Wellhead Protection Program (WHPP) Update: **We updated our WHPP Plan in 2018.**

Wellhead protection is a planning and management approach designed to protect public groundwater supply systems from contamination within a designated area surrounding the well or well field. An active wellhead protection program identifies areas that contribute water to public water supply wells, potential sources of contamination within those areas, and educates residents on developing the best management practices that minimize threats to the public water supplies. The primary goal for the WHPP is the formulation and implementation of a set of actions and management practices to protect the water supply from potential sources of contamination. More information at: **www.cityofhowell.org/water**. Click on the link: "Well Head protection page" (middle of page).

Abandoned / Unused Wells - Search & Closure:

Unplugged, abandoned and/or unused wells can threaten groundwater resources and public health because they are a potential route for vertical movement of contaminants into our source water aquifers. Contaminants such as sewage, fertilizers, pesticides or runoff water, can easily move downward through the unsealed, abandoned well casing. These contaminants may end up in your drinking water. In addition large diameter wells also pose the additional threat of being a safety hazard as people and animals can be injured by falling into them. The City of Howell together with MHOG Water Authority is asking you to consider capping / sealing such wells to remove the possibility of any contaminants reaching the aquifer.

(PFAS) Per- and Polyfluoroalkyl Substances: PFAS, sometimes called PFCs, are a group of chemicals that are resistant to heat, water, and oil. PFAS have been classified by the United States Environmental Protection Agency (EPA) as an emerging contaminant on the national landscape. For decades, they have been used in many industrial applications and consumer products such as carpeting, waterproof clothing, upholstery, food paper wrappings, fire-fighting foams, and metal plating. They are still used today. PFAS have been found at low levels both in the environment and in blood samples from the general U.S. population. These chemicals are persistent, which means they do not break down in the environment. They can also bio-accumulate, meaning the amount builds up over time in the blood and organs. Although our understanding of these emerging contaminants is constantly evolving, elevated levels of PFAS have the potential to cause increased cholesterol, changes in the body's hormones and immune system, decreased fertility, and increased risk of certain cancers. Links to these health effects in humans are supported by epidemiologic studies and by laboratory studies in animal models.

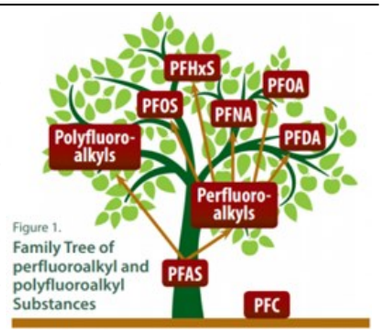

Figure 1.
Family Tree of perfluoroalkyl and polyfluoroalkyl Substances

Are there health advisory levels?: The EPA has not established enforceable drinking water standards, called maximum contaminant levels, for these chemicals. However, the EPA has set a lifetime health advisory (LHA) level in drinking water for two PFAS: perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). The PFOA and PFOS LHA is the level, or amount, *below which no harm is expected from these chemicals*. The LHA level is 70 parts per trillion (ppt) for PFOA and 70 ppt for PFOS. If both PFOA and PFOS are present, the LHA is 70 ppt for the combined concentration.

- **The City of Howell tested their plant tap water for 22 different PFCs and they were all Non-Detect (ND).**
- **Additionally we tested our two shallow wells (#1 & #7) they also were Non-Detect (ND).**

For information on PFOA, PFOS, and other PFCs, including possible health outcomes, you may visit these websites: https://www.epa.gov/pfas; https://www.atsdr.cdc.gov/pfas/; or http://www.michigan.gov/pfasresponse.

As in Previous Years: The City is committed to providing you safe and reliable water. We are pleased to provide you with this information to keep you fully informed about your water. We will be updating this report annually and will keep you informed of anything that may occur throughout the year. For more information about your water, or the contents of this report, contact Jim Webster, Operations Manager — at 517-546-5309.

Copies of this report (and previous years) at: **www.cityofhowell.org/water** or at the Howell Water Plant.

If Printing = Legal size paper works best

City of Howell - 2018 Water Quality Report

This report covers the drinking water quality for the City of Howell for the calendar year of 2018.

This information is a snapshot of the quality of the water that was provided to you in 2018. Included are details about where your water comes from, what it contains, and how it compares to U.S. Environmental Protection Agency (EPA) and State of Michigan Department of Environmental Quality (MI-DEQ) standards.

The staff at the City of Howell Water Treatment Plant are very devoted to bringing you the best drinking water possible. We watchfully safeguard the water supplies and once again report that your tap water met or exceeded all water quality standards established by federal (EPA) and state (MI-DEQ) regulations and have not violated any maximum contaminant levels (MCL).

Water Supply and Treatment:

The City of Howell is a ground water system. Water is drawn from deep rock wells (over 400 feet) taken from the Michigan formation and the deeper Marshall sandstone aquifer. We are a lime softening plant removing about 70% of the hardness. The softened water is then chlorinated, fluoridated, filtered and stored in reservoirs for distribution to our customers use & fire protection.

General Health Information:

All 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).

For People with Special Health Concerns:

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

Why are there contaminants in my Drinking Water?:

The sources of both tap and bottled drinking water include; rivers, lakes, streams, ponds, reservoirs, springs, and wells. The water distributed by the City of Howell comes from deep wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals, in some cases, 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 storm water 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, urban storm water runoff and residential uses.
- **Radioactive contaminants,** which can be naturally occurring or be the result of oil and gas production and mining activities.
- **Organic chemical contaminants,** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

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

Additional Information for Lead in Drinking Water:

The action level for lead in drinking water is 15 parts per billion (ppb) or 0.015 milligrams per liter (mg/l). The EPA requires Water Suppliers to take action to reduce lead levels if the 90th percentile sample taken is above the 15 ppb action level. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Howell 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 drinking water, you may wish to have your water tested. **NOTE:** The City tests for lead & copper every 3 years, next testing to be summer 2019. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the EPA's: Safe Drinking Water Hotline or at **www.epa.gov/safewater/lead**.

WATER SYSTEM MAJOR IMPROVEMENTS: 2018

- **New Employees:** Chelsea White & Dan Rilett joined our team in June & July. Chelsea passed the F4 exam in November. Dan will take the exam in 2019.
- **Plant Roof:** New roof was installed on the lab/office/chemical feed room areas and on generator room.
- **Lab Procedure:** Switched to a new coliform testing method, one with quicker testing results.
- **New Equipment:** New SCADA computers installed with updated software. New chemical feed pump.

City of Howell — Lead & Copper Testing History:

The City of Howell has been testing for lead & copper throughout our distribution system since 1992. Sampling is conducted within private homes that have the greatest probability of containing lead components based on the age of the home. Initial testing began in 1992 and was done annually until 1995 when testing frequency was reduced to every three years, as results in the city were well under EPA limits. The last testing cycle was completed in 2016. We will be collecting samples the summer of 2019.

The City of Howell public water supply meets all EPA safe drinking water standards. Due to many potential sources within private plumbing fixtures and the age and material used, sources of lead may be present within your home. If you have plumbing and fixtures that predate the 1986 EPA "lead ban", you may have components such as, fixtures, fittings or solder that contain higher levels of lead.

If you have concern of your water quality in your home, you can have your water tested by an MDEQ approved laboratory. Water that stands idle in pipes for long periods (overnight / while people are away) is more likely to absorb materials from the plumbing system. The best way to remove the water that may contain lead is flushing the line. Let the cold-water run until you feel it getting colder. The amount of time this takes will depend on your home – a good rule of thumb is to run the water for at least 1 minute. If concerned about lead service line / solder, you should flush water for an additional 2 to 3 minutes to make sure you are getting fresh water from the water main. The water you flush does not need to be wasted, use it for watering plants or for cleaning; Keep a container in your refrigerator for drinking, so you do not need to flush every time you want a drink.

For more information on lead visit the U.S. EPA's website: www.epa.gov/lead.

City of Howell — City Council Meetings:

All City Council meetings are held at Howell City Hall - Council Chambers, lower level, 611 E. Grand River, Howell MI 48843 (517) 546-3502.

Meeting Dates: To get the current meeting schedule & times. Go to cityofhowell.org, navigate to the City Services / Elected officials / City Council Meeting Dates

Water Quality DATA Information Table:

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of contaminants in water provided by public water systems. The table below lists all of the drinking water contaminants that we detected during the **2018** calendar year. Although many more contaminants were tested, only those substances listed below were found in your water. All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. A few naturally occurring minerals may actually improve the taste of drinking water and have nutritional value at low levels. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. As such, some of our data, though representative, may be more than one year old. In this table you will find terms and abbreviations that might not be familiar to you. To help you better understand these terms, we have provided the definitions below the table.

2018 WATER QUALITY DATA TABLE

Contaminants	Units	MCLG, MRDLG	MCL, TT, or MRDL	Your Water	Range Low	Range High	Sample Date	In Compliance	Typical Sources
Disinfectants & Disinfection By-Products (There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.)									
Chlorine as Cl_2	ppm	4	4	0.41	0.15	0.60	2018	YES	Water additive used to control microbes
Haloacetic Acids - HAA5	ppb	N/A	60	1.3	N/A	N/A	2018	YES	By-product of drinking water chlorination.
TTHM - Total Trihalomethanes	ppb	N/A	80	25.0	N/A	N/A	2018	YES	By-product of drinking water disinfection.
Inorganic Contaminants									
Arsenic	ppb	0	10	< 1.0	N/A	N/A	2015 Next testing 2024	YES	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
Barium	ppm	2	2	0.047	N/A	N/A	2015 Next testing 2024	YES	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium	ppb	100	100	< 1.0	N/A	N/A	2015 Next testing 2024	YES	Discharge from steel and pulp mills; Erosion of natural deposits
Cyanide	ppb	200	200	< 100	N/A	N/A	2016 Next testing 2019	YES	Discharge from plastic/fertilizer factories; Discharge from steel/metal factories.
Fluoride (plant tap)	ppm	4	4	0.66	0.48	0.78	2018	YES	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer & aluminum factories.
Nitrate (NO^3) (plant tap)	ppm	10	10	0.074	N/A	N/A	2018	YES	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural
Total Hardness as $CaCO_3$	ppm	N/A	N/A	105.0	91.0	131.0	2018	YES	Natural Deposits
Iron, Total	ppm	N/A	N/A	<0.10	N/A	N/A	2018	YES	Natural Deposits
Sodium, Total	ppm	N/A	N/A	74.0	N/A	N/A	2018	YES	Erosion of natural deposits; Leaching
Microbiological Contaminants									
Contaminants	Units	MCLG	MCL	Your Water	Highest Detected Level		Sample Date	In Compliance	Typical Sources
Total Coliform (RTCR) (% positive samples/month)	samples	N/A	Routine & repeat samples are total coliform positive **and** either is E. coli—positive or system fails to take repeat samples following E. coli positive routine sample or system fails to analyze total coliform positive repeat sample for E. coli.	N/A	0%		2018	YES	Naturally present in the environment.
E. coli (RTCR) - distribution system—(positive samples)	samples	0		0	0%		2018	YES	Human and animal fecal waste.
Radioactive Contaminants									
Alpha Emitters	pCi/L	0	15	1.0 ± 0.60	N/A	N/A	2014 Next testing 2023	YES	Erosion of natural deposits.
Radium (combined 226/228)	pCi/L	0	5	1.37 ±0.67	N/A	N/A	2014 Next testing 2023	YES	Erosion of natural deposits.
Contaminants	Units	MCLG	Action Level (AL)	Your Water	# Samples Exceeding AL		Sample Date	In Compliance	Typical Sources
Inorganic contaminants									
Copper Homeowners Taps.	ppb	0	1300 *	37	0		2016 Next testing 2019	YES	Corrosion of household plumbing systems. Erosion of natural deposits.
Lead Homeowners Taps.	ppb	0	15 **	0	0		2016 Next testing 2019	YES	Corrosion of household plumbing systems. Erosion of natural deposits.

* Copper Action Level = 90 percentile or 9 out of 10 homes tested must show a concentration equal to or lower than 1300 **ppb**.

** Lead Action Level = 90 percentile or 9 out of 10 homes tested must show a concentration equal to or lower than 15 **ppb**.

- **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.
- **MCL = Maximum Contaminant level:** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available treatment technology.
- **TT = Treatment Technique:** A required process intended to reduce the level of a contaminant in drinking water.
- **AL = Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- **ppb:** parts per billion, same as micrograms per liter (µg/L).
- **ppm:** parts per million, same as milligrams per liter (mg/L).
- **RTCR:** Revised Total Coliform Rule.
- **MRDLG = Maximum Residual Disinfection Level Goal:** The level of a drinking water disinfectant 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 contaminants.
- **MRDL = Maximum Residual Disinfectant Level:** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **MPL = Maximum Permissible Level:** State assigned level (example = Sodium)
- **MNR** = Monitored Not Regulated
- **N/A:** Not applicable
- **pCi/L:** picocuries per liter (a measure of radioactivity).
- **ND or Not Detected:** Not detected
- **NR:** Not Required—Monitoring not required, but recommended.