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**COLORADO
RIVER
SHORTAGE**

**IMPACT ON CAP CITY
WATER SUPPLIES?**

PG 6

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BY MARC L. LAME, PhD, PG 12

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FROM THE EDITOR



Discussion of the education of environmental management professionals continues in this issue as Dr. Marc L. Lame, PhD, Indiana University, comments on Dr. Nick Hild's remarks in his column from the June/July issue of the Journal and tells us about his experience in educating environmental professionals at Indiana University's School of Public and Environmental Affairs (see page 12).

If you (or someone you know) are working towards a degree in an environmental field in Arizona -- don't overlook the "small print" in this issue's advertisement for the upcoming Gatekeeper Regulatory Roundup (pg 3). You'll see a notice that EPAZ is accepting applications for scholarships (also read EPAZ's Association Pages article, pg 8). If you think you may qualify, I recommend you don't hesitate to apply!

Articles -- let me know if you would like to contribute an article to the Journal. It's a great way to share your experience and knowledge with other Arizona EH&S professionals!

Sincerely,

Jim Thrush, M.S. Environmental Management
Editor & Publisher 480-422-4430 x42

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JOURNAL OF Environmental Management ARIZONA

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SIGNIFICANT POSSIBILITY OF A
WATER SHORTAGE DECLARATION, BUT:

COLORADO RIVER SHORTAGE WILL HAVE NO DIRECT IMPACT ON CAP CITY WATER SUPPLIES

*The information in this article was provided
courtesy of Central Arizona Project,
Robert (Bob) Barrett, Communications &
Public Affairs, Media Relations/Maricopa
County Department.*

The U.S. Bureau of Reclamation released its monthly Operation Plan for Colorado River System Reservoirs 24-Month Study (Study), which projects that releases from Lake Powell into Lake Mead in water year 2014 (October 2014 through September 2015) will be reduced by 9% as compared to 2013 (7.48 million acre-feet versus 8.23 MAF). The study also indicates that releases will most likely be 7.48 MAF again in 2015. These back-to-back reductions could cause Lake Mead's elevation to fall below the 1,075 foot elevation by the end of 2015, which would result in the U.S. Secretary of the Interior declaring a Lower Basin shortage for 2016. These projections are subject to change as the year progresses, particularly if there is a good winter snowpack in 2014 or 2015.

If there is a Colorado River shortage in 2016, there would be no direct impact to the water supplies for cities, residential water users, and Native American Indian Tribes. The Central Arizona Project's (CAP) deliveries would be reduced by 320,000 acre-feet, which is about 20% of the CAP supply in recent years. This reduction would impact lower priority CAP users, including underground storage by the Arizona Water Banking Authority and Central Arizona Groundwater Replenishment District, as well as non-Indian agriculture.

"While the possibility of a shortage declaration is significant, Arizona has been planning and preparing for just such a condition for decades," said Sandra Fabritz Whitney, Director of the Arizona Department of Water Resources. "Arizona has led the nation in conservation efforts and long-term water management, including storing millions of acre-feet of water underground as a backup supply."

David Modeer, General Manager of the CAP, added that, "While all of us in Arizona should continue our conservation efforts, this also serves as a call to the federal government and all Colorado River water users that we need to work together to seek creative management solutions in the short term and augmentation of supplies in the long-term."

ARIZONA'S WATER: THINKING AHEAD

The results of the U.S. Bureau of Reclamation's Colorado River Basin Water Supply and Demand Study, completed in 2012, show significant water supply shortfalls within the Basin in the next 50 years.

As a result of the study, Central Arizona Project (CAP) collaborated with the Arizona Department of Water Resources, Arizona Municipal Water Users Association, Salt River Project, AgriBusiness Council and Southern Arizona Water Users Association to facilitate an assessment of what has already been accomplished within the CAP service area which includes more than 80 percent of Arizona's total population and more than 200,000 acres of irrigated agriculture. CAP uses 60 percent of Arizona's Colorado River water supply.

The study shows that Arizona leads the nation with rigorous water conservation and sustainability laws that protect Arizona water users and reduces reliance on the use of unsustainable groundwater supplies in the State's most heavily populated areas.

With its requirement of a 100-year renewable water supply for all new development, Arizona's comprehensive Groundwater Management Act, administered by the Arizona Department of Water Resources (ADWR), also requires water conservation by municipal, industrial and agricultural water users.

"Arizona's 1980 Ground Water Management Act is known as one of the most robust water management laws in the United States," said Sandy Fabritz-Whitney, Director of ADWR. "Arizona is a leader in adopting innovative conservation reuse and water banking programs. Because we live in the desert southwest Arizonans have always had to be proactive in our water management strategies."

Driven by a vision of what it takes to be sustainable, municipal water users have heavily invested in the implementation of water conservation strategies resulting in part from the adoption of the Groundwater Management Act. Municipalities' approach to water conservation has developed into a multi-dimensional approach – combining technology, enhancing water quality and security and public outreach.

In the same region, agricultural users have invested more than \$750 million since 1980 to implement efficient irrigation technology and delivery systems. Maricopa-Stanfield Irrigation & Drainage District General Manager Brian Betcher comments that agricultural users "...knew they were going to have to start doing some things to make their water go further...the Groundwater Management Act brought that into focus a little bit more precisely."

In the CAP service area agricultural conservation now exceeds the 80 percent efficiency target through lining canals, laser leveled fields, sprinkler systems, drip systems and automated and real-time delivery systems.

"We're working to develop programs where we might use Ag runoff water and/or brackish groundwater through various types of treatment including desalinization and looking at larger long-term projects that can contribute significant amounts of additional water to the Colorado," said CAP General Manager David Modeer.



LAKE MEAD AND HOOVER DAM WATER INTAKE TOWERS, AS SEEN FROM THE ARIZONA SIDE OF HOOVER DAM.

PHOTO: Courtesy of Cmpxchg8b via Wikimedia Commons.

Arizonans have also invested \$250 million to build underground storage facilities and have stored more than 3.2 million acre-feet of water to provide as back-up supplies to Arizona's municipal, industrial, and Native American water users in times of drought. Equally significant investments in underground water storage have also been made by water providers and private entities to store additional water supplies underground to reduce their vulnerability to shortages.

Water providers have also found ways to reuse their water supplies. More than 95 percent of treated wastewater generated in central and southern Arizona is used for beneficial purposes including agriculture, groundwater recharge, power generation, industrial uses, turf irrigation and other environmental purposes such as aquatic and riparian habitat.

Arizona's water management leaders are committed to continuing to be proactive in developing and enhancing conservation and reuse opportunities as well as exploring the development of new water supplies through augmentation and desalination.

Arizona recognizes its water supply future is linked to the Colorado River system. Therefore, Arizona is working with the other Basin States to not only address the long-term imbalances identified in the Basin Study, but also to meet the near-term risks posed by the on-going drought. The Basin States are committed to continuing on-going conservation programs, develop new programs to increase the water stored in Colorado River reservoirs, increase water use efficiency, and reduce losses in the Colorado River system as proactive measures to address the impacts of the drought. These cooperative efforts reflect the successful history of the States working together to create solutions for the Colorado River.

"I think in the end the states themselves realize that there is not a silver bullet to these issues," Modeer said. "We're going to need a comprehensive set of projects in order to really have a strong impact in balancing the deficit that we see going forward."

"Ultimately what happens is you get to a point where you can do no more conservation," Fabritz-Whitney said. "As Arizona's water policy leaders, we must identify whether relying on local water supplies like reclaimed water use or sustainable groundwater use is to be the limit of Arizona's development or, if we should explore new water supplies from outside of Arizona such as ocean desalination that has the potential to meet the water demands of multiple water users and secure our state's economy and quality of life into the

future. We should let these challenges inspire us to innovate and develop additional capabilities in water research and development, turning our vulnerability into strength."

FITCH RATINGS REPORT CONFIRMS: ARIZONA GROWTH NOT HAMPERED BY WATER SUPPLY

Growth in Phoenix, Tucson and Las Vegas will not be curtailed due to water supply issues for at least the next 10-15 years, according to Fitch Ratings.

Fitch Ratings, an internationally recognized leader in financial markets and independent research, issued its report about the water supply recently and noted that "Arizona has a more diverse water supply with 40% coming from groundwater. Reduced allocation from the Colorado River would likely impact local agriculture first, as users without long-term water contracts are lower in the state's water hierarchy. Agriculture accounts for 70% of all water consumption in the state."

"It is very reassuring to have Fitch Ratings conclude that Phoenix and Tucson's water supply is adaptable and resilient. As recently quantified by an economic development study commissioned by CAP and conducted by the ASU Carey School of Business, the delivery of Colorado River water by CAP creates jobs in all sectors of our economy and is crucial to maintaining and attracting new business to the state," said Pam Pickard, President of the Board of Central Arizona Project.

CAP planning and financial personnel held teleconferences with Fitch and other rating agencies early in 2014 about the Colorado River and water issues in the Southwest. "All of the rating agencies have excellent research staff and the individuals we spoke with were very knowledgeable," said Ted Cooke, Assistant General Manager for Finance and Information Technology.

"However, notwithstanding their good internal resources and understanding of the issues, Fitch wanted to connect with local experts on Arizona and Colorado River issues. I believe that our conversations deepened their understanding and appreciation of these complex issues and gave them important perspective to better frame and communicate them," he said.

"We are pleased that Fitch and others reached out to us for our expertise, listened to us, did their research and have concurred with our analysis," Pickard said.

ASSOCIATIONS PAGES

The Journal of Environmental Management Arizona invites environmental, health and/or safety organizations in Arizona to contribute news articles about their associations. Contact the editor at 480-422-4430 x42.



The Arizona Chamber of Commerce and Industry and the Arizona Manufacturer's Council is in the process of developing the organization's public policy priorities for 2015. The Environment Committee is the venue to submitting and vetting environmental legislative and regulatory issues of concern on behalf of member companies. Anyone wanting to recommend an environmental issue for consideration should contact Jeff Homer at 480-441-6672 / jeff.homer@gdc4s.com.

The Arizona Chamber of Commerce and Industry and the Arizona Manufacturer's Council will be hosting its annual Arizona Manufacturing Summit on October 3, 2014 at the Sheraton Phoenix Downtown Hotel. This event will feature speakers on topics of interest to the manufacturing segment of the economy culminating with a luncheon where Manufacture Of The Year Awards will be presented.

The Environment Committee continues to host breakfast meetings on the second Wednesday of each month at the Phoenix Sheraton Hotel located at 1600 S. 52nd Street Tempe, AZ 85281. Check the Arizona Chamber's web page at www.azchamber.com for meeting details.

Jeff Homer
Chairman
Environment
Committee



We hoped everyone enjoyed the 2014 AIPG/AHS National Conference: Water & Rocks - the Foundation of Life, held at the Prescott Conference Center and Resort, September 13-16. This year's program offered a great array of field trips, workshops, and technical presentations all supported by our wonderful sponsors and exhibitors. A BIG THANK YOU to: Platinum sponsor, SRP; Gold sponsor, Clear Creek Associates; Silver sponsors, USGS, Resolution Copper, CAP, TWG, Montgomery & Associates; Event sponsors First Bank of Westminster, Colorado, AIPG Northeast Section, and GeoSystems Analysis; Product sponsors, Rockware, Inc. and Aspen Laser & Technologies. Thank you also to all of our great vendors! We couldn't do it without you!

October brings us back to our regularly scheduled meetings. The Tucson Chapter meets on the first Tuesday of each month. The Phoenix Chapter will meet at the Sonora Brewery in Phoenix on Wednesday, October 15, topic to be announced. The Flagstaff Chapter will be recovering from hosting the conference but will email their members when the next meeting is planned!

Christie
O'Day
Executive
Director



WWW.AWMA-GCS.COM

The Air and Waste Management Association-Grand Canyon Section had our last lunch meeting at the Maricopa County Air Quality Department on Thursday, September 18. Bob Huhn from the MCAQD was our speaker, and the topic was the "Don't Let Our Air Go Up in Smoke" campaign from last year, which garnered a National Association of Counties (NACo) 2014 Achievement Award in the category of Civic Education and Public Information. Thank you MCAQD for hosting us!

We concluded our 2014-2015 scholarship program on September 1, and are currently reviewing the applications. Winners will be announced on our website under the "Scholarship" tab and contacted directly.

Our next scheduled meeting will be a joint holiday meeting with the Arizona Association of Environmental Professionals in December. Meeting information will be posted when it becomes available. Please join us! For more information about AWMA-GCS, please visit our website at <http://awma-gcs.com> or join our LinkedIn group.

Mike Sonenberg
Chair



WWW.AZAEP.ORG

The Arizona Association of Environmental Professionals (AZAEP) invites you to attend the monthly meeting on September 23 (Tuesday) at Magpies Pizzeria in Tucson (6 to 8 p.m.). The speaker will be from Native Seeds/SEARCH, a non-profit conservation organization based in Tucson. Their goal is to conserve the rich bio-diversity of the desert southwest through collections of rare and heirloom seeds. Additionally, members of the UA Plant Science Club, winners of the 2013 AZAEP Student Scholarship will talk about the club activities. The Board invites you to go to our website azaep.org to register for the September meeting.

On October 2-3, 2014 AZAEP, the Arizona Riparian Council (ARC), and University of Arizona will host a 2-day meeting/conference titled "Riparian Protection at the Local Level". The AZAEP website has a link to the ARC for registration and program materials.

A Z A E P is the state chapter of the National Association of Environmental Professionals (NAEP).

Mike Dawson
President



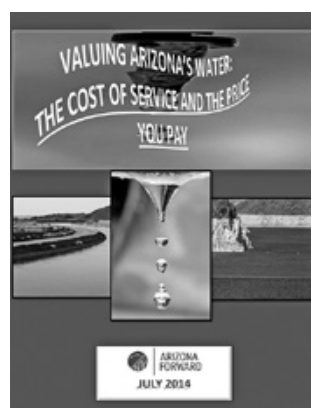
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VALUING ARIZONA'S WATER: THE COST OF SERVICE & THE PRICE YOU PAY

Perceptions about water issues in Arizona are as varied as the state's terrain but one thing is for certain – the price we pay for our most precious natural resource is going to increase in the face of shortages triggered by continued drought and climate change.

That's a key finding in a white paper released by Arizona Forward titled, "Valuing Arizona's Water: The Cost of Service & The Price You Pay." The 45-year-old,



business-based environmental public interest organization acknowledges factors driving the cost of water are complicated but imperative for state leaders to understand.

A long-term, reliable water supply is critical to the economic vitality and sustainability

of every Arizona community. The Arizona Department of Water Resources is projecting a shortfall over the next 25 to 50 years. Every Arizonan should care about where the next supply is going to come from, how much it will cost and who will step up to lead on these vital issues.

In addition to what impacts the cost of water statewide, topics addressed in the white paper include: the local nature of municipal water service; the distinction between the "price" charged for water delivered to a water customer and the "cost" of that water supply; conservation efforts; and future challenges and environmental considerations.

The purpose of this research paper is to help the public understand some of the issues that contribute to a long-term, reliable water supply in our state, as this finite resource is critical to the economic vitality and sustainability of every Arizona community.

For a copy of "Valuing Arizona's Water: The Cost of Service & The Price You Pay," or additional information about Arizona Forward, visit arizonaforward.org.

Diane Brossart
President



WWW.EPAZ.ORG

EPAZ is hard at work planning the 11th Annual Gatekeeper Regulatory Roundup conference which will be held February 3-4, 2015 at the Chaparral Suites Resort in Scottsdale. Call for Abstracts are being accepted until October 3, 2014! And Early-Bird Pricing for attendees and



Larry Olson, PhD.

IT'S ALL ABOUT CHEMISTRY

A PEBBLE MINE UPDATE

A couple of years ago, I wrote a column about the proposed Pebble Mine in Bristol Bay, Alaska. This is the site of one of the largest deposits of copper, gold, and molybdenum ever discovered. Some estimates place the total value at over \$500 billion. The problem is that the mine would be located in an unspoiled and sparsely populated area of wetlands, streams and lakes that provide the spawning grounds for almost 40 million wild sockeye salmon which is about half the world's population. Although the mine is projected to provide 3000 jobs during construction and 1000 per year during its operation, the fishing industry is estimated to generate \$1.5 billion per year and support 14,000 jobs. The developers have argued that they can conduct the mining operations without threatening the watershed or the lifestyle of Native American tribes on the land. But this is disputed by a coalition of environmental groups, sport and commercial fishermen, and many native groups.

There have been several recent developments since last I wrote. In January 2014, EPA released a peer reviewed ecological risk assessment entitled *An Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay, Alaska*, (<http://cfpub.epa.gov/ncea/bristolbay/recordisplay.cfm?deid=253500>). In this document EPA tried to analyze the impacts of the proposed mine on fisheries, and consequently wildlife, as well as Alaska Native cultures which have been dependent upon salmon fishing for centuries. Two time frames were considered: the first for 20-100 years during development and operation of the mine and the second post-mining phase which could last for centuries or even in perpetuity. Depending upon the size of the mine, EPA estimates that up to 5000 acres of wetlands, ponds and lakes would be destroyed, as well as dozens of miles of streams that support the salmon population whose

flow would be altered. They attempted to evaluate risks associated with collecting, treating and storing mine wastes, leachates, and wastewater over both short and long terms and the impact that accidents or systemic failures would have on the environment and native populations. Over 1 million comments were made during the public feedback period. You can read the conclusions for yourself, but suffice it to say that EPA did not agree that the mine could be operated without substantially impacting the entire ecosystem.

On the financial front there was more news. Northern Dynasty Minerals had secured the mineral rights to the Pebble mine in 2001 and formed a 50:50 partnership with the mining giant Anglo American in 2007 to proceed with development. But in September 2013, after spending \$541 million in exploration, Anglo American withdrew and forfeited its share of the project. A second setback occurred in April 2014, when Rio Tinto announced that it was divesting its 19.2% equity in Northern Dynasty Minerals which is now forging ahead on its own.

Finally, on the legal front, EPA announced in July 2014 that it would use its 404(c) authority under the Clean Water Act to temporarily prevent the Army Corps of Engineers from issuing any permits for placing dredge or fill materials into streams, wetlands, lakes or ponds. The Corps issues thousands of such permits a year, but EPA has authority under Section 404(c) to restrict such activities if they could adversely affect fisheries. Although 404(c) authority has been sparingly used (only 13 times since the Clean Water Act was instituted), EPA Region X has concluded that even the smallest mine proposed by Northern Dynasty Minerals would result in such adverse impacts and has proposed specific restrictions on all dredged or fill materials. A public comment period is open until September 19, 2014 after which a final decision will be made.

Not surprisingly, not everyone in Alaska is happy with these developments. Ronald Theissen, CEO of Northern Dynasty Minerals, stated that they believe that EPA is acting preemptively and does not have the statutory authority to impose conditions on future development prior to completion of the federal and state permitting process. They have sued EPA to try to halt the 404(c) process. Alaska Governor Sean Parnell called the EPA's action egregious and unprecedented, U.S. Representative Don Young called it a jurisdictional power grab, and Senator Lisa Murkowski called it a terrible precedent that discourages investors' willingness to bring capital and jobs to Alaska. The House Oversight Committee under Chairman Darryl Issa is investigating the EPA's actions.

So stay tuned. This is a classic case involving competing economic, ecological, cultural and political interests. Like making sausage, the process isn't pretty.



SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT

Nicholas R. Hild, PhD.

NO-BURN HOLIDAYS AND FIREWORKS PARTICULATES

The Arizona Environmental Strategic Alliance (AESA) sponsored two Air Quality Workshops in the first half of 2014 where Pinal and Maricopa County air regulators explained their programs to members of the regulated community. Both day-long workshops were well attended and feedback from participants showed they were very successful. Specific presentations by Maricopa County Air Pollution officials included the results of their monitoring of particulate emissions over the 2013-14 Christmas and New Year's holiday periods which summarized results that showed how their 'no-burn-day(s)' campaign around the major holidays (Christmas Eve/Day and New Year's Eve/Day) was *somewhat* "successful" at reducing the impact of emissions from fireplaces and wood-burning devices.

But county officials revealed some new information that may be a concern for the county's continued compliance status for particulates: when they were compiling the results of monitoring and tracking of particulate emissions over those holiday periods, they were able to separate and identify *specific* species of particulates contained *only* in fireworks. Surprisingly, the data revealed that the particulates emitted from fireworks combustion New Year's Eve and New Year's Day (2014), were a *major* component of the particulates emissions. Further, those pollutants correlate directly to the *residential* use of fireworks throughout Maricopa County during the New Year's celebrations!

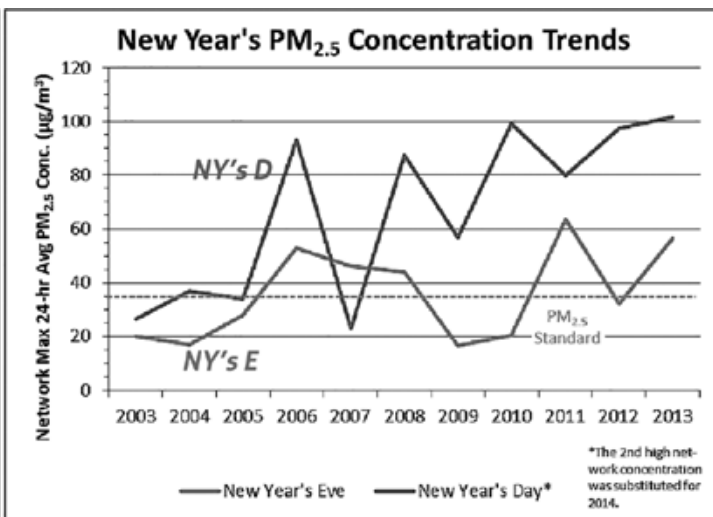
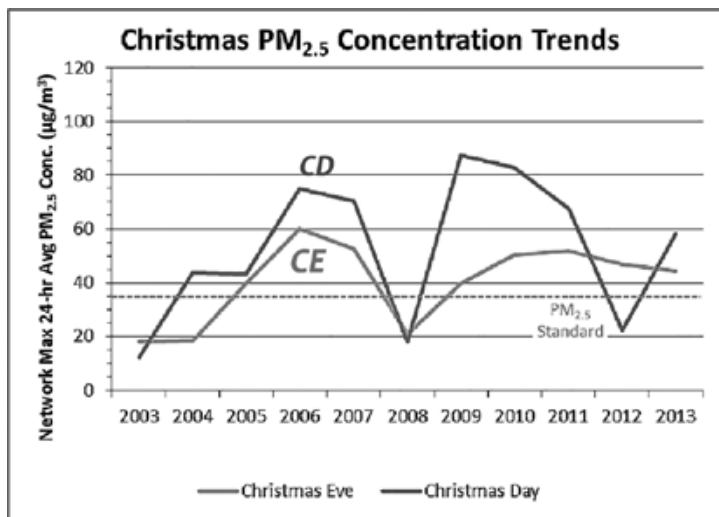
One cautionary note here is that the data and modeling the County compiled show the fireworks marker is certain *only* on New Year's Eve and New Year's Day (and only at one monitoring station in Durango), so it is uncertain if fireworks emissions will spike over other holiday periods or at other monitoring stations. But, considering that fireworks are the traditional means of celebration over the July 4th holiday period, these results should sound an alarm.

But, here is the conundrum: No-burn days target (mostly) wood burning devices that residents seem to fire up, especially during those major holiday periods. But, who knew that fireworks would have Maricopa County officials justifiably concerned that the added emissions from fireworks may put the county in jeopardy of its Federal particulates compliance status by the end of 2014, just based upon the additional particulates from fireworks shot during the major holiday periods!

This added concern is fueled by what happened this Spring, down at the Capitol, when the legislature passed Senate Bill 1158 and the Governor signed it into law in April. The new law *allows* the sale of fireworks--- from May 29 through July 6 and from December 10 through January 3rd ---and, *here is the real concern*--- this law actually *permits* the use of fireworks from June 24th through July 6th and from December 24th through January 3rd and prevents (preempts?) the cities and Pima and Maricopa County from regulating the use of non-aerial fireworks during those periods.

In the run-up to the passage of the bill, comments were solicited and the only objections considered appear to be from the various fire agencies that urged the Governor to veto the bill, based solely on the fire danger that would result from legalizing fireworks during the three major holiday periods. But it appears no one other than suspicious Maricopa County regulators saw the potential impact on the County's compliance status that the added fireworks emissions might have. That's why they wanted to look at the specific particulates in their monitoring program and, it appears their suspicions were on target.

Meanwhile, the fireworks lobby at the legislature waged heavy arguments that, basically, were about leveling the legal playing field that had allowed fireworks vendors to sell their wares in municipal (geographical) areas where they were not supposed to be selling. Plus, vendor comments were mostly aimed at getting a list of approved fireworks they *could* sell. The new state law now allows only 'ground-effects' fireworks to be sold, and not 'aerial'



GRAPHS COMPILED BY MCAQD FOR 2013/2014 HOLIDAY PERIOD WITH PERMISSION TO REPRINT IN JEMA.

Nicholas R. Hild, PhD., is an Emeritus Professor and Sustainability Scientist in the College of Technology and Innovation and the founder of the Environmental Technology Management program at Arizona State University. Dr. Hild has extensive industrial environmental engineering and management experience as well as continuing to be a consulting environmental engineer for the past 40+ years. Reach him at www.worldsleadingexpert.com or email at drnick@asu.edu.

fireworks. The truth is, all fireworks' emit particulates that rise into the night air where they become a health concern for 40% of the population that have breathing issues already.

Interestingly, there were provisions in the new law that allowed the Governor to declare it an 'emergency' in order to make it effective immediately. That was done to enable fireworks to legally be sold during the period leading up to the July 4th weekend--- it was an 'emergency' that required municipalities to amend their own fireworks ordinances---in order to be in compliance with State law, before the July 4th holiday. Since state law trumps municipal law where fireworks were already prohibited, it meant that municipalities can no longer keep their own residents from buying and shooting fireworks during those periods. To comply, at least five cities in Maricopa County called emergency council meetings in May and June and a few others scheduled their meetings prior to the end of June, in order to meet the State's requirements. The results were that all municipalities in Maricopa and Pima counties now allow fireworks during those critical holiday periods, through New Year's in 2015.

That 'emergency' rush to pass the legislation to allow fireworks sales and use during the July 4th holiday period also created another problem for Maricopa County Air officials: after the legislation was passed, the County had no time to muster a monitoring campaign over the 4th of July period to add to the data they had already collected over New Year's Eve/Day, so now we will have to wait until next December to see if the results of this past New Year's campaign can be replicated.

KUDOS TO VOLUNTEERS FROM COUNTY OFFICIALS

According to Maricopa County official Ira Domsy, the holiday monitoring efforts were very valuable---the hundreds of man hours that Maricopa County inspectors, administrative personnel, and volunteer partner organizations devoted over the 2013/14 Christmas/New Year holiday period, not to mention ADEQ and other County employees, and the stakeholders who helped to publicize the campaign---resulted in a better understanding of how fireworks has become a part of the holiday particulate emissions problem. And, even though, by law, volunteers could not have a role in inspections and complaint response or chasing smoke sources over that period, all of that man power was absolutely essential and very much appreciated by county officials who coordinated those efforts.

Of course, what the county knows for sure is we still have the problem with wood smoke. It is an issue for both holiday periods and now, we need to be more vigilant in monitoring for fireworks emissions in the future. The graphs above provide a contrast between holiday periods over the past 10 years.

What county regulators have learned from this about fireworks particulates during the Christmas/New Year's period is a potential game changer. The question for county (and State) officials now is, what is the impact on the county's particulate compliance status of legalizing, and thereby encouraging even more fireworks (emissions)? Could this be the proverbial straw that breaks the 'compliance' and attainment status of particulates standards for Maricopa County?

If the data that has been gathered is the trend for the future, Maricopa County could very well inch closer to being designated 'non-attainment' depending on what happens in 2015 during those holiday periods. But this much is certain: the attendant health and financial burden will be borne by taxpayers and allergy sufferers alike if fireworks emissions are not addressed before the Christmas and New Year's holidays.

This may be just another kooky legislative '*faux pas*' to some people, but someone, someday, will have to explain that to our children's, children's, children.

ASSOCIATION PAGES

CONTINUED FROM PAGE 8

exhibitors is being offered until December 21, 2014.

EPAZ Scholarship applications are being accepted until December 31, 2014 and will be awarded at the 2015 conference. Please spread the word to anyone you know that is studying towards a degree within the environmental field in AZ.

Upcoming Events:

October 9, 2014 luncheon will feature a presentation by Patrick Goodfellow, PE & Julie Chivington-Buck from CDM Smith. They will share CDM Smith's Sustainable Water Reuse experience helping Frito-Lay with the Design-Build-Delivery of a Water Recovery and Reuse Facility.

November 13, 2014 luncheon will feature a presentation by Eddie Al-Rayes from Trinity Consultants. He will discuss Air Quality Risk Management Plans & Recent Inspections and Enforcements.

December 11, 2014 luncheon will feature a presentation by Sowjanya Chintalapati from Abeinsa. She will share her experience with Abeinsa's EH&S Management System.

January 8, 2015 luncheon will feature Mark Howard from AZSERC and he will bring us up-to-date with any changes to Tier II reporting.

EPAZ hosts monthly luncheon meetings on the second Thursday of the month from 11:30 AM to 1:00 PM at the SRP PERA Club. For the most up to date information, event details and reservations please visit our website at www.epaz.org.



Lisa Culbert
Association
Manager



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The August Alliance meeting was held at INTEL in Chandler. Sean Aldrich, Alliance Member Delegate for INTEL, presented the INTEL 2013 Member Annual Report. A copy of this report, and the INTEL Corporate Report, is available at www.azalliance.org. I recommend you check it out if you are interested in learning more about how INTEL responsibly handles its environmental management programs. Other member reports are also available online -- these reports are a great resource for us to learn from each other!

Greg Bopp, Honeywell Aerospace, is scheduled to present the Honeywell 2013 Member Annual Report at the regular Alliance meeting on October 21st. If you would like to attend and hear the Honeywell report, and learn more about the Alliance, please contact me (Neal.Brown@aps.com) or Jim Thrush (jimthrush@cox.net).



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PROFESSOR MARC LAME CONTINUES THE DISCUSSION: EDUCATING OUR ENVIRONMENTAL MANAGEMENT PROFESSIONALS

by Marc L. Lame
Clinical Professor
Director, Master of Science in
Environmental Science Program

I found Dr. Hild's latest column [JEMA June/July 2014] on coming "full circle" particularly interesting – especially his comments regarding how we are training environmental management professionals. As a clinical professor and director of graduate environmental programs at Indiana University's School of Public and Environmental Affairs, his concerns motivate me to offer information that could be helpful to many of us in the environmental management profession. Since my days as the Ombudsman at ADEQ, I have often wondered how can we develop environmental management professionals who bring a "mastery" of science, technology, engineering and math (STEM) AND a mastery of program, resource and political management to better protect human health and the environment. Or, in Nick Hild's words: "...the importance of using the regulatory 'process' together with sound science, to lessen our global environmental footprint." It is implied in his column that current students of environmental management have less access to college programs grounded in STEM. I agree.

As a member of the National Center for Science Education's Council of Environmental Deans and Directors (CEDD) I have witnessed a trend favoring "sustainability" programs at the expense of more robust environmental science programs. Now that I am on the precipice of academic heresy I might as well jump off the cliff and opine that this trend has been lucrative to institutions of higher education. That's not just because of the worthy and broad based attraction of students wanting to explore the social consequences of environmental management. Sustainability studies are also more attractive to students that are math (STEM?) adverse. That said, there are a number of graduate programs for the environmental management professional that are not only "holding the line" on STEM but addressing the concerns of thoughtfully blending science, management and policy.

As a scientist (entomologist) I realize, at the very least, I must be able to gather and interpret data. More so, as a manager, I require that information to be: Understandable; relevant; accessible; and credible such that I can successfully direct programs via resource and political management. This may seem obvious but my point is that this is skills based learning that is sometimes not deemed a relevant outcome for students. Thus, I hope the examples of graduate environmental management education described below might be informative for current practitioners and potential employers.

We have two, 48 credit hour, masters degrees at Indiana's School of Public and Environmental Affairs designed for environmental management professionals. First is the Masters of Science

Professor Marc L. Lame, Indiana University, furthers the discussion on how we train our environmental management professionals, with a response to a recent column by Dr. Nick Hild in a previous issue, and offering insight into the value of robust programs demonstrated to produce outstanding professionals

in Environmental Science (MSES) with "concentrations" in 1) Applied Ecology, 2) Environmental Chemistry, Toxicology and Risk Assessment, 3) Water Resources and 4) Energy. We also offer the Masters of Public Affairs (MPA) using the Environmental Policy and Natural Resource Management concentration. All students are required to have core competencies. For the graduate students in Environmental Science they are:

- Applied Math
- Environmental Chemistry
- Statistics for Environmental Science
- Applied Ecology
- Environmental Engineering

Advanced courses meeting these competencies reflect what most consider the foundation for the environmental manager. In addition all students are required to complete a number of courses in these categories:

- Environmental Economics, Policy/Management and Law. I personally teach environmental management (managing humans in terms of what they put into the environment – pollution) and natural resource management/policy (managing what humans take out of the environment).
- Tool Skills such as GIS, Risk Communication, Risk Analysis, and Cost Benefit Analysis.

The remaining credit hours are delegated to the specific concentrations listed above. Unlike most master's degrees, many of our students do not do thesis work as this degree is considered to be a "terminal" degree like the MD or JD. Students must complete a "capstone" course including the utilization of learned skills on real world, team projects and an internship (thesis students are exempt from the capstone and internship). Clearly, this degree is heavy on the STEM (graduate level) but requires a "blending" of courses addressing what Nick called "process".

The Environmental Policy and Natural Resource Management (EPNRM) MPA degree also "blends" science and policy but is much more policy and management oriented. The core competencies for MPA students are:

- Public Management,
- Stats for Effective Decision Making,
- Public Management Econ,
- Public Finance and Budgeting
- Public Law

With those EPNRM students are required to take environmental economics, environmental law, environmental risk analysis and a number of electives including environmental engineering, hazardous materials, aquatic chemistry GIS, applied ecology, etc.

I also want to highlight a relatively new graduate environmental management degree innovation. This is the Dual Degree program. Again, there are a few schools around the country

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that offer them. Our program offers the MSES and MPA as a 60 hour program – essentially an extra semester by combining certain aspects of each degree. Many employers view this as a “super environmental management” degree which is very robust in both environmental science and policy/management. The students who complete these degrees are very competitive in today’s job market. My favorite dual degree options are the Environmental Management dual concentration which produces a very well rounded professional environmental manager and the very new Water Management concentration which addresses water quality, quantity and access. This concentration allows students to achieve a mastery of water science, law, policy, economics, communication and management. Pretty cool stuff these days!

It goes without saying that I think the programs I described above provide a fine graduate education that produce potentially outstanding professionals. In fact, in the past 20 years of teaching these students I have derived immense satisfaction from witnessing their success in the public, private and non-profit sectors. The key tools I use to help students compete for jobs include providing examples from the workplace and arranging meaningful internships. My background as an Extension Entomologist included getting my hands dirty in the cotton fields of Arizona (and nose bloodied in battles with pesticide companies), an Ombudsman for ADEQ (trying to help frustrated permit applicants and getting my nose bloodied in public meetings – can you spell ENSCO?) and now I serve as an advisor to the EPA and CDC. I use those experiences to teach the concepts critical to managing people with regard to the environment - concepts like program implementation/evaluation, ethics, working with the media, co-producing solutions with the public, etc. My “war stories” are of professionals using good science to lead to good...or bad management decisions and yes, they do have social consequences involving environmental justice, sustainable development and above all accountability. Please note: I require my students to read the Journal of Environmental Management Arizona – really! Not only are many of the articles great (especially the ones addressing pollution prevention) but the columns and even the ads! It is a great window into the profession for the uninitiated, starry-eyed student.

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Again, thanks to Professor Hild for calling for us to guide current and future professionals toward more effective management. I hope this helps and thanks for the opportunity to stay in touch with environmental management in Arizona.

Marc L. Lame is a Clinical Professor, and Director, Master of Science in Environmental Science Program at Indiana University. Marc is an appointed advisor to the USEPA and the educational coordinator for the CDC IPM Course on Vectors Borne Disease. Marc also has Arizona ties: he received his Ph.D. from Arizona State University in 1992, and has served as Ombudsman for the Arizona Department of Environmental Quality, and on the faculty of the University of Arizona, Entomology Department. He can be reached at 812-855-5249 or by email at mlame@indiana.edu.



FOCUS ON: WORKPLACE SAFETY SPECIALISTS

This article continues the Journal series of "FOCUS ON" interviews featuring Arizona businesses serving the environmental management community. Today the Journal speaks with Cara Garry, Client Services Representative, of Workplace Safety Specialists

JOURNAL STAFF

Thank you Cara, and our thanks to your Founder and President Ron Sciarro, for this opportunity to speak with you about Workplace Safety Specialists and the services you provide. For our readers that may not be familiar with your organization, could you give us a quick overview of what your company does, the focus of your training and consulting services?

CARA GARRY

I would be happy to. Workplace Safety Specialists has been providing EH&S consulting and training since 1991. Our staff is comprised of Certified Safety Professionals, Certified Industrial Hygienists and Professional Engineers. We provide technical hands-on training in OSHA, NFPA, EPA, DOT and MSHA. All of our classes are tailored to address the site specific issues for our clients. In addition, we have developed customizable safety training materials and trainer kits that meet regulatory requirements.

JOURNAL STAFF

Does Workplace Safety Specialists provide services state-wide, or is your focus on the Phoenix valley area?

CARA

We provide our services nation-wide, but the majority of our work is in Arizona and California. We hold several contracts for Safety Training and Consulting under the Arizona State Contract, Arizona Department of Transportation, Maricopa County,

various municipalities and private industry clients.

JOURNAL STAFF

Could you tell us what are some of the challenges for an EH&S consulting & training organization?

CARA

As always, time and money. Scheduling a project or training to work for various shifts can be a challenge, but our staff communicates closely with our clients to find a workable solution. And there is budgeting the funds when management may not recognize safety services as a cost-effective way to keep employees safe, avoid fines and reduce worker comp claims. We work with our clients to prioritize their regulatory goals while taking their employees' schedules into consideration to determine the most cost-effective way to get the job done and within budget.

JOURNAL STAFF

Proper training is, of course, critical to employee health and safety. How does Workplace Safety Specialists maintain your technical level of expertise -- for example, do you have internal "train the trainer" procedures?



CARA

Yes, our consultants attend various classes to update their credentials; maintain certifications; and keep current on the most up to date information. In addition, they are critiqued throughout the year to ensure our training is the best it can be. Our course materials are also reviewed regularly to make sure they are current while printing is done in-house so updates and client policies/procedures can be added when needed.

JOURNAL STAFF

What do you see as some of your organizations major accomplishments?

CARA

Honestly it's our reputation of integrity, professionalism and cost effectiveness that keeps our clients coming back. We take our client's feedback very seriously and I try to follow up on each of our classes to make sure their expectations are being met and determine if there is something we could do better or just differently. We also review every class critique by employees to see where we can improve.

JOURNAL STAFF

Competition with other organizations must be an issue in the EH&S field. What does Workplace Safety Specialists do that stands out "above the crowd"?

CARA

I schedule the consultant who has the right experience and background for each job. We don't hire "teachers"; we hire consultants who have real world experience out in the field. Each one of our consultants specializes in a particular discipline such as Hazwoper, confined space, heavy equipment, electrical, industrial hygiene, etc. We also tailor each class to address job-specific and site-specific issues. Classes include hands-on field exercises and scenarios whenever possible. There is no better way to teach someone than to actually do the job from start to finish and follow the established procedures.

JOURNAL STAFF

Have the advances in modern technology changed your teaching and consulting programs? Are your training classes primarily class lectures, or does technology, such as interactive computer training programs or "apps" have a place now (or in the future)?

CARA

Of course, there are some great computer based programs out there that make it safer, faster and easier to update and create written safety programs and procedures, do inspections,



assessments, etc. And while we love high-tech and apps as much as the next person, the type of training we do involves hands-on scenarios as much as possible. Our lectures include PowerPoint presentations, videos and of course class discussion. There is no 'app' or online training that can substitute for an observation being made when evaluating what an employee has learned about driving a loaded forklift and how he handles the machine in the warehouse where he works every day and to understand the constraints of a Level A suit and a respirator while doing a task in the field or what it's like to do a job in a confined space. Our goal is to give employees information and experiences that will help keep them safe; participating in real-life scenarios at a client's site using their equipment has proven to be the best way to achieve that goal.

JOURNAL STAFF

Tell us a little about the personal side of Workplace Safety Specialists. Are there any interests, activities, charities, that you or any employees are involved in perhaps outside of the actual work activity that you would like to tell us about?

CARA

Workplace Safety Specialists is a Christian owned business. Many of us here donate our time, money and expertise to various outreaches through our own churches. Our owner and other instructors have provided free CPR/FA training for their churches and developed their security and emergency management teams. A few of us have also gone on mission trips to Rocky Point to build homes for the less fortunate. Legacy Adventures is a faith based non-profit started by our owner that arranges camping trips for fathers and their children for relationship-building. We provide gear, transportation and often times medically qualified personnel for the regularly scheduled trips. We've also worked with homeless shelters by handing out bags with toiletries, water, cookies and blankets. The East Valley Veterans Parade is another non-profit group who puts on the local veterans parade the Saturday before Veterans Day. For several years we have provide printed materials and other assistance to them. I think our core values say a lot about who we are as an organization: To affirm each others' strengths and protect his/her weakness, treat others the way you desire to be treated, extend grace to those who are teachable, seek first to understand others before trying to be understood, choose relationships over profits and think outside the box -- always question status quo.

JOURNAL STAFF

That's commendable and I think it demonstrates your active involvement in the community. I had not heard of Legacy Adventures; it sounds like a great organization performing a valuable service. (Note for our readers who may be interested: the Legacy Adventures website address is legacyadventures.org).

JOURNAL STAFF

Do you have any plans or thoughts for the future that you would like to mention? Will you keep things the way they are, expand, make changes?

CARA


We listen to the needs of our clients and respond accordingly. For instance, we incorporate Behavior Based Safety into our classes and have updated our materials to reflect that culture when it became apparent our clients found value in it. And of course we keep on top of industry changes.

JOURNAL STAFF


Thank you, Cara. I appreciate your time in telling us about your business. I will include your contact information at the end of this article (at right) for readers that may wish to contact you.

Cara

Thank you, we appreciate this opportunity to share with you and Journal readers!




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CONTACT INFORMATION: Workplace Safety Specialists maintains a website at www.workplacesafetyspecialists.com. Ron Sciarro, Vice President, can be reached at rons@workplacesafetyspecialists.com or by phone at 480-649-2851. Cara Garry, Client Services Representative, can be reached at carag@workplacesafetyspecialists.com, and by phone at 480-649-2851.





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