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TO: Office of Drinking Water Technical Staff

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SUBJECT: SURVEILLANCE & REGULATIONS – Long Term 2 Rule – Results of Source Water Monitoring

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REFERENCED: WM 892 – LT2 Source Water Monitoring

Revision Highlights:

1. Removed grandfather source water monitoring data allowance and replaced with historical note.
2. Clarified reporting results of source water monitoring for the Round 1 data and Round 2 data.
3. Clarified binning procedures after Round 2 monitoring.
4. Updated table for Bin Classification Acceptance deadlines.
5. Revised time accounting, tracking and reporting procedures to account for Round 1 and Round 2 requirements.
6. Revised all form letters to account for Round 1 and Round 2 correspondence.

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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1. BACKGROUND

The requirements of LT2 apply to all waterworks using surface water or Groundwater Under the Direct Influence of Surface Water (GUDI) sources. All owners of applicable waterworks must conduct two rounds of source water monitoring for each plant that treats a surface water or GUDI source. 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.

For new sources (i.e. sources which did not previously conduct Round 1 monitoring), waterworks shall conduct Round 1 starting on a schedule established by ODW and the owner; monitoring shall begin no later than 6 months after issuance of the operation permit. The exact monitoring schedule shall be established by the Field Office for each waterworks. Round 2 monitoring should start between 5 and 6 years after the Round 1 bin determination.

2. REPORTING OF SOURCE WATER MONITORING RESULTS [§ 141.706 and 12VAC5-590-530 C 1 c]

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. The complete laboratory report containing the *Cryptosporidium* results for Schedule 1, 2, 3, or 4 waterworks will be reported by the laboratory directly to the ODW Central Office. Analytical laboratories will note the field turbidity result(s) in the laboratory report for *Cryptosporidium*. Analytical laboratories will email their *Cryptosporidium* analytical reports to: labadmin@vdh.virginia.gov with the subject of their email: "**Cryptosporidium Results for VApwsid#**". Analytical laboratories should submit *E. coli* results using ODW's standard template for data submittals. The results must be reported no later than the tenth day of the month following the month in which the sample was collected (i.e., a January sample must be reported no later than February 10th).

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, for a total of 26 samples. Analytical laboratories should submit *E. coli* results using ODW's standard template for data submittals. The results must be reported no later than the tenth day of the month following the month in which the sample was collected (i.e., a January sample must be reported no later than February 10th).

ODW Central Office data management will receive the *Cryptosporidium* and turbidity results from the laboratory, enter them into SDWIS, send an email back to the laboratory confirming receipt, and will copy the appropriate ODW Field Office Data Manager with the results attached. The ODW Field Office Data Manager will forward the email with the *Cryptosporidium*/turbidity results to the appropriate field office staff.

ODW Central Office data management will receive the *E. coli* results from the laboratory using the standard reporting template, and will upload data into SDWIS. A confirmation email will be sent back to the laboratory once results have been accepted. If field offices receive data, they must forward it to labadmin@vdh.virginia.gov. Each field office will keep track of the results and notify waterworks if/when their *E.coli* results exceed trigger levels and direct them to proceed with *Cryptosporidium* monitoring.

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*.

Each Field Office shall create a folder for each waterworks conducting Source Water Monitoring to hold the *Cryptosporidium* 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 using the Review Checklist in Appendix A-1. 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.

3. GRANDFATHERED SOURCE WATER MONITORING DATA [§ 141.707 and 12VAC5-590- 420 B 3 a (13)]

The LT2 Rule authorized the use of historical *Cryptosporidium* data for the initial round of source water monitoring. Waterworks which submitted historical *Cryptosporidium* data were not required to submit *E.coli* or turbidity data with their *Cryptosporidium* data. This section, included in previous versions of the working memo, is removed as of Jan. 30, 2015, since its’ provisions no longer apply.

4. BIN CLASSIFICATION FOR FILTERED WATERWORKS – *E. Coli* [§ 141.701(a)(4) and 12VAC5-590 -420 B 3 c (1).]

Once all the data for schedule 4 systems is 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 classified 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 B-1 provides a worksheet that may be used

to record the calculation. Appendix B-2 provides a letter to use in advising the waterworks of the results of the calculation.

The requirement for *E. coli* monitoring is for source water sampling at least every two weeks for 12 months, for a total of 26 samples. If the waterworks fails to conduct the required source water monitoring, according to 12VAC5-590-420 B 3 a, the waterworks is required to conduct *Cryptosporidium* monitoring.

5. BIN CLASSIFICATION FOR FILTERED WATERWORKS – *CRYPTOSPORIDIUM*
[§ 141.710 and 12VAC5-590 -420 B 3 c (1)]

Once all the *Cryptosporidium* data (whether Round 1 or Round 2 source monitoring) is received and determined to be acceptable, ODW will perform the bin classification. *E. coli* and turbidity data collected during *Cryptosporidium* monitoring may 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\LT2 Resources\LT2 Crypto Calculators. There are three separate versions, as follows:

- Version 1 - systems that collect 24 to 47 samples; 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).
- Version 2 - systems that collect 48 or more samples, with an equal number of samples each month;
- Version 3 - systems that collect 48 or more samples, with an unequal distribution of samples.

Choose the correct workbook for the waterworks being evaluated, and follow the instructions provided on the first sheet of the workbook. Note that the worksheets require entry of oocyst concentration, not oocyst count. The result reports will provide a count but may not provide concentration – so a calculation to convert to concentration (#oocyst/L) may be necessary. 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 into the appropriate spreadsheet. If the water treatment plant is served by multiple water sources and each water source was sampled individually, then a flow-weighted average result for each month’s sampling event(s) must be developed and entered into the spreadsheet.

A copy of the completed workbook (with the example worksheets deleted) should be renamed and saved to the Field Office 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 treatment plant is to be placed.

ODW has adopted an “anti-backsliding” policy which requires waterworks to maintain the log treatment requirements mandated by the results of their Round 1 monitoring if Round 2 monitoring results in a lower bin classification. This policy is in agreement with EPA’s guidance, which maintains that there can be temporal differences in *Cryptosporidium* appearances and the potential to adversely impact public health from *Cryptosporidium* can still exist in the source water. Only on rare cases, where there are documented changes in the watershed or documented reduction in discharges or pollutant loadings to the watershed, will ODW consider assigning a lower bin than determined in the Round 1. If a system is placed into a higher bin at the end of Round 2, they must meet the additional log treatment requirements set by the higher bin.

Appendix C-1 provides a letter informing the waterworks owner of the mean oocyst concentration and the proposed bin classification (see the table in 12VAC5-590 420 B 3 c (1) (b) 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 C-2, or provide justification for not accepting it. The deadline for the owners to submit the bin classification acceptance back to ODW is shown in the following table.

System Schedule	Round 2 Schedule ¹ for Bin Classification Acceptance (no later than the month beginning)
1	September 2017
2	March 2018
3	March 2019
4 (waterworks which monitor for <i>Crypto</i>)	March 2021

Round 1 Results

Once the waterworks owner submits the form accepting the bin classification, ODW will send the letter contained in Appendix C-3. This letter formally establishes the bin classification. If the water treatment plant is placed into Bin 2 or higher, this letter also advises of the additional log “inactivation + removal” requirement for the plant. Refer to the table in 12VAC5-590-420 B 3 c (2) (a) for the listing of bin classification, type of filtration currently practiced, and the additional treatment required. A water treatment plant placed into Bin 2 or higher must provide the increased level of treatment within 3-5 years of the initial round Bin Classification Acceptance.

If the water treatment 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. **Refer to the Regulations for further information on additional treatment requirements and removal credits, and the EPA’s Guidance Manuals (Toolbox, UV Disinfection, Membrane Filtration, etc.)** for more details on the various

¹ Deadlines are calculated as six months after scheduled completion of Round 2 source water monitoring for *Cryptosporidium* – see § 141.710(e).

treatment technologies. All of these Guidance Manuals are found on ODWshare\02-Committees\202-Rule Teams\MDBP and ESWT Rules\EPA Guidance Manuals.

Round 2 Results

If the bin classification for a water treatment plant changes following the Round 2 source water monitoring, then the waterworks must provide the additional inactivation + removal requirement based on bin classification. Field Office staff must have an engineering conference with the waterworks within 6 months of the bin determination date. During this conference, a schedule of activities (i.e. prepare engineering report, submit plans and specs) and completion dates must be developed and agreed to by the waterworks and ODW. It is recommended that the schedule provides for the additional treatment to be installed and operational within 3-5 years.

6. TIME ACCOUNTING, PROJECT TRACKING AND REPORTING

Time spent reviewing data submitted following an approved source water monitoring plan will be charged in Time Track to "Surveillance". The "bin classification statement" form received back from a waterworks owner will be entered to PT Log as an SDWA Report. Time spent in preparing the final bin classification letter will be charged to SDWA Reports.

The date that the final "Bin Classification" letter (App. C-3) to the owner is to be entered into SDWIS, as well as the bin classification. Refer to the SDWIS manual for how to enter Round 1 and Round 2 bin classification into SDWIS. Round 2 bin classification should never be lower than Round 1 bin classification (see *Bin Classification for Filtered Waterworks - Cryptosporidium*).

END OF MEMO