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January 9, 2004

Cynthia Dougherty  
Environmental Protection Agency, Mail Code  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

RE: Proposed Long-Term 2 Enhanced Surface Water Treatment Rule  
(Docket No. OW-2002-0039)

Dear Ms. Dougherty:

American Water Works Association (AWWA), Association of Metropolitan Water Agencies (AMWA), National Association of Water Companies (NAWC), and The National League of Cities (NLC) appreciate the opportunity to review the Proposed Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). As signatories of the FACA Agreement, the commenting organizations affirm their support for the Agreement in principle reached by the Federal Advisory Committee and the basic components of that agreement as reflected in the proposed rule:

As might be expected, there are a number of areas where we believe that EPA's proposed implementation of the agreement could be improved. Additionally, we feel that EPA has altered the intent of the agreement in a few areas

Overall, however, we greatly appreciate the efforts of EPA staff both in developing a very difficult and demanding proposal, and in working closely with us on a number of important issues. We believe that this joint effort will result in better regulations in the future and look forward to moving ahead in the same spirit of cooperation.

Attached is a summary of aspects of the current proposal that require revision as the Agency finalizes the LT2ESWTR. The following comments should be taken as part of our continuing effort to support prudent regulatory action in the face of significant uncertainties in virtually every aspect of the occurrence, health effects, and economic analysis information underlying the proposed rule. Nevertheless we appreciate EPA's


efforts to insure that a formal risk assessment was conducted and used as the process by which judgments are made about *Cryptosporidium's* potential to cause harm to humans in drinking water.

Your review and consideration of this letter and the attached joint comments are appreciated. If you have questions on the substance of these comments, please contact Diane VanDe Hei for the Association of Metropolitan Water Agencies, Tom Curtis for the American Water Works Associations, Peter Cook for the National Association of Water Companies, or Carol Kocheisen for the National League of Cities.

Best regards,



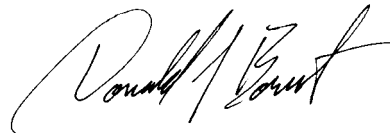
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cc: Water Docket, OW-2002-0043  
Ephraim King, U.S. EPA

**Joint Comments on the  
PROPOSED LONG TERM 2 ENHANCED SURFACE WATER TREATMENT RULE  
(LT2ESWTR)**

The following comments should be taken as part of our continuing effort to support prudent regulatory action in the face of significant uncertainties in virtually every aspect of the occurrence, health effects, and economic analysis information underlying the proposed rule.

**Source Water Monitoring**

**Background:** Under the LT2ESWTR, systems initially conduct source water monitoring for *Cryptosporidium* to determine their treatment requirements. Filtered systems will be classified in one of four risk bins based on their monitoring results. EPA projects that the majority of systems will be classified in the lowest risk bin, which carries no additional treatment requirements. Systems classified in higher risk bins must provide 90 to 99.7 percent (1.0 to 2.5-log) additional reduction of *Cryptosporidium* levels. The regulation specifies a range of treatment and management strategies, collectively termed the “microbial toolbox,” that systems may select to meet their additional treatment requirements. All unfiltered systems must provide at least 99 or 99.9 percent (2 or 3-log) inactivation of *Cryptosporidium*, depending on the results of their monitoring.

*Cryptosporidium* monitoring by large systems (serving at least 10,000 people) will begin six months after the LT2ESWTR is finalized and will last for two years. Systems must conduct a second round of monitoring beginning six years after the initial bin classification. Systems may grandfather equivalent previously collected data in lieu of conducting new monitoring, and systems are not required to monitor if they provide the maximum level of treatment required under the rule.

**Laboratory Capacity:** The Agreement in Principle (Section 2.11.a) states that the compliance schedules for the LT2ESWTR will be tied to the availability of sufficient analytical capacity for *Cryptosporidium* at approved laboratories and the availability of data management software. If either is unavailable, the monitoring, implementation, and compliance schedules for both the LT2ESWTR and the Stage-2 DBPR will be delayed an equivalent period of time.

We are pleased the agency has made a commitment to this provision in the proposed rule:

The Agency is monitoring sample analysis capacity at approved laboratories through the Lab QA Program, and does not plan to implement LT2ESWTR monitoring until the Agency determines that there is adequate laboratory capacity. (68 FR 47735).

In past rules, required new databases or modified data management systems were not in place or experienced serious problems prior to rule promulgation. Examples include

both the Information Collection Rule and the Unregulated Contaminants Monitoring Rule.

Based on our past experiences, we feel very strongly that adequate laboratory capacity and availability of data management software is fundamental to successful implementation of the rule, and we are very concerned that the total capacity needed may not be in place when needed. Utility and commercial laboratories that process EPA Method 1622 / 1623 indicate that it is unreasonable to develop additional capacity for a short duration of time.

We recommend that EPA make a formal determination whether or not sufficient capacity exists through a NODA at least six months before the rules are to be finalized. Additionally, based on experience with the ICR and in keeping with the spirit of the Agreement in Principle, we believe that each rule must contain a specific provision that will stop the implementation clock if significant implementation problems arise after the rules are finalized, and keep the clock stopped until the issues are resolved. Finally, we suggest that EPA begin thinking now about how the rule might be most effectively implemented should laboratory capacity prove to be insufficient or data management software unavailable. This might involve further staging of the rule by system size. Such staging may have additional benefits of easing primacy agency implementation issues by allowing time for states to attain primacy before medium and smaller systems (which make up the majority of systems but serve a minor portion of the population) need to take action.

**Grandfathering Data:** All of our organizations worked very hard to ensure that the Agreement in Principle allowed for grandfathering of *Cryptosporidium* monitoring data collected prior to implementation of the final rule. There are four main reasons for this provision. First, the averaging method for bin determination is such that the more data points used, the smaller the likelihood of being misclassified. Systems taking only the minimum number of required samples (24) have a much greater chance of being misclassified than those taking 48 or more samples. Second, systems that were proactive in gathering *Cryptosporidium* occurrence data should be rewarded for their efforts by not having to needlessly repeat sampling. Third, the sooner systems establish which bin they are in, the more time they have to initiate any needed corrective measures to ensure compliance. Fourth, every system using grandfathered data would reduce the problem of insufficient laboratory capacity previously discussed.

EPA has proposed requirements for grandfathered data that would require the data to meet stringent requirements. We recommend that EPA acknowledge the four reasons for allowing grandfathered data as listed above. The requirements for grandfathered data and in fact all *Cryptosporidium* data collected under LT2ESWTR, should focus on the goal of ensuring that systems are classified in the appropriate bin rather than strict compliance with analytical requirements. Minor technical deficiencies that are unlikely to significantly affect the data set should be allowed.

In this regard, systems submitting grandfathered data should receive timely notification of decisions to accept or reject the data so that they can act responsibly in meeting their obligations under the rule. Accordingly, we recommend that the rule provide that delays in approvals or disapprovals do not impact a system's total compliance timeframe. Additionally, we recommend that EPA outline and confirm the availability of resources and procedures to review grandfathered data in the previously recommended NODA to be issued prior to promulgation of the final rule.

**Failure to Complete Monitoring:** The proposed rule on page 47666 states:

“Any filtered system that fails to complete LT2ESWTR monitoring requirements must meet the treatment requirements for Bin 4.”

We strongly disagree with this requirement. We believe that the penalty proposed far exceeds the crime, and therefore EPA should remove this provision prior to finalizing the rule.

A sample could be missed for many innocent reasons, not the least of which is the possibility of insufficient laboratory capacity, or a laboratory that is overworked and misses holding times or similar requirements outside the control of a water system. EPA allows for submission of resamples but places such strict requirements on their use that the provision is meaningless. EPA acknowledges that the majority of systems are expected to fall into Bin 1, “the no-action bin” so the mandatory placement in Bin 4 (i.e., install UV disinfection) is inappropriate simply based on missed samples.

Any problems of non-compliance should be addressed with the mechanisms already in place for such a violation. Additionally, we strongly recommend that EPA include reasonable provisions for resampling.

EPA must acknowledge that missed samples will happen. We suggest that, in addition to broadening the proposed re-sampling provisions, EPA have utilities build dates into their sampling schedules for additional samples in the event of missed samples.

**Sampling Schedule:** The proposal requires that systems collect samples within 2 days of their sampling schedule or be in noncompliance. Since EPA is proposing (but should not promulgate) that noncompliance leads to an immediate requirement to install UV, (because of Bin 4 placement) this is completely inappropriate. A utility may not be able to sample within 2 days for many reasons. Moreover, this requirement stems from the thought that water utilities could “game” the system by monitoring when they knew *Cryptosporidium* would not show up. Current data show that randomized sampling is equivalent, if not superior, to time-series sampling designs (Frey et al, 1998).

We believe that plus or minus 3 or 4 days would be a more appropriate requirement, and that failure to comply with even that period should not lead to noncompliance if the system has a good reason for missing the sample.

**Monitoring Location:** The proposal requires monitoring after pre-treatment unit operations, like off-stream storage, pre-sedimentation, and riverbank filtration but before conventional treatment. EPA has also attempted to identify many site-specific situations that will occur such as blended sources, multiple sources, and part year operations. These provisions are overly complicated and make the selection of an appropriate monitoring location needlessly confusing and difficult for many systems while lacking flexibility to accommodate situations that will come up. Additionally, the requirements could foreclose the option of using grandfathered data if the specified monitoring location is different from the location historically sampled. Increased flexibility and simplification of requirements would be possible if systems were allowed to pick appropriate locations as part of their monitoring plan.

We recommend EPA change the description of monitoring from “source water monitoring” to “influent water characterization” to more accurately reflect the intent of the regulation. We suggest that EPA define influent water as the water that enters the conventional treatment train, or when alternative treatment technologies (i.e. membranes) are employed, at a similar point as established by the primacy agency. We recommend that EPA allow monitoring at a point that reflects influent water quality and the utility’s anticipated improvement options should additional treatment become necessary. Because of the many different situations expected to occur in selection of monitoring sites, we strongly recommend that the compliance schedule be modified to incorporate review and approval of the LT2ESWTR monitoring plan by the primacy agency prior to initiation of the required monitoring.

**Accounting for Recycle Practices in LT2ESWTR Monitoring:** Allowable recycle practices at treatment plants are regulated by the Filter Backwash Recycle Rule (FBRR). The intent of the FBRR is to encourage implementation of recycle practices that do not negatively impact performance of a treatment plant. In other words, facilities operated using practices consistent with the FBRR should achieve equivalent, or superior, performance to the same facility operated without recycle. Consequently, other regulations do not need to incorporate provisions for recycle because all consequences of recycle practices are accounted for in systems complying with the FBRR. The proposed log credits for treatment allowed in the proposed rule should not be discounted with respect to recycle practices. The *Cryptosporidium* removal was independent of recycle practices in the data sets used to develop the credits. Additional attention to recycle practices under the FBRR should serve to increase removal.

## **UV Disinfection Criteria**

**Background:** To receive UV disinfection credit, a system must demonstrate a UV dose as given in UV dose tables in the proposal using the results of a UV reactor validation test and ongoing monitoring. The reactor validation test establishes the operating conditions under which a reactor can deliver a required UV dose. Validation test requirements are given in the UV Guidance Manual. Monitoring is required to demonstrate that the system maintains these validated operating conditions during routine use.

**Conservative Assumptions:** Based on the proposal and the draft UV Guidance Manual, validation procedures will require doses more than three times higher than those listed in the UV dose table to comply with the rule. (i.e., for 2.0 log credit for *Giardia* and *Crypto* doses in the rule are 5.8 and 5.2 mJ/cm<sup>2</sup>, respectively, and 21 and 20 mJ/cm<sup>2</sup> in the guidance manual). This is on top of a safety factor of 2 to 3 in the UV dose table. Additionally, validation is to be applied to “worst case” conditions. Since the UV dose table already includes a safety factor, care should be taken in compounding those safety factors in guidance. We recommend that EPA take a hard look at the safety factors that are being applied to UV use and insure that they are reasonable and are not compounded leading to needlessly more expensive applications. Water systems, to insure compliance with validation requirements will, of necessity, build in their own safety factors lessening the need for EPA to be too conservative.

EPA should retain the proposed UV dose table for *Cryptosporidium* and *Giardia lamblia* in the final rule. The UV Disinfection Guidance Manual should be revised to reflect a single decision-making process that ensures that when operating the applied UV dose will be reliably equal to or greater than the required dose in the rule text. This process has to be articulated in a clear and simple way for ease of implementation, and to ensure that the Agency’s actions do not impede the rapid advancement of UV technology in drinking water treatment.

**Extend UV Dose Table to Higher Log Inactivations:** The UV dose table stops at 3.0 log inactivation and does not provide values for 3.5, 4.0 or higher log inactivation for *Giardia lamblia* and *Cryptosporidium*. The observed data from the research studies cited by the Agency included higher inactivations and demonstrates that greater than 4 log inactivation is feasible.

EPA should complete the UV dose table in the rule to include doses required to receive up to and including 4.0 log credit for *Cryptosporidium* and *Giardia lamblia* or higher if supported by the data.

**Off-Specification Limitation and Reporting:** Off-Specification simply means that water is delivered when UV reactors are not operating within validated conditions. Unfiltered systems are specifically allowed off-specification conditions. They must monitor each UV reactor while in use and must record periods when any reactor operates outside of validated conditions. The disinfection treatment must ensure at least

99 percent (or 99.9 percent if required) inactivation of *Cryptosporidium* in at least 95 percent of the water delivered to the public every month. The proposal does not have a similar provision for filtered systems. A similar 95th percentile allowance, at a minimum, should be provided for in the proposal.

EPA should provide a clearer definition of the off-specification limitations and a specific provision for meeting validation conditions in 95 percent of the water delivered for filtered water supplies. This is critical for the design and operation of a UV system, and for utilities to maintain compliance with the regulation. EPA should keep in mind that in the vast majority of cases, falling outside validation conditions will only be cutting into the built-in safety factors, and will therefore not be impacting the desired level of health protection. Likewise, compliance metrics should be equally fair to systems regardless of the number of UV reactors in operation.

### **Microbial Toolbox**

**Background:** The LT2ESWTR proposal contains a list of treatment processes and management practices for water systems to use in meeting additional *Cryptosporidium* treatment requirements under the LT2ESWTR. This list, termed the microbial toolbox, was recommended by the Stage 2 M-DBP Advisory Committee in the Agreement in Principle. A key part of the letter and spirit of that agreement on our part, and one clearly expressed in the FACA meetings was that making this a “UV Rule” was unacceptable. The requirements presently placed on areas of the microbial toolbox other than UV inactivation are such that common use of these tools is denied.

Components of the microbial toolbox include watershed control programs, alternative sources, pretreatment processes, additional filtration barriers, inactivation technologies, and enhanced plant performance. The intent of the microbial toolbox is to provide water systems with broad flexibility in selecting cost effective LT2ESWTR compliance strategies. Moreover, the toolbox allows systems that currently provide additional pathogen barriers or that can demonstrate enhanced performance to receive additional *Cryptosporidium* treatment credit.

A key feature of the microbial toolbox is that many of the components carry presumptive credits towards *Cryptosporidium* treatment requirements. Plants will receive these credits for toolbox components by demonstrating compliance with required design and implementation criteria, as described in the sections that follow. Treatment credit greater than the presumptive credit may be awarded for a toolbox component based on a site specific or technology-specific demonstration of performance.

**Credit vs. Strict Log Removal:** EPA should bring the microbial toolbox requirements in line with FACA discussions by explaining the overall concept of credit (not based on strict log removal alone), and by enumerating the additional benefits of each toolbox item.



The FACA was not focused on *Cryptosporidium* alone, but on overall risk reduction from other microbial contaminants and from DBPs. Neither was the FACA focused on strict log removal. That is why the discussion used the term “credit”. In addition to data available on *Cryptosporidium* oocyst removal for a specific toolbox item, the FACA also considered other benefits such as:

- Reducing peaks in occurrence of pathogens,
- Making other processes more stable or effective,
- Reducing other contaminants (i.e. TOC, DBP formation), etc. and
- Reducing other pathogens.

The FACA also wanted to encourage the use of a variety of technologies that achieve *Cryptosporidium* removal and ensure that there are viable alternatives to UV disinfection, and to provide removal options that are independent of the failure modes (such as lamp burnout or power loss) that UV disinfection faces (multiple barriers).

We strongly support the concept of having a toolbox of viable alternatives to select from. If options are effectively limited to UV, we believe that the agreement is effectively breached.

**Overly Conservative Assumptions:** It follows from EPA’s focus on strict log removal that the Agency would choose to apply overly conservative restrictions on the use of technologies to comply with the regulation.

Conservative assumptions are made at every turn. The conservative assumptions are then compounded leading to overly conservative endpoints. The potential risks of *Cryptosporidium* tend to be inflated while potential treatment effectiveness tends to be deflated. Worse, the additional benefits of individual technologies are mentioned but not taken into consideration in determining credit. EPA must ensure a balancing of uncertainties and not be overly conservative in assigning “credit” for technologies other than UV.

**Watershed Protection Credit:** The problems with EPA’s overall approach to credit, and its divergence from the FACA’s intentions is well illustrated in the Watershed Protection Credit requirements.

The FACA wanted to encourage watershed protection. Accordingly, the FACA supported a 0.5-log credit for watershed protection programs knowing that improvements in source water would be difficult, could likely never be measured given the available analytical techniques, and would take many years of effort. Nevertheless, all FACA members, including environmental and other advocacy groups, strongly supported the credit based on the potential for long-term reductions in *Cryptosporidium*, and also on the fact that such efforts would serve to reduce other microbial pathogens and TOC and therefore disinfection byproducts.

Contrary to the FACA's clear desire to encourage watershed protection by awarding credit, EPA has made the conditions for achieving and maintaining credit so onerous that few, if any, systems will make use of it even if they presently have a program in place.

EPA should provide watershed protection credit that will encourage and not discourage its use. As presently structured, the credit is not a viable one for water systems. Systems that presently have watershed protection programs should be rewarded for their proactive stance rather than penalized by increased requirements. The benefits of existing programs should not be expected to show up in monitoring for bin placement because of the inadequacies of the analytical method and the fact that benefits take many years to realize and may not necessarily be realized prior to monitoring.

EPA should recognize that wastewater treatment facilities are currently examining ways to avoid excessive chlorination of effluents to achieve whole effluent toxicity requirements under the Clean Water Act. Water systems encouraging or negotiating the use of ultraviolet light disinfection as part of their watershed protection program could have significant impacts on the presence of "viable and infectious" *Cryptosporidium* in their source waters. Note that none of this improvement would be detected by present analytical methods that merely count oocysts, whether they are inactivated or not (UV does not destroy the oocyst, it merely inactivates it).

The requirement for an annual watershed survey by a state certified party is excessive and unreasonable given the scope and timeframes of watershed programs. Any watershed surveys should be performed in conjunction with regular sanitary surveys.

Additionally, EPA should drop the requirement for re-approval of a watershed protection credit every six years. In its place, we recommend that the credit be a continuing one for systems once initially approved and meeting the WCP requirements on a continuing basis.

### **Revision of Enhanced Filter Performance Criteria**

The proposal of an IFE credit began with the Stage 2 M/DBP FACA's inclusion of "Peer review program (e.g., Partnership Phase IV)" in the microbial toolbox. Today, fostering peer review programs like the Partnership for Safe Water, Area Wide Optimization Programs, and efforts within individual states remain important. The LT2ESWTR should support and be an incentive to participate in such programs which set challenging operating goals and pursue comprehensive performance evaluation-like programs. However, few appropriate programs exist and these are not uniformly available to all utilities. One solution to this dilemma is to incorporate a stringent but achievable IFE or CFE credit in the microbial toolbox. Based on our analysis, the proposed IFE standard is so stringent as to not be practically achievable, even by highly optimized plants. However, alternatives such as maintaining CFE turbidity at < 0.15 NTU 97 percent of the time as measured on a monthly basis would be an example of an achievable yet robust option.

## **Economic Analysis**

The Agreement in Principle calls for EPA to prepare a health risk reduction and cost analysis (HRRCA) for LT2ESWTR. EPA has prepared an extensive and detailed compilation of background material. However, the analysis does not clearly communicate the most critical information to interested and involved parties such as ourselves.

The Agency's analysis involves a number of assumptions that have significant impacts on the resulting estimates of risks, benefits and costs. The Agency does not always clearly articulate what assumptions it is making and it often takes a one-sided view of relevant uncertainties and data limitations to derive its interpretation.

EPA should follow the basic tenants of its own Guidelines for Economic Analyses in revising the EA to support the final rule. Following these Guidelines the Agency should: (1) be explicit regarding its core assumptions, (2) document the basis for those assumptions, and (3) develop some useful sensitivity analyses to evaluate and convey the impact of core uncertainties on the outcomes of the analysis. The net effect of following the Agency's guidelines would be a more robust and transparent analysis that will be more realistic and, we believe, reduce the lower bound estimate of anticipated benefits from the proposal.