Pacific Petroleum Geology NEWSLETTER

Pacific Section • American Association of Petroleum Geologists January & February 2014

PSAAPG Convention - Bakersfield, CA
April 27-30, 2014

ON THE COVER: View of Sharktooth Hill National Natural Landmark near Bakersfield, Ca. Sharktooth Hill will be the site of a 2014 PSAAPG Convention Field Trip. *Photo by Tim Elam*

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It is amazing how fast 2013 has gone by. I know 2014 will go by in a flash. The Pacific Section AAPG has had a great deal of activity going on to make both years memorable.

The Northern California Geological Society did an excellent job of putting on the PS-AAPG convention in Monterey. The meeting was attended by about 800 registrants, significantly above what was forecasted. Field trips and short courses were sold out, the technical sessions (oral and poster) were very well attended, the IBA competition and award ceremony took place at the venue, and the convention generated significant revenue for the Section and the Societies. We will be able to continue to support educational activities through 2014 on the basis of this meeting.

Examples of the funding we have provided thus far are support for the Buena Vista Museum in Bakersfield and the California Oil Museum in Santa Paula. These contributions are combined with contributions coming from the San Joaquin Geological Society and the Coast Geological Society respectively. As we progress in 2014, we will be giving scholarships to students from across the Pacific Section. We await the requests from the Affiliated Societies for the PSAAPG matching fund contributions. The last point on the education front is IBA. Six teams have requested participation in the 2014 IBA. Next March we will hold the competition in Bakersfield and we will soon know the associated costs to bring all six teams to the competition. We will need corporate, society, and personal contributions to support IBA transportation and room and board costs for the students and the team advisors. In 2013, the costs to support IBA were about $20,000. Contributions to the PSAAPG's Foundation earmarked to IBA are tax deductible and very appreciated. We need financial support to continue this very important student program.

From an Industry perspective, the spotlight has been shining on the Monterey Formation for the past six years. There was a USGS publication on the source rock potential of the San Joaquin in 2007. In 2011 the US Energy Information Administration and INTEK published a report that the Monterey could be a tight oil play with over 15 Billion barrels of recoverable oil. The University of Southern California released a study in 2013 indicating that the Monterey could be a major driver in adding jobs and increasing tax revenue for California. Just a few weeks ago, another report was issued, entitled Drilling California: A Reality Check on the Monterey Shale. This report written by Canadian J. David Hughes was published by the Post Carbon Institute and Physicians Scientists & Engineers for Healthy Energy. The Hughes report basically says that the EIA/INTEK and USC reports are extremely optimistic and the most likely case is that there may be little or no boom coming to California from the Monterey.

While the reality may be somewhere between zero and 15 billion barrels, the spotlight and interest generated resulted in another spotlight on the potential for significant hydraulic fracturing similar to the scale seen in the Bakken and Eagle Ford. Several organizations became very active in attempting to implement a moratorium on hydraulic fracturing. Their main messages are concerns about induced seismicity, impacts on drinking water, and competition for water with farmers and urban water users. Late in the year, Senate Bill 4 (SB4) was signed by the Governor. While it does not ban hydraulic fracturing, it does put the DOGGR (California Department of Oil, Gas, and Geothermal Resources) as the responsible party for establishing regulations and regulating the drilling and completion of oil and gas wells. It has also brought numerous Environmental Non-Governmental Organizations to the state to urge the population and various governmental agencies (City, County, State, and Federal level) to ban hydraulic fracturing. Oil and Gas operators are progressing permit applications to continue drilling into 2014.

I mention this Monterey "candle" that has attracted a flight of moths, because there are some interesting side activities taking place that involve PS-AAPG membership. The topic is induced seismicity. At the close of 2013 and throughout 2014, one of our outstanding members Don Clarke, is on the AAPG distinguished lecturer tour presenting work he participated in with the National Academies of Science. Their multi-year study on the causes of induced seismicity that may related to energy production was released in late 2013. The NAS report basically says that if production and injection are balanced, no seismic activity is induced. Where injection greatly exceeds production or other thermal changes are induced, then in some cases seismic events that can be felt (greater than 3.0 magnitude), may be generated. ***Continued on Page 5***

Greg Bernaski (1959 - 2012)

On January 24, 2012, the Alaska geoscience community lost a dear colleague and friend, Greg Bernaski. Greg spent his entire career with Sohio and BP. He started his career in Houston working the Gulf Coast and then moved to Alaska in 1993 where he spent the remainder of his career. Greg was known for his careful and excellent geological analytical skills, and his deep understanding of Alaskan North Slope geology.

If you had a question about the depositional models proposed for a reservoir, you could talk to Greg. If you were interested in the structural controls and influence of faults for a particular area of interest, Greg could walk you through the latest data and help you understand the geologic history of the basin. One of his many skills was his deep knowledge of well testing and analysis.

Greg developed an appreciation of nature at an early age. Born and raised in Laramie, Wyoming, the colorful Mesozoic outcroppings surrounding town first kindled his interest in geology. Both his undergraduate and graduate degrees were completed at the University of Wyoming and he was well versed in the structure and stratigraphy of the Rockies. His Master's thesis field area was in Dinosaur National Monument and he also had the opportunity to conduct research in the Grand Canyon by raft from the Colorado River on many occasions.

Greg was also an avid outdoorsman who enjoyed everything that Alaska could offer. Greg and his wife Sally Rothwell were often boating, fishing, and hiking in the summer; then cross-country skiing in the winter. Whether it was skiing Turnagain Pass, Portage Lake, the Arctic to Indian traverse, or the Tour of Anchorage, the trips with Greg were always enjoyable, and Greg's support of the Nordic Skiing Association of Anchorage is greatly appreciated.

Greg will always be remembered for his easygoing, quiet personality and his willingness to help a friend or colleague no matter how busy he was. He was always happy to explain his thoughts on a geological issue and very open to other opinions. Greg's understated, dry sense of humor was appreciated by his co-workers. He was never the loudest voice in the room, but when he spoke, it was always a good idea to listen up. He usually either had something insightful to say on the topic at hand or had a good quip to lighten the mood.

He was a geologist's geologist, who was often sought after for his deep understanding of the field. Greg's contributions to the Alaska Geological Society will continue into the future through a donation by Sally Rothwell in memory of Greg. This donation will help students experience Alaska geology in the field and expand their knowledge of the geologic history that Greg was so often helping explain to others.

Reprinted from Alaska Geology: Newsletter of the AGS

Contributions by Joe Kirchner, Chris West, John Isby, Patti Phillips, and Eric Cannon; photo courtesy of Sally Rothwell and Bob Sutherland

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PRESIDENT'S MESSAGE *(Continued from Page 4)*

The most frequent cases are waste water injection and geothermal energy production. In the case of hydraulic fracturing, the report shows no cases where felt induced seismicity was associated with hydraulic fracturing. In most cases hydraulic fracturing related seismic events are -3 to -1 magnitude. There is some good work being done at USC on this topic (Induced Seismicity Consortium), and I had the honor to present a talk in Portland to the Northwest Energy Association on this very topic. The work continues.

Have a great 2014 and I look forward to seeing you in Bakersfield in April.

Best Regards,
Dan

Reflections on Geology Field Camp

FIELD CAMP.
Two words that all geologists can relate to: field camp. Your experiences may have been good or bad…probably good and bad… at field camp. But, if you are reading this article, it is likely you went to a field camp. This article is largely retrospective… a rose-colored glasses view of my field camps of 1979-1980.

Field camps have been challenged in recent years. Costs of administering camps and the decline of autonomous geology departments are two of the reasons, according to a 2011 report "Status of the Geoscience Workforce," published by the American Geosciences Institute.

The AGI also noted that the 257 U.S. colleges and universities offered summer field camps in 1995, as opposed to about 100 today. It is estimated that 3000 students attended field camp in 2012. But, the geoscientist employment boom is leading to renewed academic support for geology departments…and presumably field camps.

If you are a California or Alaska native, you may not have traveled far to attend field camp. The Pacific region possesses all types of geologic terrains. But, midwestern and southern folks historically travelled far to see mixed terrain regions not covered by vegetation. Many students of my vintage had never travelled west of the Mississippi River until their field camp experience.

My institution of higher learning, the University of Kentucky (UK), held a first-ever UK Field Camp Reunion during the Summer of 2013. It occurred at the long-time site of the field camp: Cement Creek, in the West Elk mountains between Gunnison and Crested Butte, Colorado. The University of Kentucky Field Camp has been held at Cement Creek each summer since 1948, except for a few years in the mid 1980's. Unfortunately, I was not able to attend the 2013 reunion, due to my summer job as a National Park Ranger. But, I wanted to be there with the 40-50 attendees. (Why the name Cement Creek? There is an abundance of colluvium from the Mississippian Leadville Limestone.)

The temptation to go back to Cement Creek got me thinking about my collegiate field experiences. Field camp was life-transforming for me…in a good way. I had no geology background, other than mineral collecting, before enrolling in Graduate School at UK in 1978. One of the many undergrad requirements I had to make up was field camp. In the summer of 1979, I was off for eight weeks to Colorado with 28 other students, two teaching assistants, and two instructors, led by Dr. Frank Ettensohn.

Yes, our camp was longer than some others, more rustic (World War II surplus supplies), and the mapping was at high elevations. There were no buildings…we lived two to a tent… at 8900' elevation. We regularly hiked to map between 8900'- 12,300'. The food was always good…anything tasted good at the end of a long day. The campfire was Grand Central Station...always a good place to pass the time. Nighttime temperatures were between 30-40° F, so you needed to get to sleep quickly. (But, we were there in the summer. If you really want to see cold temperatures check out the winter temperatures of Colorado intermontane basin (park) towns like Gunnison, Alamosa, Kremmling, and Fairplay. And, yes, Virginia, there is a South Park, Colorado.)

Since 1988, attendees have lived in dorms at Western State College in Gunnison and commuted to Cement Creek, rather than camp. (The move to dorms was necessitated by an access change: the Forest Service gently tried to nudge UK's summer campground away from forest land we had worn down over decades. That didn't work, but their removal of a logistically critical log bridge built by UK did the trick.)

Several things made the Colorado field experience different from Kentucky.

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For some reason, rocks in this area of Colorado were not flat. And, there were things like igneous and metamorphic rocks…things we had read about in books, or maybe handled in a lab. Plane table and alidade work was not a part of this field camp…those were taught in a sophomore course I never took.

We had 4 ½ mapping days each week; another weekday was a local field trip that included a mapping exercise. Plus, there was a week of regional traveling through western Colorado and eastern Utah to see features such as the Paradox basin, the Powderhorn carbonatite, the Slumgullion mudflow near Lake City, Climax molybdenum mine near Leadville, the Book Cliffs, Black Canyon, the Goosenecks of the San Juan River, Arches National Park, and on and on. The beauty and uniqueness of these locations was important. But, more important was putting a geologic context to them: their age, genesis, structural features, petrologic and sedimentologic significance, etc.

We had heard that gaining employment in the mineral industry was tough. At the Climax Mine, the employment question was put to our informative tour guide. He said they currently had an opening for a mining geologist... the first in years. But, he went on to say that there were 80 applicants for the position, and at least 40 had PhD's. I never needed to know anything more about my chances of securing mining geology employment...I headed down the soft-rock road.

Our type section included stratigraphic units from all time periods from Cambrian to Cretaceous. At the base was the Cambrian Sawatch Sandstone, a slightly metamorphosed unit. The top of the type section was the Mancos Shale, a ubiquitous clay-rich unit that represents a maximum of the Late Cretaceous Western Interior Seaway transgression. You may be familiar with names of units +/- correlative to the Mancos...the Pierre Shale, Niobrara, Mowry Shale, and Tropic Shale. Though we cooperatively worked in teams each day, we were on our own when it came to tests and preparing the final area field geology map and final mapping exercise.

I could namedrop classmate names until the cows come home, but the important thing was that there was immense camaraderie brought about by a mix of personalities. Probably ½ of the attendees were not from Kentucky, so cultural learnings about each other were abundant. These non-UK folks were usually from small colleges that didn't have field camps, and they were looking for needed field experience. You learn a lot about folks working shoulder to shoulder banging on rocks or digging a latrine. No matter how hard we worked, there was always time for Frisbee, volleyball, and beer. We humored our volleyball arch-rivals, the Rocky Mountain Biological Laboratory, (RUMBLE for short) by always losing to them. But, they had the volleyball court, and they fed us.

Our bathing facility? A tiny hot spring two miles from camp. I made the mistake of going there by myself one evening. As the sun set, flying creatures started attacking me. Apparently bats lived inside the travertine outcrop around the hot spring. How dare they scare me with my glasses off...I was blind as a...~~bat~~ *never mind*:). I disrupted their evening exodus for food. They disrupted my nervous system for a few days. The other bathing option…for those with cars… was to drive fifteen miles to Crested Butte's nude bath house.

Continued on page 8

I enjoyed the overall field camp experience so much that I requested to return in 1980 as a Teaching Assistant. The graduate faculty apparently thought I should be doing something more important…like *starting* a Master's Thesis. It all worked out. In 1980, we had 17 students. Once on the road, I kept telling myself "Don't get your hopes up…nothing is ever as fun the second time around." Fortunately, I was wrong. The field camp Director in 1979 and 1980, Dr. Ettensohn, was primarily a sedimentologist and paleontologist, and soon to become my Thesis Advisor. The field camp Director in 2014? Dr. Frank Ettensohn. Like many of the old Rocky Mtn. field camps, UK's camp and Dr. Ettensohn have become legendary.

A review of virtually any modern field camp syllabus shows that there is still a significant emphasis on field mapping. And, so it is at the University of Kentucky. So, what has changed about the UK field camp over the decades, other than living accomodations? Dr. Ettensohn and current Department Chair Dr. Dave Moecher have emphasized 1) an even greater significance on teamwork, 2) incorporation of GPS units and digital elevation models instead of topographic maps, and 3) putting a greater regional context into mapping efforts.

In short, geology field camp was a great learning experience for me and so many others. Dr. Moecher has said that "For some of the students it will be the most challenging thing they've done, so it's very memorable. It is a defining experience for our geology students." Indeed.

FIGURE 1 The University of Kentucky "Float" in the July 4, 1979 Crested Butte, Colorado Independence Day Parade. Joe Groetsch juggles oranges on top of the cab. The catch phrase on the passenger door: **"Go Geology: Get Stoned."**

FIGURE 2 UK field camp participants at the top of Cement Mountain (12,300') in 1979. Dr. Frank Ettensohn is second from right. The fashion-challenged hiker, third from right, is the author.

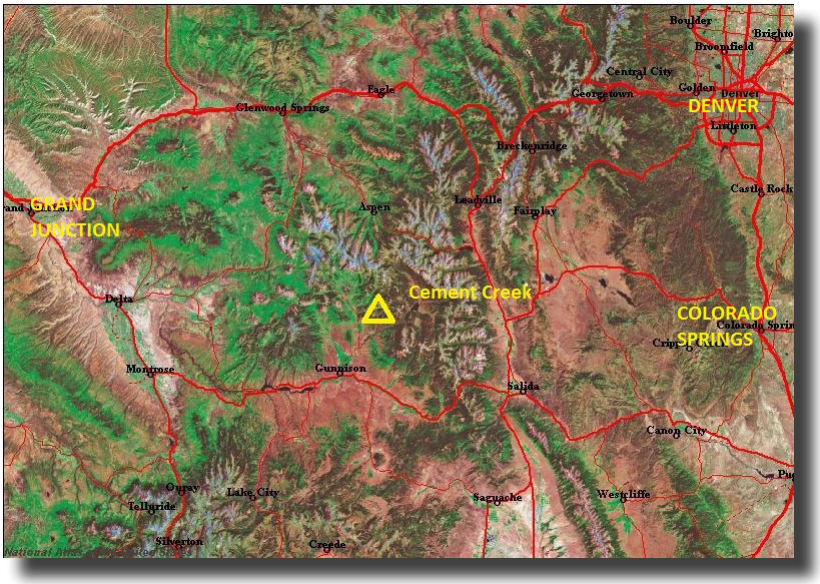


FIGURE 3 Map of central and western Colorado, showing the location of the University of Kentucky Field Camp at Cement Creek.

Do you have any field camp experiences you would like to share? Send stories to the Editor for publication in the PPG newsletter.

2014 PSAAPG CONVENTION- April 27-30

How time flies! It seems like just yesterday that we were wrapping up our highly successful 2013 Convention in Monterey, CA. The end of the year and holidays are already upon us and the 2014 PSAAPG Convention Committee is busy planning next year's conference.

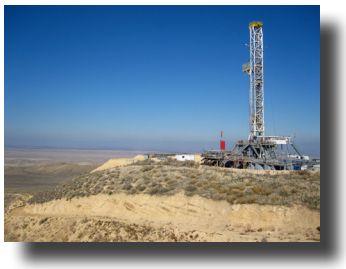
I am pleased to announce that the 2014 PSAAPG Convention will be held in downtown Bakersfield at the Marriott Convention Center from April 27th – 30th. Mark these dates on your calendars! The Convention will be held jointly with the Pacific Section- SEPM and the Pacific Coast Section- SEG. Many exhibitors and students will be there as well, so it will be a great opportunity to learn and communicate with others about the latest technical ideas and innovations in our industry. Learning is reflected in our Convention theme: **A Century of Innovation – From Exploration to EOR.**

The Convention will kick-off with an ice-breaker on Sunday evening followed by technical sessions on Monday and Tuesday. The planned technical themes offer a variety of topics for Pacific Section members to present papers in their respective areas of expertise. Short courses, field trips, and workshops will take place in the days immediately surrounding the technical sessions. Numerous social activities are also being planned for participants, guests, and spouses (see attached infographic on themes, short courses, field trips, workshops and activities).

Abstracts for technical papers are being accepted until Friday, January 31st. The abstract submittal process is currently being finalized, and Convention and field trip registration will begin shortly. Updated announcements will be posted on the PSSAAG.org website. Stay tuned!

-- Kevin Weberling – 2014 Convention General Chair

2014 PSAAPG Convention - Bakersfield, Ca. April 27-30, 2014



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Exploration Manager, Oxy
kevin_weberling@oxy.com

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ebowen@slb.com

Technical Chair
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Field Trips, Short Courses & Activities:

Heavy Oilfields and Outcrops of the Eastside San Joaquin

Reservoir Plumbing in the Injectites of Panoche Hills

Giant Oilfields of the Westside San Joaquin Basin

Cuyama Basin in Memory of Gene Fritsche

Core Examples of San Joaquin Clastic Reservoirs

Fracture Characterization Core Workshop

Basic Image Log Interpretation

Working with Ancient E-Logs

Sequoia National Park
Kern River Rafting
Wine Tasting

… and more!

Technical Themes:

Celebrating Century Fields from Discovery to EOR

Fine-grained Biosiliceous Rocks; the Monterey and Beyond

Structure, Tectonics, and Regional Geology of Western North America

Understanding Fractured Reservoirs: Characterization, Geomechanics, & Completions

Heavy Oil Development: How Technology Has Made the Unconventional Conventional

From Fluvial to Deepwater, Clastic Reservoirs and Depositional Systems of the West Coast

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Technical Theme *

Celebrating century fields from discovery to EOR

Presentation Format *

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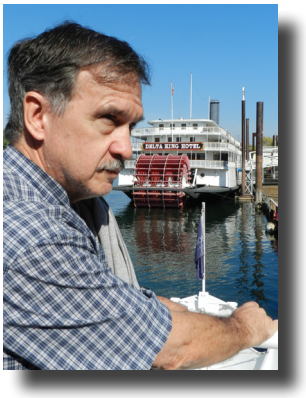
Prospects that have Revisited me in my Career:

#1 Howell's Point, California



I have been in the "upstream" part of the oil and gas industry all of my 39 years of gainful employment, and it is interesting to see how some prospects for new oil and gas fields keep coming back to my attention. Here are a few notes on one that was recycled during my career. Howell's Point gas field lies some 30 to 40 miles northwest of Sacramento, near the county line between Yolo and Colusa counties. In fact, the access road you take off Interstate 5 to get there is named County Line Road. I was working for Champlin Petroleum when the proposed drilling the wildcat well that found the field (Champlin was the oil and gas arm of Union Pacific Railroad at the time, later renamed Union Pacific Resources). I was actually working as the offshore geologist for the West Coast Division, but it was our group of geologists and geophysicists that put the play together and drilled what became the discovery well.

I remember the head of the Denver office, Mr. Lynn Adams, coming down and congratulating us for the discovery. I mentioned to him I was not involved (I was working offshore California) but he said we all deserved some credit. Lynn had been a bigwig with Chevron, and when he came to Champlin he put together a farm out deal with Chevron in California. That farm-in agreement (whereby Champlin put up the money to drill some Chevron prospects) had led to the discoveries of several new gas fields in the Sacramento Basin (Crossroads, Cache Creek, etc.). The Champlin group of geologists and geophysicists then put together some of their own plays, which included Howell's Point.

Champlin's discovery well had found pay in sand within the Winters formation, an Upper Cretaceous-aged rock layer that is a common gas reservoir in the basin. The Champlin well had a sand about 90 feet in total thickness, but only the upper 20 feet of the sand logged out as gas pay, separated by a shale bed from the lower part in the sand that was wet. So, the well had to be handled with care so that the well did not prematurely water out. The 4700' deep test well was perforated so that only the very top of the sand at 4184'-4190' was popped, with the hope that the thin perf zone at the top would delay water encroachment. The group assigned to the discovery took another look at the seismic lines, but decided that there was not need to drill another well here, since the center of the bright spot appeared to have been drilled. Champlin did drill a well on another anomaly a mile away to the south, but it was a dry hole. The "Monckton" discovery well was hooked up and produced a quarter of a Bcf (253,333 Mcf to be exact) over the four years that it was on production (1982-1985).

Years later, I met a geologist that disagreed with the Champlin scenario. He was the late Gary Nulty, who had shown me a prospect that he had at Howell's Point. Gary had been a geologist with a PG&E subsidiary called Natural Gas Corporation ("NGC") but had left them and become a consultant. I had also left Champlin, and was now consulting myself, mostly for a small company named Baker Oil and Gas out of Williams, California. Gary and his play were referred to me by my good friend Don Davis, a Redding-based petroleum geologist.

Gary had a play at Howell's Point based on the fact that Champlin had drilled their well in the wrong place. According to Gary, the proposed well location for the Champlin well had originally been given in feet from the corner of a parcel of land, but surveyors had instead measured from the corner of the quarter section, and because of that the well had been drilled about 800 feet east of where it should have been drilled. Thus, with this adjustment, Gary showed me that the actual location of the Champlin well on seismic was at the very down dip edge of the bright spot, not in the center as had been supposed.

Baker Oil and Gas funded the well by raising money from individual investors. They did not take long to fund this well, obtained the drilling permit, and rigged up on the old pad that Champlin had built. This was flat farming country near the Sacramento River, and rice was the main crop grown in the area. The fact that the farmer had kept the old Champlin drilling pad to stack equipment on saved Baker Oil and Gas money and made it easier to get a permit. We basically "twinned" the old Champlin well and drilled directionally 880 feet west to get the desired target.

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So, what were the results, you ask? The well logged a beautiful Winters gas sand, very similar to the sand in the Champlin well, but better looking and up dip. It proved that the arguments Gary made were correct. The well was put on at a rate of 3,000 Mcf/D, and lasted for most of a year. The well made a cumulative of 663,829 Mcf, almost 3 times as much as the 253,333 Mcf of the Champlin well. Later, Montis Niger and Black Mountain drilled additional wells, but their play was for deeper Forbes formation gas, and that play did not work out as well. They added three wells to the field, two in the Winters sand and one in the Forbes. None of these wells matched or exceeded the production of the Baker well, which was then and still is the best ever completed in the field.

So, there is the story of how a field that I thought I was never going to see again did a return visit in my career. The results were OK the first time, and better the second time. What I learned from this story: when you drill a well double and triple check all of your data (land, seismic, geology) to make sure an error such as the one in this story does not happen.

Scott T. Hector

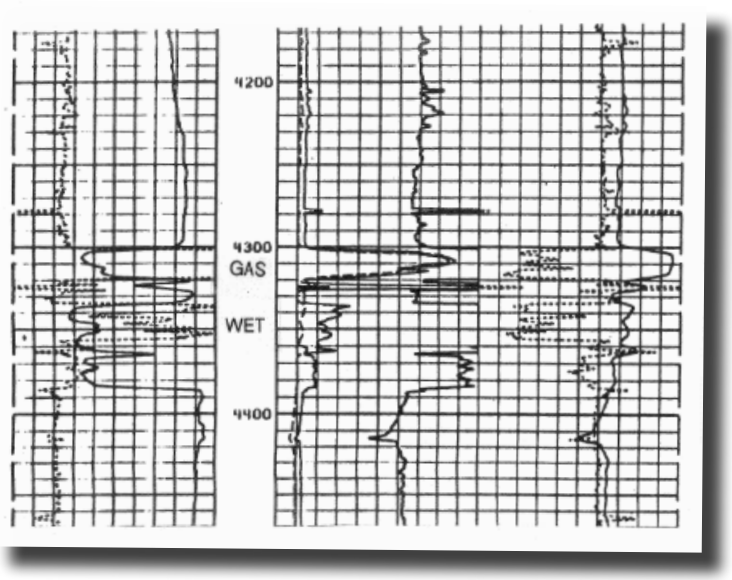

FIGURE 1 Type log, Howells Point Gas Field. "Monckton" 2-5 log; Winters Formation Pay Zone.

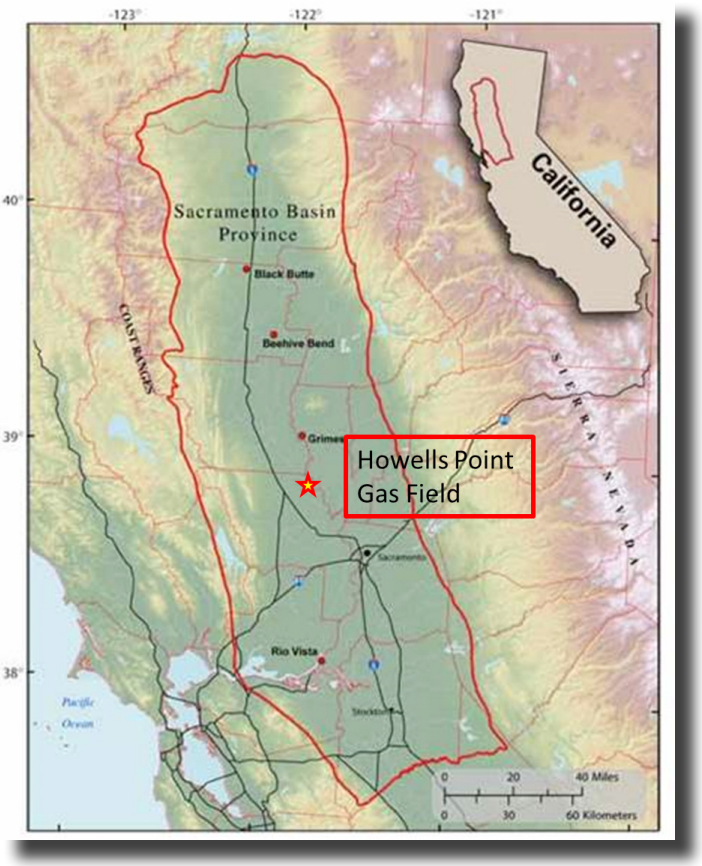

FIGURE 2
Location Map- Howells Point Gas Field

EDITOR'S NOTE: As PSAAPG earth scientists, many of us traverse the 110 miles between Bakersfield and Los Angeles on Interstate 5. The geology and scenery, from the San Joaquin Valley through the Tehachapi/ San Emigdio Mountains, into the Transverse ranges, Ridge Basin, eastern Ventura Basin, and finally the Los Angeles Basin, represent beautiful areas of differing geologic origin. Regardless of your occupation…between Bakersfield and Los Angeles you see features which mimic the diversity and uniqueness of California.

One of the most enjoyable by-ways of traveling in California has been the "Old Ridge Route" through the Ridge Basin. The Old Ridge Route was opened in 1915, and until 1933, it was the first and only road for automotive travel between the San Joaquin Valley and Los Angeles (Scott, 2003.) It was superceded by the first vintage of Highway 99. Later, in the 1960's, Interstate 5 opened to replace Highway 99, which was then flooded by Pyramid Lake.

The Old Ridge Route is one of those rare roads built on the backbone of ridges, rather than in valleys. It was a 20-foot wide macadam road. Between Castaic and Gorman...about 35 miles, the road had 697 curves, with curvature equivalent to 110 complete circles (Scott, 2003.) The original speed limit was 15 miles per hour. (Pool, 2013.) Dangerous? You bet. Various incarnations of Highway 99, Interstate 5, and repaving have obliterated all but 22 miles of the Old Ridge Route within the Angeles National Forest. This article discusses only the 22-mile section of road between Templin Highway and Highway 138. A post card (Figure 1) shows a portion of the road.

Why discuss the Old Ridge Route? The 22-mile section traverses a significant portion of the Ridge Basin. You likely know that the Ridge Basin is an areally small, but deep, elongate basin on the northeast side of the San Gabriel fault, in northwestern Los Angeles County (See Figures 2,3). It has outstanding exposures of sedimentologic features that show dramatic Upper Miocene interplay between sedimentation and tectonics (Ehman, et. al., 2000, Larue and Allen, 2012.) The basin is somewhat famous for having tens of thousands of feet of Tertiary sediments, but not producing ANY oil (depending on where one draws the Ridge Basin/Soledad Basin boundary near Castaic Lake (CDC-DOGGR, 2001.) This article does not attempt to document detailed geologic examination of the area. For detail regarding structure and stratigraphy of the Ridge Basin, please see documentation by Larue and Allen, 2012, Dibblee and Minch, 2002, Ehman, et. al., 2000, and Crowell, 2003.

The southern portion of the 22-mile section between Templin Highway and Highway 138 exposes sediment in the center and northeast flank of the Ridge Basin (See Figure 3). Within sight, only 3-4 miles away, sediments of the Violin Breccia mark the basin's southwest edge. Driving south-to-north on the Old Ridge Route, one drives up section and up depositional strike from mid-basin to northeast basin edge.

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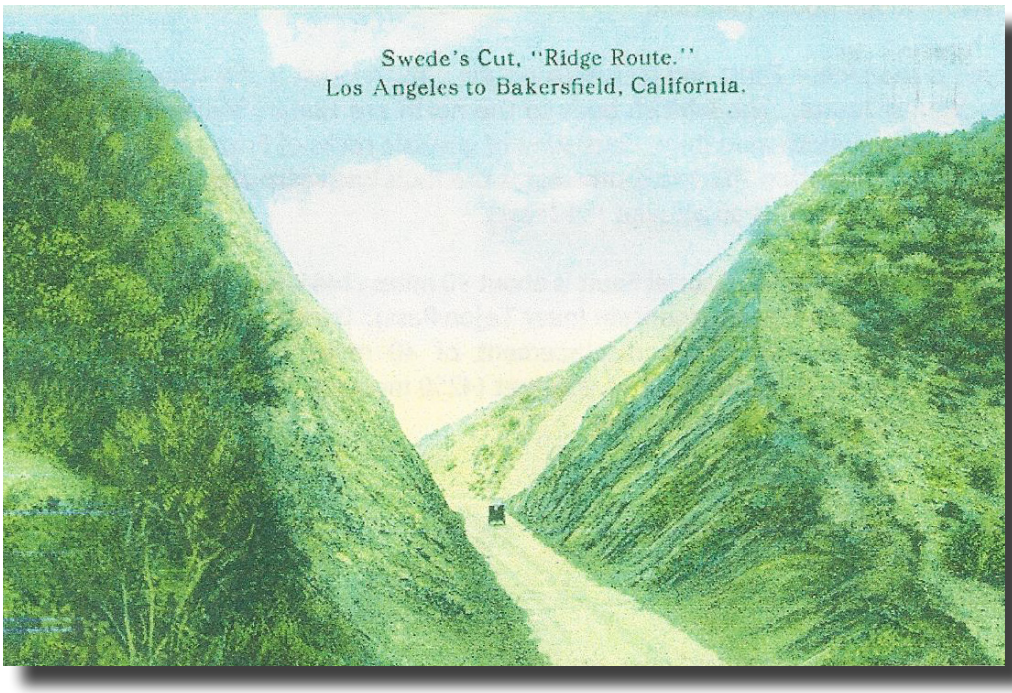


FIGURE 1 Post card of the Old Ridge Route crossing through "Swede's Cut" also known as "Culebra Cut." An engineering marvel for the early 1900's, this 110' high road cut through the Ridge Route Fm. was made by steam shovels. It is 7.8 miles north of the intersection of the Old Ridge Route and Templin Highway. *Graphic courtesy Jack and Sidney*

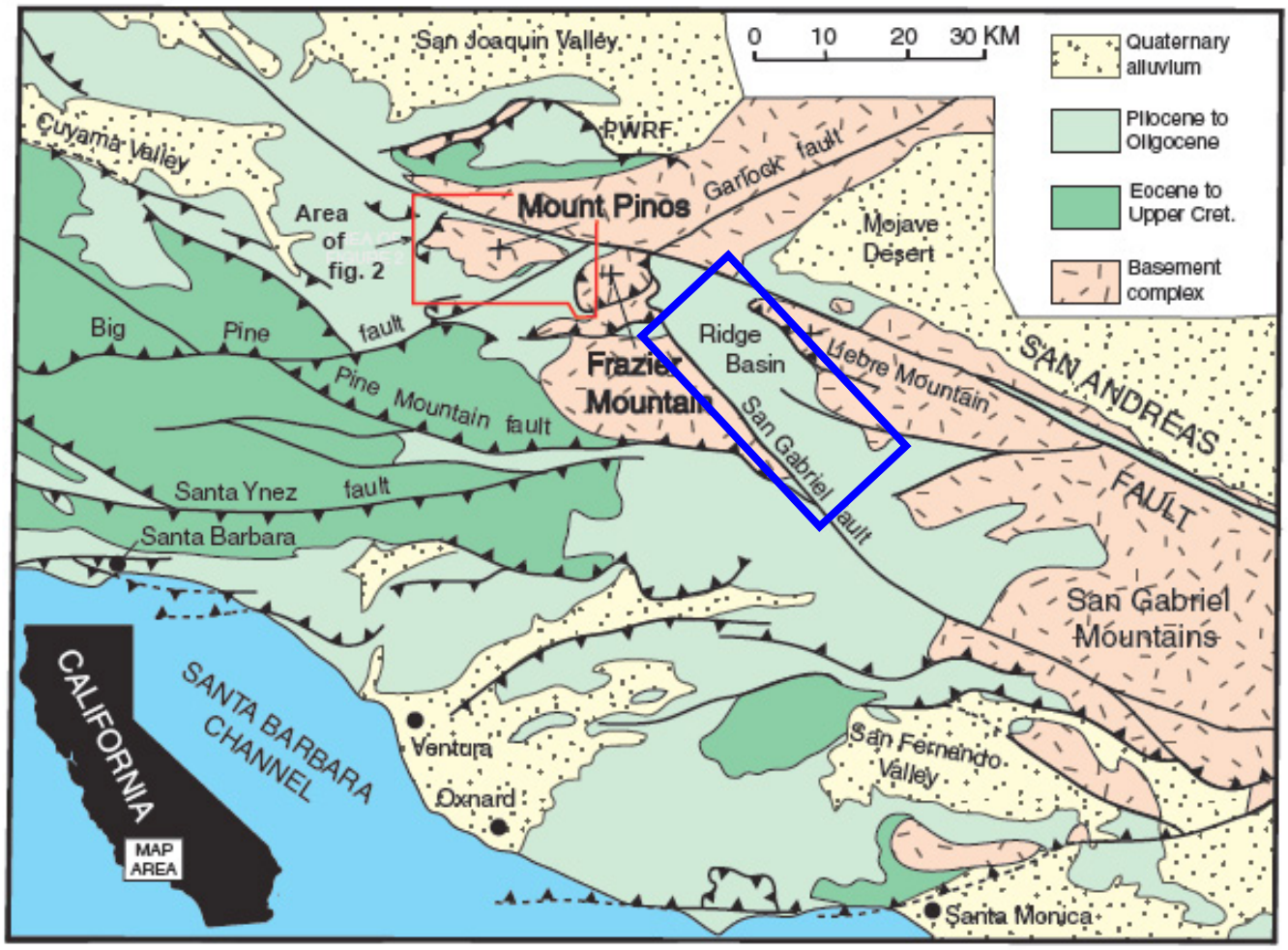


FIGURE 2 Generalized geologic map: Western Transverse Ranges (From Kellogg, 2004.) Area of Figure 3 is outlined in blue.

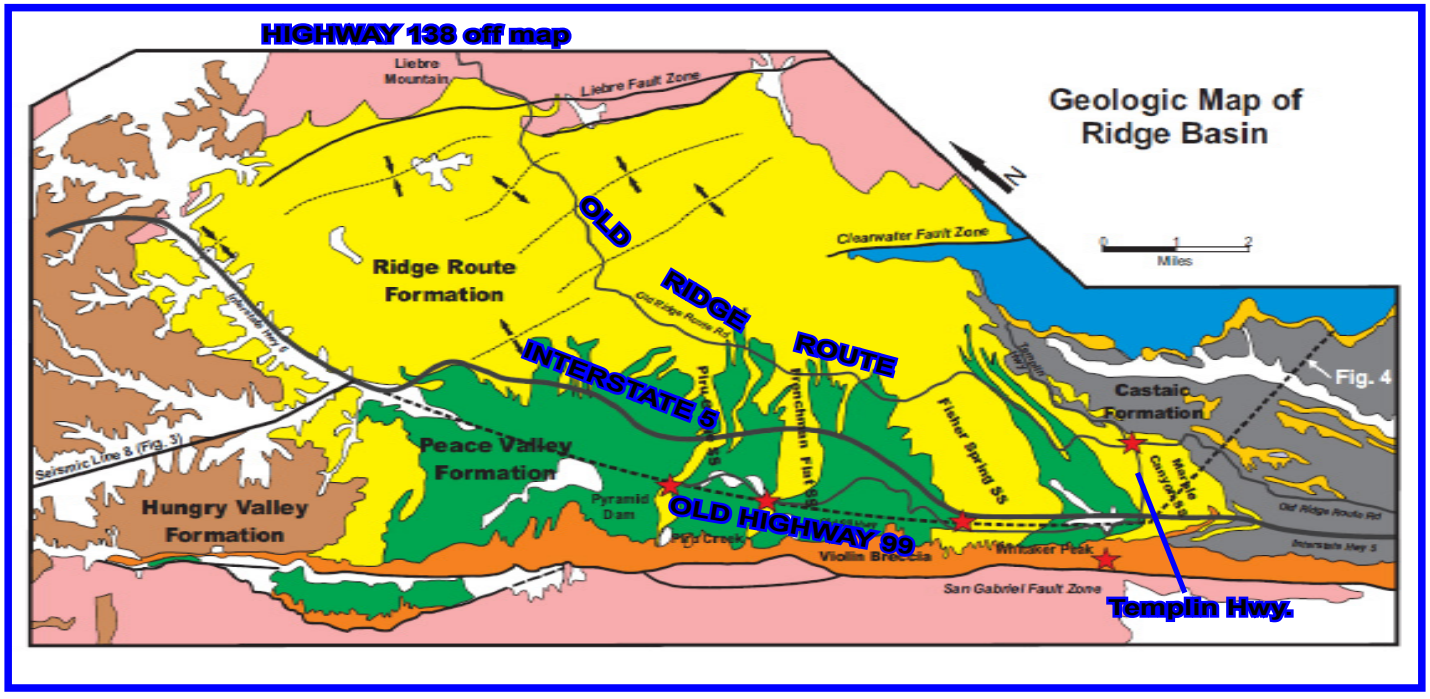


FIGURE 3 Geology of Ridge Basin (From Larue and Allen, 2012, who redrafted it from Ehman and others, 2000. Presented with permission of the Pacific Section SEPM.) Figure covers most of the 22-mile section of the Old Ridge Route discussed in this article. Road labels added for this article.

Continued on page 16

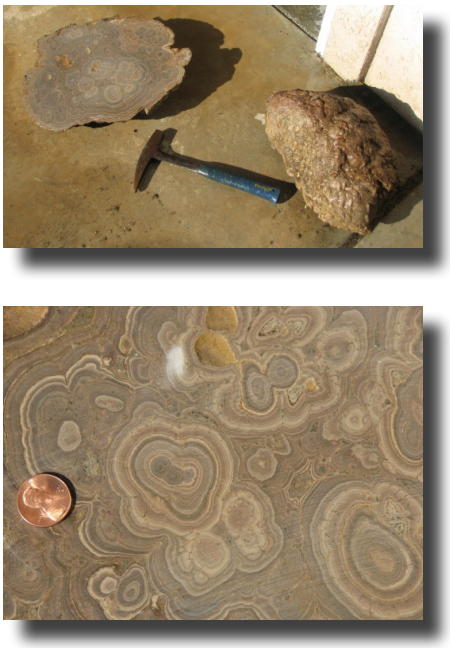
Near Templin Highway, delta front and lacustrine/ stream mouth bar sands are prominent (see Figure 4), (Larue and Allen, 2012.) Traveling north through the heart of Ridge Route Fm. exposures, coarse sand/ conglomerate-rich fluvial/ alluvial environments dominate. Rarely, thin, nodular calcareous stromalite beds are seen (see Figures 5,6). Even further north, alluvial/colluvial sandstone and conglomerate outcrops mix with weathered granite, marking the Liebre Mountain Fault Zone (Wilkerson, 2000.) Liebre Mountain basement rock marks the northeast edge of the Ridge Basin. It is composed of quartz diorite, and is the provenance for much first-cycle Ridge Basin sediment (Wilkerson, 2000.) The northernmost 6-7 miles of the 22-mile section is underlain by quartz diorite. The Old Ridge Route intersects with Highway 138 within the San Andreas Fault Zone.

Most sediments seen on the 22 mile section of Old Ridge Route are mapped simply as undifferentiated coarse sediments of the "Ridge Route Formation," (Dibblee and Minch, 2002.) However, interfingering with the Ridge Route Fm. sands are more mudstone-rich lacustrine sediments, mapped as the coeval Peace Valley Formation (see Figures 3 and 7, Larue and Allen, 2012.) Old Ridge Route roadcuts are generally not as large and dramatic as Peace Valley/Ridge Route Fm. roadcuts on old Highway 99 to the southwest. But the Old Ridge Route ridgeline enables panoramic views of basin structural and stratigraphic features.

The 22-mile stage remained open to travel until winter storms washed out sections of the road in 2005 (Pool, 2013.) It has not reopened to the public, except for a few miles on both the north and south ends. Road repair was completed rather quickly; access was needed to repair storm damage done to pipeline right-of-ways that parallel the road. The final pipeline repair was finished in 2012. But, renewed slope instability is keeping the road closed to the public (RRPO, 2013.) The road is gated on each end, but it is open to pipeline maintenance and Forest Service personnel. It is illegal to drive this road. You can hike it or bike it (RRPO, 2013.)

For the last six years, an organization known as the Ridge Route Preservation Organization (RRPO) has been working to try to have the road listed as a "National Forest Scenic By-Way." (RRPO, 2013.) A key benefit to having that designation granted is that the road would once again be open to the public.

FIGURE 4 Interbedded stream mouth bar and delta front deposits of the upper Miocene Marple Canyon Sandstone member of the Ridge Route Fm. Sands become more amalgamated upsection. The section is interpreted to reflect increased fluvial influence upsection. Picture taken on Old Ridge Route near intersection with Templin Hwy. *Photo and interpretation by Jon Allen*



FIGURES 5,6 Beds of nodular stromatolites are rarely found within the Ridge Route Fm. The fossil algal bodies show distinct concentric growth patterns in cross-section. *Photos by Tim Elam*

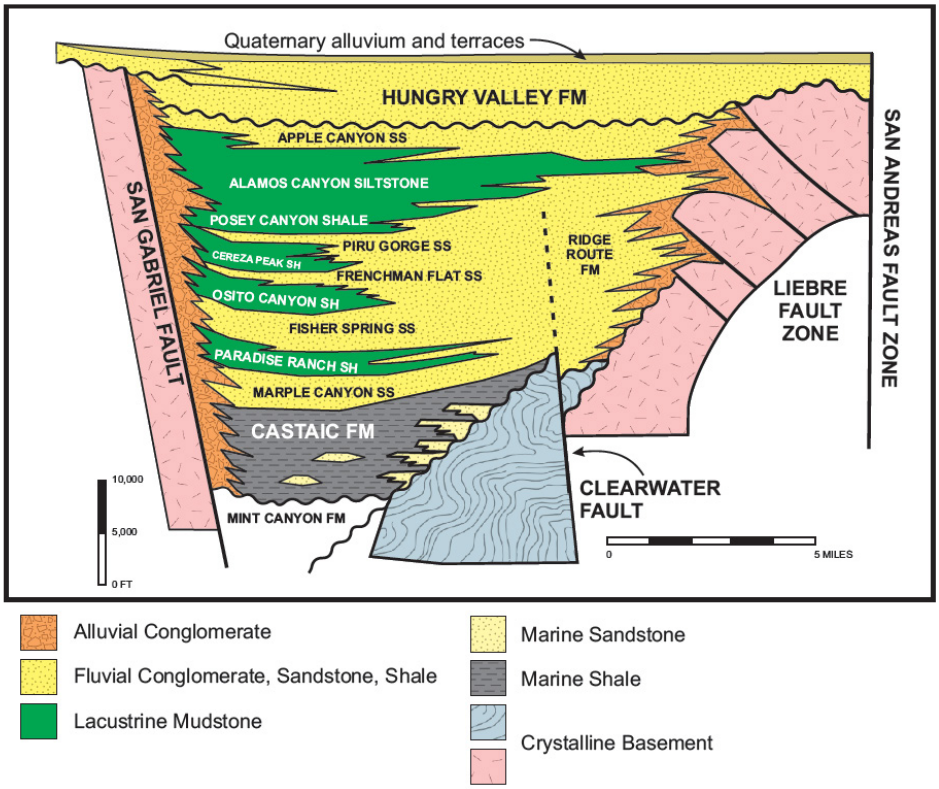


FIGURE 7 Conceptual cross-section through Ridge Basin showing nature of the basin fill, and identifying stratigraphic units and relations between units (from Larue and Allen, 2012, figure redrafted by them from Ehman and others, 2000, modified from Crowell and Link, 1982. Presented with permission of the Pacific Section SEPM.)

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PSAAPG November EXCOM Meeting • *Tim Elam*

The PSAAPG November, 2013 EXCOM meeting was hosted by PSAAPG President-elect John Williams and his wife Cindy at their ranch in the eastern Ventura Basin near Piru. It is a working ranch, situated in tight canyons that drain into Piru Canyon. This area is the type location for the Miocene Modelo Formation.

The day was special… not only was Section business conducted, but,

- John and Cindy also treated the group to a wonderful brunch they prepared.
- John and Greg Gordon led a field trip to see
  - -Ventura Basin stratigraphy, including Miocene Modelo sandstones and siliceous shales,
  - -turn-of-the 20th century remnants of North Hopper Canyon Oil Field,
  - -structural features including the Modelo anticline and San Cayetano thrust fault,
  - -oil seeps

Pebbles and laminated siliceous shale clasts in amalgamated sandstones of the Modelo Formation on Modelo anticline. 25 cent piece for scale.
Photo by Tim Elam

Yes, some work actually got done.
Photo by Tim Elam

MORE PHOTOS ON PAGE 19

FILL IN THE CAPTION

PSAAPG President-elect John Williams and Past-President Tony Reid engage in animated talk about... something. Was it:

- Denver Broncos Quarterback Peyton Manning's lack of success in cold weather games?
- Tony's choice of headwear for the day?
- Apparent dip versus true dip?
- John's plans for a zipline?

THE ANSWER: You'll have to ask them.
Photo by Jon Schwalbach

EXCOM Crew on the back porch of John Williams Field trip leaders were John Williams (far right) and Greg Gordon (second from right.)

Photo by Cindy Williams

EXCOM members stand on a topographically-challenged drill site in abandoned North Hopper Canyon Oil Field. The site, constructed between 1899-1913, required a tramway to ferry equipment and workers out of a narrow valley uphill to the well site.

Photo by Tim Elam

2012-2014 PACIFIC SECTION DIRECTORY

You should have received a “hard copy” Membership Directory, mailed in December, 2013. Paid January 1, 2013 members of PSAAPG, PSSEPM, and PCSSEG should have received this publication. Putting this directory together was a massive multi-year effort, spearheaded by Publications Chair Larry Knauer and former Membership Chair Evan Bargnesi.

The Directory has introductory remarks regarding PSAAPG history, and lists of officers and Award winners as well as a tabbed interval of the members' contact info. But, even this directory is a living document. **Please take the time to review this material and let a PSAAPG officer or member Society officer know if anything needs to be corrected. Your participation will greatly improve our data lists.**
After reviewing the award lists please let us know (or the officers in your local society) if you know someone that you would like to nominate for future awards. Also, advertisers should let us know if the ads are still current. Contact Larryknauer@chevron.com.
-Larry Knauer

NOMINATE A CANDIDATE FOR TEACHER OF THE YEAR...*TIME IS RUNNING OUT*

"Just a reminder, PSAAPG is looking for nominees for their 2014 Teacher of the Year (TOTY) award." The winner will be acknowledged at the Bakersfield PSAAPG Convention Awards Luncheon in April 2014 and their name will also be submitted to National AAPG for award consideration. Both PSAAPG and National AAPG awards are accompanied with a monetary stipend.
For more information, contact TOTY Committee Chair Bob Ballog <bob@eaglexpco.com>. Also, look at TOTY documentation on the PSAAPG website. Bob would like to have nominations in by March 1, 2014.
-Bob Ballog

ROLAND BAIN RECEIVES AWARD

Roland Bain, a long-time member of the Sacramento Petroleum Association, was awarded the California Natural Gas Producers Sentinel Award in September, 2013. The award is given “to recognize an individual outside the industry who has demonstrated leadership in fostering the viability of California’s Independent Natural Gas Producing industry.” It is the only award given by CNGPA, and Bain is the fifth person to receive the award. CNGPA recognized that Bain isn’t necessarily “outside the industry,” but he is retired from being a working geologist. His contributions to the industry continue through the report.

The industry has relied on the annual Sacramento Valley Drilling Report, prepared primarily by Mr. Bain since 1966. The Drilling Report is an important communication tool within the industry, and also between the industry and government entities in and around Sacramento.

2015 PSAAPG CONVENTION

The Pacific Section AAPG 2015 Convention will be in Ventura, California. Anticipated date will be April or May 2015. More details will be forthcoming. Convention Chair Joan Barminski welcomes inquiries and involvement; her contact address is joan.barminski@boem.gov.
-Joan Barminski

FRESNO STATE FACULTY OPENING

Chris Bowie, Teaching Assistant and Graduate student at Fresno State, notes that applications are being accepted for a geophysics instructor at Fresno State. APPLICATIONS ARE ACCEPTED UNTIL JANUARY 14. To learn more, type in the following address: http://www.fresnostate.edu/csm/ees/geophysics-job-vac.html.
-Chris Bowie, AAPG Student Chapter President

NORTHWEST ENERGY ASSOCIATION RE-ENERGIZES

After a break of several years, the Northwest Energy Association resumed meeting during the fall of 2013. John Armentrout was the spark plug, gathering a group of former NWEA officers for a series of planning meetings during the previous summer.

Luncheons began in October with a talk on shale gas by Jim Jackson, and in November with a talk on induced seismicity by Dan Schwartz. The next meeting will be in January when Ted Bizzarides will discuss recent developments in the Bakken shale play.

Attendance increased between the first and second meetings. We expect this trend to continue, and are tentatively planning a field seminar in September, 2014. The meeting will focus on new geological mapping in northwest Oregon, the site of the Mist gas field.

-Jim Jackson

Using a geology-based assessment methodology, the U.S. Geological Survey in 2009 estimated mean volumes of 2.2 trillion cubic feet (TCF) of undiscovered natural gas and 15 million barrels of oil (MMBO in the Western Oregon and Washington Province. More than 67 percent, or 1.5 TCF, of the undiscovered natural gas is continuous gas estimated to be coalbed gas in Tertiary coals in western Oregon and Washington.

Map shows Mist Gas Field referred to above.

FROM USGS FACT SHEET 2009-3060, July, 2009

NEXT Newsletter Deadline

(March/April Issue): March 1st, 2014

CONGRATULATIONS to Pacific Section AWARD WINNERS at the 2013 AAPG Annual Convention and Exhibition in Pittsburgh

JON ALLEN Jon received the George C. Matson Award, presented to honor and reward the best oral presentation at the 2012 AAPG ACE in Long Beach, Ca. (The award is typically given the year after the paper is presented.) Jon was senior author of "Improved Reservoir Characterization at Kern River Field, California, U.S.A.: New Insights into an old Field Using 4-D Saturation Modeling." Jon's co-authors were Chevron co-workers Dave Larue and Dale Beeson.

JOHN ARMENTROUT John received the Honorary Member Award, presented to members who have distinguished themselves by their accomplishments and through their service to the profession of petroleum geology and to AAPG. John is owner of Cascade Stratigraphic Inc., Damascus, Oregon.

DON CLARKE Don received the Honorary Member Award, presented to members who have distinguished themselves by their accomplishments and through their service to the profession of petroleum geology and to AAPG. Don is a Consultant in Long Beach, Ca.

DON LOWE Don received the Grover E. Murray Award, presented for distinguished and outstanding contributions to geological education, both at the university level and toward education of the general public. Don is a Professor of Geology at Stanford University.

Alaska Geological Society

- **January 16 Meeting: "Tectonics, Climate, Hydrocarbons of the Central Andes;" SPEAKER: Richard O. Lease, U.S. Geological Survey.**

- **February 20 Meeting: "Alaska's North Slope and the Chukchi Shelf;" SPEAKER: David Houseknecht, U.S. Geological Survey.**

Coast Geological Society

- **January 21 Meeting: "Seismicity and Tsunamis;" SPEAKER: Chen Ji, University of California, Santa Barbara.**

- **February 18 Meeting: "Discovery of the Ojai Field, 1890;" SPEAKER: Steve Mulqueen.**

L.A. Basin Geological Society

- **January 23 Meeting: "Oil History of the Los Angeles Basin from the Perspective of a Landman;" SPEAKER: Edward Renwick, Hanna and Morton, LLP. NOTE: Joint meeting with the Los Angeles Association of Petroleum Landmen.**

- **February 27 Meeting: "Ranger Formation in Wilmington Field;" SPEAKER: Dr. Mike Clark.**

- **March 27 Meeting: "Post-fire erosion rates in the San Gabriel Mountains;" SPEAKER: Peggye Alstrom.**

Northern California Geological Society

- **January 29 Meeting: "Imag(in)ing the Earth's Interior;" SPEAKER: Dr. Barbara Romanowicz, UC Berkeley Seismological Laboratory.**

- **February 26 Meeting: TBA**

- **March 26 Meeting: "Revisiting the Monterey Formation;" Dr. Tom Mackinnon, Consultant.**

Northwest Energy Association

- **January Meeting: Ted Bizzarides will discuss recent developments in the Bakken shale play.**

- **February Meeting: TBA**

Sacramento Petroleum Association

- **January 15 Meeting: "A Visit to the U.S. Navy Aircraft Carrier Kitty Hawk- CV-63;" SPEAKER: Roland J. Bain, Geologist.**

- **February 20 Meeting: "Review of Drilling Activity and Highlights in the Sacramento Valley for 2013;" SPEAKER: Roland J. Bain, Geologist.**

San Joaquin Geological Society

- **January 14 Meeting: "Is a Little Diatomite Hiding your Oil? Core Descriptions, Facies Identification and Implications for Mixed Diatomite and Siliciclastic Provenance Alluvial Fan, Tulare Formation:" SPEAK ER: Emily Fisher, AERA Energy, Bakersfield.**

- **February 11 Meeting: "Unraveling the Geologic History of Mars;" SPEAKER: Dr. Robert Anderson, NASA Jet Propulsion Laboratory, Pasadena, Ca.**

- **March 7 Meeting (Special Meeting at the Petroleum Club, 11:30 AM): "Natural Fractures in Shale Hydro carbon Reservoirs;" SPEAKER: Julia Gale, Univ. of Texas Bureau of Economic Geology, Austin, TX AAPG Distinguished Lecturer.**

- **March 11 Meeting (Regular monthly meeting at American Legion Hall, 6:00 PM): "Lynch Canyon Oil Field - It's History, Geology, and Development;" SPEAKER: Stan Eschner, TRIO Petroleum, Bakersfield, Ca.**

San Joaquin Geological Society President Laura Bazeley (right) presents a plaque to Bonnie Bloeser thanking her for an excellent presentation. Bloeser's talk on Diatomite at Midway Sunset Field was given at the December SJGS meeting. *Photo by Larry Knauer*

A lively social time preceeded the start of the Coast Geological Society November meeting at the Poinsettia Pavilion in Ventura. LABGS member and AAPG Distinguished Lecturer Don Clarke spoke that evening about Induced Seismicity. *Photo by Tim Elam*

Alaska Geological Society

www.alaskageology.org

P. O. Box 101288
Anchorage, AK 99510

Contact: Eric Cannon
eric_cannon@golder.com

Luncheon meetings are held monthly September through May, usually on the third Thursday of the month, at the BP Energy Center (1014 Energy Court) from 11:30 a.m. to 1:00 p.m. The hot lunch cost is $20 for members with reservations; $22 for non-members with reservations; and $25 without reservations. The box lunch cost is $13 for members with reservations, $15 for non-members with reservations, and $18 without reservations. For reservations, call the AGS reservation voice mail at 907-258-9059 or contact David Hite at hiteconsult@acsalaska.net by noon on Monday before the meeting.

President:	Matt Frankforter	mfrankforter@hilcorp.com
President-Elect:	Keith Torrance	ktorrance at apcservicesllc.com
Vice-President:	Monty Mabry	monte.mabry@bp.com
Secretary:	Eric Cannon	eric_cannon@golder.com
Treasurer:	Alan Hunter	paleoman@mac.com
Past-President:	Ken Helmold	ken.helmold@alaska.gov

Coast Geological Society

www.coastgeologicalsociety.org

P. O. Box 3055
Ventura, CA 93006

Contact: Peter Morris
805.745.2149

Dinner meetings are held monthly September through May, on the third Tuesday of the month, at Poinsettia Pavilion, 3451 Foothill Road in Ventura. Social hour starts at 6:00 p.m., dinner is served at 7:00 p.m., and the talk starts at 8:00 p.m. The cost of dinner with reservations is $20 (members), $25 (non-members), or $10 (students and K-12 teachers); the talk is free. For reservations, please email Bonnie Walters (secretary@coastgeologicalsociety.org), and should be made by 4:00 p.m. on the Friday before the meeting.

President:	Peter Morris	805-745-2149	president@coastgeologicalsociety.org
Past President:	John Harris	805-407-7644	pastpresident@coastgeologicalsociety.org
Vice President:	Bob Blackmur	805-535-2025	vicepresident@coastgeologicalsociety.org
Secretary:	Bonnie Walters	805-933-0076 Ext 292	secretary@coastgeologicalsociety.org
Treasurer:	Christine White	805-535-2074	treasurer@coastgeologicalsociety.org
Membership:	Nick Kunstek		membership@coastgeologicalsociety.org
Webmaster:	Whit Skaling		webmaster@coastgeologicalsociety.org

Los Angeles Basin Geological Society

www.labgs.org

515 So. Flower Street, Ste 4800
Los Angeles, CA 90071

Contact: Bill Long
213.225.5900 x 205

Luncheon meetings are held monthly September and October; and January through June, usually on the fourth Thursday of the month, in the Monarch Room at The Grand at Willow Street Conference Centre (4101 E. Willow Street) in Long Beach. Lunch is served at 11:30 a.m., and the talk starts at 12:15 p.m. The cost is $20 (with reservations), $25 (without reservations), or $5 for students. Reservations can be made online at www.labgs.org or by contacting Marieke Gaudet at 562.624.3364 or marieke_gaudet@oxy.com. Reservations must be made prior to Tuesday before the meeting.

President:	Bill Long	213.225.5900 X 205	william.long@breitburn.com
Vice President:	Greg Hummel	310.327.1100 X 5	ghummel@ebresources.com
Treasurer:	Bert Vogler	562.432.1696	hvogler@kleinfelder.com
Secretary:	Graham Wilson	562.326.5278	Gwilson@SHPI.net
Scholarships:	Jean Kulla	949.500.3095	k2mobile@MSN.com

Northern California Geological Society

www.ncgeolsoc.org

9 Bramblewood Court
Danville, CA 94506-1130

Contact: Barb Matz
Barbara.Matz@shawgrp.com

Evening meetings are held monthly September through May, usually on the last Wednesday of the month, at the Masonic Center (9 Altarinda Road) in Orinda. Social hour starts at 6:30 p.m., and the talk starts at 7:00 p.m. (no dinner). For reservations, contact Dan Day at danday94@pacbell.net before the meeting. Cost is $5 per regular member; $1 per student member; and $1 per K-12 teachers.

Continued on next page

NCGS Officers:

President:	Phil Reed	philecreed@yahoo.com
Program Chair:	John Karachewski	cageo@sbcglobal.net
Secretary	Dan Day	danday94@pacbell.net
Treasurer	Phil Reed	philecreed@yahoo.com
Membership Chair	Rob Nelson	rlngeology@sbcglobal.net
Newsletter Editor	Mark Detterman	mdetter1@gmail.com
Field Trip Coordinator	Tridib Guha	tridibguha@yahoo.com
Past President	Tom Barry	tomasbarry@aol.com
Scholarships	Phil Garbutt	plgarbutt@comcast.net
K-12 programs	Mark Petrofsky	mpetrof@hotmail.com

Northwest Energy Association
www.nwenergyassociation.org

P. O. Box 6679
Portland, OR 97228-6679

Contact:
Jim Jackson or John Armentrout

Breakfast meetings are held monthly September through May, usually on the second Friday of the month, at the Multnomah Athletic Club (1849 SW. Salmon Street) in Portland. Meeting time is at 7:30 - 9:00 am. The cost is $18. For information or reservations, contact Jim Jackson.

Acting President	John Armentrout		jarmenrock@gmail.com
Program Chair	Jim Jackson	503.771.3887	jackson.js@comcast.net

Sacramento Petroleum Association

P. O. Box 571
Sacramento, CA 95812-0571

Contact: David Hartley
530.304.4277

Luncheon meetings held monthly January through November, on the third Wednesday of the month. Location: Club Pheasant Restaurant in West Sacramento. The meetings starts at noon. The cost is $16 -$20. For information or reservations, contact Pam Ceccarelli.

President:	Jerry Reedy	916.486.2643	JWR5532@aol.com
Vice-President:	David Hartley	530.304.4277	drilmax1@aol.com
Secretary	Derek Jones	916.859.4710	djones@gasbiz.com
Editor/Treasurer	Pam Ceccarelli	916.439.0400	pc626@comcast.net

San Joaquin Geological Society
www.sanjoaquingeologicalsociety.org

P. O. Box 1056
Bakersfield, CA 93302

Contact: Laura Bazeley
lbazeley@wziinc.com

We have dinner meetings on the second Tuesday of the month at the American Legion Hall at 2020 “H Street” in Bakersfield. There is an icebreaker at 6:00 pm, dinner at 7:00 pm, and a talk at 8:00 pm. Dinner is $25.00 for members with reservations and $30.00 for nonmembers and members without reservations, and the talks are free.

President:	Laura Bazeley	661.326.1112	lbazeley@wziinc.com
Past President:	Vaughn Thompson	661.633.4748	Vaughn_Thompson@oxy.com
President-Elect:	Anne Draucker	661.428.0350	AnneDraucker@chevron.com
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Secretary:	Evan Bargnesi	661.412.5143	Evan_Bargnesi@oxy.com
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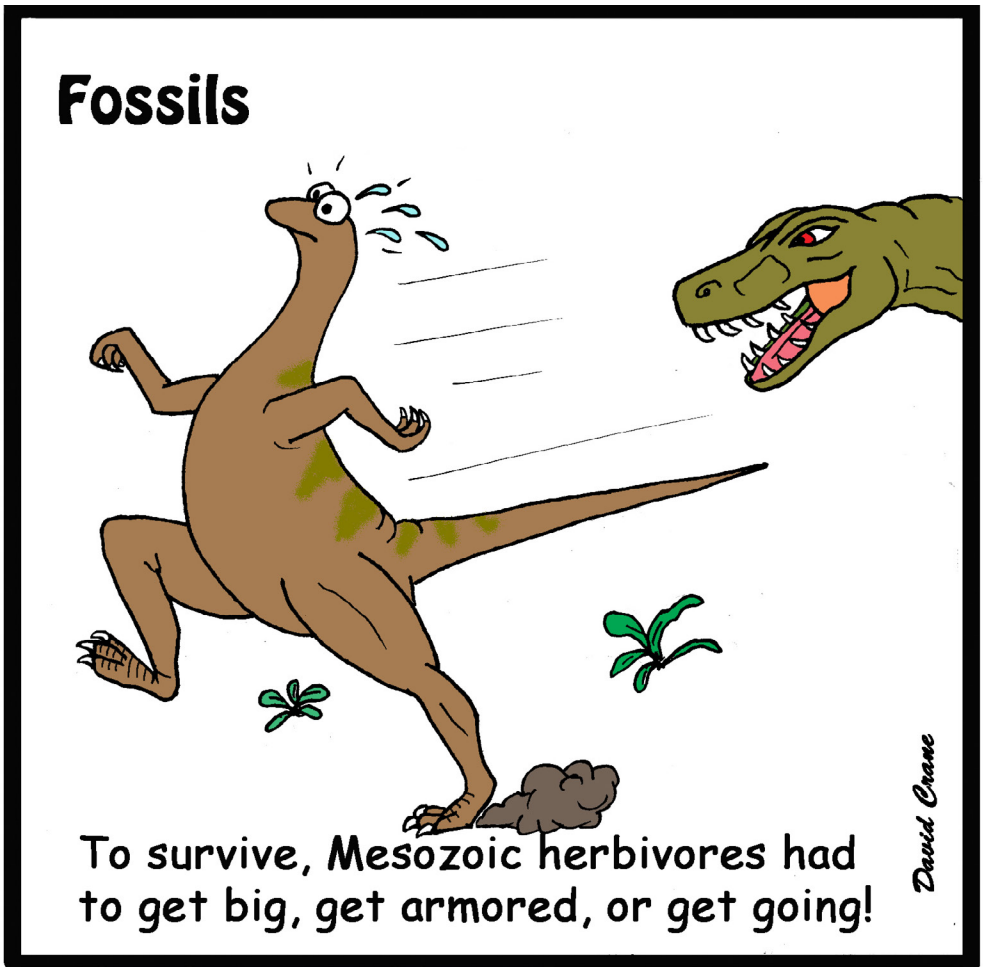

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