State of Ohio Environmental Protection Agency

Fact Sheet

January 2004

Requirements for Conducting a Comprehensive Performance Evaluation as Required by the Interim Enhanced and Long Term 1 Enhanced Surface Water Treatment Rules

What is a Comprehensive Performance Evaluation?
A comprehensive performance evaluation (CPE) is a thorough review and analysis of a water treatment plant's performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's performance. The CPE consists of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

When is a CPE required?
A public water system that uses a surface water source is required to conduct a CPE if the measured turbidity level of any individual filter effluent (or the combined filter effluent for systems serving less than 10,000 with two filters that monitor combined filter effluent in lieu of individual filters) exceeds 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months. **This is referred to as an individual filter event.** This type of individual filter event requires a CPE to be conducted.

What is the time line and procedure for submitting a CPE report?
The public water system must report that an individual filter event has occurred, must arrange and conduct a CPE, must complete and submit a CPE report, and must report that the CPE has been conducted. In addition, the Director of the Ohio EPA may require any or all of the deficiencies indicated in the CPE report to be corrected. A new CPE may not be required for systems which have completed a CPE within 12 months prior to the exceedance or if the Ohio EPA and the public water system are jointly participating in an ongoing Comprehensive Technical Assistance.

The individual filter event must be reported on Ohio EPA 5109-A form (for public water systems serving a combined population of at least 10,000) or Ohio EPA 5109-B form (for public water systems serving a combined population of less than 10,000) and must be submitted to the Ohio EPA district office by the tenth day of the following month in which the event occurs.

Public water systems serving a combined population of **at least 10,000** must arrange the CPE within **30** days following the **second consecutive** turbidity exceedance. In the month following the month in which the 30 day deadline occurs, the water system must report that the CPE was arranged within 30 days of the event on the Ohio EPA 5109-A form. A copy of the CPE report must be submitted to the appropriate Ohio EPA district office drinking water unit within **90** days following the **second consecutive** turbidity exceedance. In the month following the month in which the 90 day deadline occurs, the water system must report that the CPE was submitted on the Ohio EPA 5109-A form.

Public water systems serving a combined population of **less than 10,000** must arrange the CPE within **60** days following the **second consecutive** turbidity exceedance. In the month following the month in which the 60 day deadline occurs, the water system must report that the CPE was arranged within 60 days of the event on the Ohio 5109-B form. A copy of the CPE report must be submitted to the Ohio EPA district office drinking water unit within **120** days following the **second consecutive** turbidity exceedance. In the month following the month in which the 120 day deadline occurs, the water system must submit the CPE report and also report that the CPE was submitted, on the Ohio EPA 5109-B form.

Who may perform a CPE?
A CPE may be performed by either the Ohio EPA or a third party CPE team. The public water system must contact the Ohio EPA prior to arranging a third party CPE, since the CPE may be required to be conducted by the agency.

What is the definition of third party CPE team and what are the minimum qualifications for a third party CPE team?
A third party CPE team means qualified persons who are not employees of the public water system owner and who are independent of the public water system. The third party CPE team must have two members with the following minimum qualifications:

- An operator with a minimum Class III Water certification, certified in the State of Ohio
- An engineer with a minimum Engineer-In-Training (EIT) Certificate registered in the State of Ohio

Requirements for Conducting a Comprehensive Performance Evaluation

The CPE must be conducted under the supervision of, and the CPE report signed by, a professional engineer registered in the State of Ohio. The registered professional engineer is not required to participate in the CPE on site. However, the registered professional engineer should be available for consultation to the CPE team if necessary.

What are the minimum requirements for conducting a CPE?
The CPE must be conducted in accordance with the following USEPA document *Optimizing Water Treatment Plant Performance Using the Composite Correction Program 1998 Edition.* (EPA/625/6-91/027). August 1998.

A copy of the handbook can be obtained by contacting USEPA's National Center for Environmental Publications and Information at (800) 490-9198, or the USEPA Safe Drinking Water Hotline at (800) 426-4791, or can be ordered from the following website: http://www.epa.gov/ttbnrmrl/625/6-91/027.htm

In addition, the following procedures must be conducted during the CPE:

- Field determination of backwash water rate: The actual backwash water rate should be measured and used along with other information to determine if the backwash process is being optimized and to indicate any possible effects that the backwash process may be having on filter performance.

- Filter probing: A rod should be used to probe different locations throughout the area of the filter bed to indicate the overall condition of the filter media bed. The depth to gravel should be measured and recorded to determine whether the media and gravel layers have been displaced by improper filter backwash procedures. Filter probing and excavation of the media should also reveal whether or not mudballing or cementation of the media is occurring. A procedure for excavation of the media is located in Chapter 5 of the *Guidance Manual for Compliance with the Interim Enhanced Surface Water Treatment Rule: Turbidity Provisions* which is referenced below.

- Filter coring and sieve analysis: The filters should be cored using the following process. At least ten 1.5 inch diameter filter media cores evenly spaced through the filter should be taken. The samples should be mixed and a 2 liter sample of commingled media should be separated and analyzed by a laboratory for effective size and uniformity coefficient, and should be acid washed to assess media growth.

- Filter profile after completion of a backwash cycle: Turbidity samples should be taken from an individual filter immediately after placing the filter in operation following a backwash cycle. Turbidity samples should be once every minute for the first 15 minutes, then once every five minutes for the next 30 minutes, and then once every 10 minutes for the next 20 minutes. This process should result in 23 turbidity samples which should be plotted on a graph to illustrate a filter profile.

For more information regarding these procedures (field determination of backwash water rate, filter probing, filter coring and sieve analysis, and completion of a filter profile), please refer to the following USEPA document:

- *Guidance Manual for Compliance with the Interim Enhanced Surface Water Treatment Rule: Turbidity Provisions.* (EPA 815-R-99-010). April 1999.

A copy of the guidance manual can be obtained by contacting the USEPA's National Center for Environmental Publications and Information at (800) 490-9198, or the USEPA Safe Drinking Water Hotline at (800) 426-4791 or can be downloaded from the following website: http://www.epa.gov/safewater/mdbp/mdbptg.html#turbidity

Are there additional special studies that are recommended when conducting a CPE?
The following special study is recommended:

- Solids Retention Study - This special study involves removing media samples from different areas and depths in a filter and evaluating the amount of solids that remain attached to the filter media. The procedure for conducting a solids retention study is described in the following reference: Pizzi, Nick. 1998. *"Maintaining Filters: Part III of a Series-Filter Coring."* Ohio Section AWWA Summer 1998 Newsletter.

Additional References:

- Pizzi, Nick. 1997. *"Maintaining Filters: Part I of a Series-Bed Depth."* Ohio Section AWWA Winter 1997 Newsletter.

- Pizzi, Nick. 1998. *"Maintaining Filters: Part II of a Series-Bed Expansion."* Ohio Section AWWA Spring 1998 Newsletter.

- Wolfe, Tim. 1998. *"Maintaining Filters: Part IV of a Series-Backwashing."* Ohio Section AWWA Winter 1998 Newsletter.

- Pizzi, Nick. 1999. *"Final in the Filtration Series-Achieving Balance."* Ohio Section AWWA Spring 1999 Newsletter.

- *"American Water Works Association (AWWA) Self Assessment for Surface Water Treatment Plant Optimization"* (1P-8C-90736-12/97-CM).

- *Filter Inspection Workshop*, Operator Training Committee of Ohio (OTCO)

Copies of the *Filter Inspection Workshop* document can be requested from the Operator Training Committee of Ohio at (614) 268-6826. Copies of the Ohio Section AWWA Newsletter articles can be obtained by contacting the Ohio EPA district office or can be downloaded from the following web site: www.epa.state.oh.us/ddagw/pubs.html#factsht. For questions or additional information regarding Comprehensive Performance Evaluations, please contact the appropriate Ohio EPA district office drinking water unit.

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