

# 2005 Annual Water Quality Report

## Water Quality Management Division

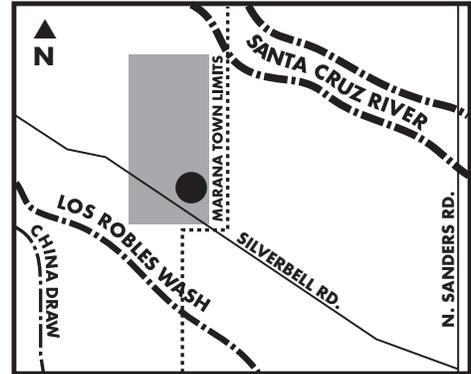
*During 2005, Tucson Water ensured that your drinking water met all drinking water standards*

This Annual Water Quality Report provides information on your drinking water. The United States Environmental Agency (USEPA) requires that all drinking water suppliers provide a water quality report to their customers on an annual basis. This report also serves as a reference with important information on the quality of water and with contacts and phone numbers you may need from time to time.

### **SOURCE WATER ASSESSMENT PROGRAM (SWAP):**

Arizona Department of Environmental Quality has completed a source water assessment of this System, which evaluates the risk of contamination from human activities. The water sources for this system are categorized as "low risk of contamination from human activities".

Si usted desea este documento escrito en español, por favor, llame al 791-4331.



Silverbell West System is a small water system serving approximately 85 homes. The system was served by well W-001A for the first 8 months of 2005. A new well, W-001B was completed and has served this system since August of 2005. This new well has been screened to produce water from a selected depth beneath the surface, from an area of the aquifer which meets all the drinking water standards. This was the most effective solution to meet the new arsenic standard. It has proven to meet all water quality standards.



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## Why are there contaminants in my drinking water?

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. Tucson's groundwater contains dissolved minerals and organic compounds, which have been leached from rocks, sediments, and plant minerals through which the water travels. One would expect to find beneficial minerals such as calcium and magnesium, harmless minerals such as chloride, bicarbonate, and sulfate, and metals such as iron, copper, arsenic, and lead, which may be either beneficial or harmless at low concentrations, but harmful at high concentrations. In addition to these naturally occurring contaminants, groundwater may contain contaminants resulting from human, industrial, or domestic activities. For this reason, water utilities must currently monitor for approximately 90 regulated and 12 unregulated contaminants.

The following language is required by the USEPA to appear in this report, some of which may not be applicable to deep groundwater wells, the source of the this water supply:

*Contaminants that may be present in a source water can include:*

- *Microbial contaminants, such as viruses and bacteria, which may come from sewage, agricultural livestock, 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, urban stormwater 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 stormwater runoff, and septic systems.*
- *Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.*

In order to ensure that tap water is safe to drink, USEPA regulations limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health. Bottled water may come from either a surface water source or groundwater source, and may be treated minimally or extensively. For information on the quality of your bottled water, contact the water bottling company.

## Were there any contaminants in my drinking water?

Tucson Water regularly samples the drinking water that is delivered to you. Much of this testing is required by drinking water regulations. In addition to this required monitoring, we perform a great deal of discretionary monitoring in order to provide both Tucson Water staff and customers with additional information.

The Detected Contaminants Table lists all contaminants that were detected in the required drinking water monitoring. Two inorganic contaminants of special interest are arsenic and fluoride, which are naturally occurring. For more information, please see the table and the specific explanations, which follow the table.

In most cases, the minimum detectable level of a contaminant is well below the USEPA regulatory limit for that contaminant. To compare the detected amount with the amount allowed by the USEPA, refer to the Maximum Contaminant Level (MCL) column in the table. The vast majority of regulated contaminants were not detectable in drinking water delivered by Tucson Water. The non-detected results were not included in the table. For a complete list of all USEPA regulated contaminants contact the USEPA at 1-800-426-4791 or visit the USEPA website at [www.epa.gov/safewater/mcl.html#mcls](http://www.epa.gov/safewater/mcl.html#mcls).

## How is my drinking water treated?

The groundwater delivered by Tucson Water meets all drinking water standards without treatment. However, approximately 0.8 parts per million (ppm) of chlorine is added to the drinking water supply to provide assurance that water delivered to customers will remain free of microbiological contamination. This also ensures that the water meets microbiological drinking water standards from the time it is pumped from the ground until it reaches the customer's tap.

## Do I need to take special precautions?

*While the Safe Drinking Water Act regulations are intended to protect consumers throughout their lifetime, some people may be more vulnerable to infections from drinking water than the general population. These "at-risk" populations include: immuno-compromised persons such as persons with cancer undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, and in some cases, elderly people and infants. These people should seek advice about drinking water from their health care providers. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the USEPA's Safe Drinking Water hotline.*

## Whom do I contact for more information?

For more information on this Tucson Water report contact Mohsen Belyani with the Water Quality Management Division. Call 791-5252 or e-mail your questions to [mohsen.belyani@tucsonaz.gov](mailto:mohsen.belyani@tucsonaz.gov).

### Telephone Numbers:

Tucson Water Public Information Office	791-4331
Tucson Water Quality Management Division	791-5252
Tucson Water Customer Liaison	791-5945
Tucson Water Customer Service/Billing	791-3242
Tucson Water 24 hour Emergency	791-4133

### Additional Information is also available from:

Tucson Water Website	<a href="http://www.tucsonaz.gov/water/">www.tucsonaz.gov/water/</a>
United States Environmental Protection Agency Safe Drinking Water Hotline	1-800-426-4791
USEPA Website	<a href="http://www.epa.gov/safewater/">www.epa.gov/safewater/</a>
City of Tucson	TTY#: 791-2639

## DETECTED CONTAMINANTS TABLE

Contaminant	Date	Maximum Result	Range	MCL	MCLG	Major Sources
<b>Inorganics</b>						
Arsenic	2005	20 ppb	4.8 - 20 ppb	50 ppb	None	Natural deposits
Barium	2005	0.08 ppm	0.05- 0.08 ppm	2 ppm	2 ppm	Natural deposits
Chromium	2001	<20 ppb	6.9 - <20 ppb	100 ppb	100 ppb	Natural deposits
Fluoride	2005	1.9 ppm	0.41 – 1.9 ppm	4 ppm	4 ppm	Natural deposits
Nitrate (as N)	2005	8.1 ppm	0.96 - 8.1 ppm	10 ppm	10 ppm	Natural deposits; septic tanks; agriculture; sewage
<b>Radiochemical</b>						
Adjusted Gross Alpha	2005	3.2 pCi/L	<1 – 3.2 pCi/L	15 pCi/L	0 pCi/L	Natural deposits
Radium 226 & 228 combined	2003	0.8 pCi/L	0.8 – 0.8 pCi/L	5 pCi/L	None	Natural deposits
Uranium	2005	9.1 ppb	8.3 – 9.1 ppb	30 ppb	0 ppb	Natural deposits
<b>Trihalomethanes (THMs)</b>						
Bromoform	2005	2 ppb	2 - 2 ppb			By-product of chlorination
Chlorodibromomethane	2005	0.7 ppb	0.7-0.7 ppb			By-product of chlorination
Total Trihalomethanes	2005	2 ppb	2 - 2 ppb	80 ppb		By-product of chlorination

Contaminant	Analysis Date	# of Samples Above the Action Level	90 <sup>th</sup> Percentile Value	Action Level	MCLG	Major Sources
<b>Lead and Copper in Standing Water Samples</b>						
Lead	2004	None	2.5 ppb	15 ppb	0	Corrosion of household plumbing systems
Copper	2004	None	0.025 ppm	1.3 ppm	1.3 ppm	Corrosion of household plumbing systems

Contaminant	Month with # of Coliform Detections	Positive Samples for the Month	Total # of Samples Collected for the Month	MCL	MCLG	Major Sources
<b>Microbiological</b>						
Total Coliform	November 2005	1	1	1 sample	0	Naturally present in environment

### Maximum Residual Disinfection Level (MRDL)

Contaminant	Annual Running Average	Monthly Average Chlorine Range	MRDL	MCLG	Major Sources of Contaminant
Chlorine	0.80 ppm	0.18 – 1.97 ppm	4 ppm	4 ppm	Disinfection additive used to control microbes

## DRINKING WATER TERMS AND DEFINITIONS

**Action level.** The concentration of a contaminant that if exceeded, triggers a treatment or other requirement 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. If a contaminant is believed to cause health concerns in humans, then the MCL is set as close as practical to zero and at an acceptable level of risk. Generally, the maximum acceptable risk of cancer is 1 in 10,000 with 70 years of exposure.

**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.

**Parts Per Billion (ppb).** Some constituents in water are measured in very small units. Organic compounds such as trihalomethanes are monitored by Tucson Water in terms of parts per billion (or micrograms per liter). To help you visualize how very small this unit is, we offer the following illustrations. One part per billion equals: One second of time in 31.7 years or the first 16 inches of a trip to the moon.

**Parts Per Million (ppm).** Many dissolved minerals such as sodium and calcium are monitored by Tucson Water in terms of parts per million (or milligrams per liter). To help you visualize how very small this unit is, we offer the following illustrations. One part per million equals: 2 ounces of water in a typical 15,000 gallon backyard swimming pool or one second of time in 11.6 days.

**Picocurie Per Liter (pCi/L).** The quantity of radioactive material in one liter which produces 2.22 nuclear disintegrations per minute.



## DETAIL INFORMATION ON DETECTED CONTAMINANTS

**Arsenic** USEPA has finalized a reduction in the arsenic drinking water standard from 50ppb to 10 ppb. All water utilities must meet this new standard beginning January 2006. While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. USEPA's new standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. USEPA continues to research the health effect 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 damages and circulatory problems.

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. In order to provide your neighborhood with drinking water which will meet the new 10 ppb drinking water standard for arsenic by 2006, Tucson Water drilled a new groundwater well. This well, W-001B, was completed and has served this system since August of 2005. It has been screened to produce water from a selected depth beneath the surface, from an area of the aquifer which meets all the drinking water standards. This was the most effective solution to meet the new arsenic standard. It has proven to meet all water quality standards. The highest arsenic concentration from the old well during 2005 was 20 ppb. The arsenic results from the new well ranged from 4.8 ppb to 7.1 ppb, with an average of 5.6 ppb.

**Barium** occurs naturally at very low concentrations in our groundwater.

**Chromium** is a trace metal and an essential nutrient; however, it can be toxic at high concentrations greater than the MCL especially in the hexavalent form, which is more common when the source is industrial waste.

**Fluoride** Monthly sampling was collected from the old well during January to August of 2005. The results ranged from 1.3 ppm to 1.8 ppm, with an average of 1.46 ppm. Tucson Water is providing this special notice to parents of children under the age of nine who live in the Silverbell West area. At levels around 1.0 ppm, fluoride can help to form healthy teeth and bones and prevent cavities. However, children whose permanent teeth are still developing and whose drinking water contains more than 2.0 ppm of fluoride may develop a cosmetic discoloration of their permanent teeth (dental fluorosis.) There is some concern that additional exposure to fluoride from swallowing fluoridated toothpaste or by taking fluoride supplements may present a risk of fluorosis in children less than nine years old. Public health authorities advise against fluoride supplements if your water contains more than 1.0 ppm of fluoride. You may want to contact your dentist for more specific recommendations for reducing the risk of cosmetic discoloration while maintaining protection against dental cavities. Monthly fluoride results from the new well during August to December of 2005 ranged from 0.47 ppm to 0.49 ppm, with an average of 0.50 ppm.

**Nitrate** is a form of nitrogen and an important plant nutrient. Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Tucson water performs extra monitoring on wells high in nitrate for extra assurance that action can be taken when approaching the MCL. Nitrate results from the new well during 2005 ranged from 5.1 ppm to 8.1 ppm, with an average of 5.9 ppm.

**Adjusted Gross Alpha** is a measure of radioactivity due to naturally occurring minerals in groundwater. The MCL for

gross alpha radioactivity is set at 15 picocuries per liter (pCi/L). This excludes the radioactivity contributed by either radon or uranium.

**Radium 226 and 228** are two of the most common radium isotopes. Radium is a naturally occurring radionuclide, formed by the decay of uranium or thorium in the environment. It occurs at low concentrations in virtually all rock, soil, water, plants, and animals. During 2003 an extensive sampling of these two isotopes was performed at our wells. For this system, the highest concentration found for radium 226 was 0.4 pCi/L and for radium 228 was also 0.4 pCi/L (the MCL is 5 pCi/L for both isotopes combined).

**Radon** is a naturally occurring radioactive gas that may cause cancer, and may be found in drinking water and indoor air. While ingesting radon in drinking water has a small risk, inhaling radon is a primary health concern, particularly for smokers or ex-smokers. Radon diffusing up from the soil into homes and buildings is usually the main source of radon in indoor air. Only about 1-2 percent of radon in indoor air comes from drinking water.

If you are concerned about radon in your home, you should test your house and install controls if you find a level of 4 pCi/L or higher in your indoor air. For more information, call USEPA's Radon Hotline (800-SOS-RADON) or visit the web site <http://www.epa.gov/iaq/radon/>. The USEPA does not currently have a final regulation for radon in drinking water. Extra radon monitoring was performed on Tucson Water wells in two quarters in 2000. Test results indicate that when compared with other communities across the country, Tucson has fairly typical concentrations for radon in the water supply.

**Uranium** is a heavy metal, which is highly toxic and radioactive. The USEPA has set a new standard of 30 ppb for uranium, which water systems must have met since December 2003.

**TTHMs** are formed when chlorine combines with naturally-occurring material in water. Because the level of organic matter in our groundwater is extremely low, these compounds are found at very low concentrations.

**Lead and Copper** are naturally occurring metals, which are generally found at very low levels in some waters. However, these levels can increase when water contacts plumbing materials containing lead pipe, lead soldered copper tubing, or brass. Infants and young children are typically more vulnerable to lead in drinking water than the general population. While Tucson Water is well within standards, concerned customers can take an extra precaution to protect children from lead leached from new brass faucets by running the water for a few seconds and using the water for something other than drinking. This is especially important if the water has been sitting in the pipes for a few hours or more. These same precautions also help to give you a better-tasting water.

**Coliform Bacteria** are very commonly found in the environment and in the digestive tract of animals. While rarely harmful, presence of Coliform bacteria in drinking water is an indicator that the water may also contain harmful microorganisms.

**Chlorine Disinfection** Approximately 0.8 ppm of chlorine is added to the drinking water supply to provide assurance that water delivered to customers will remain free of microbiological contamination. This also ensures that the water meets microbiological drinking water standards from the time it is pumped from the ground until it reaches the customer's tap. Chlorine Residual Disinfection is measured from sample station where the bacteriological samples are collected monthly. The annual Chlorine Residual is calculated using the monthly average chlorine for the past 12 months.