# Final Report

of the

# SBREFA Small Business Advocacy Review Panel

on EPA's Planned Proposed Rule**:**

# Long Term 1 Enhanced Surface Water Treatment

**October 19, 1998**

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## I. INTRODUCTION

This report is presented by the Small Business Advocacy Review Panel (hereafter referred to as SBAR Panel or Panel) convened for the proposed rulemaking on the Long Term 1 Enhanced Surface Water Treatment Rule (LT1) that the Environmental Protection Agency (EPA) is currently developing. On August 21, 1998, EPA's Small Business Advocacy Chairperson convened this Panel in accordance with Section 609(b) of the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA). Section 609(b) requires convening a review panel prior to the publication of the Initial Regulatory Flexibility Analysis (IRFA) that an agency is required to prepare under the RFA. In addition to its chairperson, the Panel consists of the Director of the of the Standards and Risk Management Division in the Office of Ground Water and Drinking Water (OGWDW) within EPA's Office of Water, the Administrator of the Office of Information and Regulatory Affairs in the Office of Management and Budget, and the Chief Counsel for Advocacy of the Small Business Administration.

This report provides the scope and statutory background of the LT1, a brief description of possible rule components, a description of the number and types of entities potentially affected by the rule, a summary of outreach activities, and the comments and recommendations of the small entity representatives (SERs). In addition, section 609(b) of the RFA directs the SBAR Panel to report on the comments of SERs and make findings regarding the key elements of the initial regulatory flexibility analysis under section 603 of the RFA. The key elements addressed in an IRFA (See 603(b) 3,4,5 and 603(c)) are:

- The number and types of small entities to which the proposed rule will apply;
- Possible reporting, record keeping, and other compliance provisions of the proposed rule, including the classes of small entities which will be subject to the requirements and the type of professional skills necessary for preparation of the reports or records;
- Other relevant federal rules which may duplicate, overlap, or conflict with the proposed rule; and
- Any significant alternatives to the regulatory components under consideration which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

The completed Panel report is provided to the agency issuing the proposed rule and included in the rulemaking record. The agency is to make changes to the draft proposed rule, the IRFA for the proposed rule, or the decision on whether an IRFA is required taking into consideration information in the Panel report.

The Panel's findings and discussion are based on information available at the time this report was drafted and EPA is continuing to conduct analyses relevant to the proposed LT1 Rule. The Agency expects additional information will be developed or obtained as part of the rule development process. Any options the Panel identifies for reducing the rule's regulatory impact on small entities may require further analysis and/or data collection to ensure that the options are practicable, enforceable,

environmentally sound and consistent with the Safe Drinking Water Act.

## 2. SCOPE AND STATUTORY BACKGROUND AND POSSIBLE RULE COMPONENTS

The purpose of the Safe Drinking Water Act (SDWA) is to protect public health by ensuring that the tap water in the United States is safe for consumption. Section 1412(b)(1)(A) of the SDWA requires EPA to establish National Primary Drinking Water Regulations for contaminants that may have an adverse public health effect, are known to occur in public water systems with a frequency and at levels of public health concern and that present a meaningful opportunity for health risk reduction. Congress required under Section 1412(b)(2)(C) that EPA develop regulations which focus on surface water drinking water systems that serve fewer than 10,000 persons.

EPA's Office of Ground Water and Drinking Water (OGWDW) is responsible for developing the LT1. To meet these requirements, OGWDW is working with stakeholders to develop the proposed rule by September of 1999 and a final rule by November of 2000. Development and implementation of the rule will also involve local, tribal, state and federal governments.

The Agency's goal in developing the LT1 is to provide additional protection from disease-causing microbial pathogens for community and non-community public water systems (PWSs) utilizing surface water and prevent increased microbial risk when small systems comply with the Stage 1 Disinfectants/Disinfection Byproduct (Stage 1 DBP) rule. The Stage 1 DBP rule sets maximum contaminant levels (MCLs) for chemicals that form when chlorine and related disinfectants react with organic chemicals in source water to form other cancer-causing chemicals (carcinogens). Small systems will be required to comply with the Stage 1 DBP rule and may have to alter their disinfection practices as a result.

In order to achieve the Agency's goal of preventing microbial risk when small systems comply with the Stage 1 DBP rule, the LT1 rule will specify measurement thresholds for turbidity, *Cryptosporidium* removal provisions and establish disinfection benchmarking provisions which provide a tool for utilities and states to evaluate how a change in disinfection practices to meet Stage 1 DBP requirements will affect microbial protection. As currently envisioned, the framework will consist of a series of filter provisions to ensure low turbidity levels generally indicating higher pathogen removals, i.e. *Cryptosporidium* and disinfection benchmarking, which requires certain utilities to characterize current disinfection practice over a period of time and calculate microbial inactivation.

OGWDW has identified a number of general regulatory components that will be addressed in the proposed rule using the Interim Enhanced Surface Water Treatment rule as a template to develop the LT1. It is anticipated that these general components will be developed in more detail in the course of discussions with states and other interested parties, including SERs. It is expected that a number of systems will be required to implement at least some of the components as a result of the rule. The particular components a system may be required to implement will vary based upon system specific

conditions and existing state requirements. The following is a brief description of each potential rule component.

***Revised Turbidity Provisions***

Tighter turbidity performance monitoring requirements are being considered, along with individual filter monitoring requirements. Lower turbidity measurements are, generally, an indicator for greater removal of *Cryptosporidium*. .

Turbidity is generally thought to be an indicator of treatment effectiveness. Although turbidity is not itself an indicator of health risks, a very low turbidity level is a good general indicator of effective filter performance and hence ability to reduce microbial health risks. As turbidity performance improves, a greater removal of *Cryptosporidium* can be achieved. EPA believes that turbidity is currently the most readily measurable parameter to indicate filtration effectiveness.

The objective of these filtration provisions is three fold; first, to improve filtration performance to maximize microbial removal; second, to provide for a 2 log *Cryptosporidium* removal provision; and third, to minimize microbial "breakthroughs" from individual filters where combined effluent requirements could be met while individual filters may be performing poorly.

***Combined-Filter Effluent Requirements***

Combined-finished water turbidity will continue to be monitored on a four-hour basis as in the Surface Water Treatment Rule (SWTR), but the maximum allowable turbidity levels under consideration would be reduced as follows:

- Less than 1 Nephelometric Turbidity Unit (NTU) at all times.
- Less than 0.3 NTU in 95% of all monthly samples.

***Individual Filter Monitoring and Exception Reporting***

EPA is considering continuous monitoring of turbidity for each individual filter in a treatment plant with exceptions reporting to the State for filters that perform poorly. A *filter profile* will be produced if no obvious reason for abnormal filter performance can be identified. *Reportable exceptions* would include the following:

- Any individual filter with a turbidity level greater than 1.0 NTU based on two consecutive measurements fifteen minutes apart.
- Any individual filter with a turbidity level greater than 0.5 NTU at the end of the first four hours of filter operation based on two consecutive measurements fifteen minutes apart.

These exceptions would be reported to the State in a monthly exceptions report.

### *Filter Self Assessment/Comprehensive Performance Evaluation*

If an individual filter shows consistently poor performance, the facility would be required to conduct a self assessment of the filter using applicable portions of EPA's guidance for Comprehensive Performance Evaluation (CPE) or arrange for a CPE based on the following requirements:

- For any individual filter with turbidity levels greater than 1.0 NTU based on two consecutive measurements fifteen minutes apart in each of three consecutive months, the facility must perform a self-assessment of the filter.
- For any individual filter with turbidity levels greater than 2.0 NTU based on two consecutive measurements fifteen minutes apart in each of two consecutive months, the facility must arrange for a CPE conducted by the State or a third party approved by the State.

### *Disinfection Benchmark Provisions*

A fundamental goal of the LT1 is to assure that existing levels of microbial protection are not significantly reduced when systems implement the Stage1 DBP rule. EPA is considering including a Disinfection Benchmarking Provision in the LT1 (which will be implemented simultaneously with the Stage 1 DBP rule for systems serving less than 10,000 people) to address this goal.

Disinfection Benchmarking defines a framework used to ensure that significant modifications (i.e., moving point of disinfection, changing disinfectants) to disinfection practices will not significantly increase microbial risk. Under this framework, public water systems governed by the LT1 would be required to develop a disinfection profile if distribution system average concentrations of total trihalomethane (TTHM) or haloacetic acids (HAA5) equal or exceed 0.064 mg/L or 0.048 mg/L, respectively, for the most recent four quarters of data, gathered by the system.

Disinfection Benchmarking consists of the following steps: developing a disinfection profile, determining a disinfection benchmark, making data available for state review, and obtaining approval from the state prior to making any significant modification to existing disinfection practice. A *disinfection profile* is developed by plotting daily levels of *Giardia lamblia* and/or virus inactivation against time. Inactivation is calculated based on daily measurements of operational data (disinfectant residual concentration, contact time during peak flow, water temperature, and pH (for systems which use chlorine only)). This plot represents a "profile" of a treatment plant's inactivation performance. The profile can cover one to three years of inactivation performance.

The system can use the profile to calculate a *disinfection benchmark* by identifying its lowest monthly average inactivation over a year. The calculated benchmark characterizes the minimum log inactivation the system achieved during the profiling period. Systems can then, in consultation with the state, compare the calculated benchmark to the projected log inactivation level that would be achieved after a significant change in disinfection practice has taken place. This comparison allows an evaluation of whether changing disinfection practices will lower or raise log inactivation levels beyond current levels.

## 3. APPLICABLE SMALL BUSINESS DEFINITIONS

EPA's authority under SDWA extends to all "public water systems." The law applies the term "public water system" to water utilities and a wide range of businesses (e.g., campgrounds, factories, and schools). As part of the 1996 SDWA amendments, Congress expressly addressed the issue of system size and included several provisions for small system regulatory relief for systems serving 10,000 or fewer people and/or systems serving 3,300 or fewer people. OGWDW believes it is appropriate to define a small system as one that serves 10,000 or fewer people. However, the Small Business Administration (SBA) regulations typically define a small business in terms of either total revenues or total employees. Under SBA's definition, a "small," privately-owned water utility would be one with revenues of less than $5,000,000. Under the RFA, a "small" governmental entity is one with a jurisdiction of 50,000 or fewer people. Data from the Community Water System Survey (CWSS) indicate that the median revenue of a community water system serving between 3,300 and 10,000 people is $605,000. Systems serving less than 10,000 people would actually have annual revenues well below $5 million. The proposed EPA definition of a small water system as one serving 10,000 or fewer people is therefore narrower than the SBA definition for small business and the RFA definition of a small government entity. However, OGWDW believes the proposed definition is appropriate both because of the statutory provisions of the SDWA, and because it believes this definition appropriately distinguishes public water systems that have stronger technical expertise and revenue sources from those that do not.

## 4. PROFILE OF THE AFFECTED INDUSTRY

As noted above, EPA's authority under SDWA extends to all public water systems. A public water system provides piped water for human consumption. Based on information identified in the Regulatory Impact Analysis (RIA) for the DBP rule, there are 5,165 public water supply systems that use surface water or groundwater under the direct influence of surface water (GWUDI). The term "public water systems" applies not only to water utilities, but also to a wide range of privately or publicly owned businesses and entities that provide drinking water (e.g., campgrounds, factories, restaurants, and schools).

Public water systems are classified as community (C), non-transient non-community (NTNC), or transient non-community (TNC) systems.

### *Community Water Systems*

Community systems provide drinking water to at least 15 service connections used by year-round residents or that regularly serve at least 25 year-round residents.

### *Non-Transient Non-Community Water Systems*

NTNC systems serve at least 25 of the same people at least six months of the year and include

schools, factories, and hospitals.

***Transient Non-Community Water Systems***

TNC systems, such as campgrounds and motels, serve transient populations.

## 5. SUMMARY OF OUTREACH ACTIVITIES

To facilitate regulation development, EPA has actively involved stakeholders in the development of the draft rule including this SBREFA SBAR Panel process as well as other outreach activities. EPA sponsored a tele-conference with small entity representatives on April 28, 1998.

To develop a list of small entity representatives (SERs) who could provide input into a series of drinking water regulations that are currently under development, OGWDW consulted with trade associations, EPA regional offices, state drinking water programs, individuals who have attended stakeholder meetings, foundations, and the Small Business Administration. This effort produced a list of representatives of small water utilities and other entities that provide drinking water ancillary to their primary business. EPA invited 24 SERs representing systems that use surface water or ground water under the influence of surface water that would be directly affected by the LT1 and Filter Backwash Recycle (FBR) rules to participate in the consultation process. These SERs were drawn from several sources, including the previously mentioned list of SERs, and additional references from trade associations and EPA regional offices. OGWDW also included one "Drinking Water System Circuit Rider," i.e. an individual who does not directly own a system but provides technical and compliance assistance to small systems. Table 1 lists the names of the 16 SERs who agreed to participate and the organizations they represent. The table also lists the dates of the tele-conference calls in which each SER participated.

| Table 1. Small Entity Representatives & Meeting Participation | | | |
|---|---|---|---|
| **NAME** | **ORGANIZATION** | **4/28/98** | **9/22/98** |
| Dan Boyce | Water and Light Dept., East Grand Fork, MN | X | X |
| Doug Evans | Salt Lake County Service Area #3, UT | X | |
| Danny Flemming | Blanding City Water Treatment Plant, UT | X | X |
| Charlie Holbrook | Water Treatment Plant, Allum Creek, WV | X | X |
| Chris Kramer | Bayfield, CO | X | X |
| Al Lamm | Thief River Falls Municipal Utilities, MN | X | |
| Tom McFeron | Nashville Water Treatment Plant, IL | X | X |
| Albert Ricksecker | Brooklyn Tapline Co., Inc., UT | X | |
| Tom Sakry | International Falls Water Utility, MN | X | X |
| Jim Sheldon | Cedar-Knox Rural Water Project, NE | X | |
| Paul Torok | Seeley Lake, Missoula County Water District, MT | X | X |
| J.D. Hightower | City of Escalon, CA | | X |
| Michael Knox | Cherrydale Valley & Rockdale Water District, MA | | |
| Gary Fluckey | Green River WTP, UT | | |
| Gary Walter | Tuolumne Utilities District, CA | X | |
| Tom Weathers | Glencoe Water Department, IL | X | X |

EPA convened a tele-conference with SERs on April 28, 1998, in Washington, D.C. The purpose of the meeting was to discuss SDWA and SBREFA, as well as to introduce upcoming rules that are relevant to disinfection and microbial protection at surface water systems. While the meeting focused on the FBR and LT1 rules, the SERs also received a brief overview of the planned Long Term 2 Enhanced Surface Water Treatment Rule and Stage 2 Disinfection Byproduct Rule. The tele-conference served specifically to provide SERs with summaries of the data that support rule development; engage SERs in analysis and discussion of the implications of the data; solicit additional data, especially actual experience with costs and how the cost burdens estimated by EPA compare to the SERs experience; discuss EPA's next steps for rule development, data analysis, and SER involvement; and identify additional parties who may be interested in future meetings. The LT1 discussion focused on possible components of the rule and the occurrence and public health data supporting the rule. EPA encouraged the SERs to ask questions and provide feedback and comments throughout the tele-conference and to provide written comments after the meeting. A summary of that meeting is included as Attachment A.

On September 17, 1998, the Small Business Advocacy Review Panel for the LT1 distributed additional information to the LT1 SERs for their review. The materials described the regulatory approaches to the LT1 developed by EPA and preliminary estimates of costs associated with the regulatory approaches. The SERs were asked to review the materials and to provide any additional comments to the Panel in writing by October 2, 1998. The SERs were asked to comment specifically on the aspects of the possible regulatory approaches which they felt were "most helpful" and those which they found to be "least helpful". They were also offered the opportunity to make oral comments in a teleconference on September 22, 1998. A summary of the SBAR Panel tele-conference is found in Attachment B.

In addition to SER outreach, the Agency held a general stakeholder meeting (i.e. open to the public) on the LT1 on July 22, 1998, in Denver, Colorado, where EPA presented potential regulatory approaches for discussion. Small entity representatives participated in this meeting and small system concerns were among the issues discussed. OGWDW is planning one additional stakeholder meeting to solicit additional input regarding possible regulatory structure and potential impacts the LT1 may have on regulated systems. The meetings will be held in Washington, DC, prior to proposal of the LT1 rule.

EPA has also organized a Small System Data Needs Working Group. The group is comprised of representatives from the American Water Works Association, Association of State Drinking Water Administrators, National League of Cities, National Resources Defense Council, and National Rural Water Association. Established in the spring of 1997, the group held six meetings, from March through December, to discuss the availability of water quality and financial data for small systems that is needed to support the LT1 and other drinking water regulations.

## 6. SUMMARY OF SMALL ENTITY REPRESENTATIVE COMMENTS

The following is a summary of written comments received from the SERs, after the April 28, 1998, meeting, organized by topic. OGWDW received eight sets of written comments from SERs. Table 2 provides a record of the commentor, the date the comments were received by OGWDW, and the number of pages of comments. The comments are summarized in the text following Table 2 with topics bolded in the text. All written comments received from the SERs were provided to the Panel and are included with this report as Attachment C. (As noted above, verbal comments made by the SERs in the April 28, 1998, and September 22, 1998, tele-conferences are summarized in Attachments A and B.)

| TABLE 2. WRITTEN COMMENTS RECEIVED ON THE DEVELOPMENT OF THE LT1 | | | |
|---|---|---|---|
| COMMENT LETTER | NAME | DATE OF COMMENT | NUMBER OF PAGES |
| 1 | Tom Weathers | 5/11/98 | 4 |
| 2 | Doug Evans | 5/18/98 | 2 |
| 3 | Al Ricksecker | 5/19/98 | 1 |
| 4 | Dan Boyce | 5/19/98 | 3 |
| 5 | Jim Sheldon | 5/19/98 | 4 |
| 6 | Thomas McFeron | 5/19/98 | 4 |
| 7 | Gary Walter | 5/20/98 | 4 |
| 8 | Thomas Sakry | 5/28/98 | 2 |
| 9 | Thomas Sakry | 9/28/98 | 3 |
| 10 | Tom Weathers | 10/1/98 | 3 |
| 11 | Danny Fleming | 10/5/98 | 2 |

## 6.1 Summary of Written Comments

The following is a summary of comments received from the SERs organized by topic.

**Revised Turbidity Provisions**

***Decrease from 0.5 NTU to 0.3 NTU for Combined Filter Effluent Monthly 95th Percentile Value Based on Four Hour Intervals***

A SER suggested that the regulatory limit remain the same as at 0.5 NTUs. While each of his filters would meet the lower limit individually, there is a 0.15 NTU increase which takes place in the clearwell ( after filtration). The clearwell was designed to get proper contact time for disinfection. This SER suggested instead that each filter be required to have an individual on-line continuous monitoring turbidimeter and the filter effluent turbidity not exceed 0.3 NTUs for 95% of the monthly 15 minute values for each filter. This SER believes that in order to meet a combined filter limit of 0.3 NTU 95% of the time, his plant would have to maintain individual filter performance below 0.15 NTU for 95% of monthly readings, which they have not been able to do during storm events and lake turnover. *[EPA believes that this problem is caused by the addition of caustic soda and fluoride at the clearwell and could be addressed more easily by measuring combined filter turbidity before entering the*

*clearwell*].

A SER agreed that lowered turbidity level is a good indicator of overall plant performance, but stated that the proposed 0.3 NTU requirement for 95% of all samples is "too tight" in light of studies showing variability and inaccuracies of low-level turbidity measuring. The SER referred specifically to Water Supply Study #40 in which over 400 labs measuring a known sample of 0.26 NTU got average readings ranging from 0.32 to 0.36 NTU, depending on the analytical method used. The SER expressed concern that many plants that are truly in compliance (in terms of public safety) will be forced "to jump through all kinds of hoops" in order to "get in compliance." The SER recommended that until technology is able to produce better results of low-level turbidity measuring a 0.5 NTU limit on the 95% reading would be a more reasonable requirement. *[EPA notes that the study which the SER refers to has not been analyzed by EPA to address variability and accuracy at low levels. Presently, only preliminary data are available.]*

A SER commented that it was a fair assumption that turbidities up to 1 NTU maximum and 0.3 NTU in 95% of all monthly samples is a good indicator of two log removal of *Cryptosporidium* with rapid sand filtration, however the SER stated that if such lower turbidities are mandated, then requirements need to be flexible enough to allow short-term exceedences for systems with automation to permit response time for operators who have many duties and may not be at the treatment plant.

***Decrease from 5 to 1 NTU for Combined Filter Effluent Maximum Reading Based on Four Hour Sample Intervals***

One SER commented that lowering the NTU from 5 to 1 would not pose a problem as long as the initial startup spike does not count during the first measurement period. This SER continued that with the exception of the startup spike, compliance with a limit of 1.0 NTU would be easily attainable and no extra cost would be incurred to meet the new NTU goal. The SER suggested that "if the startup spike were to count, but credit be given for contact time (CT) and log removal standards to offset the spike in NTUs, then the City could meet this standard and not incur extra costs in doing so."

A SER suggested keeping the MCL at 5 NTU (or even 3 NTU) with exception reporting, as was suggested for individual filter performance, based on two consecutive measurements fifteen minutes apart for readings over 1 NTU, due to the difficulty in achieving the 1 NTU MCL on a routine basis because of short duration spikes. Such spikes (lasting 10 to 15 minutes) occur at this plant when a pump is brought on that has sat idle all winter. The SER believes these spikes are caused by corrosion in the piping of the idle pump and not microbial contamination. *[EPA agrees with this assessment and believes that the spike referred to here would easily be eliminated by filtering-to-waste for the first 10-15 minutes after the pump is brought back on line.]*

A SER stated that regulation of individual filter performance is probably a good idea provided that short-term exceedences are allowed for operator response at systems with automation. However, the SER commented that continuous monitoring for the proposed exception reporting would be problematic for systems without automation or operators continuously present for rapid-succession

measurements.

A SER commented that the suggested lowered filter turbidity requirements of 1 NTU at all times and less than 0.3 NTU in 95% of all monthly samples would be difficult to obtain for many small water systems however this is generally an obtainable goal for systems with limited resources. The SER stated that systems with less than 500 connections would most likely face financial hardship in order to comply.

***Individual Filter Monitoring and Exception Reporting***

A SER stated that most of the small water systems do not currently have continuous monitoring equipment installed for more than one filter. The SER recommends that EPA allow small systems that can still meet lowered turbidity standards to continue to do so without constructing additional individual monitoring devices, or alternately, allow the existing turbidimeter to be modified to sample each filter at a specified interval.

A SER commented that many plants his size (i.e., serving 8,900 people with 2,300 connections) have on line turbidimeters with paper chart recorders. Additionally, manual turbidimeter readings are taken at the frequency required by current regulations - typically once every four hours, with paper log sheets used by plant operators.

Another SER questioned how these requirements would apply to package systems and suggested that flexibility was needed. For example a traveling bridge filter may technically be a whole series of filters, but it would be impossible to monitor the turbidity on each separately.

Another SER noted that horizontal pressure filters often have multiple cells per filter, but are not plumbed for individual monitoring or backwash. This SER suggested providing a waiver for these filters or allowing one turbidity unit to service all cells.

**Filter Self Assessment**

A SER commented that many small systems have only one filter to provide service. Requiring a self assessment CPE could mean having to decide between a water outage or water in violation of the lowered turbidity standard. The SER suggested that the LT1 provide for Comprehensive Performance Evaluation (CPE) to be conducted at a time when the system is not vulnerable to outages. The SER further stated that required State or third party CPEs are burdensome (his state, California, charges water systems $74 per hour for this type of service) and suggested that since water systems must be operated by a certified operator the rule should allow the certified operator to conduct the CPE with review by the State or third party.

**Burden Cost Assumptions**

One SER commented that for his system, which already has individual turbidimeters for each filter and continuous recording charts, no new equipment would be required for record keeping and reports for four filters on a monthly basis. The SER estimated that this would equate to 20 minutes of manpower a day and an extra cost of $112.50. The SER commented that this was an acceptable cost for the trade off in water quality and filter performance.

Another SER expressed concern that funding for new regulatory requirements would compete with funding for other capital projects. This SER has had $500,000 authorized to install two new filters and worries that requirements to install continuous monitors and automatic data recording capabilities, as well as potential filter backwash requirements could jeopardize this project.

***Generalized Turbidity Monitoring Model***

Two SERs suggested that the burden on small systems could be reduced by revising some of the cost assumptions. Under the generalized turbidity monitoring, these SERs suggested the following alternative: allow using one turbidimeter to monitor more than one point by manifolding. One of these SERs further suggested that the rule allow the use of strip charts or circular recording charts for monitoring instead of logging values every fifteen minutes to an expensive and complicated Supervisory Control and Data Acquisition (SCADA) system. (A SCADA system can electronically monitor and operate systems with minimal operator input). A third SER stated that equipment costs and the cost of improvements or modifications are not reflected in the model assumptions. These costs could be substantial when the number of customers served is considered. The SER reminded EPA that the customer bears the burden of cost of implementing these new standards.

Three SERs stated that most small systems do not have the advantage of on-line instrumentation and/or SCADA systems and that some systems cannot afford it. One of these SERs stated that it is not reasonable to assume that such automation is within reach of all small communities. The SER noted that the cost of his own SCADA system was $200,000 and expressed concern that the addition of these features will be expensive and will extend the learning curve substantially. *[EPA notes that vendor costs for a minimal SCADA system to track "individual filter monitoring" for 2 filters is $3,500, and for 6 filters is $15,000. EPA does not believe a more elaborate SCADA system would be needed for compliance with the individual filter monitoring provisions of the rule.]* Another SER stated that most plants do not have a SCADA system due to the installation and maintenance costs of the system, because of unfamiliarity with such systems, and because the plant operators do not typically have the training or skills to maintain the hardware and software. Two other SERs pointed out that no small systems have technical engineers, with the exception of top management or through a consulting firm.

A SER commented that it is not reasonable to assume that all small surface water systems have turbidimeters for each system, have on-line SCADA, have the capability of taking turbidity readings every fifteen minutes and tabulating them, or that small systems can convert each 8 hour shift's turbidity data to a reviewable form to be reviewed by a system manager. Three SERs pointed out that small systems don't have standard shifts and in many cases the manager and operator will be the same

person.

A SER commented that smaller systems are more dependent on a good SCADA and/or data collection system and it can save in man-hour costs significantly, but requires good planning, design and implementation steps up front. The SER stated that some guidance and standards in this regard may prove valuable on at least a State level and that without it electronic transmission standard, SCADA or electronic reporting would prove to be confusing and cumbersome.

***Labor Rate Assumptions***

A SER stated that operators (technical engineers) make about $20.00 per hour and management about $28.00 per hour.

Another SER stated that the labor rate assumptions used by EPA, while attractive, are unrealistic for small systems and that managers would be lucky to be paid the unloaded labor rate of $15.00 per hour.

A SER stated that labor rates and benefit levels are within reason for the larger of the small systems, however they are high for systems serving 5,000 or less people.

A SER stated that the labor rate assumptions look reasonable with the exception of the 1.4 labor load rate. The SER recommended that the rate should be adjusted up slightly to 1.5 or 1.6.

***Turbidity Monitoring and Reporting Costs***

A SER commented that the suggested monitoring and reporting costs seem reasonable.

Another SER stated that it is not reasonable to assume that small systems will have the resources to generate significant amounts of paperwork and analysis, beyond what is currently required.

A SER commented that continuous monitoring creates a potential for failure in that all small systems experience periodic spikes in turbidity levels. This may necessitate adding a rinse cycle after each backwash for some systems. In Western states, where water conservation is an issue, increased quantities of disposal water create mixed messages to the public, while recycling the additional rinse water will require system modification and increased operator time. The SER stated that under the suggested approach, any room for error or readjustment will be eliminated and it may very well require the addition of additional water storage or filtration to every small system to provide some measure of redundancy and reliability. The SER further stated that the goal to eliminate these contaminants is worthy, however there will be a significant learning curve as operators with limited experience attempt to meet new regulations. As a result failures will be common. This SER suggested that the rule provide a significant grace period after new facilities have been installed to meet new turbidity standards.

A SER commented that the additional costs of monitoring and reporting coupled with the State

requirements to obtain funding for improvements may very well result in a shift from local community control of water systems to more regional control via consolidation, transfer to other water purveyors or outright abandonment. The SER also recommend that all the necessary equipment, improvement and modification costs be considered. The SER stated that many small systems will have to add additional staff to accommodate the new reporting costs.

**Disinfection Benchmark Provisions**

A SER stated that a daily inactivation rate would require pH testing be done on a daily basis as opposed to current weekly testing, however, the other parameters are already done daily.

Another SER commented that data requirements for disinfection benchmarking would have a heavy impact on small system water treatment plant operators. The SER stated that it is not reasonable to assume that all plants currently collect daily inactivation data outlined in the discussion materials presented to the SERs. The SER further stated that small systems are lucky if they can get consulting engineers to calculate inactivation parameters (needed for state approval purposes) which the operator can then apply daily.

A SER commented that despite the fact that their plant has a computer model prepared by their consulting engineer to calculate daily inactivation rate based on the Surface Water Treatment Rule guidance document, the SER believes that this situation would be very uncommon among small plants. The SER stated that not all the data is normally collected as part of the routine operational tests.

***Burden Cost Assumptions***

A SER stated that sample collection and analysis costs seem reasonable. The SER further stated that he did not agree with the assumption that all necessary daily inactivation data are currently being collected and that the data entry and spreadsheet development hours seem low compared to the requirements in the SER's plant. The Halo Acetic Acid (HAA) sample and analysis costs seem reasonable.

**Staffing Issues**

Many SERs commented on the significant staffing concerns of small systems. It was noted that many small systems are not staffed continuously, that staff increased to comply with new record keeping or reporting requirements may be difficult to get approved, that operators may have to defer other important maintenance tasks in order to find time for new requirements, and that staff may need additional training.

**Phased Compliance**

One SER suggested that because of the difficulty for small systems to comply on an even keel with larger systems, a phased or multi-tiered approach be considered in which smaller systems would have additional compliance time. Another suggested that because of the significant learning curve for small system operators with limited experience, a significant grace period be allowed after installation of new equipment before systems are required to meet
new turbidity standards.

## 6.2 Summary Of Verbal Comments (9/22 Teleconference)

SERs commented primarily on issues affecting the costs and burden associated with process enhancements which systems might be expected to undertake in order to meet turbidity provisions of the LT1. Comments found below are grouped by process enhancement. Miscellaneous comments are found at the end of this Section

### Chemical Addition and Coagulant Improvements

Two of the SERs commented that they didn't feel capital costs for chemical or polymer addition would be much lower than for systems serving 10,000 because basically the same equipment is still necessary for very small systems, although there would be a reduction in chemical use.

A SER commented that the assumption that chemicals and polymer can be purchased on a per ton basis is unreasonable for small systems, since they do not have this sort of storage capacity and generally buy chemicals and polymer in 50 pound increments. An example by the SER stated that buying alum in a one ton increment equated to $0.11 per pound, however when purchasing alum in 50 pound increments a small system pays $0.18 per pound.

A SER commented on the high cost of switching from alum to a poly aluminum chlorite (PAC) in order to meet the turbidity requirements of 0.3 NTU. He attributed the majority of the total cost increase to the more expensive price of the PAC.

Another SER commented that the price difference between PAC and alum is large when comparing the unit prices. For example, this SER pays $0.60 per gallon for alum and $0.52 per pound for PAC.

Another SER stated that a number of systems have made the transition from alum to poly aluminum chlorohydrate and have experienced positive results in terms of lowered turbidity levels.

SERs commented that the majority of the capital costs for the LT1 would be incurred for process enhancement, such as implementing pH adjustment capabilities. For states with harsh climates there will be an additional cost for building an indoor shelter for chemicals. The cost of adding

coagulant and polymer presented in the mailing appeared high to a few of the SERs.

**Rapid Mixing Process Enhancements**

A SER commented that the basin dimensions used to determine the cost were too small for a 10,000 customer system and that the size of the basin is the driver for costs. In addition, the more remote the location of the system the higher the cost of poured-in-place concrete. In some remote areas the cost of concrete reaches $90 per cubic yard.

**Flocculation Process Enhancements**

SERs concurred that the costs estimates presented were reasonable.

**Filtration Improvements**

A SER commented that phasing out and changing the filter media raised costs from $3.00/1,000 gallons to $4.50/1,000 gallons in a system serving 3,000 people. Another SER commented that due to the 20 year life expectancy of filters, it is cheaper and more effective for the system to add filter media. A SER commented that his system replaces GAC-carbon every three years. Several SERs commented that a filtration rate of 2.5 $gpm/ft^2$ may be a conservative design parameter, however it is realistic in day to day practice. The 5 $gpm/ft^2$ filtration rate in the information presented to the SERs is the design parameter, and the average filtration rate is assumed to be 2.5 $gpm/ft^2$.

**Issues affecting Administrative Improvements**

A SER stated that an assumption can be made that small systems will have to add an additional person for filter monitoring, disinfection benchmarking, and record keeping. Several SERs noted the difficulty for small systems of obtaining staff increases.

A second SER commented that a majority of the administrative funds are spent on training part time help, due to the fact that there is not enough work for a full time position. The problem arises with the high turn over rate of part time personnel and the high costs of re-training new employees.

A SER commented that the most viable and economical option would be to use circuit riders (a trained operator who travels between plants), however there is concern from the SERs that the LT1 would increase the amount of time that a circuit rider would be required to spend at each plant.

**Laboratory Modifications**

A SER commented that the EPA's estimate of $50,000 was extreme for modifications and that he had achieved his lab modifications for approximately $7,000.

Another SER commented that lab modification costs will not decrease for smaller systems because it will still be necessary to purchase expensive equipment, for example a SCADA system which is approximately $100,000 (including on-line turbidimeters). Another SER commented that $27,000 for a SCADA system is a reasonable cost.

**Other Comments**

- In response to a panel question regarding how the SERs would go about raising the funds to implement process enhancements to their systems, one SER responded that for modest expenditures he could use the money in a capital improvements fund, however anything over $50,000 would require a loan as well as approval of the customers. Another SER stated that the money would have to come from a voter approved property tax and a rate change. A third stated that approval was needed from the town council for major expenditures.

- SERs commented that certain states have laws requiring public hearings regarding capital improvements.

- One SER commented that in one year a city council may be able to vote on only one or two drinking water projects. SERs may or not be required to send notice to customers about potential rule changes.

- Two SERs commented that there is an unfair discrepancy in the rules in that the systems waiting until the end of the allotted time to comply often receive the bulk of administrative assistance and federal funding.

## 7. PANEL FINDINGS AND DISCUSSION

It is important to note the Panel's findings and discussion are necessarily based on the information available at the time this report was drafted. EPA is continuing to conduct analyses relevant to the proposed rule, and additional information may be developed or obtained during this process and from public comment on the proposed rule. Any options the Panel identifies for reducing the rule's regulatory impact on small entities may require further analysis and/or data collection to ensure that the options are practicable, enforceable, environmentally sound, and consistent with the Safe Drinking Water Act.

Before discussing the specific elements of an IRFA which the Panel is directed to consider,

SBA and OMB note a general concern regarding the degree of flexibility available under the statute to address small entity concerns in this rulemaking. The legislative history to the SDWA indicates that Congress intended that consideration of technical and economic feasibility in the determination of best technology available is to be based on the capabilities of large systems. In November, 1998, EPA will promulgate the Interim Enhanced Surface Water Treatment rule (IESWTR) which provides tighter turbidity limits and individual filter monitoring and disinfection profiling requirements for large systems. Acquiring the technical and financial capability to implement such requirements may be considerably more challenging for small systems than for large ones. OMB and SBA are concerned with how much flexibility EPA has under the statute to tailor the large system requirements already promulgated in the IESWTR to the needs and limitations of small systems. The Panel believes it is important and worthwhile to fully consider these needs and limitations but recognizes that the development of alternatives to address them may be limited by the statutory requirements of SDWA.

### 7.1 Number of Small Entities

No commenters questioned the information provided by EPA on the number and types of small entities which may be impacted by the LT1 rule. This information is based on the national Safe Drinking Water Information System (SDWIS) database, with information about all public water systems in the country. The Panel believes this is a reasonable data source to draw from in characterizing the number and types of systems impacted by this rule.

### 7.2 Record Keeping, Reporting and Other Compliance Requirements

The Panel notes the concern of a number of SERs that small systems often have a single, part time operator with many other responsibilities. Several of the components of this rule may require significant additional operator time to implement. These include disinfection profiling, individual filter monitoring, and ensuring that short-term turbidity spikes are corrected quickly. EPA should keep these limitations in mind when developing reporting and record keeping requirements, and look for ways to tailor these requirements accordingly. Several specific suggestions are discussed below.

The Panel notes that during the September Conference Call, EPA cost estimates for each of the possible process enhancements were discussed and were generally considered accurate by the SERs, with certain exceptions. Cost estimates for chemicals were considered low because smaller systems do not purchase chemicals in as great a quantity as larger systems. It was also noted that there are significant fixed capital costs for several of the process enhancements which may not be much lower for very small systems than for "large" small systems, although the very small systems have a much smaller customer base across which to distribute these costs. The remoteness of some smaller system also adds to the cost of improvements (in some remote areas, the cost of concrete reaches $90 per cubic yard). The Panel recommends that EPA utilize the comments provided by the SERs to refine its cost estimates.

One cost element of particular concern to several SERs was the cost of acquiring a SCADA system to automatically record turbidity measurements. While SERs agreed that such systems are great for plants that can afford them and have the necessary staff expertise to operate them effectively, several expressed concern that acquiring such systems would be beyond the financial and technical capability of many small systems. EPA notes that the acquisition of a SCADA system is not required, nor is it necessary in order to ensure compliance with the turbidity requirements under consideration, unless the system does not have a full-time operator on duty. The Panel recommends that EPA provide sufficient flexibility in the record keeping requirements to allow systems to utilize simple and affordable monitoring and compliance technologies.

An additional costs concern of smaller systems is the cost associated with operator training. One SER commented that systems spend a significant amount of money training part time help. The high rate of turn-over was also noted as a concern. The Panel recommends that the EPA consider the cost of training when analyzing the impact of regulatory options on small systems.

Another option recommended by several SERs to reduce monitoring burden and cost was to allow the use of one on-line turbidimeter to measure several filters. This would entail less frequent monitoring of each filter but might still be adequate to ensure that individual filter performance is maintained. The Panel recommends that EPA consider this option.

### 7.3 Interaction with other Federal Rules

One SER commented that any added responsibility or workload due to regulations will have to be absorbed by him and his staff. The SER stated that many systems are losing staff through attrition and unable to hire more. He further stated he hopes the Panel is aware of the volume of rules and regulations that small systems are currently subject to. As an example, he noted that he had recently spent a week collecting samples for the mandated tests of the Lead/Copper rule and that as a result, important maintenance to his system was delayed by over a month.

The Panel also notes that the LT1, FBR and Stage 1 DBP rules will affect small systems virtually simultaneously. EPA should analyze the net impact of all of these rules, and consider regulatory options that would minimize the impact on small systems.

### 7.4 Regulatory Alternatives

#### 7.4.1 Turbidity Provisions

The Panel notes that one SER commented that it was a fair assumption that turbidity up to 1 NTU maximum and 0.3 NTU in 95 % of all monthly samples is a good indicator of two log removal of *Cryptosporidium,* but stressed the need to permit operator response time for exceedances in automated systems. The Panel recommends that EPA consider this limitation when developing

reporting and record keeping requirements.

The Panel further notes that another SER agreed that lowered turbidity level is a good indicator of overall plant performance but thought the 0.3 NTU limit for the 95th percentile reading was too tight, in light of studies which appear to show variability and inaccuracies in low level turbidity measurements. This SER referenced specific data suggesting that water below the 0.3 level may nonetheless give readings above 0.3 which would put it out of compliance. EPA notes that the data to which the SER referred have not been fully evaluated, and believes that readings at or around the 0.3 level are reliable. The Panel recommends that EPA not set regulatory limits below the level at which concentrations can be reliably measured, and that EPA carefully consider information available on the reliability of low level turbidity measurements as it considers alternative regulatory provisions. In this context the Panel notes that EPA is currently evaluating information from performance evaluation (PE) studies on low level turbidity measurements (i.e., turbidity levels less than 0.3 NTU) and supports this effort.

The Panel recognizes that several SERs supported individual filter monitoring, provided there is flexibility for short duration turbidity spikes. Other SERs, however noted that the assumption that individual filter monitoring was necessary was unreasonable. The Panel recommends that EPA consider the likelihood and significance of short duration spikes (i.e., during the first 15-30 minutes of filter operation) when evaluating the frequency of individual filter monitoring and reporting requirements and the number and types of exceedences that will trigger requirements for CPEs. The Panel also notes the concern expressed by several SERs that individual filter monitoring may neither be practical nor feasible in all situations. Examples include traveling bridge filters in package systems and horizontal pressure filters with multiple cells. The Panel recommends that EPA carefully consider such situations and provide appropriate flexibility.

### 7.4.2 Disinfection Profiling Applicability Provisions

No SERS commented specifically on the applicability provisions for disinfection profiling (i.e.,profiling required if average TTHM concentrations exceeds 0.064 mg/L or average HAA5 concentration exceeds 0.048 mg/L for the most recent 4 quarters of data). The Panel notes however, that burden on small systems might be reduced if alternative applicability provisions were adopted. This could both reduce the burden of determining applicability, and ensure that the more significant burden of extensive profiling was limited to situations where it was necessary to ensure continued microbial protection. The Panel thus recommends that EPA consider alternative applicability provisions that should be designed to ensure adequate public health protection and minimize the monitoring, reporting and record keeping burden on small system operators.

One alternative would be a set of criteria based on a single worst case scenario. Under this alternative, a system would measure TTHM and HAA5 only once during the warmest annual quarter, at the maximum residence time in the system. Warm weather and long residence time are documented factors that increase DBP formation. This measurement could identify systems that need to meet disinfection profiling requirements.

Another alternative would be a set of criteria based on 4 sampling events (one per quarter) at the point of maximum residence time in the distribution system, instead of requiring sampling at four locations within the distribution system. After the quarterly samples are averaged, if the measurement exceeds the MCL for TTHM or HAA5, the system would be required to develop the disinfection profile.

### 7.4.3 Disinfection Profiling Provisions

The Panel notes the SER comments that monitoring and computing *Giardia lamblia* inactivation on a daily basis for a year would place a heavy burden on operators that may only staff the plant for a few hours per day or even per week. The Panel therefore recommends that EPA consider alternative profiling strategies. EPA should, again, consider options which ensure adequate public health protection, but will minimize monitoring and record keeping requirements for small system operators.

One option would be to allow reduced profiling (i.e. less often than daily for small systems. For example, weekly profiling over the course of a year could be required.

Another option would be worst case scenario profiling. Under this approach, each state would determine the critical time of year for intensive monitoring when the lowest microbial inactivation levels are expected. Daily inactivation monitoring and calculations would then be required only during this critical time period. There may be a benefit to performing intensive monitoring during the critical period (usually the coldest month) of the year rather than reduced monitoring spread over the entire year. Colder temperatures reduce disinfection efficiency. For systems in warmer climates, or climates that do not change very much during the course of the year, the state may identify other critical periods or conditions.

A third alternative would be not to require profiling at all, at least for some types of small systems. Instead, EPA could consider allowing the state to do theoretical benchmark calculations based on engineering and water quality data at each system, along with additional assumptions about residual chlorine, etc. EPA would determine the types of systems and operating conditions for which this approach would be appropriate.

### 7.4.4 Flexible Implementation

The Panel also notes the concern of several SERs that flexibility be provided in the compliance schedule for the rule for small entities. SERs noted the technical and financial limitations that some small systems will have to address, the significant learning curve for operators with limited experience, and the need to continue providing uninterrupted service as reasons why additional compliance time may be needed for small systems. The Panel encourages EPA to keep these limitations in mind in developing the proposed rule and provide as much compliance flexibility to small systems as is allowable under the

SDWA. EPA notes that under the statute, systems have 3 years to comply, with the possibility of a two year extension if capital improvement is required.