

Water & Wastewater Digest

Summer 2016

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2016 Technical, Managerial and Financial Capacity Survey

The Missouri Department of Natural Resources', Public Drinking Water Branch is conducting a technical, managerial and financial capacity survey of all Missouri community and nontransient, noncommunity water systems. This survey will be used to help the department more effectively provide assistance, such as leak location services, to water utilities. This survey will also be used to determine the overall improvements and unmet needs of Missouri drinking water systems' technical, managerial and financial capacity over time.

As a result of previous surveys, the department has provided assistance in leak location services, flushing and valve exercising program development, compliance and operator assistance, asset management training, water rate studies, meeting facilitation, board and council training, funding application assistance and other services.



Surveys were mailed to system administrative contacts in March and are available online at: www.surveymonkey.com/r/2016TMF.

Please coordinate with your public drinking water system administrative staff to complete the survey either online or in hard copy. The Public Drinking Water Branch appreciates your participation to improve the effectiveness of assistance efforts and training.

Drinking Water Primacy Fee: What is it and what are the Billing Changes?

What is it?

In Missouri, public drinking water systems are regulated by a state agency, the Missouri Department of Natural Resources, instead of a federal agency, the U.S. Environmental Protection Agency. The public drinking water primacy fee was established to support the department's efforts to ensure access to adequate and safe drinking water. This fee is paid annually by community water system customers and is based on the number of connections. The current fee structure was set by statute (640.100.5, RSMo.) in 2006.

The primacy fee provides critical funding for laboratory services and activities that must be performed in order for the state to maintain delegation of the federal drinking water program under the Safe Drinking Water Law. This delegation is called "primacy."

What are the Benefits?

The benefits of the primacy fee to public water systems:

- Laboratory testing services provided by the state.



- Reduced monitoring commensurate to contamination risk, based on vulnerability assessments provided by the Department of Natural Resources.
- Water system inspections and compliance oversight provided by the department to satisfy federal requirements.
- Technical assistance from the department to help maintain and achieve compliance and improve customer satisfaction.
- Access to low-interest loans for capital improvements from the Drinking Water State Revolving Fund.
- Additional operator training opportunities.

Where does the money go?

Two percent of the primacy fee collected stays with the public water system to reimburse the system for its expenses for billing and collection of the fee. The department uses the primacy fee to fund monitoring of drinking water contaminants, inspections, compliance activities, complaint investigations and technical assistance.

Billing Changes

On Aug. 1, 2016, all Missouri water systems required to submit primacy fees will be invoiced annually for 2017. This change will reduce paperwork and postage costs for the water systems as well as the department, hopefully making the submittal of the fees more efficient and cost effective. For more information about primacy in Missouri, visit dnr.mo.gov/env/wpp/primacyfee.htm. If you have questions, contact Tina Stockman with the department's Fiscal Management Unit at 573-751-6723.

Understanding Geometric Mean

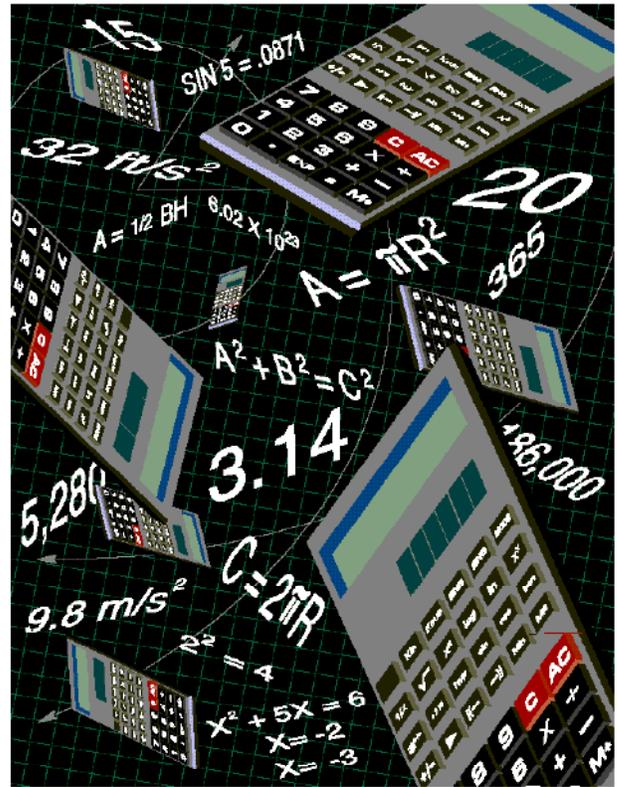
If you are required to sample for E. coli or Fecal Coliform as part of your NPDES permit, you may have noticed the following note included with the effluent limitations and monitoring requirements table: “The Monthly Average Limit for E. coli [or Fecal Coliform] is expressed as a geometric mean. The Weekly Average for E. coli will be expressed as a geometric mean if more than one sample is collected during a calendar week (Sunday through Saturday).” You may be asking yourself, “What is a geometric mean?”

You’re probably familiar with the arithmetic mean, often called the average, in which you add together the results of all the samples and divide by the number of samples. Take the following example: Let’s say this facility is required to sample for Biochemical Oxygen Demand once a week and report the weekly and monthly averages. The facility has a weekly average limit of 45 mg/L and a monthly average limit of 30 mg/L. For the month of May, the individual samples collected had the following results:

Date of Sample Collection	Sample Results in colonies/100 mL
05/03/2016	5.0
05/12/2016	20.3
05/18/2016	34.8
05/24/2016	13.0

The facility collected only one sample each week, so the weekly average is reported as the largest weekly result for the month: 34.8 mg/L. To calculate the monthly arithmetic mean (average), start by adding the results together ($5.0 + 20.3 + 34.8 + 13.0 = 73.1$), then divide that number by the number of samples, 4, giving the monthly average result of 18.3 mg/L. Simple, right?

However, the geometric mean works differently. Let’s look at another example: The facility has E. coli limits during the recreational season



of April 1 – October 31. The weekly average limit is 1030 colonies/100 mL and the monthly average limit is 206 colonies/100 mL. The facility samples once a week with the following results:

Date of Sample Collection	Sample Results in colonies/100 mL
05/03/2016	160
05/12/2016	378
05/18/2016	740
05/24/2016	774

In this case, the weekly average would be reported as 774 colonies/100 mL. This result is in compliance with the weekly average limit. What about the monthly average? If you were to calculate the arithmetic mean for the four samples, the result would be 513 colonies/100 mL, but reporting the result as an arithmetic mean would not be in compliance with the operating permit.

Geometric mean is calculated by first multiplying each of the sample results together and then taking the nth root of the result where n equals

the number of samples. If you collect two samples, you would take the square (or 2nd) root of the two results multiplied together. If you have three samples, you would take the cube (or 3rd) root. Taking the root of a number is just the opposite of taking the power of something. So, 2 cubed, 2^3 , or $2 \times 2 \times 2 = 8$, and the cube root of 8, or $\sqrt[3]{8} = 2$. $2^4 = 2 \times 2 \times 2 \times 2 = 16$, and the fourth root of 16, or $\sqrt[4]{16} = 2$. In the E. coli example, 4 samples were collected, so we would take the 4th root of all of the results multiplied together ($160 \times 378 \times 740 \times 774$). In other words, the final equation would look like this: $\sqrt[4]{(160 \times 378 \times 740 \times 774)}$ This gives a monthly average expressed as a geometric mean of 431.4 colonies/100 mL, which is out of compliance with the monthly average.

If you've been following along with a simple calculator, you may have discovered that these numbers are bigger than your calculator may be able to handle. Calculating geometric mean using a simple calculator will likely be difficult, unless you have relatively small results with only a couple of samples. If you don't mind doing the hard work yourself, you can use a scientific or graphing style calculator that can calculate larger numbers and roots easier. However, if you aren't into doing math, you can enter the result values into a computer spreadsheet program that can automatically calculate the values, such as Microsoft Excel. You can also find calculators online that can calculate geometric mean by simply entering in the values.

Electric Discharge Monitoring Report Rule

The U. S. Environmental Protection Agency has published a new rule known as the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule. Under this new rule, effective Dec. 21, 2015, all NPDES permit holders with monitoring requirements must submit discharge monitoring reports

(DMRs) electronically by Dec. 21, 2016, or seek a waiver with justifications. Details on when waivers may be granted and what information is to be submitted are currently being drafted and will be available summer 2016.

In 2013, the Missouri Department of Natural Resources released its Electronic Discharge Monitoring Reports System, or eDMR, to allow permit holders to submit their DMRs electronically.

The eDMR system is faster and more efficient than the paper process used in the past. The electronic system improves accuracy by eliminating potential errors that might be introduced by manual data entry and users receive an automatic confirmation as soon as a record has been received.

To use the eDMR system, users will need a computer, Internet access, an email address and Microsoft Internet Explorer, version 6.0 or greater.

To register, users must fill out and submit a completed Permit Holder Participation Package, which can be accessed at dnr.mo.gov/pubs/pub2474.pdf.

The Missouri Department of Natural Resources is currently offering eDMR training classes once a month at the MOTEC Training Center, 1738 E. Elm St. in Jefferson City. For more information, visit dnr.mo.gov/env/wpp/edmr.htm, or call Christopher Miller at 573-526-3337.



Free Training Available to Board and Council Members

The Department of Natural Resources Public Drinking Water Branch has provided funding to the Missouri Rural Water Association (MRWA) to provide free training to board and council members of water system utilities in 2016. The topics covered with the training include: Roles and Responsibilities of Board Members; How to Conduct an Effective Meeting; Sunshine Law; Water System Basics; Utility Rates and Finances; Funding Capital Projects; Conflict of Interest Laws; and Asset Management. Training can be provided in 2-hour, 4-hour and 6-hour sessions.

The training is aimed at board and council members but utility staff are encouraged to attend also. Sessions can be set up to accommodate board members' schedules. For example, a board may wish to schedule a 2-hour session on the same evening as a regularly scheduled board meeting. A 2-hour session will cover two or three of the topics listed above. A 6-hour session (day long or two evening sessions) can also be scheduled for those who want to cover all of the topics or, for water district boards, to meet the six hour training requirement in order to receive meeting attendance fees under RSMo 247.

Training for board and council members is essential for the efficient and proper execution of utility business. Operators are encouraged to share this article with board and council members. To find out more, or to schedule a training event, contact Liz Grove, MRWA Management Circuit Rider at 573-231-6797.

Need your Password to log in?

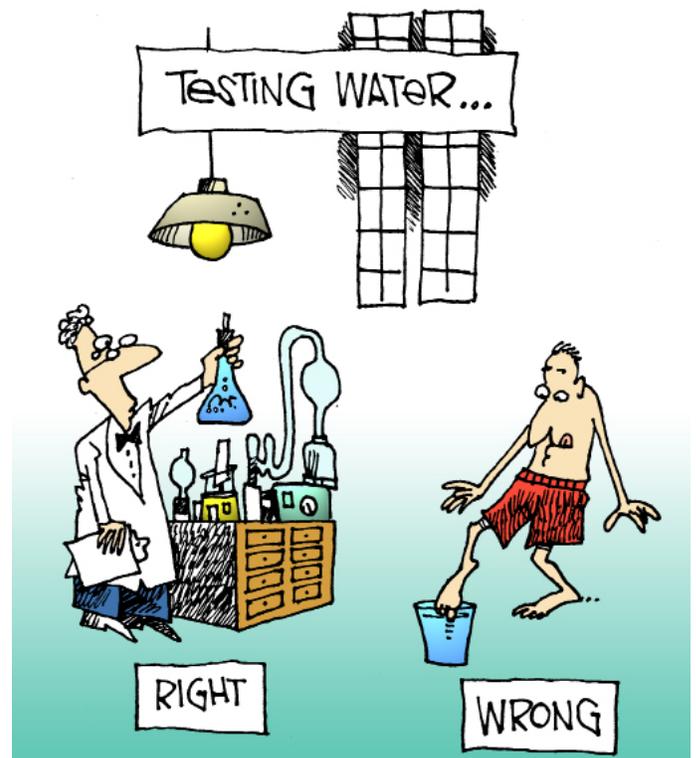
Certified operators are encouraged to access training reports by visiting the department's website at www.dnr.mo.gov/operator. To login, the password is the last four digits of your social security number.

In addition to checking training hours and renewing certificates online, this site provides a convenient place to view and update important contact information for public drinking water systems including the chief operator, sample collector and administrative contact.

For more information, contact the department's Operator Certification Section at 800-361-4827 or 573-751-1600.

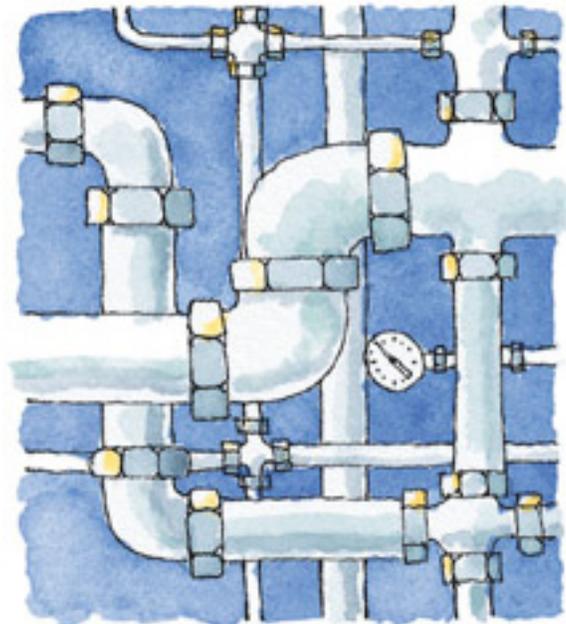
Visit us on the web

The list of approved training changes frequently and new courses are reviewed and approved by Department staff or trainers adjust schedules. By the time this newsletter reaches you, there may be new courses available in your area. visit us at www.dnr.mo.gov/env/wpp/opcert/oprtrain.htm for an up-to-date list of approved operator certification courses.



Operator Certification Exam Schedule

Exam Date	Location	Filing Deadline
July 5	Lewis & Clark State Office Building, 1101 Riverside Dr., Jefferson City	June 5
	Southeast Regional Office, 2155 N. Westwood Blvd., Poplar Bluff	
	Southwest Regional Office, 2040 W. Woodland, Springfield	
Aug. 2	Northeast Regional Office, 1709 Prospect Dr., Macon	July 3
	Kansas City Regional Office, 500 NE Colbern Rd., Lee's Summit	
	Lewis & Clark State Office Building, 1101 Riverside Dr., Jefferson City	
Sept. 6	Lewis & Clark State Office Building, 1101 Riverside Dr., Jefferson City	Aug. 7
	Powder Valley Nature Center, 11715 Cragwold Rd. Kirkwood	
Oct. 4	Lewis & Clark State Office Building, 1101 Riverside Dr., Jefferson City	Sept. 4
	Southwest Regional Office, 2040 W. Woodland, Springfield	
	Southeast Regional Office, 2155 N. Westwood Blvd., Poplar Bluff	



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Operator Certification Section
PO Box 176, Jefferson City, MO 65102-0176

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