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Environmental Management

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ARIZONA

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BY DAWN H. GOUGE PG 4

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MANAGING THE MOST DANGEROUS INSECT PEST: MOSQUITOES AND THE GREAT OUTDOORS

*“If you think
you're too small to
have an impact,
try going to bed
with a mosquito.”*

Anita Roddick

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MOSQUITOES AND US

If you were asked to name the most dangerous animals in the world, you may automatically think first of large, powerful predatory species with formidable teeth or claws. If asked to think past all the episodes of Shark Week and When Animals Attack, you may start to conjure up images of rattlesnakes, scorpions and spiders. But if you have spent any time living in countries where malaria is endemic, you would undoubtedly think of the mosquito.

Mosquitoes are the most important insect pests that affect the health and wellbeing of humans and domestic animals worldwide. They can cause a variety of health problems due to their ability to transfer (vector) viruses and other disease-causing pathogens including in the arid Southwest. From a global perspective, mosquitoes are well established as the deadliest animals on earth, and tragically over one million people die worldwide from mosquito-borne diseases every year.

Female mosquitoes usually require a blood meal from a vertebrate

animal for egg production. Some specialize on birds, some on humans, and still other mosquitoes feed on a wide range of other hosts. During feeding the mosquito injects her saliva into the host's skin, which can generate an itchy localized reaction. If she has acquired a disease pathogen from an earlier blood meal and sufficient time has elapsed for the pathogen to develop inside the mosquito (incubation period), the pathogen may be transmitted to a new host. Incubation periods are different for each pathogen, differing also due to environmental conditions, and can range from days to weeks in length. Mosquito-vectored diseases of humans include West Nile Fever, St. Louis Encephalitis, Dengue Fever, Chikungunya, Zika, Yellow Fever, Malaria and Filariasis. Mosquitoes are not known to transmit blood-borne pathogens such as hepatitis or HIV. Different mosquitoes vector specific diseases, and many mosquito species are not vectors of any human disease.

WEST NILE FEVER

West Nile Fever is currently the most common mosquito-borne disease affecting humans in Arizona. During the last 5 years there has been an average 100 cases of West Nile (including 7 fatalities) in Arizona each year. The West Nile Virus (WNV) is vectored primarily by *Culex* mosquitoes, which are generally interested in feeding on birds, but the virus can also be transmitted to humans and horses. St Louis Encephalitis (SLEV) and Western Equine Encephalitis (WEEV) viruses are enzootic (present in animal populations) in Arizona, and can occasionally result in local human infections through the bite of infected mosquitoes.

West Nile Fever is expected to be a reoccurring endemic challenge, other mosquito-borne viral diseases being less commonly reported in humans in Arizona. Currently (August 2016), Dengue, Chikungunya and Zika are considered emerging diseases in the U.S. A disease is classified

Aedes aegypti Female Adult Mosquito.

Photo Source: Alex Wild, alexanderwild.com. Provided Courtesy of Dawn Gouge, UA APMC

as emerging when the number of cases has increased over the past 20 years and could potentially increase in the future. Dengue, Chikungunya and Zika viruses are not currently transmitted by mosquitoes in Arizona, but the mosquito vector, *Aedes aegypti*, is present in many cities and towns. The viruses are circulating in Mexico, so there is a risk of outbreak in Arizona. Last month Florida Department of Health identified a neighborhood of Miami where the Zika virus was found being vectored by local mosquitoes.

IMPORTANT SKEETERS IN ARIZONA

Although there are about 180 species of mosquitoes in the U.S. and more than 40 in Arizona, only a few are problems for residents, the *Culex* and *Aedes* mosquitoes being of greatest concern because of the disease-causing pathogens they vector.

Disease incidence changes each year, but during 2015 the Arizona Department of Health reported 23 St. Louis Encephalitis and 103 West Nile cases. All considered as infections acquired from mosquitoes in our state.

The Yellow Fever mosquito *Aedes aegypti* is not native to the desert southwest, but was introduced to the Western Hemisphere during the U.S. domestic slave trade years, becoming established in many eastern cities during the 18th and 19th centuries. *Aedes aegypti* was responsible for multiple epidemics of Yellow Fever during the 19th century. Yellow Fever has been eliminated from North America. But the vector remains and has spread across the country into the desert southwest, establishing well in urban areas of Arizona. This species lives in close association with humans, even breeding indoors, and is very capable of exploiting our environment. Unlike *Culex* mosquitoes, *Aedes aegypti* does not disperse far from breeding sites. *Aedes aegypti* is a “you breed it – you feed it” mosquito.

Female *Aedes aegypti* typically lay their eggs in man-made water-containers such as old tires, flower pots, barrels, cans, and various containers that hold a limited quantity of water. They particularly favor saucers under flowerpots, simply removing these can significantly reduce the mosquito population around your home. Eggs are laid singly on a moist surface just above the water line, and they hatch when the water level is raised by rain, an overhead sprinkler, or other source. *Aedes aegypti* eggs are very resilient. They can withstand dry conditions for several months and under ideal conditions, up to a year, resume development when water becomes available. Once they hatch, the larvae develop in a relatively short time depending on the temperature. Adult females often bite around the ankles throughout the day, especially early evening. During 2015 *Aedes aegypti* was reported in the following counties in Arizona: Cochise, Maricopa, Pima, Pinal, Santa Cruz, Yavapai, and Yuma.

PREVENTION

Mosquitoes need water to complete their life cycle and humans create a lot of opportunities for mosquitoes to exploit. It is likely that many of us have mosquitoes developing in our neighborhood and even in our own backyards. Standing water left from monsoon rains or irrigation water will support increasing mosquito populations. Stagnant water in neglected swimming pools is another ideal habitat for many species, though mosquitoes cannot develop in a well-maintained swimming pool. *Aedes aegypti* can develop in “cryptic” sites, utilizing very small amounts of water in tree-holes, artificial containers and even leaf axils.

The most effective strategy for mosquito management in communities in general is prevention. The best way to prevent mosquito-borne diseases is to eliminate standing water where they can develop in the first place. Here are some tips on what you can do to manage mosquitoes around your home:

1. Eliminate standing water in plant pots, plant saucers, bird-baths, fountains, tires, tarps covering boats or other objects, and backyard trampolines and other items. Check for standing water after every rain or at least once per week; twice per week is ideal.

2. Remove unnecessary clutter. Keep rain gutters free of leaves and other debris that prevent water from draining. Store boats, canoes and other objects so they do not collect rainwater. Saucers placed under potted plants are a favorite breeding site for *Aedes aegypti*. They should be drained after watering, or removed entirely. If eggs are suspected, they need to be scrubbed away, otherwise they remain viable for months and will hatch at a later date.
3. Repair water leaks (leaky pipes, sprinkler systems, and outside faucets). Correct drainage problems in yards and playing fields. Report drainage problems in ditches etc. Valve and meter boxes are favorite breeding and resting sites for *Aedes aegypti*.
4. Empty water containers for pets regularly and check livestock watering troughs and tanks. Mosquito eating fish can be added to large (undrainable) water troughs for livestock and horses.
5. Eliminate tree-hole breeding sites. Not all tree cavities need to be filled. However, if a tree hole is retaining water, expanding foam may be a good solution. Use a foam with a lower expansion ratio, and inject the foam slowly. It is not necessary to clean out decay from the cavity before filling.
6. Add *Gambusia* (mosquito eating fish) into personal ponds or stagnant swimming pools. It is very important to avoid releasing *Gambusia* into natural water bodies, as these are voracious predators and can displace native fish. The fish are available free of charge for Maricopa County residents from the Maricopa County Vector Control office. Just call (602) 506-0700 to schedule a pickup time, and bring your own container. *Gambusia* mosquito fish may also be obtained in Yuma free of charge by arrangement with Yuma County Pest Abatement District. Call 928-726-1030 or email ycpad1@gmail.com.
7. Larvicides specifically target the larval life stage of an insect and are generally more efficient control tools compared with adulticides.

AVOID MOSQUITO BITES

1. Wear light colored clothing with loose fitting long-sleeves, long pants and socks. Use protective clothing when exposure to mosquitoes cannot be avoided.
 2. Properly apply insect repellent even if you are outside for just a short period of time, and share your insect repellent with those around you. For additional help selecting which repellent is right for you, go to the EPA search page: <http://cfpub.epa.gov/opprpref/insect/#searchform>.
 3. Use a DEET product or a good non-DEET alternative <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4667684/pdf/iev125.pdf> and if you are outside for more than a few hours, reapply repellent frequently. The higher the temperature, the more frequently you must reapply repellent for it to remain effective.
- Apply repellents only to exposed skin and/or clothing (as directed on the product label). Do not use under clothing. Apply over sunscreen after it has dried.
 - Never use repellents over cuts, wounds, or irritated skin.
 - Do not apply to eyes and mouth, and apply sparingly around ears. When using sprays do not spray directly onto face; spray on hands first and then apply to face.
 - Do not allow children to handle the products, and do not apply to children's hands. When using on children, apply to your own hands and then put it on the child.
 - Do not apply repellent on babies under 2 months old. Use mosquito netting or avoid mosquito habitats in which you are likely to encounter mosquitoes as much as possible. Insect repellents are a kind of pesticide,

Continued on next page

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MOSQUITOES AND THE GREAT OUTDOORS

CONTINUED FROM PREVIOUS PAGE

please read the label and follow instructions. Most products specify the youngest age allowable for a given product.

- Do not spray in enclosed areas. Avoid breathing a repellent spray, and do not use it near food.
- After returning indoors, wash treated skin with soap and water or bathe. If you suspect that you or your child is reacting to an insect repellent, discontinue use and wash treated skin. Call your local poison control center (800) 222-1222 if symptoms persist.
- When properly used, personal repellents can discourage biting insects from landing on treated skin or clothing.
- Using repellent and sunscreen products at the same time is acceptable practice. However, the use of combination products that contain both an insect repellent and a sunscreen is not recommended.

4. Type of repellents: According to the Centers for Disease Control and Prevention (CDC), the three most common active ingredients in repellents are DEET, picaridin, and oil of lemon eucalyptus. The CDC considers DEET and picaridin to be the most effective. Reactions to DEET are uncommon, but picaridin products are less likely to trigger dermal reactions when used repeatedly over extended periods of time.

MOSQUITO-PROOF YOUR HOME AND YARD

Drain Standing Water: Mosquitoes lay their eggs in standing water. Limit the number of places around your home for mosquitoes to develop in by getting rid of items that hold water.

Install or Repair Screens: **Some mosquitoes like to come indoors. Keep them outside** by having well-fitting screens on all windows and doors. Offer to help neighbors whose screens might be in bad shape. **Do not prop doors or keep unscreened windows open.**

Check for Indoor Sites Supporting Mosquitoes: If a female mosquito wanders inside your home she will utilize any water reservoir she can find. Check for wriggling larvae in the toilet cisterns that are not flushed daily. Maintain water in drain traps. Check swamp-cooler systems, flower vases and lucky bamboo. Use sticky tape over floor drains, sink overflows, etc. to see if you can catch mosquitoes emerging from areas you cannot see. Kill any mosquitoes noticed indoors!

AFTER-BITE CARE

Consider the following tips for relieving the itch of mosquito bites. The first step is to clean the bite area with soap and water. Topical corticosteroids can reduce the rash, itching, and discomfort. Oral antihistamines can be used effectively to reduce the symptoms of mosquito bites. Use of a cold compress can be helpful, but do not apply ice directly to the skin.

CONTROL

Effective Integrated Mosquito Management can often be complex and expensive, and frequently requires the cooperative efforts of communities. Many people are concerned about the harmful effects of pesticides



Aedes Larvae.

Photo Source: Alex Wild, alexanderwild.com. Provided Courtesy of Dawn Gouge, UA APMC

on the environment, their animals plants, and themselves. Pesticide toxicity and pesticide hazard are not the same thing. “Toxicity” is the “killing power”, whereas “hazard” is the risk of negative impact when a product is used. The dosage used, the type of chemical compound, how and when the application is made, all determine the hazard level of a pesticide. The correct use of Personal Protective Equipment (PPE) further helps to reduce risk.

Always read the pesticide label! Always use a pesticide precisely as the label instructs. For more information on options and relative risk contact:

National Pesticide Information Center
1-800-858-7378
npic@ace.orst.edu

Pest management companies offer a variety of around-home adulticide options. Generally, they are more effective than over-the-counter do-it-yourself treatments.

Retail adult mosquito catch-traps do catch mosquitoes and can be helpful, but they do catch a great deal of other insects as well as mosquitoes. Instructions tend to suggest placing the traps on patio and deck areas where you want to sit, but better results may result from placing the devices away from areas being used in ones backyard, or they can attract the mosquitoes to where you are!

The most important element in mosquito management is you. By managing water carefully around your property you can significantly reduce mosquito populations.

More information about mosquitoes and mosquito-borne viral diseases can be found at <http://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1706-2016.pdf> and <http://cals.arizona.edu/apmc/public-health-IPM#mosquitoes> on the University of Arizona, Arizona Pest Management Center (APMC) site, and <http://azdhs.gov/preparedness/epidemiology-disease-control/vector-borne-zoonotic-diseases/index.php>.

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SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT

Nicholas R. Hild, PhD.

MEASURING PROGRESS IN ENVIRONMENTAL SUSTAINABILITY PART I OF II

"It ain't easy being green!"

Kermit the Frog, Sesame Street

I have assumed a new role with my colleagues at the Polytechnic Campus Environmental and Resources Management (ERM) program: helping students find internships and full time jobs. In researching companies and agencies where internships and jobs might be available, I've had the opportunity to talk to a number of HR people and pick up some helpful information that I can pass along to students. Some of that information came as somewhat of a surprise and might also be of value for practicing EH&S professionals so I thought I would share it here in the Journal where it will get the widest exposure.

A long time ago, in 1996 to be exact, our academic and certificate program in Environmental Technology Management (now ERM) moved to the ASU East campus (now the Polytechnic campus) at the former Williams AFB site in southeast Mesa. At that time, we offered two undergraduate and graduate level courses in Sustainability and Sustainable Development, the first courses in Environmental Sustainability to be offered anywhere at ASU. In those courses, we always taught from the classic (then) definition of what "sustainable development" is: **this landmark definition first appeared in 1987 in the World Commission on Environment and Development Report (produced by the UN Brundtland Commission) as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."**

Using that definition allowed further refinement for defining sustainability as the implementation of processes, technologies, and programs which, when implemented, allowed us to target the various sustainable technologies that could be a part of any company, agency or industry's Environmental Management System (EMS). By providing the tools for implementing good EMS programs, students graduate with a broad technical environmental knowledge base that allows them to contribute to a company's sustainability (EMS) program early in their employment.

Today, 20 years later, we still teach those sustainability courses but they've taken on new challenges now that the low hanging (sustainability) fruit has been plucked. And, one of these challenges is

to prepare today's students with the latest tools to be able to join an environmental team having learned the various ways that sustainability is implemented utilizing today's digital and high tech tools and techniques. That knowledge, most importantly, includes a thorough understanding of where and how to measure (environmental) sustainability.

I have noted in previous articles that we subscribe to the adage that, **"...if you can't measure it, you can't manage it!"** and that is true of being able to measure the sustainable progress a company has made over a given period of time. Today, most companies issue an annual report that discusses their financial gains/losses as well as providing progress updates on various different products and processes within the company. One of those special sections in most company's Annual Report is how they have performed in the general area of managing their environmental footprint (i.e. just how sustainable are they?). And, most of those reports try to portray a 'positive' view of the company and its efforts to be a good environmental citizen in the communities where they are located.

But, when I spoke to several HR people in Arizona companies about what they liked to see in a graduating student seeking an EH&S position, several of them focused on the general knowledge that there are ways to measure sustainability which they want incoming applicants to be familiar with. The most common feedback they gave me was (paraphrasing): some of the questions we ask in an interview are to find out what they know about the company already, particularly if they know about EMS' and how their sustainability can be measured. Specifically several HR interviewers ask the question: *"if you were to be hired, how would you measure our progress in being environmentally sustainable?"*

As I reviewed my notes from the interviews over several different companies, I realized this was fast becoming a critical area that our students needed to be aware of if they were going to hope to succeed in becoming environmental professionals when they graduate, so I have compiled some helpful suggestions that I am sharing here in the hope that you will then utilize for your internships and/or for your newly hired EH&S professional.

Certainly, all our students (and, students majoring in the environmental sciences everywhere) and EH&S professionals everywhere are familiar with the LEED Green Building program that was one of the earliest certification programs that "measured" sustainability. Companies that are LEED certified use that in their Annual Reports, so that would be the most common response to the question in the interview has been: *"...achieving LEED certification is a measure of a company's sustainability."* But, from the HR people I spoke to about this question, they want more from today's grad than LEED. They want to know that job seekers have done their research and looked at new and innovative ways that sustainability can be implemented---they want to know what sustainability measuring tools are out there that they may not know about. And it is a key area where pre-interview efforts should be focused: knowing where to find those 'measurement' resources demonstrates that you are prepared to be a contributing member of their EH&S team.

In the next issue of the Journal, in Part II, I will share some of my findings from the literature on the methods that companies can use to measure the effectiveness of their sustainability programs. In the meantime, give some thought to how you might answer the question: *what methods would you use to measure the effectiveness of a company's sustainability program?* And, just perhaps, together, we can help reduce the environmental footprint of companies in the future, to benefit our children's, children's, children.

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.

FROM THE EDITOR



With the recent introduction of the Zika virus into the US, Americans have a renewed interest in controlling a significant, and potentially deadly, pest -- the mosquito. In this issue (*see article, on page 4*) Dawn Gouge, Professor and Specialist in Public Health IPM at the University of Arizona Department of Entomology, discusses practical prevention and control steps that you may find applicable to you, both at your business and in the home.

If you have an article or news item you would like to contribute to the Journal, please let me know. We welcome your contributions. Publishing in the Journal is a great way to reach others in Arizona's environmental management community, while sharing your experience and knowledge, as well as gaining increased recognition for your business or organization.

Sincerely,

Jim Thrush, M.S. Environmental Management

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JOURNAL OF Environmental Management ARIZONA

CONTENTS

August / September 2016

Volume 14 Number 4

ARTICLES, DEPARTMENTS, & COLUMNS

- 4 **MOSQUITOES AND THE GREAT OUTDOORS**
DAWN H. GOUGE, UNIVERSITY OF ARIZONA
- 7 **SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT**
MEASURING PROGRESS IN ENVIRONMENTAL
SUSTAINABILITY, PART I OF II NICHOLAS R. HILD, PHD.
- 8 **FROM THE EDITOR**
- 9 **IT'S ALL ABOUT CHEMISTRY**
THE COST OF CHEAP GAS LARRY OLSON, PHD.
- 10 **ASSOCIATIONS PAGES**
ASSOCIATIONS NEWS AND UPCOMING EVENTS
- 11 **AQ PERMIT COMPLIANCE ASSISTANCE SEMINAR**
- 12 **EMP. & EMPLOYEE RIGHTS & RESP. / OSHA**
- 14 **NEWS BRIEFS**

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Larry Olson, PhD.

IT'S ALL ABOUT CHEMISTRY

THE COST OF CHEAP GAS

Fracking has revolutionized the oil and gas industry and made obsolete previous predictions about “peak oil” and declining oil production, including a column I wrote in this magazine in 2005 titled “End of Cheap Oil.” U.S. oil production has increased from 5.0 million barrels per day in 2008 to 9.4 million bpd in 2015, almost back to its all-time peak of 9.6 million bpd in 1970. U.S. oil reserves have doubled to 40 billion barrels and proven natural gas reserves are at a record level of 388 trillion cubic feet. All of this is good news for our economy, for decreasing our reliance on imports from unstable regions of the world, and for your pocket book when you fill up your car at the gas station.

The ledger isn't all one sided, however. In a 2012 column, I wrote about some of the environmental problems associated with hydraulic fracturing including the millions of gallons of water per well required. I discussed the problem of disposal of the waste water generated in this process and the fact that the only current viable alternative was to inject it into deep wells, thousands of feet underground. In the 2012 column I didn't mention anything about earthquakes, because few people were concerned about them at the time. But things have changed.

In 2011, Oklahoma had its largest earthquake ever, a 5.7 magnitude, and two others of 5.0 or greater over several days. State officials called it “an act of nature, and it was nobody's fault.” That was just the beginning. Oklahoma had only three earthquakes of 3+ magnitude in 2010, 109 in 2013, 585 in 2014 and 907 in 2015. Only Alaska has more seismic activity. On

September 3, 2016 another large earthquake, tying the 2011 record, hit central Oklahoma. This one was felt as far away as Arizona.

What is going on? From 2010 to 2013, increased use of fracking pushed Oklahoma's production of oil up by 2/3 and gas production up by 1/6 with a corresponding increase in the amount of wastewater produced and injected into disposal wells. These wells are drilled into permeable formations, such as limestone, where water can seep into pores and cracks and be absorbed. But when the limestone overlies hard rock with fault lines, like it does in Oklahoma, water can find its way into those faults, reducing the friction between layers of rock. Together with the increased hydraulic pressure from millions of pounds of water, this could potentially induce an earthquake.

A 2015 article in *Science* examined a swarm of earthquakes near Jones, Oklahoma from 2010 to 2013 and found that injection linked seismicity could occur up to 35 km away from high-rate disposal wells. The authors concluded that the Jones earthquake swarm was a response to the increased pore pressure from injected fluids, primarily from four large wells within 3.5 km of each other whose combined volume was 3 million barrels per month.

This type of data linking specific wells to seismic activity is very rare and in Oklahoma a well can be shut down only if it is violating its operating permit or can be definitively tied to an increased earthquake risk. The state has been slow to respond to the dramatic rise in seismic activity over the last 8 years. But even the official earthquakes.ok.gov website now acknowledges that “the recent rise in earthquakes cannot be entirely attributed to natural causes” and that “The Oklahoma Geological Survey has determined that the majority of recent earthquakes in central and north-central Oklahoma are very likely triggered by the injection of produced water in disposal wells.” Following the September 3 earthquake this year, the Oklahoma Corporation Commission took the unprecedented step of shutting down 35 wastewater disposal wells within a 500 square mile radius of the epicenter, citing scientific evidence linking injection wells to earthquakes.

What can we learn from just this one example of unintended consequences? One undeniable fact is that the true cost of our energy is not just the price we pay at the gasoline pump.

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.



WWW.SAEMS.ORG

The not-so-new leadership began its new term in July and I'm honored to be serving as president. Vice President Erin Lansey, Treasurer Elizabeth Baker, Communications Coordinator Pat Hartshorne, and Secretary Michelle Frandsen all return to guide us. We warmly welcome President-Elect Noelle Espinoza who has been a valuable addition to the Executive Committee. Thank you to my predecessor, Derek Koller, for his leadership and wisdom. He certainly made it an easy transition, as have the committee chairs and members.

At the July luncheon, we heard from Daniel Ferguson, Ph.D., the UA director of Climate Assessment for the Southwest (CLIMAS). He discussed the intersection of research and decision-making to help improve the climate resilience of ecosystems and societies in the Southwest and northern Mexico. Interesting and heady stuff, for sure.

I'm looking forward to the remainder of the year. It should be a good one. For information on our upcoming events, please visit our website. We hope to see you soon.



Mike McGovern
President



AZ.ASSE.ORG

Greetings everyone! My name is Marc Tomeoni and I am the President of the Arizona Chapter for the American Society of Safety Engineers. It is an honor to serve such an amazing organization. I am committed to making this year a valuable experience for all of our members.

The theme for this year is Education. Our goal is to provide educational opportunities that meet or exceed our member's educational needs; including scholarships, monthly professional training events, mentoring programs, and ASP/CSP exam preparation focus groups.

If you are not currently an ASSE member, now is a great time to join our great team of over 500 valley-wide safety professionals! Please visit our website at www.az.asse.org to become a member, register for a monthly technical meeting, or pre-register for our 2017 AZASSE Professional Development Conference hosted by Arizona State University on April 12, 2017.



Marc Tomeoni
President



ARIZONA FORWARD

ARIZONA FORWARD.ORG

GOING FOR THE GOLD! WELL, IN THIS CASE THE GREEN

There may be 4,924 medals up for grabs across 28 sports at the Rio Olympic Summer Games, but Arizona Forward is seeking green medals that strengthen the Grand Canyon State. Finalists in our Environmental Excellence Awards presented by SRP are making a positive impact nationally and even around the globe.

With this year's Olympic manifesto underscoring A New World, Arizona Forward's competition promises to showcase A Better Arizona. The geographically diverse projects that will be recognized further seed our state's environmental legacy. They also help foster a new culture of stewardship for generations to come.

The 36th anniversary of Arizona's largest, most prominent awards competition of its kind, will unveil groundbreaking initiatives in four major counties – Coconino, Pima, Pinal and Maricopa. As a close observer of this longstanding program for most of its history, the rising emphasis on healthy communities in tandem with green buildings and game-changing technologies are noteworthy.

Nearly 100 nominations were submitted, demonstrating not only the priority of green design, but a shared ethic to protect natural resources and build in harmony with the environment. This year's most popular categories were sustainable communities, historic preservation and art in public places.

Sustainability is still the buzz word of the day but it's not always easily understood. The three pillars of sustainability are environmental quality, economic security and social equity. Sustainable design keeps these elements in balance, and when in sync, enhances public health and wellness through healthier communities.

Rewind to 10 years ago and our 2006 awards program – the majority of entries back then encompassed large-scale buildings and community development. Our category relating to healthy communities (previously referred to as livable communities), drew far fewer submittals. The emphasis today is on more sustainable design featuring compact development and mixed use projects that decrease our dependence on automobiles and enhance lifestyles.

Step back another few years to 2000 – historic preservation wasn't much on the radar. Today, it's as trendy as the word "hipster" and has transformed with the times to move beyond repurposing iconic structures to preserving the cultural integrity of our communities.

Interestingly, art in public places has remained steadfast and well-represented in the last decade, which speaks volumes about the integration of art into our quality of life. The collaborative spirit between artists and the community is indeed alive and well.

There are only winners in the Environmental Excellence Awards, even among projects that will not be recognized at the gala next month. Our state – and every Arizonan – is the beneficiary of your extraordinary contributions. Congratulations to all nominees, you're Green Medal superstars all the way!



Diane Brossart
President



WWW.AWMA-GCS.ORG

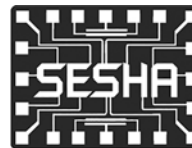
AWMA Grand Canyon Section had our August meeting at the Arizona Department of Environmental Quality in Phoenix. Matt Fraser and Thaddeus Bahl of Arizona State University presented their research on the attribution of volatile organic compound to different source categories. They used the ambient concentrations of 35 volatile organic compounds to determine likely sources and relative contributions to emissions of each ozone precursor. Their research was sponsored by the Maricopa County Air Quality Department.

Thank you to Matt and Thad for taking the time to present your research to us and Peter Hyde of our group for taking the lead on organizing this meeting.

September 29 will be our next Happy Hour. Our next meeting will be a tour of the Pinal County Air Park in late October. Check our website www.awma-gcs.org for details.



Mike Sonenberg, PE
Chair



WWW.SESHA.ORG

Just a reminder that SESA Arizona Chapter membership is free through 2016 but you do need to visit the website www.seshaonline.org to sign up under the Membership prompt. Our next planning meeting is scheduled for September 15th - 9 AM at Western Technologies Inc., 3737 East Broadway Road, Phoenix, Arizona, 85040. You are also welcome to join us on September 29th for a social event at the Firebirds Wood Fire Grill, 3435 West Chandler Boulevard, Chandler, Arizona 85224 from 4 – 6:30 PM.

Plans are underway for our annual conference that will be held early November. Please watch for "save the date" information to be released soon. We hope you make plans to join us at one or all of our events.



Vicky L. Aviles
AZ Chapter
President



ARIZONA ENVIRONMENTAL STRATEGIC ALLIANCE

AZALLIANCE.ORG

The Arizona Environmental Strategic Alliance and Maricopa County Air Quality Department co-hosted the fourth annual Air Quality Permit Compliance Assistance Seminar on July 14th. This seminar was one of our most successful and best attended educational and mentoring events, with approximately 120 attendees. This, and other Alliance seminars and events, support our goal of fostering working

Continued on next page



AESA & MCAQD Co-Host 4TH ANNUAL : AIR QUALITY PERMIT COMPLIANCE ASSISTANCE SEMINAR

The Arizona Environmental Strategic Alliance and Maricopa County Air Quality Department hosted an Air Quality Permit Compliance Assistance Seminar on July 14th, 2016, at the historical and beautifully restored 8th Floor Penthouse Ballroom in the Maricopa County Security Building on Central Avenue, in Phoenix.

Approximately 120 attendees heard presentations from Maricopa County AQ regulators, and Alliance Member industry environmental professionals, on a variety of AQ permit related topics, including the following: Philip McNeely, Director,

MCAQD, provided an introduction and overview; Johanna Kuspert and Bob Downing (MCAQD), spoke on MCAQD Planning; Richard Sumner (MCAQD) on Permitting; Greg Bopp (Honeywell Aerospace) on How to Conduct an "Air Permit Review"; Maria Cody and Bob Huhn (MCAQD) on MCAQD Outreach; Geetha Shankar (INTEL), on Improving Your Emissions Calculations; Greg Bopp (Honeywell), About the Alliance; Melissa Schmaltz (PING), on Starting a New Chemical Process: Bringing in New Equipment; Ben Davis (MCAQD), on Monitoring; Albert Leo and Reonsha Sullivan (MCAQD), on Compliance; with moderators Mark Hubbard (MCAQD) and Dr. Nick Hild (ASU).

The Alliance also co-hosts a similar annual Air Quality seminar with Pinal County Air Quality Department, with the next one planned for early in 2017. For information visit the Alliance website at www.azalliance.org or call 480-422-7392.



ASSOCIATION PAGES CONTINUED FROM PREVIOUS PAGE

relationships and communication between regulators and industry. See the Journal article (*above, on this page*) for seminar details.

On September 20th, Alliance members and guests met in Arlington, at the Arlington Valley Energy Facility for our regular meeting, and to hear the Arlington Annual Environmental Report, presented by Jaret Sullivan, Alliance Vice Chair. Our October meeting will be held at the Honeywell Sky Harbor Facility.

If you have questions on our seminars or about the Alliance, contact me at Gregory.Bopp@Honeywell.com or call our office at 480-422-7392.

Greg Bopp
Chair



WWW.EPAZ.ORG

us with how Harrison Properties transformed the East Washington Fluff Site into a viable piece of commercial property that now houses the Phoenix Police at 5th Street & Buckeye. Ms. Albright shared the City's Brownfields to Healthfields Initiative and how they are partnered with companies like Green on Purpose to promote the growth of a healthy, affordable, secure and sustainable food system that makes healthy food available to all Phoenix residents within ¼ mile of where they live.

Upcoming Events:

October 13, 2016 – Our monthly meeting will feature Disha Gadre from Trinity Consultants and she will present on "Environmental Life Cycle Assessments"

November 10, 2016 – Our monthly meeting will feature Sowjanya Chintalapati, Corporate EHS Engineer, Shutterfly, Inc. She will present on "OSHA's Safety and Health Program Management - New 2016 Version".

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.

Our August meeting featured Chuck Graf from ADEQ and was hugely successful with over 60 in attendance. Chuck shared details on the report recently published by the Advisory Panel on Emerging Contaminants. Our September meeting on Brownfields featured Rosanne Albright, City of Phoenix, Kenny W. Harris P. E., Harrison Properties and Paris Masek, Green on Purpose. Mr. Harris regaled

Lisa Culbert
Association
Manager



EMPLOYER & EMPLOYEE RIGHTS & RESPONSIBILITIES UNDER OSHA

The Occupational Safety and Health Act of 1970 (OSH Act) was passed to prevent workers from being killed or seriously harmed at work. This law created the Occupational Safety and Health Administration (OSHA), which sets and enforces protective workplace safety and health standards. OSHA also provides information, training, and assistance to employers and workers. Under the OSH Act, employers have the responsibility to provide a safe workplace.

RIGHTS AND RESPONSIBILITIES

EMPLOYERS MUST:

- Follow all relevant OSHA safety and health standards.
- Find and correct safety and health hazards.
- Inform employees about chemical hazards through training, labels, alarms, color-coded systems, chemical information sheets and other methods.
- As of January 1, 2015, notify OSHA within 8 hours of a workplace fatality or within 24 hours of any work related inpatient hospitalization, amputation or loss of an eye (1-800-321-OSHA [6742]); www.osha.gov/report_online).
- Provide required personal protective equipment at no cost to workers. (Employers must pay for most types of required personal protective equipment.)
- Keep accurate records of work-related injuries and illnesses.
- Post OSHA citations, injury and illness summary data, and the OSHA Job Safety and Health - It's The Law poster in the workplace where workers will see them.
- Not retaliate against any worker for using their rights under the law.

EMPLOYEES HAVE THE RIGHT TO:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language workers can understand) about chemical and other hazards, methods to prevent harm, and OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- Get copies of test results done to find and measure hazards in the workplace.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA rules. When requested, OSHA will keep all identities confidential.
- Use their rights under the law without retaliation. If an employee is fired, demoted, transferred or retaliated against in any way for using their rights under the law, they can file a complaint with OSHA. This complaint must be filed within 30 days of the alleged retaliation.

OSHA STANDARDS

OSHA standards are rules that describe the methods employers are legally required to follow to protect their workers from hazards. Before OSHA can issue a standard, it must go through a very extensive and lengthy process that includes substantial public engagement, notice and comment. The agency must

show that a significant risk to workers exists and that there are feasible measures employers can take to protect their workers.

Construction, General Industry, Maritime, and Agriculture standards protect workers from a wide range of serious hazards. These standards limit the amount of hazardous chemicals workers can be exposed to, require the use of certain safe practices and equipment, and require employers to monitor certain workplace hazards.

Examples of OSHA standards include requirements to provide fall protection, prevent trenching cave-ins, prevent exposure to some infectious diseases, ensure the safety of workers who enter confined spaces, prevent exposure to such harmful substances as asbestos and lead, put guards on machines, provide respirators or other safety equipment, and provide training for certain dangerous jobs.

Employers must also comply with the General Duty Clause of the OSH Act. This clause requires employers to keep their workplaces free of serious recognized hazards and is generally cited when no specific OSHA standard applies to the hazard.

INSPECTIONS

Inspections are initiated without advance notice, conducted using on-site or telephone and facsimile investigations, performed by highly trained compliance officers, and based on the following priorities:

- Imminent danger.
- Catastrophes – fatalities or hospitalizations.
- Worker complaints and referrals.
- Targeted inspections – particular hazards, high injury rates.
- Follow-up inspections.

On-site inspections can be triggered by a complaint from a current worker or their representative if they believe there is a serious hazard or that their employer is not following OSHA standards or rules. Often the best and fastest way to get a hazard corrected is to notify your supervisor or employer.

When an inspector finds violations of OSHA standards or serious hazards, OSHA may issue citations and fines. A citation includes methods an employer may use to fix a problem and the date by when the corrective actions must be completed.

Employers have the right to contest any part of the citation, including whether a violation actually exists. Workers only have the right to challenge the deadline for when a problem must be resolved. Appeals of citations are heard by the independent Occupational Safety and Health Review Commission.

HELP FOR EMPLOYERS

OSHA offers free confidential advice. Several programs and services help employers identify and correct job hazards as well as improve their injury and illness prevention programs.

FREE ON-SITE CONSULTATION

OSHA provides a free service, On-Site Consultation, for small businesses with fewer than 250 workers at a site (and no more than 500 employees nationwide). On-site Consultation services are separate from enforcement and do not result in penalties or citations. Each year, OSHA makes more than 29,000 consultation visits to small businesses to provide free compliance assistance. By working with the OSHA Consultation Program, certain exemplary employers may request participation in OSHA's Safety and Health Recognition Program, SHARP. To locate the OSHA Consultation Office nearest you, visit www.osha.gov/consultation or call 1-800-321-OSHA (6742).

COMPLIANCE ASSISTANCE

OSHA has compliance assistance specialists throughout the nation who

can provide general information about OSHA standards and compliance assistance resources. Contact your local OSHA office for more information or visit www.osha.gov/dcspp/compliance_assistance/cas.html.

COOPERATIVE PROGRAMS

OSHA offers cooperative programs to help prevent fatalities, injuries, and illnesses in the workplace. Alliance Program – OSHA works with groups committed to worker safety and health to develop compliance assistance resources and educate workers and employers. OSHA Strategic Partnerships (OSP) – Partnerships are formalized through tailored agreements designed to encourage, assist, and recognize partner efforts to eliminate serious hazards and achieve model workplace safety and health practices. Voluntary Protection Programs (VPP) – The VPP recognize employers and workers in private industry and federal agencies who have implemented effective safety and health management programs and maintain injury and illness rates below the national average for their respective industries. In VPP, management, labor, and OSHA work cooperatively and proactively to prevent fatalities, injuries, and illnesses.

INFORMATION AND EDUCATION

OSHA TRAINING INSTITUTE

The OSHA Training Institute (OTI) Education Centers are a national network of nonprofit organizations authorized by OSHA to deliver occupational safety and health training to private sector workers, supervisors, and employers.

EDUCATIONAL MATERIALS

OSHA has a variety of educational materials and electronic tools available on its website at www.osha-slc.gov. These include utilities such as expert advisors, electronic compliance assistance, videos and other information for employers and workers. OSHA's software programs and eTools walk you through safety and health issues and common problems to find the best solutions for your workplace. OSHA's extensive publications help explain OSHA standards, job hazards, and mitigation strategies and provide assistance in developing effective safety and health programs. Visit www.osha.gov/publications or call 1-800-321-OSHA (6742).

QUICKTAKES

OSHA's free, twice-monthly online newsletter, QuickTakes, offers the latest news about OSHA initiatives and products to assist employers and workers in finding and preventing workplace hazards. To sign up for QuickTakes, visit www.osha.gov/quicktakes.

WHO DOES OSHA COVER

PRIVATE SECTOR WORKERS

OSHA covers most private sector employers and workers in all 50 states, the District of Columbia, and other U.S. jurisdictions either directly through Federal OSHA or through an OSHA-approved state program. State-run safety and health programs must be at least as effective as the Federal OSHA program.

STATE AND LOCAL GOVERNMENT WORKERS

State and local government workers are not covered by Federal OSHA, but they do have protections in states that operate their own programs. The following states have approved state programs: AK, AZ, CA, CT, HI, IA, IL, IN, KY, MD, MI, MN, NC, NJ, NM, NV, NY, OR, SC, TN, UT, VA, VT, WA, WY, Puerto Rico and the Virgin Islands. *Connecticut, Illinois, New Jersey, New York and the Virgin Islands programs cover public sector (state and local government) workers only. Federal OSHA covers private sector workers in these jurisdictions.*

FEDERAL GOVERNMENT WORKERS

OSHA's protection applies to all federal agencies. Although OSHA does not fine federal agencies, it does monitor federal agencies and responds to workers' complaints.

NOT COVERED BY THE OSH ACT:

Self-employed workers; and workplace hazards regulated by another federal agency (for example, the Mine Safety and

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Health Administration, the Department of Energy, or Coast Guard).

CONTACT OSHA

For questions or to get information or advice, to report an emergency, report a fatality or catastrophe, order publications, sign up for OSHA's e-newsletter QuickTakes, or to file a confidential complaint, contact your nearest OSHA office, visit www.osha.gov or call OSHA at 1-800-321-OSHA, (6742), TTY 1-877-889-5627. For assistance, contact OSHA -- it's confidential.

Source content of this article provided by the U.S. Department of Labor, at <http://www.dol.gov>.



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NEWS BRIEFS

US EPA AND NIH AWARD \$5.1 MILLION FOR NEW ENVIRONMENTAL RESEARCH CENTER AT UA

❖ The U.S. EPA and the National Institutes of Health announced recently \$5.1 million in funding to create a new research center at the University of Arizona (UA) in Tucson, Ariz. UA is among five universities selected nationwide to work with local communities to better understand ways to improve environmental conditions for vulnerable populations.

UA will set up the "Center for Indigenous Environmental Health Research," to work with American Indian/Alaska Native communities to examine chemical contamination of traditional foods, water, air, and household environments, while increasing environmental health literacy.

"Exposures to harmful contaminants in low-income communities is an ongoing problem in our country," said Michael Slimak, director of EPA's Sustainable and Healthy Communities Research Program. "With the support of these centers of excellence, EPA is working to address this issue and protect human health."

Environmental health problems are more likely to occur in communities that have ongoing exposure to multiple sources of pollution. These communities are usually economically disadvantaged with limited access to quality healthcare.

Each university will establish a center of excellence on environmental health disparities research, which will conduct multidisciplinary research to mitigate and prevent health disparities driven by environmental causes. This research will focus on understanding the relationships between biological, chemical, environmental, genetic and epigenetic, and social factors.

The new centers, funded by five-year grants, are an expansion of a successful pilot program originally started by EPA and the National Institute of Minority Health and Health Disparities. EPA's contribution to this research partnership will be \$7.5 million, with \$18 million from three institutes at the NIH (NIMHD, NIEHS, and NICHD).

In addition to UA, the following universities received funding:

University of Southern California, LA, CA, "Maternal and Developmental Risks from Environmental Social Stressors," for studying how environmental factors may contribute to childhood obesity and excessive weight gain during pregnancy in Hispanic and Latino communities.

Harvard T.H. Chan School of Public Health and Boston University School of Public Health, Boston, Mass., "Disparities in Exposure and Health Effects of Multiple Environmental Stressors across the Life Course," for studying how housing may affect birth weight, childhood growth trajectories, and risk of death from cardiovascular disease, and whether improved urban housing may benefit health.

Johns Hopkins University, Baltimore, Md., "Comparing Urban and Rural Effects of Poverty on COPD," for comparing urban and rural effects of poverty on chronic obstructive pulmonary disease (COPD), and the impact of improved dietary intake on preventing or mitigating disease progression.

University of NM Health Sciences Center, Albuquerque, N.M., "Center for Native American Health Equity Research," for examining how contact with metal mixtures from abandoned mines affects rural Native American populations through exposures related to inadequate drinking water infrastructure, reliance on local foods, and other uses of local resources to maintain their traditional lifestyle and culture.


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**ED PETRULLO JOINS
BASCO-SUN WEST MARKETING
& PRODUCT DEVELOPMENT TEAM**

✦ BASCO-Sun West recently announced that Ed Petruccio has joined its marketing and product development team to support national sales of hazardous materials (HAZMAT) packaging, certified bulk storage, shipping and disposal containers, environmental products, steel, poly, and reconditioned drums, all sizes and types of glass and plastic containers, spill retention/clean up products, and safety equipment. Ed brings to BASCO--Sun West over 20 years of experience in the environmental and safety industries.

In 2010, after years of experimenting with the packaging then available on the market, Ed identified a sustainability and cost savings opportunity, and he developed a full Gaylord box designed to utilize the total available "pallet space". The design embraces the global initiative to "Go Green," and at the same time demonstrates a money-saving space management solution.

According to Ed, a pilot program to implement use of what is called the "Jumbo Pak", showed a reduction in the number of vehicles required to move product or waste while reducing gasoline consumption, reducing air-polluting emissions - all this with improved labor efficiency and significant cost savings."

The Jumbo Pak space management solution maximizes "pallet space" and enables fewer vehicles to be used to deliver the same quantity of goods or waste. This "best practice"

can reduce logistic factors up to 40% when compared to traditional methods.

BASCO Inc. is now the exclusive distributor of the "JUMBO PAK HAZMAT System", available nationwide in sample, pallet, or truckload quantities. This packaging system has been highly rated for the shipment and storage of certain HAZMAT products. Examples include: household hazardous waste, batteries, paints/thinners, chemicals, aerosol cans, solvents, regulated medical waste, pharmaceutical waste, contaminated soil, rags, or sweepings, asbestos waste, empty coolant containers, disinfectants, electronics, and more.

BASCO, a privately held company, was founded over 65 years ago as Barrel Accessories & Supply Company. BASCO acquired Sun West Container in 2015.

Today BASCO, Inc. is an industry leader in industrial packaging and container products which prides itself on extensive product knowledge and customer service.

Warehouses are located in Chicago, Phoenix, Tucson, Indianapolis, Dallas, Charlotte, and Detroit. Their diverse range of packaging and container products provides a wide variety of alternative solutions to packaging and container applications.

For information on BASCO, call 800-776-3786. For information on the "Jumbo Pak HAZMAT System" visit Sunwestcontainer.com, or contact Ed Petruccio at 602-625-5002 or at high4plus1@aol.com.



Ed Petruccio, BASCO-SUN WEST

■ 2016 October 13



Luncheon Featuring: Speaker: Disha Gadre, Trinity Consultants

Topic: "Environmental Life Cycle Assessments".

Sponsor: EP Container

Location: SRP Pera Club, 1 E. Continental Drive, Tempe, AZ

■ 2016 November 10



Luncheon Featuring: Speaker: Sowjanya Chintalapati, Shutterfly, Inc.

Topic: "OSHA's Safety and Health Program Management - New 2016 Version".

Sponsor: Environmental Response, Inc.

Location: SRP Pera Club, 1 E. Continental Drive, Tempe, AZ

■ 2016 December 8



Luncheon Featuring: Speaker: Phil McNeely, Maricopa County AQ Director

Topic: "Director's Air Quality Update".

Sponsor: Environmental Response, Inc.

Location: SRP Pera Club, 1 E. Continental Drive, Tempe, AZ

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