

**LABORATORY
REPORTING INSTRUCTIONS
for**

**DISINFECTION BYPRODUCTS
& PRECURSORS**

ALKALINITY, BROMATE, CHLORITE, DISSOLVED ORGANIC
CARBON, HALOACETIC ACIDS, SPECIFIC ULTRAVIOLET
ABSORBANCE, TOTAL ORGANIC CARBON, TOTAL
TRIHALOMETHANES, AND ULTRAVIOLET 254

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pennsylvania

DEPARTMENT OF ENVIRONMENTAL
PROTECTION

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Safe Drinking Water

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TITLE: Laboratory Reporting Instructions for Disinfection Byproducts and Precursors

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AUTHORITY: Pennsylvania's Safe Drinking Water Act (35 P.S. §721.1 *et seq.*) and regulations Title 25 *Pa. Code* Chapter 109

POLICY: The Department of Environmental Protection (DEP) provides laboratory directors of accredited laboratories, individuals certified to perform analysis, and public water supply personnel with the information necessary to properly report disinfection byproduct monitoring data under the safe drinking water program.

PURPOSE: The purpose of this document is to establish uniform instructions and protocol for implementing the drinking water reporting requirements for alkalinity, chlorite, bromate, total trihalomethanes, haloacetic acids, total organic carbon, ultraviolet 254 (UV₂₅₄) and dissolved organic carbon for the calculation of specific ultraviolet absorbance.

APPLICABILITY: This guidance will apply to all accredited laboratories and public water systems that are required to submit monitoring results to DEP for: alkalinity, bromate, chlorite, dissolved organic carbon, haloacetic acids, total organic carbon, total trihalomethanes, and UV₂₅₄.

DISCLAIMER: The policies and procedures outlined in this guidance document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. DEP does not intend to give this guidance that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

PAGE LENGTH: 56 pages

DEFINITIONS: See Title 25 *Pa. Code* Chapter 109

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SECTION 1: INTRODUCTION

The *Laboratory Reporting Instructions for Disinfection Byproducts and Precursors* technical guidance provides instructions for reporting disinfection byproducts in drinking water, such as total trihalomethanes (TTHM), five haloacetic acids (HAA5), chlorite, and bromate; and precursors, such as total organic carbon (TOC), alkalinity, and dissolved organic carbon (DOC) and ultraviolet 254 (UV₂₅₄). DOC and UV₂₅₄ are needed to calculate specific ultraviolet absorbance (SUVA). The *Disinfectants/Disinfection Byproducts Rules* (D/DBPRs) require public drinking water monitoring and the reporting to the Department of Environmental Protection (DEP).

BACKGROUND

D/DBPRs intent is to minimize disinfection byproducts in public drinking water that may cause harmful health effects. The D/DBPRs are applicable to all community water systems (CWS), non-transient noncommunity water systems (NTNCWS) that add an oxidizing disinfectant, and consecutive systems that deliver water treated with an oxidizing disinfectant. The D/DBPRs regulate treatment practices, at public water systems (PWSs), to eliminate or minimize disinfectant levels and Disinfection Byproducts (DBPs) that may cause harmful health effects. The D/DBPRs established maximum residual disinfectant levels (MRDLs) for chlorine and chlorine dioxide and maximum contaminant levels (MCLs) for TTHM, HAA5, bromate and chlorite. Goals of the D/DBPRs include pre-filtration treatment techniques for PWSs that use conventional filtration to reduce source water TOC and reduction of TTHM and HAA5 concentrations. TOCs may serve as a precursor to DBPs and TTHMs and HAA5s act as indicators for the various byproducts of chemical disinfection. The TTHM and HAA5 MCL compliance is determined for each sample site as a locational running annual average (LRAA). An operational evaluation level (OEL) is a LRAA threshold meant to help systems in danger of exceeding the MCL in the following monitoring quarter. The process alerts the system to the potential of an MCL violation, if DBP concentrations remain at their current level, and encourages the system to consider whether operational changes are necessary to reduce DBP levels.

Reader's Note: Laboratory reporting instructions for the monitoring/reporting requirements for the Disinfectants Residuals are addressed in the *Laboratory Reporting Instructions for Disinfectant Residual Technical Guidance manual*, available on DEP's website at <http://www.depgreenport.state.pa.us/elibrary/search>. Enter “*Laboratory Reporting Instructions*” into the document name search. The Disinfectant Residual manual contains information on Entry Point and Distribution System residual disinfectants results reporting.

In addition, please note that turbidity reporting requirements are not included in this technical guidance. Refer to DEP's website at <http://www.depgreenport.state.pa.us/elibrary/>. Reporting turbidity data is also required under the *PA Filter Rules*.

General Monitoring and Reporting Information

Drinking water analysis results are entered into the *Pennsylvania Drinking Water Information System (PADWIS)* via *Drinking Water Electronic Laboratory Reporting (DWELR)*. PADWIS is a computerized data management system used by DEP to track drinking water monitoring results. More instructions about reporting through DWELR are available in [Section 3: Electronic Assistance Tools](#) in this technical guidance manual and on DEP’s website at <http://www.dep.pa.gov/>, (enter “DWELR”).

Please read the instructions in this technical guidance manual thoroughly. Failure to monitor, analyze and/or report analytical results correctly may result in the water supplier incurring a violation of the Safe Drinking Water Regulations. A **SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS form** is used to report disinfection byproducts and disinfection byproduct precursors data electronically. Reporting on the SDWA-1 form is explained in [Section 4: Disinfection Byproducts](#), [Section 5: Disinfection Byproduct Precursors](#), and [Section 10: Case Examples](#) in this technical guidance manual.

The monitoring and reporting requirements described in this manual are in addition to, and do not supersede, other routine monitoring and reporting requirements for PWSs. To summarize, for PWSs that use a chemical disinfectant or oxidant, the *D/DBPRs* establish treatment techniques, and monitoring and reporting requirements. The requirements are shown in the following Table 1: Treatment Techniques and General Monitoring and Reporting Requirements.

Table 1: Treatment Techniques and General Monitoring and Reporting Requirements

<i>Location</i>	<i>Treatment Techniques, and Monitoring and Reporting Requirements</i>
Entry Point	Chlorite and Bromate
Distribution System	Chlorite, Bromate, TTHM and HAA5
Source Water	Alkalinity
Source and Treated Water	TOC and, DOC and UV ₂₅₄ for “optional” SUVA

SECTION 2: RESPONSIBILITIES OF THE LABORATORY

Under the provisions of Title 25 *Pa. Code* Chapter 109, Safe Drinking Water Regulations, and the authority of the PA Safe Drinking Water Act (SDWA), it is the responsibility of the accredited laboratory to:

1. Submit the results of analyses performed by the laboratory under the Safe Drinking Water Regulations to DEP in an electronic format acceptable to DEP, using a secure computer application provided by DEP, as per 25 *Pa. Code* §109.810(a).
 - a) In the event of a DEP computer application failure, DEP will notify the laboratory of an alternate reporting method.
 - b) If a laboratory is unable to submit data electronically, due to circumstances beyond its control, the laboratory shall notify DEP prior to the applicable reporting deadline. If DEP determines that the circumstances were beyond the control of the laboratory, DEP will specify a temporary, alternate reporting method the laboratory shall use to meet the reporting deadline.
2. Report the results within either the first 10 days following the month that the result is determined or the first 10 days following the end of the required monitoring period as stipulated by DEP, whichever is shorter, as per 25 *Pa. Code* §109.810(a)(1). ***Failure to report on or before the 10th day of the following month will result in the water supplier incurring a violation for failure to monitor.***
3. Obtain and maintain the DEP and County Health Department (CHD) current after-hours emergency response telephone numbers for each applicable DEP regional and CHD office.

DEP District Office and CHD contact information, by county, can be found by searching for document 3930-FM-BSDW0560 in eLibrary at the following link:
<http://www.depgreenport.state.pa.us/elibrary/Search>
4. Establish and maintain a standard operating procedure to provide the information needed to report a violation listed below to DEP. This procedure should be verified at least annually.
5. Under Pennsylvania Chapter 25 *Pa. Code* Chapters 109 and 252, notify customers served by the laboratory within 72 hours of the following:
 - a) Failure to renew or DEP denial of renewal of existing accreditation for a category of laboratory accreditation.
 - b) Revocation of accreditation by DEP for the environmental laboratory conducting testing or analysis of drinking water under 25 *Pa. Code* Chapter 109.

Whenever an MCL or a treatment technique performance requirement is exceeded, or a sample result requires the collection of check samples, according to Title 25 Pa. Code Chapter 109.810(b), the accredited laboratory must:

1. Notify the public water supply (PWS) by telephone within 1 hour of the laboratory's determination. If the supplier cannot be reached within 1 hour, notify DEP by telephone within 2 hours of the determination. If the PWS is regulated under a CHD office, the appropriate Health Department office must be notified. If it is necessary for the laboratory to contact DEP or CHD after routine business hours, the laboratory must contact the appropriate agency's after-hours emergency response telephone number. If the appropriate DEP or CHD emergency number cannot be reached, the laboratory must notify the appropriate DEP regional office by telephone within 1 hour of the beginning of the next business day.

The laboratory must provide information regarding the occurrence, the name of a laboratory contact person and the telephone number where that individual may be reached in the event further information is needed. The information regarding the PWS relayed to DEP or CHD must include, as per 25 Pa. Code §109.810(b)(1)(ii), but is not limited to:

- The public water system's identification ID number (PWSID).
 - Public water system's name.
 - Parameter (contaminant) involved in the exceedance.
 - Level of the parameter (contaminant) found.
 - Where the sample was collected.
 - Date and time that the sample was collected and analyzed.
 - Name and laboratory identification number.
 - Name and telephone number of a contact person at the laboratory.
 - Steps the laboratory took to contact the PWS before calling DEP.
2. Notify the appropriate DEP district office or CHD in writing within 24 hours of the determination, as per 25 Pa. Code §109.810(b)(2). Please use DEP document number 3930-FM-BSDW0061, found in eLibrary at <http://www.depgreenport.state.pa.us/elibrary/> and fax to the local DEP or CHD office.

With the permission of the district office, the form may be sent via email to the local DEP district office.

Note: Proper reporting and notification of analytical results to DEP is required. Failure to properly report results may lead to the revocation of accreditation. An effective surveillance program requires prompt follow-up for MCL, treatment technique, and monitoring violations to protect public health. Your assistance is critical regarding accurate and prompt data reporting.

Information recording who collected and analyzed the samples is to be documented and retained by the laboratory, as per 25 Pa. Code §252.401. For the samples that were collected by water system personnel rather than laboratory personnel, the laboratory must retain a copy of the chain of custody.

Additionally, laboratories must retain records, including original handwritten data that would allow reconstruction of all laboratory activities associated with the testing or analysis of environmental

samples for a minimum of 5 years and as required under 25 Pa. Code §109.701 and §252.706. The records must be complete enough so that assessors can reconstruct the entire analysis and all the activities related to generating the final result using the laboratory's records.

Records of analyses data must also be kept by the PWSs as required per 25 Pa. Code §109.701.

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SECTION 3: ELECTRONIC ASSISTANCE TOOLS

The following electronic assistance tools are available from DEP:

SUBSECTION A: DRINKING WATER ELECTRONIC LABORATORY REPORTING (DWELR)

All PWSs and accredited laboratories must use DWELR to report electronically, according to 25 *Pa. Code* §§109.701(j) and 109.810. DWELR is a DEP GreenPort web application for PWSs and accredited laboratories to upload sample files and/or manually enter sample results using a web screen entry form. To access DWELR, you need to have a DEP GreenPort user profile. If you do not already have a GreenPort user profile, go to GreenPort: www.depgreenport.state.pa.us and “click here to self-register.” Please contact the DEP GreenPort Helpdesk at 717-787-HELP, if you need help setting up a user account. The DWELR registration form and instructions are available online at www.depgreenport.state.pa.us/elibrary/Search. Search “*DWELR*”. DEP’s Bureau of Safe Drinking Water, Pennsylvania Drinking Water Information System (PADWIS) section may be reached at 717-772-4018 or ra-padwis@pa.gov for more information about DWELR.

DWELR’s features allow PWSs or accredited laboratories to:

- Submit data via either upload or data entry.
- Preview the data entered. A DWELR user can *view* all data submitted for the PWS(s) the user represents, regardless of who submitted it, but can only *edit* the data submitted by the user.
- Submit the data *until the 10th (by 11:59pm)* of the month. On the 11th of each month, all data is cleared from DWELR and passed to PADWIS for monthly compliance processing.
- View error reports. Upon submittal, the data is checked, and an error report is generated.
- Correct data and resubmit until the 10th of the month.

Detailed instructions are contained in the DWELR web application. Entities choosing to upload their data can retrieve the data formats from within DWELR. Accredited laboratories are obligated to provide the laboratory results to their client (PWS.) The format used to report these results is a decision to be determined mutually by the laboratory and the client.

NOTE: DWELR only stores the data temporarily. While the data remains in DWELR, it can be viewed by the submitting lab and the water system. The data is not available to be viewed by other labs or water systems. After midnight on the 10th of the month (11th), the data is moved from DWELR to PADWIS. Data stored in PADWIS includes drinking water system information, laboratory accreditation information and drinking water sample data.

When a lab submits data, a validation routine is run on the data. This routine includes checks for valid water system and lab ID numbers, analyte and method codes, along with lab accreditation status. Results that are invalid are displayed on the *Error Report* screen. Users should make necessary corrections to the data on this screen and resubmit the records. The routine will be run every time a user submits or re-submits data. Email notifications will be sent to users if they have any uncorrected errors in their data on the 1st, 5th and 9th of every month. The submitting lab is responsible for making any corrections that are necessary.

On the 11th of the month, all data is cleared from DWELR and passed to PADWIS for monthly compliance processing. Sample results, without errors, entered on or before the 10th of the month will be

included in the current reporting period. Sample results entered on or after the 11th will be included in the next reporting period and may result in late reporting violations. After sample results are in PADWIS, they are viewable online through DWRS. Please note: there may be a 2-day lag between when the data are removed from DWELR and when they are available in DWRS.

SUBSECTION B: DWRS AND CONSUMER CONFIDENCE REPORTING SYSTEM

DEP provides the following assistance tools, which can be found on the DEP website at www.drinkingwater.state.pa.us:

- **Drinking Water Reporting System (DWRS):** Provides dynamic reports on *inventory* and *sample* information for water systems from PADWIS. Instructions on how to use DWRS can be accessed from the DEP web page.
- **Consumer Confidence Reporting System:** Provides *detection* and *violation* information from PADWIS to assist community water systems with the preparation of the annual Consumer Confidence Reports.

SECTION 4: DISINFECTION BYPRODUCTS

Regulated disinfection byproducts:

- Total Trihalomethanes (TTHM) – includes the sum of the following 4 contaminants:
 - Chloroform
 - Dibromochloromethane
 - Bromoform
 - Bromodichloromethane
- Haloacetic Acids (HAA5) - includes the sum of the following 5 contaminants:
 - Monochloroacetic acid
 - Dichloroacetic acid
 - Trichloroacetic acid
 - Monobromoacetic acid
 - Dibromoacetic acid
- Chlorite (for systems using chlorine dioxide)
- Bromate (for systems using ozone)

The maximum contaminant level (MCL), which establishes the maximum level allowed in public drinking water, as incorporated under 25 *Pa. Code* §109.202(a)(2), are as follows:

- **The MCL for TTHM is 0.080 milligrams per liter (mg/L).**
- **The MCL for HAA5 is 0.060 mg/L.**
- **The MCL for chlorite is 1.0 mg/L.**
- **The MCL for bromate is 0.010 mg/L.**

PWSs and accredited laboratories need to report disinfection byproduct data as shown on the following page in Table 2: Electronic Forms and Reporting Requirements for Disinfection Byproducts:

Note: Consecutive water systems that obtain finished water from another PWS that either uses chlorine, chloramines or chlorine dioxide shall monitor for TTHM and HAA5, as per 25 *Pa. Code* §109.301(8)(vi). (For the purposes of this section, PWS refers only to Community water systems and Nontransient, noncommunity water systems.)

Table 2: Electronic Forms and Reporting Requirements for Disinfection Byproducts

Form	Public Water System	Reporting Requirements and Purpose
SDWA-1	PWSs using a <i>chemical disinfectant or oxidant</i>	Report quarterly all distribution system TTHM and HAA5 sample results. Report all individual THM and HAA constituents in addition to the totals.
	PWSs using <i>Chlorine Dioxide</i>	Report monthly all entry point and distribution system Chlorite sample results.
	Chlorite is the disinfection byproduct of concern.	The number of Chlorite samples taken is determined by the number of entry point treatment days or the number of days that Chlorine Dioxide is used at each entry point.
	PWSs using <i>Ozone</i>	Report quarterly all entry point Bromate sample results.

Refer to each PWS’s specific monitoring calendar; go to the Drinking Water Reporting System (DWRS) online link at: www.drinkingwater.state.pa.us/dwrs/HTM/SelectionCriteria.html or request the schedule from the PWS. On the DWRS web page, enter the PWSID number or PWS name, choose “Inventory Information” and “Monitoring Requirements” from the drop-down menus.

SUBSECTION A: SDWA-1 FORM; INSTRUCTIONS FOR REPORTING DISINFECTION BYPRODUCTS

The SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS form is submitted electronically through the DEP DWELR. See [Section 3: Electronic Assistance Tools](#) in this manual for information on how to gain permissions for DWELR.

A SDWA-1 form screenshot and descriptions of how the completed forms should appear in DWELR are on the following pages:

In DEP Greenport, enter *DWELR* and go to the Main Menu:

Safe Drinking Water Act



Choose from the Main Menu options

- Add New Records
- Upload File
- View and Edit Records
- Error Report
- Search Records
- Inbox
- Copy of Record
- Instructions and Messages
- Trading Partner Agreement
- Quality Assurance Procedure
- Exit



Safe Drinking Water Act



Choose from the list of SDWA forms

SDWA-1 Bacteriological / Residual Disinfectant / Turbidity / DBP Analysis
SDWA-4 Chemical / Radiological Data
SDWA-4U Unregulated Inorganic / Organic Data
SDWA-5 Monthly Filter Plant Performance Data
SDWA-S Summarized Analysis Data
Cryptosporidium Oocysts Data

SAFE DRINKING WATER ACT SDWA-1



Safe Drinking Water Act



Start entries on the first line; do not skip to the second line or the data might not enter properly.

SDWA 1 - BACTERIOLOGICAL / RESIDUAL DISINFECTANT / TURBIDITY / DBP ANALYSIS

SDWA-1

		Current Lab Certifications				Contaminants not Requiring Certification							
	PWSID	PWS Name	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Sample ID
Copy Previous													
Copy Previous													
Copy Previous													
Copy Previous													
Copy Previous													
Copy Previous													
Copy Previous													

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts

DATA FIELD	DESCRIPTION
PWSID	Enter the 7-digit identification number (ID) of the PWS to which these samples apply. Failure to enter the correct PWSID will result in the water supplier not receiving credit for conducting the required monitoring. If you do not know the PWSID, contact the local DEP or CHD office. All PWSID numbers are assigned by the local DEP or CHD office.
PWS NAME	The system automatically enters the name of the PWS after the PWSID is entered.
PARAMETER/ CONTAMINANT ID and ANALYSIS METHOD	<p>Enter the appropriate 4-digit Parameter/Contaminant identification code (ID). Enter the 3-digit code of the approved analysis method used to analyze the samples (see Section 6: Data Codes for Reporting Monitoring Results). See Table 4 for the Parameter/Contaminant ID and the Method codes for: Bromate, Chlorite, Total Trihalomethanes (TTHM), and Haloacetic Acids (HAA5).</p> <p>TTHM, HAA5, Bromate and monthly distribution system Chlorite analyses must be performed by a laboratory accredited in the analysis method, as per <i>25 Pa. Code</i> §109.304. Daily entry point Chlorite analyses may be performed by a certified operator using approved methods.</p>
ANALYSIS DATE	Enter the date (MMDDYY) that the sample analysis was performed, or if the analysis spanned more than 1 day, enter the date that the sample result was obtained. Example: For April 15, 2019, enter 041519. For daily chlorite measurements, the analysis date must be the same as the sample date, as per the approved methods.
ANALYSIS RESULT	Enter the result for each sample analyzed. Unless otherwise specified, report results to the least significant digit of the MCL or MRDL. Enter the decimal point directly in the result field.

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts (continued)

DATA FIELD	DESCRIPTION
ANALYSIS RESULT (continued)	<p><u>Entry Point Measurements.</u></p> <p>Report an entry point measurement for each day of the month that treatment is in use.</p> <p>A. Bromate: A monthly sample is required for PWSs using ozone (excludes consecutive systems and purchased water entry points unless the purchasing system treats the water with ozone).</p> <p>PWSs on reduced monitoring report bromate on a quarterly frequency, e.g.-the PWS collects and reports a sample each quarter. To remain on reduced monitoring, as per <i>25 Pa. Code</i> §109.301(12)(iv)(B)(II), the PWS must have a bromate running annual average (RAA) of less than or equal to 0.0025 mg/L.</p> <p>Report all results in mg/L to at least the nearest thousandths decimal place.</p> <p>B. Chlorite: Applies only to systems using chlorine dioxide for any reason (excludes transient, noncommunity water systems and systems that obtain finished water from another PWS unless the purchasing system treats the water with chlorine dioxide):</p> <ul style="list-style-type: none"> • Report monthly, one measurement for each chlorine dioxide entry point treatment day. • An entry point treatment day is equal to 1 entry point through which water treated with chlorine dioxide was delivered to the distribution system for any portion of 1 day. If more than 1 measurement per day is taken from a location, report the highest value for that location each day. • Report all results in mg/L to at least the nearest tenths decimal place. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note: For additional information about Chlorine Dioxide residuals reporting requirements see the <i>Laboratory Reporting Instructions for Disinfectant Residual Technical Guidance manual</i>, available on DEP’s website at www.elibrary.dep.state.pa.us/dsweb/HomePage. Enter “*Laboratory Reporting Instructions*” into the search at the top of the web page.</p> </div>

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts (continued)

DATA FIELD	DESCRIPTION
<p>ANALYSIS RESULT (continued)</p>	<p><u>Distribution System Measurements.</u></p> <p>A. Chlorite: Report monthly, the measurements of each chlorite 3-sample set collected during the month. Collect a 3-sample set in the distribution system at least once each month. If any entry point chlorite measurement exceeds 1.0 mg/L, a 3-sample set must be collected in the distribution system on the day following the exceedance according to <i>25 Pa. Code §109.301(12)(iii)(A)(III)</i>. (This will also satisfy the monthly monitoring requirement). Monitoring may be reduced to quarterly after the PWS demonstrates a year of chlorite distribution results less than the MCL.</p> <p>The distribution system samples must be collected on the same day from the following locations, as per <i>25 Pa. Code §109.301(12)(iii)(A)</i>:</p> <ul style="list-style-type: none"> • A site as close as possible to the first customer, • A site representing average residence time, and • A site representing maximum residence time. <p>B. Total Trihalomethanes and Haloacetic Acids (TTHM/HAA5): Report all results in mg/L to at least the nearest thousandths decimal place. If any result is less than the method detection limit, report the result as ‘0’ (zero). Report all individual THM and HAA constituents in addition to the totals.</p>
<p>LOCATION ID1 (Location ID, EP ID, SP ID, or Plant ID)</p>	<p>Enter a unique 3-digit number which identifies the location at which the sample was collected.</p> <p><u>Entry Point Measurements; Chlorite and Bromate:</u> Enter the 3-digit Entry Point ID in the Location ID1 column. DEP or CHD assigned Entry Point ID Numbers that always begin with “1”, (e.g., 101).</p>

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts (continued)

DATA FIELD	DESCRIPTION
LOCATION ID1 (Location ID, EP ID, SP ID, or Plant ID) (continued)	<p><u>Distribution System Measurements:</u> Enter the 3-digit distribution system sample location ID in the Location ID1 column. Distribution system ID numbers are not assigned by DEP or CHD. The water supplier assigns a unique 3-digit number for each distribution sample location. These ID numbers should be specified in the water supplier’s D/DBPR monitoring plan.</p> <p>Chlorite: Measurements must be taken on the <i>same day</i> from the locations as described on the previous page.</p> <p><u>Sample Point (SP) Measurements:</u> Enter the 3-digit distribution system sample point (SP) location ID in the Location ID1 column.</p> <p>TTHM/HAA5: SP location IDs are identified in the D/DBPR monitoring plan. TTHM and HAA5 samples are often referred to as a <i>sample set</i>. Although “dual” sample sets are common, some systems may have a separate TTHM SP <i>and</i> a separate HAA5 SP or TTHMs may be taken during a different month than HAA5s based on historic sample results.</p>
LOCATION ID2	Leave blank; ID2 is not applicable for any of the Parameters/Contaminants previously discussed.
SAMPLE DATE	Enter the date (MMDDYY) that the sample was collected. For daily chlorite measurements, the sample date will be the same as the analysis date. Example: For a sample collected October 2, 2019 enter the date as 100219

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts (continued)

DATA FIELD	DESCRIPTION
SAMPLE TYPE	<p>Enter the appropriate letter code which corresponds to the type of sample collected as follows:</p> <p>E = Entry Point: Samples taken at the entry point to the distribution system are “E” samples. D = Distribution: Samples taken in the distribution system are “D” samples. S = Special: A supplier may wish to collect and have analyzed special samples to meet his own need or may be required by DEP or a CHD to take samples to fulfill a special requirement. For example, a PWS may be ordered to take delinquent samples after a monitoring period has ended. Such samples should be coded as “S” samples.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Note: Failure to report analysis results with the correct and appropriate sample type codes will result in the water supplier receiving violations for failure to monitor.</p> </div>
SAMPLE TIME	<p>Enter the time of day at which the sample was collected. If the exact time is not known, enter an approximate time. Enter sample times as military time. Example: for 5:15 p.m. enter as 1715; for 8:30 a.m. enter as 0830.</p>
LAB ID	<p>Enter the 5-digit PA Laboratory Identification Number assigned to the laboratory that analyzed the samples. This is a required field for results to be accepted. Do not use dashes or symbols.</p>
SAMPLE ID	<p>(Optional) Enter the unique laboratory sample identification.</p>

SECTION 5: DISINFECTION BYPRODUCTS PRECURSORS

Regulated Disinfection Byproduct Precursors

- Total Organic Carbon (TOC)
- Alkalinity
- Specific Ultraviolet Absorbance (SUVA):
 - Dissolved Organic Carbon (DOC)
 - Ultraviolet 254 (UV₂₅₄)

PWSs and accredited laboratories should report disinfection by-product precursor data as shown in the following table:

Table 3: General Reporting Requirements for Disinfection Byproducts Precursors

Form	Requirements apply to:	Purpose
SDWA-1	PWSs with conventional filtration.	<p>Report all paired TOC (source and treated) sample results.</p> <p>Report all source water alkalinity results. Alkalinity samples must be taken at the same time and on the same day as TOC samples, as per <i>25 Pa. Code</i> §109.301(12)(v)(A).</p> <p>Report all individual UV₂₅₄ and DOC sample results.</p> <p>Report SUVA values (calculation based on the UV₂₅₄ and the DOC sample results.)</p>
	PWSs with surface water or GUDI sources that wish to qualify for reduced TTHM/HAA5 monitoring. (12 months of TOC sample results are needed to qualify for reduced TTHM/HAA5 monitoring. Once on reduced TTHM/HAA5 monitoring, frequency is decreased to quarterly (every 90 days.))	Report all source water TOC sample results.
<p>Key: TOC = total organic carbon DOC = dissolved organic carbon UV₂₅₄ = ultraviolet 254 SUVA = Specific ultraviolet absorbance</p>		

Refer to each PWS's systems specific monitoring calendar; go to the DWRS online link at: www.drinkingwater.state.pa.us/dwrs/HTM/SelectionCriteria.html or request the schedule from the PWS.

On the DWRS website, enter the PWSID number or PWS name, choose “Inventory Information” and “Monitoring Requirements” from the drop-down menus.

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Notes: For PWS treatment plants served by multiple sources, the source TOC and alkalinity samples should be taken at a **blended source** water tap (prior to any treatment).

If a blended tap is not available, sample each source prior to any treatment and composite a blended sample (based on the proportion each source contributes) to provide a blended source TOC and a blended source alkalinity sample to the lab.

For example: A treatment plant is supplied by two sources. A blended source water tap is not available. Source A contributes 70% of the total plant flow, and Source B contributes 30% of the total plant flow. Collect 500 mL of water from each source in separate sample containers. In a third 500 mL sample bottle, combine 350 mL from Source A with 150 mL from Source B. Use the blended source water to fill the bottles for TOC and Alkalinity.

SUBSECTION: SDWA-1 FORM; INSTRUCTIONS FOR REPORTING DISINFECTION BYPRODUCT PRECURSORS

The SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS form is submitted electronically through the DEP DWELR on-line pages.

See the previous section, [Section 4, Subsection A](#), in this manual to view a screenshot of the SDWA-1 form. A description of the SDWA-1 form and instructions on how to complete the form for disinfection byproduct precursors are on the following pages.

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts Precursors

DATA FIELD	DESCRIPTION
PWS ID	Enter the 7-digit identification number of the PWS to which these samples apply. Failure to enter the PWS ID will result in the water supplier not receiving credit for conducting the required monitoring. If you do not know the PWS ID number, contact the local DEP or CHD office, or check DEP's website. All PWS ID numbers are assigned by the local DEP or CHD office.
PARAMETER/ CONTAMINANT ID and ANALYSIS METHOD	Enter the 4-digit identification code for the Contaminant/Parameter being reported. See Table 5 for the Parameter/Contaminant ID and the Method codes for: Alkalinity, Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC), and UV ₂₅₄ for Specific Ultraviolet Absorbance (SUVA). Enter the 3-digit code of the approved analysis method used to analyze the samples. According to 25 Pa. Code §109.304, TOC, DOC and UV ₂₅₄ analyses must be conducted by a laboratory accredited for that analysis method. Alkalinity may be analyzed by a certified water plant operator.
ANALYSIS RESULT	Enter the result of each sample analyzed. Unless otherwise specified, report results to the least significant digit of the MCL or MRDL. Enter the decimal point directly in the result field.

Total Organic Carbon (TOC):

- A. **Required TOC Monitoring:** This monitoring applies to systems using conventional filtration. A *paired* source water and post-sedimentation sample set is required each month, collected at the same time, on the same day.

Note: If the treatment plant experiences detention times that exceed 24 hours, the PWS may collect the post-sedimentation sample the day following the collection of the source water sample.

Report the paired measurements in mg/L to at least the nearest tenths decimal place for each month by the 10th of the month following collection or end of the quarter, whichever is sooner.

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts Precursors (continued)

DATA FIELD	DESCRIPTION
ANALYSIS RESULT (continued)	<p data-bbox="478 326 1050 358"><u>Total Organic Carbon (TOC) (continued):</u></p> <p data-bbox="478 399 1665 431">B. Optional TOC Source Water Monitoring for Reduced TTHM/HAA5 Monitoring:</p> <p data-bbox="558 472 1843 691">To qualify for reduced TTHM/HAA5 monitoring, monthly <i>source water</i> TOC samples are collected every 30 days at a location prior to treatment. After monthly TOC samples have been collected for one year, a PWS may reduce the TTHM/HAA5 monitoring frequency, if the source water TOC running annual average (RAA) is less than or equal to 4.0 mg/L and all other requirements to qualify for reduced TTHM/HAA5 monitoring have been met. Surface water PWSs need to report source water TOC results on a quarterly basis to remain on reduced TTHM/HAA5 monitoring.</p> <p data-bbox="558 732 1850 797">Consecutive PWSs need to use the selling system's TOC results to qualify for reduced TTHM/HAA5 monitoring.</p> <p data-bbox="478 870 630 902"><u>Alkalinity:</u></p> <p data-bbox="478 902 1843 1122">Applies to systems using conventional filtration. A source water alkalinity sample must be collected at the same time and on the same day as the paired TOC sample set each month, as per <i>25 Pa. Code §109.301(12)(v)(A)</i>. The source water alkalinity analysis may be conducted by an appropriately certified water plant operator or a person using a standard operating procedure developed by an appropriately certified operator. Report the results in mg/L to at least the nearest tenths decimal place for each month by the 10th of the month following collection or the end of the quarter, whichever is sooner.</p> <p data-bbox="478 1162 1549 1195"><u>Optional UV₂₅₄ and DOC to calculate Specific Ultraviolet Absorbance (SUVA):</u></p> <p data-bbox="478 1195 1850 1341">A monthly SUVA calculation is required for systems wishing to use source water and finished water SUVA results as an Alternative Compliance Criteria (ACC) for compliance with the DBP precursor treatment technique. SUVA is defined as the UV absorption at 254 nm (UV₂₅₄) measured as cm⁻¹, divided by the DOC concentration in mg/L.</p> <p data-bbox="478 1341 1297 1375">SUVA (L/mg-m) = [UV₂₅₄ (cm⁻¹) X 100 (cm/m)] / DOC (mg/L)</p>

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts Precursors (continued)

DATA FIELD	DESCRIPTION
ANALYSIS RESULT (continued)	<p><u>Optional UV₂₅₄ and DOC to calculate Specific Ultraviolet Absorbance (SUVA):</u> UV₂₅₄ and DOC samples used to determine the SUVA value must be collected at the same time and at the same location (i.e., source water and/or finished water), as per 40 CFR 141.131(d)(4). Report monthly results quarterly: the UV₂₅₄ result in cm⁻¹ and the DOC measurement in mg/L by the 10th of the month following the end of the quarter. The sample dates need be the same for all three parameters when completing the forms.</p>
ANALYSIS DATE MMDDYY	<p>Enter the date (MMDDYY) that the sample analysis was performed, or measurement taken. If the analysis spanned more than 1 day, enter the date that the sample analysis result was obtained. Example: Enter August 15, 2019, as 081519.</p>
LOCATION ID1 (Location ID, EP ID, or Treatment Plant ID)	<p>Enter a unique 3-digit number which identifies the location at which the sample was collected.</p> <p><u>TOC:</u> Enter the 3-digit Treatment Plant ID number in the Location ID1 column. Contact your local DEP or CHD office to obtain this ID number.</p> <p>Systems with conventional filtration collect a paired sample set: One (1) sample is collected from the source (raw) water and one (1) sample is collected from a post-sedimentation location (preferably combined filter effluent). Report both the source water and the post-sedimentation TOC sample results; use the same 3-digit Treatment Plant ID number. Systems conducting optional TOC monitoring, to qualify for reduced TTHM/HAA5 monitoring, collect a source (raw) water sample.</p> <p><u>Alkalinity:</u> Enter the 3-digit Treatment Plant ID number in the Location ID1 column.</p>

SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS Form Instructions for Electronic Reporting of Disinfection Byproducts Precursors (continued)

DATA FIELD	DESCRIPTION
LOCATION ID1 (Location ID, EP ID, or Treatment Plant ID) (continued)	<u>DOC and UV₂₅₄ (entered to PADWIS to calculate SUVA):</u> Enter the 3-digit Treatment Plant ID number in the Location ID1 column. The sample results for UV ₂₅₄ and DOC may either be from source water or from finished water samples. Finished water samples are collected at the entry point and before any oxidant is added. Since most plants provide water that contains an oxidant, finished SUVA can be measured in jar tests that simulate the plant's actual treatment without the oxidant.
LOCATION ID2	Leave the Location ID2 column blank; ID2 does not apply to TOC, alkalinity, or DOC and UV ₂₅₄ .
SAMPLE DATE	Enter the date (MMDDYY) the sample was collected. Example: For a sample collected October 2, 2019 enter the date as 100219.
SAMPLE TYPE	Enter the appropriate letter code which corresponds to the type of sample collected as follows: R = Raw: All source water samples. P = Plant: All post-sedimentation TOC samples and all finished water UV ₂₅₄ and DOC samples S = Special: A supplier may wish to collect and have analyzed special samples to meet his own need or may be required by DEP or CHD to take samples to fulfill a special requirement. For example, a PWS may be ordered to take delinquent samples <u>after</u> a monitoring period has ended.
SAMPLE TIME	Enter the time of day at which the sample was collected. If the exact time is not known, enter an approximate time. Enter sample times in military time. Examples: for 5:15 p.m. enter as 1715; for 8:30 a.m. enter as 0830.
LAB ID	Enter the 5-digit PA Laboratory Identification Number assigned to the laboratory that analyzed the samples.
SAMPLE ID	Enter the unique laboratory sample identification; sample ID is currently an optional field.

SECTION 6: DATA CODES FOR REPORTING MONITORING RESULTS

This section contains parameter and method codes for *disinfection byproducts* and *disinfection byproducts precursors*. Table 4, on this and the following page, contains (disinfection byproducts) codes for reporting Bromate, Chlorite, HAA5, TOC and TTHM results.

Table 4: Codes for Reporting Bromate, Chlorite, HAA5, TOC and TTHM Results

Parameter Name	Parameter Code	EPA Analysis Method	DEP Method Code	Units
Bromate	1011	Ion Chromatography: 300.1 or ASTM D6581-00	120	mg/L
		Ion Chromatography & post column reaction: 317.0 Rev 2.0	172	
		Ion Chromatography & post column reaction: 326.0	173	
		Ion Chromatography / ICP-MS: 321.8	174	
		Two-Dimensional Ion Chromatography: 302	189	
		Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry: 557	234	
		Chemically Suppressed Ion Chromatography: ASTM D6581-08A	994	
		Electrolytically Suppressed Ion Chromatography: ASTM D6581-08B	995	
Chlorite*	1009	(Monthly) Ion Chromatography: 300.0	120	mg/L
		(Monthly) Ion Chromatography: 300.1 or ASTM D6581-00		
		(Monthly) Ion Chromatography: 317.0 Rev 2.0	172	
		(Monthly) Ion Chromatography: 326.0	173	
		(Monthly) Chemically Suppressed Ion Chromatography: ASTM D6581-08A	994	
		(Monthly) Electrolytically Suppressed Ion Chromatography: ASTM D6581-08B	995	
		(Daily) Lissamine Green Spectrophotometric: 327.0 Rev 1.1	175	
		(Daily) Standard Method 4500 ClO ₂ -E Amperometric Method II	594	
		(Daily) Amperometric Sensor (Palin Test) Chlorosense & ChlordioX Plus 32	596	

Table 4 continues on the next page.

Key:

mg/L = milligrams per liter

*-The daily entry point chlorite samples may be analyzed by any of the methods listed above; however, if Ion Chromatography is used, the samples need to be analyzed by a lab accredited for that method. All monthly distribution chlorite samples must be analyzed by an Ion Chromatography method by a lab accredited for that method, as per 25 Pa. Code §109.304. Please contact the Department of Environmental Protection (DEP) Bureau of Laboratories (BOL) at 717-346-7200 or via the DEP web page: www.dep.pa.gov for additional information.

Table 4: Codes for Reporting Bromate, Chlorite, HAA5, TOC and TTHM Results (continued)

Parameter Name	Parameter Code	EPA Analysis Method	DEP Method Code	Units
HAA5	2456	SPE GC with ECD: EPA 552.1	204	mg/L
		Liquid-Liquid Extract GC with ECD: EPA 552.2 and EPA 552.3	206	
		Liquid-Liquid Extract GC with ECD: SM 6251 B	208	
		Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry: 557	234	
		2D Ion Chromatography Conductivity Detection: EP 557.1	236	
TOC ⁺	2920	Ozone Oxidation: Hach Method 10261	577	mg/L
		High Temp. Combustion: SM 5310 B	580	
		Persulfate Oxidation: SM 5310 C	581	
		Wet Oxidation: SM 5310 D	582	
		415.3 Rev 1.1	586	
TTHM	2950	Liquid-Liquid Extract GC/ECD: EPA 551.1	211	mg/L
		P&T GC/EICD & PID: EPA 502.2	217	
		P&T GC/MS: EPA 524.2	221	
		P&T GC/MS: EPA 524.3, 524.4	224	

Key:

mg/L = milligrams per liter

⁺- EPA has established additional QA/QC procedures for TOC. Labs need to obtain and implement these procedures when conducting these analyses. Please contact the DEP Bureau of Laboratories at 717-346-7200 or view the DEP web page: www.dep.pa.gov for additional information. Search on 'Laboratory Accreditation Program'.

Table 5, on the following page, contains (disinfection byproducts precursors) codes for reporting Alkalinity, DOC, Magnesium (Hardness), pH, and UV₂₅₄ results.

Table 5: Codes for Alkalinity, DOC, Magnesium Hardness, pH, and UV254 Results

Parameter Name	Parameter Code	EPA Analysis Method	DEP Method Code	Units
Alkalinity*	1927	Titration: SM 2320 B	584	mg/L
		Titration: ASTM D1067-92, 02 B		
		Titration: USGS I-1030-85		
DOC ⁺	2919	High Temp. Combustion: SM 5310 B	580	mg/L
		Persulfate Oxidation: SM 5310 C	581	
		Wet Oxidation: SM 5310 D	582	
		415.3 Rev 1.1	586	
Magnesium	1031	AA: SM 3111 B, ASTM D511-93B	101	mg/L
		Ion Chromatography: ASTM D6919-09	120	
		Complexation Titrimetric: SM 3500-Mg E, ASTM D511-93A	141	
		ICP: EPA 200.7, SM 3120 B	169	
		AVICP-AES: EPA 200.5	171	
pH*	1925	Electrometric: EPA 150.1, 150.2, ASTM D1293-95, and SM 4500-H+ B	135	N/A
SUVA	2923	NA (this is a calculated value)	N/A	L/mg-m
UV ₂₅₄	2922	UV Absorption: SM 5910 B	583	cm ⁻¹
		415.3 Rev 1.1	586	

Key:
 mg/L = milligrams per liter
 cm⁻¹ = 1/centimeter
 L/mg-m = Liter per milligram-meter
 N/A = Not applicable
 *-Analytes not requiring certification.

⁺-EPA has established additional quality assurance/quality control (QA/QC) procedures for DOC. Laboratories need to obtain and implement the correct procedures when conducting the analyses. Please contact the Department of Environmental Protection (DEP) Bureau of Laboratories (BOL) at 717-346-7200 or view the DEP web page: www.dep.pa.gov for additional information. Search on 'Laboratory Accreditation Program'.

SECTION 7: INSTRUCTIONS FOR SDWA CORRECTION FORMS

The SDWA correction forms are for the correction of *previously* submitted data no longer in DWELR. Omitted sample results and summary forms that were not previously reported should be submitted through DWELR.

The two permitted methods to correct previously submitted data are as follows:

1. A copy of a DWELR printed report of the original submission may be used for corrections. If using a DWELR printout, strikeout the incorrect information and write the correct information on the form; initial and date the correction. (Note: Do not strikeout the incorrect information heavily so that the original information cannot be read or faxed. Do not use a highlighter on forms to be faxed or copied.)

Include the following information, which can be handwritten on the form:

- The reason for the correction
- The name of the laboratory, the authorizing personnel and the date of the corrected submission

2. SDWA Correction forms are shown in [Appendix III](#) in this document (examples only). Correction forms are available on-line at www.depgreenport.state.pa.us/elibrary/Search. Enter “*SDWA*” in the Document Name field. Enter all the correct information as it should have been submitted. In the ‘Submitted’ sections, only the incorrect information should be entered. This information is required to identify the record.

Distribute SDWA corrections forms as follows:

ORIGINAL COPY - Send a copy to DEP’s central office at the following mailing or direct carrier service (UPS, FED Ex) address:

USPS

PA DEP SDWA MONITORING DATA
10TH FLOOR RCSOB
PO BOX 8467
HARRISBURG PA 17105-8467

UPS or FED Ex

PA DEP SDWA MONITORING DATA
10TH FLOOR RCSOB
400 MARKET STREET
HARRISBURG PA 17101

Corrections may be submitted by fax if requested by DEP Safe Drinking Water central office or field personnel. Obtain the fax number directly from them. Only upon specific request by DEP field personnel should corrections be sent directly to the field office instead of the central office. In this case, a copy does not need to be sent to central office.

SECOND COPY - Send a copy to the water supplier.

THIRD COPY - Retain a copy for the laboratory’s records.

SECTION 8: REQUIRED NUMBER OF MONITORING SAMPLES

Table 6: Summary of Monitoring Frequencies/Required Number of Samples for TTHM/HAA5

System Type	Routine Monitoring								
	Schedule Number	Compliance Monitoring Begin Date	Population Category	Monitoring Frequency ^{1,2}	Distribution System Monitoring Locations				
					Total per Monitoring Period ³	Sample Type	Highest TTHM Locations	Highest HAA5 Locations	Existing Stage 1 Compliance Locations
Surface Water or GUDI	4	10/1/2013	< 500	Annual	2	Individual	1	1	----
			500-3,300	Quarterly	2	Individual	1	1	----
			3,301-9,999	Quarterly	2	Dual	1	1	----
	3	10/1/2013	10,000-49,999	Quarterly	4	Dual	2	1	1
	2 (50K-99,999)	10/1/2012	50,000-249,999	Quarterly	8	Dual	3	3	2
	1 (≥ 100,000)	4/1/2012							
	1	4/1/2012							
			1,000,000-4,999,999	Quarterly	16	Dual	6	6	4
			≥ 5,000,000	Quarterly	20	Dual	8	7	5
Ground Water	4	10/1/2013	< 500	Annual	2	Individual	1	1	----
			500-9,999	Annual	2	Dual	1	1	----
	3 (10K-49,999)	10/1/2013	10,000-99,999	Quarterly	4	Dual	2	1	1
	2 (50K-99,999)	10/1/2012							
	1	4/1/2012	100,000-499,999	Quarterly	6	Dual	3	2	1
			≥ 500,000	Quarterly	8	Dual	3	3	2

Key: TTHM/HAA5 = Total Trihalomethanes and 5 Haloacetic acids GUDI = Groundwater under the Influence of Surface Water (SW)

As per 25 Pa. Code §109.301(12)(ii):
 1 - All systems must monitor during month of highest DBP concentrations.
 2 - Systems on annual or triennial monitoring must go to increased quarterly monitoring (for at least 4 quarters), if any result is greater than (>) the Maximum Contaminant Level (MCL). Increased monitoring consists of dual sample sets at all locations.
 3 - Systems on routine quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for systems with SW or GUDI sources serving 500-3,300, which are required to take individual TTHM and HAA5 samples (instead of a dual sample set) quarterly at the locations with the highest TTHM and HAA5 concentrations, respectively. For all systems required to monitor at individual locations, if the high TTHM and high HAA5 location are the same location during the same month, one dual sample set may be collected. Systems on annual monitoring must take individual samples or dual sample set(s) at the locations and months of highest historical TTHM and HAA5 concentrations.

Table 6 continues on the following page.

Table 6: Summary of Monitoring Frequencies/Required Number of Samples for TTHM/HAA5 (continued)

System Type	Reduced Monitoring			
	Schedule Number	Population Category	Monitoring Frequency ^{4,5}	Distribution System Monitoring per Period
Surface Water or GUDI	4	< 500	Not Applicable	Monitoring may not be reduced
		500-3,300	Annual	1 TTHM sample in quarter & at location with highest result. 1 HAA5 sample in quarter & at location with highest result. 1 dual sample set if both results at same location & during same quarter.
		3,301-9,999	Annual	1 dual sample set in quarter & at location with highest TTHM result. 1 dual sample set in quarter & at location with highest HAA5 result.
	3	10,000-49,999	Quarterly	2 dual sample sets: at locations with highest TTHM and HAA5 LRAAs.
	2 (50K-99,999)	50,000-249,999	Quarterly	4 dual sample sets: at 2 locations with highest TTHM and 2 locations with highest HAA5 LRAAs.
	1 ($\geq 100,000$)			
	1	250,000-999,999	Quarterly	6 dual sample sets: at 3 locations with highest TTHM and 3 locations with highest HAA5 LRAAs.
		1,000,000-4,999,999	Quarterly	8 dual sample sets: at 4 locations with highest TTHM and 4 locations with highest HAA5 LRAAs.
		$\geq 5,000,000$	Quarterly	10 dual sample sets: at 5 locations with highest TTHM and 5 locations with highest HAA5 LRAAs.
Ground Water	4	< 500	Triennial (every 3 rd year)	1 TTHM sample in quarter & at location with highest result. 1 HAA5 sample in quarter & at location with highest result. 1 dual sample set if both results at same location & during same month.
		500-9,999	Annual	1 TTHM sample in quarter & at location with highest result. 1 HAA5 sample in quarter & at location with highest result. 1 dual sample set if both results at same location & during same month.
	3 (10K-49,999)	10,000-99,999	Annual	1 dual sample set in quarter & at location with highest TTHM result. 1 dual sample set in quarter & at location with highest HAA5 result.
	2 (50K-99,999)			
	1	100,000-499,999	Quarterly	2 dual sample sets: at locations with highest TTHM and HAA5 LRAAs.
		$\geq 500,000$	Quarterly	4 dual sample sets: at 2 locations with highest TTHM and 2 locations with highest HAA5 LRAAs.

Key: TTHM/HAA5 = Total Trihalomethanes and 5 Haloacetic acids

GUDI = Groundwater under the Influence of Surface Water (SW)

4 - All systems must monitor during month of highest DBP concentrations.

5 - Systems on annual or triennial monitoring must go to increased quarterly monitoring (for at least 4 quarters), if any result is greater than (>) the Maximum Contaminant Level (MCL). Increased monitoring consists of dual sample sets at all locations.

Table 7: Bromate, Chlorite, and DBP Precursors Monitoring Frequencies and Locations per System Type

Contaminant/ Disinfectant	Routine Monitoring		
	System Type	Monitoring Frequency	Total Number of Samples Per Monitoring Period and Monitoring Location
Bromate	Systems that use Ozone as a disinfectant	Monthly (Report within 10 days after the end of the quarter. Result may also be reported each month during the quarter.)	1 at entry point
Chlorite	Systems that use Chlorine Dioxide as a disinfectant	Daily-at entry point .	1 at entry point and 3 in distribution system Additional monitoring, if daily EP sample exceeds the chlorite MCL, 3 distribution samples at: <ol style="list-style-type: none"> 1. Location close to the first customer as possible 2. Location representing an average residence time 3. Location representing a max residence time
DBP precursors (TOC sample set)	Systems that use Conventional Filtration	Monthly-in the distribution system.	1 per source water source

SECTION 9: RULES FOR DISINFECTION BYPRODUCTS (DBP) MONITORING AND REPORTING

Disinfection Byproduct Precursors: Total Organic Carbon (TOC) (2920) – Source (Raw) Water & Post-Sedimentation (Plant)

PWSs Required To Monitor	Treatment Technique	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency ¹	It is a violation if:
CWSs & NTNCWSs with SW or GUDI sources that have conventional filtration²	See the Step 1 table (3-by-3 matrix) for removal percentage (determined by the alkalinity and TOC present in the source water)	1 sample set from each treatment plant w/ conventional filtration Must be analyzed by an accredited lab.	Monthly	R & P	Each set consists of a sample from: <ul style="list-style-type: none"> Source water tap (blended tap or composite sample if multiple sources for a plant); Post-sedimentation tap (CFE or other DEP approved location). 	<p>Reduced to: Q, if the post-sedimentation RAA TOC (“P” sample) for the plant is:</p> <ul style="list-style-type: none"> < 2.0 mg/L for 2 consecutive years; <p><i>OR</i></p> <ul style="list-style-type: none"> < 1.0 mg/L for 1 year. <p><i>Reduced TOC monitoring is plant specific.</i></p> <p>Resume: routine (monthly) monitoring if TOC RAA for the plant is ≥ 2.0 mg/L.</p> <p>PWSs who only use purchased surface water may use the seller’s TOC results to qualify for reduced TTHM/HAA5 monitoring.</p>	All “R” & “P” TOC results on SDWA-1 form.	Q Within 10 days after the end of each quarter.	<p>Treatment Technique (46) TOC removal ratio is < 1.00³ based on the RAA (computed quarterly) of monthly performance ratios <u>and</u> none of the annual ACC are achieved.</p> <p>M/R (27) <u>Major:</u> < 90% of all samples (R & P) taken or reported. Also for failure to take “R” and “P” TOC samples and alkalinity samples at same time.</p> <p><u>Minor:</u> 90-99% of all samples (R & P) taken or reported.</p>
<u>OPTIONAL</u> CWSs & NTNCWSs with SW or GUDI sources that do NOT have conventional filtration (& that serve ≥ 500 people)	N/A	1 Must be analyzed by an accredited lab.	Monthly <i>(only if PWS wishes to get to a reduced TTHM/HAA5 frequency)⁴</i>	R	Each SW or GUDI source	<p>Reduced to: Q if the TTHM/HAA5 frequency is reduced.</p> <p>Resume: routine (monthly)* if:</p> <ul style="list-style-type: none"> Source water (“R” samples) TOC RAA > 4.0 mg/L, or TTHM/HAA5 results no longer meet the reduced criteria. <p><i>*This will also reset the TTHM/HAA5 frequency to routine.</i></p>	All “R” TOC results on SDWA-1 form.	Q Within 10 days after the end of each quarter.	N/A

¹ Results may be reported each month during the quarter.

² Consecutive PWSs may use the selling system’s TOC results to qualify for reduced TTHM/HAA5 monitoring.

³ RAA as per 40 CFR 141.135(c)(1)(v); monthly ACC of 1.0 per 40 CFR 141.135(c)(2)

⁴ Refer to the “Altered Monitoring” column of the TTHM/HAA5 tables.

Disinfection Byproduct Precursors: Alkalinity (1927) – Source (Raw) Water

PWSs Required To Monitor	Treatment Technique	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency ¹	It is a violation if:
CWSs & NTNCWSs with SW or GUDI sources that have conventional filtration	N/A	1	Monthly	R	At the same time and from the same locations as “R” TOC samples.	Same as TOC.	All “R” alkalinity results on SDWA-1 form.	Same as TOC.	<u>M/R (27)</u> See TOC table.

Enhanced coagulation is the optimization of coagulant doses and pH levels to improve DBP precursor (TOC) removal.

Step 1 Required TOC Percent Removal by Enhanced Coagulation and Enhanced Softening (3 x 3 Matrix) ⁵

Source-water TOC (mg/L)	Source-water alkalinity (mg/L as CaCO ₃)		
	0 - 60	>60 - 120	>120 ⁶
> 2.0-4.0	35.0 %	25.0 %	15.0 %
> 4.0-8.0	45.0 %	35.0 %	25.0 %
> 8.0	50.0 %	40.0 %	30.0 %

Optional⁷ SUVA (Specific Ultraviolet Absorption at 254 nm) (2923) – Source (Raw) Water or Post-Sedimentation (Plant)

PWSs Required To Monitor	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency ⁸	It is a violation if:
CWSs & NTNCWSs with SW or GUDI sources that have conventional filtration (Not required at consecutive systems.)	1 set comprised of dissolved organic carbon (DOC) & UV ₂₅₄ Must be analyzed by an accredited lab.	Monthly	R or P ⁹ (Plant sample must be prior to addition of an oxidant)	Same locations as source water or plant TOC.	No altered monitoring.	All calculated “R” and/or “P” SUVA results on SDWA-1 form. All individual DOC and UV ₂₅₄ results on SDWA-1 form.	Q Within 10 days after the end of each quarter.	<u>Treatment Technique (46)</u> See TOC table. <u>M/R (27)</u> N/A

⁵ Systems practicing precipitative softening must perform enhanced softening as the treatment technique for removal of DBP precursors.

⁶ Systems practicing enhanced softening must meet the TOC removal requirements in this column.

⁷ SUVA data is used to meet either monthly or annual alternative compliance criteria (or both)

⁸ Results may be reported each month during the quarter.

⁹ Since almost all plants provide water at the entry point that contains an oxidant, plant finished water SUVA should be measured in jar test simulations.

Optional¹⁰ Magnesium Hardness (as CaCO₃) (1918) - Source (Raw) Water and Post-Sedimentation (Plant)

PWSs Required To Monitor	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency ⁴	It is a violation if:
<p>CWSs & NTNCWSs with SW or GUDI sources that have conventional filtration and that are practicing enhanced softening¹</p> <p>(Not required at consecutive systems.)</p>	1	Monthly	R and P ¹¹ (Plant sample must be prior to addition of an oxidant)	Same locations as source water and plant TOC.	No altered monitoring.	All "R" and "P" magnesium hardness results (as CaCO ₃) on SDWA-1 form	Q Within 10 days after the end of each quarter.	<p><u>Treatment Technique (46)</u> See TOC table.</p> <p><u>M/R (27)</u> N/A</p>

¹⁰ Magnesium hardness data is used to meet annual alternative compliance criteria for systems practicing enhanced softening.

¹¹ Since almost all plants provide water at the entry point that contains an oxidant, plant finished water magnesium hardness should be measured in jar test simulations.

Monthly Calculations for TOC removal:

1. Determine the actual TOC removal percent:

$$\text{Actual TOC Removal percent} = 1 - (\text{Treated water TOC} / \text{Raw water TOC}) \times 100$$

2. Determine required TOC percent removal from the 3 x 3 matrix.
3. Removal ratio = Actual TOC removal % / Required TOC removal %

If the removal ratio is greater than 1.0, the plant is in compliance for that sample set. If the removal ratio is less than 1, you may substitute 1.0 for your TOC removal ratio, if you meet any of the following Alternative Compliance Criteria (ACC) below.

Monthly ACC for Enhanced Coagulation and Enhanced Softening Systems (40 CFR 141.135(c)(2))

- (1) If the source water TOC is less than 2.0 mg/L for the month.
- (2) If the treated water TOC is less than 2.0 mg/L for the month.
- (3) If the source water SUVA values are 2.0 L/mg-m or less for the month.
- (4) If the finished water SUVA values are 2.0 L/mg-m or less for the month.

Additional ACC for Enhanced Softening: applies only to systems practicing precipitative softening:

- (1) Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as CaCO₃) for the month.
- (2) Softening that results in removing at least 10 mg/L of magnesium hardness (as CaCO₃) for the month.

Month	B Treated Water TOC (mg/L)	A Source Water TOC (mg/L)	[1-(B/A)]* 100 Actual TOC Reduction (%)	Source Water Alkalinity (mg/L)	Required TOC Reduction (%)	Actual / Required	TOC Removal Ratio (Decimal Equivalent)
Jan	1.2	1.5	Source TOC below 2.0 mg/L - no calculation required				1.0
Feb	1.3	2.1	38.1	40	35.0	38.1/35.0	1.09
Mar	1.7	2.5	32.0	45	35.0	32.0/35.0	0.91
Apr	1.4	2.2	36.4	34	35.0	36.4/35.0	1.04
May	1.7	2.7	37.0	34	35.0	37.0/35.0	1.06

Running Annual Average (RAA) Compliance Calculation:

Add the TOC removal ratios for 12 consecutive months and divide by 12. If the RAA is 1.00 or greater, the system is in compliance. If the RAA is less than 1.00, but you meet any of the ACC criterion, your system is in compliance.

Month	B Treated Water TOC (mg/L)	A Source Water TOC (mg/L)	[1-(B/A)] * 100 Actual TOC Reduction (%)	Source Water Alkalinity (mg/L)	Required TOC Reduction (%)	Actual / Required	TOC Removal Ratio (Decimal Equivalent)
Jan	2.2	3.1	29.0	46	35.0	29.0/35.0	0.83
Feb	1.3	2.1	38.1	40	35.0	38.1/35.0	1.09
Mar	1.9	2.5	24.0	45	35.0	24.0/35.0	0.69 1.0
Apr	1.4	2.2	36.4	34	35.0	36.4/35.0	1.04
May	1.7	2.7	37.0	44	35.0	37.0/35.0	1.06
Jun	1.6	2.1	23.8	43	35.0	23.8/35.0	0.68 1.0
Jul	1.8	3.7	51.4	50	35.0	51.4/35.0	1.47
Aug	2.4	2.9	17.2	46	35.0	17.2/35.0	0.49
Sep	2.2	3.3	33.3	60	35.0	33.3/35.0	0.95
Oct	2.2	3.1	29.0	57	35.0	29.0/35.0	0.83
Nov	2.5	2.8	10.7	65	25.0	10.7/25.0	0.43
Dec	1.3	2.1	38.1	61	25.0	38.1/25.0	1.52
Annual Averages	1.9	2.7	N/A	N/A	N/A	N/A	
TOC Removal Ratio Annual Average = <u>0.98</u>							Automatic Compliance

Annual ACC for Enhanced Coagulation and Enhanced Softening Systems (40 CFR 141.135(c)(1)(v))

- (1) If the source water TOC is less than 2.0 mg/L (based on a running annual average).
- (2) If the treated water TOC is less than 2.0 mg/L (based on a running annual average).
- (3) If the source water SUVA values are 2.0 L/mg-m or less (as a running annual average).
- (4) If the finished water SUVA values are 2.0 L/mg-m or less (as a running annual average).
- (5) If the TTHM levels are 0.040 mg/L or less AND HAA5 levels are 0.030 mg/L or less (as running annual averages) and the system uses only chlorine for primary and residual disinfection.
- (6) If the following three running annual averages are met:
 - source water TOC is less than 4.0 mg/L,
 - the source alkalinity is greater than 60 mg/L (as CaCO₃), and
 - the distribution system TTHM levels are 0.040 mg/L or less and the HAA5 levels are 0.030 mg/L or less.

OR

If the system meets these TOC and alkalinity levels but *not* the TTHM and HAA5 levels, they may choose to do the following:

- Make a clear and irrevocable financial commitment to use technologies that limit TTHM to 0.040 mg/L or less and HAA5 0.030 mg/L or less.
- Make this financial commitment on or before the applicable compliance date.
- Ensure the technologies are operational no later June 30, 2005.

Additional ACC for Enhanced Softening: applies only to systems practicing precipitative softening:

- (1) Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as CaCO₃), measured monthly and calculated quarterly as a running annual average.
- (2) Softening that results in removing at least 10 mg/L of magnesium hardness (as CaCO₃), measured monthly and calculated quarterly as an annual running average.

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Disinfection Byproducts: TTHM (2950) & HAA5 (2456) – Distribution System: PWSs with SW or GUDI sources

PWSs Required To Monitor ¹²	MCL	# Samples	Frequency ¹³	Sample Type	Sample Location Specifics ¹⁴	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
CWSs & NTNCWSs serving ≥ 5,000,000 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	20 ¹⁵ Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> 8 sets from highest TTHM locations; 7 sets from highest HAA5 locations; 5 sets from existing Stage 1 locations. 	<p><u>Reduced to:</u> 10 dual sample sets per Q (5 from highest TTHM sites & 5 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM LRAA ≤ 0.040 mg/L; Each HAA5 LRAA ≤ 0.030 mg/L; Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources.¹⁶ <p><u>Resume to:</u> 20 dual sample sets per Q if:</p> <ul style="list-style-type: none"> any TTHM LRAA > 0.040 mg/L; any HAA5 LRAA > 0.030 mg/L; any source water TOC RAA > 4.0 mg/L. 	All TTHM & all HAA5 sample results on SDWA-1 form.	Q Within 10 days after the end of the month result determined or after the end of the quarter, whichever is shorter.	<p><u>MCL (02)</u> Any LRAA, computed quarterly, > MCL.</p> <p><u>M/R (27)</u> Major: < 90% of samples taken or reported. Minor: 90-99% of samples taken or reported.</p>
CWSs & NTNCWSs serving 1,000,000 to 4,999,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	16 ¹⁵ Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> 6 sets from highest TTHM locations; 6 sets from highest HAA5 locations; 4 sets from existing Stage 1 locations. 	<p><u>Reduced to:</u> 8 dual sample sets per Q (4 from highest TTHM sites & 4 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM LRAA ≤ 0.040 mg/L; Each HAA5 LRAA ≤ 0.030 mg/L; Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources.⁵ <p><u>Resume to:</u> 16 dual sample sets per Q if:</p> <ul style="list-style-type: none"> any TTHM LRAA > 0.040 mg/L; any HAA5 LRAA > 0.030 mg/L; any source water TOC RAA > 4.0 mg/L. 	Same as above.	Same as above.	<p><u>MCL (02)</u> Same as above.</p> <p><u>M/R (27)</u> Same as above.</p>

¹² Includes consecutive systems & blended systems using both SW (or GUDI) and GW sources.

¹³ Must monitor during month of highest DBP concentration.

¹⁴ Sample site selection must follow EPA protocol.

¹⁵ Must be dual sample sets from each sampling location. A dual sample set consists of 1 TTHM sample and 1 HAA5 sample.

¹⁶ PWSs using only purchased surface water may use the seller's TOC results to qualify for reduced TTHM/HAA5 monitoring.

<p>CWSs & NTNCWSs serving 250,000 to 999,999 people</p>	<p>TTHM - 0.080 mg/L HAA5 - 0.060 mg/L</p>	<p>12¹⁵ Must be analyzed by an accredited lab.</p>	<p>Q</p>	<p>D</p>	<ul style="list-style-type: none"> • 5 sets from highest TTHM locations; • 4 sets from highest HAA5 locations; • 3 sets from existing Stage 1 locations. 	<p><u>Reduced to:</u> 6 dual sample sets per Q (3 from highest TTHM sites & 3 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> • Each TTHM LRAA \leq 0.040 mg/L; • Each HAA5 LRAA \leq 0.030 mg/L; • Source water TOC RAA \leq 4.0 mg/L for each plant treating SW or GUDI sources.⁵ <p><u>Resume to:</u> 12 dual sample sets per Q if:</p> <ul style="list-style-type: none"> • any TTHM LRAA > 0.040 mg/L; • any HAA5 LRAA > 0.030 mg/L; • any source water TOC RAA > 4.0 mg/L. 	<p>Same as above.</p>	<p>Same as above.</p>	<p><u>MCL (02)</u> Same as above. <u>M/R (27)</u> Same as above.</p>
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Disinfection Byproducts: TTHM (2950) & HAA5 (2456) – Distribution System: PWSs with SW or GUDI sources (cont.)

PWSs Required To Monitor ¹⁷	MCL	# Samples	Frequency ¹⁸	Sample Type	Sample Location Specifics ¹⁹	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
CWSs & NTNCWSs serving 50,000 to 249,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	8 ²⁰ Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> 3 sets from highest TTHM locations; 3 sets from highest HAA5 locations; 2 sets from existing Stage 1 locations. 	<p>Reduced to: 4 dual sample sets per Q (2 from highest TTHM sites & 2 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM LRAA \leq 0.040 mg/L; Each HAA5 LRAA \leq 0.030 mg/L; Source water TOC RAA \leq 4.0 mg/L for each plant treating SW or GUDI sources.²¹ <p>Resume to: 8 dual sample sets per Q if:</p> <ul style="list-style-type: none"> any TTHM LRAA > 0.040 mg/L; any HAA5 LRAA > 0.030 mg/L; any source water TOC RAA > 4.0 mg/L. 	All TTHM & all HAA5 sample results on SDWA-1 form.	Q Within 10 days after the end of the month result determined or after the end of the quarter, whichever is shorter.	<p>MCL (02) Any LRAA, computed quarterly, > MCL.</p> <p>M/R (27) <u>Major:</u> < 90% of samples taken or reported. <u>Minor:</u> 90-99% of samples taken or reported.</p>
CWSs & NTNCWSs serving 10,000 to 49,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	4 ²⁰ Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> 2 sets from highest TTHM locations; 1 set from highest HAA5 location; 1 set from existing Stage 1 location. 	<p>Reduced to: 2 dual sample sets per Q (1 from highest TTHM site & 1 from highest HAA5 site) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM LRAA \leq 0.040 mg/L; Each HAA5 LRAA \leq 0.030 mg/L; Source water TOC RAA \leq 4.0 mg/L for each plant treating SW or GUDI sources.⁵ <p>Resume to: 4 dual sample sets per Q if:</p> <ul style="list-style-type: none"> any TTHM LRAA > 0.040 mg/L; any HAA5 LRAA > 0.030 mg/L; any source water TOC RAA > 4.0 mg/L. 	Same as above.	Same as above.	<p>MCL (02) Same as above.</p> <p>M/R (27) Same as above.</p>

¹⁷ Includes consecutive systems & blended systems using both SW (or GUDI) and GW sources.

¹⁸ Must monitor during month of highest DBP concentration.

¹⁹ Sample site selection must follow EPA protocol.

²⁰ Must be dual sample sets from each sampling location. A dual sample set consists of 1 TTHM sample and 1 HAA5 sample.

²¹ PWSs using only purchased surface water may use the seller's TOC results to qualify for reduced TTHM/HAA5 monitoring.

<p>CWSs & NTNCWSs serving 3,301 to 9,999 people</p>	<p>TTHM - 0.080 mg/L HAA5 - 0.060 mg/L</p>	<p>2²⁰ Must be analyzed by an accredited lab.</p>	<p>Q</p>	<p>D</p>	<ul style="list-style-type: none"> • 1 set from highest TTHM location; • 1 set from highest HAA5 location. 	<p><u>Reduced to:</u> Annual monitoring² at <i>both</i> locations⁴ if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> • Each TTHM LRAA \leq 0.040 mg/L; • Each HAA5 LRAA \leq 0.030 mg/L; • Source water TOC RAA \leq 4.0 mg/L for each plant treating SW or GUDI sources.⁵ <p><u>Resume to:</u> 2 dual sample sets per Q if:</p> <ul style="list-style-type: none"> • any TTHM result > 0.060 mg/L; • any HAA5 result > 0.045 mg/L; • any source water TOC RAA > 4.0 mg/L. 	<p>Same as above.</p>	<p>Same as above.</p>	<p><u>MCL (02)</u> Same as above. <u>M/R (27)</u> Same as above.</p>
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Disinfection Byproducts: TTHM (2950) & HAA5 (2456) – Distribution System: PWSs with SW or GUDI sources (cont.)

PWSs Required To Monitor ²²	MCL	# Samples	Frequency ²³	Sample Type	Sample Location Specifics ²⁴	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
CWSs & NTNCWSs serving 500 to 3,300 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	2 Must be analyzed by an accredited lab.	Q	D	Individual Samples: • 1 TTHM sample from highest TTHM location; • 1 HAA5 sample from highest HAA5 location.	Reduced to: Individual samples ²⁴ annually ²³ if, after 1 year of monitoring: • TTHM LRAA \leq 0.040 mg/L; • HAA5 LRAA \leq 0.030 mg/L; • Source water TOC RAA \leq 4.0 mg/L for each plant treating SW or GUDI sources. ²⁵ <u>Resume to:</u> 2 individual samples per Q if • any TTHM result > 0.060 mg/L; • any HAA5 result > 0.045 mg/L; • any source water TOC RAA > 4.0 mg/L. <u>Increased to:</u> Dual sample sets at both locations quarterly, for at least 4 Qs, if while on the reduced frequency, any TTHM result > 0.080 mg/L or any HAA5 result > 0.060 mg/L. May resume 2 individual samples per Q if, after 1 year of monitoring: • TTHM LRAA \leq 0.060 mg/L; • HAA5 LRAA \leq 0.045 mg/L.	All TTHM & all HAA5 sample results on SDWA-1 form.	Q Within 10 days after the end of the month result determined or after the end of the quarter, whichever is shorter.	MCL (02) Any LRAA, computed quarterly, > MCL. M/R (27) <u>Major:</u> < 90% of samples taken or reported. <u>Minor:</u> 90-99% of samples taken or reported.
CWSs & NTNCWSs serving < 500 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	2 Must be analyzed by an accredited lab.	A	D	Individual Samples: • 1 TTHM sample from highest TTHM location; • 1 HAA5 sample from highest HAA5 location.	<u>Reduced to:</u> N/A <u>Increased to:</u> Q at both locations (dual sample sets) for at least 4 Qs if any TTHM result > 0.080 mg/L or any HAA5 result > 0.060 mg/L. <u>Resume to:</u> Individual samples annually ²³ (1 at highest TTHM site & 1 at highest HAA5 site) ³ if, after 1 year of monitoring: • TTHM LRAA \leq 0.060 mg/L; • HAA5 LRAA \leq 0.045 mg/L.	Same as above.	Same as above.	MCL (02) Same as above. M/R (27) Same as above.

²² Includes consecutive systems & blended systems using both SW (or GUDI) and GW sources.

²³ Must monitor during month of highest DBP concentration.

²⁴ May be 1 dual sample set at the same location *IF* the highest TTHM concentration & highest HAA5 concentration occur at the *same location* and *during the same month*.

²⁵ PWSs using only purchased surface water may use the seller's TOC results to qualify for reduced TTHM/HAA5 monitoring.

Disinfection Byproducts: TTHM (2950) & HAA5 (2456) – Distribution System: PWSs with GW sources only

PWSs Required To Monitor ²⁶	MCL	# Samples	Frequency ²⁷	Sample Type	Sample Location Specifics ²⁸	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
CWSs & NTNCWSs serving ≥ 500,000 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	8 ²⁹ Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> 3 sets from highest TTHM locations; 3 sets from highest HAA5 locations; 2 sets from existing Stage 1 locations. 	<p><u>Reduced to:</u> 4 dual sample sets per Q (2 from highest TTHM sites & 2 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM LRAA ≤ 0.040 mg/L; Each HAA5 LRAA ≤ 0.030 mg/L; <p><u>Resume to:</u> 8 dual sample sets per Q if any TTHM LRAA > 0.040 mg/L or any HAA5 LRAA > 0.030 mg/L.</p>	All TTHM & all HAA5 sample results on SDWA-1 form.	Q Within 10 days after the end of the month result is determined or after the end of the quarter, whichever is shorter.	<p><u>MCL (02)</u> Any LRAA, computed quarterly, > MCL.</p> <p><u>M/R (27)</u> <u>Major:</u> < 90% of samples taken or reported. <u>Minor:</u> 90-99% of samples taken or reported.</p>
CWSs & NTNCWSs serving 100,000 to 499,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	6 ²⁹ Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> 3 sets from highest TTHM locations; 2 sets from highest HAA5 locations; 1 set from existing Stage 1 location. 	<p><u>Reduced to:</u> 2 dual sample sets per Q (1 from highest TTHM site & 1 from highest HAA5 site) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM LRAA ≤ 0.040 mg/L; Each HAA5 LRAA ≤ 0.030 mg/L; <p><u>Resume to:</u> 6 dual sample sets per Q if any TTHM LRAA > 0.040 mg/L or any HAA5 LRAA > 0.030 mg/L.</p>	Same as above.	Same as above.	<p><u>MCL (02)</u> Same as above.</p> <p><u>M/R (27)</u> Same as above.</p>
CWSs & NTNCWSs serving 10,000 to 99,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	4 ²⁹ Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> 2 sets from highest TTHM locations; 1 set from highest HAA5 location; 1 set from existing Stage 1 location. 	<p><u>Reduced to:</u> 2 dual sample sets annually² (1 from highest TTHM site & 1 from highest HAA5 site)³⁰ if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM LRAA ≤ 0.040 mg/L; Each HAA5 LRAA ≤ 0.030 mg/L; <p><u>Resume to:</u> 4 dual sample sets per Q if any TTHM result > 0.060 mg/L or any HAA5 result > 0.045 mg/L.</p>	Same as above.	Same as above.	<p><u>MCL (02)</u> Same as above.</p> <p><u>M/R (27)</u> Same as above.</p>

²⁶ Includes consecutive systems.

²⁷ Must monitor during month of highest DBP concentration.

²⁸ Sample site selection must follow EPA protocol.

²⁹ Must be dual sample sets from each sampling location. A dual sample set consists of 1 TTHM sample and 1 HAA5 sample.

³⁰ May be 1 dual sample set at the same location *IF* the highest TTHM concentration & highest HAA5 concentration occur at same location & during same month.

Disinfection Byproducts: TTHM (2950) & HAA5 (2456) – Distribution System: PWSs with GW sources only (cont.)

PWSs Required To Monitor ³¹	MCL	# Samples	Frequency ³²	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
CWSs & NTNCWSs serving 500 to 9,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	2 Must be analyzed by an accredited lab.	A	D	Dual Sample Sets: <ul style="list-style-type: none"> 1 set from highest TTHM location; 1 set from highest HAA5 location. 	<p><u>Reduced to:</u> Individual samples annually³² (1 at highest TTHM site & 1 at highest HAA5 site)³³ if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM result \leq 0.040 mg/L; Each HAA5 result \leq 0.030 mg/L; <p><u>Resume to:</u> 2 dual sample sets annually³² if any TTHM result > 0.060 mg/L or any HAA5 result > 0.045 mg/L.</p> <p><u>Increased to:</u> 2 dual sample sets per Q, for at least 4 Qs, if any TTHM result > 0.080 mg/L or any HAA5 result > 0.060 mg/L.</p> <p>May resume 2 dual sample sets annually³² if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> TTHM LRAA \leq 0.060 mg/L; HAA5 LRAA \leq 0.045 mg/L. 	All TTHM & all HAA5 sample results on SDWA-1 form.	Q Within 10 days after the end of the month result is determined or after the end of the quarter, whichever is shorter.	<p>MCL (02) Any LRAA, computed quarterly, > MCL.</p> <p>M/R (27) <u>Major:</u> < 90% of samples taken or reported. <u>Minor:</u> 90-99% of samples taken or reported.</p>
CWSs & NTNCWSs serving < 500 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	2 Must be analyzed by an accredited lab.	A	D	Individual Samples: ³³ <ul style="list-style-type: none"> 1 TTHM sample from highest TTHM location; 1 HAA5 sample from highest HAA5 location. 	<p><u>Reduced to:</u> Individual samples³³ once every 3 years³² if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> Each TTHM result \leq 0.040 mg/L; Each HAA5 result \leq 0.030 mg/L; <p><u>Resume to:</u> Individual samples³³ annually³² if any TTHM result > 0.060 mg/L or any HAA5 result > 0.045 mg/L.</p> <p><u>Increased to:</u> Q at both locations (dual sample sets) for at least 4 Qs if any TTHM result > 0.080 mg/L or any HAA5 result > 0.060 mg/L.</p> <p>May resume 2 individual samples³³ annually³² if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> TTHM LRAA \leq 0.060 mg/L; HAA5 LRAA \leq 0.045 mg/L. 	Same as above.	Same as above.	<p>MCL (02) Same as above.</p> <p>M/R (27) Same as above.</p>

³¹ Includes consecutive systems.

³² Must monitor during month of highest DBP concentration.

³³ May be 1 dual sample set at the same location *IF* the highest TTHM concentration & highest HAA5 concentration occur at same location & during same month.

Additional information about TTHM and HAA5 monitoring for ALL system types and sizes:

- Blended systems (i.e., systems with both SW/GUDI and GW sources) are considered SW systems under this rule. For TTHM/HAA5 monitoring, these systems must refer only to the surface water tables to determine their requirements.
- DEP will compute altered monitoring determinations at the end of each quarter. PWSs should indicate on their monitoring plans that, when on annual monitoring, the samples will be taken during the month of warmest water temperature during that quarter.
- DEP will compute TTHM and HAA5 MCL compliance only when a system is on quarterly monitoring. That is, a PWS can only incur a violation when on quarterly monitoring. The one exception is when a system on annual or triennial monitoring has a result that is more than four times the MCL value. Any result > MCL will trigger quarterly monitoring, and the annual (or triennial) sample will count as the first quarter of quarterly monitoring. So, if a result is more than four times the MCL value, the system will immediately be in violation because it will be impossible for any results in the subsequent three quarters to cause the RAA to be less than the MCL.
- Systems on a quarterly monitoring frequency also have to calculate the **Operational Evaluation Level (OEL)** each quarter and report any exceedances to the State.

$$\text{OEL Calculation: } \text{OEL} = \frac{(\text{current quarter result} * 2) + (1^{\text{st}} \text{ previous quarter result}) + (2^{\text{nd}} \text{ previous quarter result})}{4}$$

OEL Specifics	OEL Frequency	OEL Exceedance if:	Report for each OEL Exceedance	State Reporting Frequency	Follow-up Action	It is an M/R violation if:
<ul style="list-style-type: none"> • Calculate TTHM OEL for each sample location; • Calculate HAA5 OEL for each sample location. 	Quarterly	<ul style="list-style-type: none"> • TTHM OEL > 0.080 mg/L • HAA5 OEL > 0.060 mg/L 	<ul style="list-style-type: none"> • Sample location & date • TTHM OEL value • HAA5 OEL value 	<p>Q</p> <p>Within 10 days after the end of each calendar quarter.</p>	Conduct an operational evaluation and submit a written report to the State	<ul style="list-style-type: none"> • OEL report not submitted within 90 days of receiving notification of result causing OEL exceedance; • OEL report does not contain all required elements (& DEP did not approve limited scope)

Chlorite (1009) – Entry Point

PWSs Required To Monitor	MCL	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
CWSs & NTNCWSs that treat with chlorine dioxide (excludes consecutive systems unless the consecutive PWS uses chlorine dioxide.)	1.0 mg/L	1	Daily (only when chlorine dioxide treatment is in use)	E ³⁴	Each EP treated with chlorine dioxide (Purchased water connections are excluded.) ³⁵	No altered monitoring. Any “E” result > MCL, an additional 3-sample “D” sample set is required.	All daily entry point chlorite results on SDWA-1 form. Note: The state will use the chlorine dioxide information reported on an SDWA-S form to determine how many chlorite samples are required for the month.	Monthly Within 10 days after the end of each month that chlorine dioxide treatment is used.	MCL (02) None. MCL exceedance used only as trigger. M/R (27) See table: “Chlorite - Distribution System.”

Chlorite (1009) – Distribution System

PWSs Required To Monitor	MCL	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
CWSs & NTNCWSs that treat with chlorine dioxide (excludes consecutive systems unless the consecutive PWS uses chlorine dioxide.)	1.0 mg/L	3-sample set (all on same day) Must be analyzed by an accredited lab.	Monthly (only when chlorine dioxide treatment is in use)	D	All samples are “D” samples, but the monitoring plan must indicate the following: <ul style="list-style-type: none"> • 1 sample near first customer. • 1 sample at average residence location. • 1 sample at maximum residence location. 	<u>Increased:</u> Any time a daily “E” sample result > MCL (1.0 mg/L), a set is required the <u>next</u> day. ³⁶ (Note: This set <u>may</u> be used to meet the monthly requirement.) <u>Reduced</u> to: 1 set/Q if all chlorite samples (both E & D) ≤ MCL value (1.0 mg/L) for 1 year. <u>Resume</u> routine (1 set/month) if: <ul style="list-style-type: none"> • Any qtrly “D” sample exceeds MCL value; or • Any daily “E” sample exceeds MCL value. 	All “D” Chlorite results on SDWA-1 form.	Monthly OR Quarterly, if on reduced monitoring. If any sample > MCL value while on reduced monitoring, must resume monthly reporting immediately.	MCL (02) Average of any 3-sample “D” sample set > MCL. (The state will average each 3-sample set monthly.) M/R (27) <u>Major:</u> < 90% of all samples (E & D) taken or reported. <u>Minor:</u> 90-99% of all samples (E & D) taken or reported.

³⁴ The state will not track “E” samples by specific entry point, only that the correct number of samples was taken per month.

³⁵ If chlorite samples exceed the MCL value in the selling system, the state may require the purchasing system to conduct chlorite monitoring.

³⁶ The state will look for the additional 3-sample “D” set whenever an elevated “E” result is reported; and the samples must be taken the next day, even if chlorine dioxide treatment is not used the next day.

Bromate (1011) – Entry Point

PWSs Required To Monitor	MCL	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
<p>CWSs & NTNCWSs that treat with ozone</p> <p>(excludes consecutive systems unless the consecutive PWS uses ozone.)</p>	0.010 mg/L	1 Must be analyzed by an accredited lab.	Monthly	E ³⁷	Each EP treated with ozone. (Purchased water entry points are excluded) ³⁸	<p><u>Reduced to:</u> 1 per EP per Q if RAA of monthly bromate \leq 0.0025 mg/L</p> <p><u>Resume:</u> routine (1 per EP per month) if RAA of quarterly bromate > 0.0025 mg/L</p>	All EP Bromate detail result information on SDWA-1 form	Q Within 10 days after the end of the quarter, but results may be reported each month during the quarter.	<p><u>MCL (02)</u> RAA, computed qtrly, of monthly averages of all samples > MCL.</p> <p><u>M/R (27)</u> <u>Major:</u> < 100% of samples taken or reported.</p> <p><u>Minor:</u> N/A</p>

³⁷ The state will not track “E” samples by specific entry point, only that the correct number of samples was taken per month.

³⁸ If bromate samples exceed the MCL value in the selling system, the state may require the purchasing system to conduct bromate monitoring at the interconnection.

SECTION 10: CASE STUDY EXAMPLES

Case Study 1: Mountain Valley Water Company

The Mountain Valley Water Company is a community water system (CWS) serving a population of 5,500 people. The water system has a *surface water* source that supplies a conventional filter plant. The system uses chlorine gas for disinfection and has one entry point (EP 101) to the distribution system. The laboratory should refer to DWRS (See [Section 3](#): Electronic assistance tools) or the water system for this PWS's monitoring calendar for sampling requirement details.

The Mountain Valley Water Company is required to perform the following activities based on the requirements of the *D/DBPR*:

- Measure source water, treated water, total organic carbon (TOC) and alkalinity.
- Collect TTHM/HAA5 samples. Refer to [Section 8: Required Number of Monitoring Samples](#) and [Section 9: Rules for Disinfection Byproducts \(DBP\) Monitoring and Reporting](#) in this manual for additional information about the monitoring/reporting requirements.
- Collect and report disinfectant residual samples. The reporting requirements for disinfectant residuals samples are independent of the reporting requirements for the DBP and DBP precursor samples.

Note: See the *Laboratory Reporting Instructions for Disinfectant Residuals* technical guidance manual for the disinfectant residuals and HPC reporting and requirements for this situation. Reporting instructions are available on-line at: www.depgreenport.state.pa.us/elibrary/Search. Enter “*Laboratory Reporting Instructions*” into the document name search field.

In addition, turbidity monitoring and reporting requirements are not discussed in this manual. Refer to the *Filter Rules Reporting Instructions for Public Water Systems Using Filtered Surface Water or Groundwater under the Direct Influence of Surface Water (GUDI) Sources* also available on DEP's website at www.depgreenport.state.pa.us/elibrary/.

The following pages show Case 1 screenshot examples of completed **SDWA-1** forms. Monthly TOC and alkalinity samples were collected. (See Case Study 1/Example screenshot 1.) In addition, the PWS reports SUVA for the source water monthly; therefore, UV254 and DOC samples were collected. (See Case Study 1/Example screenshot 2.) Samples for TTHM/HAA5 samples were collected on October 14, 2019. (See Case Study 1/Example screenshot 3.)

Case Study 1/Example screenshot 1: SDWA-1 TOC and Alkalinity VIEW AND EDIT RECORDS Screens:

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SDWA-1													
Current Lab Certifications						Contaminants not Requiring Certification							
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Sample ID	Record ID
	Sort		Sort Entry Point Chlorine					Sort			Sort		
<input type="checkbox"/>	3540000	2920	580	2.9	121119	301		121019	R	0920	03330		STUDENTE_276
<input type="checkbox"/>	3540000	2920	580	2.0	121119	301		121019	P	1420	03330		STUDENTE_277
<input type="checkbox"/>	3540000	1927	584	50.0	100419	301		100419	R	0840	03330		STUDENTE_278
<input type="checkbox"/>	3540000	1927	584	57.4	111419	301		111419	R	0815	03330		STUDENTE_279
<input type="checkbox"/>	3540000	1927	584	62.7	121019	301		121019	R	0920	03330		STUDENTE_280
<input type="checkbox"/>	3540000	2920	580	2.6	101219	301		100419	R	0840	03330		STUDENTE_281
<input type="checkbox"/>	3540000	2920	580	1.8	101219	301		100419	P	1340	03330		STUDENTE_282
<input type="checkbox"/>	3540000	2920	580	2.8	111819	301		111419	R	0815	03330		STUDENTE_283
<input type="checkbox"/>	3540000	2920	580	1.7	111819	301		111419	P	1315	03330		STUDENTE_284

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SDWA-1													
Current Lab Certifications						Contaminants not Requiring Certification							
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Sample ID	Record ID
	Sort		Sort Entry Point Chlorine					Sort			Sort		
<input type="checkbox"/>	3540000	2923		1.8	101319	301		100419	R		03330		STUDENTE_265
<input type="checkbox"/>	3540000	2923		2.1	111919	301		111419	R		03330		STUDENTE_266
<input type="checkbox"/>	3540000	2923		2.0	121419	301		121019	R		03330		STUDENTE_267
<input type="checkbox"/>	3540000	2922	583	3.9	100419	301		100419	R	0845	03330		STUDENTE_268
<input type="checkbox"/>	3540000	2922	583	3.6	111419	301		111419	R	0820	03330		STUDENTE_269
<input type="checkbox"/>	3540000	2922	583	3.8	121019	301		121019	R	0950	03330		STUDENTE_270
<input type="checkbox"/>	3540000	2919	580	2.2	100419	301		100419	R	0850	03330		STUDENTE_271
<input type="checkbox"/>	3540000	2919	580	1.7	111419	301		111419	R	0825	03330		STUDENTE_272
<input type="checkbox"/>	3540000	2919	580	1.9	121019	301		121019	R	0930	03330		STUDENTE_273



Case Study 1/Example screenshot 3: SDWA-1 TTHM and HAA5 Results VIEW AND EDIT RECORDS Screens:

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SDWA-1														
Current Lab Certifications						Contaminants not Requiring Certification								
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Sample ID	Record ID	
	Sort	Sort Entry Point Chlorine						Sort				Sort		
<input type="checkbox"/>	3540000	2950	211	0.072	102119	701		101419	D	1320	01913		STUDENTE_513	
<input type="checkbox"/>	3540000	2456	206	0.023	102219	701		101419	D	1320	01913		STUDENTE_514	
<input type="checkbox"/>	3540000	2950	211	0.071	102119	702		101419	D	1321	01913		STUDENTE_515	
<input type="checkbox"/>	3540000	2456	206	0.022	102219	702		101419	D	1321	01913		STUDENTE_516	



Case Study 2: Hometown Water Company

The Hometown Water Company is a CWS serving a population of 23,000 people. The system has two (2) *surface water* sources that supply two (2) separate treatment plants. Both treatment plants use direct filtration, *chlorine dioxide for taste and odor control* and *chlorine gas for disinfection*. There are two (2) entry points (101 and 102) to the distribution system (one from each treatment plant). The laboratory should refer to DWRS (See [Section 3](#): Electronic assistance tools) or the water system for this PWS's monitoring calendar for sampling requirement details.

The Home Water Company is required to perform the following activities based on the requirements of the *PA Filter Rules* and the *D/DBPR*:

- Report the number of entry point treatment days (the total number of days that chlorine dioxide was used at each treatment plant during the month).
- Measure the chlorite level at each entry point on each day that chlorine dioxide is used and report the results.
- Collect at least one chlorite 3-sample set from the distribution system each month.
- Collect TTHM and HAA5 samples.
- Continuously monitor the disinfectant residual and coliform bacteria for compliance.

Note: A separate *Laboratory Reporting Instructions for Disinfectant Residuals* technical guidance manual further explains reporting requirements for chlorine residual data and HPC results and is available on DEP's website at www.depgreenport.state.pa.us/elibrary/Search. Enter *Laboratory Reporting Instructions* into the document name search field.

Refer to [Section 8: Required Number of Monitoring Samples](#) and [Section 9: Rules for Disinfection Byproducts \(DBP\) Monitoring and Reporting](#) in this manual for additional information about the monitoring/reporting requirements.

During the month of November 2019, the system used chlorine dioxide for 10 days at one treatment plant and 15 days at the second treatment plant. Therefore, the total number of entry point treatment days was 25 (10 days for entry point 101 plus 15 days for entry point 102 equals 25 entry point treatment days).

The following events should be noted for the system:

- On November 7, 2019, there was a malfunction in the chlorine dioxide treatment at treatment plant 301; the entry point chlorine dioxide residual measurement was over 0.8 mg/L, and the chlorite level was over 1.0 mg/L. Therefore, on Nov. 8, 2019, the system was required to collect a chlorine dioxide 3-sample set in the distribution system and a chlorite 3-sample set in the distribution system. (Note that the chlorite samples will satisfy the monthly chlorite distribution system sampling requirement.)

- During the month of December 2019, the system did not use chlorine dioxide at either treatment plant. The system has chosen to measure source water TOC each month at each source to qualify for reduced TTHM/HAA5 monitoring.

Case Study 2 examples and screenshots show completed SDWA-1 and SDWA-S forms on the following pages. Descriptions of these examples include:

- For Chlorine Dioxide residuals reporting information, see the *Laboratory Reporting Instructions for Disinfectant Residual Technical Guidance manual*, available on DEP’s website at www.elibrary.dep.state.pa.us/dsweb/HomePage. Enter “*Laboratory Reporting Instructions*” into the search at the top of the web page.
- *Example screenshots 1 and 2* show the entry points and distribution chlorite (1009) sample results.

Note: Distribution system chlorite samples are analyzed and reported by an accredited laboratory.

- *Example screenshot 3* shows the completed SDWA-1 form to report TOC (2920) in raw water for the 4th quarter of 2019. *Example screenshot 4* shows the SDWA-1 form that should be used to report the TTHM and HAA5 (2450 and 2456) samples. The TTHM/HAA5 samples for this quarter were collected in November 2019; the number of samples taken is based on the system size.

Case Study 2/Example screenshot 1: SDWA-1 Chlorite (EP 101 and EP 102):

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SDWA-1													
Current Lab Certifications						Contaminants not Requiring Certification							
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Sample ID	Record ID
<input type="checkbox"/>	Sort			Sort	Sort	Sort		Sort			Sort		
<input type="checkbox"/>	4130065	1009	301	0.5	110219	101		110219	E	0915	03470		STUDENTE_376
<input type="checkbox"/>	4130065	1009	301	0.7	110519	101		110519	E	0905	03470		STUDENTE_377
<input type="checkbox"/>	4130065	1009	301	1.1	110719	101		110719	E	0900	03470		STUDENTE_378
<input type="checkbox"/>	4130065	1009	301	0.6	110819	101		110819	E	0920	03470		STUDENTE_379
<input type="checkbox"/>	4130065	1009	301	0.6	110919	101		110919	E	0845	03470		STUDENTE_380
<input type="checkbox"/>	4130065	1009	301	0.6	111219	101		111219	E	0915	03470		STUDENTE_381
<input type="checkbox"/>	4130065	1009	301	0.5	111619	101		111619	E	0855	03470		STUDENTE_382
<input type="checkbox"/>	4130065	1009	301	0.4	111819	101		111819	E	0920	03470		STUDENTE_383
<input type="checkbox"/>	4130065	1009	301	0.5	112419	101		112419	E	0925	03470		STUDENTE_384
<input type="checkbox"/>	4130065	1009	301	0.5	112819	101		112819	E	0850	03470		STUDENTE_385
<input type="checkbox"/>	4130065	1009	301	0.4	110219	102		110219	E	1015	03470		STUDENTE_386
<input type="checkbox"/>	4130065	1009	301	0.5	110519	102		110519	E	1005	03470		STUDENTE_387
<input type="checkbox"/>	4130065	1009	301	0.5	110719	102		110719	E	1000	03470		STUDENTE_388
<input type="checkbox"/>	4130065	1009	301	0.5	110819	102		110819	E	1020	03470		STUDENTE_389
<input type="checkbox"/>	4130065	1009	301	0.5	110919	102		110919	E	0945	03470		STUDENTE_390
<input type="checkbox"/>	4130065	1009	301	0.4	111119	102		111119	E	0935	03470		STUDENTE_391
<input type="checkbox"/>	4130065	1009	301	0.4	111219	102		111219	E	1010	03470		STUDENTE_392
<input type="checkbox"/>	4130065	1009	301	0.5	111619	102		111619	E	0955	03470		STUDENTE_393
<input type="checkbox"/>	4130065	1009	301	0.3	111819	102		111819	E	1020	03470		STUDENTE_394
<input type="checkbox"/>	4130065	1009	301	0.4	111919	102		111919	E	0900	03470		STUDENTE_395

Case Study 2/Example screenshot 1: (Continued) SDWA-1 Chlorite (EP 102):

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SDWA-1													
Current Lab Certifications						Contaminants not Requiring Certification							
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Record ID	
	Sort	Sort Entry Point Chlorine							Sort			Sort	
<input type="checkbox"/>	4130065	1009	301	0.4	112119	102		112119	E	0930	03470	STUDENTE_396	
<input type="checkbox"/>	4130065	1009	301	0.6	112419	102		112419	E	1025	03470	STUDENTE_397	
<input type="checkbox"/>	4130065	1009	301	0.6	112719	102		112719	E	0845	03470	STUDENTE_398	
<input type="checkbox"/>	4130065	1009	301	0.5	112819	102		112819	E	0950	03470	STUDENTE_399	
<input type="checkbox"/>	4130065	1009	301	0.5	112919	102		112919	E	0940	03470	STUDENTE_400	

Case Study 2/Example screenshot 2: SDWA-1 Chlorite (Distribution):

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SDWA-1													
Current Lab Certifications						Contaminants not Requiring Certification							
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Record ID	
	Sort	Sort Entry Point Chlorine							Sort			Sort	
<input type="checkbox"/>	4130065	1009	120	0.5	110819	001		110819	D	0810	03470	STUDENTE_401	
<input type="checkbox"/>	4130065	1009	120	0.4	110819	002		110819	D	0850	03470	STUDENTE_402	
<input type="checkbox"/>	4130065	1009	120	0.4	110819	003		110819	D	0930	03470	STUDENTE_403	

Case Study 2/Example screenshot 3: SDWA-1 TOC (Raw Water):

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SDWA-1													
Current Lab Certifications						Contaminants not Requiring Certification							
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Sample ID	Record ID
	Sort		Sort Entry Point Chlorine					Sort			Sort		
<input type="checkbox"/>	4130065	2920	582	2.2	101719	301		101519	R	1430	56789		STUDENTE_409
<input type="checkbox"/>	4130065	2920	582	2.0	111919	301		111819	R	0925	56789		STUDENTE_410
<input type="checkbox"/>	4130065	2920	582	1.9	121719	301		121619	R	0715	56789		STUDENTE_411
<input type="checkbox"/>	4130065	2920	582	1.9	101719	302		101519	R	1455	56789		STUDENTE_412
<input type="checkbox"/>	4130065	2920	582	1.7	111919	302		111819	R	1005	56789		STUDENTE_413
<input type="checkbox"/>	4130065	2920	582	1.8	121719	302		121619	R	0740	56789		STUDENTE_414

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SDWA-1													
Current Lab Certifications						Contaminants not Requiring Certification							
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Sample ID	Record ID
	Sort		Sort Entry Point Chlorine					Sort				Sort	
<input type="checkbox"/>	4130065	2950	217	0.014	112019	701		111819	D	0825	56789		STUDENTE_424
<input type="checkbox"/>	4130065	2950	217	0.027	112019	702		111819	D	0855	56789		STUDENTE_425
<input type="checkbox"/>	4130065	2950	217	0.011	112019	703		111819	D	0915	56789		STUDENTE_426
<input type="checkbox"/>	4130065	2950	217	0.037	112019	704		111819	D	0940	56789		STUDENTE_427
<input type="checkbox"/>	4130065	2456	206	0.0080	112019	701		111819	D	0830	56789		STUDENTE_428
<input type="checkbox"/>	4130065	2456	206	0.011	112019	702		111819	D	0900	56789		STUDENTE_429
<input type="checkbox"/>	4130065	2456	206	0.0050	112019	703		111819	D	0920	56789		STUDENTE_430
<input type="checkbox"/>	4130065	2456	206	0.022	112019	704		111819	D	0945	56789		STUDENTE_431



Case Study 3: Acme Industries

ACME Industries is a small NTNC **groundwater system** serving 980 people. The system has 2 wells that are disinfected with sodium hypochlorite in the same treatment building prior to storage. The laboratory should refer to DWRS (See [Section 3: Electronic assistance tools](#)) or the water system for this PWS's monitoring calendar for sampling requirement details.

ACME Industries is required to:

- Collect and report TTHM/HAA5 sample results. Refer to [Section 8: Required Number of Monitoring Samples](#) and [Section 9: Rules for Disinfection Byproducts \(DBP\) Monitoring and Reporting](#) in this manual for additional information about the monitoring/reporting requirements.
- Measure and report disinfectant residual results. The reporting requirements for disinfectant residuals samples are independent of the reporting requirements for the TTHM/HAA5 samples.

Note: A separate *Laboratory Reporting Instructions for Disinfectant Residuals* technical guidance manual further explains reporting requirements for chlorine residual data and HPC results and is available on DEP's website at www.depgreenport.state.pa.us/elibrary/Search. Enter “*Laboratory Reporting Instructions*” into the document name search field.

The following example screenshot shows the completed SDWA-1 form for the TTHM/HAA5 sampling requirements in the third quarter of 2019.

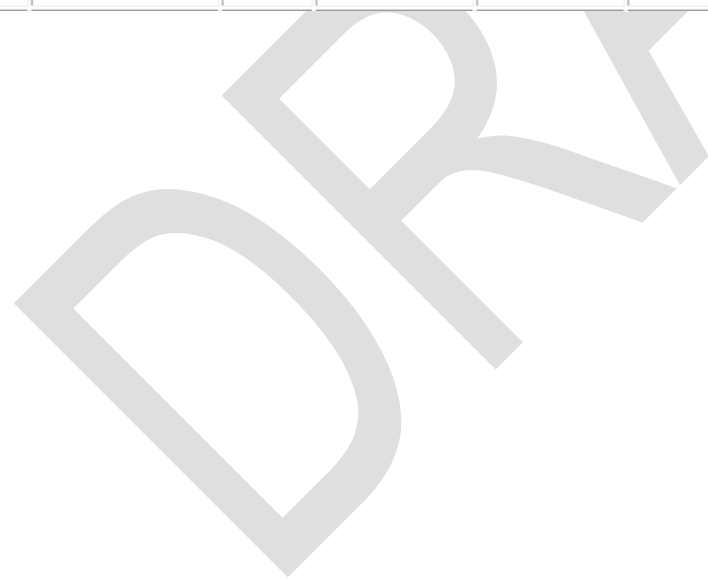
Case Study 3/Example screenshot: SDWA-1 BACTERIOLOGICAL/RESIDUAL DISINFECTANT/TURBIDITY/DBP ANALYSIS for TTHM and HAA5:

Safe Drinking Water Act

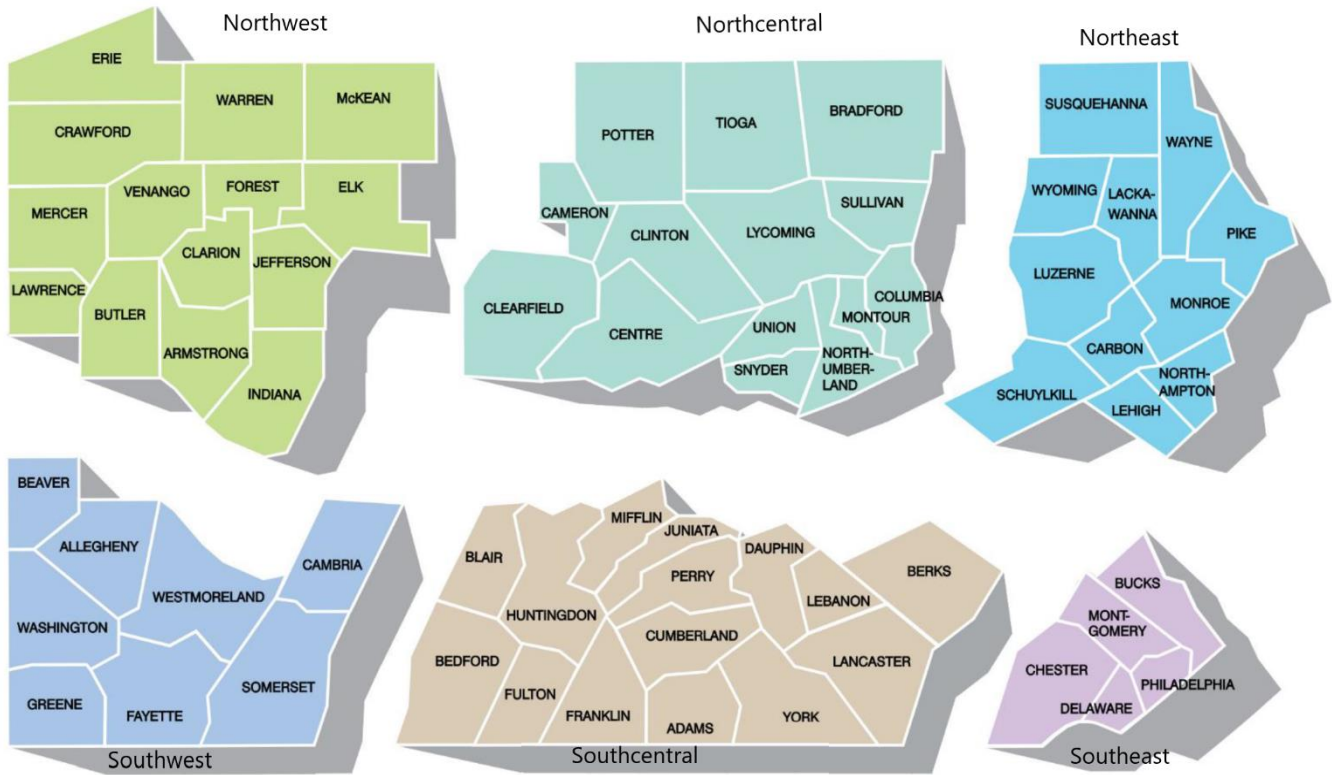


VIEW and EDIT RECORDS
 Click [here](#) for a Printer Friendly Version
[View a Monitoring Calendar](#)

SDWA-1													
Current Lab Certifications						Contaminants not Requiring Certification							
<input type="checkbox"/>	PWSID	Contam ID	Analysis Method	Result	Analysis Date	Location ID 1	Location ID 2	Sample Date	Sample Type	Sample Time	Lab ID	Sample ID	Record ID
	Sort		Sort Entry Point Chlorine					Sort				Sort	
<input type="checkbox"/>	2345678	2950	211	0.011	081319	701		080219	D	0900	03470		STUDENTE_436
<input type="checkbox"/>	2345678	2950	211	0.012	081319	704		080219	D	1245	03470		STUDENTE_437
<input type="checkbox"/>	2345678	2456	204	0.0	081319	701		080219	D	0900	03470		STUDENTE_438
<input type="checkbox"/>	2345678	2456	204	0.0	081319	704		080219	D	1245	03470		STUDENTE_439



**APPENDIX I: DEPARTMENT OF ENVIRONMENTAL PROTECTION
FIELD OPERATIONS REGIONAL OFFICES AND EMERGENCY PHONE NUMBERS**



DEP Regional Offices

Northwest Region

230 Chestnut St.
 Meadville, PA 16335-3481
 Main Telephone: 814-332-6945
 24-Hour Emergency: 800-373-3398

Counties: Armstrong, Butler, Clarion, Crawford, Elk, Erie, Forest, Indiana, Jefferson, Lawrence, McKean, Mercer, Venango and Warren

Southwest Region

400 Waterfront Drive
 Pittsburgh, PA 15222-4745
 Main Telephone: 412-442-4000
 24-Hour Emergency: 412-442-4000

Counties: Allegheny, Beaver, Cambria, Fayette, Greene, Somerset, Washington and Westmoreland

Northcentral Region

208 W. Third St., Suite 101
 Williamsport, PA 17701-6448
 Main Telephone: 570-327-3636
 24-Hour Emergency: 570-327-3636

Counties: Bradford, Cameron, Clearfield, Centre, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union

Southcentral Region

909 Elmerton Ave.
 Harrisburg, PA 17110-8200
 Main Telephone: 717-705-4700
 24-Hour Emergency: 800-541-2050

Counties: Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York

Northeast Region

2 Public Square
 Wilkes-Barre, PA 18701-1915
 Main Telephone: 570-826-2511
 24-Hour Emergency: 570-826-2511

Counties: Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming

Southeast Region

2 E. Main St.
 Norristown, PA 19401-4915
 Main Telephone: 484-250-5900
 24-Hour Emergency: 484-250-5900

Counties: Bucks, Chester, Delaware, Montgomery and Philadelphia

For the most recent emergency numbers, see the DEP webpages: <http://www.dep.pa.gov/>.

APPENDIX II: SDWA DATA CORRECTION FORMS



COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 BUREAU OF SAFE DRINKING WATER

**BACTERIOLOGICAL / RESIDUAL DISINFECTANT /
 TURBIDITY / DBP ANALYSIS**

**SDWA-1
 CORRECTION**

Reason for Correction: _____

White Areas: Enter the complete information with the correct information. **Shaded Areas: Enter the information which was reported incorrectly. Enter only the data which needs to be changed.**

PWS Name: _____	Reported PWS Name: _____	CONTAMINANT NAME	
Address: _____	Address: _____		
Phone: _____	Phone: _____		
PWS ID: _____	PWS ID: _____	CONTAM ID: _____	CONTAM ID: _____

	ANALYSIS			LOCATION ID 1	LOCATION ID 2	SAMPLE			
	METHOD	RESULT (Incl. Decimal)	MMDDYY	(Loc, EP or Plant)	(Individual Filter)	MMDDYY	TYPE	TIME	SAMPLE ID
CORRECT DATA									
SUBMITTED DATA									
CORRECT DATA									
SUBMITTED DATA									
CORRECT DATA									
SUBMITTED DATA									
CORRECT DATA									
SUBMITTED DATA									

LAB. NAME: _____ PHONE: _____ LAB ID: _____
 APPROVED BY: _____ DATE: _____