

## SAN DIEGO ASSOCIATION OF GEOLOGISTS

www.sandiegogeologists.org

## SDAG MEETING ANNOUNCEMENT

#### WEDNESDAY, JANUARY 27, 2016

## <u>A Tale of Two Water-Bearing Zones in a Fractured Hard-Rock</u> Aquifer in East San Diego County

Presented by: Chuck Houser

- Where:Marina Village Catalina Room1936 Quivira Way, San Diego, 92109 (See Map)
- When: 5:30 pm Social Hour 6:30 pm - Dinner 7:30 pm - Program
- **Directions:** FROM INTERSTATE 5: Take the SEA WORLD DRIVE exit. From SEA WORLD DRIVE, take WEST MISSION BAY DRIVE on your right. When you see the large green sign that says QUIVIRA ROD, get in the farthest left of the two left turn lanes. Turn left, go one very short block and turn left again. Drive about one half mile and MARINA VILLAGE will be on your right.

FROM INTERSTATE 8: Take the WEST MISSION BAY DRIVE exit to the right. You will be on INGRAHAM STREET for a short distance from which you will take the next exit marked WEST MISSION BAY DRIVE on your right. When you see the large green sign that says QUIVIRA ROAD, get in the farthest left of the two left turn lanes. Turn left, go one very short block and turn left again. Drive about one half mile and MARINA VILLAGE will be on your right.

- Dinner: Traditional Buffet Roast Beef and Chicken. Cash bar
- **Cost:** \$30 per person, \$5 discount for members, STUDENTS: \$15. Add \$5 if you did not make a reservation.
- **Reservations:** Make your reservation <u>online</u> at <u>www.sandiegogeologists.org</u> no later than noon, Monday January 25th. Reservations cannot be guaranteed after Monday at noon; but are always preferred over walk ins. Reservations well before the deadline are MUCH appreciated.

#### Maps:





## ABSTRACT

#### A Tale of Two Water-Bearing Zones in a Fractured Hard-Rock Aquifer in East San Diego County

#### Presented by: Chuck Houser

At Pine Valley Trailer Park in the town of Guatay, the Hilltop Mobil Station, as it was known most recently, provided gasoline, radiator water, and other services to travelers on Old Highway 80. After removal of underground gasoline storage tanks in 1992 and limited excavation of impacted soil, it was determined that groundwater, occurring at a depth of 25 to 30 feet, was impacted with petroleum hydrocarbons, including free product. The San Diego County Department of Environmental Health required assessment and remediation of the leaking UST case.

The site is underlain by fractured rock of the Peninsular Ranges batholith. According to Todd (2004), these rocks include Cuyamaca Gabbro and Chiquito Peak Monzogranite. Fracture trace analyses suggested fractures associated with plutonic emplacement, stress-release, and regional tectonic stresses are present at or in the vicinity of the site. Assessment included 16 shallow groundwater monitoring wells to assess the extent of groundwater impacts in a shallow waterbearing zone at a depth of 25 to 30 feet, and one deep well to assess a regional deep waterbearing zone at a depth of 150 to 160 feet. Coring the deep boring, along with analytical results, illustrated the shallow and deep water-bearing zones have minimal connectivity.

Remediation of free product and reduction of dissolved-phase hydrocarbons were accomplished using high-vacuum, dual phase extraction (HVDPE) in multiple remediation wells installed at the site. However, once remediation was largely completed, several impediments to closure still remained. A nearby supply well had low concentrations of aromatic hydrocarbons, suggesting possible connectivity between that well and the site. Aquifer testing confirmed the separation between the shallow and deeper water-bearing zones, and little to no connectivity between the Site and this well. Remaining high TPH concentrations, another impediment to closure, were addressed by additional HVDPE to evaluate whether additional mass was available for extraction. Upon determining that the hydrocarbons had been removed to the extent practicable, and with confirmation that sensitive receptors in the area were not affected, the case was closed.

## SPEAKER BIO

Chuck Houser is a geologist and project manager with SCS Engineers in San Diego. He has a Bachelor of Science degree from San Diego State University from 1986, and a Master's degree from SDSU from 1997. His undergraduate thesis was on structural controls and mineralogical indicators for the formation of pockets in the Elizabeth R Mine in Pala, and his master's thesis was on the tectonic geomorphology and Quaternary history of the Old Woman Springs fault in the western Mojave Desert in San Bernardino County.

His practice has included an emphasis in assessment and remediation of leaking underground storage tank sites. He has worked on numerous leaking UST sites in San Diego County, and has achieved closure of at least 20 cases over the past decade.

## UPCOMING MEETINGS

Meetings are usually held on the 3rd Wednesday of the month but may change to accommodate the speaker and meeting place schedules. Check the SDAG web site for updates.

February 17, 2016	Keith Meldahl - Surf, sand and stone; how waves, earthquakes and other forces shape the Southern California coast	
March 16, 2016	Diana Lindsey – The Geology of Africa	
April 20, 2016	SDAG Student Scholarship Presentations	

## 2016 SDAG EXECUTIVE COMMITTEE

PRESIDENT - Randy Wagner; Ph: (760) 877-3490 randallwagner@live.com VICE PRESIDENT - Rupert Adams, rsa\_sdag@geoconinc.com SECRETARY - Chris Livesey, secretary.sdag@gmail.com TREASURER - Ken Haase, kenwhaase@gmail.com PAST PRESIDENT/BARTENDER - Jennifer Bauer Morton, MB PUBLICATIONS – Lowell Lindsay; Sunbelt Publications; Ph: (619) 258-4911, x111; fax:(619) 258-4916; Ilindsay@sunbeltpub.com

WEBMASTER – Carolyn Glockhoff; Caro-Lion Enterprises, Ph: (858) 549-3396; carolyn@caro-lion.com

## 2016 SDAG MEMBERSHIP

The regular membership is \$25 (only \$5 for students) while the sponsor membership starts at \$100. Both forms are included on the following pages or they can be found on the home page of the SDAG website.

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## SAN DIEGO ASSOCIATION OF GEOLOGISTS

www.sandiegogeologists.org

#### 2016 MEMBERSHIP FORM

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<b>NOTE</b> : Your member email addresses give		y SDAG newsletter and announcements to the			
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Are you willing to serv	ve as an <b>officer</b> ? Are you wi	lling to volunteer as a <b>guest speaker</b> ?			
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San Diego Geological Society, Inc. 3130 North Evergreen St. San Diego, California 92110 *Thank you!*  Donations may also be made at monthly meetings. Revised 11/18/2015

## SDAG PRESIDENT'S CORNER

#### **Greetings SDAG Members!**

It's hard to believe another year has passed. I would like to start out thanking, Jen our 2015 SDAG President, on the superb job she done in the different SDAG officer positions she's been in. We are extremely appreciative of the time she has dedicated to SDAG and I am especially thankful for all the help she has given me over the past few years. I would also like to thank (I think) Diane M for talking me into taking over the secretary role midway through the year in 2014.

While I'm in a thankful mood, I'd also like to thank all of the other SDAG officers for their willingness to volunteer. I'm looking forward to our new Vice President, Rupert Adam's upcoming field trip to northern Baja California. If anyone has any ideas on things to look below the border let me or Rupert know. Welcome to our new Treasurer, Ken Haase of Geocon and Chris Livesey in his new role as our Secretary.

December's meeting proved to be another great presentation from Dr. Tom Deméré – his 35th! It is always fascinating to hear about the latest research being conducted by the San Diego Natural History Museum. I'd also like to acknowledge our two student scholarship recipients - Kaitlin Wessel of SDSU and Michelle Zill of UCSD who were recognized at our December meeting and look forward to their presentations in April of this year. A BIG thank you to Anne Sturz for all the work she has put into the student scholarship program.

I am looking forward to serving as President this year and hope that I can make 2016 another eventful year for SDAG. I welcome any feedback, input, or suggestions from our membership. Lastly, I wish you all a successful new year and hope to see you at the upcoming meetings in 2016 and beyond!

Randy Wagner 2016 SDAG President

## ANNOUNCEMENTS

## **CALL FOR PAPERS**

## **GEOHAZARDS OF NORTHERN BAJA CALIFORNIA**

Evaluating the Effects of Geologic Hazards on the Local Landscape

SDAG 2016 Field Trip – October 21th through 23th

On this field trip, we will travel south of the US-Mexico border to examine the geomorphic features related to faulting, landsliding and other erosional and mass wasting processes. If possible, we will also examine fault related features on a smaller scale in trench exposures. In addition, depending on the outcome of this year's highly anticipated El Niño, we may be able to examine the effects of the heavy rains on the local landscape. Where possible, we will look at how geotechnical engineering solutions have been employed to stabilize the local landscape.

SDAG seeks new manuscripts based on original work relating to earthquakes, faulting, landsliding, and/or any other geologic hazards that may affect Northern Baja. We also invite authors to submit articles on a broader



range of topics including regional geology, structural geology, hydrogeology and groundwater resources.

## Deadline for Abstracts: Friday, May 20<sup>th</sup>, 2016

Please submit the following information along with abstracts:

- Title
- Author(s) and affiliation
- Address, email, and telephone numbers for the author(s)

Please submit abstracts by email to Rupert Adams at adams@geoconinc.com





## Picacho and the Cargo Muchachos

Todd Wirths (SDAG president, 2012) will be presenting "Picacho and the Cargo Muchachos" for the Anza-Borrego Desert Natural History Association on Friday, January 22, 2016, and you all are invited. This presentation is part of the ABDNHA's popular lecture and activities offerings on various topics. The talk will talk place at the Borrego Desert Nature Center, 652 Palm Canyon Drive in Borrego Springs. Sign up here: <u>http://www.abdnha.org/calendar1.htm</u>.

## "ROCK DONATIONS NEEDED:

Amy Romano, one of our former student members, is looking for rock donations. Amy is currently attending Humboldt State University and majoring in Geology. She is very involved with Humboldt's Geology Club, and every year the club holds a rock auction to support their activities. If you have any rocks to donate, please contact Amy at <u>ajr612@humboldt.edu</u>.

## CALL FOR ARTICLES

SDAG invites members to submit articles on their current research or an interesting project they are working on for publication in the monthly newsletter. The article should be no more than 1 page in length. Photos are welcomed; too. Please submit articles to the SDAG secretary via email.

## SDAG RESEARCH TOOL

**SDAG RESEARCH TOOL** - A comprehensive listing of all papers published by SDAG, whether as annual field trip guidebooks or special publications, is now available on our website. Entries are sorted by primary author, or chronologically by date of publication, from our first guidebook in 1972, up the San Luis Rey River in 2013, and from Coast to Cactus in 2014. These can be accessed or downloaded as .pdf files. They are fully searchable in Adobe Reader or Acrobat, so if you are researching a topic, "tsunami" for example, you can search for that keyword. This listing will be updated as new books are published. Thanks to Greg Peterson and Hargis + Associates, Inc., for making this possible. See the links below:

http://www.sandiegogeologists.org/SDAG\_Pubs\_authors.pdf

http://www.sandiegogeologists.org/SDAG\_Pubs\_chronological.pdf



The 2015 GSA Annual Meeting will be September 25 - 28, 2016 in Denver, Colorado

## SDAG MONTHLY PHOTO COMPETITION

This month's submittal originated from Chris Livesey, our esteemed Secretary. The photo is from an undisclosed mass grading project in the county of Los Angeles. During grading for an earthen buttress, within the Monterey (Puente) Formation, Yorba Shale Member, a backcut failure occurred. For a general sense of scale, the backscarp is approximately 20 feet of vertical relief. The bottom photo is a closer view of the backscarp of the top photo.





## GEOLOGY JOB OPPORTUNITIES

We have several new job opportunities:

## **Thomas Harder & Co**

#### Position and Description of Responsibilities:

Staff Geoscientist Opening: Thomas Harder & Co (TH&Co) is accepting applications for a new Staff Geoscientist. TH&Co is a groundwater consulting firm based in Anaheim, CA. This entry-level position is full-time and will start as early as Mid-January. The applicant must have a bachelor's degree in geology. Courses in GIS and hydrogeology are a plus. Duties will include field inspection at well drilling sites and hydrogeological data compilation and analysis.

Resumes may be submitted via email to: Ben Lewis blewis@thomashardercompany.com

## Geocon

Certified Engineering Geologist, Orange County, California

Geocon has an immediate opportunity for a highly motivated geologist to work on a wide variety of engineering geology projects based out of our office in Irvine, Orange County. The ideal candidate will have experience performing a wide variety of geotechnical investigations for public and private sector clients, supervising rough grading operations for large-scale land development projects, and be proficient in utilizing field data to characterize and solve complex engineering geologic problems. Flexibility to travel, ability to work simultaneously on multiple projects, willingness to learn new skills, and a commitment to workplace health and safety while maintaining a positive attitude is desired.

**Responsibilities:** 

- Prepare project proposals and budgets and coordinate staff scheduling
- Plan, coordinate, and conduct geotechnical investigations
- Collate, analyze, and present project geologic data, including the preparation of trench and boring logs, geologic maps and cross-sections, fault trench logs, and interpretation of historical stereographic aerial photographs
- Perform construction documentation during grading projects, including field mapping of cut slopes and other excavations
- Identify/evaluate geologic conditions impacting project design, construction and/or longterm performance of engineered structures
- Coordinate the collection of field samples and assignment of laboratory testing
- Prepare project geotechnical reports
- Review project plans, specifications, and related documents
- Attend meetings with clients, contractors, and project staff as-needed

Requirements:

- Bachelor's or Master's Degree in Geology or Engineering Geology (graduate level education preferred)
- Professional California Registration as a Certified Engineering Geologist required
- A minimum of 5-plus years of relevant work experience
- Knowledge of complex structural geology, ability to recognize geologic hazards, and experience in evaluating the impacts of slope instability and landsliding on land development.
- Experience in a variety of subsurface investigation techniques, including downhole logging of large diameter borings
- Excellent verbal and written communication skills
- Ability to work both independently and as the member of a professional team to accomplish project goals
- Valid California driver's license

Geocon is an Equal Opportunity Employer committed to retaining talented staff; therefore, we offer competitive market wages and extensive benefits to our full-time employees. We have established a variety of employee benefit programs designed to assist our employees and their dependents in meeting financial requirements that can result from illness and disability as well as assist in planning for their retirement. Our benefits package includes medical insurance, vacation and sick leave, bereavement leave, family leave, medical and pregnancy leave, life insurance, short-term and long-term disability insurance, and a profit sharing program. We practice same-week

reimbursements for mileage and expenses as well as flexible work hours to accommodate employees' needs. Most of our employees have been with the company for over five years, and the majority for over ten to twenty years. Come work for a company that truly values its employees and offers an energetic work environment, great benefits, pleasant office dynamics, no corporate red tape, flexible work hours, and the opportunity to advance in your career!

Benefits and salary based on experience

For consideration, please e-mail resume to Rupert Adams at adams@geoconinc.com

#### Klondex

Junior Geologist (Ore Control) - Fire Creek Mine

Proficient in all aspects of mine geology work required to safely and efficiently mine, narrow vein, gold and silver deposits hosted in Tertiary volcanic rock. This includes participating in weekly safety meetings, daily underground ore control, channel sampling, Qa/Qc, geologic mapping/digitizing, production core logging and geologic modeling in Vulcan. Collects and analyzes underground geological data and acts as a liaison with mine operations. Bachelor's Degree in Geology or Geological Engineering required with an M.S. preferred. Entry-level graduate to 4 years of experience in the mining industry, with narrow vein experience preferred. Mine software experience required, Vulcan preferred.

Interested geologists can respond by sending their resumes to:

careers@klondexmines.com

#### San Diego Natural History Museum

#### Paleontology Collection Assistant

The San Diego Natural History Museum is operated by the San Diego Society of Natural History, a private non-profit scientific organization incorporated in 1874. The Museum's mission is to interpret the natural world through research, education and exhibits; to promote understanding of the evolution and diversity of Southern California and the peninsula of Baja California; and to inspire in all a respect for nature and the environment. Within the Museum, the Department of Paleontology specializes in

managing over 1.5 million specimens as well as engaging in and facilitating collections-based research of fossil vertebrates, invertebrates, and plants collected primarily from Late Mesozoic- through Cenozoic-aged sites in southern California and northern Baja California, Mexico.

#### **Position Summary:**

The Paleontology Collections Assistant will improve the digital data associated with SDNHM fossil specimens and fossil collection localities as part of a grant funded, Institute of Museum and Library Services (IMLS) Collections Stewardship project.

#### Primary Functions and Major Responsibilities:

The Paleontology Collections Assistant will use a geographic information system (GIS) to locate and georeference fossil collection localities and compile locality reports for uncatalogued specimens from southern California, USA and Baja California, Mexico. Responsibilities will also include database entry of locality and specimen data for uncatalogued specimens. Managing these digital data for fossils will extend to capturing digital images of specimens and associating the photographs to the specimen database.

#### **Duties Include:**

- Learning and using the department's GIS, which employs ESRI's ArcGIS
- Reviewing existing information for uncatalogued SDNHM fossils from Baja California in notes and paper maps, and creating and georeferencing new localities.
- Preparing locality reports based on existing locality and stratigraphic data from field books and hand-written locality forms.
- Entering new locality data into the paleontology collection database.
- Assisting in the curation and cataloging of fossil specimens from southern California and Baja California.
- Helping to develop protocols for capturing digital images of selected fossils.
- Digitally photographing fossils, editing images in Adobe Photoshop, and associating images with specimen records in the paleontology collection database.
- Other duties as assigned.

#### Qualifications:

- Bachelor of Science in geology or related field
- Academic emphasis in paleontology, sedimentary geology, or geographic information systems
- Background using USGS 7.5 minute topographic maps

- Strong verbal and communication skills, including scientific writing
- Proven organizational skills and attention to detail
- Experience using Microsoft Excel and Word, and Adobe Photoshop
- Familiarity with digital cameras and photography
- Ability to lift up to 50 pounds

#### Compensation:

This is a full time, temporary, 1 year position, beginning January of 2016 with a rate of pay of \$19.00 per hour and a generous benefits package.

To apply please submit resume, cover letter outlining your experience, and three professional references to <u>hr@sdnhm.org</u>. Please include the following in the subject line of your email "PCA Application- YOUR LAST NAME.FIRST INITIAL" (example: PCA Application-Smith. P.) No phone calls or drop ins please.

#### San Diego Natural History Museum

#### Invertebrate Paleontologist

The San Diego Natural History Museum is operated by the San Diego Society of Natural History, a private non-profit scientific organization incorporated in 1874. The Museum's mission is to interpret the natural world through research, education and exhibits; to promote understanding of the evolution and diversity of Southern California and the peninsula of Baja California; and to inspire in all a respect for nature and the environment. Within the Museum, the Department of Paleontology specializes in managing over 1.5 million specimens as well as engaging in and facilitating collections-based research of fossil vertebrates, invertebrates, and plants collected primarily from Late Mesozoic- through Cenozoic-aged sites in southern California and northern Baja California, Mexico.

#### **Position Summary:**

The Invertebrate Paleontologist will increase the scientific significance of the SDNHM paleontology collection by applying his/her knowledge of marine invertebrate taxonomy to curate uncatalogued Baja California, Mexico fossil invertebrates as part of a grant funded, Institute of Museum and Library Services (IMLS) Collections Stewardship project.

#### Primary Functions and Major Responsibilities:

The Invertebrate Paleontologist will curate (identify, organize, and database) marine invertebrate fossils from Baja California, Mexico. The collections are mostly restricted to marine Cenozoic, molluscan faunas of the northeastern Pacific region. The successful candidate will need to be familiar

with molluscan taxonomy and be experienced with using appropriate library and internet references to assist in taxonomic identification.

#### **Duties Include:**

- Identifying marine invertebrate fossils from Baja California and utilizing relevant resources to assist in taxonomic identification.
- Using geological maps and literature of Baja California to become acquainted with relevant sedimentary rock units.
- Assisting collection managers with compiling and databasing SDNHM Baja California fossil localities.
- Becoming familiar with department procedures for curating fossils.
- Learning and becoming proficient with the department's current collection data entry program (dbaseIII) and future collection data entry program (Specify).
- Working with the curator, collections managers, and other department staff to produce a quality curation product.
- Other duties as assigned.

#### **Qualifications:**

- Bachelor of Science in geology, biology, or related field
- Masters of Science.S. preferred
- Academic emphasis in paleontology, sedimentary geology, or marine invertebrate biology
- Background in marine Cenozoic molluscan taxonomy of the northeastern Pacific region
- Experience working in a museum paleontology department
- Strong verbal and communication skills, including scientific writing
- Proven organizational ability and attention to detail
- Experience using Microsoft Excel and Word, and Adobe Photoshop
- Ability to lift up to 50 pounds

#### Compensation:

This is a full time, temporary, approximately 1/2 year position, beginning in late Spring of 2016 with a rate of pay of \$21.00 per hour and a generous benefits package.

To apply please submit resume, cover letter outlining your experience, and three professional references to <u>hr@sdnhm.org</u>. Please include the following in the subject line of your email "IP Application- YOUR LAST NAME.FIRST INITIAL" (example: IP Application-Smith. P.) No phone calls or drop ins please.

## Geology Job Seekers

We have heard from many upcoming geologists at our recent meetings, all of whom are seeking work opportunities here in San Diego. Included herein, in no particular order, are bio's and contact information of our members looking to gain a foothold in the local professional community:

This is Farida Baxamusa, MS- Earth Science from Scripps Institution Of Oceanography (SIO), University of California, San Diego (UCSD). I am originally from India, and have another Master's in Earth Sciences from St. Xavier's College, University of Mumbai, India. I have also been granted the Dr. Ratan Nadirshaw Sukeshwala and Dr. Dayanand Dattatraya Yellur scholarship for securing highest rank in Earth Science at MS Part I and Part II. After completing my MS in India, I secured an internship at Oil and Natural Gas Corporation (ONGC), Mumbai, India. Later I worked as an Earth Science lecturer at St. Xavier's College, University of Mumbai, India where I held classes, directed discussions among large groups ranging from 35 to 80 students on mineralogy, petrology, geochemistry, crystallography, economic geology, oceanography, and plate tectonics and led lab courses involving mapping, stratigraphy, and paleontology. In September of 2013, I was accepted at SIO, UCSD for a master's program. Dr. Lisa Tauxe was my advisor and I worked as a research assistant under her in the field of paleomagnetism. I worked in the paleomagnetism laboratory where I skillfully selected quenched rock materials from lava flow samples to obtain accurate estimates of the Earth's magnetic field intensities. I developed python scripts to analyze individual samples to obtain their paleointensity values. I also worked as a teaching assistant for a year where I assisted teaching undergraduates introductory geology and Earth processes, collaborated with other teaching assistants and professors to aid in conducting an introductory course about hydrologic processes on Earth and held office hours, tutored students, proctored and graded exams. Around the time of completion of my degree I presented my year's research to the faculty members of the Geoscience Research Division (GRD) and qualified for my MS in Earth Science and graduated in September of 2014. I am currently doing 3 part time jobs, one as a Staff Research Associate at SIO, the other as a Staff scientist at the Bodhi Group where I perform phase I site assessments, and the third as a geology education website volunteer at California Coastal Commission Public Education Department, CA. I am now actively looking for a job in environmental consultancy firms or educational institutions. I believe that I have a varied background and education and the perseverance and grit in achieving excellence in everything I do. If you have any advice, jobs, internships please feel free to contact me at fbaxamus@ucsd.edu or call me on 858-397-8456. Your help and guidance will be highly appreciated.

## REQUEST for 2015 SDAG/SDGS and PUBLICATION SPONSORS

On behalf of the San Diego Geological Society, Inc. (SDGS), a public benefit 501(c)3 nonprofit educational corporation, we would like to request tax deductible Donations for our San Diego Association of Geologists (SDAG) group. The list of paid Sponsors and the forms to become a Sponsor are located on the SDAG web site at: <u>http://www.sandiegogeologists.org/Sponsors.html</u>.

Your donation will further the SDGS mission to promote geology and related fields in the greater San Diego region, operating through the San Diego Association of Geologists (SDAG), a committee of SDGS. To achieve our primary educational objective, we organize frequent field trips and maintain a program of monthly meetings featuring speakers on current geological topics. We also publish field trip guidebooks and other publications related to geology and natural history. We encourage scholarship and research by awarding scholarships from the elementary through graduate levels. With your \$100 "EMERALD" donation, your name/business will be listed as a sponsor on the SDAG web site (http://www.sandiegogeologists.org/) and in the monthly SDAG meeting newsletters. With your \$500 "RUBY" or \$1,000 or more "DIAMOND" level donation, your business card will also be included on the SDAG web site and in the monthly SDAG meeting newsletters. In addition, as a "\$1,000 or more DIAMOND" level donation will be presented with a thank you plaque.

Should you have any questions regarding a Sponsorship, please contact our non-profit SDGS Secretary (Diane Murbach) at 619-865-4333.



Hargis + Associates, Inc. is an environmental consulting firm specializing in hydrogeology and engineering. We are headquartered in San Diego, California and have offices in Mesa and Tucson, Arizona. Our practice areas include all aspects of hydrogeology and engineering.

As a client service organization, we pride ourselves in being attentive and efficient in meeting our client's needs and solving their problems. In addition to our technical expertise, communication and responsive coordination are hallmarks of our reputation.

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HARGIS+ASSOCIATES, INC. HYDROGEOLOGY • ENGINEERING

Contact: Dr. David R. Hargis

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Contact: Dave Bloom

#### Contact: Louise Adams or Suzie Nawikas



Contact: Rupert Adams, CEG

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