



MEMORIAL VILLAGES WATER AUTHORITY

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2017 DRINKING WATER QUALITY REPORT

(Consumer Confidence Report)

January 1, 2017 to December 31, 2017

Public Water Supply I.D. TX1010148

The United States Environmental Protection Agency (EPA) requires most drinking water suppliers in the country to provide a water quality report to their customers. This annual report concerns the quality of water provided by Memorial Villages Water Authority to the residents of Hedwig, Hunters Creek and Piney Point Villages. Questions concerning this report should be directed to our General Manager, Mr. Mike Montgomery, by calling 713-465-8318.

Para más información sobre su calidad del agua, por favor llame al 713-465-8318.

OUR DRINKING WATER MEETS OR EXCEEDS ALL FEDERAL (EPA) DRINKING WATER REQUIREMENTS.

In order to ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health. We hope this report helps you become more knowledgeable about what's in the water you drink. **All drinking water may contain contaminants.** When drinking water meets federal standards there may not be any health based benefits to purchasing bottled water or point of use devices. 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, call EPA's Safe Drinking Water Hotline (1-800-426-4791). The following pages list many of the federally regulated/monitored constituents that have been found in your drinking water. **Secondary Constituents:** Many constituents (such as calcium, sodium or iron) which are often found in drinking water, can cause taste, color, and odor problems. These constituents are not necessarily causes for health concerns. Secondary constituents are not required to be reported in this document but they may greatly affect the appearance and taste of your water. For more information on taste, odor or color, contact the Water Authority at 713-465-8318.

SPECIAL NOTICE

You may be more vulnerable than the general population to certain microbial contaminants, such as *Cryptosporidium*, in drinking water. **INFANTS**, some **ELDERLY** or **IMMUNO-COMPROMISED PERSONS** such as those undergoing **CHEMOTHERAPY** for cancer; those who have undergone **ORGAN TRANSPLANTS**; those who are undergoing treatment with certain **STEROIDS**; and people with **HIV/AIDS** or other immune system disorders can be particularly at risk from infections. You should seek advice about drinking water from your physician or healthcare providers. Additional guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* & other microbial contaminants are available from the Safe Drinking Water Hotline at:
1-800-426-4791.

WHERE DOES YOUR DRINKING WATER COME FROM?

In 2017, the Water Authority provided 39.03% of its treated drinking water from its 5 water wells which draw water from the Evangeline aquifer in Harris County. This type of water source is commonly referred to as **groundwater**. The other 60.97% of our drinking water came from the City of Houston (COH) in the form of **surface water** from Lake Houston, Harris County. **Surface water** comes from rivers, lakes, streams, ponds, reservoirs, and springs. The TCEQ completed an assessment of your source water and results indicate that some of your sources are susceptible to certain contaminants. The sampling requirements for your water system are based on this susceptibility and previous sample data. Any detections of these contaminants may be found in this Consumer Confidence Report. For more information on **Source Water Assessments** and protection efforts at our system, please contact Mr. Montgomery at 713-465-8318. Further details about sources and source-water assessments are available in Drinking Water Watch at the following URL: <http://dww.tceq.texas.gov/DWW>.

SOURCES OF DRINKING WATER

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, in some cases radioactive material, and can pick up substances resulting from the presence of animals or from human activity. For further details about sources of water, go to: <http://gis3.tceq.state.tx.us/swav//Controller/index.jsp?wtrsrc=>

Contaminants that may be present in source water:

- **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.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive contaminants**, which can be naturally-occurring or be the result of oil and gas production and mining activities.

WHAT YOU NEED TO KNOW TO BETTER UNDERSTAND WHAT IS IN YOUR WATER

Definitions and Abbreviations: The following tables contain scientific terms and measures, some of which may require explanation.

Maximum Contaminant Level (MCL): The highest permissible level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available **TT. Treatment Technology:** A process used to reduce contaminants in water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

Maximum Residual Disinfectant Level (MRDL): The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): 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 contamination.

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. **Action Level Goal (ALG)** The level of a contaminant in drinking water below which there is no known or expected risk to health. ALG's allow for a margin of safety.

Avg: Regulatory compliance with some MCL's are based on running average of monthly samples.

pCi/l = Pico curies per liter (a measure of radioactivity); **NTU** = Nephelometric Turbidity Units; **ppm** = parts per million or milligrams per liter (mg/l); **ppb** = parts per billion, or micrograms per liter (ug/l); **ppt** = parts per trillion, or nanograms per liter; **ppq** = parts per quadrillion, or picograms per liter (pg/L); **MFL** = million fibers per liter (a measure of asbestos); **mrem** = millirems per year (a measure of the radiation that is absorbed by the body); **ND** = Not Detected; **NA** = Not Applicable. **SCL** = Secondary Contaminant Level.

Level 1 Assessment: A study of the water system to identify potential problems & determine, if possible, why total coliform bacteria have been found in a water system.

Level 2 Assessment: A very detailed study of the water system to identify potential problems & determine, if possible, why an E.coli MCL violation has occurred and/or why total coliform bacteria have been found in a water system on multiple occasions.

TABLE I = Information on the **groundwater** supplied by the Water Authority as part of its drinking water supply.

TABLE II = Information on the **surface water** supplied by Houston to the Water Authority as part of its drinking water supply.

**TABLE I - Memorial Villages Water Authority's Public Water Supply System — I.D. No. 1010146
2017* CONTAMINANTS DETECTED IN YOUR DRINKING WATER**

| REGULATED CONTAMINANTS | | | | | | | | |
|---|--|---------------------------|--------------------|---------------|------|--------------------|---|--|
| Year/ Range | Constituent | Highest Level | Range of Levels | MCLG | MCL | Unit of Measure | Source of Constituent | |
| 01/04/17 | Arsenic | 7.7 | 3.4 — 7.7 | 0 | 10 | ppb | Erosion of natural deposits; Runoff from orchards And from glass and electronics production wastes. | |
| 01/04/17 | Barium | 0.271 | 0.136 — 0.271 | 2 | 2 | ppm | Erosion of natural deposits; Discharge of drilling wastes and metal refineries. | |
| 01/04/17 | Beryllium | < 0.80 | 0 — < 0.80 | 4 | 4 | ppb | Discharge from metal refineries & coal-burning factories; discharge from electrical, aerospace & defense. | |
| 01/04/17 | Cadmium | < 0.1 | 0 — < 0.10 | 5 | 5 | ppb | Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; runoff from waste batteries. | |
| 01/04/17 | Chromium | < 10.0 | 0 — < 10.0 | 100 | 100 | ppb | Discharge from steel & pulp mills; Erosion of natural deposits. | |
| 01/04/17 | Fluoride | 0.83 | 0.28 — 0.83 | 4 | 4 | ppm | Erosion of natural deposits; Water additive which promotes strong teeth. Discharge from fertilizer & aluminum factories. | |
| 01/04/17 | Mercury | <0.00040 | 0 — < 0.0004 | 2 | 2 | ppb | Erosion of natural deposits; Discharge from re- fineries & factories; runoff from landfills/croplands. | |
| 01/04/17 | Nitrate as (N) | 0.11 | <0.01 — 0.11 | 10 | 10 | ppm | Erosion of natural deposits. Runoff from fertilizer use; leaching from septic tanks & sewage. | |
| 2017 | Cyanide | < 100 | 0 — 100 | 200 | 200 | ppb | Discharge from plastic and fertilizer factories. Discharge from steel/metal factories. | |
| 01/04/17 | Selenium | 4.6 | < 3.0 — 4.6 | 50 | 50 | ppb | Discharge from petroleum and metal refineries; erosion of natural deposits discharge from mines. | |
| 01/04/17 | Thallium | < 0.40 | 0 — < 0.40 | 0.5 | 2 | ppb | Discharge from electronics, glass & leaching from ore-processing sites; Drug factories. | |
| RADIOACTIVE CONTAMINATES* | | | | | | | | |
| | | Highest Level Detected | Range of Levels | MCLG | MCL | Unit of Measure | Source of Constituent | |
| 01/04/17 | Uranium | 2.4 | <1.0 — 2.4 | 0 | 30 | ug/L | Erosion of natural deposits. | |
| 01/04/17 | Combined Radium (226 & 228) | 1.23 | <1.0 — 1.23 | 0 | 5 | pCi/L | Erosion of natural deposits. | |
| 01/04/17 | Gross alpha excluding radon & uranium | 5.1 | 0 — 5.1 | 0 | 15 | pCi/L | Erosion of natural deposits. | |
| 01/04/17 | Gross beta emitters | <4.0 | 0 — 4.0 | 0 | 50 | pCi/L | Decay of natural & manmade deposits. | |
| * The MCL for beta particles is 4/mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles. | | | | | | | | |
| Maximum Residual Disinfectant Level —No violation associated with disinfectant residuals. | | | | | | | | |
| Year | Disinfectant | Average Level | Min Level | Max Level | MRDL | MRDLG | Units | Source of Disinfectant |
| 2017 | Chloramine | 1.09 | 0.14 | 3.50 | 4.0 | 4.0 | ppm | Disinfectant used to control microbes. |
| Disinfection By-Products | | | | | | | | |
| Year | Constituent | Highest Level | Range of Level | MCLG Level | MCL | Unit of Measure | Source of Constituent | |
| 2017 | Total Haloacetic Acids | 23 | 0.00 — 25.5 | No Goal | 60 | ppb | Byproduct of drinking water disinfection. | |
| 2017 | Total Trihalomethanes | 29 | 0.00 — 43.5 | No Goal | 80 | ppb | Byproduct of drinking water disinfection. | |
| Total Coliform: MCLG=0; One positive monthly sample. MCL=2 or more/month: NO VIOLATION-Naturally present in the environment. | | | | | | | | |
| E. Coli or Fecal Coliform: Total No. of Positive E. Coli or Fecal coliform Samples = ZERO (-0-) NO VIOLATION. | | | | | | | | |
| UNREGULATED INITIAL DISTRIBUTION SYSTEM EVALUATION FOR DISINFECTION BYPRODUCTS: WAIVED OR NOT YET SAMPLED | | | | | | | | |

**TABLE I — CONTINUED - Memorial Villages Water Authority's Public Water Supply System — I.D. No. 1010146
2017* CONTAMINANTS DETECTED IN YOUR DRINKING WATER**

| Secondary and Other Regulated Constituents (No associated adverse health effects) | | | | | | | |
|--|---------------------------------------|-----------------|---------------------------|---------------|-----------------|--|--|
| Year | Constituent | Average Level | Minimum Level | Maximum Level | Secondary Limit | Unit of Measure | Source of Constituent |
| 01/04/17 | Aluminum | 0.020 | 0.020 | 0.020 | .05 | ppm | Abundant—naturally occurring Element. |
| 01/04/17 | Bicarbonate | 246.33 | 217.0 | 295.0 | N/A | ppm | Corrosion of carbonate rocks |
| 01/04/17 | Calcium | 22.70 | 12.3 | 28.2 | N/A | ppm | Abundant—naturally occurring element. |
| 01/04/17 | Copper | < 0.0020 | < 0.0020 | < 0.020 | 1 | ppm | Corrosion of household plumbing systems; erosion of natural deposits leaching from wood preservatives. |
| 01/04/17 | Hardness as CaCO ₃ | 79.4 | 44.1 | 99.3 | N/A | ppm | Naturally occurring calcium & magnesium. |
| 01/04/17 | Iron | 0.0887 | 0.032 | 0.181 | 0.3 | ppm | Erosion of natural deposits; iron or steel water delivery. |
| 01/04/17 | Magnesium | 5.52 | 3.25 | 7.39 | N/A | ppm | Abundant naturally occurring element. |
| 01/04/17 | Manganese | 0.0078 | 0.0052 | 0.0127 | .05 | ppm | Abundant naturally occurring element. |
| 01/04/17 | Nickel | < 0.0010 | < 0.0010 | < 0.0010 | N/A | ppm | Erosion of natural deposits. |
| 01/04/17 | Potassium | 2.11 | 1.66 | 2.33 | N/A | ppm | Naturally occurring in nature. |
| 01/04/17 | pH | 7.90 | 7.7 | 8.1 | > 7 | units | Measure of waters corrosivity. |
| 01/04/17 | Sodium | 86.90 | 66.4 | 124.0 | N/A | ppm | Erosion of natural deposits; byproduct of oil field activity. |
| 01/04/17 | Sulfate | 13.33 | 9 | 14 | 300 | ppm | Naturally occurring; common industrial byproduct; byproduct of oil field activity. |
| 01/04/17 | Total Alkalinity as CaCO ₃ | 202.0 | 178 | 242 | N/A | ppm | Naturally occurring in mineral salts. |
| 01/04/17 | Total Dissolved Solids | 304.0 | 272 | 356 | 1000 | ppm | Total dissolved mineral constituents in water. |
| LEAD and COPPER | | | | | | | |
| Year | Constituent | 90th Percentile | No. of Sites Exceeding AL | Action Level | Unit of Measure | Source of Constituent | |
| 2017 | Copper | 0.1653 | 0 | 1.3 | ppm | Corrosion of household plumbing systems; Erosion of natural deposits. | |
| 2017 | Lead | 5.1 | 0 | 15 | ppb | Corrosion of household plumbing system; Erosion of natural deposits; Leaching from wood preservatives. | |
| MCLG—Copper = 1.3 | | MCLG—Lead = 0 | No Levels Above MCL | | | | |

LEAD in Drinking Water: 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. We are responsible for providing high quality drinking water, but it 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 at (1-800-426-4791) or by logging on to EPA's web site at: <http://www.epa.gov/safewater/lead>.

ARSENIC: While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

NITRATE: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than 6 months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, ask for advice from your health care provider.

COLIFORM BACTERIA are used as indicators of microbial contamination of drinking water because testing for them is easy. While not disease-causing organisms themselves, they are often found in association with other microbes that are capable of causing disease. Coliform bacteria are more hardy than many disease-causing organisms; therefore, their absence from water is a good indication that the water is microbiologically safe for human consumption. **TURBIDITY**—has no health effects. However, it can interfere with disinfection & provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms including bacteria, viruses & parasites that can cause nausea, diarrhea & associated headaches.

**PUBLIC PARTICIPATION OPPORTUNITIES
FOR
MEMORIAL VILLAGES WATER AUTHORITY**

BOARD MEETINGS: 1st Tuesday of each Month
LOCATION: 8955 Gaylord Drive, Houston, 77024
TIME: 7:00 p.m.
FOR INFORMATION CALL: 713-465-8318

VISIT OUR WEB SITE AT: WWW.MVWA.ORG

DISINFECTANTS IN DRINKING WATER

The drinking water provided to you contains **Chloramines** as a disinfectant which provides protection from waterborne diseases but can cause problems to persons dependent on dialysis. You are encouraged to discuss this with your health care provider. Chloraminated water may also be toxic to fish. For more information about the use of chloramines contact the Water Authority at 713-465-8318.

For 2017:

Disinfectant used: Chloramines (chlorine + ammonia)
 Quarterly average levels: Jan. - Mar. 1.31 mg/L
 Apr. - June 1.13 mg/L
 July - Sept. 0.95 mg/L
 Oct. - Dec. 0.97 mg/L
 Lowest single sample result: 0.14 mg/L
 Highest single sample result: 3.50 mg/L
 Annual average of all samples: 1.09 mg/L
 Maximum Residual Disinfectant Level (MRDL): 4.0 mg/L*
 Maximum Residual Disinfectant Level Goal (MRDLG): 4.0 mg/L*
 *Measured as chlorine as an annual average

Unregulated Contaminants

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water & whether future regulations are warranted.

Chromium in Drinking Water

The current federal drinking water standard for total chromium is 0.1 mg/L or 100 ppb. Chromium-6 and Chromium-3 are covered under the total chromium standard. The level of Total Chromium in your drinking water in 2017 measured < 0.0100 mg/L or what is consider lower than the detectable level. If your water supply measures ever exceeds the federal standard for Total Chromium, consumers will be notified. For more information call us at 713-465-

TABLE II - City of Houston: Surface Water supplied to Memorial Villages Water Authority

Houston Entry Points 101 - East Water Plant III

Houston's Main System I.D. No. 1010013

2017* CONTAMINANTS DETECTED IN YOUR DRINKING WATER; NONE WERE ABOVE THE MCL

Regulated Contaminates

| Year | Constituent | Detected Level | Unit of Measure | MCL | MCLG | Source of Constituent |
|--|----------------|----------------|-----------------|-----|------|--|
| 09/26/17 | Arsenic | <0.0020 | ppm | 10* | 0 | Erosion of natural deposits; Runoff from orchards and from glass and electronic production waste. production waste. |
| (*New arsenic values were effective January 23, 2006. In the event of a violation, you will be notified) | | | | | | |
| 09/26/17 | Atrazine | 0.11 | ug/L | 3 | 3 | Runoff from herbicide used on row crops. |
| 09/26/17 | Barium | 0.0462 | ppm | 2 | 2 | Erosion of natural deposits; Discharge of drilling wastes and metal refineries. |
| 09/26/17 | Fluoride | 0.53 | ppm | 4 | 4 | Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories. |
| 09/26/17 | Nitrate as (N) | 0.41 | ppm | 10 | 10 | Erosion of natural deposits; Runoff from fertilizer use; Leaching from septic tanks and sewage. |
| 09/26/17 | Cyanide | 0.05 | mg/L | 200 | 200 | Discharge from plastic and fertilizer factories. Discharge from steel/metal factories. |

RADIOACTIVE CONTAMINATES

| | | | | | | |
|----------|----------------|----------|-------|---|----|------------------------------|
| 09/26/17 | Radium 228 | < 1.0 | pCi/l | | | Erosion of natural deposits. |
| 09/26/17 | Alpha Emitters | < 3.0 | pCi/l | | | Erosion of natural deposits. |
| 09/26/17 | Beta Emitters | < 4.0 | pCi/l | | | Erosion of natural deposits. |
| 09/26/17 | Uranium | < 0.0010 | mg/L | 0 | 30 | Erosion of natural deposits. |

SECONDARY and OTHER UNREGULATED CONSTITUENTS

| Year/Range | Constituent | Detected Level | Unit of Measure | SCL | Source of Constituent |
|------------|------------------------------|----------------|-----------------|-----------|---|
| 2017 | Aluminum | <0.2 | ppm | 50 to 200 | Naturally occurring element. |
| 2017 | Bicarbonate | 107 | ppm | | Corrosion of carbonate rocks such as limestone. |
| 2017 | Calcium | 45 | ppm | | Naturally occurring element. |
| 2017 | Chloride | 28 | ppm | 250 | Erosion of natural deposits; Discharge of drilling |
| 2017 | Hardness-CaCO ₃ | 126 | ppm | | Naturally occurring calcium & magnesium. |
| 2017 | Alkalinity-CaCO ₃ | 88 | ppm | | Naturally occurring soluble mineral salts. |
| 2017 | Sulfate | 37 | ppm | 250 | Naturally occurring; common industrial byproduct |
| 2017 | Iron | <0.010 | ppm | 300 | Erosion of natural deposits |
| 2017 | Magnesium | 3.25 | ppm | | Abundant occurring natural element. |
| 2017 | Manganese | 0.0078 | ppb | 50 | Abundant occurring natural element. |
| 2017 | Nickel | 0.0025 | ppm | | Erosion of natural deposits. |
| 2017 | Sodium | 16.8 | ppm | | Erosion of natural deposits. Byproduct of oil fields. |
| 2017 | Total Dissolved Solids | 214 | ppm | 500 | Total dissolved mineral constituents in water. |
| 2017 | pH | 8 | units | 6.5—8.5 | Measure of waters corrosivity. |
| 2017 | Potassium | 3.74 | ml/L | | Naturally occurring in nature. |

| Turbidity: Year | Avg. | Min. | Max. | Unit of Measure | Lowest Monthly % of samples Meeting Limits | Turbidity Limits | Source of Constituent |
|-----------------|------|------|------|-----------------|--|------------------|-----------------------|
| 2017 | 0.10 | 0.06 | 0.31 | NTU | 95% | 0.3 | Soil Runoff |

CONSECUTIVE SYSTEM PUBLIC NOTICE

The Texas Commission on Environmental Quality (TCEQ) sets water quality standards for public drinking water. Samples taken in the **City of Houston (COH) Main Public Water System (TX1010013)** during October, November and December 2017 were below the TCEQ required minimum standards for chlorine disinfectant residual levels in more than 5 percent of the samples taken triggering the COH to notify all of its customers of this issue with their water system. This includes customers like the Water Authority who are required to purchase water from the COH. The Water Authority's system **did not** have this issue as we monitor and adjust disinfectant levels before distributing water to our customers.

Additional information concerning the City of Houston's Water Quality may be obtained by calling the Water Authority at 713-465-8318 or the Water Production Branch of the Department of Public Works, City of Houston at 713-842-4001.

*Or latest information available.