EPA Region 8 Surface Water Treatment Rules & Significant Deficiencies

WARWS  April 24, 2013

Jake Crosby, EPA Region 8
303.312.6389
crosby.jake@epa.gov
Discussion Outline:

1. Surface Water Treatment Monitoring & Reporting Requirements.
   A. Basic Requirements
   B. Common Reporting Issues

2. When to Contact EPA.

3. LT2 Surface Water Treatment Rule Requirements & Update
   A. Rule Implementation Update
   B. Installing and reporting for UV systems

4. Sanitary surveys – Changes & Common Significant Deficiencies
Surface Water Treatment Rules – Overview

• Apply to all public water systems using surface water or ground water under the direct influence of surface water (GWUDI)
• Required for community and non-community systems.
  • Acute health risk
• Treatment technique requirements (not MCLs)
• Requires multiple barriers including:
  • Filtration
  • Disinfection.
SWTRs Treatment Techniques for Filtered Systems Require:

- At least 99% (2-logs) removal of Cryptosporidium (could be more based on LT2 monitoring)
- 99.9% (3-logs) removal and/or inactivation of Giardia
- 99.99% (4-logs) removal and/or inactivation of viruses

ADD (+) LOGS FROM EACH TREATMENT STEP TO SHOW COMPLIANCE
Monitoring Requirements

(1) Turbidity of the Combined Filter Effluent (CFE), to ensure that the filtration barrier is effective. Conventional/direct/membrane filtration systems must continuously monitor turbidity from individual filters (IFE). Membranes must monitor membrane integrity.

(2) Chemical Disinfectant Residual (e.g., chlorine) at Point of Entry (POE) to the distribution system. Residual must be sufficient to provide the needed inactivation barrier, AND always be at least 0.2 mg/L. Systems using UV must also report certain parameters.

(3) Disinfectant Residual in Distribution System must be measured when Total Coliform Rule samples are taken (write results on lab slip). It must be detectable, to prevent re-growth of organisms.
Common Reporting Issues
CFE Turbidity

• Report 4 hr CFE turbidity at same time (if possible) every day
  • Eliminates subjectivity.
• Report the highest CFE turbidity reading for the day, even if it doesn’t fall on one of the 4 hour readings.
  • If high value occurs due to pump kicking on or other issue, provide explanation.
  • CFE value can never exceed 1 or 5 NTU (depending on type of filtration)
• Rounding
  • Regulations only list 1 significant figure.
CFE Turbidity

REQUIRED # OF 4-HOUR TURBIDITY READINGS/DAY = 6 (UNLESS PLANT OFF - INDICATE "PO" IN EACH CELL)

** REPORT MAXIMUM TURBIDITY READING THAT DAY, EVEN IF IT WAS BETWEEN 4 HOUR READINGS

DO NOT REPORT RESULTS COLLECTED DURING BACKWASH, FILTER-TO-WASTE, OR ANY TIME WATER IS NOT BEING PROCUCED FOR CONSUMPTION

<table>
<thead>
<tr>
<th>Date</th>
<th>1st (NTU)</th>
<th>2nd (NTU)</th>
<th>3rd (NTU)</th>
<th>4th (NTU)</th>
<th>5th (NTU)</th>
<th>6th (NTU)</th>
<th>DAILY MAX &quot;*(NTU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.13</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>0.211</td>
</tr>
<tr>
<td>2</td>
<td>0.12</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>0.204</td>
</tr>
<tr>
<td>3</td>
<td>0.11</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>0.117</td>
</tr>
<tr>
<td>4</td>
<td>0.12</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>0.169</td>
</tr>
<tr>
<td>5</td>
<td>0.11</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>0.189</td>
</tr>
<tr>
<td>6</td>
<td>0.12</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>PO</td>
<td>0.185</td>
</tr>
</tbody>
</table>
Chlorine Residual at POE

- Can never go below 0.2 mg/L for more than 4 hours **BUT**
- You should also be checking to make sure that the chlorine residual results in an inactivation that achieves the required logs removal / inactivation of the target organism.
  - Surveyors will be checking CT calculations during sanitary surveys.
- Good operational practice to perform these calculations at least weekly.
  - I can provide a spreadsheet for this if anyone wants it.
You are Required to Notify EPA within 24 hours under the SWTRs if*:

- (1) CFE turbidity exceeds the maximum limit (1 or 5 NTU)
- (2) point of entry chlorine residual drops below 0.2 mg/L

Document time/date of these calls on the monthly SWTR report

Call me at 303.312.6389 and leave a message if I am not available.

If situation is more serious,

*This is not a comprehensive list of emergency situations.
You should also notify EPA under the SWTRs if:

- You are planning to switch to a new source.
  - Additional testing might be required (i.e. LT2, etc)
- You are making changes to your treatment.
  - Might require EPA review for treatment adequacy.
- You are making significant changes to your disinfection processes.
- You are making any other changes (management, designated operators, etc)

System change forms located at: [http://www2.epa.gov/region8-waterops/reporting-forms-and-instructions-reporting-forms](http://www2.epa.gov/region8-waterops/reporting-forms-and-instructions-reporting-forms)
LT2 ESWTR

(*most recent SW regulation*)
LT2 is Risk-Based Rule: Source Water Monitoring

- Systems serving at least **10,000** – monitor for *Cryptosporidium*, *E. coli* and turbidity at least 1x/month for 24 months

- Systems serving **<10,000** – monitor for *E. coli* biweekly for one year; evaluate annual average against “trigger” level. If exceed trigger (100 *E. coli*/100 mL), you must conduct monitoring for *Crypto*.

- Required unless a treatment plant achieves maximum (5.5 logs) *Cryptosporidium* reduction (Bin 4 treatment).
### LT2 Bins & Treatment Requirements:

<table>
<thead>
<tr>
<th>Cryptosporidium Concentration (oocysts/L)</th>
<th>Bin Classification</th>
<th>Additional Cryptosporidium Treatment Required</th>
<th>Alternative Filtration</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.075</td>
<td>Bin 1††</td>
<td>No additional treatment required</td>
<td></td>
</tr>
<tr>
<td>0.075 to &lt; 1.0</td>
<td>Bin 2</td>
<td>1 log</td>
<td>1 log</td>
</tr>
<tr>
<td>1.0 to &lt; 3.0</td>
<td>Bin 3</td>
<td>1.5 log</td>
<td>2 log</td>
</tr>
<tr>
<td>≥ 3.0</td>
<td>Bin 4</td>
<td>2 log</td>
<td>2.5 log</td>
</tr>
</tbody>
</table>

†† Systems serving < 10,000 people that are not required to monitor for Cryptosporidium are placed in Bin 1.

(1) As determined by the state (or other primacy agency) such that the total removal/inactivation > 4.0-log.
(2) As determined by the state (or other primacy agency) such that the total removal/inactivation > 5.0-log.
(3) As determined by the state (or other primacy agency) such that the total removal/inactivation > 5.5-log.
Status of WY Systems – 1st Round of LT2

• # of systems in Bin 3 or Bin 4 = 0
• # of systems in Bin 2 = 3 (need 4 logs total Cryptosporidium reduction)
• All other WY systems that monitored:
  • # that monitored for E. coli = 27; all are Bin 1
• # committed to 5.5 logs treatment waiver (filtration & UV or membranes & pretreatment) = 35
## Compliance Dates for Installation of Additional Treatment (after 1\textsuperscript{st} round of monitoring)

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Population Served</th>
<th>Crypto Treatment Compliance Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100,000 +</td>
<td>4/1/2012</td>
</tr>
<tr>
<td>2</td>
<td>50,000 - 99,999</td>
<td>10/1/2012</td>
</tr>
<tr>
<td>3</td>
<td>10,000 – 49,999</td>
<td>10/1/2013</td>
</tr>
<tr>
<td>4</td>
<td>&lt;10,000</td>
<td>10/1/2014</td>
</tr>
</tbody>
</table>
Second round of LT2 source water monitoring

• Begins in 2015 for systems serving >50,000; starts in subsequent years for smaller systems.
  • May NOT be done early
• Does not apply to systems that maintain the maximum 5.5 logs treatment for Crypto.
  • But this maximum treatment MUST be in place by the compliance date!
• Must redo LT2 monitoring if change to a new SW source
Advice Regarding UV Installation and Reporting

- Substantial # of systems still need to install and begin reporting.
- Don’t wait until the last minute!
- Inform EPA of manufacturer and provide validation report before installing system.
  - Some units do not have the required certification and / or validation.
  - Clarify with the manufacturer / your engineer regarding reporting method and complexity.
- Make sure you inform / work with WY DEQ.
- Work through reporting issues BEFORE your compliance date.
Sanitary Surveys and Significant Deficiencies
Upcoming Changes:

- Flooded master meter pit only a significant deficiency if it relates to a leaking fitting (Need to Confirm!!!).
- SW / GWUDISW systems – you must be able to monitor or verify flow through your treatment process.
- High hazard cross connections and required devices have been more clearly defined.
- Flapper valves on overflows must also have a screen (unspecified size) inside.
- Drain requirements have been modified.
- Storage tanks must be cleaned and inspected at least every 10 years.
- Unknown integrity of storage tank.
Common Significant Deficiencies:

- Lack of a written Emergency Response Plan:
  - Template located at: http://www2.epa.gov/region8-waterops/reporting-forms-and-instructions-reporting-forms
- Unprotected high hazard connections
- Finished water storage tank concerns
  - Overflows/drains directly connected to storm sewer
  - No 24 mesh screen on vents, overflows
  - Inadequate air gap on overflows/drains
  - Access hatch poorly constructed
EPA Region 8 Surface Water Treatment Rules Refresher
April 2013
Additional Issues for SW / GU Systems

• Calibration and Condition of Monitoring Equipment
• Recording/Reporting Capability
• Disinfection Profile Available
• Filter Backwash Recycling Records Available
• Adequate Filtration and Disinfection design and operation / monitoring.
• Identify 1st customer and calculate inactivation at that point – is it adequate.
• Are you meeting treatment techniques for Crypto, Giardia and viruses?
Significant Deficiency Requirements

• Significant Deficiencies (SDs) at Surface Water and SW Consecutives require a Written Response from the System within 45 days. The response must
  – -- indicate how you will address the SDs
  – --provide a schedule for addressing them.

• Failure to respond within 45 days, and/or failure to correct the SDs per your schedule, is a Treatment Technique violation of the Surface Water Treatment Rules.

• Bottom line – Be proactive and avoid the process!
WARWS  April 24, 2013

Thanks!

Jake Crosby, EPA Region 8
Surface Water Treatment Rule Manager
303.312.6389
crosby.jake@epa.gov