

## Disinfectants / Disinfection Byproducts (DBP) Rules Monitoring & Reporting Requirements For Public Water Systems Treated with a Chemical Disinfectant

**Note: The initial compliance dates for the Stage 1 DBP Rule requirements are as follows:**

**January 2002**

- CWSs and NTNCWSs with surface water or GUDI sources serving  $\geq 10,000$  persons
- TNCWSs with surface water or GUDI sources serving  $\geq 10,000$  persons and treating with chlorine dioxide

**January 2004**

- CWSs and NTNCWSs with surface water or GUDI sources serving  $< 10,000$  persons
- CWSs and NTNCWSs with GW sources only
- TNCWSs with surface water or GUDI sources serving  $< 10,000$  persons and treating with chlorine dioxide
- TNCWSs with GW sources only and treating with chlorine dioxide
- BVRBs

**Note: The initial compliance dates for the Stage 2 DBP Rule requirements are as follows:**

- April 1, 2012 – for PWSs serving  $\geq 100,000$  people
- October 1, 2012 – for PWSs serving 50,000-99,999 people
- October 1, 2013
  - for PWSs serving 10,000-49,000 people
  - for PWSs serving  $< 10,000$  people if Cryptosporidium monitoring is not required under LT2ESWTR
- October 1, 2014 – for PWSs serving  $< 10,000$  people if Cryptosporidium monitoring is required under LT2ESWTR

*PWSs that are part of a combined distribution system must comply with the **schedule** of the system serving the largest number of customers in the combined distribution system.*

**Abbreviations**

<p>A = Annually ACC = Alternative Compliance Criteria BVRB = Bottled, Vended, Retail, and Bulk Water Hauling Systems CWS = Community Water System D = Distribution System E or EP = Entry Point GUDI = Groundwater Under the Direct Influence of SW GW = Groundwater HAA5 = Haloacetic Acids</p>	<p>LRAA = Locational Running Annual Average MCL = Maximum Contaminant Level M/R = Monitoring/Reporting MRDL = Maximum Residual Disinfectant Level MRR = Minimum Residual Required NTNCWS = Nontransient Noncommunity Water System P = Plant PWS = Public Water System Q = Quarter or Quarterly</p>	<p>R = Raw Water RAA = Running Annual Average SUVA = Specific Ultraviolet Absorption SW = Surface Water TOC = Total Organic Carbon TT = Treatment Technique TTHM = Total Trihalomethanes TNCWS = Transient Noncommunity Water System</p>
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Chlorine (0999) – Entry Point

PWSs Required To Monitor	Minimum Residual Required (MRR)	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
CWSs & NCWSs using SW/GUDI sources w/ filtration treatment	0.2 mg/L measured as chlorine (0999)	Continuously <sup>1</sup>	E	Each finished water entry point.	No altered monitoring.	<u>SDWA-1 Form:</u> <ul style="list-style-type: none"> <li>Lowest value each day if all values &gt; MRR.</li> <li>The date &amp; time the residual &lt; MRR AND the date &amp; time residual is again ≥ MRR.</li> <li>Each day EP is off-line.</li> </ul>	Monthly, within 10 days after the end of the month.	<b>TT (P1)</b> Failure to maintain MRR for > 4 hours. <b>M/R (P3 or P4)</b> Major: < 90% of samples taken or reported. Minor: 90-99% of samples taken or reported.
CWSs using GW sources and demonstrating 4-log inactivation of viruses	0.40 mg/L (unless an alternate residual is approved)	Continuously <sup>2</sup>	E	Each finished water entry point or other location approved by DEP.	No altered monitoring.	Same as above.	Same as above.	<b>TT (41)</b> Failure to maintain MRR for > 4 hours. <b>M/R (34)</b> Major: No samples taken or reported. Minor: ≥ 1 sample, but < total # required, taken or reported.
NCWSs using GW sources and demonstrating 4-log inactivation of viruses	Value used to demonstrate 4-log treatment & approved by DEP	Continuously <sup>2</sup>	E	Each finished water entry point or other location approved by DEP.	No altered monitoring.	Same as above.	Same as above.	<b>TT (41) &amp; M/R (34)</b> Same as above.

Chlorine (0999) – Distribution System

PWSs Required To Monitor	MRDL	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
All CWSs & NTNCWSs w/ chlorine or chloramines treatment All TNCWSs w/ filtered SW or GUDI sources (includes consecutive systems)	4.0 mg/L	Same as for total coliform monitoring.	Monthly <sup>3</sup>	D	The disinfectant residual must be monitored at the same time and from the same location as each routine and check total coliform sample that is taken.	No altered monitoring.	The monthly average of all samples on SDWA-S form.  If the system switches between chlorine and chloramines, include all results in the average.	Monthly, within 10 days after the end of the month.	<b>MRDL (11)</b> RAA of monthly averages of all samples, computed quarterly, > MRDL. <b>M/R (27)</b> Major: < 90% of samples taken or reported. Minor: 90-99% of samples taken or reported.

Note: Compliance is based on the running annual average (RAA), not individual samples or a single monthly average. For surface water systems, the monthly average may be reported on the same SDWA-S form used for reporting monthly-summarized disinfectant residual performance monitoring results.

<sup>1</sup> PWSs serving < 3,300 with SW/GUDI sources may reduce monitoring, upon DEP approval. If reduced monitoring is granted, PWS must again measure residual ASAP but within 4 hours of any residual < 0.2 mg/L.  
<sup>2</sup> PWSs serving < 3,300 with GW sources may reduce monitoring to once per day, during hour of peak flow. If the residual falls below MRR, PWS must conduct grab sampling every 4 hours until residual ≥ MRR.  
<sup>3</sup> For groundwater NTNCWSs serving ≤ 1,000 people, the monitoring frequency is quarterly. This coincides with quarterly total coliform monitoring.

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

PWSs Required To Monitor <sup>1</sup>	MCL	# Samples	Frequency <sup>2</sup>	Sample Type	Sample Location Specifics <sup>3</sup>	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 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>8 sets from highest TTHM locations;</li> <li>7 sets from highest HAA5 locations;</li> <li>5 sets from existing Stage 1 locations.</li> </ul>	<p><u>Reduced to:</u> 10 dual sample sets per Q (5 from highest TTHM sites &amp; 5 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> <li>Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources.<sup>5</sup></li> </ul> <p><u>Resume to:</u> 20 dual sample sets per Q if:</p> <ul style="list-style-type: none"> <li>any TTHM LRAA &gt; 0.040 mg/L;</li> <li>any HAA5 LRAA &gt; 0.030 mg/L;</li> <li>any source water TOC RAA &gt; 4.0 mg/L.</li> </ul>	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><b><u>MCL (02)</u></b> Any LRAA, computed quarterly, &gt; MCL.</p> <p><b><u>M/R (27)</u></b> <u>Major:</u> &lt; 90% of samples taken or reported. <u>Minor:</u> 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 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>6 sets from highest TTHM locations;</li> <li>6 sets from highest HAA5 locations;</li> <li>4 sets from existing Stage 1 locations.</li> </ul>	<p><u>Reduced to:</u> 8 dual sample sets per Q (4 from highest TTHM sites &amp; 4 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> <li>Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources.<sup>5</sup></li> </ul> <p><u>Resume to:</u> 16 dual sample sets per Q if:</p> <ul style="list-style-type: none"> <li>any TTHM LRAA &gt; 0.040 mg/L;</li> <li>any HAA5 LRAA &gt; 0.030 mg/L;</li> <li>any source water TOC RAA &gt; 4.0 mg/L.</li> </ul>	Same as above.	Same as above.	<p><b><u>MCL (02)</u></b> Same as above.</p> <p><b><u>M/R (27)</u></b> Same as above.</p>
CWSs & NTNCWSs serving 250,000 to 999,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	12 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>5 sets from highest TTHM locations;</li> <li>4 sets from highest HAA5 locations;</li> <li>3 sets from existing Stage 1 locations.</li> </ul>	<p><u>Reduced to:</u> 6 dual sample sets per Q (3 from highest TTHM sites &amp; 3 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> <li>Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources.<sup>5</sup></li> </ul> <p><u>Resume to:</u> 12 dual sample sets per Q if:</p> <ul style="list-style-type: none"> <li>any TTHM LRAA &gt; 0.040 mg/L;</li> <li>any HAA5 LRAA &gt; 0.030 mg/L;</li> <li>any source water TOC RAA &gt; 4.0 mg/L.</li> </ul>	Same as above.	Same as above.	<p><b><u>MCL (02)</u></b> Same as above.</p> <p><b><u>M/R (27)</u></b> Same as above.</p>

<sup>1</sup> Includes consecutive systems & blended systems using both SW (or GUDI) and GW sources.

<sup>2</sup> Must monitor during month of highest DBP concentration.

<sup>3</sup> Sample site selection must follow EPA protocol.

<sup>4</sup> Must be dual sample sets from each sampling location. A dual sample set consists of 1 TTHM sample and 1 HAA5 sample.

<sup>5</sup> 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 SW or GUDI sources (cont.)

PWSs Required To Monitor <sup>1</sup>	MRDL	# Samples	Frequency <sup>2</sup>	Sample Type	Sample Location Specifics <sup>3</sup>	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 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>3 sets from highest TTHM locations;</li> <li>3 sets from highest HAA5 locations;</li> <li>2 sets from existing Stage 1 locations.</li> </ul>	<p><u>Reduced to:</u> 4 dual sample sets per Q (2 from highest TTHM sites &amp; 2 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> <li>Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources.<sup>5</sup></li> </ul> <p><u>Resume to:</u> 8 dual sample sets per Q if:</p> <ul style="list-style-type: none"> <li>any TTHM LRAA &gt; 0.040 mg/L;</li> <li>any HAA5 LRAA &gt; 0.030 mg/L;</li> <li>any source water TOC RAA &gt; 4.0 mg/L.</li> </ul>	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><b><u>MCL (02)</u></b> Any LRAA, computed quarterly, &gt; MCL.</p> <p><b><u>M/R (27)</u></b> <u>Major:</u> &lt; 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 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>2 sets from highest TTHM locations;</li> <li>1 set from highest HAA5 location;</li> <li>1 set from existing Stage 1 location.</li> </ul>	<p><u>Reduced to:</u> 2 dual sample sets per Q (1 from highest TTHM site &amp; 1 from highest HAA5 site) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> <li>Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources.<sup>5</sup></li> </ul> <p><u>Resume to:</u> 4 dual sample sets per Q if:</p> <ul style="list-style-type: none"> <li>any TTHM LRAA &gt; 0.040 mg/L;</li> <li>any HAA5 LRAA &gt; 0.030 mg/L;</li> <li>any source water TOC RAA &gt; 4.0 mg/L.</li> </ul>	Same as above.	Same as above.	<p><b><u>MCL (02)</u></b> Same as above.</p> <p><b><u>M/R (27)</u></b> Same as above.</p>
CWSs & NTNCWSs serving 3,301 to 9,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	2 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>1 set from highest TTHM location;</li> <li>1 set from highest HAA5 location.</li> </ul>	<p><u>Reduced to:</u> Annual monitoring<sup>2</sup> at both locations<sup>4</sup> if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> <li>Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources.<sup>5</sup></li> </ul> <p><u>Resume to:</u> 2 dual sample sets per Q if:</p> <ul style="list-style-type: none"> <li>any TTHM LRAA &gt; 0.040 mg/L;</li> <li>any HAA5 LRAA &gt; 0.030 mg/L;</li> <li>any source water TOC RAA &gt; 4.0 mg/L.</li> </ul>	Same as above.	Same as above.	<p><b><u>MCL (02)</u></b> Same as above.</p> <p><b><u>M/R (27)</u></b> Same as above.</p>

<sup>1</sup> Includes consecutive systems & blended systems using both SW (or GUDI) and GW sources.

<sup>2</sup> Must monitor during month of highest DBP concentration.

<sup>3</sup> Sample site selection must follow EPA protocol.

<sup>4</sup> Must be dual sample sets from each sampling location. A dual sample set consists of 1 TTHM sample and 1 HAA5 sample.

<sup>5</sup> 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 SW or GUDI sources (cont.)

PWSs Required To Monitor <sup>1</sup>	MRDL	# Samples	Frequency <sup>2</sup>	Sample Type	Sample Location Specifics <sup>3</sup>	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.	<u>Reduced to:</u> Individual samples <sup>3</sup> annually <sup>2</sup> if, after 1 year of monitoring: • TTHM LRAA ≤ 0.040 mg/L; • HAA5 LRAA ≤ 0.030 mg/L; • Source water TOC RAA ≤ 4.0 mg/L for each plant treating SW or GUDI sources. <sup>4</sup> <u>Resume to:</u> 2 individual samples per Q if • any TTHM LRAA > 0.040 mg/L; • any HAA5 LRAA > 0.030 mg/L; • any source water TOC RAA > 4.0 mg/L. <u>Increased to:</u> Dual sample sets at <b>both</b> locations quarterly, for at least 4 Qs, if 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 ≤ 0.060 mg/L; • HAA5 LRAA ≤ 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.	<u>MCL (02)</u> Any LRAA, computed quarterly, > MCL. <u>M/R (27)</u> <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 <b>both</b> 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 <sup>2</sup> (1 at highest TTHM site & 1 at highest HAA5 site) <sup>3</sup> if, after 1 year of monitoring: • TTHM LRAA ≤ 0.060 mg/L; • HAA5 LRAA ≤ 0.045 mg/L.	Same as above.	Same as above.	<u>MCL (02)</u> Same as above. <u>M/R (27)</u> Same as above.

<sup>1</sup> Includes consecutive systems & blended systems using both SW (or GUDI) and GW sources.

<sup>2</sup> Must monitor during month of highest DBP concentration.

<sup>3</sup> 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*.

<sup>4</sup> 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 <sup>1</sup>	MRDL	# Samples	Frequency <sup>2</sup>	Sample Type	Sample Location Specifics <sup>3</sup>	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 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>3 sets from highest TTHM locations;</li> <li>3 sets from highest HAA5 locations;</li> <li>2 sets from existing Stage 1 locations.</li> </ul>	<p><u>Reduced to:</u> 4 dual sample sets per Q (2 from highest TTHM sites &amp; 2 from highest HAA5 sites) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> </ul> <p><u>Resume to:</u> 8 dual sample sets per Q if any TTHM LRAA &gt; 0.040 mg/L or any HAA5 LRAA &gt; 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><b><u>MCL (02)</u></b> Any LRAA, computed quarterly, &gt; MCL.</p> <p><b><u>M/R (27)</u></b> Major: &lt; 90% of samples taken or reported. Minor: 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 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>3 sets from highest TTHM locations;</li> <li>2 sets from highest HAA5 locations;</li> <li>1 set from existing Stage 1 location.</li> </ul>	<p><u>Reduced to:</u> 2 dual sample sets per Q (1 from highest TTHM site &amp; 1 from highest HAA5 site) if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> </ul> <p><u>Resume to:</u> 6 dual sample sets per Q if any TTHM LRAA &gt; 0.040 mg/L or any HAA5 LRAA &gt; 0.030 mg/L.</p>	Same as above.	Same as above.	<p><b><u>MCL (02)</u></b> Same as above.</p> <p><b><u>M/R (27)</u></b> Same as above.</p>
CWSs & NTNCWSs serving 10,000 to 99,999 people	TTHM - 0.080 mg/L HAA5 - 0.060 mg/L	4 <sup>4</sup> Must be analyzed by an accredited lab.	Q	D	<ul style="list-style-type: none"> <li>2 sets from highest TTHM locations;</li> <li>1 set from highest HAA5 location;</li> <li>1 set from existing Stage 1 location.</li> </ul>	<p><u>Reduced to:</u> 2 dual sample sets annually<sup>2</sup> (1 from highest TTHM site &amp; 1 from highest HAA5 site)<sup>5</sup> if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM LRAA ≤ 0.040 mg/L;</li> <li>Each HAA5 LRAA ≤ 0.030 mg/L;</li> </ul> <p><u>Resume to:</u> 4 dual sample sets per Q if any TTHM result &gt; 0.060 mg/L or any HAA5 result &gt; 0.045 mg/L.</p>	Same as above.	Same as above.	<p><b><u>MCL (02)</u></b> Same as above.</p> <p><b><u>M/R (27)</u></b> Same as above.</p>

<sup>1</sup> Includes consecutive systems.

<sup>2</sup> Must monitor during month of highest DBP concentration.

<sup>3</sup> Sample site selection must follow EPA protocol.

<sup>4</sup> Must be dual sample sets from each sampling location. A dual sample set consists of 1 TTHM sample and 1 HAA5 sample.

<sup>5</sup> 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 <sup>1</sup>	MRDL	# Samples	Frequency <sup>2</sup>	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"> <li>1 set from highest TTHM location;</li> <li>1 set from highest HAA5 location.</li> </ul>	<p><u>Reduced to:</u> Individual samples annually<sup>2</sup> (1 at highest TTHM site &amp; 1 at highest HAA5 site)<sup>3</sup> if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM result <math>\leq 0.040</math> mg/L;</li> <li>Each HAA5 result <math>\leq 0.030</math> mg/L;</li> </ul> <p><u>Resume to:</u> 2 dual sample sets annually<sup>2</sup> if any TTHM result <math>&gt; 0.060</math> mg/L or any HAA5 result <math>&gt; 0.045</math> mg/L.</p> <p><u>Increased to:</u> 2 dual sample sets per Q, for at least 4 Qs, if any TTHM result <math>&gt; 0.080</math> mg/L or any HAA5 result <math>&gt; 0.060</math> mg/L.</p> <p>May resume 2 dual sample sets annually<sup>2</sup> if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>TTHM LRAA <math>\leq 0.060</math> mg/L;</li> <li>HAA5 LRAA <math>\leq 0.045</math> mg/L.</li> </ul>	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><b><u>MCL (02)</u></b> Any LRAA, computed quarterly, <math>&gt; \text{MCL}</math>.</p> <p><b><u>M/R (27)</u></b> <u>Major:</u> <math>&lt; 90\%</math> of samples taken or reported. <u>Minor:</u> <math>90\text{-}99\%</math> 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: <sup>3</sup> <ul style="list-style-type: none"> <li>1 TTHM sample from highest TTHM location;</li> <li>1 HAA5 sample from highest HAA5 location.</li> </ul>	<p><u>Reduced to:</u> Individual samples<sup>3</sup> once every 3 years<sup>2</sup> if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>Each TTHM result <math>\leq 0.040</math> mg/L;</li> <li>Each HAA5 result <math>\leq 0.030</math> mg/L;</li> </ul> <p><u>Resume to:</u> Individual samples<sup>3</sup> annually<sup>2</sup> if any TTHM result <math>&gt; 0.060</math> mg/L or any HAA5 result <math>&gt; 0.045</math> mg/L.</p> <p><u>Increased to:</u> 2 dual sample sets per Q, for at least 4 Qs, if any TTHM result <math>&gt; 0.080</math> mg/L or any HAA5 result <math>&gt; 0.060</math> mg/L.</p> <p>May resume 2 individual samples<sup>3</sup> annually<sup>2</sup> if, after 1 year of monitoring:</p> <ul style="list-style-type: none"> <li>TTHM LRAA <math>\leq 0.060</math> mg/L;</li> <li>HAA5 LRAA <math>\leq 0.045</math> mg/L.</li> </ul>	Same as above.	Same as above.	<p><b><u>MCL (02)</u></b> Same as above.</p> <p><b><u>M/R (27)</u></b> Same as above.</p>

<sup>1</sup> Includes consecutive systems.

<sup>2</sup> Must monitor during month of highest DBP concentration.

<sup>3</sup> 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.
- The state 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.
- The state 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"> <li>• Calculate TTHM OEL for each sample location;</li> <li>• Calculate HAA5 OEL for each sample location.</li> </ul>	Quarterly	<ul style="list-style-type: none"> <li>• TTHM OEL &gt; 0.080 mg/L</li> <li>• HAA5 OEL &gt; 0.060 mg/L</li> </ul>	<ul style="list-style-type: none"> <li>• Sample location &amp; date</li> <li>• TTHM OEL value</li> <li>• HAA5 OEL value</li> </ul>	<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"> <li>• OEL report not submitted within 90 days of receiving notification of result causing OEL exceedance;</li> <li>• OEL report does not contain all required elements (&amp; DEP did not approve limited scope)</li> </ul>



Chlorine Dioxide (1008) – Entry Point

PWSs Required To Monitor	MRDL	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
<b>PWSs that treat with chlorine dioxide</b>  (excludes consecutive systems unless the PWS uses chlorine dioxide.)	0.8 mg/L	1	Daily  (only when chlorine dioxide treatment is in use) <sup>1</sup>	E <sup>2</sup>	Each EP treated with chlorine dioxide.  (Purchased water connections are excluded) <sup>3</sup>	No altered monitoring.  However, distribution system monitoring (“D”) is required if an “E” sample > MRDL (See table: “Chlorine Dioxide - Distribution System”).	<b>SDWA-S Form:</b>  The number of entry point samples required and the number of entry point samples taken each month, based on the number of “entry point treatment days.” <sup>4</sup>  <b>SDWA-I Form:</b>  All entry point chlorine dioxide detail result information* (may be reported on same form as “D” samples).  *If monitoring continuously for GWR, report highest measurement recorded each day.	Monthly  Within 10 days after the end of each month.  Note: For months when chlorine dioxide treatment is not used, an SDWA-S form must still be submitted, indicating 0 samples required and 0 samples taken.	<b>MRDL (11/13)</b> <b>Acute (13) if:</b> Any “E” sample > MRDL and: 1. At least 1 of 3 “D” samples next day > MRDL; or 2. System fails to take 3 “D” samples the following day.  <b>Non-acute (11) if:</b> 1. Any 2 consecutive daily “E” samples >MRDL and all “D” samples ≤ MRDL; or 2. Failure to take any “E” sample the day after any “E” sample is > MRDL.  <b>M/R (27)</b> <b>Major:</b> < 90% of all samples (E & D) taken or reported. <b>Minor:</b> 90-99% of all samples (E & D) taken or reported.

PWSs Required To Monitor	Minimum Residual Required (MRR)	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
<b>CWSs &amp; NCWSs using GW sources &amp; demonstrating 4-log inactivation of viruses</b>	Value used to demonstrate 4-log treatment & approved by DEP	Continuously <sup>5</sup>	E	Each finished water entry point or other location approved by DEP.	No altered monitoring.	<b>SDWA-I Form:</b> <ul style="list-style-type: none"> <li>Lowest value each day if all values &gt; MRR.</li> <li>The date &amp; time the residual &lt; MRR AND the date &amp; time residual is again ≥ MRR.</li> <li>Each day EP is off-line.</li> </ul>	Monthly, within 10 days after the end of the month.	<b>TT (41)</b> Failure to maintain MRR for > 4 hours.  <b>M/R (34)</b> <b>Major:</b> No samples taken or reported. <b>Minor:</b> ≥ 1 sample, but < total # required, taken or reported.

Note: If chlorine dioxide treatment is used by a system with GW sources demonstrating 4-log inactivation of viruses, **BOTH** the lowest and highest residual values must be reported for each day treatment is in use.

<sup>1</sup> If a daily “E” sample exceeds the MRDL, an “E” sample and follow-up “D” samples must be taken the next day, even if chlorine dioxide treatment is not being used the next day.

<sup>2</sup> The state will not track “E” samples by specific entry point; only that the correct number of samples was taken each month.

<sup>3</sup> If any chlorine dioxide samples exceed the MRDL in the selling system, the state may require the purchasing system to conduct chlorine dioxide monitoring.

<sup>4</sup> An “entry point treatment day” is equal to one entry point through which water treated with chlorine dioxide was delivered to the distribution system for any portion of one day.

<sup>5</sup> PWSs serving < 3,300 with GW sources may reduce monitoring to once per day, during hour of peak flow. If the residual falls below MRR, PWS must conduct grab sampling every 4 hours until residual ≥ MRR.

Chlorine Dioxide (1008) – Distribution System

PWSs Required To Monitor	MRDL	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
<b>PWSs that treat with chlorine dioxide</b>  (excludes consecutive systems unless the PWS uses chlorine dioxide.)	0.8 mg/L	3-sample set for each “E” sample that is > MRDL	Only the day after an “E” sample > MRDL	D	If no Cl <sub>2</sub> booster, close to 1 <sup>st</sup> customer.  If Cl <sub>2</sub> booster: <ul style="list-style-type: none"> <li>close to 1<sup>st</sup> customer</li> <li>average</li> <li>end of distribution system.</li> </ul>	No altered monitoring.	All “D” chlorine dioxide detail result information on SDWA-1 form.  (May be reported on same form as “E” samples.)	Monthly (if “D” sampling required)  (See above)	<b>MRDL (11/13)</b> See table: “Chlorine Dioxide - Entry Point.”  <b>M/R (27)</b> See table: “Chlorine Dioxide - Entry Point.”

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:
<b>CWSs &amp; NTNCWSs that treat with chlorine dioxide</b>  (excludes consecutive systems unless the PWS uses chlorine dioxide.)	1.0 mg/L	1	Daily  (only when chlorine dioxide treatment is in use)	E <sup>1</sup>	Each EP treated with chlorine dioxide  (Purchased water connections are excluded.) <sup>2</sup>	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.	<b>MCL (02)</b> None. MCL exceedance used only as trigger.  <b>M/R (27)</b> 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:
<b>CWSs &amp; NTNCWSs that treat with chlorine dioxide</b>  (excludes consecutive systems unless the 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"> <li>1 sample near first customer.</li> <li>1 sample at average residence location.</li> <li>1 sample at maximum residence location.</li> </ul>	<b>Increased:</b> Any time a daily “E” sample result > MCL (1.0 mg/L), a set is required the <u>next day</u> . <sup>3</sup> (Note: This set <u>may</u> be used to meet the monthly requirement.)  <b>Reduced:</b> to 1 set/Q if all chlorite samples (both E & D) ≤ MCL value (1.0 mg/L) for 1 year.  <b>Resume routine</b> (1 set/month) if: <ul style="list-style-type: none"> <li>Any qtrly “D” sample exceeds MCL value; or</li> <li>Any daily “E” sample exceeds MCL value.</li> </ul>	All “D” Chlorite results on SDWA-1 form.  Entry point and distribution system sample results may be reported on the same form.	Monthly  <i>OR</i> Quarterly, if on reduced monitoring.  If any sample > MCL value while on reduced monitoring, must resume monthly reporting immediately.	<b>MCL (02)</b> Average of any 3-sample “D” sample set > MCL. (The state will average each 3-sample set monthly.)  <b>M/R (27)</b> <b>Major:</b> < 90% of all samples (E & D) taken or reported.  <b>Minor:</b> 90-99% of all samples (E & D) taken or reported.

<sup>1</sup> The state will not track “E” samples by specific entry point, only that the correct number of samples was taken per month.

<sup>2</sup> If chlorite samples exceed the MCL value in the selling system, the state may require the purchasing system to conduct chlorite monitoring.

<sup>3</sup> 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.

Ozone (1014) – Entry Point

PWSs Required To Monitor	Minimum Residual Required (MRR)	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
<b>CWSs &amp; NCWSs using GW sources &amp; demonstrating 4-log inactivation of viruses</b>  (excludes consecutive systems unless the PWS uses ozone.)	Value used to demonstrate 4-log treatment & approved by DEP	Continuously <sup>1</sup>	E	Each finished water entry point or other location approved by DEP.	No altered monitoring.	On a SDWA-1 Form: <ul style="list-style-type: none"> <li>• Lowest value each day if all values &gt; MRR.</li> <li>• The date &amp; time the residual &lt; MRR AND the date &amp; time residual is again ≥ MRR.</li> <li>• Each day EP is off-line.</li> </ul>	Monthly, within 10 days after the end of the month.	<b>TT (41)</b> Failure to maintain MRR for > 4 hours. <b>M/R (34)</b> <u>Major:</u> No samples taken or reported. <u>Minor:</u> ≥ 1 sample, but < total # required, taken or reported.

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:
<b>CWSs &amp; NTNCWSs that treat with ozone</b>  (excludes consecutive systems unless the PWS uses ozone.)	0.010 mg/L	1  Must be analyzed by an accredited lab.	Monthly	E <sup>2</sup>	Each EP treated with ozone.  (Purchased water entry points are excluded) <sup>3</sup>	<u>Reduced to:</u> 1 per EP per Q if RAA of monthly bromate ≤ 0.0025 mg/L  <u>Resume:</u> routine (1 per EP per month) if RAA of quarterly bromate > 0.0025 mg/L	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.	<b>MCL (02)</b> RAA, computed qtrly, of monthly averages of all samples > MCL. <b>M/R (27)</b> <u>Major:</u> < 100% of samples taken or reported. <u>Minor:</u> N/A

<sup>1</sup> PWSs serving < 3,300 with GW sources may reduce monitoring to once per day, during hour of peak flow. If the residual falls below MRR, PWS must conduct grab sampling every 4 hours until residual ≥ MRR.

<sup>2</sup> The state will not track “E” samples by specific entry point, only that the correct number of samples was taken per month.

<sup>3</sup> 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.

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 <sup>1</sup>	It is a violation if:
CWSs & NTNCWSs with SW or GUDI sources that have conventional filtration <sup>2</sup>	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"> <li>Source water tap (blended tap or composite sample if multiple sources for a plant);</li> <li>Post-sedimentation tap (CFE or other DEP approved location).</li> </ul>	<p><u>Reduced to:</u> Q, if the post-sedimentation RAA TOC (“P” sample) for the plant is:</p> <ul style="list-style-type: none"> <li>&lt; 2.0 mg/L for 2 consecutive years;</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>&lt; 1.0 mg/L for 1 year.</li> </ul> <p><i>Reduced TOC monitoring is plant specific.</i></p> <p><u>Resume:</u> routine (monthly) monitoring if TOC RAA for the plant is <math>\geq 2.0</math> 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 monthly “R” & “P” TOC results on SDWA-1 form.	Q Within 10 days after the end of each quarter.	<p><b><u>Treatment Technique (46)</u></b> TOC removal ratio is &lt; 1.00 based on the RAA (computed quarterly) of monthly performance ratios and none of the annual ACC are achieved.</p> <p><b><u>M/R (27)</u></b> <u>Major:</u> &lt; 90% of all samples (R &amp; 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 &amp; P) taken or reported.</p>
<b><u>OPTIONAL</u></b> CWSs & NTNCWSs with SW or GUDI sources that do NOT have conventional filtration (& that serve $\geq 500$ 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)</i> <sup>3</sup>	R	Each SW or GUDI source	<p><u>Reduced to:</u> Q if the TTHM/HAA5 frequency is reduced.</p> <p><u>Resume:</u> routine (monthly)* if:</p> <ul style="list-style-type: none"> <li>Source water (“R” samples) TOC RAA &gt; 4.0 mg/L, or</li> <li>TTHM/HAA5 results no longer meet the reduced criteria.</li> </ul> <p><i>*This will also reset the TTHM/HAA5 frequency to routine.</i></p>	All monthly “R” TOC results on SDWA-1 form.	Q Within 10 days after the end of each quarter.	N/A

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 <sup>1</sup>	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.	<b><u>M/R (27)</u></b> See TOC table.

<sup>1</sup> Results may be reported each month during the quarter.

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

<sup>3</sup> Refer to the “Altered Monitoring” column of the TTHM/HAA5 tables.

Step 1 Required TOC Percent Removal by Enhanced Coagulation and Enhanced Softening (3 x 3 Matrix) <sup>1</sup>

Source-water TOC (mg/L)	Source-water alkalinity (mg/L as CaCO <sub>3</sub> )		
	0 - 60	>-60 - 120	>120 <sup>2</sup>
> 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 %

Optional<sup>3</sup> 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 <sup>4</sup>	It is a violation if:
<b>CWSs &amp; NTNCWSs with SW or GUDI sources that have conventional filtration</b> (Not required at consecutive systems.)	1 set comprised of dissolved organic carbon (DOC) & UV <sub>254</sub>  Must be analyzed by an accredited lab.	Monthly	R or P <sup>5</sup> (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 <sub>254</sub> results on SDWA-1 form.	Q  Within 10 days after the end of each quarter.	<b><u>Treatment Technique (46)</u></b> See TOC table.  <b><u>M/R (27)</u></b> N/A

Optional<sup>6</sup> Magnesium Hardness (as CaCO<sub>3</sub>) (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 <sup>4</sup>	It is a violation if:
<b>CWSs &amp; NTNCWSs with SW or GUDI sources that have conventional filtration and that are practicing enhanced softening<sup>1</sup></b> (Not required at consecutive systems.)	1	Monthly	R and P <sup>7</sup> (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 <sub>3</sub> ) on SDWA-1 form	Q  Within 10 days after the end of each quarter.	<b><u>Treatment Technique (46)</u></b> See TOC table.  <b><u>M/R (27)</u></b> N/A

<sup>1</sup> Enhanced coagulation is the treatment technique for removal of DBP precursors. Systems practicing precipitative softening must perform enhanced softening as the treatment technique for removal of DBP precursors.

<sup>2</sup> Systems practicing enhanced softening must meet the TOC removal requirements in this column.

<sup>3</sup> SUVA data is used to meet either monthly or annual alternative compliance criteria (or both)

<sup>4</sup> Results may be reported each month during the quarter.

<sup>5</sup> 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.

<sup>6</sup> Magnesium hardness data is used to meet annual alternative compliance criteria for systems practicing enhanced softening.

<sup>7</sup> 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.

**Alternative Compliance Criteria (ACC) for Enhanced Coagulation and Enhanced Softening Systems**

Enhanced Coagulation: CWSs & NTNCWSs with SW or GUDI sources that have conventional filtration may use any of the following ACCs to comply with the treatment technique for control of DBP precursors:

- (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 CaCO<sub>3</sub>), 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.

Enhanced Softening: CWSs & NTNCWSs with SW or GUDI sources that have conventional filtration practicing precipitative softening may use the following ACCs to comply with the treatment technique for control of DBP precursors:

- (1) Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as CaCO<sub>3</sub>), 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 CaCO<sub>3</sub>), measured monthly and calculated quarterly as an annual running average.

**Bottled, Vended, Retail, and Bulk System (BVRB) M/R Requirements**

**Note 1:** The following BVRB systems are exempt from all DBPR monitoring and reporting requirements:

- Vended systems permitted-by-rule.
- BVRB systems using no chemical disinfectant/oxidant (e.g., using only ultraviolet light (UV)) or purchasing water that has not been treated with a chemical disinfectant/oxidant.

**Note 2:** Requirements for BVRBs that purchase finished (chlorinated) water from another public water system:

- The buying BVRB only has to monitor for TTHM/HAA5.
- If the buying BVRB treats with chlorine dioxide, they must also monitor for chlorite.
- If the buying BVRB treats with ozone, they must also monitor for bromate.

**Note 3:** BVRBs using GW sources and demonstrating 4-log inactivation of viruses are required to monitor and report residual disinfectant information.

**Note 4:** BVRBs using SW/GUDI sources with filtration treatment are required to monitor and report residual disinfectant information under the SWTR.

**Disinfectant Residual Requirements – Entry Point**

BVRBs Required To Monitor	Minimum Residual Required (MRR)	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
<b>Chlorine/Chloramines (Cl<sub>2</sub>) (0999)</b> For GW EPs for compliance monitoring to demonstrate 4-log inactivation of viruses For SW/GUDI EPs with filtration	Value used to demonstrate 4-log treatment & approved by DEP  0.2 mg/L	Continuously <sup>1</sup>	E	Each finished water entry point or other location approved by DEP.	No altered monitoring.	On a SDWA-1 Form: <ul style="list-style-type: none"> <li>• Lowest value each day if all values &gt; MRR.</li> <li>• The date &amp; time the residual &lt; MRR AND the date &amp; time residual is again ≥ MRR.</li> <li>• Each day EP is off-line.</li> </ul>	Monthly, within 10 days after the end of the month.	<b><u>TT (41-GWR or P1-SWTR)</u></b> Failure to maintain MRR for > 4 hours. <b><u>M/R (27)</u></b> <u>Major:</u> < 90% of samples taken or reported. <u>Minor:</u> 90-99% of samples taken or reported.
<b>Chlorine Dioxide (ClO<sub>2</sub>) (1008)</b> Only for GW EPs for compliance monitoring to demonstrate 4-log inactivation of viruses	Value used to demonstrate 4-log treatment & approved by DEP	Continuously <sup>1</sup>	E	Same as above.	No altered monitoring.	Same as above.	Same as above.	<b><u>TT (41)</u></b> Same as above. <b><u>M/R (34)</u></b> Same as above.
<b>Ozone (O<sub>3</sub>) (1014)</b> Only for GW EPs for compliance monitoring to demonstrate 4-log inactivation of viruses	Value used to demonstrate 4-log treatment & approved by DEP	Continuously <sup>1</sup>	E	Same as above.	No altered monitoring.	Same as above.	Same as above.	<b><u>TT (41)</u></b> Same as above. <b><u>M/R (34)</u></b> Same as above.

<sup>1</sup> BVRBs with GW sources serving < 3,300 may reduce monitoring to once per day, during hour of peak flow. If the residual falls below MRR, grab sampling must be conducted every 4 hours until residual ≥ MRR.

Disinfection Byproduct Requirements – Entry Point

Parameter Being Monitored	MCL	# Samples	Frequency	Sample Type	Sample Location Specifics	Altered Monitoring	Report	State Reporting Frequency	It is a violation if:
<b>Chlorite (1009)</b>	1.0 mg/L	1	Daily	E <sup>1</sup>	Each EP supplying water treated with ClO <sub>2</sub> . (Purchased water EPs are excluded) <sup>2</sup>	If any “E” sample > 1.0 mg/L, collect 3 additional samples within 24 hours from same lot, batch, machine, carrier vehicle or delivery point.	All EP chlorite detail result information on SDWA-1 form.	Monthly Within 10 days after the end of the month.	<b>MCL (02)</b> Average of any “E” and follow-up 3-sample set > MCL. <b>M/R (27)</b> <u>Major:</u> < 90% of all samples taken or reported. <u>Minor:</u> 90-99% of all samples taken or reported.
<b>Bromate (1011)</b>	0.010 mg/L	1 Must be analyzed by an accredited lab.	Monthly	E <sup>1</sup>	Each EP supplying water treated with O <sub>3</sub> . (Purchased EPs are excluded) <sup>2</sup>	<u>Reduced to:</u> 1 per EP per Q if RAA of monthly bromate ≤ 0.0025 mg/L. <u>Resume to:</u> routine (1 per EP per month) if RAA of quarterly bromate > 0.0025 mg/L.	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.	<b>MCL (02)</b> RAA, computed quarterly, of monthly averages of all samples > MCL. <b>M/R (27)</b> <u>Major:</u> < 100% of samples taken or reported. <u>Minor:</u> N/A
<b>TTHM (2950) HAA5 (2456)</b>	TTHM = 0.080 mg/L HAA5 = 0.060 mg/L	1 <sup>3</sup> Must be analyzed by an accredited lab.	Annually	E	Each EP supplying water treated with a chemical disinfectant or oxidant.  <i>Includes purchased water EPs if the seller treats the water with a chemical disinfectant or oxidant.</i>	<u>Increased to:</u> Quarterly monitoring if any TTHM result > 0.080 mg/L or any HAA5 result > 0.060 mg/L. <u>Resume to:</u> Annual monitoring if, after at least 4 consecutive Qs, <ul style="list-style-type: none"> <li>• TTHM RAA &lt; 0.060 mg/L;</li> <li>• HAA5 RAA &lt; 0.045 mg/L.</li> </ul>	All EP TTHM & HAA5 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.	<b>MCL (02)</b> The RAA, computed quarterly, from any EP is > MCL. <b>M/R (27)</b> <u>Major:</u> < 90% of samples taken or reported. <u>Minor:</u> 90-99% of samples taken or reported.

<sup>1</sup> The state will not track “E” samples by specific entry point, only that the correct number of samples was taken per month.  
<sup>2</sup> If sample result exceeds the MCL value in the selling system, the state may require the purchasing system to conduct monitoring.  
<sup>3</sup> Must be a dual sample set from each sampling location. A dual sample set consists of 1 TTHM sample and 1 HAA5 sample.