

# Water for Tomorrow

California's Water, Our Responsibility

Volume Three • Number Two



## The Value of Tap Water

Levi's Introduces Sustainable Denim  
A Word with the Expert Water Taster



NATIONAL  
GEOGRAPHIC

A Custom Publication



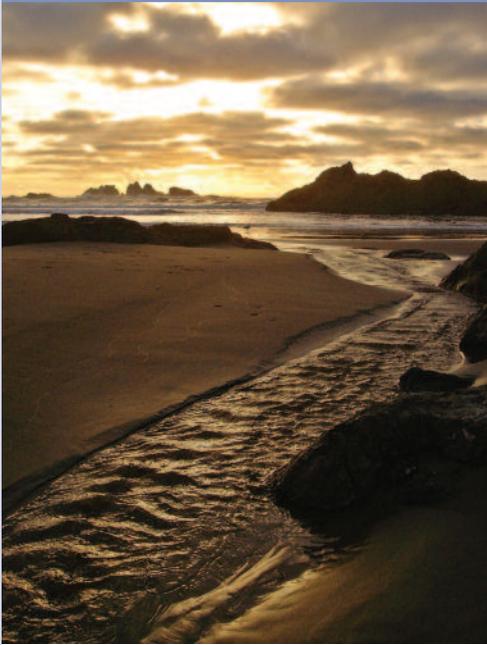


Photo Credit: Kerry Karas, *Water for Tomorrow* reader

# dear READERS,

These days, who isn't concerned about rising prices? Even the cost for the most essential resource, clean water delivered to your tap, is under scrutiny.

In this issue of *Water for Tomorrow*, we take a close look at the cost of tap water, including investments in energy, infrastructure and treatments that assure its availability, safety and purity. We also show how water compares with other common household products and services. You may be surprised by how reasonable tap water is — an essential service that by any measure is a true bargain, along with the cost-effective effort to bring it safely to our homes, farms and businesses every day.

As part of this investigation, you'll see a feature on how San Francisco is working to modernize its aging water infrastructure. The goal: Make sure the people in the Bay Area continue to get the water they need, when they need it, for decades to come — despite the threat of earthquakes or any other disaster.

And if you've ever wondered how our water system stacks up against other countries, especially in the poorer regions of the world, take a look at "It's Easy to Take California Water for Granted." We need to remember that nearly a billion people in the world don't have access to safe drinking water.

One practical way to save water is through the use of artificial turf, which was once reserved for professional sports arenas. Now, the applications have expanded — from residential lawns and school playgrounds to churches and parks — creating savings on water, maintenance, and fertilizers.

On the business front, you'll learn how Levi Strauss & Co. has introduced a new denim manufacturing process here in the U.S. and in 110 other countries, which saved 156 million liters of water in 2011 — part of a corporate-wide global water initiative.

You'll also see that California gardeners like Anita McNair continue to do their part to save water by combining their favorite water-wise grasses and blooms with groundcover, gravels, and garden accessories. They're not only slashing outdoor water use by 30 to 70 percent, they're also creating striking landscapes that celebrate the dramatic beauty of the California desert. Also, be sure to check out our reader-submitted photos in the middle of this issue.

And in our unsung hero department, we're profiling a senior chemist working for the Helix Water District in San Diego County (known for its great-tasting tap water). You'll learn that she wears many hats to ensure that the district is in compliance with all water quality standards, while also working on the frontline of customer service.

With organizations like the San Francisco Public Utilities Commission, companies like Levi Strauss, and gardeners like Anita McNair, it's clear that many Californians are showing a great deal of care and concern for our most precious commodity, water.

Sincerely,

Don Heymann  
Editor-in-Chief

## READER PHOTOS

Turn to pages 8 and 9 to see impressive photos of California waterscapes submitted by *Water for Tomorrow* readers like you.

Thanks for helping to make this issue stunning. Be sure to visit [www.waterfortomorrowmag.com](http://www.waterfortomorrowmag.com) to browse the full gallery.



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*Water for Tomorrow* is published exclusively  
for ACWA by:  
Onward Publishing, Inc.  
in partnership with National Geographic  
6 Bayview Avenue, Northport, NY 11768  
Phone: 631.757.8300  
www.onwardpublishing.com  
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# The Value of Tap Water

**Our Most Vital Resource  
is a True Bargain**

A thirst-quenching glass of water. A refreshing shower. The single most important ingredient for cooking our meals. Then, of course, there's irrigation for crops, hydroelectric power generation, industrial manufacturing, waste disposal, recreation, and wildlife enhancement.

What's more basic to life than water? While water is so fundamentally valuable to us, we don't often stop to consider a simple fact: that regular tap water is a true bargain — even with increasing costs — especially compared to other everyday products or services.

Tap water costs less than a penny a gallon. Yet how many of us consider what it takes to treat and deliver safe and reliable water to homes and businesses across California every single day?

There is, for example, the challenge of meeting increasingly stringent drinking water regulations that can require new treatment technologies. There is the need to repair and upgrade aging pipelines, pumps, and other facilities, some more than 100 years old. And there is the rising cost of electricity to transport and treat the water. That's not to mention the cost of developing new supplies of water through recycling, desalination, and conservation that increase availability and reliability, or the millions of dollars it takes to contain the spread of non-native species — like quagga mussels that can clog and compromise pipelines and other water facilities.

What's more, consumers get more than just the molecules of water they drink and use. They're getting reliable services that include ongoing maintenance, sophisticated water quality testing and treatment, and highly trained personnel — a 24-hour-a-day system of people and equipment to maintain water supply safety and reliability.

“Simply put, Californians are getting a higher quality product along with more environmental protection as part of their water service. Even though costs are increasing, tap water is still very reasonable when you compare it to other common household products and services that we rely on everyday,” says Timothy Quinn, executive director of the Association of California Water Agencies, which represents more than 450 public water agencies.

## The Best Deal Around

On average, a gallon of California tap water costs two-tenths of a cent. Compare this to the cost of other products and services we use every day.

### A Gallon of Tap Water: \$0.002



### Monthly Cost of Tap Water: \$53



### What Drives Water Rates

Some of the factors affecting the cost of treating and delivering water:

- Rising treatment costs:** California tap water meets some of the most stringent water quality standards in the nation. Producing high-quality water requires significant investments in treatment technologies. In addition, new drinking water regulations continue to be established since new technology detects contaminants at extremely minute levels.
- Aging water infrastructure:** From treatment plants to pumping stations to local storage tanks to pipelines, much of the system that delivers water to Californians was built decades ago. Aging parts of that system must be upgraded, repaired or replaced to ensure reliable water deliveries for future residents and businesses. Capital expenses and debt service to fund those repairs and upgrades can account for a significant portion of monthly water bills.
- Increasing energy costs:** Electricity can account for a substantial portion of a local water agency's operating expenses. Water is a heavy substance that requires a great deal of energy to move from the source to the tap, which could require pumping it out of the ground, over mountains, and long distances. Energy is also used during the water treatment process to remove impurities.
- Investing in new supplies:** California's population continues to grow, but our statewide water supply system of canals, pipelines or other storage facilities has not been significantly expanded in more than three decades. Local water agencies have invested billions of dollars in local resource strategies, such as water recycling, groundwater storage, conservation and other projects, to stretch supplies and increase reliability. These strategies are much more expensive than sources we have relied on in the past and monthly water bills may reflect a share of the costs.
- Environmental protection and non-native species:** Perhaps the biggest cost driver today is taking care of the environment and protecting water systems from non-native species. Efforts by local agencies to help protect their distribution systems from the spread of debilitating non-native species such as quagga mussels have added another unforeseen cost, particularly over the past five years. Some agencies are now spending millions of dollars annually to contain the spread of some species that can clog and compromise pipelines and other water facilities.

A photograph of the Golden Gate Bridge in San Francisco at dusk. The bridge's towers and suspension cables are silhouetted against a sky transitioning from blue to orange. The city lights are visible in the background.

# San Francisco: Investing for the Long Haul

## San Francisco rebuilds its outdated water system

The San Francisco Public Utilities Commission manages a complex water supply system stretching from the Sierra Nevada Mountains to the city of San Francisco, featuring a series of reservoirs, tunnels, pipelines, and treatment systems.

Two unique features of this system stand out: The drinking water provided is among the purest in the world; and the system for delivering that water is almost entirely gravity fed, requiring almost no fossil fuel consumption to move water from the mountains to the tap.

Because 2.5 million people in southern Alameda, northern Santa Clara and the Bay Area depend on a reliable water system, SF-PUC is moving aggressively to complete the \$4.6 billion Water System Improvement Program (WSIP) to create long-lasting improvements to its aging water infrastructure. In 2002, the agency launched WSIP, a program that includes more than 80 projects throughout the service area, to be completed by mid-year 2016.

“Built in the early to mid-1900s, many parts of the system are nearing the end of their working life, with crucial portions crossing over or near to three major earthquake faults,” explains Julie Labonte, director of the WSIP. “We couldn’t wait any longer to upgrade this system.”

### The WSIP objectives:

- Improve the system to provide high-quality water that reliably meets all current and foreseeable local, state, and federal requirements.
- Reduce vulnerability of the water

system to damage from earthquakes.

- Increase system reliability to deliver water by providing the redundancy needed to accommodate outages.
- Provide improvements related to water supply and drought protection.
- Implement improvements that optimize protection of the natural and human environment.

### A massive and essential undertaking

“The WSIP is one of the largest and most complex infrastructure improvement programs in the history of public works in our country,” says

The third largest municipal utility in California, the SF-PUC serves 2.5 million residential, commercial, and industrial customers in the Bay Area, including southern Alameda, northern Santa Clara, and San Mateo counties. The system consists of over 280 miles of pipeline, over 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants located outside the city and over 1,250 miles of pipeline, 12 reservoirs, 9 storage tanks, and 17 pump stations located within the city. The Hetch Hetchy watershed, an area located in Yosemite National Park, provides approximately 85 percent of San Francisco's total water needs.



Construction work is being done at Sunol Valley Water Treatment Plant and on a five-mile tunnel beneath San Francisco Bay.

Labonte. “The capital expenditures and geographical breadth are unprecedented, and we are in the midst of executing a tremendous volume of construction while maintaining full water supply service to a major metropolitan area that has no adequate alternative sources.”

Fifty-one of the 81 projects are completed, but the remaining ones include the most complex construction challenges, including the replacement of the seismically unsafe Calaveras Dam and two tunnel projects — one a five-mile tunnel under San Francisco Bay and a new three-and-a-half mile tunnel from Fremont to Sonoma.

“While the costs of the projects are substantial, water rates will still remain within the average range for California, because the system historically has been

so efficient,” says Steve Ritchie, the SF-PUC’s assistant general manager for water operations. Besides, he notes, “The cost of doing nothing would be so much greater.”

One study suggests that an outage at the Hetch Hetchy Aqueduct alone would have a \$30 to \$40 billion impact on the region. And because many pipelines cross active earthquake faults, a major earthquake could cripple the system to such an extent that service might not be restored for 20 to 30 days or longer, according to one SF-PUC study commissioned in 2000.

For this reason, several key projects are intended to ensure that should a large seismic event occur, the system will remain relatively intact and continue to deliver water to people and businesses within 24 hours of the event. One 84-inch

pipeline crossing the Hayward Fault, for example, will be able to move seven feet in any direction to withstand a seismic shift.

“In addition to upgrading a system that’s in the middle of one of the most seismically active areas in the country,” Ritchie says, “we’ve had to get these plans approved and underway while respecting the missions of public works agencies, labor organizations, environmental groups, and most importantly, the needs of the residents of San Francisco and the surrounding area.”

“People expect electricity outages from time to time, but no one expects to be without water,” explains Labonte. “We’re making sure we’re prepared for any eventuality — from droughts to earthquakes. The majority of the people have been very supportive; they get it.”



## Your Perspective

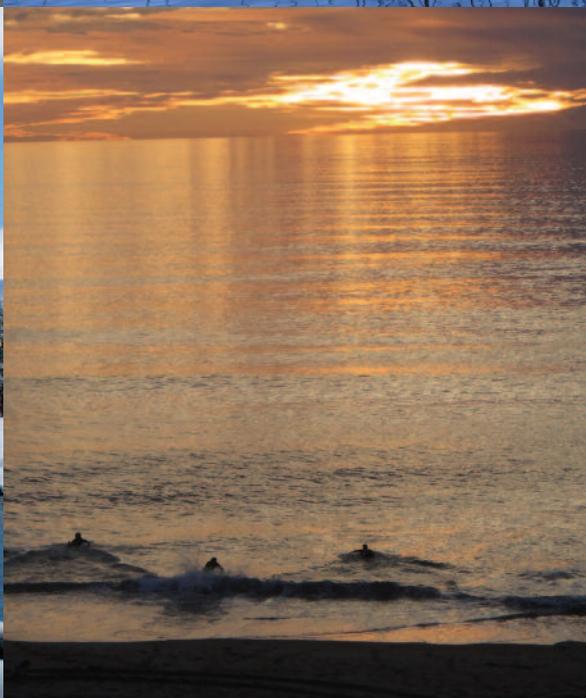
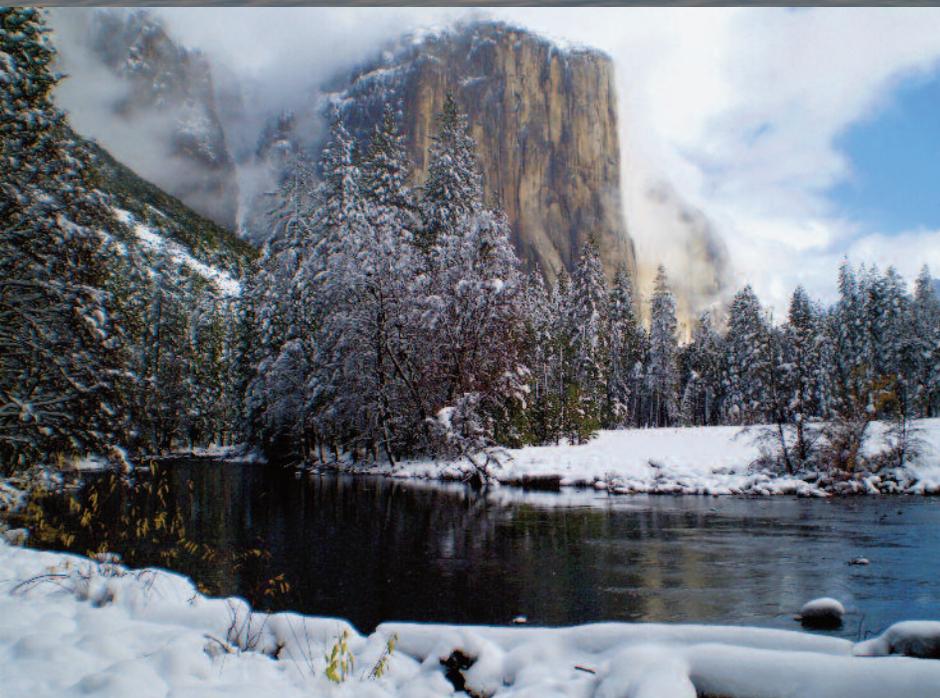
Our call has been answered! Featured here is a diverse selection of California waterscape photos submitted by *Water for Tomorrow* readers. Visit [www.waterfortomorrowmag.com](http://www.waterfortomorrowmag.com) to browse the full gallery. Thank you, and please continue to send your photos to [waterfortomorrow@acwa.com](mailto:waterfortomorrow@acwa.com).

**This page, clockwise from top left:**

Jack Gerard, Monterey; Jack Gerard, Monterey; Joann Eigenbrod, Feather River Canyon; Kerry Karas

**Opposite, clockwise from top:**

Kerry Karas; Hal Janzen, Gull Lake; Alicia Jimenez, Manresa Beach in Santa Cruz; Steve Tramz, El Capitan; Henry Gutierrez, sunrise over Sausalito



# New Costs Are Driving Rates for Safe, Reliable Tap Water



## Removing Naturally Occurring Arsenic

Arsenic occurs naturally in sediments and groundwater, and water districts must make sure levels in drinking water are safe. The Environmental Protection Agency decided in 2001 to lower the maximum contaminant level of arsenic in drinking water from 50 parts per billion to 10 parts per billion. The Coachella Valley Water District was required to conduct extensive monitoring to identify arsenic occurrence throughout the Coachella Valley. It then had to implement an \$18 million compliance plan (\$13 million in capital costs to evaluate and install a water supply and treatment infrastructure and another \$1 million annually to operate and maintain

these facilities and to dispose of arsenic residuals created during the treatment process).

## Making Sure Non-Native Species Don't Damage or Hinder the Water System

Efforts to protect water systems from the infiltration and spread of debilitating non-native species like quagga mussels have added another unforeseen drain on budgets, particularly over the past five years. Metropolitan Water District of Southern California, for example, is now spending \$4 million a year to contain the spread of quagga mussels that can clog and compromise pipelines and other water facilities. The cost includes activities such as monitoring, diving, facility shutdowns, and boat

inspections at reservoirs. The district has spent more than \$30 million since quagga mussels were first discovered in a key reservoir on the Colorado River in 2007.

## New Pollution Regulations Mean Higher Costs for Consumers

California's upcoming cap-and-trade program designed to reduce greenhouse gas emissions could require some water suppliers to purchase costly pollution allowances to offset the energy they use from fossil-fuel power plants. The regulations are also expected to add at least \$20 million a year to the cost of operating the State Water Project, which serves 25 million Californians. The combined impact will translate into higher costs for water that will be passed on to consumers.



**In many parts of Africa, water is a scarce resource and needs to be purified by boiling before drinking.**

## It's Easy to Take California Water for Granted

Depending on where you live in California, your water may come from a nearby well or river. Or it may travel hundreds of miles through canals or pipelines to reach your tap. Regardless of where it originates, your tap water is filtered, cleaned, tested and distributed in an exhaustive process that produces some of the highest quality drinking water in the nation and the world.

In fact, anyone living in California, or any developed country, hardly gives a thought to the availability of water. One simply needs to open a tap at any time of day or night to obtain as much clean water as desired.

A few decades ago, industrial countries like the United States and Canada still had not developed an infrastructure that could deliver running water to many rural areas.

Often, it was only when these regions gained electricity that they could also be supplied with running water.

### **A billion people without safe water**

In developing countries today, nearly a billion people, mostly in rural, undeveloped regions, lack access to safe, clean water supplies — that's approximately one in eight people in the world, according to Water.org, a nonprofit organization that provides access to safe water and sanitation around the world. And more than three-and-a-half million people die each year from water-related diseases. The water and sanitation crisis claims more lives through disease than any war claims through guns.

Indonesia, though considered a middle-income country, is a prime

example. More than 100 million people in Indonesia lack access to safe water, and more than 70 percent of the country's 220 million population rely on water obtained from potentially contaminated sources. Women in Jakarta reportedly spend \$11 a month on boiling water, which is a significant burden for the poor.

And while China is becoming an economic powerhouse, it still faces significant water problems. Water consumed by the Chinese contains dangerous levels of arsenic, fluorine, and sulfates. An estimated 980 million of China's 1.3 billion people drink water every day that is partly polluted. China's high rates of liver, stomach and esophageal cancer have been linked to water pollution.



## Levi's Finds Sustainability Fit In New Water<Less™ Jeans

Levi Strauss & Co. has introduced a new denim manufacturing and finishing process to conserve water here in the U.S. and in 110 other countries around the globe. Known as Levi's Water<Less™ collection, its inaugural shipment was delivered to Levi's stores this spring. In 2011 alone, the techniques used in Water<Less™ lines have saved 156 million liters of water around the world.

"It's part of a global initiative to improve the way Levi's produces its products, to save water, and to help deliver this excess water to the communities that need it most," explained Levi's vice president of social and environmental sustainability Michael Kobori.

Global conservation is in the interest of Levi's customers and shareholders, as the anticipated water shortages of climate change could inhibit cotton growth — or stoke its price point out of range of some consumers. Cotton cultivation consumes over three percent of the world's agricultural water use and 95 percent of Levi's products are made from cotton.

"We did an environmental product life cycle assessment on a pair of 501s and found that — from the raw materials stage to manufacturing to customer laundering patterns — 919 gallons of water are used. That's significant," said Kobori. "We charged our concept design team with figuring out how Levi's could produce the looks and finishes our customers love using less water."

The company identified savings at every stage of the product life cycle. First, they reached out to growers — from India and Brazil to here in the U.S. — to share innovations in irrigation, pesticide use, and rainwater catchment that improve crop yields while reducing cost. Water and pesticide use fell by an average

of 32 percent while profits rose by 20 percent.

Suppliers were introduced to techniques like combining multiple wet cycle treatments into a single process, incorporating ozone processing into garment washing, and removing the water from stone washing. Water use was cut between 28 and 96 percent, depending on the denim line to which the Water<Less process was applied.

Next, Levi's partnered with global non-profit Water.org on a Facebook-based initiative to raise awareness of water's value. The company introduced the sustainability philosophy behind its new Water<Less process and encouraged consumers to conserve water in ways that could raise funds for Water.org.

People have embraced the concept. Products with Water<Less tags are experiencing higher sell-through rates than their traditionally manufactured brethren. Levi's is expanding its Water<Less product lines and adding retailers to the distribution network.

On Facebook, 33,168 pledges were made to save 200 million gallons of water. Levi's in turn donated \$250,000 to Water.org, enough to provide 8,000 people in water-challenged regions with clean water for the rest of their lives.

Consumers could save more: "If people wash their jeans less — say every two weeks — their estimated water consumption goes down by about 32 percent. If they launder them every four weeks, it goes down by 48 percent," said Kobori. With tens of millions wearing Levi's around the world, that could amount to a remarkable level of water conservation. Offered at the same price point with less environmental cost, Levi's Water<Less jeans deliver one attractive bottom line.

## Water-wise Californians Showcase Signature Garden Treasures

Californians are combining their favorite water-wise grasses and blooms with groundcover, gravels, and garden accessories to slash outdoor water use by 30 to 70 percent. Not only are they conserving water, they're maintaining attractive, improved landscapes.

**Anita McNair, Compton:** For Anita McNair, water-wise gardening is a teaching and bonding tool and offers a chance to celebrate the dramatic beauty of the California desert.

"When I told my friends I was trading in my lush, green, grassy, water-guzzling yard for a lush, colorful, drought-tolerant oasis, they were surprised," she said. Her front and back yards showcase a wonderland of blue agave, aloe, blooming cactus, and ornamental grasses framed in a mosaic of decorative rock, bark, and native groundcover. Quiet spaces invite people to sit for a spell and a rustic footbridge straddles a dry creek bed.

"I love that I water my whole yard only twice a month; once a week during the hot summer season," McNair said. Her project gave her the opportunity to share her passion with her three grandchildren while teaching them about conservation. "I took them to nurseries to help me select fun cacti and succulents. More converts means less water wasted in California."

**Sue Lovelace, Cotati:** Hundreds of miles up the California coastline, Sue Lovelace's garden hosts a treasure trove of colorful, water-prudent perennials, edibles, and wildlife that thrive in the cooler climate of her Cotati community. Like Anita McNair, she enjoys gardening with her grandchildren.

Bedecked with Gaillardia, Nepeta, Oakleaf Hydrangea, and a variety of succulents, Lovelace's garden holds a

world of possibilities. "It's a habitat for wildlife, a place to grow our own food, and a setting that hosts a colorful mix of drought-tolerant flora for my arrangements," notes the floral designer. It's also a wonderful learning lab for her beloved grandchildren.

"My grandkids love to eat fruit and veggies right out of the garden," Lovelace said. The garden also offers tranquility. "Having a water-wise garden is good way to free ourselves of the noisy, polluting array of lawn mowers, blowers, and weed whackers more traditional landscapes warrant," she observed.

**Kristan Ulicki, Anaheim:** The valuable lessons teacher Kristan Ulicki shares with her students and associates weren't all learned in school. Some came from her father. "My father's my hero. He taught me not only to love the great outdoors, but to care for it," she said.

Kristan gave his ideas a water-wise twist by replacing her home's thirsty grass with creative brickwork and colorful, drought-tolerant butterfly bushes, agapanthus, lilies, lavender, and marguerite daisies.

Embracing ways to conserve water saves time and money while benefiting the community. Kristan now inspires a new generation to experience the physical, intellectual, and spiritual renewal that comes from tending a water-wise garden.

Through the Real People, Real Savings website, ACWA and the California Department of Water Resources are sharing the show-stopping, water-saving designs that residents throughout the state are manifesting to improve their properties, save money, and soothe their spirits. Learn more at [www.saveourh2o.org/real-stories](http://www.saveourh2o.org/real-stories).



Anita McNair and her garden (below), in Compton



Sue Lovelace



Kristan Ulicki

## Getting Real About the Benefits of Artificial Turf



Artificial turf is now being used for residential applications and in school playgrounds and parks.

Businesses, homeowners, and public agencies are saving water and enjoying lush, maintenance-free landscapes by getting real about the benefits of artificial turf.

“While many aspects of the construction industry have struggled the last few years, the business of artificial turf is blossoming,” said Tony Vena, owner of turf distributor Purchase Green. The industry has expanded 20 percent per year over the past decade.

Until three years ago, 95 percent of all installations were on sports fields. Improvements in the quality and varieties of artificial turf have fueled growth in the residential and commercial space. Today’s products mimic the colors and textures of natural grasses like Kentucky blue grass, fescue, and rye.

California homeowners are increasingly turning to synthetic lawns as an alternative to natural grasses. Because they require no irrigation or trimming, these lawns can conserve significant amounts of water and money. Additionally, improved quality and greater variety of artificial turfs has led to expanded residential applications.

Applications for today’s artificial turf are as varied as its product lineup. Turf

improves highly trafficked playgrounds at schools, homes, and churches. “Natural grass often can’t stand up to the wear and tear of children,” said landscape contractor Jake Mensing. “Artificial turf



transforms half-grass, half-dirt playgrounds into fully functional, virtually maintenance-free play areas.”

Administrators save on water, maintenance, and fertilizers. Allergy issues dissipate. Restrictions on lead chromate as a color-preserving UV protectant have made for a safer product while the use of flex sand as a shock absorber prevents the turf from overheating. “The kids love it. They can dash outside immediately following a

rainstorm. Teachers love it because the kids expend energy and there’s no muddy mess,” Mensing said.

Artificial turf can be used on pool perimeters to inhibit debris from dirtying the water and it provides consistent color where uneven sunlight occurs. Various artificial grasses are installed in kennels and dog runs because animals can’t tear it up or destroy it with urine. Turf also eliminates soiled animal paws, and because it’s permeable, artificial turf is easily cleaned.

The economic benefit of artificial turf is appealing to educational institutions, which sometimes spend \$50,000 to \$70,000 a year on field maintenance. Artificial turf reduces spending on equipment needs, supports year-round play, and lasts from 10 to 12 years.

When a field’s ready to retire, it’s pulled up, recycled, and new turf — replete with logo — is more cheaply installed, because base and drainage infrastructures remain intact.

For every square foot of properly irrigated grass that artificial turf replaces, 48 gallons of water are saved per year. “The rule of thumb is 70 percent of residential water use is for landscape and irrigation,” noted Vena. “So whether it’s with artificial grass or native plants, the amount people can save by replacing water-intensive landscapes is staggering.” In some areas rebates can also offset costs by up to 10 percent.

“When compared to sod, there is an element of sticker shock, as artificial grass costs about three times more. But it pays for itself in around 36 months,” Vena added. “The product has a life expectancy of 15 to 20 years, so the rest is gravy.”



# A Word with... **the Expert Water Taster**

**Cindy Bamfield, Senior Chemist, Helix Water District, San Diego County**

California's water agencies employ tens of thousands of professionals to ensure reliable delivery of clean water to irrigate our crops, sustain our livestock, maintain our homes and businesses — and provide California's 37 million citizens with safe, palatable drinking water. Today, we talk with someone integral to maintaining water quality of the highest caliber: Helix Water District's Cindy Bamfield, who, with a bachelor's degree in chemistry and a master's in analytical chemistry, knows a thing or two about the makeup of H<sub>2</sub>O.

**Q.** What is your primary role at Helix Water District?

**A.** I wear many hats, so identifying one single objective is difficult. Some days I'm collecting samples from the district's water distribution system, or I'm at the instruments in the lab, testing and analyzing samples. I work to ensure we're in compliance with state and federal water quality standards. And I serve on the frontline for customer service as it relates to water quality.

**Q.** What does a chemist have to do with customer care?

**A.** Most people, when they're really concerned about the water, want to talk to the scientist behind the data. While we've never had a serious quality issue, we get some unusual concerns. There are some people who feel we're poisoning their water, some say they smell rotten eggs in their water (that's usually a drain trap issue, nothing to do with the water), or people see black particles floating throughout (typically, it's a washer from their home plumbing that's broken down). One woman told me that her aura had changed; she was

convinced it correlated to changes in the water. I make it a point to troubleshoot with customers so that when they hang up, they feel confident about the quality of water we deliver.

**Q.** Helix Water District is renowned for having some of the region's best tasting water. To what do you attribute that?

**A.** Helix is the first water treatment plant in San Diego County to use a process known as ozonation — the bubbling of ozone gas through water to destroy bacteria and other micro-organisms. It's a very strong disinfectant without the residual chemicals. There are fewer byproducts than from chlorination, and I feel strongly the process removes taste and odor problems that could otherwise affect our water.

We are constantly monitoring water quality. We test for everything: turbidity, color, taste, odor, chlorine. Our water tastings are very similar to wine tastings, actually. We swirl, we smell, we sip.

In the rare instance of a taste or odor problem, we'll work to correct it before it hits the public. Rather than chemically modify the water, we usually change the source. We have that option, as we obtain water from Northern California, the Colorado River and from local lakes and wells.

**Q.** How has your job evolved over the years?

**A.** With plant expansions, ozone upgrades — and the ebb and flow of our regulatory environment — we must be proactive to remain compliant. We're currently working to identify new local sources of water, to keep ahead of the drought and to educate people about conservation.

What's new is our capacity to test water at the nano-level for personal care product residuals and pharmaceuticals. Now that we're able to test for them, we're able to monitor and treat them. I feel I'm making a difference in people's lives by ensuring the chemical levels in their water are nice and low.

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