

DATE: February 26, 2008

TO: Office of Drinking Water Staff

THROUGH: J. Wesley Kleene, Ph.D., P.E., Director  
Office of Drinking Water

FROM: John I. Capito, P.E., Chairman  
M/DBP Rule Team

SUBJECT: Water – Surveillance & Regulations – Long Term 2 Rule – Results of Source  
Water Monitoring

RELATED: WM 892 – LT2 Source Water Monitoring

SUMMARY STATEMENT:

This memo summarizes how ODW will address the results of the source water monitoring required under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2), as published in the Federal Register on January 5, 2006 (effective March 6, 2006).

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BACKGROUND:

The requirements of LT2 apply to all waterworks using surface water or Groundwater Under the Direct Influence of surface water (GUDI). All owners of applicable waterworks must conduct both an initial and a second round of source water monitoring for each plant that treats a surface water or GUDI. The monitoring may include *Cryptosporidium*, *E. coli*, and turbidity. The results of the monitoring will determine the level, if any, of additional *Cryptosporidium*

treatment that must be provided. This memo discusses how ODW will handle the results of the initial and second round of monitoring. Refer to WM 892 for the Source Water Monitoring requirements. The second (follow-up round) of source water monitoring will be done in 2015 to 2019, depending upon the size of the waterworks.

#### REPORTING OF SOURCE WATER MONITORING RESULTS [§ 141.706]:

1. All owners of schedule 1, 2, and 3 waterworks (those serving 10,000 or more persons) will sample for *Cryptosporidium* at least once per month for 24 months. Owners of schedule 4 waterworks (serving < 10,000 persons) required to monitor for *Cryptosporidium* have a choice of monitoring once per month for 24 months or twice a month for 12 months. *Cryptosporidium* results for Schedule 1, 2 or 3 waterworks will be reported directly to the EPA database by their approved laboratory. **All** waterworks owners must provide paper copies of the *Cryptosporidium* results to ODW. The results must be reported no later than 10 days after the end of the month that the sample was collected.
2. Owners of Schedule 4 waterworks (those serving < 10,000 persons) with filtration will normally begin by conducting *E. coli* monitoring (every two weeks for 12 months – a total of 26 samples). If DCLS becomes certified for enumeration of *E. coli* and the waterworks owners utilize DCLS as their laboratory, DCLS will provide those results via R&R. {In order to enter these results into R&R, they must be labeled “Special” and associated with the raw water facility.} Waterworks utilizing certified laboratories<sup>1</sup> must have those laboratories provide the results directly to ODW, with results submitted no later than 10 days after the end of the month that the sample was collected.
3. Once ODW has received all of the results (whether *Cryptosporidium* or *E. coli*), ODW will perform a “binning” calculation. “Binning” is to be completed within 3 months of the completion of sampling for *Cryptosporidium* and within 1 month for *E. coli*.

Because R&R does not have the capability to receive *Cryptosporidium* data, it is suggested that each District Engineer create a folder for each waterworks conducting Source Water Monitoring to hold the paper result forms until the “binning” occurs. The results can then be moved to the correspondence folder with the letter summarizing the results. The District Engineer should review the results as they are received to ensure that the data meets EPA requirements, with a detailed check of the first several sample reports. ODW does not need to comment on the individual results, unless it appears that they do not meet the EPA requirements or the owner’s approved monitoring plan. Use the Review Checklist in Appendix A-1.

#### GRANDFATHERED SOURCE WATER MONITORING DATA [§ 141.707]:

Owners of waterworks may submit grandfathered *Cryptosporidium* data to comply with the initial Source Water Monitoring requirement.

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<sup>1</sup> There is no explicit laboratory certification for MPNs. However, the statistical analyses used to calculate MPNs rely on Presence/Absence (PA) testing of the water, whether using Multiple Tube techniques on a series of dilutions, or ONPG-MUG techniques on a Quantitray array. In this sense, the lab reporting MPNs should be certified for the underlying PA methods used.

- The waterworks owner must have submitted an “Intent to Grandfather” package by the monitoring plan deadline, and ODW must have approved that “Intent” package (see WM 892).
- The waterworks owner must submit a “Grandfathered Data Package”, due 2 months after normal monitoring would have begun. This “Data Package” must be reviewed to ensure completeness and usefulness. Use the Review Checklist in Appendix B-1 and letter to the owner (noting if the data is complete, or if more sampling is required) in Appendix B-2.
- If the grandfathered data is found to be complete, proceed to the binning calculation, to be completed in three months. (Note – while binning may occur immediately, the deadline for any required treatment is not shifted; the deadline is linked to the scheduled completion date for initial source water monitoring, not the actual completion date.)
- If the grandfathered data is found to be incomplete, retain the data and meld it with the additional data submitted under initial source water monitoring. Once all the required data is received, proceed to the binning calculation.

#### BIN CLASSIFICATION FOR FILTERED WATERWORKS – *E. Coli* [§ 141.701(a)(4)]:

Once all the data for schedule 4 systems has been received ODW will calculate the annual mean *E. coli* concentration. [Note- *E. coli* results will not be evaluated for schedule 1-3 systems.] The annual mean will be compared to the following trigger levels:

1. For waterworks using lake or reservoir sources: the trigger level is an annual mean *E. coli* concentration of 10 per 100 mL.
2. For waterworks using free-flowing stream sources: the trigger level is an annual mean *E. coli* concentration of 50 per 100 mL.
3. GUDI waterworks need to use the trigger level for the surface water body closest to the water source. If there is no surface water body nearby, the trigger level for lake or reservoir sources is to be used.

If the annual mean *E. coli* concentration equals or is below the trigger level, the waterworks is classed as a “Bin 1” waterworks. If the annual mean *E. coli* concentration is above the trigger level, the waterworks must move to *Cryptosporidium* monitoring, or the system may elect to provide full *Cryptosporidium* treatment. Appendix C-1 provides a worksheet that may be used to record the calculation. Appendix C-2 provides a letter to use in advising the waterworks of the results of the calculation.

Note that the requirement for *E. coli* monitoring is for the source water to be sampled at least every two weeks for 12 months (a total of 26 samples). Failure to conduct the required source water monitoring, according to § 141.701(a)(4)(iii), results in the waterworks having to conduct *Cryptosporidium* monitoring.

**BIN CLASSIFICATION FOR FILTERED WATERWORKS – *CRYPTOSPORIDIUM***  
[§ 141.710]:

Once all the *Cryptosporidium* data (whether grandfathered or initial source water monitoring) is received and determined to be acceptable ODW will perform the bin classification. *E. coli* and turbidity data collected during *Cryptosporidium* monitoring will be used by EPA for non-binning purposes.

EPA has provided Excel workbooks to be used in the binning calculation. Each workbook includes instructions, a worksheet to use for data input (to be “personalized” for each individual water plant), and examples. Those workbooks are found at ODWshare\02-Committees\202-Rule Teams\MDBP and ESWT Rules\Stage 2 and LT2 Rules\LT2 Crypto Calculators. There are three separate versions, as follows:

1. a version for systems that collect 24 to 47 samples;
2. a version for systems that collect 48 or more samples, with an equal number of samples each month; and
3. a version for systems that collect 48 or more samples, with an unequal distribution of samples.

Version 1 (24-47 samples) is to be used for Schedule 4 systems that collect 2 samples per month for only 12 months (according to EPA, the spreadsheet calculates correctly for this situation). Please note that the worksheet requires entry of oocyst concentration, not oocyst count (the result reports will provide a count but may not provide concentration – you may have to perform the calculation to convert to concentration), and cells are to be left blank if there was no sample. If a water plant has only one raw water source, or if there are several water sources and the plant sampled from the combined raw water, enter the sample results directly to the appropriate spreadsheet. If the plant is served by multiple water sources and sampled each water source individually, then you will need to develop a flow-weighted average result for each month’s sampling event(s) to enter to the spreadsheet. Choose the correct workbook for the waterworks you are evaluating, and follow the instructions provided on the first sheet of the workbook. A copy of the completed workbook (with the example worksheets deleted) should be renamed and saved to the FO local server, in the district directory along with other LT2 materials for the waterworks (DO NOT OVER WRITE THE FILES ON ODWShare!).

The spreadsheet will automatically calculate the mean *Cryptosporidium* concentration and the appropriate bin into which the water plant is to be placed. Appendix D-1 provides a letter informing the waterworks owner of the mean oocyst concentration and the proposed bin classification (see the table in § 141.710 for the listing of oocyst concentration vs. bin classification). The letter will propose the bin classification and ask the owner to accept that classification, using the form in Appendix D-2, or provide justification for not accepting it (this is similar to the approach ODW took with the “40/30 certifications” under the Stage 2 DBP Rule). The deadline for the owners to submit the bin classification acceptance back to ODW is shown in the following table.

System Schedule	Deadline for submitting Bin Classification Acceptance <sup>2</sup>
1	April 1, 2009
2	October 1, 2009
3	October 1, 2010
4 (waterworks which monitor for <i>Crypto</i> )	October 1, 2012

Once the waterworks owner submits the form accepting the bin classification, ODW will send the letter contained in Appendix D-3. This letter formally establishes the bin classification. If the plant is placed into bin 2 or higher, this letter also advises of the additional log “inactivation + removal” requirement that the plant will face. Please refer to the table in § 141.711 for the listing of bin classification vs. type of filtration currently practiced vs. the additional treatment required. A plant placed into bin 2 or higher must provide the increased level of treatment by the deadlines contained in the table in § 141.713 (the compliance date is based on system schedule).

If the water plant is classified as bin 2 or higher, ODW will need to meet with the waterworks owner and their consultant to begin discussions about which Toolbox Options will be appropriate for the particular waterworks. Note that plants placed in bin 3 or 4 must provide at least 1.0 log of additional *Cryptosporidium* treatment via certain specified treatment technologies [see § 141.711(b)(2)]. Please refer to the EPA’s Guidance Manuals (Toolbox, UV Disinfection, Membrane Filtration, etc.) for more details on the various treatment technologies. All of these Guidance Manuals are found on ODWshare\02-Committees\202-Rule Teams\MDBP and ESWT Rules\Guidance Manuals.

#### TIME ACCOUNTING AND TRACKING

All “Grandfathered Data” packages are to be entered to PT Log as an SDWA Report. Time spent reviewing these packages is to be charged to SDWA Reports. Approval of grandfathered data packages will NOT be entered to R&R as a date. Time spent reviewing data submitted following an approved SWM plan will be charged to SDWA Reports. The “bin classification statement” form received back from a waterworks owner will be entered to PT Log as an SDWA Report, and time spent in preparing the final bin classification letter will be charged to SDWA Reports. In addition, the date that the final “Bin Classification” letter (App. D-3) is sent to the owner is to be entered to R&R (System Information button, Dates tab).

#### APPROVAL LETTERS:

Copies of the final letters (Appendices B-2, C-2, and D-3) must be sent to:

LT2ESWTR and STAGE 2 DBPR  
US EPA-IPMC  
P O Box 98  
Dayton, OH 45401-0098

END OF MEMO

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<sup>2</sup> Deadlines are calculated as six months after scheduled completion of initial source water monitoring for *Cryptosporidium* – see § 141.710(e).

Appendix A-1 – LT2 REVIEW CHECKLIST FOR INITIAL SOURCE WATER MONITORING

<b>Review Checklist - LT2 Initial Source Water Monitoring <i>Cryptosporidium</i> Results Review Sheet</b>		
City/County: _____	Waterworks Name: _____	
PWSID #: _____	Water Plant Name: _____	
Schedule of System: _____	Date of Data Submission: _____	
Reviewed By: _____	Date Review Started: _____	
<b>I. GENERAL</b>		
Date Source Water Monitoring Plan approved	_____	
Samples collected in accordance with approved SWM plan		
Within "5 day window"?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
At approved sample location?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Using laboratory identified in SWM plan?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If "no", what laboratory?	_____	
Is new lab on EPA Approved List?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Has new lab submitted "certification letter" about analytical work?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Was approved SWM plan revised?	<input type="checkbox"/> Yes <input type="checkbox"/> No (if so, discuss below)	
<b>II. REVIEW OF RESULTS</b>		<b>COMMENT</b>
Results submitted in a timely fashion	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Results reported appropriately (i.e., "oocysts)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Appropriate number of MS samples collected and reported?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

(see attached pages for check of individual results)

General comments & discussion:

**DETERMINATION:**

*Cryptosporidium* data  IS  IS NOT acceptable.

Date Review Completed: \_\_\_\_\_

Reviewed By: \_\_\_\_\_

Source Water Monitoring <i>Cryptosporidium</i> Data Quality Control Checklist				
Required Elements	Sample ID:			
	Collection Date:			
Sample Type	field or matrix spike			
Sample volume filtered (L)	Liters			
Was 100% of filtered volume examined? *	Yes or No			
Number of oocysts counted	Number			
Results (oocysts per Liter) – three decimal places	Number			
If less than 100% examined				
Volume of resuspended concentrate	Liters			
Volume of resuspended concentrate processed via IMS	Liters			
If less than 10L filtered or less than 100% examined				
Number of filters used *	Number			
Packed pellet volume *	mL			
For matrix spike samples				
Sample volume spiked	Liters			
Estimated number of oocysts spiked	Number			
Sample meets all requirements?	Yes or No			

\*Volume analyzed for all field samples must be at least 10 L, 2 mL of packed pellet, or as much volume as could be filtered by 2 filters

Make copies of this page, in order to complete for each sample submitted. If sample is NOT acceptable, contact waterworks **immediately** to advise of problem, and to discuss possible resolution of the problem.

Appendix B-1 – REVIEW CHECKLIST FOR GRANDFATHERED DATA

<b>Review Checklist – LT2 Grandfathered Data Submission</b>	
City/County: _____ Waterworks Name: _____	
PWSID #: _____ Water Plant Name: _____	
Schedule of System: _____ Date of Data Submission: _____	
Reviewed By: _____ Date Review Started: _____	
<b>Part 1. Submission Basics</b>	* Required for all unfiltered systems and those filtered systems that bypass <i>E. coli</i> monitoring or exceed <i>E. coli</i> trigger levels
<input type="checkbox"/> YES <input type="checkbox"/> NO	Grandfathered data package was submitted no later than two months after the date when the system’s monitoring period begins Schedule 1 – by December 1, 2006 Schedule 2 – by June 1, 2007 Schedule 3 – by June 1, 2008 Schedule 4 – by December 1, 2008 Schedule 4 – PWS monitoring for <i>Cryptosporidium</i> * – by June 1, 2010
<input type="checkbox"/> YES <input type="checkbox"/> NO	Data package includes a list of the field and matrix spike (MS) samples identified by sample ID and collection date
<input type="checkbox"/> YES <input type="checkbox"/> NO	At least 24 field samples, collected monthly over a two-year period, and all field sample results during period are reported
<input type="checkbox"/> OK <input type="checkbox"/> NO	Date “Intent to grandfather” was approved: _____ Any additional samples needed on basis of “Intent” approval? <input type="checkbox"/> Yes <input type="checkbox"/> No (If yes, discuss in comments section) Data submitted matches up with approved “Intent”? <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> YES <input type="checkbox"/> NO	If the PWS was to collect additional samples on basis of “Intent”, a sampling schedule and sample location description was submitted no later than three months prior to the date when the system’s monitoring period begins. -Schedule 1 – by July 1, 2006 -Schedule 2 – by January 1, 2007 -Schedule 3 – by January 1, 2008 -Schedule 4 – filtered PWS monitoring for <i>E. coli</i> – by July 1, 2008 -Schedule 4 – PWS monitoring for <i>Cryptosporidium</i> * – by July 1, 2010
<input type="checkbox"/> OK <input type="checkbox"/> NO	Grandfathered data package includes a description of the sampling location in relation to its water source(s) and treatment processes, including points of chemical addition and filter backwash recycle. <input type="checkbox"/> Verbal description <input type="checkbox"/> Schematic Same as proposed in “intent to grandfather” <input type="checkbox"/> Yes <input type="checkbox"/> No All samples collected no earlier than January 1999? <input type="checkbox"/> Yes <input type="checkbox"/> No Samples representative of plant’s current water source? <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> YES <input type="checkbox"/> NO	Grandfathered data samples were collected each calendar month on a regular schedule or documentation was provided for any cases when this requirement was not met

<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>The laboratory analyzing the samples provided a letter certifying that all quality control criteria were met as listed below or the laboratory provided bench sheets and sample examination report forms.</p> <ul style="list-style-type: none"> <li>• Ongoing precision and recovery</li> <li>• Method blank</li> <li>• Positive and negative staining controls</li> <li>• Matrix spike</li> <li>• Sample receipt temperature</li> <li>• Holding time and temperature</li> </ul>
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>Samples collected from appropriate location(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No          All source water <i>Cryptosporidium</i> results collected during the monitoring period are included in package? <input type="checkbox"/> Yes <input type="checkbox"/> No          Additional documentation provided regarding re-sampling, use of pre-sedimentation, or use of off-stream storage during routine plant operations?  <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</p>
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>Laboratory is on EPA's "approved list"</p>
<p><b>Part 2. Grandfathered Data Review</b></p>	
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>Total number of field samples collected: _____          Total number of matrix spike samples collected: _____          At least one matrix spike sample for each 20 field samples? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>At least 10 liters filtered for each sample? <input type="checkbox"/> Yes <input type="checkbox"/> No          If no, were samples run until 2 filters clogged? <input type="checkbox"/> Yes <input type="checkbox"/> No          All samples have similar volumes (<i>undefined by EPA</i>)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>Was 100% of filtered volume examined? <input type="checkbox"/> Yes <input type="checkbox"/> No          If no, was packed pellet at least 2 mL? <input type="checkbox"/> Yes <input type="checkbox"/> No          If no, was volume of resuspended concentrate and volume of resuspension processed reported? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>For matrix spike samples:          Volume spiked listed? <input type="checkbox"/> Yes <input type="checkbox"/> No          Estimated number of oocysts spiked listed? <input type="checkbox"/> Yes <input type="checkbox"/> No          Lab addresses oocyst recovery and discusses any recoveries below 11% or above 100%? <input type="checkbox"/> Yes <input type="checkbox"/> No          Volume of matrix spike sample analyzed within 10% of volume analyzed of associated field sample? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>Samples analyzed using EPA approved method.          Method _____ Year of Method _____</p>
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>Samples meet all requirements? (If no, list unacceptable samples and discuss in "comments section" – such samples need to be replaced with new samples.)</p>
<p><b>Part 3. Review of Bench Sheets &amp; Sample Examination Report Forms</b>          (Use only if there is no laboratory certification letter)  <input type="checkbox"/> Itemized review is NA because laboratory certification letter was submitted.</p>	
<input type="checkbox"/> YES <input type="checkbox"/> NO	<p>All required data elements reported for all samples:</p> <ul style="list-style-type: none"> <li>• PWSID</li> <li>• Facility ID or name</li> <li>• Sample Type</li> <li>• Sample ID No.</li> <li>• Sample temperature upon receipt at the lab (<math>\leq 20</math> °C, and not frozen)</li> <li>• Holding temperature never exceeds 20 °C</li> </ul>

<input type="checkbox"/> YES <input type="checkbox"/> NO	Acceptable ongoing precision and recovery sample with each field sample <ul style="list-style-type: none"> <li>• Reagent water sample spiked with 100 to 500 oocysts</li> <li>• OPR sample processed within one week of field sample</li> <li>• Recovery between 11% and 100%</li> </ul>
<input type="checkbox"/> YES <input type="checkbox"/> NO	All samples processed within appropriate holding times. 1999 version of Methods 1622/1623 <ul style="list-style-type: none"> <li>• Time from initiation of sample collection to completion of concentration ≤ 72 hours</li> <li>• Concentration held ≤ 24 hours between IMS and staining</li> <li>• Slides read &amp; confirmed ≤ 72 hours of staining</li> </ul> 2001, 2003, 2005 versions of Methods 1622/1623 <ul style="list-style-type: none"> <li>• Sample elution initiated ≤ 96 hours of sample collection or field filtration</li> <li>• Elution, concentration &amp; purification completed in 1 workday</li> <li>• Slides stained ≤ 72 hours of application of purified sample to slide</li> <li>• Slides read &amp; confirmed ≤ 7 days of staining</li> </ul>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Acceptable method blank associated with each field sample
<input type="checkbox"/> YES <input type="checkbox"/> NO	Positive and negative staining controls were acceptable for all samples.
<input type="checkbox"/> YES <input type="checkbox"/> NO	Any samples rejected due to data or lab problems? List and discuss in "comments".

**Comments:**

**DETERMINATION:**

LT2 Grandfathered Data  IS  IS NOT complete.

LT2 Grandfathered Data  IS  IS NOT acceptable.

Additional monitoring  IS  IS NOT needed.

Date Review Completed: \_\_\_\_\_

Appendix B-2 – GRANDFATHERED DATA APPROVAL LETTER

Date

SUBJECT: (City or County)  
Water - (System Name)  
PWSID No.: \_\_\_\_\_

*Waterworks Owner Name*  
*Address 1*  
*Address 2*  
*City/Town, VA ZIP Code*

Dear \_\_\_\_\_:

We have received *Cryptosporidium* data from your waterworks, which is proposed for grandfathering under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2). This is to advise that the data proposed for grandfathering has been found by the Virginia Department of Health (VDH) to meet the requirements of § 141.707 of LT2, and is hereby provisionally approved.

↑ *(option 1)* This data meets all requirements for source water monitoring, for the full 24 (or 12) months required. No further monitoring is required. VDH will now proceed to the next step, of determining the bin placement for your waterworks.

★ *(option 2)* While this data is acceptable, it does not meet the requirements for the full 24 (or 12) months of source water monitoring. Please see the attachment for a listing of months that will need to be monitored.

↓ You will need to develop a schedule to address those months, and submit that schedule to VDH for approval within the next 30 days. Please remember that all samples must be collected per the approved schedule (no more than 2 days before or 2 days after the scheduled date), and must be analyzed by a laboratory which has been approved by EPA for the specific analysis. The laboratory must report the results electronically to EPA. You will have the opportunity to review the data once it is posted on EPA’s web tool. In addition to the electronic reporting of the data by your lab, the results must be reported to VDH in paper format.

If you have any questions on this, please do not hesitate to call \_\_\_\_\_, District Engineer, of this office.

Sincerely,

Name  
Engineering Field Director

Attachment: Listing of months not accepted for grandfathering *(only if needed)*  
pc: VDH – Central Office – ATTN: Steve Pellei  
----- Health Department  
U.S. EPA – Information Processing and Management Center

Appendix C-1 – REVIEW OF *E. COLI* RESULTS

<b>LT2 Source Water Monitoring for Waterworks &lt; 10,000 population Worksheet for <i>E. coli</i> results</b>	
City/County: _____	Waterworks Name: _____
PWSID #: _____	Water Plant Name: _____
Schedule of System: _____	Date of Data Submission: _____
Evaluated By: _____	Date: _____
<b>Monitoring Requirement:</b>	<b>Met?</b>
Requirement: Sample at least every two weeks for twelve months (If not met, discuss on next page)	<input type="checkbox"/> Yes <input type="checkbox"/> No

Sample No.	Month	Year	Result ( <i>E. coli</i> /100 mL)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			

Name of Laboratory: \_\_\_\_\_

Certified by \_\_\_\_\_ for *E. coli* enumeration.

(Continued)

**Results:** Average of all results: \_\_\_\_\_ E. coli per 100 mL

**Water Source for Plant:** \_\_\_\_\_

**Water Source Type and “Trigger Levels”:**  Lake/Reservoir: 10 *E. coli*/100 mL

Stream/River: 50 *E. coli*/100 mL

GUDI: \_\_\_\_\_ *E. coli*/100 mL

**Do results exceed “Trigger Levels”?**  Yes  No

If “No”: Plant is classified as “Bin 1”

If “Yes”: Plant must perform Source Water Monitoring for *Cryptosporidium* in order to determine bin classification

**Monitoring Performance (discussion):**

The LT2 requires filtered systems serving < 10,000 to sample for *E. coli* every two weeks for 12 months, or move to *Cryptosporidium* monitoring. If the waterworks did not collect the full number of required samples, discuss what will be done to resolve the issue.

Appendix C-2 – APPROVAL LETTER FOR *E. COLI*  
Date

SUBJECT: (City or County)  
Water - (System Name)  
PWSID No.: \_\_\_\_\_

*Waterworks Owner Name*  
*Address 1*  
*Address 2*  
*City/Town, VA ZIP Code*

Dear \_\_\_\_\_:

We have received *E. coli* data from your waterworks, collected during source water monitoring under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2). This is to advise that the Virginia Department of Health (VDH) has reviewed the data, and has calculated the mean annual *E. coli* concentration, as required by the rule.

The water source of your waterworks is a (*choose correct source type*) lake or reservoir/free flowing stream/GUDI. Per § 141.701 (a) (4) of LT2, a waterworks with your source type has a trigger level of \_\_\_\_\_ *E. coli* per 100 mL.

↑ (option 1) The mean annual concentration of the source water samples from your waterworks is \_\_\_\_\_ *E. coli* per 100 mL. This means that your waterworks has not exceeded the trigger level. According to the bin classification table in § 141.710 of LT2, your waterworks is hereby provisionally classified as Bin 1. This means that no additional treatment is required of your waterworks with respect to *Cryptosporidium*. VDH will advise you in the future concerning the next round of required source water monitoring and of any other reporting requirements.  
↓

↑ (option 2) . The mean annual concentration of the source water samples from your waterworks is \_\_\_\_\_ *E. coli* per 100 mL. This means that your waterworks has exceeded the trigger level. According to § 141.701 (a) (4) of LT2, your waterworks must now move to *Cryptosporidium* monitoring. You will need to develop a monitoring plan for *Cryptosporidium* monitoring, and submit that schedule to VDH for approval within the next 60 days. Please contact this office for guidance in developing that monitoring plan.  
↓

If you have any questions on this, please do not hesitate to call \_\_\_\_\_, District Engineer, of this office.

Sincerely,

Name  
Engineering Field Director

pc: VDH – Central Office – ATTN: Steve Pellei  
----- Health Department  
U.S. EPA – Information Processing and Management Center

Appendix D-1 – LETTER RECOMMENDING BIN CLASSIFICATION

Date

SUBJECT: (City or County)  
Water - (System Name)  
PWSID No.: \_\_\_\_\_

*Waterworks Owner Name*  
*Address 1*  
*Address 2*  
*City/Town, VA ZIP Code*

Dear \_\_\_\_\_:

We have received *Cryptosporidium* data from your waterworks, collected (during initial source water monitoring/as grandfathered source water monitoring) under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2). This is to advise that the Virginia Department of Health (VDH) has reviewed the data, and has calculated the (mean *Cryptosporidium*/highest annual mean *Cryptosporidium*) concentration, as required by the rule.

The (mean *Cryptosporidium* /highest annual mean *Cryptosporidium*) concentration for the source water samples from your waterworks is \_\_\_\_\_ oocysts per Liter. According to the bin classification table in § 141.710 of LT2, your waterworks would be provisionally classified as Bin \_\_\_\_.

If you are in agreement with our findings, please complete the enclosed LT2 Bin Classification statement, and return it to this office, by (*deadline shown in the table on Page 3 of the Working Memo*). A copy of the bin calculation worksheet, listing the *Cryptosporidium* results for your waterworks, is attached to the Bin Classification statement, for your files and information. If you have any objections to the proposed classification, please respond as soon as possible, providing additional information and justification for an alternate classification, so that we may begin discussions concerning your alternate classification.

If you have any questions on this, please do not hesitate to call me at the number in the letterhead.

Sincerely,

Name  
District Engineer

Enclosures: Owner's statement and Bin calculation worksheet  
pc: VDH – Central Office – ATTN: Steve Pellei  
----- Health Department

Appendix D-2 – BIN CLASSIFICATION STATEMENT

**LT 2 BIN CLASSIFICATION STATEMENT**

Waterworks Name: \_\_\_\_\_ PWSID No.: \_\_\_\_\_

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I have reviewed the attached spreadsheet containing *Cryptosporidium* data collected from the \_\_\_\_\_ waterworks, and the bin classification based on that data. I accept the classification based on the results of the monitoring.

<i>Cryptosporidium</i> concentration	Bin Classification
<i>Cryptosporidium</i> < 0.075 oocysts per Liter	1
0.075 oocysts per Liter ≤ <i>Cryptosporidium</i> < 1.0 oocysts per Liter	2
1.0 oocysts per Liter ≤ <i>Cryptosporidium</i> < 3.0 oocysts per Liter	3
<i>Cryptosporidium</i> ≥ 3.0 oocysts per Liter	4

*Cryptosporidium* concentration: \_\_\_\_\_ Bin Classification: \_\_\_\_\_

Owner Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Printed Name: \_\_\_\_\_  
Title: \_\_\_\_\_

Attachment: Printout of the *Cryptosporidium* data – Bin Calculation worksheet.

For ODW use only:	
After reviewing the above Owner's Statement and the data in the attached spreadsheet, this is to advise that this Bin Classification is:	
<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	
By _____	_____
Field Director	Date

Appendix D-3 – APPROVAL OF BIN CLASSIFICATION

Date

SUBJECT: (City or County)  
Water - (System Name)  
PWSID No.: \_\_\_\_\_

*Waterworks Owner Name*  
*Address 1*  
*Address 2*  
*City/Town, VA ZIP Code*

Dear \_\_\_\_\_:

We have received the LT2 Bin Classification statement for your waterworks, submitted in accordance with the Long Term 2 Enhanced Surface Water Treatment Rule.

↑ (option 1) The (mean *Cryptosporidium* /highest annual mean *Cryptosporidium*) concentration for the source water samples from your waterworks is \_\_\_\_\_ oocysts per Liter. According to the bin classification table in § 141.710 of LT2, your waterworks is hereby provisionally classified as Bin 1. This means that no additional treatment is required of your waterworks with respect to *Cryptosporidium*. The Virginia Department of Health (VDH) will advise you in the future concerning the next round of required source water monitoring and of any other reporting requirements.

↑ (option 2) The (mean *Cryptosporidium* /highest annual mean *Cryptosporidium*) concentration for the source water samples from your waterworks is \_\_\_\_\_ oocysts per Liter. According to the bin classification table in § 141.710 of LT2, your waterworks is hereby provisionally classified as Bin \_\_\_\_\_. This means that your waterworks will need to provide an additional \_\_\_\_\_ logs of removal/inactivation for *Cryptosporidium*, in order to achieve a total removal and inactivation of \_\_\_\_\_ logs. Such additional treatment must be installed and operational no later than \_\_\_\_\_, per § 141.713 of LT2. The Virginia Department of Health (VDH) may be able to grant an extension of up to two years to that deadline, if capital improvements are necessary in order to meet the additional treatment requirements. Please contact this office to schedule a meeting to discuss your plans for meeting the requirement for additional *Cryptosporidium* removal/inactivation.

A copy of the approved Bin Classification statement is enclosed, for your files and information.

If you have any questions on this, please do not hesitate to call \_\_\_\_\_, District Engineer, of this office.

Sincerely,

Name  
Engineering Field Director

Enclosure: Bin Classification Statement  
pc: VDH – Central Office – ATTN: Steve Pellei  
----- Health Department  
U.S. EPA – Information Processing and Management Center