



Hometown People. Hometown Power.

Lansing Board of Water & Light
2018 Annual Water Quality Report



**TOMMY
TAP WATER
SAYS. 'FILL.
AT THE TAP
DRINK. REPEAT.'**

Dear Customer,

We are pleased to present the 21st annual report summarizing the quality of the drinking water provided to you by the Lansing Board of Water & Light (BWL) for the 2018 calendar year. This Consumer Confidence Report is required by the Federal and State of Michigan Safe Drinking Water Acts (SDWA). This report discusses the source of your tap water, the results of tests we regularly conduct to assure the quality of your water and additional information you may wish to know about your drinking water.

As a publicly-owned utility, the BWL encourages public interest and participation in decisions affecting the community's drinking water. The BWL's Board of Commissioners meet on the fourth Tuesday of every other month at our REO Town Depot Facility, 1201 S. Washington Avenue in Lansing. Meeting dates and times are published in advance and may be found on the BWL's website or by calling us at 517-702-6006. Our board meetings are open to the public.

Many water topics, such as lead, PFAS, Hexavalent Chromium and 1,4-Dioxane have recently been in the news. We believe it is important to be transparent regarding our water quality and additional sampling we do to ensure the safety of our customers. The BWL has included information in this report and created a Contaminants of Emerging Concern page on our website.

The BWL takes great pride in our water. In 2017, the BWL created our new water mascot, Tommy Tap Water, to spread the love and passion for our drinking water to customers of all ages.

The BWL has confidence in the product we serve and wants to spread the word about the benefits of drinking from the tap. Watch for Tommy Tap Water at events in and around Lansing.

Sincerely,

Angie Goodman
Water Quality Administrator

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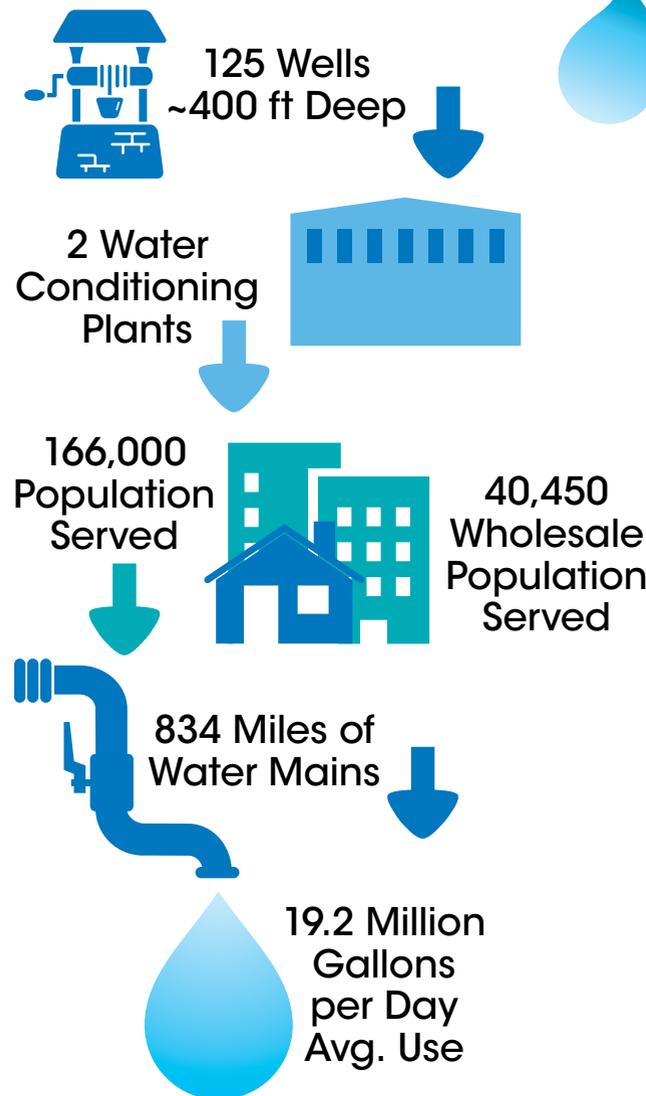


About Us

The BWL was established in 1885 by a vote of the people of Lansing to fund a publicly owned utility to meet their need for adequate fire protection, proper sanitation and improved street lighting for the city. The Lansing community and the BWL service territory have been very fortunate to be located over the center of the Saginaw Aquifer, which has been called one of the finest natural sources of groundwater ever discovered.



BWL Water comes from the Saginaw Aquifer



Recognitions

In 2018, the BWL was presented with the Michigan Section American Water Works Association Research & Treatment Practices award for our Lead Service Line Replacement Program.

In 2016, the BWL received Michigan American Water Works Association award for Exemplary Wellhead Protection Program Award for Large-Sized Systems.

In 2014, the John F. Dye Water Conditioning Plant was recognized as a National Waterworks Landmark by the American Water Works Association and the Plant was also presented with a Clean Corporate Citizen Award by the EGLE for its environmental stewardship.



During 2018, BWL drinking water continues to meet or exceed all quality standards established by the U.S. Environmental Protection Agency (EPA) and the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

Water Source

BWL drinking water comes from 125 groundwater wells that are approximately 400 feet deep. The source of this plentiful supply is an underground aquifer, which underlies much of the mid-Michigan region. Water from BWL wells is transported through large transmission mains to one of two water conditioning plants.

The plants soften the water by removing about 80 percent of the hardness. The softened water is then disinfected, fluoridated, treated with corrosion control, filtered and stored in reservoirs for distribution to customers. Lansing is one of the largest communities in the country to rely exclusively on groundwater to meet its drinking water requirements.

Protect Your Water Supply



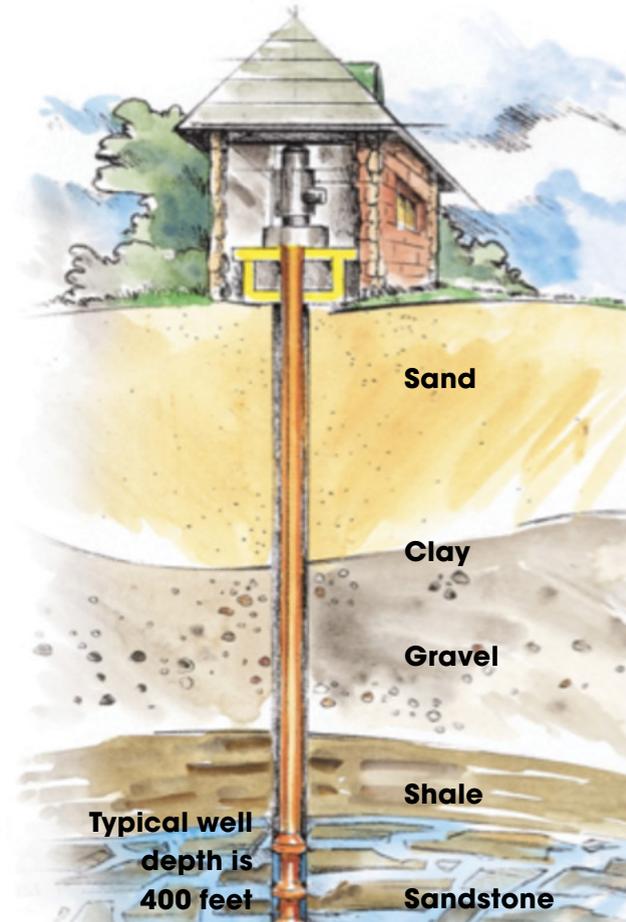
The BWL actively supports regional wellhead protection activities and has an award-winning Wellhead Protection Program. The United States Geological Survey has developed a regional aquifer

computer model of the mid-Michigan area that provides important information about the groundwater supplies. The BWL received major support for the project through a state-administered wellhead protection grant.

Lansing's drinking water source is largely protected from contamination or direct contact with surface waters by layers of clay and shale. There are areas at the surface, however, that directly contribute to the aquifer without the protection of clay and shale layers.

In 2003, EGLE conducted an assessment of the vulnerability of the aquifer to impacts from human activities. Because there are several known and potential sources of contamination in and near the BWL's wellhead protection areas, the aquifer in this region has been assessed as "highly susceptible" to contamination. If you desire more information on this local Source Water Assessment, contact Angie Goodman at 517-702-7059 or angie.goodman@lbwl.com.

Actions taken on the surface can impact the groundwater we drink.



Help protect this essential resource.

- **Waste Disposal:** Properly dispose of waste such as gasolines, oils, pesticides, paints and antifreeze. Toxic substances poured/spilled on the ground or down a drain can contaminate the water you drink.
- **Never Flush:** Many items containing toxins are non-biodegradable. They clog pipes, destroy protective bacteria and wreak havoc at the Wastewater Treatment Plant. For a complete list, visit epa.gov/septic.
- **Medications:** Prescription and over-the-counter drugs are NOT safe to flush. They break down in the water and wastewater treatment plants. Treatment plants are not equipped to remove them, and they end up back in our water supply. Visit Michigan.gov/deqdrugdisposal to find a place to dispose of them properly.
- **Conserve:** Saving water reduces energy costs and helps keep more water in our lakes, rivers and groundwater supply.

How to Read the Water Quality Data Tables

The BWL conducts frequent tests of the water and the results of all detected contaminants, even in the smallest traces, are shown in the tables below. Per the EPA, a contaminant is defined as any physical, biological or radiological substance or matter in the water. Drinking water may reasonably be expected to contain at least small amounts of some contaminants. These tables contain the name of each contaminant, the highest level allowed if regulated, the ideal goals for public health if established, the amount detected and the usual sources of such contamination. There are also footnotes explaining our findings and a key to units of measurement.

Unless otherwise noted, the data presented in this table is from testing done January 1 - December 31, 2018. The BWL is allowed to monitor for certain contaminants less often than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. While all the data are representative of the BWL's water quality, some results are more than one year old.

The tables do not list the hundreds of contaminants for which the BWL tested but did not detect a presence. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk.

Key to Tables

AL	Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
L1	Level 1 Assessment: A study of the water supply to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.
L2	Level 2 Assessment: A very detailed study of the water system to identify potential problems and determine (if possible) why an E. coli MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.
MCL	Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG	Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
MRDL	Maximum Residual Disinfectant Level: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that the addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	Maximum Residual Disinfectant Level Goal: The level of a disinfectant in drinking water below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.
N/A	Not Applicable
ND	Not detectable at testing limit
pCi/l	Picocuries per liter (a measure of radioactivity)
PPB	Parts Per Billion , or micrograms per liter (ug/l) (equivalent to one penny in \$10,000,000).
PPM	Parts Per Million , or milligrams per liter (mg/l) (equivalent to one penny in \$10,000).

Substances Measured in the Distribution System

Total Coliform Bacteria

As referenced by the EPA, total coliforms are a group of related bacteria that are (with few exceptions) not harmful to humans. A variety of bacteria, parasites and viruses, known as pathogens, can potentially cause health problems if humans ingest them. The EPA considers total coliforms a useful indicator of other pathogens for drinking water. Total coliforms are used to determine the adequacy of water treatment and the integrity of the distribution system.

epa.gov/dwreginfo/revised-total-coliform-rule-and-total-coliform-rule.

Microbial Contaminants	Number Detected	L1 Assessment Triggered?	L2 Assessment Triggered?	Major Sources	Violation?
Total Coliform Bacteria	2	No	No	Naturally present in the environment	No
E. coli	0	No	No	Human or animal fecal waste	No

Disinfectants and Disinfection By-Products

The BWL adds chloramine to its water at the conditioning plants to protect against bacterial growth. Chloramine is used instead of other disinfectant options because it minimizes the number and level of chlorination byproducts, persists longer in the distribution system and leaves little or no unpleasant odor and taste. The following table lists the chloramine levels and disinfection byproducts created by the reaction of our chloramine treatment and naturally occurring organic compounds.

Regulated Contaminant	Unit	MCL	MCLG	Highest Average Detected Level	Range of Detected Levels	Major Sources	Violation?
Haloacetic Acids (HAA5)	PPB	60	N/A	2.0	0 to 3.0	By-product of drinking water disinfection	No
Total Trihalomethanes (TTHMs)	PPB	80	N/A	3.9	2.4 to 4.2	By-product of drinking water disinfection	No
Chloramines	PPM	MRDL 4	MRDLG 4	1.7	0.17 to 2.6	Water additive to control microbes	No



Substances Measured at the Water Conditioning Plant

Regulated Contaminant	Unit	MCL	MCLG	Highest Detected Level	Range	Date Tested	Major Sources	Violation?
Barium	PPM	2	2	0.022	0.015 to 0.022	7/25/12	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits.	No
Fluoride	PPM	4	4	0.72	0 to 0.72*	7/24/18	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories.	No

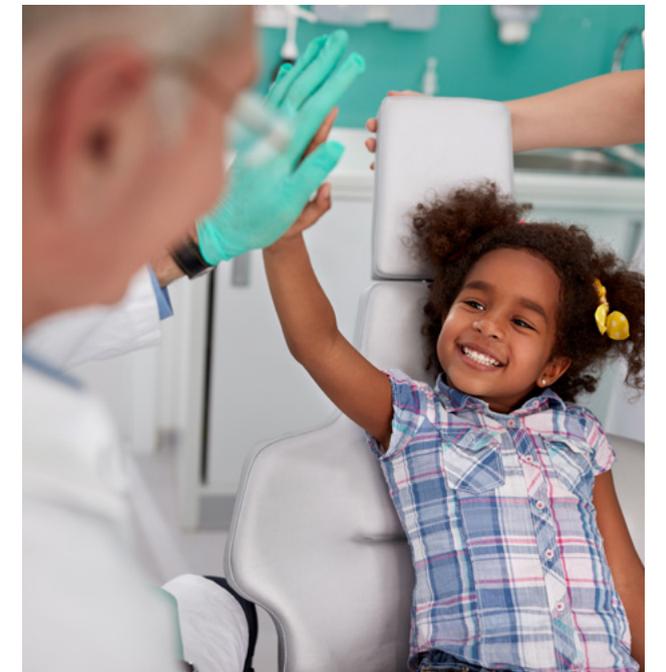
*Water Quality Table Footnote: Dye Conditioning Plant was not feeding fluoride periodically during 2018 while the fluoride equipment was down for maintenance.

Fluoride

The raw water coming into the BWL's two water conditioning plants has a naturally occurring level of fluoride of approximately 0.35 ppm. The BWL adds fluoride to the water to bring it to the optimal level of 0.7 ppm recommended by the Center for Disease Control and Prevention and the U.S. Public Health Service and approved by the EPA.

As stated on the [CDC.gov/fluoridation/safety](http://cdc.gov/fluoridation/safety) website, the "CDC monitors the public health benefits and risks of community water fluoridation from studies published by panels of experts from health and scientific fields. These reviews, conducted over many years, have concluded that water fluoridation is both safe and effective."

Further information about fluoride in drinking water, including specific information about infants, can be obtained from the CDC website at cdc.gov/fluoridation.



Radioactive Contaminant	Unit	MCL	MCLG	Highest Detected Level	Range	Date Tested	Major Sources	Violation?
Radium 226 and 228	pCi/L	5	0	1.95±0.44	0.84±0.51 to 1.95±0.44	7/7/16	Erosion of natural deposits.	No

Special Monitoring (Not Regulated)	Unit	MCL	Highest Detected Level	Range	Date Tested	Major Sources	Violation?
Sodium	PPM	Not Established	120	110-120	7/26/18	Natural constituent of groundwater.	N/A

Important Information About Lead

The BWL follows a two-part strategy to protect its residential and commercial customers from exposure to lead leaching into drinking water. First, in December 2016, the BWL replaced its last active lead service line, joining Madison, Wisconsin as the second water utility in the nation to have removed all lead service lines. The project began in 2004 and removed 12,150 active lead service lines at a cost of \$44.5 million. The BWL replaced the connection from the water main to the meter, which the BWL owns, at a home or business. Secondly, the BWL uses a corrosion control additive to create a protective coating in the water mains, service lines and indoor plumbing. To assure that these strategies are effective, the BWL conducts daily monitoring at the plant for corrosion control concentrations and periodic monitoring in the distribution system for corrosion control and lead and copper in the drinking water. These are just a few of the many tests performed by the BWL to assure that its water remains safe.



Contaminant Subject to AL	Unit	AL	9 out of 10 homes were below a level of:	# of samples above the action level:	Range of Individual Sample Results:	Major Sources	Violation?
Copper	PPM	**1.3 at 90th percentile	0	0	1.3 to 37	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives.	No
Lead	PPB	***15 at 90th percentile	1.1	0	0 to 1.7	Corrosion of household plumbing systems; Erosion of natural deposits.	No

Water Quality Table Footnotes:

* Lead and copper were last sampled in June 2017

** 9 out of 10 homes tested must show a concentration equal to or lower than 1.3 parts per million

*** 9 out of 10 homes tested must show a concentration equal to or lower than 15 parts per billion

If you're concerned about lead, have the water tested. Arrangements can be made for water testing through the Ingham County Health Department at 517-887-4312 and each test costs about \$20. Or you may choose to install a water filter that is NSF-certified for lead removal. If a water filter is installed, replace it at least as often as recommended by the manufacturer.

Is There Lead in My Water?

There is no detectable lead in BWL drinking water when it leaves our conditioning plants. However, since water is naturally corrosive, small amounts of lead can dissolve into your drinking water if your water sits for several hours in contact with household plumbing fixtures, solder or faucets. The corrosion control additive creates a protective coating to reduce or eliminate the risk of exposure.

EPA's Message About Lead

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water comes primarily from materials and components associated with water service lines and home plumbing. The BWL is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at water.epa.gov/drink/info/lead/index.cfm.

Minimize Lead in Your Home

- **Flush your pipes before drinking.**
If your water has sat in your home's plumbing for more than 6 hours, run the tap until the water feels cold. To conserve water, the water could be collected to water household plants.
- **Use only cold water for drinking, cooking and especially for making baby formula.**
Hot water is likely to contain higher levels of lead.
- **Check your plumbing fixtures.**
A new "lead-free" law came into effect in 2014 limiting the amount of lead in faucets and plumbing.

Lead and Copper sampling was conducted by the BWL during the summer of 2017. Monitoring results can be found in the tables under the heading, "Substances Measured in Homes and Businesses." BWL compliance monitoring is every three years and the next sampling round will be in 2020.



The BWL performs an average of 16,000 water quality tests per year. This table represents results of typical concentrations and ranges of other parameters present in your water supply. These results are within acceptable ranges. The results can vary depending on the wells that are in use, the time of the year and the different areas of the water distribution system. For a PDF version of this list, please visit the BWL website at lbwl.com and click the *Typical Analysis of Conditioned Water*.

Parameter	Units	Your Water Results	
		Typical Concentration	Range
Calcium (as CaCO3)	PPM	58	50-80
Magnesium (as CaCO3)	PPM	41	34-50
Hardness* (as CaCO3)	PPM	99	84-130
	Grains per gallon	5.8	4.9-7.6
Carbonate (as CaCO3)	PPM	22	17-27
Bicarbonate (as CaCO3)	PPM	16	13-23
Total Alkalinity (as CaCO3)	PPM	33	30-50
Iron*	PPM	0.1	0.1-0.7
Sulfate*	PPM	109	82-130
Chloride*	PPM	70	49-100
Phosphate, Total (as P)	PPM	0.7	0.2-0.8
Phosphate, Ortho (as P)	PPM	0.3	0.2-0.4
pH	pH units	9.2	9.0-9.8
Turbidity	NTU	0.1	0.1-0.5
Conductivity*	uS/cm	556	450-750

*These parameters will typically be at the high end of the range during high demand periods in the summer months of June, July and August.

The BWL has ZERO Water Quality Violations!

Unregulated Contaminants

Unregulated contaminants do not have an MCL or MCLG but are reported to and evaluated by the EGLE and EPA. Monitoring helps the EPA determine which areas of the country these contaminants are being detected and to develop future regulations. As our customers, you may request the results of our tests by contacting Angie Goodman at 517-702-7059 or angie.goodman@lbwl.com.

The BWL monitored for 1,4-Dioxane, at the entry point to the distribution system in 2015 and it was detected at trace levels at our Dye Water Conditioning Plant (less than 0.2 ppb). The EPA has established a lifetime health advisory level of 200 ug/L (or ppb), and the EGLE established an action level of 7.2 ppb (consistent with the Part 201 Residential Drinking Water Cleanup Criterion). The BWL continues to monitor 1,4-Dioxane quarterly at our Dye Water Conditioning Plant so we can respond accordingly if needed. Quarterly monitoring has shown no change of the 1,4-Dioxane level.

The BWL monitored for Perfluorinated Compounds, which included PFAS and PFOA, at the entry point to the distribution system in 2015 and 2018 and none were detected.

For more information on contaminants of emerging concern visit lbwl.com/contaminantsofconcern.

Unregulated Contaminant Monitoring Rule 3 That Were Detected

Unregulated Contaminants	Unit	Average Detected Level	Range	Date Tested	Major Sources
Chromium	PPB	0.2	0.2-0.3	Feb & Aug 2015	Natural constituent of groundwater
Molybdenum	PPB	1.1	0-1.2	Feb & Aug 2015	Industrial activities; naturally occurring sources
Strontium	PPB	166	120-210	Feb & Aug 2015	Industrial activities; naturally occurring sources
Vanadium	PPB	0.3	0.2-0.4	Feb & Aug 2015	Industrial activities; naturally occurring sources
Chromium, Hexavalent	PPB	0.2	0.14-0.24	Feb & Aug 2015	Industrial activities; naturally occurring sources
Chlorate	PPB	174	32-330	Feb & Aug 2015	By-product of disinfection
1,4-Dioxane	PPB	0.14	0.14-0.14	Feb & Aug 2015	Groundwater contamination from manufacturing processes & landfills



WHAT'S THE VALUE OF WATER?

Without clean water, soccer uniforms would never make it through the season.

Most of us never think about how clean water gets to us or where our dirty water goes. Luckily we don't have to. Pumps, treatment plants, and pipes bring us clean water and carry our wastewater away.

But here's a dirty secret about our water systems: They're aging. They need investment so they can continue to deliver life's most precious resource. All day, every day.

Water—Essential. Reliable. Invaluable.

Learn how water works for you. Visit TheValueofWater.org.

Value of Water
COALITION
#ValueWater



Water Infrastructure

There's the age-old question: If a tree falls in the woods and no one is there to hear it, does it make a sound? Well, we can't answer that question for you, but it does lead us to a question we can answer. If you can't see the water pipes underground, does that mean they don't have issues?

When you wake up in the morning, go into the bathroom, turn on the faucet to brush your teeth or turn on the shower to bathe, you expect clean, fresh and safe water. As a public utility, our goal is to make sure your expectation is met. But as the years pass and our water infrastructure ages, this goal becomes more challenging. It's easy to believe that because we can't see the water pipes and because the water is clean, fresh and safe to drink, the water pipes must be fine. Well, unlike the tree question, we can answer the question of whether the water pipes have issues. The answer is yes, and before these issues impact the safety and reliability of our water supply, they need to be addressed.

The water infrastructure in the United States is aging, and the same is true of our water infrastructure here in Lansing. BWL has over 800 miles of water mains. Some of these mains are nearing the end of their useful life. The Lansing BWL is committed to addressing the issue of aging infrastructure and is already making plans for the eventual rehabilitation or replacement of these mains as part of our asset management strategy.

Why invest? Not replacing mains can result in increased main breaks, unaccounted for water loss, water quality concerns and fire prevention flow concerns.

We may not always appreciate the value of water in our everyday lives, but imagine a day without water. We need water to shower, make coffee, fight fires, flush toilets, wash laundry, wash dishes and so much more. We need water to grow produce, generate electricity, and make life-saving medicines. A core message from the Value of Water Campaign is "Water is essential...From agriculture to manufacturing, most sectors of our economy rely on water. Without water, our economy would grind to a halt. While nature provides water, it takes pipes, pumps, equipment and people working 24/7 to deliver clean water to homes and businesses."

We must invest in our water infrastructure, and the needs are large. The typical customer in our service territory on average spends around \$1 per day per household, making it one of the best values for an essential service. The BWL continues to evaluate options for reinvestment in infrastructure to minimize the impact on customer bills. Our goal is to continue to provide clean, fresh, safe and affordable drinking water. Thank you for your support in our ongoing efforts.

General Health Information Provided by the EPA

In order to ensure that tap water is safe to drink, the EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. United States Food and Drug Administration (FDA) regulations also establish limits for contaminants in bottled water, which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- **Inorganic contaminants**, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, stormwater runoff and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organics, which are byproducts of industrial processes and petroleum production, can also come from gas stations, urban stormwater runoff and septic systems.
- **Radioactive contaminants**, which can be naturally occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk of infections. These people should seek advice about drinking water from their healthcare providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection from microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

National Primary Drinking Water Regulation Compliance

For more information about our water quality, please contact Angie Goodman at 517-702-7059 or angie.goodman@lbwl.com. Learn more about the BWL water system at lbwl.com/water. For more information about safe drinking water, visit the U.S. Environmental Protection Agency (EPA) at epa.gov/safewater/.



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