



Well Said

SUMMER 2018 • Newsletter of Arizona Water Well Association for our Members and Friends

The AzWWA 2018 Annual Golf Tournament, Membership Meeting, Picnic and Chili Cook – Off will be held Friday and Saturday

June 22 and 23, 2018

Agenda

Friday June 22, 2018

Golf Tournament
Quailwood Greens Golf Course

Dewey, AZ
9am Shotgun start

Membership Meeting Dinner
Goldwater Lake, Prescott, AZ
5:30pm



Jesse Richardson, Jr., Policy & Research Advisor for the Water Systems Council, will be discussing legal and legislative issues impacting Arizona water wells.

Annual Picnic



Saturday, June 23, 2018

Picnic, Horse Shoe Tournament (starting at 8am), Chili Cook-Off and Live Auction
Goldwater Lake, Prescott AZ

Please join us for this fun event!

Any questions, email admin@azwwa.org or call 480-609-3999

REGISTRATION (Scan and email to admin@azwwa.org)

Name _____ Company _____

Address: _____ City: _____

State: _____ Zip: _____ Phone: _____ Email: _____

Number of people attending dinner @ \$30 per person _____ \$ _____

Number of children attending dinner (hamburger meals) @ \$10.00 each _____ \$ _____

TOTAL DUE: \$ _____

_____ Will pay at the door; _____ Check is in the mail; _____ Charge my credit card:

CC# _____ Exp date: _____ CVV #: _____

_____ Fax registration to 480-609-3939 or mail to:
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GOT NEWS?

Any upcoming or recent events?

Open Houses? Other Events? Jobsite Photos?

Articles? New Products or Services?

Items for sale? Weddings? Births? Obituaries?

Contact Debbie Hanson Tripp at 480-609-3999
or via Email admin@azwwa.org

Correction: The photos on page 12 of the spring 2018 *Well Said* newsletter were compliments of WorldWide Drilling Resource® Drilling Magazine. We very much appreciate all of the photos that WWDR sends us and sincerely apologize for the oversight.

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Ducey Vetoed Two Arizona Groundwater Bills

Brandon Loomis and Caitlin McGlade, The Republic | azcentral.

STORY HIGHLIGHTS:

- Gov. Doug Ducey has vetoed two bills that would have eased groundwater restrictions
 - Opponents feared the bills would have weakened efforts to protect scarce water supplies
 - Backers said the bills protected property rights and local control
-

Early in May, Gov. Doug Ducey vetoed two bills that would have eased groundwater restrictions in southern Arizona, drawing praise from water-management advocates who had urged him to reject the legislation. The vetoed bills would have removed impediments to groundwater pumping in Cochise and Yuma counties, potentially enabling at least one large housing development to proceed without having to prove long-term water availability.

Opponents of the legislation feared it could harm the state's reputation as a prudent manager of scarce waters, and the governor agreed. "We're not going to allow bills that get in the way of the 1980 Groundwater Management Act or take away from the work that the people have done before I came into office in protecting Arizona's water," he told reporters while announcing his intention to veto the bills. The landmark law that he mentioned has protected homebuyers ever since by requiring developers in the state's major urban centers to demonstrate that they have adequate and lasting water supplies.

Much of rural Arizona is without restriction on groundwater pumping, but Cochise and Yuma counties used a later law enabling ordinances to require that developers prove before construction that they have a 100-year water supply. One of the measures, Senate Bill 1400, would have required county supervisors to review their groundwater ordinances every five years and provided an option to rescind them.

The other vetoed bill, SB 1268, would have allowed cities and towns in those counties to opt out of the 100-year water-supply requirement. That bill could have removed an impediment to building a 7,000-home Sierra Vista development called Tribute that wildlife and water activists say could kill the tiny San Pedro River and possibly endanger the future of the Army's Fort Huachuca. Tribute is the subject of a lawsuit claiming that there is insufficient groundwater to support it and protect the river and competing water rights.

San Pedro River

The bills had backing by Sierra Vista's legislators, state Sen. Gail Griffin and House Speaker David Gowan. They argued that the legislation protected private property rights and local control. Sierra Vista City Manager Charles Potucek had supported the bill and said that his city has a history of water conservation and deserves "a voice in the development process."

Fate of Arizona's only free-flowing river is now in judges' hands.

Asked for comment after the governor's vetoes, Potucek wrote in an email, "We appreciate greatly Senator Griffin's efforts to protect our community."

The Arizona Municipal Water Users Association, a coalition of the Phoenix area's largest cities, had asked for the vetoes. Executive Director Warren Tenney said the governor's action favored the state's future over short-term gains.

"We're able to strongly state that we're doing the best job in the West when it comes to managing our water," Tenney said. "That helps us for long-term economic development."

Water-law and sustainability scholars at the state's universities also had stated opposition to the bills. Sierra Vista resident and San Pedro River advocate Tricia Gerrodette, a plaintiff in the case seeking to stop the Tribute development, said she was "surprised but gratified" by the vetoes. "Water budgets need to be balanced," she said.

Water "certainty and sustainability" is a priority, Ducey said in a written statement. "I will not sign legislation that threatens Arizona's water future."



Water Spelled Development for Sedona

Excerpts by the Sedona Historical Society, Reprinted from The Red Rock Review - June/July 2001 Issue

Portions reprinted from the Water Well Journal, December 1986 and November 1998 Issues

For four generations, the Williams' family has drilled wells providing water to various areas of the Midwest, Northwestern and Southwestern U.S.. Following are portions of an article written by the Sedona Historical Society about David's grandfather drilling the first water well that resulted in the development of Sedona. Other comments are reprinted from a feature article in the December 1986 issue of the Water Well Journal honoring Earl H. Williams Well Drilling and another article from November 1998 listing David E. Williams Water Well Services as one of the Top 50 U.S. multi-generationally, family named, owned and operated well drilling companies.

In the late 1800's, shortly after the lead and zinc mining 'fell apart', F.H. Williams of Joplin, MO, (David's great grandfather) turned to water well drilling for a living. The lure of the West drew F.H. to the state of Washington where he worked as a core driller for a cable tool outfit. In 1909, he moved to Lake County, Oregon, homesteaded and started his own business. He was the only water well driller in that area for 30 years. His three sons, including Carl, followed F.H. into the business but because of Carl's arthritis, his family moved to Arizona in 1945 where he made his mark by drilling the first water producing well in the Sedona area.

Sedona was never the same after Carl Williams arrived. In 1945, it was still a tiny community on the banks of the creek consisting mainly of a school, ranger station and combination general store/café/gas station/ post office/ice house. A mile from town, west of Hwy 89A, was an open area near beautiful red rock cliffs which was an ideal building site with property selling for \$10-\$25/acre, less if you paid cash. Sounds like a good deal and lots of people tried dry farming the land but were starved out because there wasn't enough water.

Fanny Belle Gulick was one of the area's largest land holders, including several acres along Hwy 89A in what is now West Sedona. Known as a sharp business woman, the widow Gulick called Carl and they made a deal. A well would cost her nothing unless it came in. If it came in, Carl would get a deed to several acres of her property and they would part friends. Carl had met with all the 'local experts', which included a U.S. Forest Ranger who was a geologist, and another who was a member of the Geology Department at U of A. They were all skeptical and indicated there was no appreciable underground water in the area.

Carl studied the precipitation, heavy snowfall on the Mogollon Rim and observed natural artesian springs in the area. After comparing various statistics, he determined there was lot of unaccounted-for water and his instincts told him there must be fissures and crevices feeding the excess flow into aquifers under the Redlands. So he dug and the widow Gulick's well came in only a few feet from where Carl had predicted.

This well was an occasion of tremendous celebration for the whole area. Carl staged an open house picnic and hundreds came. After that, Carl and his son, Earl, drilled more than 50 successful wells in the area. For a time, they kept two drilling rigs busy year around and their business expanded around the state. People would stop Carl on the street to order a well or shake the hand of the man who brought water to this dusty little village.

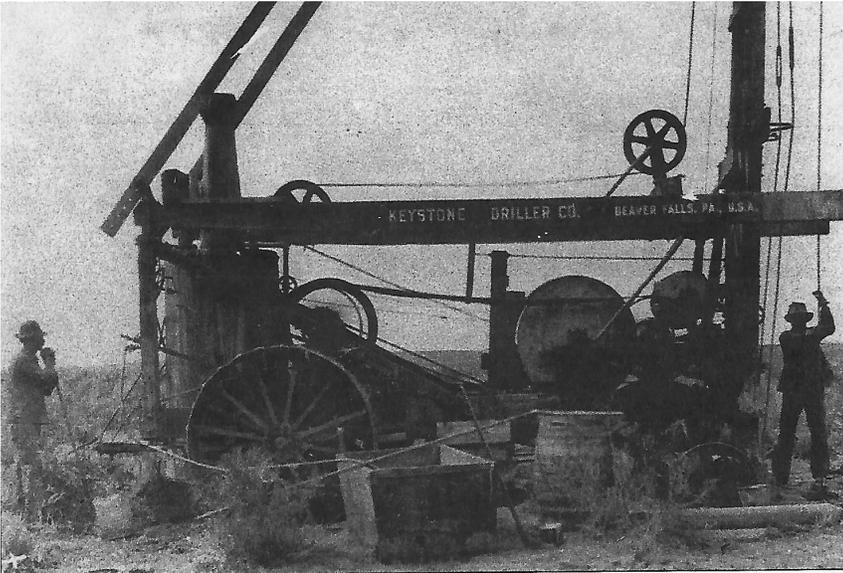
With water n Grasshopper Flats and Big Park, the real estate boom began and housing moved from the canyon to the flats.

Carl's son, Earl, worked in the family business as a teenager and eventually earned a degree in Geology at ASU but returned to the water well business in 1960. As his father, Earl, and grandfather, Carl, did before him, David Williams also learned to drill by working in the family business and in 1989, Earl H. Williams Well Drilling became David E. Williams Water Well Services.

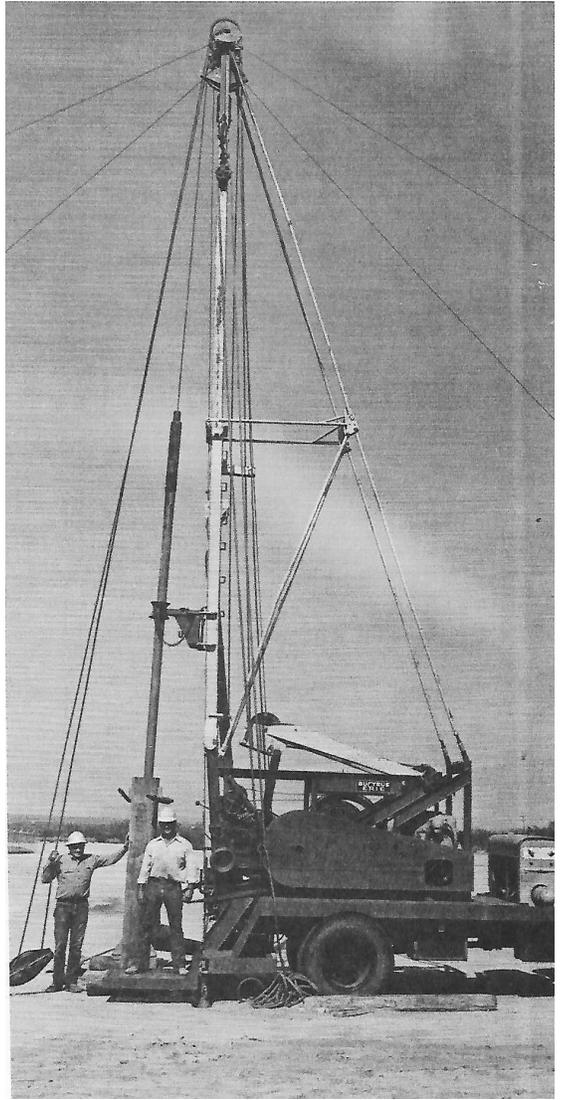
The Williams family members have been very active in various organizations including NGWA and AZWWA. They've been very supportive of the Arizona Water Well Association since the 1960's with Helen involved in the Water Belles, cooking and baking for events, and Earl and David serving various positions on the Board of Directors. With AZ Drilling License #8, it is very likely that Earl was also involved in the early drafting of licensing standards and requirements.

The AzWWA is very proud to have this multi-generational family business as part of our organization!

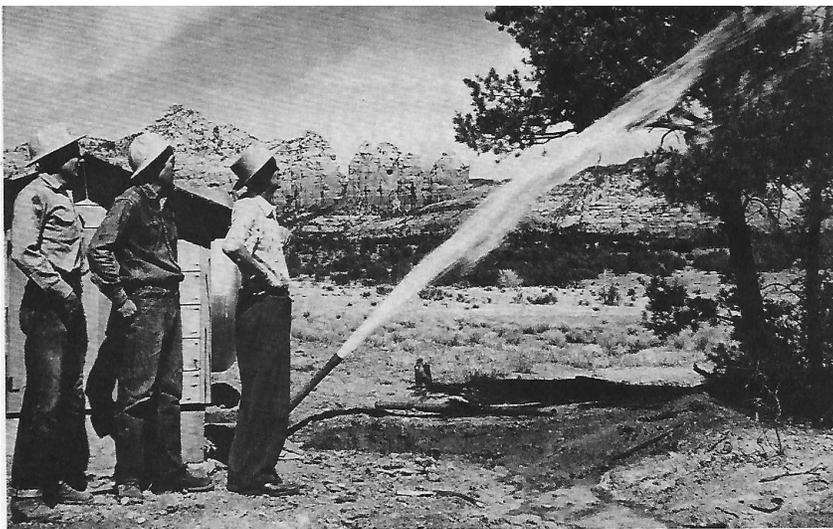
See photos on Page 5



E.H. Williams stands beside his "Keystone #5" in the late 1800s.



Earl (left) and David (right) on a jobsite with their Bucyrus Erie drill rig.



This is one of the first wells in Sedona, Arizona; drilled by C.E. Williams and son. In photo are Earl Williams (left), Gene Harris and Carl Williams.



The photo on the left shows David (left), Helen and Earl at their shop in Tucson. This photo was published in a feature article on Earl H. Williams Well Drilling in the December 1986 issue of the Water Well Journal.

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Power Lines

By John Fowler, CSP, National EWP/AZWWA Safety Director



On November 29th of last year, a 39 year old driller in Missouri was killed when he raised his derrick into 12,000 volt power lines. The driller was working along Interstate 44 taking multiple core samples of the concrete for an upcoming project. The force of the electricity was so powerful that it blew a crater in the reinforced cement that the driller was standing on. He failed to look up and this mistake cost him his life. More recently on May 10th, a driller and helper, both in their 20's, were killed when their rig contacted a 12,500 volt power line while working on a project for the Colorado Springs Utilities near Colorado Springs, CO.

We, in the pump servicing and drilling industry, often work in the vicinity of power lines - but how close is too close? OSHA has a table in 1926.1400 (new Crane Regulations) which shows the minimum safe clearances for cranes operating near power lines.

Power line voltage Phase to phase (kV)	Minimum Safe Clearance (ft)
50 or below	10
Above 200 to 350	20
Above 350 to 500	25
Above 500 to 750	35
Above 750 to 1,000	45

OSHA also states that if you don't know what the voltage is but know it is under 350 kV, stay a minimum of 20 ft. away from the line. If you don't know what the voltage is but know that it is over 350 kV, OSHA requires you to stay a minimum of 50 ft. away from the line.

So, how can you determine the voltage? I have heard people say that you can determine the voltage by counting how many insulators are being used on each line. This can be done, but only if you know what power company is responsible for the lines and what type of insulators they are using. For this reason, counting insulators is not a good way to determine voltage. The best way is to pick up the phone and call your local power company. Give them your location using cross streets and the number that is on the pole. Usually each pole has a metal tag with a number on it. They will either tell you the voltage of the lines over the phone or come out themselves to have a look. Keep in mind that this process could take a week or more so plan ahead.

The best option when working around power lines is to have them de-energized or moved, but that is not always possible. So, how close is too close? The OSHA table above is good guidance, but we have to remember that it is designed for crane operators. Crane operators have the ability to swing away from the power lines but when we setup a pump rig or a drill rig, we are locked in place. Why is this important? Because if we setup on a calm day and begin to work and then the wind starts blowing, those power lines might move a couple feet - or more - back and forth. If we followed the OSHA table and setup 10 ft. from a 50kV line thinking we were safe, we would find ourselves much too close and in what OSHA calls the "Prohibited Zone". It's not just wind, but torrential rains and dense fog that can also effect the safe working distance from power lines. So always give yourself a cushion in case the conditions change.

I have had a couple people ask about whether or not you can work closer to power lines when they are covered in insulating blankets. Nowhere in the OSHA crane standards does it list this as an option allowing you to work within the "Prohibited Zone". The insulating blankets can be helpful and help prevent brush contact with the power lines, but are not designed to allow drill rigs to work closer than the recommended distance. If someone wants you to use insulating blankets, ask questions and if possible, get the power company involved. Remember: it is the pump or drill crews who are the ones who will suffer if the rig is energized.

(Continued on page 11)

Unlike a crane, when a drill or pump rig is energized, the operator is usually the first to be electrocuted. This is because the operator is typically standing on the ground with his hands on the controls. He/she becomes a great path for the electricity to get to the ground. Those working on the ground around the equipment have a chance, but only if they stand still. The ground around the equipment becomes energized and if you walk or run and step from one voltage zone into another different voltage zone, you can become a pathway and be electrocuted. So stand still until someone from the utility company tells you that the power is off.

And remember that other equipment is going to be on that drill site. The drill might be a safe distance from the power lines, but what about your other equipment? For example, is there a roll off dumpster under the power lines? Or what about a regular dumpster? Years ago a drilling company employee was killed while putting some old hose sections into the dumpster. He raised the boom on a reach fork so that the hoses, which were hanging down from the forks, could clear the sides of the dumpster and hit powerlines with the forks.

We need to be aware of our surroundings and this is sometimes easier said than done. When it is raining, blowing snow or we are in hurry, it is easy to forget to look up. I was not there, but the driller in Missouri was likely in a rhythm moving from hole to hole and had stopped looking up every time the derrick was raised. And it only takes one time, when you should have looked, to change your life forever.

Please look up and think about where you are drilling, servicing a pump and/or the other activities that will take place on that site. We should never get complacent around power lines.

John is Safety Manager for National EWP and can be reached as follows:



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Epiroc Launches New U.S. Website

Epiroc has launched its new U.S. website, www.epiroc.us. The new site features user-friendly navigation and functionality, and offers valuable information on Epiroc products, parts and services, applications and industry solutions. Epiroc.us provides simplified navigation and enhanced search capabilities to help visitors find and discover exactly what they need.

The website connects to the Epiroc “Shop Online” system where customers can easily handle Epiroc orders 24 hours a day, seven days a week. Other components of the site include a newsroom, media gallery, careers area, corporate information section and links to follow Epiroc on social media.

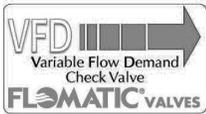
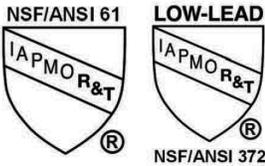
Epiroc is a subsidiary of the Atlas Copco Group that is planned to be listed on the stock exchange in 2018. Atlas Copco announced in January 2017 that it would split into two companies: Atlas Copco, focusing on industrial customers, and Epiroc, focusing on mining, infrastructure and natural resources customers.

‘Even a stopped clock is right twice a day’ Source Unknown



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Hot Weather Can Mean More Tire “Gators” on Highways

The word likely makes you think of a state like Florida, but Arizona highway drivers should stay alert for “gators” on the highway, especially with summer upon us. Gator is the nickname given to tire treads that end up on highways after blowouts, creating a risk for other drivers and their vehicles.

ADOT and DPS are reminding motorists to stay alert to tire treads or other debris that can wind up on highways. Drivers also should regularly check their vehicles’ tire pressure to reduce the risk of blowouts.

Whether DPS troopers toss tire gators to the shoulder or ADOT maintenance crews respond after getting a call, it’s impossible to catch everything immediately along more than 6,300 miles of state highways.

“We all need to pay attention and be prepared for debris at any time, but tire gators increase in number when the weather turns hot,” said Raul Amavisca, ADOT Central District engineering administrator for maintenance. “Our maintenance yard bins fill up with more rubber during the summer.”

DPS is often the first line of defense against gators, conducting traffic breaks to temporarily stop traffic so troopers can toss tire debris to the shoulder of a freeway.

“We also get to see the damage a large piece of tire tread can inflict on another vehicle,” said DPS Captain Tony Mapp. “These can be dangerous situations, which makes it so important to avoid distractions and keep an eye on the roadway out in front of you.”

ADOT crews spot pickups of roadside shoulder debris along busy freeways throughout the year and the agency’s freeway shoulder sweeping contractors also maintain weekly schedules for collecting larger debris items in advance of street sweepers, finishing the cleaning job at night.

Maintaining proper tire pressure to limit the chances of creating a highway gator is imperative. “You’re improving your odds, since over or under inflated tires are more likely to suffer blowouts,” said Captain Mapp. “It’s worth it

AZWWA Scholarships Available

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A completed Scholarship Application, including a resume, a letter of endorsement from the applicant’s parents or employer and a transcript from the last educational institution attended is required.

For more information or questions, please contact our current Scholarship Chair or the AZWWA office. To request a Scholarship Application, please contact the AZWWA Administrative office directly.

Scholarship Chair

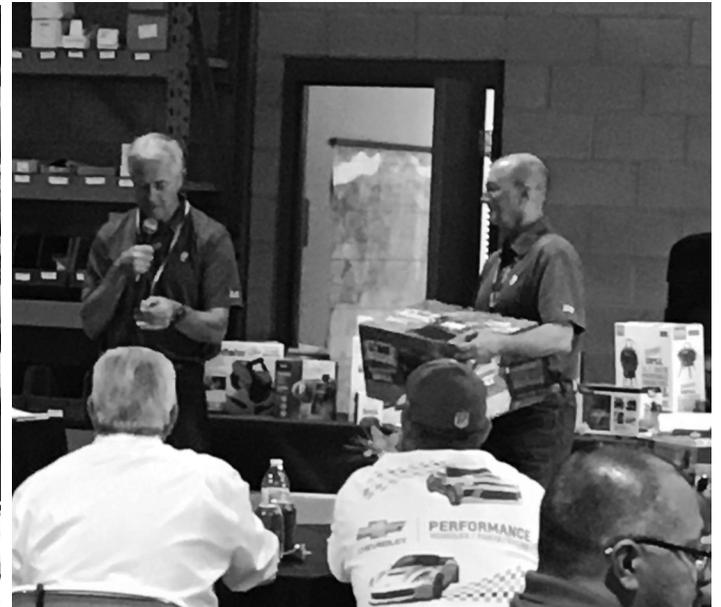
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U.S. Solar Capacity Could More than Double in the U.S.

By Brian Eckhouse and Christopher Martin (Reprinted from Industry Week with edits due to space)

Production capacity could increase in the U.S. by at least 3.4 gigawatts, compared with 1.8 gigawatts at the end of last year. (Bloomberg / May 31, 2018)

Hanwha Q Cells Korea on Wednesday, May 30th, said it will build a factory in Georgia. JinkoSolar Holding Co. of China is planning one in Florida. U.S. companies SunPower Corp. and First Solar Inc. say they'll boost production in Oregon and Ohio.

The expansion underscores how immediate the reaction has been to the imposed tariffs on imported panels in January to spur domestic manufacturing. The duties could increase production capacity in the U.S. by at least 3.4 gigawatts, compared with 1.8 gigawatts at the end of last year, and would add to even more capacity already planned, based on Bloomberg New Energy Finance data.

The push for tariffs began in April 2017, when Suniva Inc., a bankrupt Georgia-based panel maker filed a trade complaint arguing it had been crippled by a flood of imports. In January, imposing duties of as much as 30% were deemed necessary to protect American manufacturers and create jobs.

"Trade disputes are forcing these companies to build capacity in the U.S.," said Peng Peng, general secretary of China New Energy Investment & Financing Alliance, an industry group. However, only a handful will do so as production in the U.S. may predominantly target only Western markets and have higher costs than China, she said.

While the plants announced by Hanwha and others will boost U.S. production, they're unlikely to employ armies of workers, analysts said. As panel prices have declined, solar factories have become increasingly automated.

"However, America's victory is modest," said Hugh Bromley, a New York-based analyst at Bloomberg New Energy Finance. "The profits will flow offshore and the highly-automated production lines will bring few jobs."

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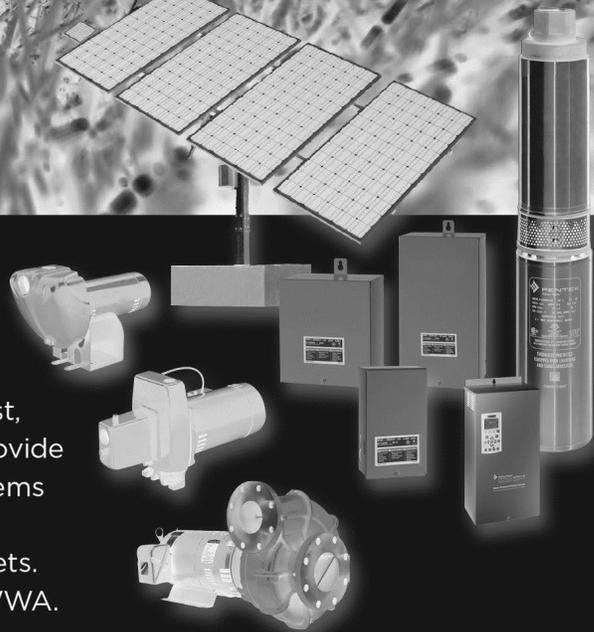
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Arizona Considers Desalination Options for Future Water Supply

From a partnership with Mexico to treating brackish groundwater, Arizona is exploring opportunities to incorporate desalinated water into its long-term water supply planning.

Written by Jerry Redfern, AzCentral.com



Employees work at a desalination plant in Carlsbad, California. *Don Bartletti/Los Angeles Times via Getty Images*

Not if, but when. That's the future of water desalination plants in Arizona, according to the head of the state's water department. They are controversial and expensive, but Arizona's current leadership views desalinated water – or “desal” – as key to the state's long-term water plans. Arizona sits atop an estimated 600 million acre-feet of brackish water.

“Desalination is in our future,” said Thomas Buschatzke, director of the Arizona Department of Water Resources. In late 2016, the state formed a committee to study the feasibility of desalination for a region with rising population and droughts exacerbated by climate change. More recently, an international water treaty update with Mexico is another factor in the movement toward desalinated water in Arizona. “We are doing our due diligence to make that happen,” Buschatzke says.

But that future is still years down the road. While the basics of desalination are fairly straightforward, the practicalities are messy and expensive.

The process behind utility-scale desalination is called reverse osmosis. Saline water – either from an ocean or brackish underground aquifer – is forced through an extremely fine filter that strips the water of salts and other dissolved solids. The process takes a phenomenal amount of energy and the resulting wastewater – saturated with the unwanted salts and minerals – poses environmental concerns.

All of this makes desalination an expensive way to bring water to consumers. Desalinated water can cost from several times more up to an order of magnitude more than surface water. But if rivers are running dry, adding a zero to a water bill may become an acceptable option. Currently Arizona is talking with Mexico about a possible plant on the Sea of Cortez, while a committee on the Governor's Water Augmentation Council explores how to tap and treat the state's 600 million acre-feet of brackish water – a potentially less expensive option. Either way, Buschatzke says that even ballpark estimates on either possibility are still years down the road.

But a couple of rough comparisons can be seen next door in California. Last year, Santa Barbara brought a desalination plant back online after it had been mothballed in the '90s. The cost? About \$71 million. And that doesn't include \$4.1 million a year in energy costs to squeeze seawater through the filters. The plant provides 30 percent of the water in a city of 91,000, although that amount could increase in the future.

(Continued on page 27)

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Pipes for a water intake pump sit on an area of Pyramid Island that used to be under the waters of Lake Mead near Boulder Beach on May 13, 2015 in Lake Mead National Recreation Area, Nevada. Falling water levels in the lake and concern over long-term security has prompted Arizona to consider desalination. (Justin Sullivan/Getty Images)

Down the coast, the Claude “Bud” Lewis Carlsbad Desalination Plant cost \$1 billion to build by the time it came online in 2015. It draws around 36 megawatts from a neighboring power plant to produce about 10 percent of the potable water used by the 3.1 million people of San Diego County.

Sandy Bahr, director of the Grand Canyon Chapter of the Sierra Club in Phoenix, notes that desalination plants aren’t a new idea for Arizona water planners. She says the idea comes up “pretty much every time” there is talk of the state water supply at the Capitol. And each time, the conclusion is the same: “What they find is that it’s very costly, takes a lot of electricity and there’s no good way to dispose of the brine.”

Bahr says she doesn’t necessarily have anything against the governor’s desalination committee. “Looking at things: I don’t think it does harm. But it does detract from things we can do right now,” she said. “They are looking for the magic solution – the magic bullet – and desal just isn’t that.”

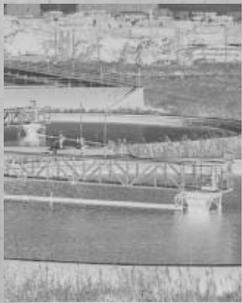
The state should be much more aggressive in adopting strict municipal and agricultural conservation goals, and dramatically improve water reuse and recycling programs before desalination should be considered, she says. For example, Arizona agriculture accounts for 74 percent of state water use. The top three crops by acreage are hay, alfalfa and cotton – comparatively low-value crops considering their water requirements (as noted in this 2015 University of California, Davis study).

“We are in the Sonoran desert – we should act like it,” Bahr says. “There’s no real big silver bullets out there in Arizona, so we’re going to have to cobble together several different ideas,” Buschatzke said. Those combine desalination with many of the same ideas Bahr mentions: improved conservation programs, water recycling and agricultural-to-municipal water rights swaps. “Cost will drive a lot of what happens in terms of the timing,” he said, with the least-costly options happening first. “I think desal is further out in time – but it’s just a matter of time.” He thinks a minimum of 10 years, and quite possibly more.

(Continued on page 29)



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He points out that, over decades, Arizona has implemented a series of widely hailed conservation efforts that have led to overall state water use equaling that of 1957 while the population has increased sixfold.

But one day, he says, the state will “squeeze the last drop” out of the water resources it has, and, “the market will help decide the when and the where for desal.”

The climate will factor as well. This winter’s snowpack has water managers across the Southwest worried for the coming summer. “The bad start to the water year is certainly weighing heavily on my mind,” Buschatzke said.

But one more wild card in Arizona’s desalination equation is Mexico.

The Colorado River Agreement apportions Colorado River water among seven U.S. states and Mexico. A recent update, called Minute 323, sets aside \$31 million to study and improve Mexico’s water infrastructure and to consider building a desalination plant on the Sea of Cortez, about 50 miles from the Arizona border. That water could be piped to Arizona, or kept in Mexico and offset against that country’s allotment of Colorado River water.

This idea isn’t exactly new. “There’s been a kind of buzz that refuses to go away on this,” said Margaret Wilder, an associate professor at the University of Arizona School of Geography and Development and the Center for Latin American Studies.

Nine years ago, she headed a study group that traveled to Mexico and talked with government officials and other locals about just this possibility. She said her Mexican colleagues were receptive to the idea but concerned whether such a large infrastructure project would equally benefit those south of the border. They were also concerned about potential environmental damage from pumping high-salinity water back into the Sea of Cortez – environmental tourism is a major local industry.

“I think we need to advance as carefully as possible,” Wilder said. But as hard as the development would be, Wilder says that a cross-border desalination plant may be likely. “Maybe not in my future,” she says, “but maybe my children’s future.”



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It's not enough that we build premium pumps; we also build our own motors, right down to the windings, right here in Kendallville USA. And we insist on testing them again and again—and again. We test before assembly, throughout manufacture, after pump integration and yet again through extensive field audits. We do this, all to ensure our 4-inch motors will perform and pass the ultimate test—yours.

That's premium quality and reliability—*tested and trusted.*



Call 800.584.8089 or visit
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FLINT & WALLING

Zoeller Family of Water Solutions™

Trust runs deep™



Arizona Water Well Association
6101 S. Rural Rd. #106
Tempe, AZ 85283

Events Calendar

June 22 , 2018 &	AzWWA Annual Golf Tournament (Quailwood Greens Golf Course) and Membership Meeting & Dinner (Goldwater Lake)
June 23, 2018	Picnic, Horseshoe Tournament, Chili Cook- Off and Auction Goldwater Lake, Prescott, AZ
October, 2018	AzWWA Membership Meeting—Exact date and location TBD
December 3-6, 2018	National Ground Water Association 2018 Groundwater Week Las Vegas, NV For more information go to www.ngwa.org
February 7 & 8 , 2019	Mountain States Ground Water Expo Aquarius Casino Resort Laughlin, NV For more information go to www.mountainstatesgroundwater.com