

# Well Said

SUMMER 2016 • Newsletter of Arizona Water Well Association for our Members and Friends

**Friday, July 22, 2016**  
**10th Annual Golf Tournament**  
Quailwood Greens Golf Course  
Dewey, AZ  
9am shotgun start



**Membership Meeting**  
**Goldwater Lake**  
**Prescott, AZ**  
5:30—Meet & Greet/Networking  
6:00pm—Dinner & Guest Speaker

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

Business meeting will be immediately following the speaker presentation.

**\*\*Golf and dinner registration forms can be found online at [www.azwwa.org](http://www.azwwa.org) or use the forms on pages 28 and 29.\*\***

Dinner \$27 and \$6.50 for children

**Saturday, July 23, 2016**  
**Picnic, Horse Shoe Tournament, Chili Cook—Off & Auction**  
Location: Goldwater Lake  
8am—?

We have a room block at the Springhill Suites Marriott in Prescott. The group rate is \$144 per night. You can make reservations by calling 1-800-228-9290 or 928-776-0998. Ask to make a reservation under 'Az Water Well Association'. **Reservations must be made by June 22.** After this date, reservations at the group rate will be accepted based on a space and rate available basis

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**The Arizona  
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As of Monday, June 13, 2016, ADWR's new office will be located at:

1110 W. Washington St. Suite 310 , Phoenix, AZ 85007

Mailing Address: PO BOX 36020, Phoenix, AZ 85067

\*ADWR staff phone numbers and email addresses will stay the same

**ADWR has launched the  
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Link to past articles: [http://www.azwater.gov/azdwr/  
ADWR\\_News/default.htm](http://www.azwater.gov/azdwr/ADWR_News/default.htm)

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## Billion-Dollar Project to Mine Arizona Copper

*Adapted from Information Provided by Resolution Copper Mining*

Located in the historic Magma Copper Mine in the Pioneer Mining District of Arizona, Resolution Copper is one of the largest undeveloped copper deposits in the world. It lies almost 7000 feet below the earth's surface and is believed to contain more than 1.9 billion tons of copper ore.

In 2014, the Resolution Copper Project accomplished an important milestone by constructing the 28-foot diameter #10 shaft to a final depth of 6943 feet, making it the deepest shaft in the U.S. The company has used this project to collect geotechnical information needed to design a mine expected to produce 25% of the nation's copper demand.

Project Director Andrew Taplin said the project "will bring jobs and meaningful economic and community benefits to the entire region."

With over \$1 billion invested to sink the exploratory shaft to full depth, Resolution Copper is now focusing on working with regulators and the community to finalize operating plans and earn the permits necessary to responsibly and safely develop an operational, world-class copper mine. In March 2016, the mining company marked another significant milestone when the United States Forest Service opened a 60-day public scoping period under the National Environmental Policy Act (NEPA) for the proposed copper project near Superior, Arizona.



"We welcome the opening of the public comment period and the process to evaluate our Mine Plan of Operation and Land Exchange," said Taplin. "NEPA is entirely consistent with the way in which we develop state-of-the-art projects worldwide, and it is an important process that allows stakeholders to identify potential environmental and cultural concerns so that they can be analyzed and mitigated...Our values mandate that our project be open to public scrutiny and respectful to all views being expressed." All comments from the public are due by May 17, 2016.

As the mine moves forward from project permitting to full operation, Resolution Copper seeks to create mutually beneficial partnerships in areas such as land stewardship, direct employment, and job training, along with contracting and commercial opportunities for local and Native American owned businesses.



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# In Slap to Lawmakers, Ducey Vetoes 'bad' Water Bills

By: Howard Fischer, Capitol Media Services



Gov. Doug Ducey vetoed two measures that could ease water-supply requirement for developers. "We're not going to allow bills that get in the way of the 1980 Groundwater Management Act or take away from the work of the people that have come before I came into office in protecting Arizona's water," Ducey said.

The decision is a slap at the three lawmakers who represent Cochise County who had pushed for the changes. It also marks a defeat for a developer who had hoped to make an end-run around its legal problems that have so far thwarted its efforts to construct a 7,000-home development in Sierra Vista.

**But Ducey called the two measures "some bad bills."**

One measure, SB 1400, would have required counties that have chosen to require developers to show they have an assured water supply to revisit and revote on the mandate. Only Cochise and Yuma counties fit that definition.

The more far-reaching measure would allow any city within either county to simply declare itself not subject to those county requirements.

**Both have their roots in that 1980 law which has resulted in the creation of five "active management areas."**

**For the Phoenix, Prescott and Tucson areas, the goal is "safe yield" by 2025, when the amount of groundwater withdrawn is no more than recharge.** Pinal and Santa Cruz have other goals.

Outside those areas, developers must get a determination from the Department of Water Resources of whether there is a 100-year assured water supply. But the lack of that does not prevent them from building. They do, however, have to disclose that fact to initial buyers.

At issue here is a change in the law that allows counties to mandate that 100-year showing, which Cochise and Yuma counties have done.

Castle & Cooke, which is proposing the Tribute development, got such a finding from DWR. But that was overruled by a trial judge who said the state agency did not properly consider competing claims to the groundwater, including the Bureau of Land Management which wants to protect the flow of the San Pedro River for the riparian area there.

That ruling is on appeal.

In the interim, Sen. Gail Griffin, R-Hereford, introduced two measures designed to short-circuit the need for the developer to win the lawsuit. SB1400 originally would have required county supervisors to review and unanimously reenact its water-supply requirement within two years. Facing stiff opposition, she diluted it. It still required review. But it would take a unanimous vote of the board to scrap the mandate.

The potentially more far-reaching measure would have allowed any city in either county to simply decide it was no longer subject to the county ordinance.

There were some conditions a city would have to meet. But SB1268 was crafted in a way to ensure that Sierra Vista could fit within the law. The measure drew sharp criticism and calls for vetoes from many environmental interests.

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# Well Drilling in Extremely Hot Weather

By Gary L. Hix, R.G, CWD/PI

As I'm writing this brief article, it is June 21, 2016, the longest daylight day of the year, and plenty of the highest daily temperature records are being broken. When the thermometer reaches one hundred degrees before 8:00 AM and is still be above the century mark well after 7:00 PM, it's hot. Daytime temperatures reached 123 F degrees in nearby locations yesterday, and they tell us there's more of it to come. Those of us who work in the deserts have to face some nearly unbelievable hot working conditions for a few days almost every year. This year is no exception. It's been a record breaking year and it's only June. As desert well drillers we have learned how to deal with temperatures in excess of a hundred degrees and avoid the skin penetrating solar radiation.

There is simply no easy way to set up artificial shading when you're drilling that will cover enough ground to keep everyone cool. What we really need is low angle shade on our bodies during the hottest part of the day, from 4:00 PM to sun-down. If you try to build shading walls, it cuts off what might be a cooling breeze and it reflects the radiant heat back at you. **But setting up the drill rig to have the mast shade the operator's controls late in the afternoon is one way to get a little relief for the driller at the controls.**

A common recommendation for working in extreme heat is having workers take ten minute breaks every hour. I find that very difficult to do while drilling wells or while pulling or setting pumps. Instead, we typically work until we get to a spot where everyone can take a break without disrupting the flow of the task at hand. While we work on, we watch each other carefully for the first signs of heat stress and make that individual take a break while the rest of us work on to a better time to take our break.

A subtle, but very real, indicator of approaching heat stress is observing your own, or that of a co-worker's, **tendency to stumble while walking or moving about around. Perhaps there's a slowing down of communication between the brain and the feet**, but it happens and we know to watch for it. When body temperatures are elevated the brain does not work as fast and as smoothly as it does in our more preferred operating temperatures. Doing mental calculations and clear thinking are dramatically reduced as body temperatures rise. What cranial functions I do manage to perform under these conditions is done at a much reduced speed.

Moving and working in the extreme heat takes greater effort and that requires working at a slower pace. Your heart beats faster when working in extreme temperatures. I try to never get in a hurry or move about quickly in these extreme conditions. I find that taking slow steady deliberate steps, moving at a moderate pace allows me keep my heart rate at a reasonable level throughout the day.



One way we beat the heat in the middle of the hottest months is drilling at night. The desert typically cools down quickly as soon as the sun goes down and if you can provide enough light, drilling at night may be the better option. There are additional hazards with working during the night in the **desert, as that's when many animal and reptile species also come out to hunt for food. Drilling at night** requires paying attention to every step you take and every object you pick up.

Working around drill rigs and pump hoists in blinding sunlight with temperatures in excess of one hundred and fifteen degrees coupled with hot blowing winds that sears your lungs and wicks away **your bodies' moisture has discernible impacts on the human body. Through necessity we have** learned what these indicators are and what they tell us about how fragile we are

In these hot and dry environments our bodies must loose water in order to **stay cool so we consume lots of water. We perspire heavily but it doesn't** always show as sweat running off our faces and staining our clothes because our sweat evaporates as fast as it forms. The evaporation of our sweat is what cools our skin **and helps to lower our body temperature. The searing sun's ultra-violet rays, wind blown dust and sand** also so our eyes and skin needs constant protection from the suns damaging rays that cause skin cancers. Everyone wears sun glasses in the desert and not just for making a fashion statement.

**Along with the sleepiness, there's is a feeling of lethargy that comes over your body that** makes you both tired and listless and fills you with a wanting to just sit in the shade and go to sleep. Brain activity actually slows down when the body is approaching heat stress conditions. Breathing be



(Continued from page 11)

# New Law Puts the Squeeze on the Arizona Geological Survey

Reprinted from *EOS Earth and Space Science News*  
By Randy Showstack June 3, 2016

Arizona state services at risk include a program to map Earth fissures; the state's earthquake monitoring network; and the Survey's mineral resources program.



The consolidation threatens some important state programs including mapping Earth fissures.

Pictured is Michael Conway, chief of the Geologic Extension Service at the Arizona Geological Survey, mapping Earth fissures in the Queen Creek area south of Phoenix, AZ

Credit: Joseph Cook, AZGS

A new law that consolidates the Arizona Geological Survey within the University of Arizona at Tucson could result in dramatic cuts to state geological services, according to the Survey and some industries that rely on its capabilities. **However, Arizona governor Doug Ducey's office maintains that the cost-cutting action benefits taxpayers while building on synergy between the Survey and the university.**

The action, part of broader budget legislation Ducey signed into law in May, calls for the Survey to vacate its current quarters by 30 June and move into space 75% smaller, but the law does not provide funding for the Survey for fiscal year (FY) 2017, which begins July 1<sup>st</sup>.

**The University of Arizona has agreed to provide the Survey with the equivalent of the Survey's FY 2016 state appropriation of \$941,000 for the upcoming fiscal year, after which the Survey would need to become entirely self-supporting, according to Lee Allison, Arizona state geologist and director of the Survey.** Allison serves as a member of the *Eos* editorial advisory board.

At risk is funding for mapping, hazard monitoring, and other services.

## Reduction In Services

Since 2011, the Survey received \$5.36 million from the state while entrepreneurially raising an additional \$35.8 million through external research grants and contracts, according to a Survey document, which notes that the Survey had 27 employees earlier this year.

Allison applauded the University of Arizona for agreeing to replace state funds for the Survey for the coming year. However, he told *Eos* that the grant and contract funding that the Survey has raised on its own to support its state services now **"will mostly go to the university to support [its] services, resulting in a 40%-50% reduction of those [Survey] functions and the staff that carried them out."** He said that concerns about the Survey's future have prompted 20% of its staff to take other jobs. Allison also has notified another 25% of staff of pending layoffs.

**The uncertainty of having only 1 year of funding "puts the Survey's medium-term capabilities and functions at risk,"** Survey director Lee Allison said. The uncertainty of having only 1 year of assured funding for the remaining staff

(Continued on page 7)

“puts the Survey’s medium-term capabilities and functions at risk,” he said. As the Survey transitions to a soft money grant-seeking center, Allison said that state service priorities, subsidized through indirect costs from grants and contracts, “could go by the wayside.”

State services at risk include a program to map Earth fissures—giant tension cracks formed by subsiding basins—which developers and local planners depend on; the state’s earthquake-monitoring network; and the Survey’s mineral resources program, according to Allison.

### **Governor’s Office Defends Action**

The consolidation language, which was in the final state budget package approved in May, reflects a strategic way to cut the budget while taking advantage of synergies between the Survey and the university, according to Dan Scarpinato, spokesman for Arizona governor Ducey. He said the consolidation is a cost-efficient “net positive” for the Survey and the clients it assists and for the university.

Experts need to figure out how to combine programs and make the consolidation work “in a way that doesn’t have an impact on the clients themselves or the services that are provided,” according to the governor’s office. “Anytime you change something that’s been operating one way for a very long period of time, there are going to be concerns and there are going to be questions,” he said, adding that the state wants to address concerns so that the consolidation works. With the budget approved, experts need to “come to the table and figure out how we combine these programs [and] make the consolidation work in a way that doesn’t have an impact on the clients themselves or the services that are provided.”

University of Arizona spokesman Chris Sigurdson reiterated to *Eos* what he told the *Arizona Daily Star*—that the transfer of the Survey to the university “makes scientific sense to us and is in line with our land-grant mission of service.”

### **Consolidation Could Be “Devastating”**

However, Doug Bartlett, president-elect of the *Arizona Chapter of the American Institute of Professional Geologists*, said that moving the Survey to the university without a long-term funding mechanism “will be devastating to the Survey.”

He told *Eos* that the move will result in a loss of primary research, field mapping, monitoring for geological hazards, and detailed geologic mapping useful to Arizona’s minerals industries. “Private industry cannot and will not step in to replace what the Survey does,” he said.

Steve Trussell, executive director of the Phoenix-based *Arizona Rock Products Association*, said that perhaps the biggest concern about the changes affecting the Survey is what might happen to mapping and other services it provides. He said, for instance, that the Survey’s maps and other programs help the construction, real estate, mining, and natural resources-related industries.

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## Welcome New Member!

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PH: 480-921-3110; Fax: 480-921-3225  
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# Final Outcome of HB 2613

From: Doug Bartlett, Clear Creek Associates

**HB 2613** was signed into law by the governor on May 19<sup>th</sup>. As you all know, this has been quite a bumpy ride for all Arizona geologists. We started out on February 5 with a bill that deregulated the geologic profession and removed the geologist representation on the Arizona Board of Technical Registration. We quickly moved to retain lobbyists to represent us as the bill was debated and moved from committee to floor vote in the House and then again in the Senate.

Your many emails to House and Senate members were instrumental in getting the bill modified while still in the House to retain geology registration and our position on the AZ BTR. However, an amendment was introduced that would have allowed geologists to work in the state in a non-regulated capacity as “**Trained Geologists**” essentially making geology registration optional. Our lobbyists came up with a sponsored amendment (the Donahue Amendment) that eliminated this language essentially keeping geology registration at status quo. The amendment initially passed on voice vote. The governor did not like this and pressured various Republican **Senators. Our lobbyists felt that it was likely that the Governor’s pressure would cause the Donahue Amendment to fail.** The Trained Geologist category was problematic and needed qualifications.

**This was done by modifying the Donahue Amendment in coordination with the Governor’s office such that Trained Geologists could not practice in Arizona if they were convicted felons or had lost their geologist license in another state.** It also requires the Trained Geologist to disclose their lack of licensing to a prospective employer/client. A Trained Geologist cannot prepare materials related to any State Law that required professional registration (e.g. Aquifer Protection Permits, UST Permits, etc). A Trained Geologists must also have received a Geology Degree from an accredited university and have at least 4 years of professional experience.

In my view, we achieved about 90 percent of what we wanted. The only thing left that is still not acceptable is that there is no provision for who will monitor Trained Geologists. The AZ BTR will not have any records of these individuals, so the onus will be on the buyer of the services of a Trained Geologist to do a background check and make sure the individual is truly qualified. But, considering where we started this process back in February, we achieved a very workable outcome.

Thank you all for your support! I would also like to thank all the organizations and individuals listed below who ponied up money to support our lobbying efforts. This could not have happened without financial support.

AIPG Arizona Section  
Arizona Geological Society  
Arizona Hydrological Society  
Association of Environmental and Engineering Geologists (AEG)  
Civil & Environmental Consultants  
Clear Creek Associates

Cori Hoag  
Keith Scoular  
Matrix New World Engineering Inc.  
Montgomery and Associates  
Southwest Ground-Water Consultants  
SRK Consulting

Cheers,

Doug

**R. Douglas Bartlett, RG, CHG**

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# Welcome New Member!



Chris Gardner, R.G., is joining the Arizona Water Well Association after providing professional services to the water resources community as a hydrogeologist for almost 20 years. During this time, Chris learned the standards of the water well industry and has provided successful well designs and development programs which are providing long-term results for well owners.

He has developed an eye for detail when evaluating well and borehole issues. He understands the problems and has developed solutions for Contractors to execute and made recommendations for well owners to optimize their operation. This involves an understanding of the science, the standards and practices of the industry as well as the skills



and capabilities of the Contractors. Chris has relied upon hands-on involvement in the field to better understand and progress with the industry by working with Contractors as a team, but his situation dramatically changed last Summer. After several tough weeks in the field, Chris knew there was something wrong and saw his doctor. He was admitted to intensive care that day. To everyone's surprise, Chris was diagnosed with Type 1 Diabetes. As a result, he decided to be less hands-on in the field as he adjusts to this change.

Joining the Arizona Water Well Association provides the opportunity for a different hands-on experience which aligns with his desire to develop with the water resources community. He is looking forward to contributing as a Technical Member of the AZWWA.

Chris has been with **Haley and Aldrich** for almost two years and is helping expand their services to the water resources community. Haley and Aldrich is a unique employee-owned environmental consulting firm with offices across the country, including Phoenix and Tucson.

Chris can be reached at:  
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# Governor's Water Initiative

Governor Doug Ducey announced a new two-track initiative through the Arizona Department of Water Resources to help ensure the certainty and vitality of Arizona's water supply long into the future.

The initiative, which is based off of and continues the work published in the 2014 Strategic Vision for Water Supply Sustainability Report, involves two tracks. The first will be to identify and prioritize the 22 planning areas identified in the report, beginning with rural areas. The goals of this track will be to look at refining the issues that are causing supply and demand imbalances; identify strategies that are likely to be successful in each planning area; and work together with local stakeholders to create solutions that Arizona can then implement to meet future water demands.

The second track will involve a team – appointed by the governor – that will investigate the long-term augmentation strategies identified for these areas, as well as explore additional water conservation opportunities, identify infrastructure needs and, ultimately, report back with policy direction or statutory changes to take Arizona into the future. The group, led by ADWR Director Thomas Buschatzke, will consist of a wide array of experts including water providers and leaders in Arizona agriculture, mining, agribusiness, homebuilding, watershed groups and government.

**“Thanks to more than a century of careful planning, sound decision-making and bold leadership from our predecessors, Arizona's water supply, at least in the near-term, is in a better-than-expected position,”** said Governor Ducey. **“Of course, vulnerabilities and uncertainties remain, and we must continue to be pragmatic and proactive – just like those before us – in how we manage our water resources.**

**“All Arizonans have a role and responsibility to play in the future of this great state, and a strong water supply will be central to that future. With the leadership of Director Buschatzke and his team of experts at Water Resources, we've come up with a long-term plan to help guide our efforts.”**

Link to Arizona Water Initiative: [http://www.azwater.gov/AzDWR/Arizona\\_Water\\_Initiative/index.htm](http://www.azwater.gov/AzDWR/Arizona_Water_Initiative/index.htm)

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(Continued from page 5)

comes harder as the excess heat in your body strains to be released. This is the danger zone time and if you happen to be working alone, the last thing you want to do is lay down and go to sleep.

Dizziness is another sure indicator or advanced dehydration. Another sign is a person just standing and staring into nothing for brief periods means that their body is being stressed by the heat and dehydration. Muscle cramps while working are another indicator of dehydration. But the muscle cramps you get during the day while working in the extreme heat are nothing compared to the cramps you can get in the middle of the night if you are still dehydrated.

Drinking some cool water (cool but not ice cold) in a cooled environment does amazing things for your spirit to continue on with the tasks at hand when working in extreme heat conditions. Heavily sun screened windows and a hard roof overhead lets the entire body cool down. It cools your head, your torso, and your feet. Your outer clothing is cooled at the same time. I think the brightly colored vests that we are often forced to wear for visual recognition restricts evaporative body cooling and add extra weight making keeping cool even more difficult. But it's comforting to know we will be seen when we fall down from heat stress.

While working in extreme heat conditions, drink water, not sodas, not even straight Gatorade. Water, and lots of it, is better for you. Water, water and more water, not colas, not power drinks, and definitely not alcohol.

Desert well drillers and pump installers bring water out of the ground in areas where it is needed the most. It takes water to drill wells to make more water. It takes water to keep well drillers alive while they drill new wells and repair existing ones. Desert well drillers are a special breed of people that have learned to work and survive in the very difficult environment of extreme heat conditions. My hard hat is off to all of them.



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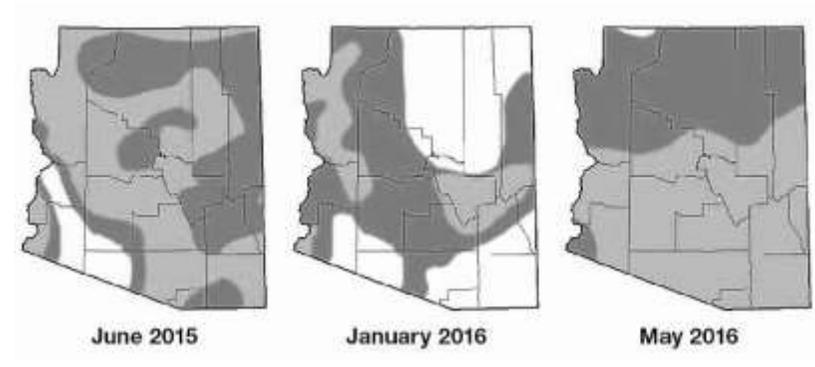
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# Arizona's Drought Conditions Worsening

By Les Bowen; Reprinted from the Daily Courier (Prescott)



Drought maps from the National Drought Mitigation Center indicate the intensity of drought conditions, and changes over time. White indicates no current drought conditions, lighter grey indicates abnormally dry or moderate drought and darkest indicates severe drought. There are two other drought conditions not present in Arizona: extreme drought and exceptional drought.

It's not as bad as it was a year ago, but Arizona's drought conditions grew over the first half of 2016. "Between the first of the year and now, we are moving in the wrong direction," Arizona Department of Water Resources Director Thomas Buschatzke said.

According to the latest figures from the National Drought Mitigation Center at the University of Nebraska-Lincoln, nearly 60 percent of Arizona is in moderate to severe drought, with the worst conditions near Yuma. Virtually the entire state is experiencing drought or abnormally dry conditions – the only exception is a pocket at the Utah border near Colorado City. Compare that to where the state was at the end of January: Less than 16 percent of the state was experiencing moderate drought, and nearly 43 percent had improved to the point of not having a drought classification.

In Yavapai County, abnormally dry conditions persisted over the winter. In March, drought monitoring officials reclassified the southern half of the county as having moderate drought conditions.

Not only have drought conditions returned to more areas of the state in recent months, but in May the National Drought Mitigation Center bumped the state back to "long-term" drought impacts – typically longer than six months with impacts on ecology and hydrology.

The backslide caught the attention of the Governor's Drought Interagency Coordinating Group at its May 17 meeting. "We made a recommendation to continue the existing drought declaration," Buschatzke said. He was quick to note the state is still in a better position than it was a year ago, when more than 80 percent of the state was in moderate to severe drought.

Above average rainfall last spring and summer was reversing the multi-year trend, and last fall, weather forecasters and drought monitoring officials had expected a wetter-than-normal winter because of a strong El Niño weather pattern in the Pacific Ocean.

National Weather Service Forecaster Darren McCollum said the predictions were right, with one exception: The wet weather patterns bypassed the Southwest. The winter was good for other parts of the West, including Northern California and the Pacific Northwest, but Arizona and Southern California didn't get the expected precipitation. Buschatzke said that's contributed to continued low flows in the Verde and Salt river basins, and with the current weather outlook, it's not expected to improve. "As far as we can see, on our forecast, it looks like it segued into a typical June," McCollum said. That means warm, dry weather for the next few weeks. "The fire threat is going to start going up," he said.

While state and federal land agencies haven't yet issued fire restrictions for any areas outside Phoenix, at least 10 wildfires started across the state in the past week. "We have a lot of very high risk," Buschatzke said.



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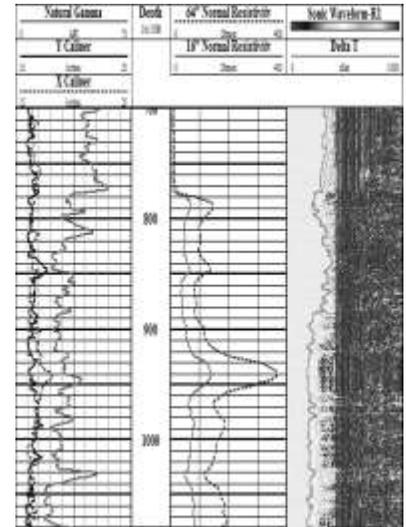
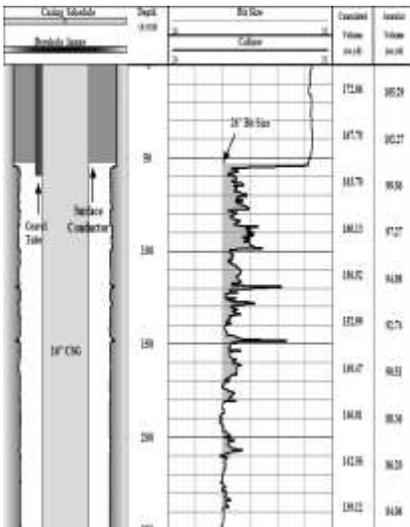
### Meet Steve Stroud, Our Southwest Regional Manager

Steve is a graduate of Arizona State University (Geology) and has 5 years of experience conducting sophisticated geophysical logging that includes on-site data interpretations to better serve our client's needs. Steve has built excellent relationships within the Arizona Water Well market which fit well with COLOG's priority to grow long-term relationships with our customers. Please contact Steve for more information: [steve.stroud@colog.com](mailto:steve.stroud@colog.com).

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# Do CDs & DVDs Wear Out?

By: Ken Colburn of Data Doctors

**Question:** I'm trying to access pictures on an old CD I made long ago, but can't. Do they wear out?

**Answer:** Few things changed our digital lives like CDs and DVDs, especially when it became affordable to make our own discs. They don't 'wear out' in the same way a cassette tape or vinyl record used to wear out because there is no physical contact with the recording service, but they do deteriorate.



Anyone that has important files or music stored on CDs or DVDs that they burned themselves may want to get them copied to another storage device before they become unusable.

## Common Misnomer

The companies that sold optical disks boasted lifespans of up to 200 years, which gave a lot of people a false sense of security when they decided to use them for long-term storage.

Many variables can dramatically impact the actual lifespan of all of your optical discs; some you have control over while others are totally out of your control.

The biggest variable that you have no control over is the manufacturing quality of the discs themselves, which has proven to have a huge impact on the actual life-span.

Laboratory researchers have done tests comparing discs made by the same company in the same year, wrapped in identical packaging that showed to have dramatically different lifespans.

## Understanding 'Disc Rot'

We also have a couple decades of experience with optical storage, so we've learned more about things like 'disc rot' which causes discs to become unreadable.

Disc rot can occur from chemical or physical deterioration due to poor manufacturing quality or oxidation from exposure to sunlight, heat and humidity.

Disc rot appears as a discoloration, especially around the edges of the disc or if it's a poor quality disc, you may start to see delamination or separation of the disc itself.

CDs and DVDs are read by a laser that bounces light off the shiny surface below the clear plastic layer that protects it; oxidation will dull the shiny layer over time, making it harder to read.

## Both Sides Matter

Your recorded information is read from the blank side, but it actually resides just below the label. If you see any scratches of the label that have torn through, the associated data is essentially gone.

If you hold the disc up to a light and can see tiny holes, the shiny recorded layer has begun disintegrating or the label side has suffered damage.

Scratches on the blank side can also cause read errors but if they're small enough, you may be able to buff them out in a circular motion with a cotton ball or soft cloth and a dab of toothpaste (not a gel).

## Store Them Properly

Much of the damage isn't noticeable with the human eye, so just looking at the disc won't necessarily alert you to a problem.

Discs that weren't stored vertically for long periods of time can suffer minor bending or warping that can contribute to de-bonding of the layers or slight stretching of the recorded layers.

Commercially produced CDs and DVDs can also experience read errors if they aren't stored properly, so if you value your old discs, take good care of them.



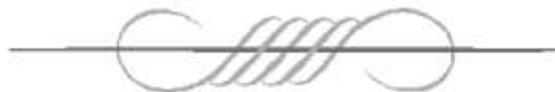
AZWWA Membership Meeting  
April 23, 2016  
Preferred Pump & Equipment in Tucson  
(formerly Grand Canyon Pump)



**“Thank you”** to Preferred Pump & Equipment in Tucson for hosting our Spring Meeting. We had a great turnout!!

**And “Thank You” to Edd Schofield** with Johnson Screens who gave a great presentation on ***What’s New on Well Screens***, answered a lot of questions and stayed for our business meeting. **This was a very informative talk on what’s new and changing in our industry and we appreciate** him taking time to do this on a Saturday!

We had several discussions on various topics during our business meeting, one of which was giving AZWWA recognition in UofA booklets about water. Gary Hix is helping with booklet. We also discussed some of the legal issues happening that we need to be watching closely because of how they could affect our industry. Since there is a lot going on in various parts of our state, we decided to invite Jesse Richardson, Legal Advisor to Water Systems Council, back to speak at our July meeting in Prescott on Friday, July 22<sup>nd</sup>. For those of you who have not heard him before, he is very well informed on legal issues happening in Arizona affecting groundwater issues so his talk will be quite informative as well as other topics that will also be discussed. We hope to see many of you there!!!!



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# 13 Rules to Live By

By John Fowler, CSP, AZWWA Safety Director



When you work in the well drilling and pump service industry, jobs can take you anywhere from a remote farmer's field to a large open pit mine to a nuclear power plant. This wide variety of locations means that not only do the hazards change from job to job, but the regulations as well. One day you are expected to comply with OSHA (Occupational Safety and Health Administration) regulations and the next with MSHA (Mine Safety and Health Administration) regulations. Both OSHA and MSHA use safety analysis to decipher the most common hazards relating to the majority of their incidents.

Below are the rules created by MSHA relating to the most common incidents happening on jobsites. Like OSHA's "Fatal Four" hazards; Falls, Electrocutions, Struck By Objects, and Caught-In/Between., MSHA created 13 "Rules to Live By", specific to metal/non-metal mines. Despite the difference in the industries regulated by OSHA and MSHA, the hazards they identified are similar and almost all are dealt with on a daily basis in the drilling and pump service industry. We know what OSHA's "Fatal Four" hazards are, but what are MSHA's 13 "Rules to Live By"?

The first MSHA Rule to Live By is: Operating speeds of equipment. MSHA 30 CFR 56.9101 says, "Operators of self-propelled mobile equipment shall maintain control of the equipment while it is in motion. Operating speeds shall be consistent with conditions of roadways, tracks, grades, clearance, visibility, and traffic, and **the type of equipment used.**" Whether we are driving on a muddy mine road or on an icy highway, we need to drive according to the conditions, specifically watch our speed, our following distances, and always drive defensively. The more severe the driving conditions the more conservative regarding speed, the more space you should leave between you and the vehicle in front of you and be an aware and defensive driver. And Remember: Driving to and from work is probably the most hazardous activity we do all day!

The second Rule to Live By is: Working on power circuits. MSHA 30 CFR 56.12017 says, "Power circuits shall be de-energized before work is done on such circuits unless hot-line tools are used. Suitable warning signs shall be posted by the individuals who are to do the work. Switches shall be locked out or other measures taken which shall prevent the power circuits from being energized without the knowledge of the individuals working on them. Such locks, signs, or preventative devices shall be removed only by the person **who installed them or by authorized personnel.**" This Rule to Live By is very similar to the second rule of OSHA's "Fatal Four" Hazards: **Electrocution**. When we are locking out a piece of equipment we need to think about all the potential sources of energy involved: electric, hydraulic, gravity, pneumatic, etc. Once we have identified what energy source needs to be isolated, we lock it out using a personal lock and then tag it out using a tag with your name and the reason why it is locked out. It is important to make sure that the key you use to lock it out is solely **controlled by you, that key is your protection. The last step of Lockout is the "Try Out" step, which is often overlooked.** After the equipment is locked out you must try to start it and ensure the power circuits are no longer energized. Only then, after the final step of LOTOTO is completed, is the equipment safe to work on.

The third Rule to Live By is: Brake performance. MSHA 30 CFR 56.14101(a) says, "**Self-propelled mobile equipment shall be equipped with a service brake system capable of stopping and holding the equipment with its typical load on the maximum grade it travels.**" Brakes must be checked every shift regardless of whether we are working in a mine or preparing to drive down a highway. When we inspect our brakes for our pre-shift or pre-operational equipment inspection examine the service brake, park brake, low air alarms and general condition of the air system. Brake checks should not just be for heavy trucks. Inspect all brakes on all equipment including your crew pickup to your backhoe to your forklift. Know how the manufacturer recommends the brakes to **be tested, and also know that MSHA expects you to park the vehicle on the "maximum grade it travels" to make sure the brake is able to hold the weight of its typical load.**

The fourth Rule to Live By is: Procedures during repairs or maintenance. MSHA 30 CFR 56.14105 says, "**Repairs or maintenance of machinery or equipment shall be performed only after the power is off, and the machinery or equipment blocked against hazardous motion. Machinery or equipment motion or activation is permitted to the extent that adjustments or testing cannot be performed without motion or activation, provided that persons are effectively protected from hazardous motion.**" This Rule to Live By is similar to the fourth rule of OSHA's "Fatal Four" Hazards: **Caught In/Between**. Are we correctly locking out our equipment when we are working on it? Have we thought through what will happen when we remove a guard or a hydraulic

hose? Or loosen that bolt? If a guard is removed during equipment repair or maintenance take the time to re-install it before starting the equipment. The time you saved taking a shortcut will be quickly lost if someone is injured.

The fifth and sixth Rules to Live By are almost identical: Seatbelts shall be worn by equipment operators and seat belts shall be provided and worn in haul trucks. MSHA 30 CFR 56.14130(g) says, **“Seat belts shall be worn by the equipment operator”** and MSHA 30 CFR 56.14131(a) says, **“Seat belts shall be provided and worn in haulage trucks.”** We should always wear our seatbelts. Period. End of story. Unfortunately, every year there continue to be cases where operators were not wearing their seatbelts or took them off in the hope that they could jump clear of rolling equipment. Mine sites require mobile equipment to have Roll-over Protective Structures (ROPS) and if a piece of equipment rolls it is almost always safer to stay inside. Operators often try to jump free of rolling equipment and then the piece of equipment lands on top of them or rolls over them, instead stay inside and wear your seatbelt at all times.

The seventh Rule to Live By is: Machinery, equipment and tools used beyond design. MSHA 30 CFR 56.14205 says, **“Machinery, equipment, and tools shall not be used beyond the design capacity intended by the manufacturer where such use may create a hazard to persons.”** Know the limits of your tools and equipment and do not work beyond those limits. If a tool or piece of equipment has a built in safety factor it does not mean you can take the safety factor into account when determining capacity. If the manufacturer says that specific tool or piece of equipment is rated for X amount then that is all it rated for. **If you need more capacity get a bigger tool or piece of equipment. Please don’t reach for a cheater bar.**

The eighth Rule to Live By is: Parking procedures for unattended equipment. MSHA 30 CFR 56.14207 says, **“Mobile equipment shall not be left unattended unless the controls are placed in the park position and the parking brake, if provided, is set. When parked on a grade, the wheels or tracks of mobile equipment shall be either chocked or turned into a bank.”** When parking a piece of equipment put the vehicle in park, set the parking brake and chock the wheels. Some mines have policies that require wheels to be chocked only when on a grade or only require chocks for trucks over a certain tonnage, but many companies including our company chock the wheels at all times. It might seem like **overkill to take all these steps when parking a vehicle, but the reason it’s on this list is because incorrect parking and rolling equipment have led to fatalities.**

The ninth Rule to Live By is: Safety belts and lines. MSHA 30 CFR 56.15005 says, **“Safety belts and lines shall be worn when persons work where there is danger of falling; a second person shall tend the lifeline when bins, tanks, or other dangerous areas are entered.”** This Rule to Live By is similar to the first rule of **OSHA’s “Fatal Four” Hazards: Falls.** MSHA says fall protection or prevention is to be used **at any height when “there is danger of falling.” Use common sense, and look at not just the height you are working at, but at what you would fall on or in if you did fall.** If you are asking yourself the question of whether or not you need some form of fall protection, you most likely do.

If you are going to be working in a Confined Space make sure you are properly trained, that you have an attendant who is properly trained and you have the required testing and rescue equipment. Keep in mind that OSHA has recently changed their Confined Space regulations for construction and they are now a lot more stringent.

The tenth Rule to Live By is: Bins, hoppers, silos, tanks and surge piles. MSHA 30 CFR 56.16002 says, **“Where persons are required to enter any facility listed in this standard for maintenance or inspection purposes, ladders, platforms, or staging shall be provided. No person shall enter the facility until the supply and discharge of materials have ceased and the supply and discharge equipment is locked out. Persons entering the facility shall wear a safety belt or harness equipped with a lifeline suitably fastened. A second person, similarly equipped, shall be stationed near where the lifeline is fastened and shall constantly adjust it or keep it tight as needed, with minimum slack.”** **Although we don’t work often in bins, hoppers, etc. this reminds us that we need to be aware of our surroundings and make sure that equipment is properly locked out. And like in the ninth “Rule to Live By” make sure you have been trained in how to safely work in a Confined Space.**

The eleventh Rule to Live By is: Suspended loads. MSHA 30 CFR 56.16009 says, **“Persons shall stay clear of suspended loads.”** This Rule to Live By is similar to the third rule of **OSHA’s “Fatal Four” Hazards: Struck By.** Stay out of the line of fire. It is important for you to make sure you are in a safe area,

but also to watch out for the other members of your crew. We work around suspended loads almost every shift. A really good practice for keeping you and your entire crew safe is to make sure that overhead shackles are **positively locked so that vibration won't cause the pin to back out.** A growing trend is to make sure everything hanging off the rig has a cable attached as back up if the primary mount breaks off. If using a crane to move a load use a tag line. Pay attention to what is overhead and make sure you stay out of the line of fire.

The twelfth Rule to Live By is: Barricades and warning signs. MSHA 30 CFR 56.20011 says, **"Areas where health or safety hazards exist that are not immediately obvious to employees shall be barricaded, or warning signs shall be posted at all approaches. Warning signs shall be readily visible, legible, and display the nature of the hazard and any protective action required."** Our drill sites contain hazards and it is critical that we **communicate these hazards to visitors as well as each other. Don't assume that visitors and even new employees understand what areas to avoid.**

The thirteenth and last Rule to Live By is: 57.3360 Ground support use. This standard applies to underground scaling and does not have much to do with the work we perform except for this: We need to always be aware of our surroundings and do a work place inspection.

**The hazards identified in the 13 "Rules to Live By" contributed to the 589 deaths in the mining industry between 2000 and 2008. In 2014, 45 miners were killed on the job and last year although the official numbers are not in, 28 miners were killed which is the lowest number on record. That is a great improvement, but it still means that people are waking up, going to work, and never coming home. By being aware of our surroundings and completing all inspections we can continue to lower the number of fatalities. Even if you don't work on a mine site think about the 13 "Rules to Live By" and how they can be applied to what you do.**

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

John Fowler, CSP



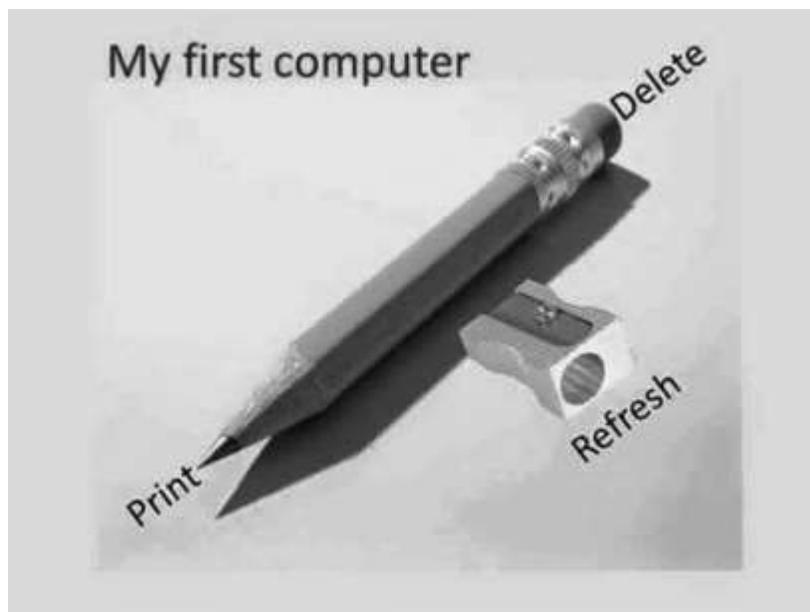
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# You are invited!



## Jesse Richardson, Jr., Policy and Research Advisor for the Water Systems Council

will be the Guest Speaker at our meeting in July. He will bring us up to date on legal and legislative issues impacting Arizona water wells, pending lawsuits, calls for reform, exempt well litigation and more. Since it concerns everyone in this industry, you are invited to attend, hear what he has to say and participate in any discussions that may take place.

Although you may or may not be a member of our Association, it is a great opportunity for everyone to hear what is happening in our area and how these issues could affect our industry, business and livelihood. Feel free to invite co-workers or others involved in our industry who may also want to hear what he has to say.

You are also welcome to attend our Steak Fry and if you plan to do so, please be sure to RSVP below ASAP so we have an accurate headcount for dinner.

Our business meeting follows the Steak Fry and Jesse’s presentation and you are welcome to stay for that too, if you’d like.

**Date: Friday, July 22, 2016**  
**Place: Goldwater Lake, Prescott, AZ**  
**Time: 5:30 pm Meet & Greet/Networking**  
**6:00 pm Dinner & Guest Speaker**  
**AZWWA Business Meeting follows**  
**DINNER REGISTRATION:**



Name \_\_\_\_\_ Company \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_  
Zip: \_\_\_\_\_ Phone: \_\_\_\_\_ Email: \_\_\_\_\_  
Number of people attending dinner at \$27 per person \_\_\_\_\_ \$ \_\_\_\_\_  
Number of Children’s hamburger meals @ \$6.50 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 with payment to:  
950 E. Baseline Rd. #104-1025, Tempe, AZ 85283

**Goldwater Lake;**  
Located at 2900 S Goldwater Lake Rd, from Prescott, go south on Mount Vernon Street, which becomes Senator Highway, about four miles to the entrance of the lake. Turn right and park in the designated parking spots only.



10th Annual  
 AzWWA Golf Tournament  
 July 22, 2016  
 Quailwood Greens Golf Course  
 Dewey, AZ  
 Shotgun start at 9:00 am

Sponsorship Opportunities and Golf Registration

- Hole Sponsorship \$200
  - Company name on a hole sponsor sign
  - An opportunity to host a table at a specific hole
  - Recognition as golf tournament sponsor at the Saturday Picnic
- Longest Drive Sponsor (2) \$250
  - **Company name on a hole sponsor sign as "Longest Drive Sponsor"**
  - An opportunity to host a table at a specific hole
  - Recognition as golf tournament sponsor at the Saturday Picnic
- Closest to the Pin Sponsor (4) \$250
  - **Company name on a hole sponsor sign as "Closest to the Pin Sponsor"**
  - An opportunity to host a table at a specific hole
  - Recognition as golf tournament sponsor at the Saturday Picnic
- Beverage Sponsor \$300
  - Company name on the tickets that will be given to golfers to use in exchange for libations
  - Recognition as golf tournament sponsor at the Saturday Picnic
  - Company name on a hole sponsor sign

PLAYER REGISTRATION & SPONSORSHIP

Deadline for golfer registration is Friday, July 15th

Name \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_  
 \_\_\_\_\_ Number and Names of Golfers @ \$45/person ) \$ \_\_\_\_\_  
 (includes range balls, lunch & 2 drink tickets) 4 man team scramble

\_\_\_\_\_

Hole Sponsorship @ \$200 \_\_\_\_\_  
 Longest Drive Sponsor @ \$250 \_\_\_\_\_  
 Closest to the Pin Sponsor @ \$250 \_\_\_\_\_  
 Beverage Sponsor @ \$300 \_\_\_\_\_

\*Sponsorships do not include golfers

Total \$ \_\_\_\_\_

Method of Payment: \_\_\_Check \_\_\_Credit Card (Visa, MC or American Express)  
 Credit card number: \_\_\_\_\_ Exp. Date: \_\_\_\_\_ Security code: \_\_\_\_\_

Fax registration to 480-609-3939 or mail to:  
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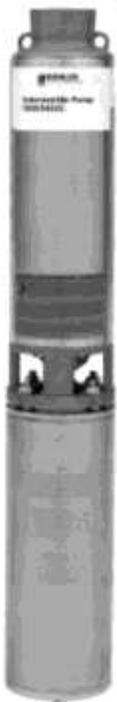
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## **Welcome New Member!**



The Organitec team is dedicated to the creation of products and systems which improves the performance and quality of water wherever it is used.

Incorporated in 1991, Organitec has developed innovative and highly successful water treatment solutions for local companies, as well as foreign governments, in a diverse number of fields, including: agriculture, commercial aquaculture, waste water treatment, oil field fracking, and oil and gas breakwater re-use treatment systems.

Arizona Ag Holding Company, LLC is a subsidiary of a locally-owned family business with its roots in agriculture. The owners have serviced dairies, cattle operations and farms in Arizona for over 30 years. Working together with Organitec we are developing a cost-effective line of new products focused on Irrigation Well Re-Hab and Down-Hole maintenance. Being proactive saves money!



For more information on how they can help eliminate mineral and bacteria build-up, contact:

Keith Cayton,  
Arizona Agricultural Holding Company, LLC,  
1757 E. Baseline Rd #125, Gilbert, AZ 85233  
Phone: (480) 633-6141 or Email: keith@arizonaag.net.



PROTECTING ARIZONA'S  
WATER SUPPLIES  
FOR ITS NEXT CENTURY

## **Silica Rule Released by OSHA**

A controversial rule limiting crystalline silica exposure for workers was released on March 24<sup>th</sup> after years of deliberation by OSHA.

The current rule caps exposure at construction sites to 250 micrograms per cubic meter of air per eight hours of exposure. The new rule will drop that figure to 50 micrograms per cubic meter.

The regulations are broken down into three categories: (1) the construction industry, (2) the hydraulic fracturing industry and, (3) general industry and maritime.

The final rule will go into effect June 23<sup>rd</sup> with various industries having between one to five years to comply with the new standards.

NGWA filed comments on the proposed silica rule, citing the unique nature of drilling for geothermal wells. NGWA is in the process of reviewing the rule to determine specific implications for its members.

**To view a copy of the final rule, visit**

***<https://s3.amazonaws.com/public-inspection.federalregister.gov/2016-04800.pdf>***



# Arizona Water Well Association Scholarship Criteria

The **AZWWA** offers educational scholarships in the amount of \$1,000 per semester for the children and/or grandchildren of contractors who have been members of our Association for a minimum of 2 years or employees of said contractor who has a reasonable relationship with the Association.

Other qualifications of the applicant are:

- Has the support of his/her family. If the applicant is a child or grandchild of an employee of a contractor, the owner/manager must also support the applicant.
- Acceptance by aforementioned Arizona institution. The Committee will take into consideration any requests or attendance at schools outside of Arizona.
- Full time enrollment. The Committee will take into consideration requests for less than a full schedule.
- Maintain a 2.5 grade point average.

The above qualifications are in reference to university or junior college enrollment. However, the Committee will consider requests for trade school or other participation at reduced levels of financial support if such education is deemed beneficial to the family's business effort.

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.

The sum will be paid upon applicant's submittal of proof of registration at an Arizona institution.

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**  
**Fred Tregaskes**  
**ftregaskes1@gmail.com**  
**PH: 480-404-2788**

**AZWWA Office**  
**Debbie Hanson Tripp**  
**admin@azwwa.org**  
**PH: 480-609-3999**

# GateWay Community College

## Water Resources Technologies Program

Located in Phoenix, they are opening its new training center inside the City of Surprise's wastewater treatment plant located in the west valley. The WRT Hydrologic Technician (AAS degree) and Water and Wastewater Treatment (Certificate of Completions and AAS Degrees) programs will be offered there too. This unique partnership with the City of Surprise will expand their hands-on approach to their programs.



### **WATER RESOURCES TECHNOLOGIES PROGRAMS AND AN OCCUPATIONAL SAFETY AND HEALTH TECHNOLOGY EDUCATION COURSE ARE COMING TO THE SURPRISE & GATEWAY TRAINING FACILITY IN FALL 2016**

Register today before courses in those two programs fill up. Complete a degree or a certificate in these two programs.

**Classes are open to anyone interested.**

They offer potential scholarships for Surprise residents and active military personnel stationed at Luke Air Force Base or if you know anyone in those areas, let them know.

#### **FOR MORE INFORMATION CONTACT:**

Beth Jordan at (602) 238-0060 or [beth.jordan@gatewaycc.edu](mailto:beth.jordan@gatewaycc.edu)  
Craig Urbanski at (602) 286-8616 or [craig.urbanski@gatewaycc.edu](mailto:craig.urbanski@gatewaycc.edu)



Arizona Water Well Association  
950 E. Baseline Rd. #104-1025  
Tempe, AZ 85283

### Events Calendar

- |                            |  |
|----------------------------|--|
| <b>July 22, 2016</b>       | <b>AzWWA Golf Tournament and Membership Meeting<br/>Dewey Golf Course and Goldwater Lake</b>   |
| <b>July 23, 2016</b>       | <b>AzWWA Annual Picnic<br/>Goldwater Lake, Prescott, AZ</b>  |
| <b>December 6-8, 2016</b>  | <b>2016 NGWA Groundwater Week (aka Annual Convention)<br/>Las Vegas, Nevada For more information go to<br/><a href="http://www.groundwaterweek.com">www.groundwaterweek.com</a> or go call NGWA 800-551-7379</b> |
| <b>February 9-10, 2017</b> | <b>Mountain States Ground Water Expo<br/>Aquarius Casino Resort<br/>Laughlin, NV</b>   |