

2017

City of Tempe

Water Quality Report



Tempe

*This report is also available at
www.tempe.gov/ccr*



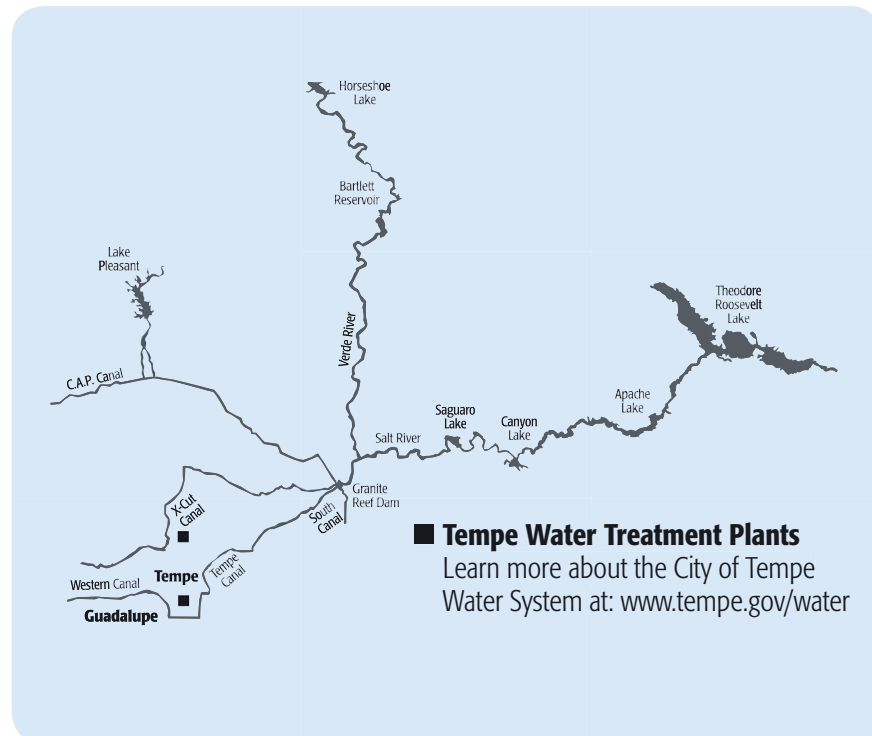
The City of Tempe is pleased to provide our customers with Tempe’s annual “Consumer Confidence Report” for calendar year 2017. This report provides information regarding the quality of drinking water provided by the City of Tempe. Included is a listing of results from required water quality tests, as well as an explanation of where our water comes from and tips on how to interpret the data. The City of Tempe is committed to delivering safe, high quality water to our customers.

El informe contiene información importante sobre la calidad del agua en su comunidad. Tradúzcalo o hable con alguien que lo entienda bien. Póngase en contacto con el Departamento de Comunicaciones de la Ciudad de Tempe al (480) 350-2860.

If other people, such as tenants, residents, patients, students, or employees receive water from you, it is important that you provide this report to them by posting it in a conspicuous location or by direct hand or mail delivery.

Overview

In 2017, the City of Tempe Water Utilities Division of the Public Works Department distributed 17.5 billion gallons of water to Tempe and Guadalupe customers. In addition to testing that we are required to perform, the results of which are provided in this report, our water system routinely monitors for additional substances and microscopic organisms to make certain our water is safe and of the highest quality. For more information, please contact the City of Tempe at (480) 350-2860.



Water Sources

In 2017, the drinking water in Tempe was produced at two conventional surface water treatment plants and ten groundwater wells. The Johnny G. Martinez Water Treatment Plant is located at 255 E. Marigold Lane. The South Tempe Water Treatment Plant is located at 6600 S. Price Road. The City of Tempe provides water to its customers from several sources:

Central Arizona Project (CAP) water – Beginning its journey from Lake Havasu, Colorado River water is delivered through the CAP canal system to central Arizona, including the Phoenix and Tucson areas. Tempe used 1.3 billion gallons (or 3.5 million gallons per day) of Colorado River water delivered by CAP for municipal use in 2017.

Salt River Project (SRP) water – This water is collected from the Salt and Verde River watersheds, stored in six SRP reservoirs and diverted into SRP canals at the Granite Reef Dam in Mesa. SRP also relies on groundwater wells to supplement surface water in the canal system. Tempe’s allocation of SRP water depends on the amount of runoff from the watershed and the amount of water available in storage in SRP reservoirs, and therefore varies from year to year. Tempe’s SRP water use for 2017 was 12.5 billion gallons (or 34.2 million gallons per day).

Groundwater – In 2017, Tempe used ten of its groundwater wells to supplement the supplies of Central Arizona Project water and Salt River Project water. Tempe pumped 3.7 billion gallons (or 10 million gallons per day) of water from its wells, which was a combination of groundwater and surface water previously stored underground in our aquifers.

Contaminants in Drinking Water

In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The levels of contaminants in Tempe’s finished water are largely determined by source water, which can vary from year-to-year depending on watershed conditions, reservoir storage, and the volume of groundwater pumped. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants in tap water and potential health effects can be obtained by calling the Safe Drinking Water Hotline (800) 426-4791. Information on bottled water can be obtained from the Food and Drug Administration.

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. Contaminants that may be present in source water include the following:

- (A) microbial contaminants, such as viruses and bacteria, that may be from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;
- (B) inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;
- (C) pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;
- (D) organic chemical contaminants, including synthetic and volatile organics that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff and septic systems; and
- (E) radioactive contaminants that can be naturally-occurring or can be the result of oil and gas production and mining activities.



Tempe Drinking Water Quality

The following tables show regulated substances that were required to be tested and were detected in Tempe drinking water in 2017. Tempe monitored for many more substances which were not detected. The tables contain the name of each substance detected, the highest level allowed by regulation, the ideal goals for public health, the amount detected, and the usual sources of such contamination. Certain contaminants are required to be monitored less than one time per year because concentrations of these contaminants are not expected to vary significantly from year to year. For those contaminants that were not required to be tested in 2017, this report includes data from the most recent required testing.

Tempe maintained compliance with all Safe Drinking Water Act Maximum Contaminant Levels (MCL) with the exception of Total Trihalomethanes (TTHM) at one of eight compliance sampling sites. The results from site A-10 in west Tempe, on the southeast corner of Baseline Road and 48th Street exceeded the Locational Running Annual Average (LRAA) for the sample collected in May 2017. The LRAA is determined by averaging the samples collected at a sampling location for the four most recent calendar quarters. The sample collected at A-10 in May 2017, caused the LRAA for the period between August 2016 and May 2017 to exceed the MCL of 80 ppb, with a level of 85 ppb. Measures were immediately taken to meet compliance levels and the sampling site was determined to be back in compliance upon results of the next quarterly sample. TTHMs are a combination of four volatile organic compounds that form when disinfectants, such as chlorine, react with natural organic matter in the water. People who drink water containing TTHMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

The City of Tempe distributed a public notice on June 12, 2017 announcing the violation and implemented several immediate responses to ensure that TTHMs returned to target levels. Response measures included:

- Using wells to blend TTHM-free water into the system
- Flushing at strategic locations within the water system
- Chemical adjustments at water treatment plants

Tempe conducted daily water sampling to evaluate the effectiveness of these and other strategies. Water Utilities staff worked 24 hours a day, 7 days a week to resolve the issue as quickly as possible. In addition to these measures, Tempe performed a comprehensive Operation Evaluation Level (OEL) study and prepared a report to identify possible causes and implement corrective measures. Compliance sampling conducted on August 8, 2017 at location A-10 produced results that returned Tempe to compliance.



Definitions and Acronyms:

Action Level (AL): The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a public water system shall 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.

Non-Detect (ND): Not detected in sample.

Not Applicable (N/A): Does not apply.

Parts per billion (ppb) or micrograms per liter (ug/l)/
Parts per million (ppm) or milligrams per liter (mg/l): Units used to measure the concentration of a substance found in water. One ppm is approximately equal to ½ gallon of water in an Olympic sized swimming pool. One ppb is a thousand times less than one ppm.

Picocuries per liter (pCi/L): A measure of radioactivity.

Running Annual Average (RAA): The average of analytical results for samples taken during the previous four calendar quarters.

Locational Running Annual Average (LRAA): RAA for a specified location.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Variations and Exemptions: State or EPA permission to not meet an MCL or a treatment technique under certain conditions.

Substance	Unit	MCL	MCLG	Level Detected / Range	Violation (Yes or No)	Major Sources
Arsenic	ppb	10	0	1.6 - 5.6	No	Erosion of natural deposits.
Barium (2014)	ppm	2	2	0.055 - 0.14	No	
Chlorine	ppm	4 MRDL	4 MRDLG	0.20 - 1.5	No	Disinfectant added to control microbial contaminants.
Chromium (Total) (2014)	ppb	100	100	ND - 7.9	No	Erosion of natural deposits.
Fluoride	ppm	4	4	0.14 - 1.3	No	Erosion of natural deposits; water additive which promotes strong teeth.
Gross Alpha (2014)	pCi/L	15	0	1.8 - 10	No	Erosion of natural deposits.
Nitrate	ppm	10	10	ND - 8.6	No	Runoff from fertilizer use.
Selenium (2014)	ppb	50	50	ND - 1.6	No	Leaching of natural deposits; discharge from metal refineries and mining.
Tetrachloroethylene (2014)	ppb	5	0	ND - 0.73	No	Discharge from factories and dry cleaners.
Total Organic Carbon	ppm	TT	N/A	ND - 3.5	No	Naturally present in the environment.
Uranium (2014)	ppb	30	0	0.90 - 7.7	No	Erosion of natural deposits.

* Range includes calculated running annual averages.

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.

Fluoride - In addition to compliance sampling, fluoride is monitored daily at both Tempe water treatment plants and reported to Arizona Department of Health Services monthly for oral health monitoring. The ranges reported in the table above are combined results from the daily treatment plants and system site monitoring.

Nitrate - Nitrate in drinking water at levels above 10 ppm is a health risk for infants less than six 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, you should ask for advice from your healthcare provider.

Substance	Unit	Action Level	90 th Percentile Result	# of results above action level	Violation (Yes or No)	Major sources
Copper (2015)	ppm	1.3	0.25	0	No	Corrosion of household plumbing systems.
Lead (2015)	ppb	15	8.4	4	No	Corrosion of household plumbing systems.

50 Households tested for lead and copper.

Lead - 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 Tempe is responsible for providing high quality drinking water, but cannot control the variety of materials used in home 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 two 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 <http://water.epa.gov/drink/info/lead/index.cfm>.

Substance	Unit	MCL	High	Lowest monthly % meeting limit	Violation (Yes or No)	Major Sources
Turbidity	NTU (Nephelometric Turbidity Units)	TT = 1; and not less than 95% ≤ 0.3 NTU	0.16	100%	No	Soil runoff into canals.

Turbidity is a measure of the cloudiness of the water. Turbidity is monitored because it is a good indicator of water quality. High turbidity can reduce the effectiveness of disinfectants.

Tempe's Approach to Lead

Lead in drinking water comes from the leaching of lead from service lines, plumbing, fixtures, and solder as water is being delivered by a water provider to its customers. There are several important factors that can impact the levels of lead in water: the age of plumbing; type of materials used; workmanship; size of pipes within the customer's household or structure; and the corrosivity of the water delivered by the water provider.

Tempe's water is not considered corrosive. The water in Tempe is considered "hard", meaning it is more likely to deposit constituents than to leach them. Hard water can be seen as a nuisance, but the depositional quality of hard water in general makes it non-corrosive. Every three years Tempe monitors a cross-section of households within the City that are considered to be most vulnerable to the possibility of lead leaching from plumbing and fixtures. These are predominantly homes built between 1982 and 1988 when lead solder was used to install plumbing and fixtures. Tempe consistently complies with the EPA's action level for lead. The City provides any individual household for which testing indicates lead above the EPA's action level with notice and a suggested course of action for the household to take to reduce that level.

In 2017, Arizona Department of Environmental Quality (ADEQ) took the central role in an initiative to evaluate approximately 7,000 school buildings across the state for student exposure to lead through on-premise plumbing fixtures. As part of the Public School Drinking Water Lead Screening Program, Tempe partnered with ADEQ to provide support by offering city staff for sampling and laboratory analyses at 36 public schools within Tempe. The data is presented in Arizona's Public School Drinking Water Lead Screening Program report and can be found at http://static.azdeq.gov/dw/lead_screening.pdf.

Substance	Unit	MCL	MCLG	Result	Violation (Yes or No)	Major Sources
E-coli	Absent or Present	Positive repeat sample with original or repeat result having positive E-Coli OR failing to take or test repeat samples for E.coli	0	Absent	No	Naturally present in the environment.

Substance	Unit	MCL	Highest Locational Running Annual Average	Range (single sample)	Violation (Yes or No)	Major Sources
Total Trihalomethanes (TTHM)	ppb	Running Annual Average of 80	85	2.5 - 118	Yes	By-products of drinking water chlorination.
Total Haloacetic acids (HAA)	ppb	Running Annual Average of 60	25	ND - 44	No	

Total Trihalomethanes (TTHM) - Some people who drink water containing TTHMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

Special Information for Immuno-compromised People

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

Cryptosporidium

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. Although filtration removes Cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates, although infrequent, these organisms are present in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Based on source water monitoring for Cryptosporidium at Tempe's two water treatment plants between October 2003 and October 2006, Tempe's source water was determined to be low risk under EPA's regulations for cryptosporidium, and no additional measures were required. Recent results collected between 2015-2017 will result in no additional treatment requirements, but will require Tempe to maintain ongoing documentation of effective disinfection practices.

Source Water Assessment Summary

ADEQ completed an assessment of the source waters and drinking water wells for Tempe's public water system in 2004. The assessment reviewed the hydrologic settings in which sources are located and any adjacent land uses that may pose a potential contamination risk to water sources. These potential risks include, but are not limited to, gas stations, landfills, dry cleaners, agricultural fields, wastewater treatment plants, and mining activities. ADEQ categorized sources as either "high risk" or "low risk" to future contamination (either natural or manmade). A designation of high risk indicates there are additional source water protection measures that can be implemented at the local level. A low risk designation indicates that most source water protection measures are either already implemented, and/or the hydrogeologic setting is such that it is protective of the source water.

ADEQ categorized all surface water sources as high risk because they are open to the atmosphere. The overall risk posed to surface water is addressed by EPA through its increased monitoring requirements for surface water sources.

Most of Tempe's drinking water wells were designated at low risk in the ADEQ 2004 source water assessment. However, two wells were considered at high risk for possible future contamination based upon adjacent land use. The two wells are located within the boundaries of the South Indian Bend Wash Superfund Site in Tempe (SIBW). EPA's first five-year review of the SIBW (September, 2011) suggests that the risk to these wells is decreasing. Tempe continues to regularly conduct monitoring of drinking water from all wells to ensure that nearby land use has not impacted the source water. Regular monitoring provides time for Tempe to sever contaminated sources from Tempe's drinking water infrastructure well in advance of reaching concentrations that posed a public health risk. For more information on the SIBW visit the following website: <http://www.epa.gov/region9/cleanup/arizona.html>

The complete Source Water Assessment is available for review at ADEQ, 1110 W. Washington St., Phoenix, AZ 85007, or you may request an electronic copy from ADEQ by phone: (602) 771-4597. For more information visit the ADEQ website at: <http://azdeq.gov/environ/water/dw/swap.html>

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Substances of Frequent Interest to Customers

Substance	Units	Average Value	Range of Values
Alkalinity	ppm	140	110 - 380
Aluminum	ppm	0.063	ND - 0.13
Boron	ppm	0.15	0.095 - 0.6
Bromide	ppm	<0.05	ND - 0.23
Calcium	ppm	52	39 - 110
Chloride	ppm	211	58 - 430
Conductivity	µmhos/cm@25°C	1200	560 - 2300
Hardness	ppm	210	180 - 450
Hardness	grains /gallon	12.3	10.5 - 26.3
Hexavalent chromium	ppb	< 10.0	ND
Iron	ppm	<0.05	ND - 1.4
Magnesium	ppm	23	19 - 51
Manganese	ppm	<0.001	ND - 0.33
Nickel	ppb	<5.0	ND
pH	pH units	7.2	6.3 - 8.3
Potassium	ppm	4.7	2.7 - 6.6
Radon (2008)	pCi/L	346	ND - 688
Silica	ppm	15	8.4 - 33
Silver	ppb	<0.25	ND
Sodium	ppm	150	45 - 350
Sulfate	ppm	100	48 - 170
Temperature	°F	76	56 - 95
Total Dissolved Solids	ppm	650	330 - 870
Zinc	ppm	<0.02	ND - 0.054

Radon - Radon is a radioactive gas that occurs naturally in groundwater and is released from water into the air during household use. Compared to radon entering the home through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. For additional information, call Arizona Radiation Regulatory Agency (ARRA) at (602) 255-4845 or contact EPA's Radon Hotline (800) 767-7236.

If you have questions about the information provided in this report or about your tap water, call the City of Tempe at (480) 350-2860.

Residents are invited to address the Tempe City Council about water quality issues during regularly scheduled Council meetings. The Council meetings are usually every other Thursday. The schedule and agendas may be found online at www.tempe.gov/clerk or by calling (480) 350-4311. For additional information, visit Tempe's web site at www.tempe.gov/waterquality, visit www.tapintoquality.com or see information provided by the U.S. Environmental Protection Agency (EPA) at www.water.epa.gov/drink/.



www.tapintoquality.com

