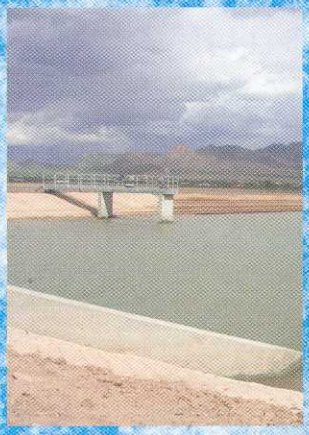
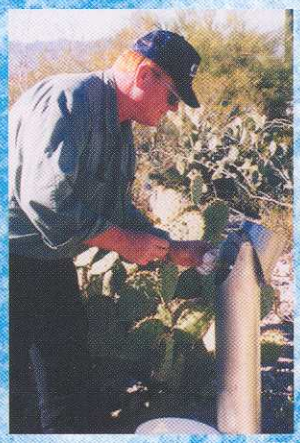
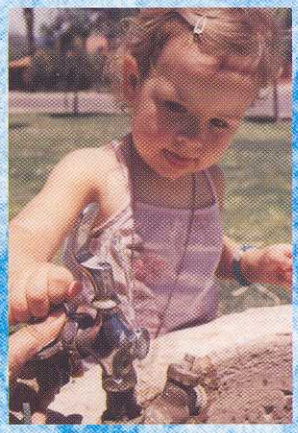
TUCSON WATER

2002





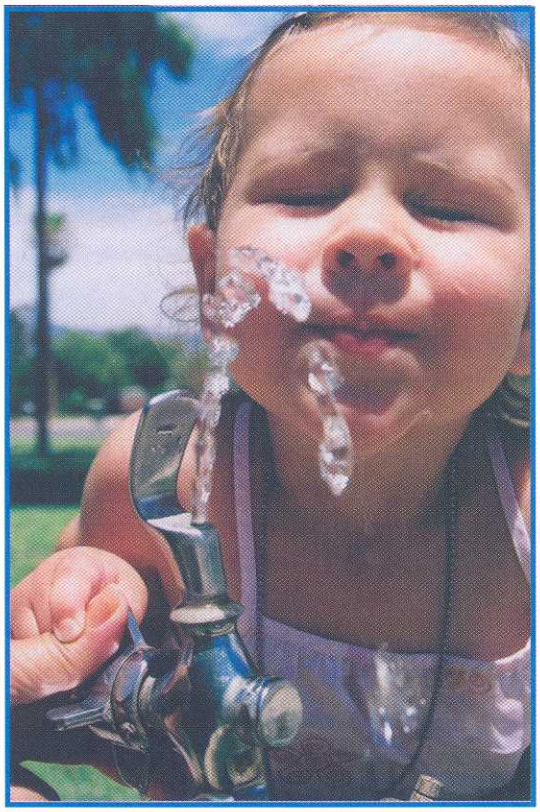


Annual Water Quality Report

Water Quality Management Division

TUCSON WATER

2002 Annual Water Quality Report



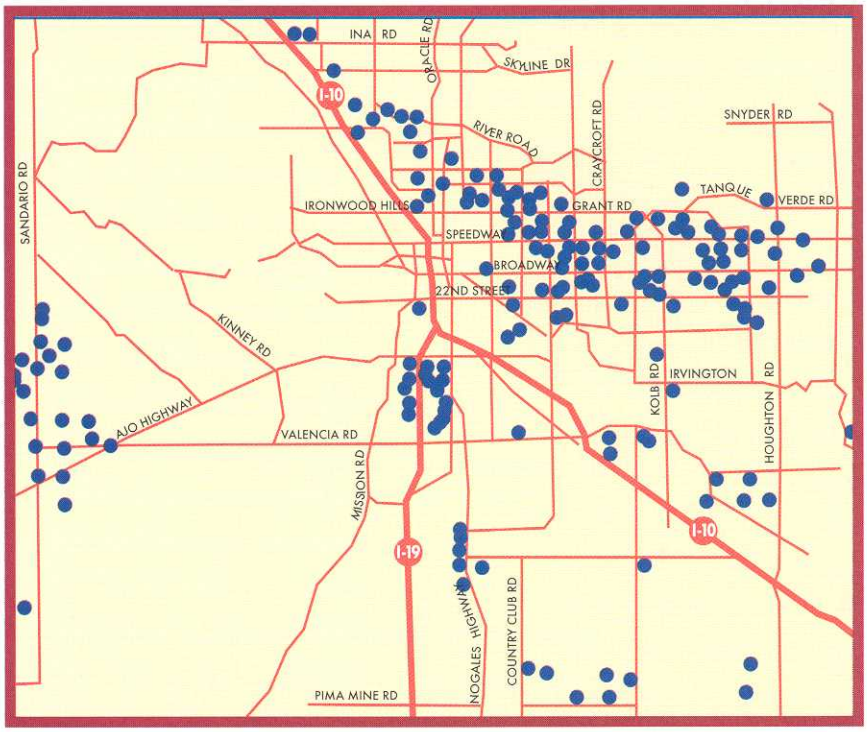
Tucson Water is pleased to provide our customers with this fifth Annual Water Quality Report. The publishing of this report is required annually by the Safe Drinking Water Act and State of Arizona regulations. This report will also serve as a reference with important information on the quality of water we deliver and will provide you with contacts and phone numbers you may need from time to time.

The Report Contains:

- Your drinking water source
- Contaminants detected in our drinking water
- Expected drinking water contaminants
- Detected contaminants table
- Definitions of technical and regulatory terms
- Detail information on detected contaminants
- Any monitoring failure or violations?
- How is our drinking water treated?
- Contacts for more information
- A better tasting tap water!

YOUR DRINKING WATER SOURCE

In 2002, Tucson Water served about 675,000 people in the Tucson area. The water supply came from approximately 185 groundwater wells located in and around the Tucson metropolitan area (see map). In urban Tucson, most of the wells (also known as Points of Entry or POE) serve the neighborhood in which they are located, with excess supply routed to reservoirs for use elsewhere in the system. Wells located outside the urban core often deliver water to a single "collector" main prior to delivery to customers. In these cases, the collector main is termed a "combined Point Of Entry (POE)" to the drinking water system. The Tucson Water system has four combined POEs: the Clearwater well field (which delivers a blend of recharged CAP water and groundwater), the Southern Avra Valley well field, the Santa Cruz well field, and the South Side well field, which includes treated water from Tucson Airport Area Remediation Project (TARP).



If you are a non-English speaking resident, we recommend that you speak with someone who understands the report. Call our Public Information Office at 791-4331 for a copy of this report in Spanish.

CONTAMINANTS DETECTED IN OUR 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 table on page 4 lists all contaminants that were detected in either the required or the discretionary drinking water monitoring.

Three inorganic contaminants of special interest are arsenic, fluoride, and nitrate. Fluoride and arsenic are naturally occurring and tend to increase as water is drawn from greater depths. Nitrate, on the other hand, is typically found in higher concentrations near the surface of the groundwater table because it is frequently associated with fertilizer use, septic tanks and other human activities. For more information, please see the Detected Contaminants Table and the specific explanations, which follow the table.

It is important to remember that the detection of a contaminant in drinking water does not necessarily represent a threat to public health. Current technology allows water utilities to detect extremely low levels of contaminants in drinking water. A detected result means a concentration that is above the minimum value that can be measured by the laboratory. 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/ogwdg/wot/appa.html.

A SPECIAL NOTE TO AT-RISK POPULATIONS

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.

EXPECTED DRINKING WATER CONTAMINANTS

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 the rock, sediments, and plant materials through which the water traveled. 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, our 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 Tucson 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.

DETECTED CONTAMINANTS TABLE- Regulated Contaminants

NOTE: This table does not contain contaminants tested for but not detected.

Inorganics Contaminant	*Maximum Result*	*Range*	*MCL*	*MCLG*	*Major Sources*
Arsenic	11 ppb	< 2 – 11 ppb	50 ppb	None	Natural deposits
Barium	0.065 ppm	< 0.02 – 0.065 ppm	2 ppm	2 ppm	Natural deposits
Fluoride	1.8 ppm	< 0.1 – 1.8 ppm	4 ppm	4 ppm	Natural deposits
Nitrate (as N)	6.8 ppm	<0.25 – 6.8 ppm	10 ppm	10 ppm	Natural deposits; septic tanks; agriculture; sewage
Radiochemical Contaminant					
Adjusted Gross Alpha	3.7 pCi/L	1.0 – 3.7 pCi/L	15 pCi/L	0 pCi/L	Natural deposits
Radon Activity	684 pCi/L	466 – 684 pCi/L	No MCL	None	Natural deposits
Uranium Activity	14.3 pCi/L	2.8 – 14.3 pCi/L	30 pCi/L	0 pCi/L	Natural deposits
Volatile Organics Contaminant					
Ethylbenzene	0.7 ppb	< 0.5 – 0.7 ppb	700 ppb	700 ppb	Solvent used in paint coatings; Component of aviation and automotive gasoline
Tetrachloroethene (PCE)	0.7 ppb	<0.5 – 0.7 ppb	5 ppb	0 ppb	Dry cleaning agent; degreaser
Total Xylenes	0.0031 ppm	<0.0005-0.0031 ppm	10 ppm	10 ppm	Solvent used in paint coatings, adhesives, and fuel
Synthetic Organics Contaminant					
Di(2-ethylhexyl)phthalate	1.1 ppb	< 0.6 – 1.1 ppb	6 ppb	0 ppb	Rubber and plastic manufacturing
Trihalomethanes[1] Contaminant					
Total Trihalomethanes (TTHMs)	11.5 ppb	< 0.5 – 11.5 ppb	80 ppb	0 ppb	By-product of chlorination
Annual Running Average for TTHMS	2.7 ppb				

Contaminant	*No. of Samples Above the Action Level*	*90th Percentile Value*	*Action Level*	*MCLG*	*Major Sources*
Lead and Copper in Standing Water Samples - 2002					
Lead	none	2.5 ppb	15 ppb	0	Corrosion of household plumbing systems
Copper	none	0.23 ppm	1.3 ppm	1.3 ppm	Corrosion of household plumbing systems

Microbiological Contaminant	*Months- Positive Coliform Detected*	*Number of Positive Samples for the Month*	*Total # of Samples Collected for the Month*	*MCL[2]*	*MCLG*	*Major Sources*
Total Coliform	July	3	255	≥ 5%	0	Naturally present in environment
	September	4	258	≥ 5%	0	Naturally present in environment
	October	1	249	≥ 5%	0	Naturally present in environment

[1] MCL for Trihalomethanes are based on the Annual Running Average.
[2] The MCL for microbiological contaminants is 5% of the total number of samples collected in the month.

DEFINITIONS OF TECHNICAL AND REGULATORY TERMS

Action level. The concentration of a contaminant which, 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.

Parts Per Billion (ppb). Some constituents in water are measured in very small units. One ppb equals one microgram per liter. For example, one part per billion equals: 2 drops of water in a 15,000 gallon backyard swimming pool, one second of time in 31.7 years, or the first 16 inches of a trip to the moon.

Parts Per Million (ppm). One ppm equals one milligram per liter or 1000 times more than a ppb. One ppm equals: 1/4 cup 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.

Point of Entry (POE). All water sources are monitored at the point of entry to the distribution system, before the first customer, but after any required treatment.

DETAIL INFORMATION ON DETECTED CONTAMINANTS

Arsenic USEPA recently finalized a reduction in the arsenic drinking water standard from 50 ppb down to 10 ppb. All water utilities must meet this reduced standard beginning January 2006. While your drinking water meets USEPA's reduced 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 cost 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 damage and circulatory problems. The highest arsenic concentration during 2002 was 11 ppb. For more information and a color coded map indicating the arsenic concentrations in our wells, please visit our website: www.cityoftucson.org/water.

Barium occurs naturally at very low concentrations in our groundwater. The highest barium value in 2002 was 0.065 ppm (MCL is 2 ppm).

Fluoride is an important naturally occurring mineral that helps to form healthy teeth and bones. A concentration of 1 ppm is considered optimum. At concentrations above 2 ppm, fluoride can cause mild discoloration of teeth, and exposure above the MCL of 4 ppm can cause both severe discoloration of teeth and over many years of exposure, bone disease. The highest level for fluoride during 2002 was 1.8 ppm (MCL is 4 ppm).

Nitrate is a form of nitrogen and an important plant nutrient. The highest level for nitrate in 2002 was 6.8 ppm. (MCL is 10 ppm). Tucson Water performs additional monitoring for wells high in nitrate for extra assurance that action can be taken when approaching the MCL. 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.

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. The highest level for gross alpha during 2002 was 3.7 pCi/l.

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. A comprehensive radon monitoring was performed on all Tucson Water wells in two quarters during 2000. Test results indicate that, when compared with other communities across the country, Tucson has fairly typical concentrations for radon in the water supply. For more information on radon, please visit our website: www.cityoftucson.org/water

Uranium is a metallic element, which is highly toxic and radioactive. The USEPA has just set a new standard of 30 ppb or approximately 30 pCi/l for uranium, which water systems must meet by December 2003. The highest level for uranium during 2002 was 14.3 pCi/l. The second highest was 4.8 pCi/l.

Synthetic Organic Contaminants (SOCs) The well monitoring program rarely detects SOCs, with the exception of a chemical called Di(2-ethylhexyl) phthalate, DEHP. Unlike VOCs, which have been repeatedly shown to readily migrate through soils to groundwater, SOCs are generally less mobile. DEHP, is the most commonly used of a group of related chemicals called phthalates or phthalic acid esters. The greatest use of DEHP is as a plasticizer for polyvinylchloride (PVC) and other polymers including rubber, cellulose and styrene. Because of its very broad use in plastic and rubber products DEHP is frequently a laboratory contaminate. In 2002, DEHP was detected in three wells, with highest concentration of 1.1 ppb (MCL is 6 ppb). Frequently the detection of this chemical is most likely the result of contamination in the collection or analysis process. At this time there is insufficient data to confirm the presence of SOCs in any of Tucson Water's wells.

Volatile Organic Compounds (VOCs) include such compounds as trichloroethylene (TCE) and tetrachloroethylene (PCE). VOCs are volatile, like alcohol or gasoline, and are made up of relatively small molecules, which allows them to migrate readily through soils. Solvents such as TCE and PCE have been commonly used for cleaning machine parts and for dry cleaning. These contaminants are often associated with industrial operations and landfills. Despite the vulnerability of groundwater to such contamination, Tucson Water's potable supplies are virtually free of such contamination.

Ethylbenzene and Xylenes are residual solvents, typically associated with the coatings used to protect new or refurbished water pressure tanks. These low concentration releases from pressure tank coatings rapidly decrease as the tank ages. In 2002 ethylbenzene was detected in one well at concentration of 0.7 ppb (MCL is 700 ppb), and total xylenes was detected also in one well at concentration of 0.0031 ppm (MCL is 10 ppm).

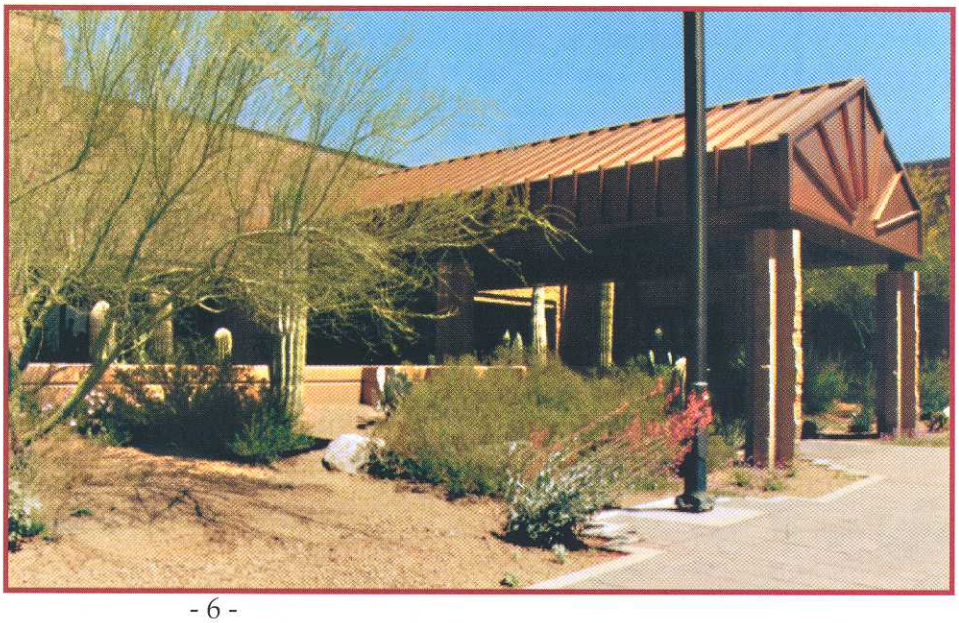
Tetrachloroethylene (PCE) is a solvent used by industry and dry cleaners. It was detected in one well, at concentration of 0.7 ppb (MCL is 5 ppb).

Methyl-tert-butyl Ether (MTBE) was detected in only a single well during the previous year, 2001 at the very low concentration of 0.6 ppb. MTBE is a popular gasoline additive used to reduce air pollution. EPA is currently reevaluating its use due to its threat to water supplies. While MTBE is not thought to be a significant health threat at low concentrations, it has a very low taste and odor threshold and is difficult to remove from drinking water supplies by treatment. Unlike most VOCs, MTBE is very soluble in water. This property allows it to move readily with percolating water and contaminate groundwater much more readily than the less soluble components of gasoline. MTBE does not appear to present a major threat to Tucson's groundwater supplies.

Total Trihalomethanes (TTHMs) are formed when chlorine combines with naturally occurring organic material in water. Since the level of organic matter in our groundwater is extremely low, these compounds are found at very low concentrations. The compounds that make up the TTHMs include chloroform, bromodichloromethane, bromoform, and chlorodibromomethane. The highest result during 2002 for the Total THM was 11.5 ppb and the highest concentration for any of the four compounds was 4.6 ppb for chlorodibromomethane. Compliance with the TTHM standard is based on the quarterly running average concentration at 16 distribution monitoring points. The annual running average for the 4 quarters of 2002 was 2.7 ppb. The standard is 80 ppb.

Lead and Copper are naturally occurring metals, which are generally found at very low levels in source waters. However, these levels can increase when water contacts plumbing materials that contain lead or copper or brass. Infants and young children are 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, Coliform bacteria in drinking water are an indicator that the water may also contain harmful microorganisms.



MONITORING WAIVERS

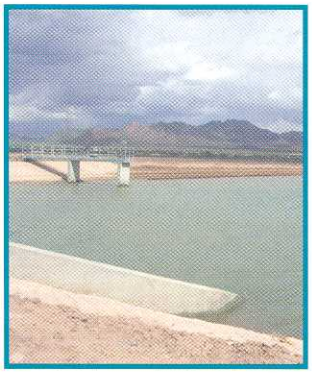
The Arizona Department of Environmental Quality, the regulatory agency for all public water suppliers in Arizona, grants waivers for certain monitoring requirements during a year. Waivers are granted for specific contaminants if previous monitoring results, and the land uses within a half-mile radius of the well, allows ADEQ to conclude that the risk of contamination by a specific substance is very low.

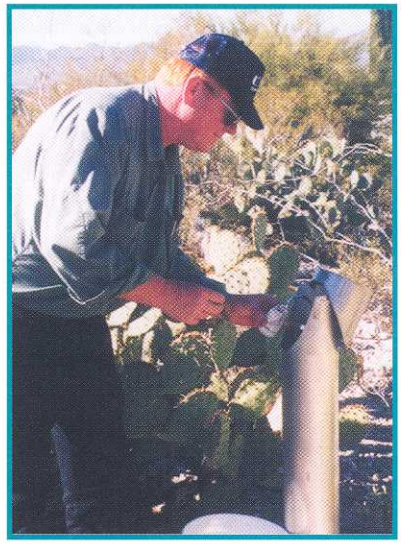
ANY MONITORING FAILURES OR VIOLATIONS?

At the end of each quarter, Tucson Water conducts an internal audit of compliance monitoring records to verify that all required monitoring has been completed and reported to the State. There have been no monitoring failures or violations during 2002.

WHAT ABOUT CAP WATER?

City of Tucson has rights to approximately 139,000 acre-feet of Colorado River water per year, delivered through the Central Arizona Project (CAP). In 2002, the City of Tucson's Colorado River allocation was not used directly, but a portion of this allocation was recharged. The CAP allocation utilized by Tucson Water at the end of 2002 was 21%. At the Clearwater Renewable Resource Facility located in Avra Valley, Tucson Water is recharging a portion of the City's available CAP supply by delivering the river water to shallow basins and allowing the water to percolate (or recharge) naturally through the earth to reach and blend with the groundwater below. Tucson Water began delivery of this blend of recharged Colorado River water and groundwater May 3, 2001. At the end of 2002, the blend was about 90% native ground-water and 10% Colorado River water. Over time, it will contain an increasing percentage of recharged Colorado River water. Information on the quality of this blend is contained in this report, and more information is available on Tucson Water's web site.





HOW IS OUR DRINKING WATER TREATED?

The groundwater delivered by Tucson Water meets all drinking water standards without treatment, with the exception of the water supplied from the Tucson Airport Area Remediation Project (TARP). See more about TARP below. However, approximately 0.8 ppm of chlorine is added to the drinking water supply at well sites, reservoirs and other facilities 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.

MORE ABOUT TARP

The TARP program was developed in order to clean and make beneficial use of water contaminated with the industrial solvent trichloroethylene (TCE). Tucson Water operates TARP under an agreement with the USEPA and other industrial and governmental agencies, which pay for operation of the TARP program.

Nine wells extract the contaminated water and deliver it through a pipeline to a treatment plant that removes the TCE from the water. The TARP treatment plant uses an "air stripping" process which forces volatile contaminants such as TCE to evaporate from the water into air. The air is then passed through activated carbon filters, which removes the airborne TCE. The TARP plant treats approximately 6.2 million gallons of water per day. During 2002, this plant treated a total of approximately 2.3 billion gallons of water.

As part of the TARP monitoring, a new compound called 1,4-Dioxane was detected using recent improvements in analytical methods. The laboratory's minimum reporting limit for this chemical is 1 ppb. At this time, there is no limit set by EPA for 1,4-Dioxane. However, the EPA Office of Drinking Water has a Health Advisory Level of 3 ppb. It was detected at one location in 3 out of 6 monthly analyses. The highest concentration was 1.8 ppb. 1,4 Dioxane is used primarily as a stabilizer in chlorinated solvents, particularly 1,1,1-Trichloroethane (TCA).

WHOM DO I CONTACT FOR MORE INFORMATION?

For more information on this Tucson Water report contact Tom Jefferson or Mohsen Belyani with the Water Quality Management Division.
Call 791-5252 or e-mail your questions to tjeffer1@ci.tucson.az.us, or mbelyan1@ci.tucson.az.us.

HOW CAN I HAVE BETTER TASTING WATER?

It may be stating the obvious, but water drawn from the tap may have chlorinous odors. It may have also been in contact with pipes for hours or even longer. It may contain dissolved air, and it may be warmer than you may like. You can improve the taste of your drinking water by simply drawing it after other water uses, which brings fresh water to the tap, then allowing it to stand several hours or longer in a clean odor--free pitcher or bottle. You can store your water either on the kitchen counter or in the refrigerator, depending on which temperature you prefer. If you store the water in the refrigerator, you may want to be sure it is capped to help prevent picking up refrigerator odors.

The Water Quality Management Division also publishes an Annual Microbiological Water Quality report detailing the results of monthly distribution system monitoring. Call 791-5252 to receive a copy or for more information.

In 2002, Tucson Water also collected additional monthly water quality data. The results of this additional monitoring are available on the Tucson Water web page, www.cityoftucson.org/water and the water quality phone line at 791-4227.

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

The approximate cost for each of these individual reports was 14 cents.

Telephone Numbers:

Tucson Water Quality Automated Phone Line	791-4227
Tucson Water Public Information Office	791-4331
Tucson Water Quality Management Division	791-5252
Tucson Water Customer Advocate	791-5945
Tucson Water Customer Service/Billing	791-3242
Tucson Water 24 Hour Emergency	791-4133
City of Tucson TTY#	791-2639
United States Environmental Protection Agency	
Safe Drinking Water Hotline	1-800-426-4791
USEPA Website	www.epa.gov/safewater/

Since 2001 Tucson Water and ten community partners have been collaborating with USEPA in the Environmental Monitoring for Public Access and Community Tracking program (EMPACT) which is designed to provide the community more information about your water. For more information please call 791-2666 or visit our web site www.cityoftucson.org/water

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