



**PUBLIC WATER SYSTEMS MONITORING
REQUIREMENTS OF S.B. 373**

**Report to the Joint Committee on Government and
Finance**

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President of West Virginia American Water



BACKGROUND

Senate Bill 373 created the following Article 2G. Public Water Utilities Monitoring Requirements under Chapter 24. Public Service Commission.

§24-2G-1 Public water utilities required to install monitor for contaminants.

All public water utilities that provide water to more than one hundred thousand customers, including public service districts providing water service and municipally owned and operated utilities, subject to the requirements and limitations of this article, shall implement a regular monitoring system as specified to the same technical capabilities for detection as utilized by the Ohio River Valley Water Sanitation Commission.

§24-2G-2. Requirements.

- (a) Each public water utility, public service district or municipal water system, as set forth in section one of this article, shall provide testing for contamination of its water supply by the following contaminants:
- 1) Salts or ions;
 - 2) Metals, including heavy metals;
 - 3) Polar organic compounds;
 - 4) Nonpolar organic compounds;
 - 5) Volatile compounds, oils and other hydrocarbons;
 - 6) Pesticides; and
 - 7) Biotoxins.
- (b) Each public water utility is empowered to determine at its discretion which of the contaminants listed in subsection (a) are most likely to contaminate its water supply, and shall provide a monitoring system which shall detect the three of the listed contaminants deemed most likely to affect that water system: *Provided*, That each public water utility shall file its list with the Commission: *Provided, however*, That any public water system serving over one hundred thousand customers from any one treatment plant is requested to test for all listed contaminants at each treatment plant: *Provided further*, That if technology to adequately detect contaminants, as required by this section proves to be not feasible to implement, the public water utility shall report by January 1, 2015, such to the Joint Committee on Government and Finance with the reasons why such technology is not able to obtain or use, and suggest alternatives.

APPLICABILITY OF §24-2G TO WEST VIRGINIA AMERICAN WATER

- West Virginia American Water is the only public water utility in the state that serves more than 100,000 customers. Therefore, Section 24 Article 2G applies only to West Virginia American Water, which serves 171,000 customers, (approximately 550,000 people) through nine water treatment plants. No other water utilities in West Virginia are required to comply with these monitoring requirements.
- The number of customers served by individual West Virginia American Water systems range from less than 1,000 (Webster Springs system) to approximately 93,000 (Kanawha Valley system).
- Because §24-2G-1 states that all water **utilities** that provide water to more than one hundred thousand customers, rather than all water **systems** that provide water to more than one hundred thousand customers, “shall implement a regular monitoring system as specified to the same technical capabilities for detection as utilized by the Ohio River

Valley Water Sanitation Commission,” West Virginia American Water interprets this as an instruction to implement a system similar to the ORSANCO system at all of its water treatment plants, regardless of size or number of customers served. The company does not believe this was the intent of the legislation, as it would impose a significant cost to monitor systems that serve very small groups of customers. Instead, we believe that the intent of the legislation was for a monitoring system like ORSANCO’s to be installed at the company’s Kanawha Valley water treatment plant in Charleston – the largest water treatment plant in West Virginia.

- §24-2G-2 Creates additional requirements for “each public water utility...as set forth in section one of this article,” which again only applies to West Virginia American Water and no other water utilities.
- §24-2G-2-b Outlines a list of contaminant classes and requires West Virginia American Water to install a monitoring system capable of detecting the three contaminant types that it deems most likely to contaminate its water supply and to file its list with the Public Service Commission.

FEASIBILITY OF COMPLYING WITH §24-2G

While West Virginia American Water understands and appreciates the Legislature’s intent in creating this article, the technical capabilities of the required water monitoring systems are not feasible for the company to implement precisely as written. There is no commercially available device that tests for the list of contaminants set forth. As described in a March 5, 2014 letter by ORSANCO’s Manager of Source Water Protection and Emergency Response, ORSANCO’s Organics Detection System, comprised of an online gas chromatograph and a thermo gas chromatograph/mass spectrometer (GC/MS), detects **only volatile organic chemicals** in source water. It cannot detect non-volatile chemicals such as salts or inorganic ions; metals, including heavy metals; semi volatile compounds such as polar or non-polar organic compounds; oils and other hydrocarbons; pesticides; or biotoxins (*see Appendix – letter from Jerry Schulte*).

Furthermore, as currently written, the law requires West Virginia American Water to install this type of equipment at all of its water treatment facilities, regardless of size. The company does not believe that to be the intent of the legislature because it was clearly focused on the size of the utility and system, as evidenced by differentiating between system size in §24-2G-2. The company does not believe the Legislature intended to impose such a significant cost on ratepayers of smaller systems, including those smaller systems owned by the company.

WEST VIRGINIA AMERICAN WATER’S IMPLEMENTATION OF SOURCE WATER MONITORING

During an EPA workshop held in Morgantown in August, federal regulators and water industry experts recommended online, multi-panel source water quality monitoring devices as an effective option for early detection of source water contamination. This type of equipment establishes baseline water quality data and then alerts water plant operators to certain changes in water characteristics. These devices do not identify specific contaminants, but can alert water systems of a potential change in water quality at certain concentrations, spurring further investigative testing.

Figure 1. Example of quality monitoring devices.



West Virginia American Water conducted a thorough analysis of available early detection technology, including researching multiple vendors, to determine the most versatile units. The parameters selected for the company's multi-panel sour water monitoring approach are:

- **Turbidity and Total Suspended Solids** - Potential indicators of contamination, potentially indicate elevated bacterial levels or presence of some chemical compounds
- **pH** - Acidity or basicity of water
- **Temperature**
- **Conductivity** - Measures ionic species in water
- **Oxidation Reduction Potential (ORP)** - Changes can indicate presence of certain reactive chemicals
- **Dissolved Oxygen** - Change can indicate presence of toxic materials
- **Total Organics** - Change can indicate presence of organic compounds like hydrocarbons

The company selected monitoring equipment based on reliability, purchase price, maintenance and operational costs, and the variety of installation locations, at the cost of approximately \$30,000 per facility. The following equipment has been purchased and will be installed in the first quarter of 2015 as the baseline early detection systems at West Virginia American Water's water treatment plant intakes:

1. **ABB Probes**

- pH: Range 0-14
- ORP: -2000 to 2000mV
- Temperature
- Dissolved oxygen
- Conductivity: 0 to 1000 uS/cm
- Total Organics (Via UV254 surrogate): 0 - 100 mg/L
- Recorder/data logger and transmitters

2. **Hach Solitax ts SS Wiper** - Turbidity and total suspended solids

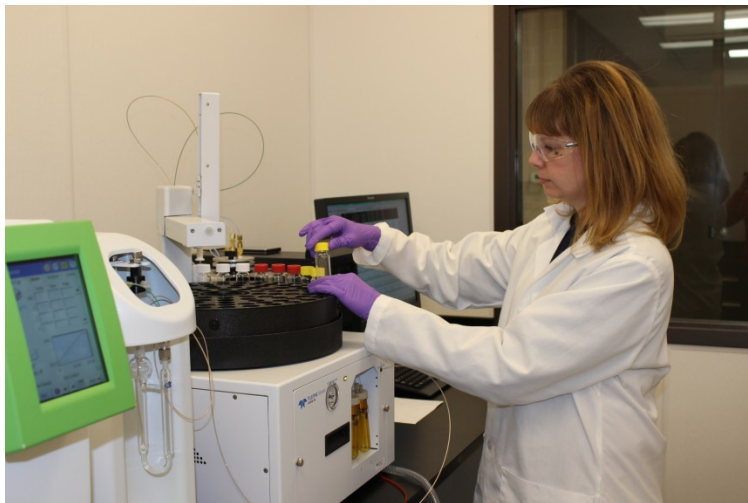
- Turbidity range: 0.001 to 4000 ntu
- Total suspended solids: 0.001 mg/L - 50 g/L

Figure 2. Hach Solitax ts SS Wiper with controller.



Additionally, West Virginia American Water constructed a new \$400,000 laboratory at the Kanawha Valley water treatment plant and installed two gas chromatograph/mass spectrometers – one to test for volatile organic compounds and one to test for semi-volatile organic compounds. The analytical capability of this new lab goes beyond the requirements of §24-2G-1 to install equipment “as specified to the same technical capabilities for detection as utilized by [ORSANCO]” because a great deal of calibration time is required for one GC/MS unit to switch from testing for volatile organic compounds to testing for semi-volatile organic compounds. In an emergency situation, the time necessary to change equipment calibration may impede efforts to quickly detect or identify a potential contaminant. Therefore, we believe it is prudent to maintain both pieces of equipment at our largest water treatment plant and we recently hired a skilled laboratory technician to perform the new laboratory’s analytical work.

Figure 3. Technician operating new GC/MS unit at the Kanawha Valley treatment plant.



The ORSANCO GC/MS equipment at the Huntington plant and the new GC/MS laboratory at the Kanawha Valley plant make these two West Virginia American Water facilities the only water treatment plants in West Virginia with this advanced testing capability. GC/MS analyses can only

be performed by technicians with specific skills and training beyond the typical work scope of a certified water treatment plant operator.

CONCLUSION

West Virginia American Water's thorough analysis and selection of the above discussed monitoring systems exceeds the intent of the monitoring requirements set forth in §24-2G to achieve early detection of certain potential source water contaminants. The company recommends that the Legislature and the Bureau for Public Health continue to consider the value of these added protections for all customers served by surface water treatment plants in West Virginia rather than just the customers of surface water treatment plants operated by West Virginia American Water.

The company also wishes to point out that the Public Service Commission does not oversee drinking water regulations related to water quality. Regulations for water monitoring systems related to the quality of public drinking water fall under the purview of the West Virginia Bureau for Public Health, which oversees compliance with the EPA Safe Drinking Water Act and is the only agency authorized to enforce drinking water regulations. The Source Water Protection Plans set forth in SB 373 require all applicable water utilities to submit "an examination of the technical and economic feasibility of implementing an early warning monitoring system" (§16-1-9c) to the WVBPH; therefore, it would be inefficient and redundant for West Virginia American Water's requirements for early warning monitoring systems to be overseen by the PSC when other water utilities' requirements for early warning monitoring systems are overseen by the BPH.



APPENDIX



WEST VIRGINIA
AMERICAN WATER



OHIO RIVER VALLEY WATER SANITATION COMMISSION

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TOBY FREVERT
CHAIRMAN

PETER A. TENNANT, P.E., BCEE
EXECUTIVE DIRECTOR
AND CHIEF ENGINEER

March 5, 2014

To Whom It May Concern:

The ORSANCO Organics Detection System detects volatile organic chemicals in water to protect drinking water utilities and drinking water quality. It is comprised primarily of two types of purge and trap gas chromatographs (GC): the Inficon CMS 5000 and the Thermo GC/Mass Spec.

The Inficon CMS 5000 is an on-line gas chromatograph with a micro argon ionization detector that is used to monitor river water for only volatile organic chemicals. River water is plumbed to the unit where it purges volatile organic chemicals, if present, from the stream of water flowing through it. Analyses are run on a user defined time increment, i.e., every 20 minutes, every hour, etc. This system is calibrated to detect (identify/name) and quantitate (provide concentration in ppb) the suite of 30 volatile organic chemicals on ORSANCO's list of volatile organic chemicals of concern. While this unit can detect a wide range of volatile organic chemicals, it is not capable of identifying (naming) any volatile organic chemical for which it has not been previously calibrated to identify. Water samples containing unidentified volatile organic chemicals must be taken to a GC/MS for identification.

The Thermo GC/Mass Spec with purge and trap concentrator is also used in ORSANCO's Organics Detection System to monitor river water for only volatile organic chemicals. Grab samples of river water are collected from the river or a raw river water faucet in the laboratory, placed in small vials, then analyzed individually by this system. This system is also calibrated to detect (identify) and quantitate (provide concentration in ppb) the suite of 30 volatile organic chemicals on ORSANCO's list of volatile organic chemicals of concern. However, unlike the Inficon CMS 5000 above, the Thermo GC/MS is capable of identifying literally thousands of volatile organic compounds that it detects in the river water. Once a chemical that is not on the ORSANCO calibration list is identified, the system still needs to be calibrated to provide accurate concentration information.

Both the Inficon CMS 5000 and the Thermo GC/MS are used by ORSANCO to detect volatile organic chemicals ONLY. Gas chromatography with purge and trap concentrators are not capable of detecting or identifying the following compounds: non-volatile chemicals such as salts or inorganic ions; metals, including heavy metals; semi volatile compounds such as polar or non-polar organic compounds; oils and other hydrocarbons; pesticides; insecticides; biotoxins and radioactive compounds. Each of these classes of compounds would require additional analytical instrumentation which ORSANCO currently does not use as part of its Organics Detection System.

Sincerely,

Jerry Schulte
Manager of Source Water Protection and
Emergency Response