

Compliance Monitoring Plan for the Stage 2 Disinfectants and Disinfection Byproducts Rule Instructions

Under the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR), all community water systems (CWS) and non-transient non-community water systems (NTNC) that use a primary or residual disinfectant other than ultraviolet light or that deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light shall develop and implement a Stage 2 DBPR Compliance Monitoring Plan (Plan). A public water system must submit a copy of its Stage 2 DBPR Compliance Monitoring Plan to the Public Water Supply (PWS) Section by the date specified below.

- Water systems serving from 50,000 to 99,999 people must submit a copy of the Plan by **July 1, 2012**.
- Water systems serving from 10,000 to 49,999 people must submit a copy of the Plan by **July 1, 2013**.
- Water systems serving less than 10,000 people must submit a copy of the Plan by:
 - **July 1, 2013**, if *Cryptosporidium* monitoring *is not* required under the Long Term 2 Enhanced Surface Water Treatment Rule
 - **July 1, 2014**, if *Cryptosporidium* monitoring *is* required under the Long Term 2 Enhanced Surface Water Treatment Rule

Also, the system must keep the Plan on file for State and public review. **CWS and NTNC systems that purchase water from or sell water to another water system shall comply by the same date as the system with the *earliest* compliance date in the combined distribution system.** For example, a consecutive (purchase) system serving 3,000 people, receiving water from a wholesale (seller) system serving 75,000 people, must submit their monitoring plan by July 1, 2012.

After submittal and approval, a water system may revise its Stage 2 Plan to reflect changes in the population served, treatment, distribution system operations and layout (including new service areas), or other factors that may affect Total Trihalomethanes (TTHM) or Haloacetic Acids (HAA5) formation, or for PWS Section-approved reasons, after consultation with the PWS Section regarding the need for changes and the appropriateness of changes. The public water system shall submit a copy of its modified Plan to the PWS Section for approval before the next required sampling event.

Complete and Submit PARTs 1, 2, 3 and 4 of the Compliance Monitoring Plan template.
(The template is available on the Web at <http://www.ncwater.org/pws/DDBP.html>)

PART 1 – General System Information

Please complete the general information including water system name, 7-digit Public Water System Identification Number (PWSID#), mailing address, and the system contact person with their telephone number and email address. In the space provided indicate the population served by your system.

Please check the box for the type of untreated raw-water source(s) used by your system. In the treatment section, check the treatment(s) that YOUR system uses and provide the number of each source type that use the treatment.

PART 2 – Sample Site Information

In the first Sample Site Information table entitled “*Sample Site Information - Chlorine Dioxide, Chlorite, Total Organic Carbon, Alkalinity, Specific Ultraviolet Absorption, Bromate,*” please list each parameter, by code (see Parameter Code Key table), that your system is required to monitor, along with the following information:

- Sample Type (see Sample Type Key table)
- Facility ID (3-digit, if applicable)
- Sample Point ID for each sample location (3-digit)
- Location or address for each sample site

In the second Sample Site Information table entitled “*Sample Site Information - TTHM/HAA5,*” enter the following information for each Sample Point ID (B01-BXX) for the number of routine monitoring samples your system is required to collect :

- Location or address for each distribution system sample site – If applicable, include the Site IDs from your IDSE Report.
- The type of sampling location (High TTHM, High HAA5, Stage 1 or Other).
- The justification for selecting a sample location as a High TTHM, High HAA5, Stage 1 or Other site.
- Indicate whether the site is a reduced monitoring location. (Remember, *even if a system qualifies for reduced compliance monitoring under the Stage 2 DBPR, the monitoring plan **must** include the required number of routine monitoring sites and identify which locations will be used for reduced monitoring.*) **For more information regarding reduced monitoring, please refer to the Reduced Monitoring table in 15A NCAC 18C .2008 §141.623(a).**

Note: Systems that received a 40/30 certification or qualified for a very small system (VSS) waiver or did not identify the required number of Stage 2 DBPR compliance monitoring sites in their Initial Distribution System Evaluation (IDSE) Standard Monitoring Plan (SMP) or System Specific Study (SSS) should refer to Appendix A for site selection guidance.

PART 3 - Proposed Schedule & Compliance Calculations

You only need to submit proposed schedules for the parameters you are required to monitor, and for those parameters you choose to monitor as an option for reduced monitoring or to meet an Alternative Compliance Criteria (ACC) for Total Organic Carbon (TOC) removal. For instance, all systems will be required to monitor for TTHM/HAA5, while only systems using conventional filtration will be required to monitor for TOC and alkalinity. However, any system with surface water (SW) or ground water under the direct influence of surface water (GWUDI) sources may choose to monitor for TOC.

You do not need to submit compliance calculations to the State. Official compliance calculations will be performed on the data submitted by certified laboratories. The “Compliance Calculations” provided are for your reference, however, your system should still calculate each locational running annual average (LRAA) with each new sample result so that your system can be aware of and take steps to address any violations. These calculations fulfill the requirements of the Stage 2 DBPR and may be submitted “as is” for each required parameter. Systems are required to perform Operational Evaluation Level (OEL) calculations to determine the need to conduct an operational evaluation and submit a written report to the State within 90 days. An OEL calculation spreadsheet will be available on the PWS Section website.

For each parameter section, provide the information denoted below. Note: For any parameter section in Part 3 that does not pertain to your water system, check the “N/A - Not Applicable” box.

TTHM/HAA5

Please check the appropriate monitoring frequency and fill in the number of sample locations per monitoring period. Denote whether the samples are individual samples (TTHM or HAA5) or dual sample sets (both TTHM and HAA5) at each sample site location. In the space provided, indicate the anticipated sample schedule (*i.e.*, 1stWk/Jul, 1stWk/Oct, etc.). It is important to note that Stage 2 DBPR TTHM/HAA5 compliance monitoring must take place during the peak historical month and then, if conducting quarterly monitoring, at 90 day intervals before and after the peak historical month. Purchase systems should use the same peak month as their wholesaler. Systems that do not purchase their water should use the month during which the highest TTHM and HAA5 concentrations have historically occurred. If the peak historical month for TTHM and HAA5 concentrations is different, contact the PWS Section for guidance. (Routine monitoring requirements are provided in Appendix A.)

DBP Precursors

Please fill in the number of samples collected per period. List the dates that you anticipate collecting samples (*i.e.*, 1st Tues. of month). Also, list the associated 3-digit treatment plant (facility) ID or associated 3-digit SW / GWUDI source (facility) ID.

Optional TOC

Please fill in the number of samples collected per period. List the dates that you anticipate collecting samples (*i.e.*, 1st Tues. of month). Also, list the associated 3-digit SW / GWUDI source (facility) ID.

Chlorine Dioxide, Chlorite and Bromate

For chlorine dioxide (ClO₂), chlorite and bromate, please indicate whether the treatment (ClO₂ or ozone) is used year round or seasonally by checking the appropriate box. If seasonal, please indicate the months the treatment is normally used on the line provided. Please fill in the number of samples collected per period. Provide the anticipated sample schedule (*i.e.*, 1st Tues. of month). Also, list the associated 3-digit treatment plant (facility) ID.

PART 4 – System Schematic and System Changes

Attach a map or drawing of your current distribution system. Include the location of any interconnections with other public water systems. Also, where applicable, designate on the map the locations of the following facilities and their 3-digit location code:

- Sources
- Treatment Plants
- Entry Points
- Storage facilities, including volume
- All compliance sample sites that are required under the Stage 2 DBPR, as well as, Stage 1 Compliance Sites

Have there been any major changes to your distribution system since your approved IDSE Report? If Yes, explain (attach additional sheets if necessary).

Completed Compliance Monitoring Plans should be mailed or emailed to:

Dr. Rebecca Sadosky
Public Water Supply Section
1634 Mail Service Center
Raleigh, NC 27699-1634

Rebecca.Sadosky@ncdenr.gov

If you have any questions regarding the completion of the Compliance Monitoring Plan template, please contact:

Rebecca Sadosky at (919) 707-9096 or by email at Rebecca.Sadosky@ncdenr.gov

Appendix A

For systems that did not conduct monitoring as part of an Initial Distribution System Evaluation (IDSE) or have undergone major distribution system changes since submitting the IDSE Report

STAGE 2 DBPR - MONITORING REQUIREMENTS

TTHM/HAA5 monitoring is required for all CWS and NTNC water systems that use a primary or residual disinfectant other than ultraviolet light or that deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light (includes consecutive water systems that purchase treated water). TTHM/HAA5 samples are collected in the distribution system as a sample set unless otherwise noted. Stage 2 DBPR compliance monitoring must take place during the peak historical month and then, if conducting quarterly monitoring, at 90 day intervals before and after the peak historical month. If the peak historical month for TTHM and HAA5 concentrations is different, contact the PWS Section for guidance. Sample locations represent areas within the distribution system with the highest TTHM/HAA5 concentrations as determined during IDSE monitoring or as justified using other criteria such as Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) sample results, disinfectant residual levels and water age. All TTHM/HAA5 samples must be analyzed by an NC certified laboratory.

ROUTINE MONITORING

CWS and NTNC systems using Surface Water (SW) or GWUDI sources shall monitor as follows:

Population Size	Monitoring Frequency	Sample Set Type*	Total Monitoring Locations Per Monitoring Period
< 500	Annually	Individual	1 TTHM and 1 HAA5
500 – 3,300	Quarterly	Individual	1 TTHM and 1 HAA5
3,301 – 9,999	Quarterly	Dual	2
10,000 – 49,999	Quarterly	Dual	4
50,000 – 249,999	Quarterly	Dual	8
250,000 – 999,999	Quarterly	Dual	12
1,000,000 – 4,999,999	Quarterly	Dual	16
≥ 5,000,000	Quarterly	Dual	20

CWS and NTNC systems using Ground Water (GW) sources shall monitor as follows:

Population Size	Monitoring Frequency	Sample Set Type*	Total Monitoring Locations Per Monitoring Period
< 500	Annually	Individual	1 TTHM and 1 HAA5
500 – 9,999	Annually	Dual	2
10,000 – 99,999	Quarterly	Dual	4
100,000 – 499,999	Quarterly	Dual	6
≥ 500,000	Quarterly	Dual	8

*Systems on quarterly monitoring must take dual sample sets (both TTHM and HAA5) every 90 days at each monitoring location, except for systems with SW or GWUDI sources serving 500-3,300 people. Systems with ground water sources serving 500-9,999 people on annual monitoring must take dual sample sets at each monitoring location. All other systems on annual monitoring and systems with SW or GWUDI sources serving 500-3,300 people are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location and month.

STAGE 2 DBPR - SITE SELECTION INFORMATION

Systems that were granted a 40/30 certification or a VSS waiver and systems that did not conduct an IDSE should use their Stage 1 DBPR monitoring sites as the basis for Stage 2 DBPR site selection. New systems should work with the appropriate PWSS regional office to identify Stage 2 DBPR monitoring locations.

If the number of Stage 1 DBPR monitoring locations in your system is exactly the same as the required number of Stage 2 DBPR monitoring locations, continue to use all of your Stage 1 DBPR sites for Stage 2 DBPR compliance monitoring. Remember each location will have an assigned 3-digit Sample Point ID (BXX).

If you have more Stage 1 DBPR sites than required by the Stage 2 DBPR, select the sites with highest DBP levels for Stage 2 monitoring. Using the data from the most recent calendar year, calculate the locational running annual average (LRAA) TTHM and HAA5 concentrations at each Stage 1 DBPR monitoring site. Starting with the highest TTHM site, alternate site selection between locations representing high TTHM levels and high HAA5 levels until the required number of Stage 2 DBPR compliance monitoring locations have been identified.

If you have fewer Stage 1 DBPR sites than required by the Stage 2 DBPR, you must identify additional locations. Starting with the expected highest TTHM site, alternate site selection between locations representing expected high TTHM levels and high HAA5 levels until the required number of Stage 2 DBPR compliance monitoring locations have been identified.

- *High TTHM sites:* In general, higher water temperatures and increased water age lead to higher TTHM concentrations. Storage facilities in a distribution system typically increase water age. Therefore, if your system has storage tanks or reservoirs, locate high TTHM sites downstream of those tanks. In addition, sites near dead ends and sparsely populated residential areas can be likely sites for high TTHM. Other possible areas of high TTHM levels include hydraulic dead ends (where water flow is low or stagnant) and prior to the last fire hydrant. However, be sure to locate TTHM sites before or at the last group of customers on a dead end line. Samples taken at the very end of a dead end line are not representative of the water received by customers. Additionally, if your system

practices booster disinfection, TTHM sites should not be located just before booster chlorination is applied.

- *High HAA5 Sites:* As with TTHM, higher temperatures and increased residence time can lead to higher HAA5 concentrations. However, HAA5 can biodegrade where biological activity is present and disinfectant residual levels are low or non-existent. Therefore, consider locating high HAA5 sites where disinfectant residuals are significantly less than the system average (indicating a long residence time), but avoid areas that have very low or no residual. When booster disinfection is applied, the disinfectant residual will increase despite advanced water age. HAA5 levels are likely to increase after a booster disinfectant is applied due to the greater concentration of disinfectant available to react with DBP precursors and the lack of biological activity in these areas. Therefore, if your system practices booster disinfection, locate high HAA5 sites after booster disinfection is applied. Do *not* select high HAA5 sites in locations that regularly or in the summer months have free chlorine residuals less than 0.2 mg/L or with chloramine residuals less than 0.5 mg/L.

- *Final Site Selection:* Consider the following issues when making the final site selections:
 1. Select sites that provide the best geographic and hydraulic representation.
 2. Locate sites in as many key areas as possible, including isolated portions of the distribution system, areas downstream of tanks, areas downstream of booster chlorination, and within each pressure zone.
 3. Consider site access issues as each selected site must remain accessible over the long term.