



City of Houston
Department of Public Works & Engineering
WATER QUALITY REPORT
2008



HOUSTON'S WATER IS RATED SUPERIOR!



The City of Houston Department of Public Works & Engineering (PWE) is pleased to present its 2008 Annual Water Quality Report. This report contains information about your water supply, treatment and monitoring performed to provide the highest possible quality of drinking water. **Houston's drinking water continues to meet or exceed all Federal and State standards for safe drinking water.** The City of Houston has maintained a **record of providing safe and reliable drinking water of Superior Quality for well over 10 years.** In addition, the city participates voluntarily in the **Partnership for Safe Drinking Water** to produce water of a quality better than most other water providers in the nation.



Lake Houston is one of the water supply reservoirs for Houston.

City of Houston Water Sources

Sources of drinking 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 materials, and can pick up substances resulting from the presence of animal or human activity.

In 2008 Houston received 82 percent of its treated drinking water from its major surface water treatment plants. Surface water comes from the San Jacinto River through Lake Conroe and Lake Houston, and the Trinity

River, through Lake Livingston. The remaining 18 percent comes from groundwater wells. These are deep wells with typical depths greater than 750 feet, producing water from the Evangeline and Chicot Aquifers, and are not vulnerable to surface contamination. There is enough water in our distribution system at any given time to fill the Astrodome two and one-half times.

Visit our web site for more information: www.publicworks.houstontx.gov/utilities/drinkingwater.htm

Houston Drinking Water Operations

Quality

We work hard to bring you one of the highest quality drinking water in the nation! Houston's drinking water is rated "**Superior**" by the Texas Commission on Environmental Quality (TCEQ), meaning we have exceeded its expectations of a water utility. This includes not only bringing you great tasting water but taking extra efforts to protect our water sources.

The City of Houston actively participates with the **American Water Works Association (AWWA)** and other agencies that research water quality issues. Such research helps us optimize and improve our drinking water operations.

Reliability

The City of Houston has been providing dependable water service to our customers since the early 1900's. This includes operating three water purification complexes and maintaining over 7,000 miles of water pipelines.

Recently, the City's of Houston's water purification plants have been nationally recognized among the most effective water plants in the nation. The East Water Purification Plant recently won the **Five-Year Directors Award** for achieving excellence in water purification maintenance. This award is given to utilities' which meet or exceed water quality standards established by the **Partnership for Safe Drinking Water**. This program ensures that preventive measures are being optimized at our treatment plants to increase performance and protection against microbiological contamination.

Service

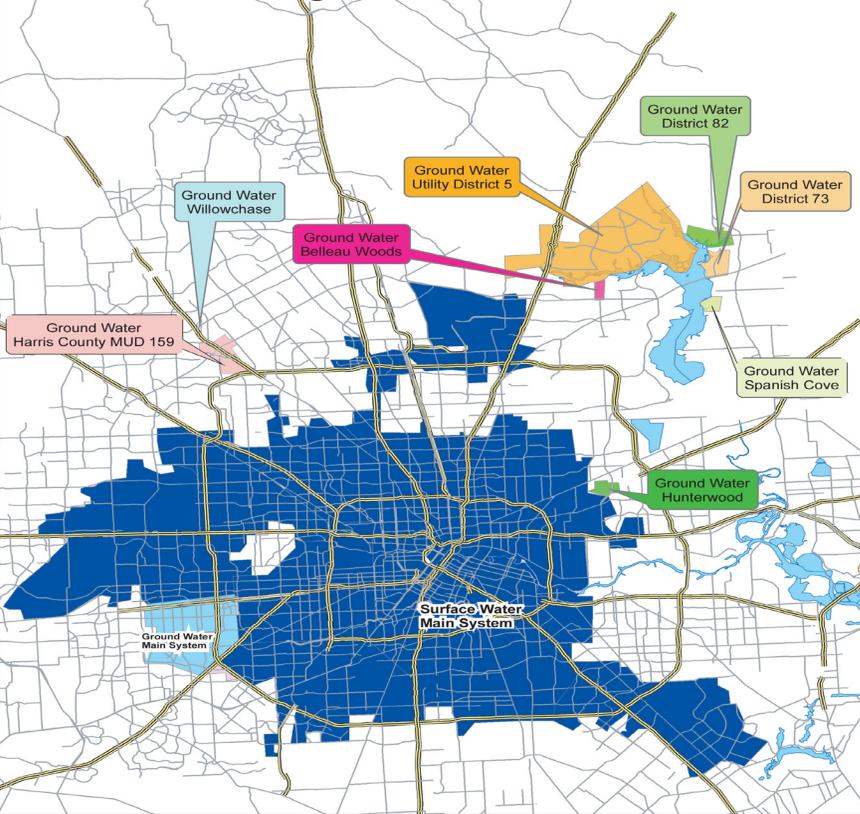
The City of Houston operates a non-emergency help line - **311**. Customers can dial this number to notify us of any problems they may be experiencing and a water quality investigator will be dispatched within twenty-four hours to respond to and resolve the problem. In addition, Houston Drinking Water Operations operates a 24-hour control center to remotely monitor system conditions at all its facilities. This control center assists with responding to system problems before they affect the customers. Please dial 311 if you have any questions or concerns regarding your drinking water.

En Español

Este informe contiene información muy importante sobre el agua que bebe. Tradúzcalo, ó hable con alguien que lo entiende. Para mas información por favor llame Línea de Ayuda de Houston marcando 311.

Main Water System*																
Contaminant (units)	MCLG	MCL	Surface Water				Ground Water				Sources of Contaminants					
			Avg		Max		Avg		Max							
Alpha Emitters (pCi/L)	0	15	<2.0		<2.0		8.3		11.1		Erosion of natural deposits					
Arsenic (ppb)	0	10	4.1 ('06)		4.1 ('06)		3.0		5.0		Erosion of natural deposits					
Atrazine (ppb)	3	3	0.42		0.50		< 0.20 ('05)		< 0.20 ('05)		Runoff from herbicide used on row crops; commonly found in surface water at low levels					
Barium (ppm)	2	2	0.0839 ('05)		0.2010 ('05)		0.195		0.211		Discharge of drilling wastes; erosion of natural deposits					
Beta/Photon Emitters (pCi/L)	0	50***	2.6		5.1		5.2		7.8		Decay of natural or man made deposits					
Copper (ppm)	1.3	90% below AL = 1.3	90% below 0.192 ('05)				90% below 0.192 ('05)				Erosion of natural deposits; corrosion of household plumbing (measured at customer tap - none exceeded AL)					
Fluoride (ppb)	4	4	0.54		0.74		0.23		0.45		Water additive which promotes strong teeth; erosion of natural deposits					
Lead (ppb)	0	90% below AL = 15	90% below 4.2 ('05)				90% below 4.2 ('05)				Erosion of natural deposits; corrosion of household plumbing (measured at customer tap - none exceeded AL)					
Nitrate as N (ppm)	10	10	0.29		0.85		0.09		0.28		Runoff from fertilizer use; erosion of natural deposits					
Selenium (ppb)	50	50	< 3.0 ('05)		5.9 ('05)		< 3.0		<3.0		Erosion of natural deposits					
Simazine (ppb)	4	4	0.12		0.15		<0.20 ('05)		<0.20 ('05)		Herbicide runoff					
Combined Radium (pCi/L)	0	5	< 1.0		<1.0		1.22		1.6		Erosion of natural deposits					
Combined Uranium (ppb)	0	30	17.1 ('05)		17.1 ('05)		3.5 ('06)		3.5 ('06)		Erosion of natural deposits					
Isolated Groundwater Systems*																
Contaminant (units)	MCLG	MCL	Belleau Woods	Spanish Cove	District 82		Harris County Mud 159		Utility District 5		Hunterwood	Willow-Chase		District 73		Sources of Contaminants
					Avg	Max	Avg	Max	Avg	Max		Avg	Max	Avg	Max	
Alpha Emitters (pCi/L)	0	15	ND ('05)	ND ('05)	2.9 ('01)	3.2 ('01)	6.2 ('03)	6.2 ('03)	2.9 ('05)	5.0 ('05)	ND ('05)	4.3	5.3	5.2	6.0	Erosion of natural deposits
Arsenic (ppb)	0	10	< 2.0 ('05)	2.9 ('05)	< 2.0 ('05)	< 2.0 ('05)	2.2 ('03)	2.2 ('03)	< 2.0	3.0	7.4 ('03)	2.2 ('03)	2.2 ('03)	< 2.0	< 2.0	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium (ppm)	2	2	0.292 ('01)	0.3350 ('05)	0.139 ('04)	0.139 ('04)	0.257 ('03)	0.257 ('03)	0.269	0.269	0.276 ('03)	0.246 ('02)	0.246 ('02)	0.259	0.259	Discharge of drilling wastes; erosion of natural deposits
Beta/Photon Emitters (pCi/L)	0	50***	< 4.0 ('05)	5.8 ('01)	< 4.0 ('05)	< 4.0 ('05)	< 4.0 ('05)	< 4.0 ('05)	< 4.0 ('05)	7.1 ('05)	2.5 ('03)	2.1	4.1	4.5	4.9	Decay of natural or man made deposits
Copper (ppm)	1.3	90% below AL = 1.3	90% below 0.081 ('99)	90% below 0.002 ('03)	90% below 0.043 ('00)		90% below 0.257 ('99)		90% below 0.2440 ('05)		90% below 0.113	90% below 0.0333		90% below 0.19		Erosion of natural deposits; corrosion of household plumbing (measured at customer tap-none exceeded AL)
Fluoride (ppm)	4.0	4.0	ND ('05)	0.1 ('05)	ND ('05)	ND ('05)	ND	ND	0.78	1.18	0.5 ('00)	<0.1	<0.1	0.13	0.13	Water additive which promotes strong teeth; erosion of natural deposits
Lead (ppb)	0	90% below AL = 15	90% below 2.1 ('99)	90% below 1.0 ('03)	90% below 1.4 ('00)		90% below 3.8 ('99)		90% below 2.2 ('05)		90% below 1.6	90% below 2.2		90% below 3.2		Erosion of natural deposits; corrosion of household plumbing (measured at customer tap-none exceeded AL [one exceeded AL -District 73])
Nitrate as N (ppm)	10	10	< 0.01 ('05)	< 0.01 ('05)	0.16 ('07)	0.16 ('07)	0.18	0.20	0.01	0.06	< 0.01 ('05)	0.18	0.19	<0.01	<0.01	Runoff from fertilizer use; erosion of natural deposits
Selenium (ppb)	50	50	< 3.0 ('05)	< 3.0 ('05)	< 3.0 ('05)	< 3.0 ('05)	3.9 ('03)	3.9 ('03)	1.0	3.0	< 3.0 ('02)	3.8 ('02)	3.8 ('02)	< 3.0	<3.0	Erosion of natural deposits
Total Trihalomethanes (TTHMs) (ppb)	N/A	Running Annual Avg = 80	8.6	< 8.0 ('05)	4.6 ('05)	9.2 ('05)	< 8.0 ('05)	< 8.0 ('05)	3.2	3.2	< 8.0 ('05)	2.4 ('05)	2.4 ('05)	< 8.0 ('05)	< 8.0 ('05)	Byproducts of drinking water disinfection
Combined Radium (pCi/L)	0	5	< 1.0 ('05)	< 1.0 ('05)	< 1.0 ('04)	< 1.0 ('04)	0.4 ('03)	0.4 ('03)	1.0 ('05)	1.1 ('05)	< 1.0 ('05)	0.55	1.10	<1.5	<1.5	Erosion of natural deposits

City of Houston Drinking Water Service Areas



RESIDUAL DISINFECTANT LEVEL (ppm)

MAIN SYSTEM

MCL	4.0	
MCLG	< 4.0	
Running Annual Avg.	CHLORINE = 1.22	CHLORAMINES = 2.08
Range of detected levels	FREE CHLORINE = 0.30 - 2.30	CHLORAMINES = 0.07 - 3.60
Source of Constituent	Disinfectant used to control microbes	

STAGE 1 DISINFECTION BYPRODUCTS

MAIN SYSTEM

	HALOACETIC ACIDS - HAAS (ppb)	TOTAL TRIHALOMETHANES - TTHMS (ppb)
MCL	60 as Running Annual Average (RAA) of quarterly samples in distribution system	80 as Running Annual Average (RAA) of quarterly samples in distribution system
Running Annual Avg.	10.6	13.9
Range of detected levels	< 6.0 - 70.9	< 4.0 - 66.1
Source of Constituent	Byproducts of drinking water disinfection	

UNREGULATED CONTAMINANTS*

Unregulated contaminants are those for which 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 and whether future regulation is warranted. Any unregulated contaminants detected are reported in the following table. For additional information and data visit <http://www.epa.gov/safewater/ucmr/ucmr2/index.html>, or call the Safe Drinking Water Hotline at (800) 426-4791.

CONTAMINANT (units in ppb)	MAIN SYSTEM (Surface)		MAIN SYSTEM (Ground)		BELLEAU WOODS	UTILITY DISTRICT 5	DISTRICT 73
	Avg	Max	Avg	Max			
Chloroform	8.4	54.2	<0.5	<0.5	1.3	1.1	<0.5
Bromodichloromethane	4.2	11.4	<0.5	0.8	2.2	1.0	<0.5
Dibromochloromethane	1.9	9.6	0.2	1.1	3.1	1.1	<0.5
Bromoform	0.6	8.7	<0.5	0.6	2.0	<1.0	< 0.5

MICROBIOLOGICAL AND PHYSICAL QUALITY*

CONTAMINANT (units)	MCLG	MCL	MAIN SYSTEM	UTILITY DISTRICT 5	SOURCES OF CONTAMINANTS
Total Coliforms	0	5% of monthly samples tested positive	1.1% Highest percentage of monthly samples	2.6% Highest percentage of monthly samples	Naturally present in the environment
E. Coli	0	0	0	0	Human and animal fecal waste
Viruses, Giardia, Legionella	0	TT	ND	ND	Naturally present in the environment
Turbidity (clarity) (NTU) Main System - Surface Water	N/A	95% of samples tested each month less than or equal to 0.3	Range = 0.00 - 0.76 97.2% was the Lowest monthly percentage of samples meeting the limit	N/A	Soil runoff

WHERE DOES YOUR WATER COME FROM?

Locate the approximate area you live on the map provided. Identify the corresponding color of your area. Match the color of the area to the table. You can then determine the quality of your water by comparing the MCL.

- The City of Houston uses chloramines for the disinfection of its drinking water. This protects public health by controlling central exposure to waterborne organisms known to cause infectious diseases in humans, while at the same time lowering regulated disinfection by-products. For certain sensitive uses such as kidney dialysis, chlorinated water must be treated before use.
- During 2008, the City of Houston collected and analyzed more than 600,000 laboratory samples for contaminants in its source water, treated water and distribution system.
- Over 600 bacteriological samples are collected every month from the City's distribution system.

Concerns:

- Arsenic** - Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
- Copper** - Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.
- Lead** - Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. 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 Houston 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 or at <http://www.epa.gov/safewater/lead>.

Terminology

- Action Level (AL):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- Maximum Contaminant Level (MCL):** 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.
- Maximum Contaminant Level Goal (MCLG):** 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.
- Maximum Residual Disinfectant Level (MRDL):** 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.
- 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 contaminants.
- Treatment Technique (TT):** A required process intended to reduce the level of a contaminant in drinking water.

Measurement Definitions

Nephelometric Turbidity Unit (NTU):

Turbidity is a measure of how clear the water looks.

N/A: Not Applicable

ND: Not Detected

ppm: 1 part per million = 1 mg/L = 1 milligram per liter

ppb: 1 part per billion = 1 ug/L = 1 microgram per liter

[1 ppm = 1,000 ppb]

pCi/L: picocuries per liter (a measure of radioactivity)

* Calendar Year 2008 data unless otherwise specified

** Includes groundwater and surface water sites.

*** The EPA considers 50 picocuries per liter to be the level of concern for beta particles.



Drinking Water and Your Health

Notice from the EPA

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. Contaminants may be found in drinking water that may cause taste, color, or odor problems. Presence of contaminants does not necessarily indicate that the water poses a health risk. In order to ensure that tap water is safe to drink, the EPA and the TCEQ enforce regulations that limit the amount of certain contaminants in water provided by public water systems.

Health-Related Notices

Special Notice for the Elderly, Infants, Cancer Patients, People with Weakened Immune Systems

At-risk citizens may be more vulnerable than the general population to certain microbial contaminants such as *Cryptosporidium*, in drinking water. Those potentially effected include; infants, some elderly or immunocompromised persons such as those who have undergone chemotherapy for cancer, those who have undergone organ transplants, those who are undergoing treatment with steroids, and people with HIV/AIDS or other immune system disorders. Those concerned should seek advice about drinking water from their physician or health care provider. More information about contaminants and potential health effects and additional guidelines on appropriate means to lessen the risk of infection by microbial contaminants can be obtained by calling the following:

- **Safe Drinking Water Hotline 1-800-426-4791**
- **City of Houston Department of Health and Human Services/Bureau of Epidemiology 713-794-9181**

If other people, such as tenants, receive water from landlords, or property owners, it is important that owners provide this notice by posting it in a prominent location or by hand or mail delivery.

Please feel free to copy this report. Visit our web site: www.publicworks.houstontx.gov/utilities/drinkingwater.htm

Is *Giardia* or *Cryptosporidium* in our water supply?

Cryptosporidium and *Giardia* are waterborne pathogenic (disease causing) organisms. Both are naturally present in the intestines of most mammals including humans, and are passed into the environment through urban runoff or sewage disposal system failure. The diseases caused by *Cryptosporidium* or *Giardia* can lead to symptoms such as diarrhea, abdominal discomfort, fever, weight loss, malabsorption, or anemia. Although not life threatening to healthy adults, *Cryptosporidium* and *Giardia* can be fatal to infants, the elderly, pregnant women, and immunocompromised persons.

Neither *Giardia* nor *Cryptosporidium* is found in deep wells such as the City's, which are protected from surface water contamination. We routinely monitor our source water entering and treated water leaving our filtration plants for these two organisms. To date, we have detected no confirmed occurrences of either organism in any of our finished drinking water.

Lake Houston - a short story

Lake Houston is a man-made reservoir created by the construction of a dam and spillway across the San Jacinto River. The reservoir was completed in 1954 as the first part of the City's raw water system to supply the East Water Purification Plant (EWPP) and industrial raw water customers. Lake Houston impounds the East and West Forks of the San Jacinto River and its water rights are solely owned by the city.

The region has a fascinating history. In the late 17th century, an east-west trail was established for military use by Spanish explorer Alonzo DeLeon. The trail got its name from the Spanish settlement, Atascosito now known as Liberty, Texas. By 1820, the trail had become the most traveled road in Texas, connecting San Antonio, San Felipe, and Atascosito. The old trail crossed the San Jacinto River where FM 1960 crosses Lake Houston. Early pioneers of the piney woods and grassy prairies depended on local rivers, streams and rainwater catchment for their daily water needs. Settlers in Harrisburg and Houston pumped water from Buffalo Bayou and in 1839 artesian water from a Heights-area spring could be purchased in 30-gallon barrels for 75 cents. Fortunately, Houston water customers no longer have to go to such lengths for a shower, shave or a cool drink of water. The first City Water Works Plant was built by New York investors in 1879 and for the next eight years untreated water from Buffalo Bayou was pumped through city water mains. Additional wells were drill to supplement supply, however community leaders realized that additional water resources were crucial to the region's continued economic growth.

In 1906, under Mayor Baldwin Rice, the city purchased the waterworks, and created a position for a Water Commissioner to run the municipal water works. During the next 50 years, Houston would become an international shipping port, an oil and gas boom town, and a sprawling metropolis nurtured by such leaders as Jesse H. Jones and Oscar Holcombe. A decisive action by Mayor R. H. Fonville in 1937 ensured the region's long term growth and economic prosperity. Houston city engineers returning from a state water board meeting in Austin reported to Mayor Fonville that a private firm was planning to file for water rights on the San Jacinto River. The Mayor instructed

the engineers to take immediate action to thwart the private firm's plans. Since the mayor received this news on a weekend when city offices were closed for business, Fonville wrote a personal check to cover the cost of the water rights application. This swift action by city officials would lead to the construction of the Lake Houston reservoir nearly 20 years later. (To read more History of Houston's Drinking Water, visit www.publicworks.houstontx.gov/utilities/drinkingwater.htm)



Lake Houston Dam under construction - 1953
Courtesy of WaterWorks Museum & Education Center