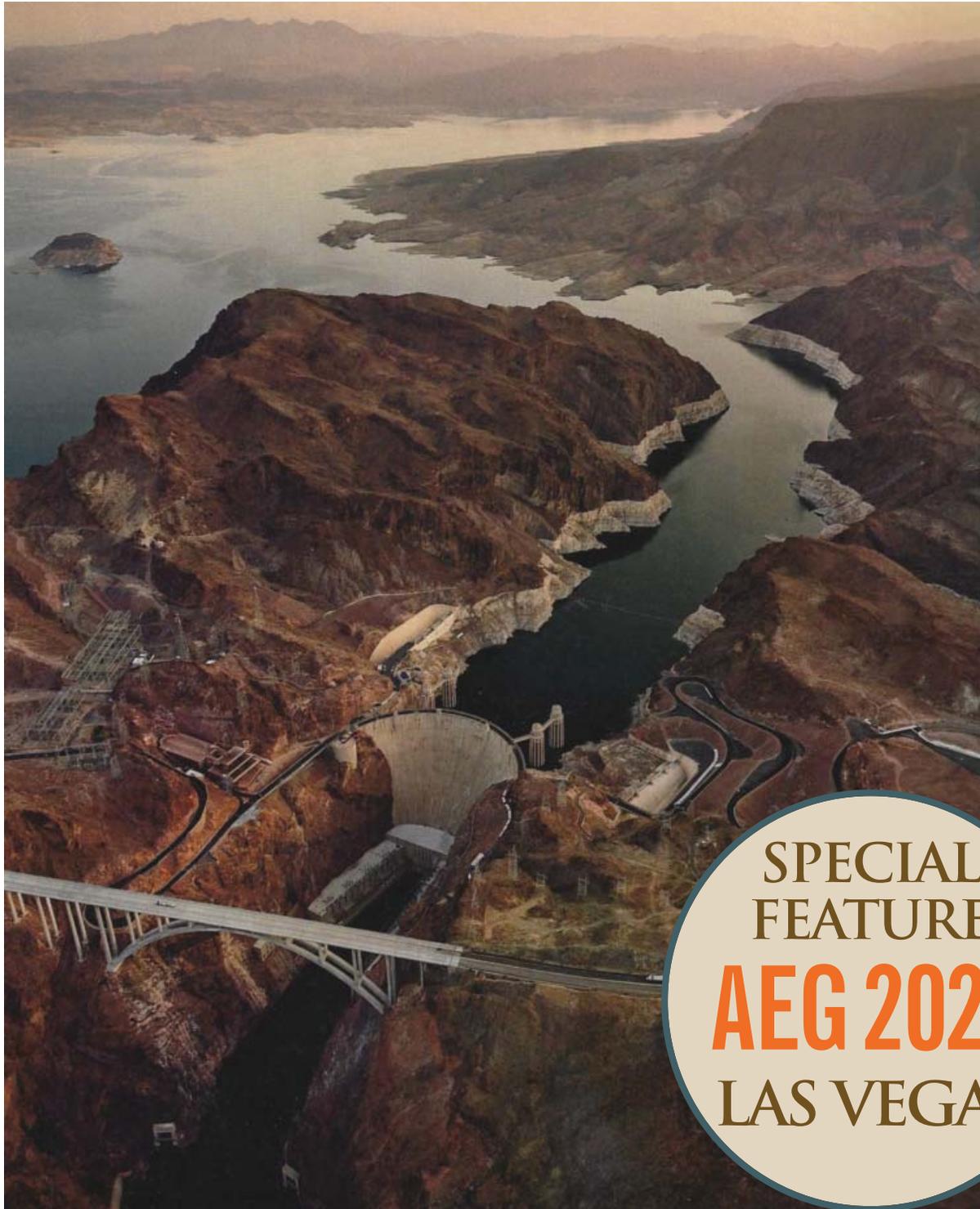


Vol. 65, No. 3 – Summer 2022

News



SPECIAL
FEATURE
AEG 2022
LAS VEGAS

Special Section

Preview

AEG 65th Annual Meeting “Geology in the Wild”

Las Vegas, Nevada – September 12–17, 2022



Geology of the Area

Adapted from Alden, Andrew. “Las Vegas Geology Highlights.” ThoughtCo, Feb. 16, 2021, [thoughtco.com/las-vegas-geology-highlights-1440698](https://www.thoughtco.com/las-vegas-geology-highlights-1440698).

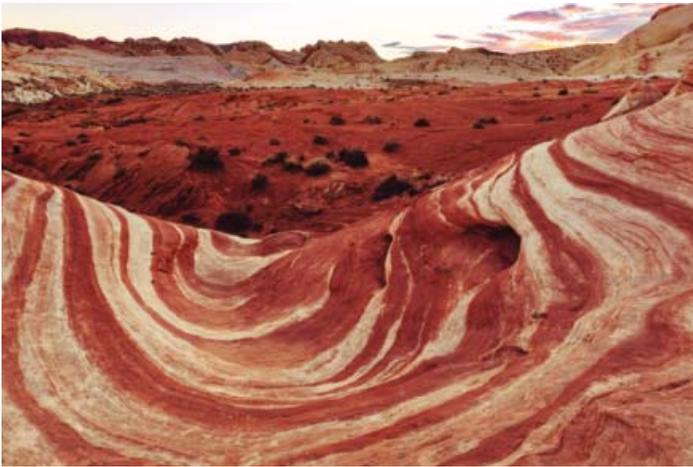
The Las Vegas Valley is a down-dropped basin typical of hundreds in the Great Basin of the Basin and Range province. The Great Basin is characterized by numerous arid to semi-arid basins separated by mountain ranges and extends over most of Nevada and a little beyond on all sides. Over the last 25 million years or so, the Earth’s crust here has been stretched in an east-west direction to around 150 percent of its former width, and the surface rocks have broken into strips of mountains running north to south. As a result, the hot material beneath has bulged upward, turning Nevada into a high plateau rich in metal ores and geothermal energy. During this century, numerous earthquakes have been recorded as the area’s tectonic activity continues.

The high elevation and the upwind barrier of the Sierra Nevada and Cascade Ranges on the west have made the Great Basin a very dry place, one where the mountains remain bare and settlements sparse. The Great Basin is an endorheic basin where drainages do not reach the ocean and converge instead into lakes, swamps, or sinks that fluctuate in extent with

hydrologic conditions. Typical desert landforms—playas, dunes, desert pavement, arroyos, alluvial fans, and bajadas—are plentiful, and bedrock outcrops and fault traces are well exposed. Geologists love deserts. Las Vegas was once a small settlement named Bringhurst, but it got its current name from the grasslands (las vegas, the meadows) that once grew in the valley. In the desert, grass represents a shallow water table, and in the Las Vegas Valley, grass was a sign of the natural faults that force the water table near the ground surface there.

Las Vegas languished as a tiny railroad town, serving the nearby mines until the Colorado River was dammed to create Lake Mead in the 1930s. The city has also exploited the aquifers beneath the Las Vegas Valley so that even if the city vanished tomorrow, the meadows would not return. The availability of enough water to boat in and fill pools helped turn Las Vegas into the tourist destination it is today. While the Las Vegas Strip makes spectacular playthings out of water, the rest of the city tends to landscape itself in gravel and cactus. The University of Nevada campus here is an elegant example of this approach, and it’s worth a visit just for the grounds. The geology department building has hallways lined with display cases full of excellent rock and mineral specimens, too.

There are many beautiful places to see while you’re in town. Three great national parks—Grand Canyon, Zion, and Death



Valley—are within reach. Just west of the city is Red Rock Canyon Conservation Area, a prime destination for rock climbers. You can just take a slow drive through the colorful formations if you like. One of the geologic highlights is an excellent exposure of the dramatic Keystone Thrust, where ancient crustal motions 65 million years ago shoved great thicknesses of gray limestone on top of younger beds of red sandstone. An hour or so northeast of Las Vegas is Valley of Fire, Nevada's first state park. The geologic setting is similar to Red Rock but in addition, this park features many ancient petroglyphs, rock art left by the local tribes (including the mysterious Anasazi). Both Red Rock Canyon and Valley of Fire are places that display the Sevier Thrust Belt, a gigantic zone of tectonic upheaval that stretches from the Las Vegas area into Canada. The thrust belt records a continental collision far to the west, on the continent's edge, during Cretaceous times about 80 million years ago. There are other places near Las Vegas where you can see its signs. To the north of Las Vegas is the understated Upper Las Vegas Wash, where locals come to get away from it all while geologists come to explore the rich fossil record. Take a visit. To the south, you can take trails down to the Colorado River valley below Hoover Dam. Maybe a desert hot spring or an all-terrain vehicle tour is more to your liking.

About Las Vegas

For more details visit www.visitlasvegas.com

Good reasons to visit Las Vegas are plentiful—300 days of sunshine and world-class dining and accommodations are just a few things that have made Las Vegas the world's top destination for the last twenty-six years. Las Vegas is located in Clark County, situated within a basin on the floor of the Mojave Desert, and surrounded by mountain ranges on all sides. Much of the landscape is rocky and arid, with desert vegetation and wildlife. It can be subjected to torrential flash floods, although much has been done to mitigate the effects of flash floods through improved drainage systems. The peaks surrounding Las Vegas reach elevations of over 10,000 feet (3,000 m), and act as barriers to the strong flow of moisture from the surrounding area. The elevation is approximately 2,030 ft (620 m) above sea level. After Alaska and California, Nevada is the third most seismically active state in the United States. The United States Geological Survey (USGS) estimates a ten to twenty percent chance of an M6.0 or greater earthquake occurring within 50 km (31 mi) of Las Vegas over the next fifty years.



Climate/What to Wear

Located in the Mojave Desert, Las Vegas has a hot, desert, subtropical climate that is characterized by arid and sunny conditions. In fact, Las Vegas weather is some of the sunniest in the world with an annual average of more than 3,800 hours—or 300 days—of sunshine, meaning there's almost never a bad time to visit Vegas. Autumn, from September to November, and spring, from March to May, are wonderful times to visit as the days are warm and sunny and cooling in the evenings, making for rather comfortable conditions when it comes to being out in the desert. This is the perfect time for those wishing to enjoy outdoor activities. Las Vegas receives only approximately 4.2 inches (110mm) of annual rainfall, most of which occurs during twenty-six to twenty-seven days of the year. Much of Vegas's rainfall occurs in winter, with February being the wettest month receiving an average of four days of rain. The best time to visit Las Vegas is from March to November as conditions are at



their most comfortable—being neither too warm or too cool, however there really is no bad time to visit Las Vegas. The meeting attire is business casual. The only event that is more dressy is the Annual Banquet where formal or semi-formal attire is suggested but not mandatory.

Annual Meeting Hotel
Planet Hollywood Las Vegas Resort & Casino
Group Rate: \$175* (includes resort fee)

Book your reservation now!
**The group rate is only available until 8/11/22.*

If you prefer to make reservations by phone, please call the Reservation Center at 1-866-317-1829. However, a processing fee per reservation will be incurred if you choose not to use the dedicated weblink. The group code is SMAEE2.



Overlooking the Las Vegas Strip, this sprawling high-rise casino resort is a five-minute walk from the Bellagio fountains and 1.2 miles from Madame Tussauds Las Vegas wax museum. Colorful rooms feature movie memorabilia and

flat-screen TVs. Posh suites add separate sitting areas and panoramic views. Some have soaking tubs, walk-in showers, pool tables, and hot tubs. Dining options include an upscale steakhouse plus casual restaurants and bars. Other amenities include a spa, two pools, and a shopping mall. In addition to the glitzy casino, there are live shows performed by famous entertainers.



Field Courses

Field Course Disclaimer: Field courses will be filled on a first-come/first-served basis, and registration will be limited to the number of spaces shown. The indicated minimum and maximum numbers of participants are based on a combination of factors, including: transportation, accessibility, and safety at roadside outcrops. Field courses are subject to cancellation if the minimum number of registrants is not met. Field course logistics (e.g., schedule, duration, route, transportation, location/number of stops, etc.) are also subject to change. Participants should be prepared for variable weather conditions and hiking on uneven ground. Field courses will proceed rain or shine. Additional information regarding the logistics of each field course will be provided to the paid registrants by the field course leader(s) at a later date, but well in advance of the course.

FIELD COURSE 1

Field Analysis of the Blue Diamond Landslide: Implications for Environmental and Engineering Geology in the Basin and Range Province

Date: Monday, September 12

Time: 8:00am – 1:00pm

Location: Departs from the Hotel Lobby

Fee: \$65.00 before 8/1/22, \$80.00 after 8/1/22

Leader: Daniel Sturmer, University of Cincinnati

Minimum to Run the Tour: 30, Max: 48

Rock avalanches often have a catastrophic and long-lasting impact on infrastructure, society, and regional landscapes. This half-day field trip will examine the Blue Diamond landslide deposit exposed in the Red Rock Canyon National Conservation Area in the western Las Vegas Valley. We will investigate sedimentological, stratigraphic, and geomorphic features of the landslide complex and discuss their engineering and environmental implications. This trip includes two short hikes over moderate terrain that could be strenuous for some participants. Be sure to bring a hat, sunscreen, and personal water. We recommend hiking boots, leather gloves, and binoculars.



Need Professional Development Hours?

PDHs will be available for all Field Courses and Technical Sessions. This is a great way to earn your hours while enjoying an educational day in the Field. Contact Meeting Manager, Heather Clark, after the meeting to get your PDH Certificate.

FIELD COURSE 2

Hard Hat Tour of Hoover Dam and the Hoover Dam Bypass Bridge

Date: Monday, September 12

Time: 8:00am – 1:00pm

Location: Departs from the Hotel Lobby

Fee: \$100.00 before 8/1/22, \$115.00 after 8/1/22

Leaders: Bryan Simpson, US Bureau of Reclamation and Jeffery Keaton, Wood, PLC

Minimum to Run the Tour: 30, Max: 96



Get up close with the inner workings of the Hoover Dam, originally Boulder Dam, and completed in 1936. For this field course, visitors will see the power generators, penstocks, and tailrace and outflow of the dam, getting VIP access to secured areas not offered to the public. This special tour is off the normal route and is conducted on the Arizona Wing of the Powerhouse. Closed-toed shoes are required, and hard hats will be provided. Hiking boots are recommended as there are steep hills to climb. Be sure to bring sunscreen, hat, and personal water. The bus will drop off passengers in a paved parking lot on the Nevada side where they will walk on a paved trail to the mid-point of the bridge. Note that canyon winds were the most significant dynamic load for design, even though earthquake design will be a topic for discussion on the field trip.

Visit the Bypass Bridge and learn about the foundation conditions and seismic analysis for this high concrete-steel arch bridge completed in 2010.

FIELD COURSE 3

The Great Unconformity, Las Vegas Valley Shear Zone, and the Discovery of Extensional Tectonics

Date: Tuesday September 13

Time: 8:00am – 1:00pm

Location: Departs from the Hotel Lobby

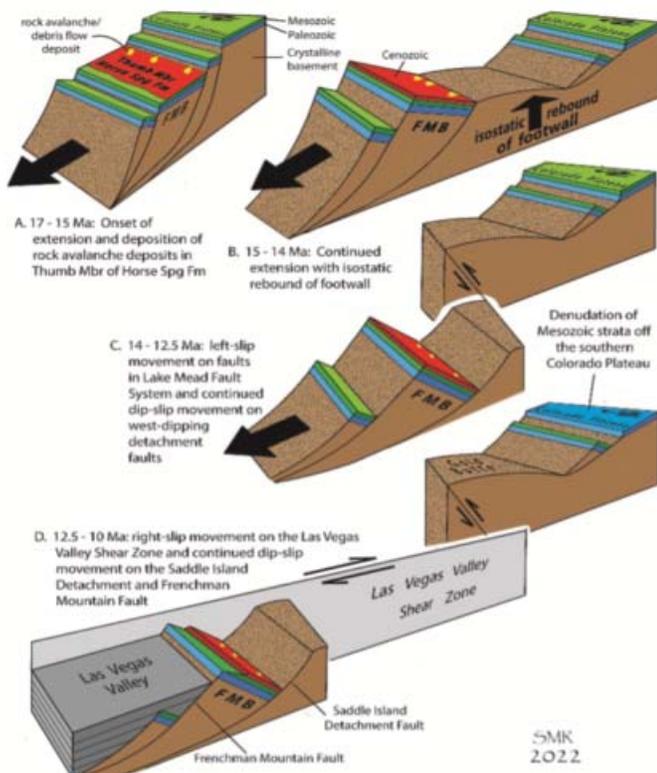
Fee: \$65.00 before 8/1/22, \$80.00 after 8/1/22

Leaders: Steve Rowland, Professor Emeritus, UNLV and James Faulds, Nevada State Geologist

Minimum to Run the Tour: 30, Max: 48

Difficulty Level – Strenuous

The focus of this trip will be extensional tectonics and the history of the supercontinent cycle recorded in the rocks of the Frenchman Mountain Block. We will examine the Frenchman Mountain Fault (a low-angle normal fault), and the base of Frenchman Mountain, where we will examine the Great Unconformity, then view at a distance the Las Vegas Valley Shear Zone, and arm wave about regional geology and the Walker Lane. Also, we will examine Miocene rock-avalanche deposits that played a key role in the discovery of extensional tectonics in southern Nevada. We recommend personal water, sun protection, binoculars, hiking poles, and footwear suitable for a short hike on a steep, rocky trail.



FIELD COURSE 4

Las Vegas Valley Water District Groundwater Recharge Well Field

Date: Tuesday, September 13

Time: 8:00am – 1:00pm

Location: Departs from the Hotel Lobby

Fee: \$60.00 before 8/1/22, \$75.00 after 8/1/22

Leader: James Prieur, Southern Nevada Water Authority

Minimum to Run the Tour: 22, Max: 30



We will visit the operating well field within the Las Vegas Springs Preserve. An Aquifer Storage and Recovery (ASR) program was initiated in Las Vegas Valley in 1989 as a water resource management tool to provide a reserve water storage bank and to stabilize groundwater levels in the Principal Aquifer. Since inception, over 365,000 acre-feet of treated Colorado River water has been recharged through seventy-three permitted dedicated recharge wells and dual use recharge/production wells during the off-peak season. Groundwater in the Valley was over-pumped extensively in the 1930s through 1970s resulting in declining water levels and subsidence bowls in certain areas. Well # 5 is a historic well which demonstrates the effects of subsidence. Be sure to bring a hat, sunscreen, walking shoes, and personal water. Participants will be transported around the well field via a tram with limited walking to the conference room and from the tram to tour sites.

FIELD COURSE 5

Geologic and Hydrologic Cruise on Lake Mead

Date: Saturday, September 17

Time: 8:00am – 1:00pm

Location: Departs from the Hotel Lobby

Fee: \$110.00 before 8/1/22, \$125.00 after 8/1/22

Leaders: Eugene Smith, UNLV and Dan Bunk, USBR

Minimum to Run the Tour: 30, Max: 96



Lake Mead was created by the construction of Hoover Dam in the early 1930s. Take a two-hour cruise on the lake on the Desert Princess. Features of the geology dominated by Cenozoic volcanics, will be discussed by Eugene Smith, volcanologist and Emeritus Professor at the University of Nevada at Las Vegas. The construction of Hoover Dam, and the status of the Colorado River water supply system—including the effects of the drought—will be discussed by Dan Bunk, US Bureau of Reclamation geohydrologist. Enjoy spectacular scenery, interesting geology, and Colorado River history and hydrology. Be sure to bring a hat, sunscreen, binoculars (highly recommended), camera, and personal water. Snacks and drinks are available for sale on the ship.



FIELD COURSE 6

Geology of the Skywalk at the Grand Canyon, Hualapai Nation, Arizona (West of the National Park)

Date: Saturday, September 17

Time: 8:00am – 5:00pm

Location: Departs from the Hotel Lobby

Fee: \$185.00 before 8/1/22, \$200.00 after 8/1/22

Leader: John H Peck, Consulting Geologist

Minimum to Run the Tour: 30, Max: 48

Travel to the west rim of the Grand Canyon and venture out on the glass-bottomed skywalk, cantilevered beyond the cliff at Eagle Point. The route will take us over the Hoover Dam Bypass bridge, through spectacular Basin and Range country to the Colorado Plateau. Engineering geology of the Skywalk and geologic hazards of the canyon walls will be highlighted. Luncheon at the Skywalk is included for this all-day field course. Be sure to bring a hat, sunscreen, and personal water. West Grand Canyon, outside of Grand Canyon National Park. Easy walking required.



Guest Tours

Guests of attendees are a special part of the Annual Meeting. The local committee takes great care to help make their time at the meeting pleasant and entertaining by offering a variety of activities while attendees participate in the daily sessions. Guest Registrations are a great value and include the Opening Welcome Icebreaker and unlimited entrance to the Exhibit Hall with all day coffee. (Must have an Annual Meeting or Guest Registration to attend Guest Tours.)

GUEST TOUR 1

Spring Mountains Tour

Date: Tuesday, September 13

Time: 9:00am – 2:00pm

Location: Departs from the Hotel Lobby

Fee*: \$100.00 before 8/1/22, \$115.00 after 8/1/22

**Includes: Transportation and lunch*

Minimum to Run the Tour: 16, MAX: 23



Escape the heat and bustle of the Las Vegas Strip to spend the day under majestic limestone cliffs and towering pines of the Spring Mountains. Catch a glimpse of the wild horse herd grazing in the lush Lee Meadows and be among the first to spot the changing aspens high on the slopes of the Lee Canyon terminus. Enjoy expansive views of the Mojave Desert at the Desert View Overlook, including atomic bomb detonation areas, and learn about the flora, fauna, and geology of the surrounding mountains and dry lake beds on the accompanying information panels. Continue your exploration of this special place with a visit to the Spring Mountain Visitor Center to experience the Silent Heroes of the Cold War Memorial, the Seven Stones Plaza celebrating the heritage of the Southern Paiute tribes, plus numerous diverse and engaging exhibits. Our final stop is a relaxing box lunch picnic at the top of Kyle Canyon (elevation 7,600 feet!), followed by return to the hotel. Bring your hat and sunscreen; water, snacks, and box lunch are provided

GUEST TOUR 2A

Hoover Dam Tour

Date: Wednesday, September 14

Time: 8:00am – 12:00pm

Location: Departs from the Hotel Lobby

Fee*: \$100.00 before 8/1/22, \$115.00 after 8/1/22

**Includes: Tour and Transportation*

Minimum to Run the Tour: 15, Max: 20

Our tour will begin with a brief stop for photos at the historic and world famous “Welcome to Fabulous Las Vegas Nevada” sign. As we enter the beautiful Lake Mead National Recreation Area, we will stop at the Lake Mead Scenic View to admire the beauty and the amazing geographic features of Lake Mead basin. Our next stop will be the Mike O’Callaghan - Pat Tillman Memorial Bridge (also known as the Hoover Dam Bypass Bridge) for one of a kind views of Hoover Dam and the Colorado River Canyon. Our tour will culminate with a 1.5-hour visit to the dam including the Hoover Dam Express Tour and approximately one hour of free time to explore and take advantage of many more unique and spectacular photo opportunities. Bring your hat, sunscreen, water and snacks, if desired!



GUEST TOUR 2B

Emerald Cave Kayak Tour

Date: Wednesday, September 14

Time: 9:30am – 2:00pm

Location: Departs from the Hotel Lobby

Fee*: \$195.00 before 8/1/22, \$210.00 after 8/1/22

**Includes: Transportation, Equipment, Lunch, Snacks and Kayak Tour*

Minimum to Run the Tour: 10, Max: 20

Experience the serenity of Emerald Cave, a picturesque natural attraction on the Colorado River. From the launch point at Willow Beach, enjoy a guided, small-group paddle for a four-mile, round-trip along a gentle section of the crystal-clear Colorado River stopping for snacks, swimming, photos and wildlife sighting along the way. A short fifteen-minute hike above the river on a bluff with amazing views is included, along with a history of the River Gaugers. Kayak fitting, paddle, personal floatation device, snacks, and bottled water are provided as part of this unique and safely adventurous tour offering. Be sure to bring your hat, sunscreen, bathing suit, and extra snacks if desired!



GUEST TOUR 3A

Red Rock Horseback Riding Tour

Date: Thursday, September 15

Time: 7:00am – 11:00am

Location: Departs from the Hotel Lobby

Fee*: \$165.00 before 8/1/22, \$180.00 after 8/1/22

**Includes: Transportation and Horseback Riding Tour*

Minimum to Run the Tour: 10, Max: 15



Take a break from the glitz and clamor of the Las Vegas Strip for a true western adventure on a two-hour early morning horseback ride through spectacular Red Rock Canyon. Climb atop a trusted mount and experience the thrill of the rugged desert landscape, while a friendly cowboy wrangler leads the way. Ride among natural wildlife and plants for a spectacular up-close look at Mojave Desert life. Learn about horses and the cowboy lifestyle from expert, professional guides including the basics of riding and proper riding techniques to make your journey not only safe and enjoyable, but educational, too. No riding experience necessary! Bring a hat, sunscreen and at least one liter of water, and wear walking shoes or hiking boots.



GUEST TOUR 3B

Red Rock Canyon Tour

Date: Thursday, September 15

Time: 8:30am – 1:00pm

Location: Departs from the Hotel Lobby

Fee*: \$90.00 before 8/1/22, \$105.00 after 8/1/22

**Includes Transportation and tour*

Minimum to Run the Tour: 10, Max: 15

In 1990, Red Rock Canyon was designated as Nevada's first National Conservation Area. It consists of 200,000 acres, renowned for spectacular scenery and landscapes, as well as both natural and cultural resources. Join us for a morning guided bus tour of this remarkable place, where we will explore and learn about the unique geology and ecology, including Nevada's first documented dinosaur track site, Native American archaeological sites, and the 19th and 20th Century history of the site, including its location on the Old Spanish Trail and the early homesteaders. Our tour will also include a visit to the Red Rock Canyon Visitor Center, as well as many excellent photo opportunities. There will be short walks/hikes to some of the sites. Bring a hat and at least one liter of water; wear walking shoes or hiking boots. Snacks will be provided. We will be back early afternoon.



GUEST TOUR 4

Chocolate and Wine Tasting Tour

Date: Friday, September 16

Time: 12:30pm – 4:30pm

Location: Departs from the Hotel Lobby

Fee*: \$89.00 before 8/1/22, \$99.00 after 8/1/22

**Includes: Transportation, Snacks and Wine Tasting*

Minimum to Run the Tour: 18, Max: 23



Indulge your decadent side with an afternoon of chocolate and wine! The Ethel M Chocolate Factory has been producing the famous Mars' family gourmet chocolates for over forty years. We will visit the factory for a self-guided tour and chocolate shopping opportunity. The factory grounds are also the site of a three-acre Botanical Cactus Garden with over 300 species of cacti, succulents, desert trees, and shrubs. After chocolate, the rest of the afternoon will be spent at Las Vegas Valley's first and only winery, where each of the Nevada-made wines has a story to tell. A winery tour is included to better understand the journey from vine to wine. Following the tour, a flight of five, one-ounce tastes will be offered in the winery tasting room, along with a light charcuterie accompaniment. Wine will also be available for purchase by the glass, as well as bottles of your favorites to take home.

Special Event

Join us for a “Night on the Town.”

As dusk falls, the city comes to life illuminated by the dazzling neon lights Las Vegas is famous for. We will be including a flyer on the website and in the registration bags with all the available activities along the strip.



HIGH ROLLER LAS VEGAS – Soar 550 feet above the center of the Las Vegas Strip on the largest observation wheel in North America. This stunning attraction provides the ride of a lifetime. Get ready to be wowed when you take a spin above the Strip. With sweeping 360-degree views, the wheel takes thirty minutes to complete one revolution. We have reserved three, spherical, Italian handcrafted glass, enclosed airconditioned cabins. Two of the cabins will enjoy a one-of-a-kind cocktail experience aboard the High Roller Observation Wheel, which includes an open bar and bartender for one full thirty-minute rotation of the wheel. Happy Half-Hour cabins can accommodate up to twenty-five guests aged 21 and over and are reserved from 6:30 to 7:00 pm. Or, enjoy the breathtaking views in an observation cabin without the bar at 6:45 pm. Be sure to make your reservations now before tickets sell out!

Cost is \$40/person for the 6:45 pm cabin and \$75/person for the Happy Half Hour cabins.

FREE SHUTTLE – Take in the Views of the Strip and Downtown from the Top Deck of our private BigBus Hop On Hop Off shuttle reserved just for AEG Annual Meeting attendees. The shuttle will include four stops along the strip and the Planet Hollywood Resort and Casino.

This will be a continuous shuttle loop from 6:00 – 10:00 pm and is free for all attendees.

Here are just a few possible teaser activities to enjoy on your own.

The Bellagio Fountains are a must-see in Las Vegas at night. This show is an impressive display of dancing water, colorful lights, and choreographed music that will amaze you no matter how many times you see it. It uses over 1,200 nozzles and jet sprayers to make the water twist, turn, and dance to the music, as high as 460 feet. The combination of graceful



movements and whimsy has made it one of the top night attractions in Las Vegas and it is FREE! You can catch the show every fifteen minutes from 8:00 pm to midnight.



The Mirage volcano is another amazing light show. Watching the volcano show is one of the most popular free things to do in Las Vegas, and it's not hard to see why. The eruption includes elaborate explosions and fireballs that shoot up to twelve feet in the air. As you watch the show, you might feel the heat of the flames or smell the piña colada fragrance of the smoke effects. The volcano erupts every day on the hour from 7:00 pm to 10:00 pm.

Enjoying the nightlife at a club is one of the best things to do in Las Vegas at night. Sin City is known for its vast array of evening entertainment and party venues, so you'll always have somewhere to go.

See a concert or show. As the entertainment capital of the world, you can find just about any kind of show in this city! There are dozens of concerts and variety shows that you can see practically every day in Vegas.



Gambling at a casino is another must-do in Las Vegas at night; you must try it at least once. The feeling of hitting the floor of one of the casinos and trying your luck at a slot machine or table is something many people come to Vegas to experience. The rush of excitement, the plinking sounds of the games, the enticing cocktails...it's no wonder visiting a casino is one of the most popular things to do in Las Vegas.



If you want to see the City of Lights transform into the City of Love, then head to the **Eiffel Tower Experience** at the Paris Hotel. This Eiffel Tower in Las Vegas is a half-scale replica of the real one in France. Even so, it's 460 feet tall, so you'll get sweeping views of the Strip and surrounding areas. There is a fine restaurant at the top and having a date here would be a great thing for couples to do in Las Vegas at night.

Technical Sessions

Keynote Speaker

Colby Pellegrino

Deputy General Manager, Resources Southern Nevada Water Authority and the Las Vegas Valley Water District



After joining the agency in 2003, Pellegrino served as an instrumental part of the Water Resources division supporting Colorado River modeling efforts to anticipate changes caused by climate change, reduced flows, and other inputs.

In her current capacity, she is responsible for the management of the Water Authority's water resource portfolio, which includes protecting Nevada's interests and rights to Colorado River water through interstate negotiations, developing regional water conservation programs, managing groundwater resources, and water resource planning.

Pellegrino also serves on the Board of Alliance for Water Efficiency, a nonprofit organization dedicated to the efficient and sustainable use of water and water conservation advocacy throughout North America.

A native of Las Vegas, she earned her Bachelor of Science degree in civil engineering from the University of Nevada, Las Vegas, and her Master of Business Administration from Mississippi State University.

Pellegrino has two children and is an avid cook, hiker, and outdoors enthusiast.

Keynote Abstract

As the Colorado River Compact turns 100 years old, Southern Nevada aims to reshape its water future.

In the past 100 years since the Colorado River Compact was signed, the Colorado River Basin has seen many changes: dams, environmental protections, human impact, periods of high flows, and decades-long drought. Among its most remarkable, a decades-long megadrought affecting snowfall and runoff has resulted in significant water level declines at major system reservoirs, including Lake Mead and Lake Powell. For the seven states who depend on this river for municipal supplies and agricultural demands, these drought conditions present a looming threat to their economies, landscapes, and livelihoods.

The elevation of Lake Mead—the United States's largest reservoir—has dropped by nearly 170 feet since 2000, prompting the Secretary of the Interior to make the first-ever shortage declaration. The risk of shortage remains high in future years and the federal government is projecting a high probability that Lake Mead water levels will continue to decline. While the ongoing work of federal, state, and municipal water partners have helped to slow the decline of Lake Mead water levels, through the 2007 Interim Guidelines for the Coordinated Operation of Lakes Mead and Powell and the 2019 Lower Basin Drought Contingency Plan, the Basin is reaching a critical point that requires more work and difficult decisions.

With the current state of the river system, the aridification of the southwestern United States, the 100-year-old Colorado River Compact, its framework and related agreements and policies will be at the heart of many discussions and debates in the coming months. At the center of the framework is the Interim Guidelines, the agreement that was signed in 2007 that shaped today's Colorado River operations. These guidelines have provided the path forward to cooperation among the river's users, but with the guidelines set to expire in the coming years and users facing unprecedented inflow projections, river users are facing an uncharted path forward.

Every user has a unique stake and perspective within the Colorado River system: from urban demands to meet the West's growing population centers to expansive agricultural operations, and the states have been asked for additional conservation in an amount that yields between 2 million to 4 million acre-feet, representing nearly a third of the river's total use.

In Southern Nevada, the Southern Nevada Water Authority (SNWA), the region's wholesale water provider, and its member agencies have been reducing demands since drought effects were first realized in the early 2000s. For the past twenty years, Southern Nevada has reshaped how the community grew and continues to rewrite its future and to reduce the

impacts of drought and climate change on water supplies and facilities through securing infrastructure, diversifying water resources, and reducing demands through a comprehensive water conservation program.

As the southwestern United States moves into the next decade and beyond, unprecedented changes will continue to occur, within municipalities and agriculture, to help secure one of the desert's most precious resources.

OPENING SESSION

Outstanding Environmental & Engineering Geologic Project Award:

Lake Mead Intake No. 3 and Low Lake Level Pumping Station

AEG/GSA 2021/22 and 2022/23

Richard H. Jahns Distinguished Lecturers

TECHNICAL SESSIONS AND SYMPOSIA

- Diversity, Equity, and Inclusion—Words Matter Symposium
- Tunneling Symposium
- Tectonics and Seismicity of the Walker Lane: A Potential Incipient Plate Boundary Symposium
- Water Management in the Era of Climate Change Caused Megadroughts and Mega-Floods Symposium
- Landslides, Parts I, II, & III
- Naturally Occurring Asbestos Symposium
- Wild Problems with Geophysics Solutions Symposium
- Dams and Levees Symposium, Parts I, II, & III
- Infrastructure and the Environment: Impacts on the Built World Symposium
- Hydrogeology & Groundwater Recharge
- Geologic and Seismic Hazards, Parts I & II
- Land Subsidence Symposium, Parts I & II
- Geohazards and Site Characterization
- Wild Problems, Unique Solutions, and Lessons Learned

POSTER PRESENTATIONS

Posters will be presented on Wednesday, 9/14 and Thursday, 9/15.

We will be awarding winners of the Student Poster Competition at the poster reception on Thursday from 5:00–6:30pm. A drink ticket is included for all full, Thursday-only, and student registrations.

SELECT SYMPOSIUMS

Diversity, Equity, and Inclusion—Words Matter Symposium

Join us for a symposium featuring speakers who are pioneers in representing diversity in our profession—starting decades ago through today. Others will address the issue from the level of the individual—to ways it is being handled in schools, companies, and organizations—to current initiatives across the geosciences. Our speakers will tell their stories, lead exercises, and talk about how they have made a difference and how we can too. Come with your questions and concerns—the last 20 minutes of the symposium will be a panel discussion with all the speakers.

Tectonics and Seismicity of the Walker Lane: A Potential Incipient Plate Boundary Symposium

The Walker Lane and eastern California shear zone currently accommodate ~20-25% of the relative dextral motion between the Pacific and North American plates. This zone of deformation poses significant seismic hazards to much of western and southern Nevada as well as eastern California. It has recently been responsible for several major earthquakes in the region. In this session, we review recent seismicity and crustal deformation along the Walker Lane, including its long-term evolution and potential to eventually develop into the primary plate boundary (i.e., heir apparent to the San Andreas fault).

Dams and Levees Symposium

Hosted by the Dams Technical Working group, this symposium will have a great lineup of wide-ranging talks including case histories, landslides impacting dams, instrumentation, paleoflood analyses, karst foundation issues, and erodibility studies of spillways. It will kick off with our Keynote Presentation on *Hoover Dam—Past, Present, and Future*, by Brian Simpson (Reclamation); plus a second keynote presentation on *Mosul Dam Foundation and Emergency Grouting*, by Georgette Hlepas (USACE). Join us! You will not be disappointed.

Wild Problems with Geophysics Solutions Symposium

Many standard and wild geological and geotechnical issues can be appraised inexpensively and relatively quickly with geophysics—but not “your father’s” geophysics! Geophysical methods have long been used for subsurface investigations. These methods have become the standard in preparation for engineering studies, such as infrastructure construction. The full breadth of geophysical investigations’ capabilities and applications, as well as the interpretation of geophysical results and their presentation in the clients’ jargon, can be utilized to answer some of the wildest problems geologists and engineers have seen. This symposium will present talks explaining newer concepts, providing case studies where novel geophysics methodology, applications, or complementary methods assisted in solving clients’ common problems in engineering, environmental projects, and beyond.

SELECT TECHNICAL SESSIONS

Hydrogeology & Groundwater Recharge

Daily, communities across the world are faced with dwindling water resources and water shortages. The research and work being conducted by experts in hydrogeology and groundwater recharge are providing the tools to successfully address these issues. Share your research, experiences, and lessons learned in this session.

Geologic and Seismic Hazards

This technical session, organized and convened by AEG's Geologic and Seismic Hazards (GASH) Technical Working Group, showcases practical examples illustrating how data were collected and analyzed to evaluate a broad range of hazards in a variety of geologic and geographic settings. Presentation topics address analysis methods for prioritizing geohazard risks, including landslide and slope monitoring; rockfall hazard evaluations in Peru, Puerto Rico, Idaho, and California; February 2019 alluvial fan flood damage inferred from available information, Coachella Valley, California; seismic hazard assessment of the Musandam Region, Sultanate of Oman; seismic design criteria for the Southern Salton Sea, California; the California Earthquake Clearinghouse database for the 2019 Ridgecrest earthquake sequence; geologic characterization of the Healdsburg-Rogers Creek fault stepover in California, for mitigation and real estate evaluation; the role of erosion in development of ground fissures around Lake Ziway, Ethiopia; evaluation of geologic and seismic hazards for two nuclear power units in Georgia, the first to be constructed in the United States in more than three decades; geologic and structural engineering assessments for school buildings in Washington; geotechnical design of permafrost and wetland mitigation for Colorado State Highway 5; and updates to Quaternary fault maps for the areas of Carson City and New Empire, Nevada, with implications for the Basin and Range Province. By discussing the practical examples on data collection and analysis methods for evaluation of geologic and seismic hazards, speakers will inform session attendees about proven methods that can be applied for evaluation of similar hazards at other locations.

Geohazards and Site Characterization

Earthquakes, sinkholes, tsunamis, sea level rise, and differing site conditions are all issues that challenge the best of our profession. Share your experiences, adaptations, and solutions for addressing and living with these issues. Tell us the good, the bad, and the ugly; we want to hear it all.

Wild Problems, Unique Solutions, and Lessons Learned

Ever encounter a problem that seems to have no explanation; a problem that seems to redefine everything you know? The Wild Problems, Unique Solutions, and Lessons Learned is the session for you. Tells us about your problems, strategies, and resolutions.

Student Opportunities

Annual Meeting Mentor Program

The Student and Young Professional Support Committee (SYPSC) is developing a mentor program to pair professionals that plan to attend the 2022 Annual Meeting with interested student attendees. We hope mentors can provide advice and support both before and during the Annual Meeting to make the meeting more relaxing, enjoyable, and beneficial for students. Students interested in being aired with a mentor will identify themselves when they register for the meeting and will be provided with the contact information of a professional who has volunteered to be a mentor. The student can then contact the professional with questions ranging from "What should I wear?" to "Could we meet during the Ice Breaker?"

Student/Professional Networking Reception

Tuesday, Sept. 13, 5:15 – 6:30pm

Be sure to attend this fun and relaxed event as it is the perfect place for you to make new friends and meet future employers/employees! You don't want to miss it! Be sure to sign up on your registration form.

Young @Heart Student/Professional Special Event

Tuesday, Sept. 13, 8:00 – 10:00pm

Students Attend Free/All Others \$15

This social event is a great way to start your week in Las Vegas. Make or to mingle with friends in environmental and engineering geology while you enjoy free appetizers (and a free drink ticket if you arrive early!) Just a short walk from the hotel, this event is an excellent opportunity to build connections with peers, mentors, senior fellows, and potential employers. We encourage students and young professionals to join the event and welcome experienced professionals who are "young at heart!"

Volunteer at the Meeting 8 Hours of Time Equals a Complimentary Registration!

A \$95 – 125 Value!

Duties can include any of the following: Control the lights and speaker timer for the technical sessions, assist speakers with uploading their presentations onto the session laptops at the Speaker/Moderator Breakfast, help with check-in for the Guest Tours and Field Courses, and stuff registration packets preconference.

Interested students should contact Heather Clark for all of the details, heather@aegweb.org.

Optional Events

Young @Heart Student/Professional Special Event

Tuesday, September 13, 8:00 – 10:00pm

Students Attend Free, All Others \$15

This social event is a great way to start your week in Las Vegas. Take this opportunity to meet many of our Student Members in the environmental and engineering geology sciences while you enjoy free appetizers (and a free drink ticket if you arrive early!) Just a short walk from the hotel, this event is an excellent opportunity to recruit future Chapter members, meet potential employees, find a student to mentor, and see the future of AEG. We encourage young professionals to join the event and welcome experienced professionals who are “young at heart!”

Strength through Equity – AEG Inclusion Luncheon

(Formerly the Women in AEG Luncheon)

Thursday, September 15, 12:00 – 1:30pm

\$50 per person

Join us for this networking event that focuses on diversity and inclusion issues in the industry and offers an open forum for discussion and education. Everyone is welcome!

Annual Banquet

Thursday, September 15, 7:00 – 10:00pm

\$100 per person

This is a well-attended, high-profile event at which the Association’s major awards are given. Join us for a gourmet dinner, fine wine, and a chance to visit with friends—both old and new. Semi-formal attire is recommended, though not required.

Awards Ceremony and Corporate Business Meeting

Friday, September 16, 3:00 – 5:00pm

Included with all registration types

The Awards Ceremony and Corporate Business Meeting is a time for Association officers, board members, and committee members to participate, report on their activities, witness the installation of new officers, the transition of the outgoing and incoming Presidents, and the presentation of some of the AEG and AEG Foundation awards.

Registration Rates and Deadlines

| Rate | by 8/1 | after 8/1 |
|--------------------------|----------|-----------|
| Full Registration | | |
| AEG Member | \$495.00 | \$595.00 |
| Non-Member | \$645.00 | \$745.00 |
| Student | \$95.00 | \$125.00 |

Events included with Full & Student Registrations:

- Student/Professional Networking Reception
- Icebreaker Reception with drink ticket and appetizers
- Exhibitor Hosted Luncheon
- Poster Session Reception with drink ticket
- Opening General Session
- All Technical Sessions and Symposia
- Exhibit Hall with All-Day Coffee and Technical Session Breaks
- Closing Reception with one drink ticket

Guest Registration *Must be linked to a full or one day registration*

| | | |
|-----------|----------|----------|
| Per Adult | \$150.00 | \$175.00 |
|-----------|----------|----------|

Included with Guest Registration:

- Icebreaker Reception with drink ticket and appetizers
- Exhibit Hall with All-Day Coffee
- Ability to sign up for Guest Tours

One Day Registration

| | | |
|------------|----------|----------|
| Member | \$275.00 | \$325.00 |
| Non-Member | \$325.00 | \$375.00 |

Optional Events for Additional Fees: *All are per person*

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|--|------------|
| Special Event: “A Night on the Town – Cocktails on the High Roller Ferris Wheel” | \$40–75.00 |
| Young at Heart Social Event (free for students!) | \$15.00 |
| Strength through Equity – AEG Inclusion Luncheon | \$50.00 |
| Annual Banquet | \$100.00 |

Field Courses and Guest Tours vary by event. Visit the Field Course, Guest Tour, and Special Event pages for details and fees.

Cancellation Policy

All cancellations and requests for refunds must be made in writing to the Annual Meeting Committee Chair(s). Verbal requests will not be accepted. Refunds may be issued 4–6 weeks after the close of the meeting.

For cancellations received at least 30 days prior to the start of the Annual Meeting: A \$75 processing fee will be applied for cancellation of a full Professional registration • A \$45 processing fee will be applied for cancellation of a daily Professional registration • A \$40 processing fee or the cost of the activity, whichever is less, will be applied for cancellation of each Annual Meeting activity: Short Courses, Events, Field Courses, Workshops • A 50% refund will be issued for cancellations received between 15 and 30 days prior to the start of the Annual Meeting.

No refunds will be issued within 15 days of the start of the Annual Meeting. Special consideration will be given for verifiable personal and medical emergencies.

Infrastructure and the Environment: Impacts on the Built World

AEG 2022 Annual Meeting—Las Vegas, Nevada

www.aegannualmeeting.org

Thursday, September 15, 2022 – 1:40–5:00pm

3 PDHs available for this session, 20 PDHs if you attend the entire Annual Meeting

This symposium will examine the many ways that human infrastructure impacts the environment—not necessarily from roads and bridges—but from pharmaceutical and PFAS contamination, to aquaculture, and uranium mining. The focus will be on the role that environmental and engineering geologists play in the process. Our featured local speakers will include experts from the Nevada DEP, the Southern Nevada Water Authority, the Desert Research Institute (DRI) and Geosyntec Consultants. Symposium attendees will come away with a real sense of the environmental challenges their colleagues in Nevada are dealing with in 2022.

Symposium Featured Speakers:



BEN MOAN, PE - KEYNOTE SPEAKER

Ben Moan is a supervisor in the Remediation & Leaking UST Branch, Bureau of Corrective Actions, with the Nevada Division of Environmental Protection, overseeing soil and groundwater remediation cases. He earned a BS in Geology (2003) and an ME in Environmental Engineering (2014) from Northern Arizona University.

His work experience includes environmental analytical chemistry, process engineering, and environmental compliance. Moan is licensed as a Professional Engineer in Nevada.



DANIEL GERRITY, PHD

Dr. Gerrity is the Principal Research Microbiologist in Water Quality R&D at the Southern Nevada Water Authority (SNWA). He is currently leading SNWA's involvement in a National Science Foundation grant studying the nexus of unsheltered homelessness and urban water quality. For the past two years, his team has also been applying

principles of wastewater-based epidemiology to better understand the link between wastewater occurrence of SARS-CoV-2 and COVID-19 in Southern Nevada.



MOLLY SMALL, PG

Small is a California Professional Geologist in Geosyntec's Reno, Nevada, office. She attended California State University Stanislaus and UC Merced for her bachelor's and master's degrees in Geology and Environmental Science, and has spent the last seven years at Geosyntec Consultants gaining a wide variety of experience and

expertise in site characterization, remediation, and mitigation methods, including high volume sampling, in-situ remediation injections, and sub-slab depressurization.



ARIEL ATKINSON, PHD

Ariel Atkinson is a Process Systems Engineer in the Applied Water Quality Research Group at the Southern Nevada Water Authority. She works on applied research projects in support of full-scale operations at their water treatment facilities and groundwater wells, as well as supporting external projects. Dr. Atkinson received her bachelor's

degree in Chemistry from Appalachian State University and her PhD in Environmental Engineering from UNC Chapel Hill.



ADAM KATLEIN, CEM

Adam Katlein is a Project Scientist with Geosyntec Consultant and Certified Environmental Manager with ten years of experience in environmental services, primarily in Nevada, managing projects under the regulatory oversight of the Nevada Division of Environmental Protection and Southern Nevada Health District.

Environmental assessment and remediation activities have included soil vapor extraction, air sparging, and groundwater pump and treat systems, plus the negotiated regulatory closure of eight sites using the groundwater risk-based closure exemption through NDEP.



WAYNE ISPHORDING

Wayne Isphording, is a Professor Emeritus at the University of South Alabama, and a member of the Trace Materials Subcommittee of the National Institute of Science and Technology, who specializes in environmental geochemistry, engineering geology, forensic geology, and natural disasters. He has spent five decades investi-

gating all the bays and estuaries of the northern Gulf of Mexico—from Barataria Bay, Louisiana, eastward to Apalachicola Bay, Florida—for agencies that include NOAA, the US Fish and Wildlife Service and the US Army Corps of Engineers.



AHDEE B. ZEIDMAN

Ahdee Zeidman earned a Master of Science in Water Resource Management from the University of Nevada Las Vegas and is currently researching non-conventional water treatment technologies with interests in advanced oxidation processes (AOPs) soil water interactions at nanoscale; soil mitigation, restoration, and amendments for agricultural lands; and phytoremediation using industrial hemp. Her main employers are the Division of Hydrologic Sciences at the Desert Research Institute and the Department of Water Resource Management at the University of Nevada, Las Vegas. She was the recipient of the George Burke Maxey Fellowship for 2019.

STUDENT POSTER SPEED PRESENTATIONS:

- *Shawna Hunnicutt* – Analyses of Spring Water Chemistry and Microbiology in the Spring Mountains, Nevada
- *Khalid Haji Omar* – Removal of a Mixture of Toxic Metals and Metalloids from Petroleum Produced Water by Dolomite Filtration