition, both states (California and Colorado) with AWP (called Direct Potable Reuse or DPR) rules, require the monitoring of Tier II chemicals.
ADEQ is developing a guidance document for the ESCP. This document will contain examples and templates for AWPRAs who have previous NPP experience and those without any NPP experience. It will also contain examples for small utilities (e.g., < 1 MGD WWTPs). Precise language will be included in the guidance document for a comparative analysis between the NPP and ESCP.

ADEQ will incorporate explicit language in the guidance document which will account for the size of the sewershed and impact from certain non-domestic discharges. In addition, ADEQ is adding language for increased clarity for enhanced source control implementation. For large sewersheds, it may be unnecessary to track all entities such as nail salons (e.g., acetone use), dry cleaners (e.g., Trichloroethylene use), car washes (heavy metals, Volatile organic compounds, (VOCs) use), dentists (e.g., mercury use), and/or restaurants (Fats, Oils and Grease (FOGs)). Instead, a qualitative description must be provided as a part of the design report submission on the number of such establishments within the sewershed and the contaminants that are used and or stored. This information should be contrasted with the overall flow to account for dilution. This approach will minimize the count of entities and/or dischargers and associated chemicals.
While large sewersheds may not be impacted by dry cleaners or nail salons, these establishments may have a significant impact on smaller sewersheds. The method described in Figure 9 of the AWP Roadmap includes paper exercises meaning not actual measurements) for the selection of chemicals, which is site-specific based on impact. The Tier II chemicals should be selected based on each utilities' sewershed and their contributing dischargers.

Defining a specific list of Tier II chemicals will introduce unnecessary burden to both small and large AWPRAs. Small sewersheds that don’t have industries do not need to measure chemicals that are not being generated, used or stored in

their sewershed. Large sewersheds that don't have significant flows of specific chemicals may not need to sample for contaminants which will be diluted out due to the large flows in the system.

Furthermore, ADEQ will clarify in the proposed rule to only focus on chemicals based on the established Reference Dose (RfD) or Risk Specific Dose (RSD) for specific chemicals that are listed in the documents such as 2018 Edition of the Drinking Water Standards and Health Advisories Tables or any documented health advisory. The final list of chemicals shall account for AWTF removal which will be demonstrated during pilot testing.

Response to Comment 3: ADEQ has updated the Public Notice process so that public notification or public reporting will only be required if an exceedance occurs and the water is distributed to the public.

Comment 5: Salinity Management

ADEQ received comments regarding the requirement to regulate and establish a standard for Total Dissolved Solids (TDS) removal. Summary of comments include:

1. TDS is primarily of aesthetic concern and does not impact public health.
2. Regulation of TDS will increase treatment costs.
3. Regulation of TDS will increase cost to ratepayers.

ADEQ Response:

ADEQ has removed salinity management requirements from the proposed AWP program to be consistent with other drinking water regulations. AWTFs may need to manage salinity to ensure that AWTF operates within acceptable parameters that include compliance with DBPs (Disinfection by-products) and SDWA Maximum Contaminant Levels (MCLs) in addition to managing corrosion due to variable or fluctuating salinity levels as measured through TDS.

Comment 6: Total Organic Carbon (TOC) Management

ADEQ received comments regarding the requirement to regulate TOC beyond the SDWA. Summary of specific comments include:

1. TOC removal beyond SDWA has no perceived increase in public health benefit.
2. Does not help with disinfection byproduct precursor removal.
3. TOC of 2 mg/L is restrictive in a carbon train.

ADEQ Response:

The AWPRA must achieve a specific TOC goal in the advanced treated water (ATW) as a CCP monitoring parameter for chemical reduction. TOC is an important bulk surrogate for AWP. When considering AWTF as a whole, TOC removal correlates with trace organic contaminant (TOrC) removal. TOrCs refer to an array of natural and manufactured substances including industrial chemicals, household chemicals, metabolites excreted by people, and by-products formed during wastewater treatment processes. Some TOrCs have high toxicity, such as NDMA, while others are considered nontoxic, for example, sucralose. TOC removal also correlates with regulated Disinfection by-products (DBP) precursor removal. An increase in TOC breakthrough could indicate process failure, process exhaustion, or breakthrough of a recalcitrant industrial contaminant. Concentration of TOrC in treated wastewater is generally higher than conventional sources used as raw water for the production of drinking water. Hence, to achieve a similar water quality outcome, a different approach for TOC management than what is required under SDWA is necessary and is described here.

When the TOC in the ATW is lower than the TOC in the original drinking water source, the TOrC concentrations are lower as well. If the TOC is greater in the original drinking water source, it creates uncertainty about DBP formation and bacterial regrowth in the distribution system in addition to presenting a public acceptance challenge. Applying the SDWA framework directly to the AWP program will result in excessively high concentration of TOC in the ATW resulting in an increase of both regulated DBPs and unregulated DBPs. TOCs are regulated in SDWA even though MCLs exist for DBPs because of the presence of a large number of non-regulated DBPs. The approach presented addresses both TOrCs and unregulated DBPs similar to the SDWA framework.

In response to comments, ADEQ has added a site-specific option allowing an AWTF to establish a site-specific TOC limit. TOC management options are described below, namely (1) standard option and (2) site-specific option:

Standard approach

A TOC concentration of 2 mg/L must be achieved in ATW from the AWTF. This approach will not impact membrane trains nor penalize water systems that rely solely or mostly on groundwater sources instead of surface water as their primary source before the adoption of AWP program. Under no circumstances can the TOC concentration in the RO permeate exceed 0.5 mg/L, and membrane trains must comply with removing low molecular weight compounds per the 2018 Edition of the Drinking Water Standards and Health Advisories Tables. All flows bypassing RO must achieve 2 mg/L without blending with RO permeate. AWPRA may choose the site-specific approach outlined in the next section if a higher TOC limit is desired.

Site-specific approach

The AWPRA shall conduct both procedures described below and then select the lower of the TOC value for the establishment of a TOC limit. The two procedures are (1) Trace organics removal procedure and (2) Disinfection byproducts reduction procedure. An AWPRA that does not conduct site-specific testing as part of the pilot must achieve a TOC of < 2.0 mg/L.

(1) Trace Organics Removal Procedure:

In the process of characterizing the treated wastewater in the application for AWP, the AWPRA must determine the recalcitrant TOC concentration that was contributed by the original drinking water that ultimately became treated wastewater. Once done, the ATW TOC maximum is determined. Each system must submit a plan to characterize the TOC of the drinking water that feeds the wastewater collection system. In some cases, characterization of the drinking water TOC may be as simple as reporting the median TOC at the finished water entry points. In other cases, samples from portions of the drinking water distribution system may need to be collected and analyzed for TOC if a specific portion feeds the AWP process and has a different water quality than the entry points.

At a minimum, the following must be collected and analyzed:

1. One year of TOC sampling (at least 1 sample per week) of the TOC (depending on system configuration) feeding the wastewater collection system.
    a. The location of TOC monitoring must be approved by the department.
    b. Median, 75th percentile, and 95th percentile must be calculated.
    c. Action limit will be set at 1.5×95th percentile of recalcitrant natural TOC.
    d. The alert limit will be set at the 75th percentile.
2. The treated water TOC (after AWP treatment) must be measured continuously.
3. Exceedance of the action limit (1.5×95th percentile) – within 72 hours of becoming aware:
    a. either stop producing finished water, investigate, identify, and correct the issue, or
    b. correct the issue with confirmation that advanced treated water TOC is acceptable, and identify the cause.
4. Exceedance of the alert limit (75th percentile) - develop an action plan, and report to the state.

(2) Disinfection Byproducts Precursor Reduction Procedure:

In addition, the AWPRA must collect the following data for one year.

1. Apply 5710 (C), simulated distribution system (SDS) - Trihalomethanes (THMs) testing method found in the Standard Methods for the Examination of Water and Wastewater, 24th Edition to the ATW to determine the TOC limit. Determine TOC limit based on Tier I and Tier II using free chlorine and with reaction time established based on actual distribution system residence time and standard conditions as described in 5710 (B) to ATW. ATW sampling and the corresponding testing for Tier I and Tier II DBPs

must be conducted monthly to establish critical limits for TOC. Collect all DBP data (for the 23 DBPs listed in the Contaminant Candidate List (CCL5)) to develop a greater body of data. Compliance with NDMA and formaldehyde based on health advisories listed in the 2018 Edition of the Drinking Water Standards and Health Advisories Tables is required.

2. Testing shall occur on the full-scale plant every month for DBPs using 5710 (C).

In conclusion, ADEQ sincerely appreciates the time and effort the AWP stakeholders have dedicated to providing valuable feedback on the AWP Roadmap. Your constructive input is instrumental in refining our approach and ensuring the success of the proposed program. We look forward to ongoing dialogue and continued collaboration as we finalize the AWP rule, working together to achieve a scientifically sound, flexible, and affordable program that is based on our guiding principles.