Long-Term, Stage 2 Enhanced Surface Water Treatment Rule:

The Early Years (or, in Some Cases, Months)

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The Bottom Line

- LT2ESWTR applies to all systems that treat surface water or groundwater under the direct influence of surface water
- Implementation begins almost immediately after EPA adopts the rule
- EPA will be implementing the first part of this rule themselves
- Includes source water Cryptosporidium monitoring
- Additional treatment may be required based on monitoring results

Scope of the Presentation

- Implementation Timeline
- Applicability Monitoring

And if we have time

- Bin Classifications
- Treatment Options . . . the “Toolbox”

Implementation Timeline
EPA Proposal

- LT2ESWTR and DBP2 Rule are tied inextricably together
- Applicability Monitoring for large systems begins and ends under EPA jurisdiction
  - Systems >= 10,000: Adoption date + 6 months
- TCEQ adopts the state rule:
  - Adoption + 24 months
- Applicability Monitoring for small systems begins and ends under TCEQ jurisdiction
  - Systems <10,000: Adoption + 30 months

Rumors

- *Crypto* lab capacity is somewhat limited
- Labs are not all that happy that the EPA proposal creates a 24 – 30 month lag between large system and small system monitoring
  - Loss of staff
  - Skill erosion for those that remain
- States are not all that happy about early implementation in the first place

Implementation Timeline Rumor

- EPA promulgates final rule (12/05 or so)
- Applicability Monitoring begins under EPA jurisdiction
  - Systems >= 100,000: Adoption date + 6 months
  - 50,000 <= systems < 100,000: Adoption + 12 months
- TCEQ adopts the state rule: Adoption + 24 months
- Applicability Monitoring continues under TCEQ jurisdiction
  - 10,000 <= systems < 50,000: Adoption + 24 months
  - Systems <10,000: Adoption + 30 months

Implementation Timeline Proposal and Rumor (cont)

- LT2 additional treatment requirements
  - All systems at higher risk:
    date monitoring ends + 36 months
- A second round of Applicability Monitoring
  - All systems:
    date that first round of monitoring began + 6 years

Applicability Monitoring General Provisions

- Monitoring Plan Required
  - ***(in addition to normal Monitoring Plan)***
- Must include specific sampling dates
- Must identify specific sampling locations
  - Prior to any treatment or recycle
  - After Presedimentation or Terminal Reservoir
  - After Riverbank Filtration
  - Options for Plants with Multiple Sources
    - After sources are blended
    - On composited samples
    - On individual samples with weighted results
- Plan due to appropriate regulatory authority: 3 months before the date sampling must begin
- Subject to regulatory authority review and approval

Applicability Monitoring General Provisions (cont)

Other Sampling Issues

- Plants that already provide 4.5-log *Crypto* control are exempt from LT2ESWTR source water monitoring requirements
- *Crypto* labs must have passed EPA's QA/QC program for *Crypto*
- *Crypto* samples run $350 – $450 per sample
- *E. coli* labs must be certified by NELAC or TCEQ
- *E. coli* samples run $20 – $25 per sample
- Turbidity at plant lab

Applicability Monitoring General Provisions (cont)

Grandfathered Data Allowed

- Must meet current method and QA/QC standards
  - Method 1622 or 1623 for *Crypto*
  - Coliform methods
    - Membrane filtration
    - 15-tube MPN
    - ONPG-MUG, 51-well
    - ONPG-MUG, 97-well
- Request due to appropriate regulatory authority: 4 months before the date sampling must begin
- Subject to regulatory authority review and approval

Applicability Monitoring Systems >= 10,000

- Monthly Sampling for *Crypto*, *E. coli*, and turbidity is required
- Two options
  - One raw water sample per month for 24 months
  - Two raw water samples per month for 24 months (although this option is hidden in the bin classification rule)

Applicability Monitoring Systems < 10,000

- One raw water sample every two weeks for 12 months for *E. coli* and turbidity
- Follow-up Monitoring Plan
  - Required if average *E. coli* levels are:
    - > 10 CFU per 100 mL for lakes
    - > 50 CFU per 100 mL for rivers
  - One raw water sample for *Crypto*, *E. coli*, and NTU every two weeks for 12 months
  - Due to TCEQ: Adoption + 45 months
  - Subject to the review and approval of the TCEQ

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- EPA will be implementing the first part of this rule themselves
- Includes source water Cryptosporidium monitoring
- Additional treatment may be required based on monitoring results

For more information on the LT2 timeline and Applicability Monitoring, you may contact:

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Bin Classification Systems >= 10,000

Bin classification is based on:

- Overall average *Cypto* level if the plant collected at least 48 samples (at least 2 per month)
- Highest average for any consecutive 12-month period if the plant collected 24 – 47 samples
- Highest bin if the plant failed to collect all of the required 24 monthly samples

Bin Classification Systems < 10,000

Bin classification is based on:

- Average *Cypto* level if the plant collected at least 24 samples (at least 2 per month)
- Highest bin if the plant failed to collect all of the required 24 bi-weekly samples

Bin Classification & Treatment Requirements

Crypto Level	Bin Classification	Additional Treatment Required
< 0.075 oocysts/L	Bin 1	None
≥ 0.075 but < 1.0	Bin 2	1-log*
≥ 1.0 but < 3.0	Bin 3	2-log*
≥ 3.0 oocysts/L	Bin 4	2.5-log*

* Direct filtration plants must provide an additional additional 0.5-log removal, e.g., 1.5-log for Bin 2.

Toolbox Options

- Watershed Control
- Coagulation and Presedimentation
- Riverbank Filtration
- Two-stage softening
- Filter Performance
  - Combined Filter Performance
  - Individual Filter Performance
  - Demonstration of Performance

Toolbox Options (cont)

- Filtration Technologies
  - Bag and Cartridge Filters
  - Membrane Filters
  - Second Stage Filtration
  - Slow Sand Filters
- Chlorine dioxide, ozone, and UV

Toolbox Options – Details

- Watershed Control
  - 0.5-log presumptive credit until second round of monitoring
  - Notify the TCEQ within one year of completing monitoring
  - Submit plan within one more year for TCEQ review and approval
  - Annual reports thereafter

Toolbox Options – Details (cont)

Coagulation and Presedimentation

- 0.5-log presumptive credit until second round of monitoring
- All the water has to flow through the basin
- Coagulant has to be applied continuously at inlet
- Plant must achieve at least 0.5-log of turbidity reduction during at least 11 of each 12 previous consecutive months

Toolbox Options – Details (cont)

Riverbank Filtration

- Must be a horizontal or vertical well and a granular aquifer
- 50-foot flow path . . . 1-log presumptive credit until second round of monitoring
- 25-foot flow path . . . 0.5-log presumptive credit until second round of monitoring
- Aquifer coring and initial report required
- On-going reporting requirements

Toolbox Options – Details (cont)

Two-stage lime softening

- 0.5-log presumptive credit
- All the water has to flow through both stages
- Coagulant must be applied in each stage

Toolbox Options – Details (cont)

- Combined Filter Effluent
  - 0.5-log credit if CFE ≤0.15 NTU in at least 95% of the required readings
- Individual Filter Effluent
  - 1.0-log credit if:
    - IFE ≤ 0.1 NTU in at least 95% of the **maximum daily readings** * each month **AND**
    - IFE ≤ 0.3 NTU in 100% of the 15-minute readings
    - Plant may exclude the first 15 minute reading after backwash

* This is a much more stringent requirement than that contained in the Agreement in Principal and much different than that required for Phase IV recognition under Partnership for Safe Water

Agreement in Principle: 95% of all readings $\leq$ 0.1 NTU

EPA Proposal: 95% of max daily readings $\leq$ 0.1 NTU

@ 15-minute intervals:

96 readings per day, about 2,700 readings per month

5% of 2,700 is about 135 readings

assuming they all occur consecutively, that will be 2 days

@ max daily interval:

maximum number of days is 31

5% of 31 is 1.6 days

Under the EPA proposal, a plant may have no more than 96 readings above 0.1 NTU, which means at least 96.4% of the readings must meet the 0.1 NTU criteria.

Moreover, if the readings do not occur consecutively, a system could loose credit if as few as 2 readings exceed 0.1 NTU (which effectively means 99.6% of all readings $\leq$ 0.1 NTU).

Toolbox Options – Details (cont)

Demonstration of Performance

- No details
- It's up to the PWS and the TCEQ to work out the details
- Provides the TCEQ with the ability to reduce presumptive credits

Bag Filters

- 1-log presumptive credit if bag passes a 2-log challenge study

Cartridge Filters

- 2.0-log presumptive credit if cartridge passes a 3-log challenge study

Toolbox Options – Details (cont)

- Membrane Filters
  - Credit will be based on site-specific design
  - Daily direct integrity testing required
    - Pressure Tests
    - Molecular marker
    - Particulate marker
  - Dilution factor is considered
  - Continuous on-line monitoring required
  - Additional reporting requirements

Toolbox Options – Details (cont)

- Second-stage Filtration
  - 0.5-log presumptive credit
  - All water must pass through the second filter
  - This may be where TCEQ requires demonstration of performance because the data is weak.
- Slow sand filter
  - 2.5-log presumptive credit

Toolbox Options – Details (cont)

- ClO_2 and O_3 Disinfection
  - Credit based on CT calculations
  - There may (or may not) be additional reporting requirements . . . depending on whether TCEQ adds *Crypto* inactivation to the SWMOR
- UV Disinfection
  - UV credit based on challenge studies
  - There may (or may not) be additional reporting requirements
  - TCEQ staff is monitoring the development of this technology

For more information, on Bin Classification and Toolbox Options:

Wait until you finish Applicability Monitoring for heaven's sake

Or, if you just can't stand it, you may contact:

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