



SAN DIEGO ASSOCIATION OF GEOLOGISTS

<http://www.sandiegogeologists.org>

SDAG MEETING ANNOUNCEMENT

Wednesday, February 20th, 2019 *3rd Wednesday*

Early History of the Yellowstone Hotspot Track and Its Interaction with the Subducting Farallon Slab

Presented by: **Dr. Vic Camp**

- Where:** Marina Village – Catalina Room
1936 Quivira Way, San Diego, CA 92109 (See Map)
- When:** 5:30 pm – Social Hour
6:30 pm – Dinner
7:30 pm – Presentation
- Dinner:** Traditional Buffet – Chicken, Beef, Grilled Vegetables, Caesar Salad, Scalloped Potatoes, Bread Rolls, and Chocolate Truffle Cake.
Cash Bar - Walawender Tavern
- Cost:** \$30 Member, \$35 Non-Member, \$20 Students.
- Reservations:** Make your reservation **online** at <http://www.sandiegogeologists.org/Meetings.html> **no later than noon, Monday, February 18th**. Reservations cannot be guaranteed after Monday at noon, but are always preferred over walk-ins. **EARLY reservations well before the deadline are MUCH appreciated.**

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 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.

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.

Map:



ABSTRACT

EARLY HISTORY OF THE YELLOWSTONE HOTSPOT TRACK AND ITS INTERACTION WITH THE SUBDUCTING FARALLON SLAB

Presented by: Dr. Vic Camp

In this talk, I will discuss how the Yellowstone hotspot was manifested in eastern Oregon in late Oligocene to early Miocene time, before generation of the Columbia River flood basalts and the Snake River Plain hotspot track. Integrated data reveal a broadening of the southern segment of the ancestral Cascades arc into the Oregon back-arc region from 30-20 Ma where volcanism was derived from melting of a hydrated mantle enriched in the water-soluble elements. This broadening event is attributed to thermal uplift of the Farallon slab by the underlying Yellowstone plume, with heat diffusion, decompression and the release of volatiles promoting high-K calc-alkaline volcanism throughout the Oregon back-arc region. Several of the 30-20 Ma outcrops in the Oregon-Nevada border region are dominated by unusual rocks called adakites derived from the melting of oceanic crust or equivalent rock types. These define a broad area of northeast trend parallel to plate motion which we consider to be an older extension of the Yellowstone-Snake River Plain hotspot track, where melting of oceanic crust was a consequence of slab breakup. Slab uplift and the cessation of corner flow resulted in a volcanic hiatus from ~20 to 16.7 Ma with coeval rupture of the uplifted slab in two separate places. The eastern rupture resulted in the eruption of early flood basalts derived from the ascent of a dry mantle-plume source. The western rupture resulted in the contemporaneous rejuvenation of high-K calc-alkaline volcanism due to renewed subduction and melting of a wet mantle source restricted to the Nevada-California border region. The southern segment of the ancestral Cascades arc has since migrated to the west at 7.8 km/m.y. Destruction of the slab is evident today in the seismic resolution of a slab hole beneath southern Oregon bound on the south by the Yellowstone adakite hotspot track.

SPEAKER BIO

Dr. Vic Camp grew up in West Virginia where he attended Marshall University (B.S.), followed by graduate studies at Miami University (M.S.) and Washington State University (Ph.D.). His research interests are in geologic mapping, volcanology, igneous petrology, and the tectonic evolution of volcanic terrains. After 10 years of research experience in Africa and the Middle East, he moved back to the U.S. and began teaching San Diego State University in 1993 where he has taught a variety of courses from General Education to hard-rock courses for undergraduate and graduate majors. His current research focus is on mid-Miocene volcanism and related tectonic evolution in the Pacific Northwest.

UPCOMING MEETINGS

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

March 20, 2019 TBD	Dr. Matthew Weingarten - TBD
April 17, 2019 Geocon Inc.	Student Presentations
May, 2019	TBD

2019 SDAG EXECUTIVE COMMITTEE

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SDAG PRESIDENT'S CORNER

I would like to again thank Diane Murbach, Dr. Ken Hudnut (who unfortunately couldn't present due to the government shutdown), and Matt Burgess for providing such wonderful insight into last year's Kilauea eruption at our January meeting. Pleased to see such a great turnout!

If anyone has a One Stop Wonder (OSW) for February, let me know! We are always looking for interesting places and things to see.

Our February 20, 2019 meeting brings us Dr. Vic Camp of SDSU continuing our volcanic themed talks to start 2019. He will present the Early History of the Yellowstone Hotspot Track. I learned about this when I took his class at SDSU but I'm looking forward to a refresher on the topic!

The meeting will be at the Catalina Room at Marina Village, happy hour starts at 5:30 pm at the Walawender Tavern!

SDAG is off to a great start in 2019 and if you have any questions, concerns, want to be a speaker or have a cool OSW just email me!

See you on February 20th!

Ken Haase

2019 SDAG President

Geocon, Inc.

ANNOUNCEMENTS

ONE-STOP WONDER CHALLENGE!

ONE OSW A MONTH IN 2019!

BE A PART OF SDAG HISTORY!

Have an idea for a one-day or half-day field trip?

Want to share your favorite aspect of San Diego
geology?

Contact SDAG to schedule your One-Stop
Wonder!

Your OSW may be chosen to be included in SDAG's One Stop
Wonder Guidebook!

Contact Monte Murbach for scheduling!

montemurbach@gmail.com

2019 SDAG Annual Field Trip – Owens Valley, CA

Hi SDAG members. My name is Adam Avakian. I am the current secretary and future 2019 vice president for SDAG. I am very excited to be tasked with pulling together the annual field trip for 2019 and have some big shoes to fill after attending our latest trip out to the Mojave Desert (thanks to Ken and everyone involved for an amazing trip, and what an awesome group photo!). I am planning on taking us to Owens Valley / Eastern Sierras. I have a few stops in mind already but could definitely use some help on more stop suggestions and *especially any enthusiastic speakers* who have some knowledge and a love for the geology of Owens Valley. Here is a sneak peek at next year's trip:

- Owens Valley Fault - 1872 Earthquake Fault Scarp - Lone Pine.
- Alabama Hills – I was recommended a very interesting geological feature to look at here, also potential campground
- Poverty Hills Geology - Owens Valley Fault Pressure Ridge and beautiful fault scarps preserved in basalt flows - Tinemaha Dam – Big Pine
- Crowley Columns – Lake Crowley
- Bishop Tuff – Ideas??
- More ideas (basalt flows, glacial moraines etc.??)

Because it's a long drive and there is a lot to see I would like to try to start the trip Friday morning which would require participants to either get up extremely early Friday morning to drive or to camp out with the group Thursday night (my preferred option) or you can join the group midday on Friday. The bulk of the trip would be completed Friday and Saturday. I think I will plan for a half day of stops on Sunday and try to make them on the way back south towards home. Sunday would also be optional if anyone wants to get home earlier they can head out Sunday morning and skip the stops. Any help or advice would be much appreciated. Like I said, speakers are more than welcome. I'm planning to speak at Tinemaha Dam as my company has done work there but that's all I've got so far! Please send responses to armenianmenace1@gmail.com

Cheers!

Adam

The “Lindavista” Fm: Marine Terraces to Terrestrial Terraces and all Plants in Between

by Eleanora (Norrie) Robbins, PhD (USGS-retired; SDSU-retired)

I have several specialties, one of which is iron bacteria. So anytime I see red rocks I wonder if iron bacteria had a role in their formation. Recently I've been fixated on the red sandstones at the top of the cliffs at Cabrillo, Torrey Pines, Crest Canyon, and along Highway 52. Tom Rockwell teaches that these red rocks were all Pleistocene marine terraces that have been uplifted to become terrestrial terraces in the past 1.5 or so million years. He and his predecessors have mapped seven old terraces and thirteen very old terraces. In general, the red sandstones on these terraces are called “Lindavista” Fm.

If you drive to Torrey Pines, you've seen the large vertical structures that start in the Lindavista and continue down into the Torrey Sandstone. I am fascinated with Pat Abbot's hypothesis that these large structures might have been mineralized tree roots. That got me thinking about the plant communities that would have colonized the marine sediments when they were uplifted into the terrestrial environment. The first plant community growing on uplifted marine sands had to have been coastal salt marsh; then I presume fresh water marsh, forested wetland, grassland, and now the rocks are colonized by coastal sage scrub and Torrey pines. Using this as my model, I am trying to unravel the post-depositional history of these rocks.

Lithified but never buried, the “Lindavista” is cemented with iron oxide. What was the source of reduced iron that could be oxidized? My working hypothesis is that the sediments contained iron monosulfides and pyrite that formed during the marine and coastal salt marsh phases. I am thinking that with uplift, the iron sulfides were oxidized by iron bacteria to ferrihydrite. If the sediments then went through a salinity phase (i.e., sea level rise), ferrihydrite would dehydrate to hematite; but using reflected light, I rarely see hematite in any of the rocks.

Another fascinating characteristic of the “Lindavista” are Mn-rich soil concretions and nodules. In Virginia, I worked in a wetland that was actively forming these; there, iron bacteria were active in the subsurface where the concretions formed. In places, the “Lindavista” concretions form vast accumulations at the surface, where we call them rollers because they are easy to slip on (ask Joe Coronas). I presume that they are residual lag deposits from sediments and rocks that have eroded away.

Thinking as a paleoecologist, I've started tromping around our coastal salt marshes: Tijuana, Sweetwater, South Bay, Los Penasquitos, and all the coastal lagoons. In these, I'm searching for sedimentary structures, distinctive shells, and sediments with iron sulfides.

There's more to the story, such as the abundance of magnetite in the rocks. The magnetite is perfectly black under the microscope, not rimmed red. I don't understand its provenance and its role. And where are the shell fossils from the marine history? The only shells that have been collected are from the base of the Lindavista, only inland, where it sits on calcareous rocks.

I've been taking the students I mentor out in the field with me, seeing if I can interest some of them in these rocks. But they need a funded professor to move forward with XRD and thin sections; I'm retired. I do welcome anyone who wants to tromp with me on the red sandstones or in the stinky marshes.

See Next Page For Pictures:



Lindavista at Miramar (49) Joe on concretions



Torrey Pines LV with Natasha Rodriguez (9) big concretions in Torrey Ss

Geology Education Rule Making Notice – Board of Professional Engineers, Land Surveyors and Geologists

On November 30, 2018 the Board for Professional Engineers, Land Surveyors, and Geologists (Board) published the Geology Education Rulemaking Notice. The Board proposes to adopt Title 16, California Code of Regulations sections 3022, 3022.1, 3022.2, and amend Title 16, California Code of Regulations section 3031.

Software Info from Woody Higdon's September 2018 Talk

Hi All. For those of you who were not at the September meeting, Woody Higdon discussed his methods and programs he uses for taking amazingly detailed photos in stereo and with gps coordinate attachments. He showed us examples of his from the 2018 debris flows in Montecito. Below are links to free software where one can do more than get their toes wet in this type of work. Thanks again to Woody for the interesting talk!

The GIS software can be found at qgis.org

The canon file display software is called Canon Map Utility and is available on the Canon Camera site.

The image viewing program is called Stereo Photo Maker, and available at stereo.jpn.org/eng/.

WOODROW HIGDON

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Todd Wirths will be bringing stacks of original California Dept. of Mines and Geology articles, maps, papers, and books to this month's meeting. **Please come and take them home!** There will be something for everyone.

Support SDAG/SDGS using AmazonSmile



What is AmazonSmile?

AmazonSmile is an automatic way for you to support the **“San Diego Geological Society”** (SDGS) SDAG’s 501(c)(3) as your favorite public charitable organization every time you shop on Amazon at no cost to you at smile.amazon.com.

How do I select a charitable organization to support when shopping on AmazonSmile?

On your first visit to AmazonSmile smile.amazon.com, you need to select a charitable organization to receive donations from eligible purchases before you begin shopping. Please select the **San Diego Geological Society**. Amazon will remember your selection, and then every eligible purchase you make at smile.amazon.com will result in a donation to SDGS (SDAG).

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Please see complete AmazonSmile [program details](#).

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, starting with our first guidebook in 1972, from Coast to Cactus in 2014, and finally on the Julian 'Road to Gold' in 2017. 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, "oikocryst" 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

Interactive Fault Map for San Diego - Tijuana

As part of the update for the San Diego-Tijuana Earthquake Planning Scenario, Working Group No. 1's "Fault Map Subcommittee" completed the first publicly available bi-national active and potentially active fault map (http://sandiego.eeri.org/?page_id=265). This interactive GIS map includes the first publicly available active and potentially fault map locations from the City of San Diego. The map also integrated the faults south of the border for a bi-national cross border view. This map is an on-going project as our knowledge increases about local active and potentially active faults.

You can expand the map legend on the left side to select layers that can be turned on or off for the map view. You can also select from 1 of 12 base maps at the base map icon. You can click on the fault line in your map layer view to see the meta-data source. In addition, the City of San Diego Seismic Safety Study Geologic Hazards & Faults Maps are available in the layer titled "GeoHaz SD City." Please note that the City "Zone 12 Potentially Active" fault layers was not included in this data, therefore you will need to use the City Maps to find Zone 12.

The Fault Map link is available at: http://www.sandiegogeologists.org/Faults_map.html

Please contact Diane Murbach (dianemurbach@gmail.com 619-865-4333), Chair for the SDTJ Earthquake Scenario Working Group #1 - Earth Science, if you have any questions, or see any errors on this new fault map.

I would like to thank Carolyn Glockhoff for her endless GIS work, Jim Quinn and the City for providing their data and time, Jerry Treiman with CGS for his time preparing the Surface Rupture and providing their new State fault data layer, and Luis Mendoza at CICESE for providing the faults south of the border. Please contact Diane Murbach (dianemurbach@gmail.com), Chair for the SD-TJ Earthquake Scenario Working Group #1 - Earth Science, if you have any questions, or see any errors on this new fault map.

Diane Murbach (619) 865-4333

Engineering Geologist, C.E.G.

www.murbachgeotech.com

Request for 2019 SDAG/SDGS 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: <http://www.sandiegogeologists.org/Sponsors.html>.

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 you 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.

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.

Geo Job Listings

Trevet is an Environmental and Engineering Consulting Firm headquartered in San Diego, CA. We are seeking a **full-time staff level Geologist or Environmental Scientist**. Two to five years of experience preferred. At a minimum a bachelor's degree in geology, engineering, or a related scientific discipline is required. Must be eligible to work in the United States, and on Department of Defense installations. Ability to travel for extended duration (2 to 3 weeks) is required. The ideal candidate will possess great attention to detail, excellent written and verbal communication skills, and ability to work independently and within a team.

Duties will include a combination of field and office related tasks.

Field experience should include:

- Installation of soil borings using multiple drilling methods
- Describing soil using the USCS and ASTM classification systems
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- Field sampling of groundwater, soil, and soil gas
- Remediation system operation and sampling

Field work may be performed at project sites with environmental media (e.g., soil, sediment, groundwater, surface water, etc.) that has been impacted with hazardous substances and/or hazardous wastes.

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- Field data collection, analysis, and interpretation
- Preparation of data in visual, graphical, and tabular formats
- Technical report writing

Other Requirements

Familiarity with CERCLA/RCRA requirements

OSHA 40-Hour HAZWOPER Training with current 8-hour refresher class preferred.

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Entry-Staff Hydrogeologist

OVERVIEW:

Hargis + Associates, Inc. (H+A) is an environmental consulting and engineering firm founded in 1979 with a commitment to providing high-quality, cost-effective services for our clients. We are headquartered in San Diego and have offices in Sacramento, CA, and Phoenix and Tucson, AZ. Our practice focuses on large facility investigation and remediation projects for Fortune 500 clients where we provide responsive, practical and innovative solutions for the treatment of soil, vapor and groundwater contamination. H+A also provides hydrogeologic and engineering services for groundwater resources assessment, stormwater management, and environmental regulatory and litigation support. H+A employs a staff of approximately 60 hydrogeologists, geologists, engineers, industrial hygienist, and project support personnel.

We are currently seeking an entry-staff level hydrogeologist to join our San Diego office supporting environmental investigation and remediation projects located throughout Southern California. These projects are primarily focused on the characterization and remediation of soil, vapors, and groundwater impacts at large industrial sites. In addition to implementing fieldwork for site investigations, the position will also involve data entry, interpretation, and technical report writing for various soil and groundwater monitoring programs.

RESPONSIBILITIES:

- Implement/and support field investigations for soil sampling, groundwater sampling, borehole drilling, and well installations.
- Complete tasks requiring utilization of critical-thinking skills, scientific, geologic, and engineering analytical techniques.
- Assist in the preparation of reports, work plans, sampling and analysis plans, remedial investigation reports, and groundwater monitoring reports under the direction and guidance of a Senior Geologist/Engineer/Scientist.
- Follow corporate health and safety and quality management plan standards.

REQUIREMENTS:

- BS degree in geology, hydrogeology or related technical discipline is required.
- 1-3 years of field experience in environmental consulting is preferred.
- Experience with geologic, engineering, scientific, or general environmental projects and data interpretation.
- Field experience with drilling, sampling (soil and groundwater), and well installations is a plus.
- OSHA 40-hr. HAZWOPER, current refresher preferred; training provided.
- General computer knowledge (Microsoft Office, Email); GIS and other environmental software experience is a plus.
- Excellent organizational and sound written/oral communication skills.
- Local candidates only; must be eligible to work in the United States.

PHYSICAL DEMANDS:

- Ability to drive, travel and/or perform field work approximately 50% of the time; some overnight and extended travel.
- Ability to lift 45 pounds.
- Must be able to perform the following actions while conducting fieldwork: stooping/kneeling/crouching, standing for long periods of time, pulling/pushing and lifting equipment and supplies, walking on uneven terrain.
- Ability to work in outdoor environments and hot/arid conditions.
- Ability and willingness to work long hours and in proximity to loud noises and hazards (i.e., proximity to moving mechanical parts, moving vehicles, and exposure to chemicals, fumes, odors, dusts, and gases).

Those who seek to apply may submit a cover letter and resume via email to hargisinfo@hargis.com

All qualified applicants will receive consideration for employment without regard to race, color, national origin, ancestry, sex, gender, gender identity, gender expression, age, sexual orientation, religious creed, physical or mental disability, medical condition, genetic information, marital status, veteran status, or any other classification protected by applicable federal, state, or local law.

STAFF GEOLOGIST

Helenschmidt Geotechnical, Inc. seeks a full-time staff geologist for its office in Carlsbad, California. Requirements: Bachelor's degree in geology or engineering geology (Master's degree preferred), strong technical and writing skills ability to work as a team player. Competitive salary and benefits package. EOE. Email resume in confidence to engineering.hgi@att.net.

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Seeking Industrial Hygienist/Radiation Safety Officer

Please contact:

Chris Baker
Senior Environmental Specialist
m: 562.331.4507
cbaker@mpmaterials.com | www.mpmaterials.com

PHOTO OF THE MONTH

If you would like to submit a photo, email them to secretary@sandiegogeologists.org and I will try and put them in the newsletter. Provide a short description of the picture.



Topic: Mount Merapi, Indonesia

Source: **Associated Press**, *The Washington Post*

“In this Tuesday, Jan, 29, 2019, photo. Mount Merapi spews volcanic material as it erupts as seen from Cangkringan, Yogyakarta, Indonesia. Indonesia’s most volatile volcano unleashed a 1,400 meters (4,600 feet) dark red volcanic material 1,400 meters (1,500 yards) down the slopes. (Slamet Riyadi/Associated Press).”

Full Article: https://www.washingtonpost.com/world/asia_pacific/indonesias-merapi-volcano-unleashes-river-of-lava/2019/01/30/07edd118-244e-11e9-b5b4-1d18dfb7b084_story.html?utm_term=.268134852fbc



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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.

We invite you to explore our website to learn more about our firm and the services we provide. We welcome the opportunity to discuss our consulting expertise directly with you.

Contact: **Dr. David R. Hargis**

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Contact: **Louise Adams or Suzie Nawikas**



Contact: **Rupert Adams, CEG**
Geocon Incorporated
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Tetra Tech is a leading provider of consulting, engineering, and technical services worldwide. We are a diverse company, including individuals with expertise in science, research, engineering, construction, and information technology. Our strength is in collectively providing integrated services—delivering the best solutions to meet our clients' needs.

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Trevet is a San Diego-based environmental engineering and consulting 8(a)-certified small business enterprise.



Leighton is a multidiscipline engineering firm, providing geotechnical, environmental, and testing and inspection services. Founded in 1961, Leighton provides engineering solutions to public agencies, property owners, and facilities. With offices located in San Diego, Irvine, Los Angeles, Temecula, Rancho Cucamonga, Palm Desert, Santa Clarita, Ventura, and Bakersfield, we efficiently service any region of Southern California. Our professional staff of Registered Geotechnical Engineers, Professional Geologists and Certified Engineering Geologists, Registered Hydrogeologists, and Registered Environmental Assessors and Certified Inspectors provide decades of local experience for the successful completion of your projects.

For additional information, please contact Bob Stroh (rstroh@leightongroup.com)

Website link: <http://www.leightongroup.com>

- [Dr. Pat Abbott](#) — SDSU Professor of Geology, Emeritus
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- Greg Cranham — Consulting Geologist
- Damon DeYoung — Battelle
- Dr. Margaret R. Eggers, CHG — [Eggers Environmental, Inc.](#)
- Karen Evans for Jim Evans (Deceased)
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- Carolyn Glockhoff — [Caro-Lion Enterprises](#)
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- Vic Camp

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