



**TOCA, Chlorine Dioxide, and Bromate
DBP Stage 1 Monitoring Plan**
Please fill-out and submit by **September 1, 2016**
Send completed form by mail or email: DBPR@azdeq.gov

Part 1: General Public Water System (PWS) Information

Regulatory Agency: <input type="checkbox"/> ADEQ <input type="checkbox"/> PDEQ <input type="checkbox"/> MCESD		Population Served:
PWS Name:		PWS ID#: AZ04 -
PWS Mailing Address:		
Contact Person:		Phone#:
Email Address:		
PWS Type (Select one): <input type="checkbox"/> CWS <input type="checkbox"/> NTNCWS <input type="checkbox"/> TNCWS <input type="checkbox"/> Seasonal System		
PWS Source Types: (Check all that apply) <input type="checkbox"/> Surface Water <input type="checkbox"/> GUDI <input type="checkbox"/> Ground Water <input type="checkbox"/> Purchase Water From: _____ <input type="checkbox"/> Wholesales Water To: _____		

Part 2: Monitoring Summary

Check all that are applicable: TOCA Chlorine Dioxide/Chlorite Bromate

A. DBP Precursors/ TOCA: required of Surface Water or GUDI systems that use Conventional Filtration. Each month that Conventional Filtration is used, one sample set consisting of one RAW Alkalinity, one RAW Total Organic Carbon (TOC) and one TREATED TOC sample will be taken. The RAW water samples must be taken at the same time prior to any treatment. Samples will be analyzed by an AZ certified laboratory. (If you have more than one treatment plant using Conventional Filtration please attach the additional plant(s) information on an attached sheet.)

Treatment Plant Name: _____
 Inlet Number: _____ Treatment Plant Number: _____
 Projected Sampling Date (date or week of): _____
 We reserve the option to use Alternative Criteria in place of TOC removal ratio: YES / NO

Step 1 – TOC Removal Requirements:

- Removal of Total Organic Carbon (TOC) based on the below table.

Step 1 TOC Table: Required TOC Removal Matrix

Source Water TOC (mg/L)	Source Water Alkalinity, mg/L, as Ca CO ₃		
	0-60	>60-120	>120
>2.0 to 4.0	35.0%	25.0%	15.0%
>4.0 to 8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

Removal Ratio Calculations:

$$\text{Actual \% Removal} = \frac{\text{Source Sample} - \text{Treated Sample}}{\text{Source Sample}} \times 100 \quad \text{Actual Removed \%}$$

$$\text{Percent Removal Ratio} = \frac{\text{Actual Removed \%}}{\text{Required Removal \%}}$$

Alternative Criteria:

- If the system cannot meet the TOC percent removal ratio, one of the following alternative criteria may also be used. **(Any of the following alternative criteria would give the system a 1.0 Percent Removal Ratio for the month.)**
 - Raw TOC results are less than or equal to 2.0 mg/L, calculated quarterly as a running annual average.
 - Treated TOC results are less than or equal to 2.0 mg/L, calculated quarterly as a running annual average.
 - Raw SUVA results are less than or equal to 2.0 mg/L, calculated quarterly as a running annual average.
 - Treated SUVA results are less than or equal to 2.0 mg/L, calculated quarterly as a running annual average.
 - Raw TOC is less than 4.0 mg/L and Raw Alkalinity is greater than 60 mg/L and TTHM is less than or equal to 0.04 mg/L and HAA5 is less than or equal to 0.03 mg/L.
 - TTHM is less than or equal to 0.04 mg/L and HAA5 is less than or equal to 0.03 mg/L as a running annual average and systems are only using Chlorine as disinfectant throughout the system.
- If none of the above criteria is achievable and the system is using enhanced softening ONLY. **(Any of the following alternative criteria would give the system a 1.0 Percent Removal Ratio for the month.)**
 - Softening results in treated alkalinity is less than 60 mg/L (CaCO₃) measured monthly, calculated quarterly as a running annual average.
 - Softening results remove at least 10 mg/L of Mg hardness as CaCO₃, measured monthly, calculated quarterly as a running annual average.

*TOCA Compliance: Running Annual Average (RAA) of Percent Removal Ratio \geq 1.0.

B. Chlorine Dioxide and Chlorite:

This sample siting plan identifies the locations where Chlorine Dioxide and Chlorite samples will be collected and measured.

Disinfectant – Chlorine Dioxide, Maximum Residual Disinfectant Level (MRDL) = 0.8 mg/L

1. Daily chlorine dioxide (ClO₂) measurements will be collected at each EPDS.
2. If the daily chlorine dioxide measurement exceeds 0.8 mg/L, three follow-up distribution chlorine dioxide samples will be measured the following day. *Notify Regulatory Agency contact.*
 - If the system uses chlorine dioxide or chloramines to maintain disinfectant residuals –OR- Chlorine is used to maintain disinfectant residuals and there are NO disinfection additions points after the EPDS
 - Take 3 samples as close to the 1st customer as possible at intervals of at least 6 hours.
 - If chlorine is used –AND- additional disinfection points after the EPDS are used
 - Collect samples at the Three Sample Set locations specified below

Disinfection Byproduct – Chlorite, Maximum Contaminant Level (MCL) = 1.0 mg/L

1. Daily Chlorite (ClO₂⁻) measurements will be collected at each EPDS.
2. If the daily chlorite measurement exceeds 1.0 mg/L, three follow-up distribution Chlorite samples will be measured the following day. Samples will be collected at the Three Sample Set locations specified below. *Notify Regulatory Agency contact.*
3. Monthly Chlorite samples will be collected within the distribution system, at the Three Sample Set locations specified below. *Monthly* Chlorite samples will be submitted to and analyzed by an AZ certified lab using an appropriate method.

Treatment Plant Name: _____ EPDS number: _____

Monthly Chlorite Distribution Sampling Date (Date or week of): _____

Date Treatment Plant began using Chlorine Dioxide: _____

Three Sample Set Location Siting Plan

Site ID	Sampling Location	Sample Site Type
DDBP1		Minimum Residence Time – as close to the first customer as possible
DDBP2		Average Residence Time – location where the water has traveled an average distance/time from source to tap or connection.
DDBP3		Maximum Residence Time – location where the water has traveled the greatest distance/time from source to tap or connection.

***Chlorine Dioxide Compliance:**

- Were any of the daily entry point Chlorine Dioxide samples > 0.8 mg/L? *If yes, a 3-sample distribution set must be collected the following day.*
- Was a Chlorine Dioxide EPDS sample collected the following day? *If no, Non-Acute MRDL (Tier 2) violation.*
- Were any 2 consecutive days of the daily EPDS Chlorine Dioxide samples >0.8 mg/L? *If yes, non-acute MRDL (Tier 2) violation.*
- Was a (3-sample set) of Chlorine Dioxide distribution samples collected the following day? *If no, acute MRDL (Tier 1 violation).*
- Do any results of the 3-sample set exceed 0.8 mg/L? *If yes, acute MRDL (Tier 1 violation).*

***Chlorite Compliance:**

- Were any of the EPDS Chlorite samples >1.0 mg/L? *If yes, a 3-sample distribution set must be collected the following day.*
- Were any of the 3-sample set averages > 1.0 mg/L? *If yes, Chlorite MCL violation (Tier 1 violation)*

C. Bromate: Community Water Systems and Non-transient, Non-community Water Systems must sample for Bromate on a monthly (Routine) basis at each EPDS associated to treatment plants using Ozone.

Treatment Plant Name: _____ EPDS number: _____

Monthly Bromate Sampling Date (Date or week of): _____

Date Treatment Plant began using Ozone: _____

***Bromate Compliance:** Running Annual Average (RAA) of Bromate results are ≤ 0.010 mg/L.

Please attach a map of the distribution system, with the location(s) of the Source, Treatment Plant, Entry to the Distribution system (EPDS), and Distribution System sample points identified, as applicable.

**Please keep a copy of this Sample Siting Plan readily available for use at your PWS. Also send a copy of this plan to Arizona Department of Environmental Quality (ADEQ) for reference in your facility file, by 09/01/2016. If at any point your sample locations need to change please fill out a new form and notify ADEQ.*

I hereby certify that the information provided on this form is accurate and correct to the best of my knowledge.

Authorized Name: _____ Authorized Signature: _____