Oil Fields in Railroad Valley Nevada

Part Two

by Louis C. Bortz, #1698

This article is from the Denver Chapter and is the second in a new series submitted by SIPES Members and Chapters. Part One of this article was published in August 2015.

TRAP SPRING OIL FIELD
(Duey, 1979; French, 1994a)

Geology

Exploration Method: Seismic data, geomorphic and airphoto studies
Type of Trap: Stratigraphic and structural
Producing Formation: Oligocene Garrett Ranch
Gross Thickness and Lithology of Reservoir Rocks: 800 feet, ignimbrite (ash-flow Tuff)
Other Significant Shows: None

Discovery Well

Name: Northwest Exploration No. 1 Trap Spring
Location: SE/4 SE/4 (200’ FEL and 800’ FSL), Sec. 27, T9N-R56E
Elevation (KB): 4,756 feet
Date of Completion: November 30, 1976
Total Depth: 6,137 feet
Production Casing: 4,220 feet
Perforations: None, open hole completion
Stimulation: None
Initial Potential: Pumping 417 BOPD
Bottom Hole Pressure: 1959 psi (at 4830’ from DST)

(Continued on Page 21)
The following reports on national, state, and environmental information were prepared by SIPES Vice President of National Energy Pat Nye, State Legislative Affairs Chairman Gary Huber, and Environmental Committee Chair John Kimberly. The views and opinions expressed are those of the authors. Some of the information presented is in the public domain and is available from a variety of sources; other references were selected by the authors, and are noted in their reports.

**NATIONAL ENERGY**

**Presidential Candidates Ponder Energy Policy**

With over a year to go, the presidential election candidates on both sides of the aisle are polishing up their positions on critical national energy policy. Polls will undoubtedly change in the coming months, but some comments made by the two frontrunners from both parties warrant some caution from the voters. Most of the candidates do not have a comprehensive energy plan, but some touch on issues that affect our industry. In an effort to educate our members, outlined below are a couple of the key points, positions and interesting quotes from the presidential candidates that were found online.

**Hillary Clinton** is clearly pro-renewables, clean energy and an advocate of climate change. She has taken a stance against drilling in the Arctic and the Keystone XL pipeline. (Democratic Poll 10/8/15 42%)

**Hillary Quotes:** “We’ll stop the giveaways to big oil companies and extend, instead, tax incentives for clean energy, while making them more cost-effective for both taxpayers and producers.” “The reality of climate change is unforgiving no matter what the deniers say.”

**Bernie Sanders** is pro-renewables, primarily solar and clean energy, and an advocate of climate change. He led the opposition against the Keystone XL pipeline, and secured an economic stimulus package for grants to reduce greenhouse gas emissions utilizing solar energy systems. (Democratic Poll 10/8/15 25.4%)

**Bernie Quotes:** “We must transform our energy system away from polluting fossil fuels and towards energy efficiency and sustainability.” “We must make significant reductions in carbon emissions and break our dependency on fossil fuels,” Sanders said. “That is why I have helped lead the fight in the Senate against the Keystone pipeline, which would transport some of the dirtiest fossil fuel in the world.”

**Ben Carson** is for developing our natural energy resources including renewable energy sources. (Republican Poll 10/8/15 18.4%)

**Ben Quotes:** “Whether we are experiencing global warming or a coming ice age, which was predicted (in) the 1970s, we as responsible human beings must be concerned about our surroundings and what we will pass on to future generations. However, to use climate change as an excuse not to develop our God-given resources makes little sense. Expanding our wealth of energy resources, as well as encouraging development of new renewable energy sources, can provide an enormous economic lift with obvious benefits.”

**Donald Trump** is for the Keystone XL pipeline, and supports fracking and energy independence. (Republican Poll 10/8/15 23.7%)

**Donald Quotes:** “Honestly, we’re taking oil from Canada. We’re paying Canada a lot of money. We don’t even need Canadian oil if we did it right. The really right way is to drill our own oil. We have so much of it we don’t know what to do. Between natural gas and oil and lots of other things, we should be doing our own.”

On another note, I highly recommend that SIPES members refer to a recent publication from the American Geosciences Institute titled “Geoscience for America’s Critical Needs – Invitation to a National Policy Dialogue.” This publication outlines the key elements that all voters need to understand to help our country with the critical thinking approach to our Nation’s resources. Please refer

(Continued)
to the website http://www.americangeosciences.org/policy/critical-needs as this publication is supported by SIPES as well as a host of other professional societies.

What the Heck, OPEC?

Oversupply of world oil has been widely reported to be OPEC’s response to the success of U.S. shale oil production, but lately OPEC has changed its tune. In a recent article by CNBC, OPEC states that an increase in global oil demand was forecasted, and that OPEC was in the best position to “mop up the increase.” OPEC further reports that oil demand increased 0.3 mb/d in 2015 and is expected to grow to 0.6 mb/d in 2016 as non-OPEC supply decreases. But wait, the International Energy Agency (IEA) just reported (at the time of this writing) their forecasts for a market slowdown in demand growth for 2016 of 0.6 mb/d. Exactly the same amount as OPEC expects demand to increase!? (Figure 1). In addition, IEA anticipates Iran will add additional barrels to keep the oversupply intact through 2016 if sanctions are lifted. So this gets back to the crystal ball question of which prediction is viable. Or as Ellie said in the last SIPES Quarterly… “Where are the fish?” (Figure 2).

Syria is another major battle front led by a U.S. coalition that includes Saudi Arabia, Bahrain, Jordan, Qatar and the United Arab Emirates. With the recent insertion of Russia in the conflict, military analysts suggest that Vladimir Putin’s real targets are the coalition-backed rebels that threaten the regime of Syrian President Bashar al-Assad – a Russian ally. Formal talks with Deputy Crown Prince and Defense Minister Mohammad bin Salman Al Saud and President Vladimir Putin resulted in Russia taking sides with Assad and the Shiite leaders of Iran and Iraq. Theories abound, but one thing is certain, Saudi Arabia is in direct conflict with Russia’s strategy that many believe are more focused on escalating uncertainty in the region and boosting oil prices than creating a peaceful solution.

The Saudis on the other hand believe that by flooding the market with cheap oil both Iran and Russia will feel the brunt of the lower prices. Their budgets are based upon $72 and $80 respectively. Estimates of Russian costs in the conflict are on the order of $2-2.5 million per day, and costs to date including the cruise missile strikes in the first two weeks of its bombing campaign beginning September 30th is another $87 million. (Continued)
One analyst indicated that Russia has spent 82% of its military budget and will need to dig into national reserves to cover costs at a time when the Russian economy is stretched by low oil prices and Western sanctions. Who will win? Cash strapped Russia pushing for higher oil prices or the coalition whose coffers are evaporating? (Figure 4).

Substituting new natural gas fired electrical facilities near the old retired coal plants saves costs by utilizing the existing infrastructure such as transmission lines and substations. Earlier this year, the EIA reported that natural gas-fired generation surpassed coal electricity generation for the first time. (Figure 5).

Natural gas is forecast to continue to be in abundant supply and pricing forecasters expect the fuel to be inexpensive for a few more years. The EIA reported in early October that the underground natural gas storage was near a record for this date of over 3.6 trillion cubic feet, up 14% from a year ago. This report is in the wake of the Baker Hughes rig count who said the number of rotary rigs in the U.S. devoted to gas was at an all-time low – 189 rigs. This number is 80% off the gas rig count high in 2012 of 811 rigs. Coal saw a major drop in consumption by utilities during the first four months of the year and the EIA is now reporting that coal usage is heading towards a 25 year low. U.S. coal companies and 16 state governments are challenging the EPA’s carbon emission rule and some are expected to file suit once the EPA publishes the carbon rules in October 2015.

**In Summary**

Stay positive and continue to become more informed on the presidential candidates’ energy plans. Here is one final quote from T. Boone Pickens who responded to a question on CNN Money concerning Goldman Sachs prediction of $20 oil. “I’ve got it right. It’s just that my timing might be a little bit off. I say $70 by the end of the year. If I miss, I won’t miss by any more than six months.” Let’s hope that his crystal ball works better than most!

**STATE LEGISLATIVE NEWS**

**States**

**Wyoming**

On September 30, 2015, a federal judge in Wyoming issued a preliminary injunction against the U.S. Bureau of Land Management (BLM) that prevents the agency from regulating hydraulic fracturing on federal lands until the court hears the case. As the federal judge noted, “At this point, the Court does not believe Congress has granted or delegated to the BLM authority to regulate fracturing.” The judge further noted, “An administrative agency derives its existence and authority to regulate from Congressional authorization or delegation. Congress has not authorized or delegated to the BLM authority to regulate hydraulic fracturing and, under our constitutional structure, it is only through Congressional action that the BLM can acquire this authority.” This ruling guarantees that the BLM cannot put the hydraulic fracturing rule in place until the entire case is concluded.
North Dakota

North Dakota regulators on September 24, 2015, gave the energy industry ten extra months to reduce the amount of natural gas burned off at oil wells, acquiescing to industry worries that construction delays have made it all but impossible to meet existing targets. Regulators in the No. 2 U.S. oil producing state stopped short of approving the full two-year extension sought by companies grappling with the steepest price downturn in years. The extension pushes back potential penalties for companies, including forced reductions in oil output, and gives contractors next summer to try to expand a crucial network of natural gas gathering pipelines. Industry officials noted impediments to gas collection included regulatory delays to construct Hess Corp. and Oneok pipelines, as well as technological advancements fueling a 16 percent spike in natural gas production. The final flaring reduction target rise to 91 percent of produced gas by November 2020, is up from a previous goal of 90 percent. There are a lot of states that think 90 percent isn’t all that great,” said the North Dakota Governor. Indeed, Texas oil producers collect more than 99 percent of gas from their wells.

Texas

The Environment Texas Research & Policy Center and the Frontier Group reported issues with oil drilling on University of Texas (UT) System land, such as excessive water usage and the release of chemicals during drilling, in a study released in early September. Since 2005, the UT System has leased 1.3 million acres of land to oil and gas companies. The report criticized that drilling and fracking has resulted in huge use of water, and pumping underground millions of pounds of chemicals, has released [these chemicals] into our air and soil.”

According to the report, more than 6 billion gallons of water were used between 2012 and 2014, and 1.6 million gallons of wastewater spilled into both the soil and groundwater from the wells on System land. In addition to fracking, the environmental group also worries about the potential threats to endangered wildlife and areas along the Pecos River. The Texas Producers & Royalty Owners Association (TIPRO) immediately responded that the group’s claims of harm from fracking are “false” and that the organization lacks credibility. UT officials addressed the fracking concern in a statement which read in part:

“We certainly are not casual in our stewardship of these lands. We understand that they were given to us in perpetuity. We want to preserve them, we want to make sure they are used effectively and efficiently and that we do not in any way permanently alter or disrupt the landscape there.”

UT received close to $1.1 billion in annual royalty payments from companies that lease mineral rights from the UT System.

Induced Seismicity

A 150-page report, produced by the States First Initiative, provides guidance on mitigating risks of induced seismic events. The report discusses the topic of tremors being linked to fracking and deep-injection wastewater disposal. Thirteen states partnered through a multi-state initiative called States First this past year to share and summarize current knowledge related to earthquakes potentially caused by human activity, otherwise referred to as induced seismicity. The working group arose after Ohio’s discovery in April 2014 of a probable link between fracking and five small tremors in eastern Ohio near Youngstown. The report primarily focuses on potential induced seismicity associated with Class II disposal wells. Injection wells are currently regulated under the Safe Drinking Water Act through the Underground Injection Control Program. This program, through primary delegation by the U.S. EPA, is administered by certain states due to their in-depth knowledge of local industry operations and geology. In its assessment, the working group observed that the majority of disposal wells in the United States do not pose a hazard for induced seismicity; however, most cases of felt injection-induced earthquake activity has generally been associated with direct injection into basement rocks, and in the proximity of faults. A copy of the report can be downloaded from: www.statesfirstinitiative.org.

Separately, Oklahoma is expanding restrictions on disposal activities to stem a sharp increase in earthquakes. Most recently, the Oklahoma Corporation Commission’s Oil and Gas Conservation Division began implementing a plan to change the operation of certain disposal wells in the Cushing area. In Pennsylvania, the state Department of Conservation and Natural Resources and the Department of Environmental Protection will spend $531,000 on a network of seismic activity monitors at thirty stations across the state for three years. Many of the stations will be on park lands and the equipment will include five mobile units for quick deployment to areas of concern. This seismic monitoring network will give the state a better baseline understanding of the state’s geology. Despite a boom in drilling that has made Pennsylvania the number two natural gas producer in the country, the state has not had earthquakes connected to fracking or the deep wastewater injection wells blamed for tremors in states such as Ohio.


EPA

Refineries

U.S. oil refineries will face tighter standards in coming years on toxic emissions that cause lung problems and increase cancer risks, according to environmental regulators. The Environmental Protection Agency finalized a rule, to be fully implemented in 2018, that aims to reduce emissions of benzene and other toxic emissions. The EPA said the capital cost to refiners will be about $283 million, with an annualized cost of $63 million, but that the standards will have a “negligible impact on the costs of petroleum products,” like gasoline and diesel fuel. The standard will require continuous monitoring of concentrations of benzene and other pollutants at the fence line of refineries. The EPA said it would strengthen emissions controls at flares, storage tanks and delayed coker operations that will cut thousands of tons of hazardous air pollutants.

Oil and Gas Production

In August the U.S. Environmental Protection Agency (EPA) proposed new standards which they believe will reduce emissions of greenhouse gases (GHG) and volatile organic compounds (VOC) from the oil and natural gas industry. The proposal is a part of the Administration’s strategy to cut methane emissions from the oil and gas sector by 40 to 45 percent from 2012 levels by 2025. The proposed standards for new and modified sources are expected to reduce 340,000 to 400,000 short tons of methane in 2025, the equivalent of reducing 7.7 to 9 million metric tons of carbon dioxide. Those standards are also expected to reduce 170,000 to 180,000 tons of ozone-forming VOCs in 2025, along with 1,900 to 2,500 tons of air toxics, such as benzene, toluene, ethylbenzene and xylene. The proposed standards will complement voluntary efforts, and are based on practices and technology currently used by industry. To cut methane and VOC emissions, the proposal requires:

- Finding and repairing leaks;
- Capturing natural gas from the completion of hydraulically fractured oil wells;
- Limiting emissions from new and modified pneumatic pumps; and
- Limiting emissions from several types of equipment used at natural gas transmission compressor stations, including compressors and pneumatic controllers.

The proposed rules were published in the Federal Register on September 18, 2015 and the comment period is for the following 60 days.

Bureau of Land Management

On October 2, 2015, the Bureau of Land Management (BLM) released a proposed rule to update and replace its regulations governing the measurement of natural gas produced from onshore federal and Indian leases. The proposed rule is intended to modernize its oil and gas measurement rules. The BLM states that this proposal addresses longstanding concerns about the adequacy of existing rules and will be critically important to ensuring proper measurement so that American taxpayers, Indian tribes and allottees, and state and local governments receive the full royalties they are due. The proposed rule would replace Onshore Oil and Gas Order No. 5. Specifically, the proposed rule would:

- Incorporate proven industry standards developed by gas measurement experts from industry and the BLM.
- Increase BLM’s ability to account for the gas produced by ensuring that higher volume facilities, where erroneous measurement can have large financial implications, have more frequent equipment inspections and heating value determinations (or Btu content) and higher measurement accuracy in order to ensure produced gas is being properly accounted for and facilities are operating properly.
- Require operators of the highest volume facilities to use updated measurement tools including electronic gas measurement systems, while making allowance for lower volume facilities to continue using existing technology.
- Update regulations governing assessments and civil penalties to ensure those measures are aligned with the true cost of developing and overseeing a modern oil and gas well.

Oil Export Ban

The lifting of the oil export ban is moving forward. In mid-September the House Committee on Energy and Commerce passed H.R. 702, a bill designed to lift outdated trade restrictions on United States crude oil, with a bipartisan vote of 31 to 19. And recently on October 1, 2015 the bipartisan legislation designed to lift the outdated restrictions on exporting United States crude oil, was approved by the Senate Committee on Banking, Housing, and Urban Affairs.

Sources

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The Washington Post, Internet article, September 28, 2015
Reuters, Internet article, Oklahoma regulations, July 17, 2015
Oklahoma Corporations Commission, Media Advisory, September 18, 2015
Pittsburg Tribune-Review, Internet article, September 29, 2015
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Natural Gas Intelligence, Internet article, September 9, 2015
Kuve.com, Internet story, September 8, 2015
EPA, News Release, August 8, 2015
BLM, News Release, October 2, 2015
IPAA, News Release, October 1, 2015
IPAA, Issues and Insight, September 17, 2015

(Continued)
Ozone Revisited

The Environmental Protection Agency (EPA) recently announced a new ruling on surface ozone pollution, changing the permissible level from 75 PPB to 70 PPB. Along with the usual hoopla of the EPA saying this action will cut down public health problems, and of opponents claiming the ruling will be the most expensive regulation ever, leading to billions of dollars in compliance costs, I was caught off guard by the subject matter, ozone. Ozone has been heralded as the atmospheric gas that blocks solar radiation and allows life to exist on Earth’s surface. The concern in the past was that anthropogenic activity was depleting the ozone layer. Now the EPA is going in the other direction, trying to reduce ozone. This prompted me to revisit ozone and below are some of my findings.

Ozone is formed differently at the Earth’s surface and in the stratosphere. Surface ozone is a byproduct of nitrogen oxides reacting with volatile organic compounds, whereas stratospheric ozone is formed naturally by an oxygen molecule combining with a loose oxygen atom accompanied by a release of heat. Although the formation process is different, the result is the same — ozone. This report will concentrate on the stratospheric ozone, not the surface ozone that the EPA recently restricted.

Oxygen occurs in the atmosphere in three forms: single atoms, molecules consisting of two oxygen atoms, and molecules consisting of three oxygen atoms, which is ozone. The National Aeronautics and Space Administration (NASA) estimates that ozone represents only 0.00006 percent of the atmosphere and in Figure 1, they show how ozone concentration varies with altitude. The ozone layer at 30 – 35 kilometers is quite apparent.

Both the EPA and NASA take the position that the ozone layer acts as a shield that prevents ultraviolet solar radiation from penetrating Earth’s atmosphere, thereby protecting life on Earth. Quoting NASA, “ozone in the stratosphere absorbs most of the ultraviolet radiation from the Sun. Without ozone, the Sun’s intense UV radiation would sterilize the Earth’s surface.” NASA claims that “ozone is destroyed when it reacts with molecules containing nitrogen, hydrogen, chlorine or bromine. They concede that such molecules occur naturally, but add that mankind also manufactures damaging gases.

The position of EPA and NASA leads one to believe that the stratospheric ozone absorbs the UV radiation from the Sun. That presumption is challenged by O. G. Sorokhtin, G. V. Chilingarian and N. O. Sorokhtin in their book Evolution of Earth and its Climate; Birth, Life and Death of Earth, Elsevier, 2011, pages 462-467, (Figure 2). Sorokhtin et al. say “the absorption of the solar UV rays within the tenuous stratospheric and mesospheric layers is associated mostly with the photochemical dissociation of the oxygen molecules accompanied by the absorption of energy of hard solar radiation.” In other words, the oxygen molecule O2 plus energy splits into two oxygen atoms, O+O. These free oxygen atoms then combine back into oxygen molecules accompanied by a release of heat. According to this theory, the life threatening solar radiation is not absorbed mostly by ozone as proposed by the EPA and NASA, but is consumed by breakup of oxygen molecules with a release of heat when the atoms recombine. Sorokhtin et al. say “the ozone layer in the stratosphere is actually not a protective shield against the UV radiation that is deadly to all living things. The only real ‘shield’ is oxygen.”

Like the oxygen molecule, ozone formation in the stratosphere always occurs with heat release under an exothermal reaction and not with the absorption of solar radiation energy, according to Sorokhtin et al. Solar energy absorption occurs at ozone dissociation. The authors go through a comprehensive discussion comparing energy absorption and critical frequencies at absorption for O2, CO2, H2 O and O3, and conclude that “the restoration of O2, CO2 and H2O molecules results in the heat release Q exactly equal to these molecules dissociation energy. For this reason, the described reactions actually convert the energy of the solar (Continued)
UV radiation into heat.” Ozone, on the other hand, can absorb only shorter wavelength radiation in the infrared (IR) portion of the spectrum and cannot absorb UV radiation.

The heating effect from the recombination of oxygen atoms into molecules raises the temperature in the stratosphere and mesosphere, resulting in a well documented increase in temperature from about 215 degrees Kelvin at 20 km elevation to 270 degrees Kelvin at 50 km. (Figure 3).

Some other quotes from the Sorokhtin et al. book:

• “ozone dissociation and even more so its formation cannot cause the absorption of the solar UV radiation as these reactions occur in the IR radiation domain. The solar UV radiation with the wavelength shorter than 0.24 mcm (2400 A) is absorbed only by the oxygen dissociation process.”

• “Ozone formation is just a consequence and not the cause of the absorption of the solar UV radiation.”

• “the role of the anthropogenic effect on the ozone layer in the stratosphere, where the ozone ‘holes’ emerge, is negligible, three to four orders of magnitude below the natural effect. That is why all fluctuations of the ozone concentration in the atmosphere are natural and in no way are associated with human activity. It was shown by Kapitsa and Gavrilov (1999) that the stratospheric ozone concentration fluctuates seasonally and bears no danger. There is no ozone ‘hole’ problem, and still colossal amounts are expended to fight it.”

The positions of the EPA and NASA are radically different from those of Sorokhtin et al. Which one is true? It would be good to have the principles of the scientific method applied to these theories in order to determine which is right or wrong before policies are adopted that will be expensive and perhaps of no use.
WELCOME NEW MEMBERS

In accordance with the SIPES Constitution, By-Laws & Code of Ethics, the following announcement of new members unanimously approved by the SIPES Membership Committee during the last quarter is printed below.

Any member in possession of information which might possibly disqualify an applicant is asked to submit this information to the secretary of the society (Michael L. Jones) within thirty days of this publication. To be considered, this information should be in writing and bear the writer's name. If this information is received within thirty days after the publication of the applicant's name, the SIPES Board of Directors must reconsider its previous approval of the applicant. The board's action, after consideration of such new information, shall be final.

Douglas H. McGinness II, National Membership Committee

<table>
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Wilbur C. Bradley — Wichita, KS
William C. Burkett — Midland, TX
Stewart Chuber — Schenectady, TX
Ralph J. Daigle — The Woodlands, TX
Kenneth J. Humfry — Mandeville, LA
Stephen D. Reynolds — Denver, CO
Eugene R. Sidwell — Amarillo, TX
Thomas A. Smith — Austin, TX
Paul M. Strunk — Corpus Christi, TX

Driller – $750
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William D. Bennett — Frederick, MD
Dennis M. Gleason — Arlington, TX
Walter S. Light, Jr. — Houston, TX
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Marc D. Maddox — Midland, TX
D. Craig Smith — Midland, TX

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Thornton E. Anderson — Wichita, KS
Donna F. Balin — San Antonio, TX
James B. Bennett — Houston, TX
Duncan D. Dubroff — Houston, TX
Marlan W. Downey — Dallas, TX
Marshall C. Crouch III — Golden, CO

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Paul W. Britt — Houston, TX
Garnet W. Brock — Midland, TX
James R. Cleveland — Dallas, TX
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Eugene J. Lipstate — Lafayette, LA
Steven R. Lockwood — Austin, TX
Gregg A. McDonald — Oklahoma City, OK
Michael F. McKenzie — Lafayette, LA
Robert J. Moffat, Jr. — Shreveport, LA
William D. Neville — The Woodlands, TX
Terence G. O’Hare — Dallas, TX
E. X. O’Keefe — Denver, CO
Elwin M. Peacock — Houston, TX
David M. Pulling — Santa Fe, NM

(Continued)
Our annual Think Tank session produced several ideas that I believe will benefit SIPES now and in the future. Planning for future conventions, as always, occupied much of our time and I believe that SIPES Members should be excited about upcoming conventions in San Diego, CA this coming August 2016 and in Vail CO in 2017.

Our Oklahoma City Chapter is co-host for the 2016 Convention, and they are making steady progress toward organizing the technical program, foundation seminar and the post-convention field trip. As is always the case, organizing the technical program for the convention is a top priority for the host chapter, and suggestions for “excellent” speakers that might be added to the program in San Diego, CA are appreciated. Contact Kirk Kolar in OKC with your suggestions. Advertising and sponsorship slots for the convention are available and I encourage everyone to get their ads and sponsorships in as soon as possible. You should have recently received your convention advertising order form in the mail.

Much of the discussion at our recent board meeting involved looking at ways that we can better serve our members and the earth science community at large. One idea in particular that struck a chord with me involved the role SIPES and its local chapters can play in mentoring potential future members. This idea, in turn, evolved from a discussion of how to best serve younger independents and whether changes were needed to the SIPES membership requirements.

Many of us became independents during similar industry downturns of the past. Consequently, we feel a positive kinship toward the new independents being created in this current crucible, and we hope they will enter our ranks as they become qualified under our membership charter.

There has been much discussion around SIPES and at recent Directors meetings about bringing younger members into SIPES, and whether or not that is desirable and doable under our current constitution. In many cases, potential interested applicants do not have the number of years of experience in the industry, or the necessary Full Member sponsors to qualify for our Limited/Junior membership status.

Rather than change our membership requirements, which I believe are well established and fair, we should encourage these younger earth scientists to attend our local chapter meetings as guests, to meet our members and interact with them. I believe there is an opportunity for local SIPES chapters to mentor these potential future members and provide scientific and business guidance to these young people in accordance with our Society Charter without compromising our high membership requirements. It should not be easy to get into SIPES, and I firmly believe that maintaining our high standards of entry into the society makes SIPES membership more valuable to these potential members when in the future they do qualify to join our ranks.

As I mentioned in my last column “Hard times always hide great opportunities.” Those opportunities require assessing the current environment and making the changes necessary to survive. During this difficult time in our industry many of us individually find ourselves adapting to the new circumstances that lower product prices have created. For geoscientists, “adaptation” is a concept we all understand. As my paleontology professor used to say, “adapt or perish.” Perhaps it is time for some of us to get lean and mean.

Best Regards to All,

D. Craig Smith
SIPES National President
WICHITA

Revival of the Wichita Chapter

An enthusiastic group of former, current and potential SIPES Members met for an organizational luncheon on August 14, 2015 at Firebirds Grill in Wichita, Kansas. The Wichita Chapter has been silent for approximately five years and this effort to restore the chapter has begun. Fifteen individuals met over lunch to discuss how to structure the meetings, social events, possible formation of a local directory and website. Any ideas or suggestions from other chapters and individual members are welcome to help us get the Wichita Chapter off to a sound footing again. Please email Lanny Butner @ lanny_butner@hotmail.com.

The first meeting of the revived Wichita Chapter was held in conjunction with the local SPE chapter on September 22, 2015 at the Wichita Petroleum Club. Elwood Vogel, a principal technical advisor for Halliburton Energy Services Wireline, presented a talk on “Pulsed Neutron Logging Tools.” We learned how to use these logs to look for by-passed pay zones and monitor changing reservoir characteristics. The combined memberships of both chapters helped to provide for a much larger attendance and stimulated many table conversations.

Lanny Butner
Chairman

SAN ANTONIO

The San Antonio Chapter continues to enjoy good turnouts and interesting discussions at our chapter meetings. The subjects for presentations at our July, August, and September meetings were Jack Elam, a leader in the field of exploration geology; and discussion of exploration methods and technology.

In July, Deborah King Sacrey, #1271, presented a talk on “Managing ‘Big Data’ and finding the ‘Sweet Spots’” using what she referred to as “Principal Component Analysis and Neural Analysis of Seismic Attributes.” Deborah is a geologist/geophysicist with 36 years of experience in the Texas and Louisiana Gulf Coast and Mid-Continent areas of the U.S. For the past three years, she has been part of a team studying and bringing the power of multi-attribute neural analysis of seismic data to the geoscience public.

She said that subsurface geology and fluids have a multitude of effects on seismic data, many of which can now be seen or patterns of effects seen with modern seismic analysis. Recognizing the significance of the hierarchy of data patterns one sees is of utmost importance to maximize product and results and time utilization. Splitting the seismic signal into various components first started in the late 1970s with the measurement of single-trace attributes like Instantaneous Phase and Instantaneous Frequency. Over the last forty years, a plethora of attributes have been created and are commonly used in today’s interpretation workflow. Using Principal Component Analysis (PCA), which is a linear quantities process designed to understand which seismic attributes have interpretative

(Continued)
significance has proven to be an effective approach to sorting through vast amounts of data. The process looks for attributes that have the greatest amount of statistical variation and rates them accordingly. Several case histories showing examples of both the Principal Component Analysis and Self-Organized Mapping were presented to allow the interpreter to see the importance of these time-saving tools.

In August, the speaker was San Antonio Chapter Member Stew Chuber, #221. Stew gave a talk elaborating on the article he wrote about Jack Elam (SIPES #124) in the November 2014 SIPES Quarterly. The talk was titled "Jack G. Elam: A Most Creative Person."

Jack Elam was a geologist whose ability to use deductive and inductive reasoning led to several substantial discoveries in the Permian Basin. His search to answer the question “why” made him a unique, creative geologist.

Jack had said: “I am an unabashed enthusiast about geology and exploring for oil and gas.” Some quotes:

- "It is my hobby as well as my vocation……”
- “….wealth has been fairly far down on my list of priorities……”
- “…my wife and I live relatively modestly, we have the ultimate freedom to be able to live our lives as we choose. I never go to “work.” You can’t get any richer than that in my book.”

Jack said: “I lay claim to have been the first geologist to recognize that the Spraberry-Dean-Clearfork pay zones all constituted a part of a very large stratigraphic trap that had become commercial. The entire Midland basin was fractured, embracing about 150,000 square miles…It was a rare opportunity to get in on a better than one-billion-barrel field just after arriving in the basin!”

Jack was a true friend and a great mentor. He will be missed — we need more like him.

In September, Brian Reynolds with Schlumberger gave a presentation on “The Value of Magnetic Resonance for Understanding Unconventional Reservoirs.” Brian Reynolds works for Schlumberger Data Services in San Antonio as a petrophysicist and technical team lead. He has twenty-eight years in the oil industry with Schlumberger, as a wireline field engineer, manager and petrophysicist.

He said understanding unconventional reservoirs has been a difficult task. Often petrophysical evaluations look very similar throughout a resource play but well performance can vary greatly. Magnetic resonance has been very valuable in understanding differences in well performance in unconventionals. Core analysis was used to tune models for the use of magnetic resonance in unconventional Reservoirs. Magnetic resonance is used to define the amount of total organic carbon (TOC) in the formation. Properly computing TOC is important for determining hydrocarbon porosity for reserve calculations. Magnetic resonance can also be used to compute a reservoir producibility index and the amount of bound hydrocarbons.

Doug McGookey
Secretary

**LAFAYETTE**

The Lafayette Chapter holds its monthly meetings at the Petroleum Club of Lafayette on the second Wednesday of each month. There were no meetings in July and August due to summer break. The fall program began on September 9th with John Foreman presenting “Oil & Gas Pricing/Possible Forecasting.”

John S. Foreman III is the oil and gas marketing manager of PetroQuest Energy, Inc., a publicly traded, independent exploration and production company headquartered in Lafayette. He joined PetroQuest in 2006 and has previously served in engineering, operational, and financial roles. John is also an adjunct professor with the Tulane University Energy Institute teaching Energy Fundamentals and Trading since the spring of 2013. He currently serves as president of the API Acadiana Chapter.

Mr. Foreman earned a bachelor of science degree in mechanical engineering from Louisiana State University in 2000 and a master of business administration with a concentration in finance from the Flores MBA Program at Louisiana State University.

Mr. Foreman’s presentation gave the audience a snapshot of the many variables that affect the price of oil, such as global oil inventories, world production outputs, international market politics, OPEC control, and much more. John did an excellent job on providing the membership with current information on a difficult subject.

For membership or Lafayette Chapter information contact Tom Poche’, chairman, or King Munson, secretary/treasurer (tpoche@shelfenergy.com) (kingmunson@gmail.com).

Tom Poche
Chairman
**WANTED:**

**UPSTREAM OPPORTUNITIES**

Privately owned company seeking to expand activity in the Permian Basin (with focus on the Central Basin Platform), Eastern Shelf and East Texas.

- Leasehold Acreage
- Lease Banking
- Farm-Out
- WI (Op. or Non-Op.)
- Production
- O.R.R.I.

Call David Fitzell at (214) 390-2901

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**DENVER**

The Denver Chapter was on hiatus over the summer, but heard an interesting talk in September.

Bob Cluff’s talk was titled “What is net pay? Reassessing the productive potential of tight carbonate reservoirs in the Illinois Basin.” Bob Cluff, #1832, is the president and co-founder of the Discovery Group, a geological and petrophysical consulting group in Denver since 1987. He specializes in the integration of geologic, petrophysical, and engineering data into a coherent reservoir model. He is also a former chairman of the Denver SIPES Chapter.

Bob’s talk discussed the recent activity in the Griffin bottoms. This area produces from the Mississippian St. Louis, Salem, and Warsaw Formations. About 80 wells have been drilled since 2008 with approximately 50 permits or active locations. The wells produce 2-4 times as much as nearby wells completed in the same formation prior to 2008. He believes the difference is modern frac technology which connects many small lenticular carbonate sands not connected to the borehole and a different definition of pay.

Special core analysis was run that sheds some light on how to determine pay cutoffs. He concludes that this technology can be applied to many of the older areas in the U.S. and Canada which are approaching the tail end of the production curve. Bob Cluff’s talk is available on the Sipes-Denver.org website.

Sue Cluff
Secretary

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**CHAPTER NEWS CONTINUED**

**SEPTEMBER**

Bob Cluff’s talk was titled “What is net pay? Reassessing the productive potential of tight carbonate reservoirs in the Illinois Basin.” Bob Cluff, #1832, is the president and co-founder of the Discovery Group, a geological and petrophysical consulting group in Denver since 1987. He specializes in the integration of geologic, petrophysical, and engineering data into a coherent reservoir model. He is also a former chairman of the Denver SIPES Chapter.

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Sue Cluff
Secretary
MIDLAND
In July our speaker was Paul Smolen of Fox, Smolen and Associates. His talk was entitled “The Restructuring of the Texas Electricity Market.” Mr. Smolen discussed efforts at the Public Utility Commission of Texas to deal with resource adequacy, the future supply of electricity to meet the projected demand, and other proceedings that will affect electricity rates. He also discussed congestion and related costs, distributed generation, battery storage and other current topics. Smolen also discussed recent electricity-related legislation that passed or failed in the recently concluded 84th Texas Legislative Session.

Our August speaker was Jerry Morales, mayor for the City of Midland. His talk was entitled “Midland, World Class City, Past, Present, Future.” Mayor Morales discussed where Midland has been, where it is today, and where the future will take us.

At our September meeting the speaker was Taft Armandroff, director of the McDonald Observatory. His talk was “McDonald Observatory and the Future of Astronomy.”

Dr. Armandroff described some of the significant astronomical discoveries made at the observatory during its 76-year history, and he focused on the potential impact of two future projects — the Hobby-Eberly Telescope Dark Energy Experiment, which is about to begin observations at McDonald Observatory; and the Giant Magellan Telescope (GMT), a 25-meter next generation telescope, planned for construction in Chile in 2021.

The University of Texas at Austin is a founding partner in the GMT.

He also talked about the extensive efforts the observatory makes to support K-12 education and outreach, and he closed by describing the efforts, in cooperation with the oil and gas industry, to keep the West Texas skies dark.

Bill Mueller
Secretary

IN MEMORIAM
We regret to note the passing of the following members:

William D. Blankenship, #2006
of Denver, Colorado
who died on August 5, 2015

Bill D. Broughton, #421
of Oklahoma City, OK
who died on October 6, 2015

Louis E. Harlan, #450
of Dallas, Texas
who died on September 28, 2015

Steven M. Murray,
Limited Member
of Houston, Texas
who died on August 30, 2015

Robert C. Saultz, #601
of Edmond, Oklahoma
who died on May 5, 2015

Rudolf B. Siegert, #777
of Slidell, Louisiana
who died on October 14, 2015

Alfred W. Stude, #381
of Belaire, Kansas
who died on October 7, 2014
HOUSTON
Our July luncheon speaker was Charles T. Goodson, chairman, CEO and president of PetroQuest Energy. His talk was titled “Thunder Bayou and La Cantera, PetroQuest Discoveries.” PetroQuest is a young public company with operations in the Gulf Coast and East Texas, having recently sold its Oklahoma properties. Currently the company uses the cash flow generated from its South Louisiana properties to fund drilling in East Texas where it estimates a program of approximately 1,000 Cotton Valley horizontal locations. The company allocates its drilling budget with 25% high risk/high reward wells and the remaining inventory equally split between close in exploration and development.

A new 3D survey, the conviction in internally-generated prospects, and the fortitude to overcome drilling problems led to great success. The La Cantera area has yielded three successful wells with an EUR of approximately 200 BCF, while the discovery at Thunder Bayou is expected to yield 150 BCF through one well. The flow rate there is approximately 40 MMCFED. Both properties produce from the Lower Cris R sands. La Cantera is a deeper pool test migrating downthrown on a faulted structure. Coincidentally, there is an old well that just missed the gas-water contact downdip by a handful of feet. The reservoir has a gross thickness of about 500 feet with the top 150 being a massive sand. PetroQuest unsuccessfully tried to sell this prospect 65 times, and ultimately drilled the prospect heads up with its money, and that of a long time internal investment group. They had the confidence in their work and the support of their management to take a company changing risk.

Thunder Bayou is also a deeper extension of a productive structure. This prospect lies downdip of Tigre Lagoon Field which has produced over 550 BCFE from a number of horizons. The field is situated along a failed shelf margin with significant growth into a fault. A major factor in the structural mechanism is the pinchout of the lower Cris R sand which adds another 200 feet of structural closure to the reservoir. There are a number of challenges associated with deeper pool tests and many are illustrated here. Total depth is 21,000 feet, the bottom hole temperature is 350 degrees F and the bottom hole pressure is over 16,000 psi. There are 5 strings of pipe in the discovery well and formation evaluation proved challenging in that environment. The surface equipment must be rated to over 20,000 psi. Additionally, the gas contains some CO2 and a trace of H2S which requires treatment before pipeline delivery. These factors resulted in a well cost of $25 million, and an equal amount spent on pipelines and surface facilities. Even at this depth, porosities are greater than 20% and permeabilities average over 100 mD. The geophysical modeling work done indicates the AVO response to approximate a class III response. Given the depth of the prospect, to have any AVO expression the reservoir had to be thick. These discoveries demonstrate what the conviction of internal confidence can produce for independents and larger companies alike.

A few years ago, we opted to end our August luncheon meeting due to the recurring conflict with summer NAPE and members’ travel plans. Eliminating the meeting does not mean that we don’t get together in August. Our annual Independent’s Day Celebration took place on August 6. We all enjoyed the food and camaraderie, and some lucky winners walked away with great door prizes. There were 146 in attendance this year including over 30 potential new members.

Our September luncheon speaker was Eric Potter, geologist and program director for energy research at the Bureau of Economic Geology at the University of Texas at Austin. Prior to this position, he spent a number of years with Marathon Oil Company, so he does understand private sector mindset. Current research focuses on three areas: energy, economy and the environment with the goal of policy input based on unbiased science. The BEG’s current staff is 80 full-time scientists, 30 graduate assistants and 15 post-graduate fellows. Just like the rest of the industry, the bureau faces challenges with an aging workforce and funding issues in the current low-price environment. The bulk of their research is global and soft-funded, while the remainder of the research time is devoted to state geological survey efforts. The BEG has a long history of making its’ research available to the public, but respects the confidentiality that industry providers require. The public can look up or purchase...
these publications through the website at http://www.beg.utexas.edu/pubs/pubsales.php. Currently over 70 companies support the bureau. This support is through membership in one of nine consortia, the Center for Energy Economics, the State of Texas Advance Resource Recovery (STARR), project funding or data access.

The Center for Energy Economics performs policy research related to industrial hydrocarbon demand, liquefied natural gas issues, natural gas and power markets. Recently it is researching shale resources beginning with the Barnett Shale and continuing to the Bakken and Eagle Ford trends. This long-term effort has and will continue to produce meaningful research based upon complete and thorough investigation. The example illustrated in the presentation concerned horizontal well spacing in a part of the Eagle Ford area. It examined operators’ efforts at 200’, 400’, and 800’ spacing between laterals, but based on the short-term production history, could not recommend an ideal interval at this time. One important aspect of the center’s research results is to make scenario-based conclusions instead of discrete values.

Two industry sponsored consortia were discussed: the Applied Geodynamics Laboratory (AGL) and the Fracture Research and Application Consortium or FRAC. The AGL performs global salt tectonics research via observations, computational models and physical models. Interestingly, the laboratory almost abandoned the physical modelling efforts, but the industrial partners saw great value in these efforts and requested to continue this line of research. The FRAC group has been continuously funded for twenty years. Much of its work is petrography based and strives to relate microfractures seen in lab samples to macrofractures seen in cores, outcrops and production data.

The State of Texas Advance Resource Recovery Project, commonly known as STARR, benefits all Texans, but should be of keen interest to those of you who operate production in our home state. Its goal is to increase production through research projects. Operators can benefit from field studies, production modifications and new drilling proposals near or below existing assets. It performs reservoir characterization studies on individual fields, regional studies on formations and producing basins, and unconventional resource analysis. Recently, the group has reexamined Texas’ geothermal endowment and produced several new conclusions. First, the state has more geothermal resources than previously identified. Second, those resources could be converted into the lowest baseload electricity cost for consumers while not subjected to the vagaries of some types of power production.

To add to the gatherings in September, our annual Continuing Education Symposium took place on the 25th at the Marathon Oil conference facility. This year the theme was “Old Field Revitalization.” Please give thanks to Ken Mallon, #3079, for organizing the event, James Mertz, Junior Member, for his fundraising efforts and B.K. Buongiorno for keeping up the myriad logistical details of the undertaking.

Russell Hamman
Secretary
NEW ORLEANS

The New Orleans Chapter kicked off the fall season with a lunch meeting on September 15 at Andrea’s Restaurant in Metairie. The speaker was Eric Smith, associate director of the Tulane Energy Institute at Tulane University’s Freeman School of Business. Dr. Smith is also known to those in the audience as the “Face of Tulane” on energy issues in local media. Dr. Smith gave an informative talk on “The Midstream Energy Sector.” He noted that while SIPES Members are mainly interested in the upstream, the midstream (from the wellhead to the refinery or gas plant) has important implications for exploration and production.

Dr. Smith set the stage with some information about current supply and demand. He noted that OPEC’s “official” production limit is 30 MMBOPD but is currently producing 32 MMBOPD. The future is uncertain as production in some volatile nations could quickly drop while new production could come on stream from locations such as Iran. Dr. Smith noted that Saudi Arabia needs oil at $90-100/ barrel to meet its internal social subsidies, and is currently running a 20% deficit on GDP. The current global surplus is 3MMBOPD and the crash in oil prices is having impacts throughout the U.S., and not just the oil producing states. The oil and gas industry supports 9.3 million jobs and is responsible for 30% of all U.S. jobs created since the start of the recession.

In his discussion of the midstream business, Dr. Smith described the current infrastructure of pipelines and processing facilities, including the need for its expansion. The difficulty in expanding pipeline capacity is compounded by the lack of tanker capacity. Under the Jones Act, all goods transported by water between U.S. ports must be carried on U.S.-flag ships, constructed in the United States, owned by U.S. citizens, and crewed by U.S. citizens and U.S. permanent residents. At present there are only 55 Jones Act tankers, with 5 currently under construction. As a result, there has been an increase of two orders of magnitude in oil transport by rail since 2008, although this remains a small percentage of domestic oil transport.

In the Q&A session, Dr. Smith fielded many questions and comments from the SIPES Members. He noted that he sees natural gas price maintaining or increasing from current levels as it has an increasing role in the petrochemical industry and electric power generation.

Art Johnson
Secretary

FORT WORTH

The September meeting was held at the Petroleum Club of Fort Worth on September 2, with 35 members and guests attending. Marshall Gandy of the U.S. Securities and Exchange Commission spoke on “The SEC and the Oil & Gas Industry.”

Mr. Gandy is a senior officer and associate regional director in the Fort Worth Office of the SEC. He leads forty-five professionals (including a geophysicist) and support staff that are responsible for examining broker-dealers, investment companies and advisors, as well as many other types of firms and advisors across Texas, Oklahoma and Arkansas. Mr. Gandy received his JD from SMU and began his legal career in Dallas as an assistant district attorney, a county criminal court judge, and as senior regional counsel of the Financial Industry Regulatory Authority.

Gandy’s father, Harvey Gandy, #588, was a member of the SIPES Dallas Chapter and served as SIPES National Treasurer in 1985.

Mr. Gandy began his talk with a brief history of the SEC and how Fort Worth came to be the location of one of eleven regional offices. He then spoke in detail about one particular oil and gas investment company that consumed much of his and his staff’s time over a several year period. He said that his company was set up to buy oil and gas leases with the intent of establishing production through farmouts or other deals. In addition, the firm committed to pay its investors a set dividend per year. During a period of industry growth, the firm issued a stream of new investment packages and paid dividends to its investors. When industry growth stalled, the firm was unable to issue more new packages. There was little or no production revenue, so there was no other source to continue paying dividends, and the scheme unraveled. Mr. Gandy noted that the principals of the firm did not have any previous oil industry experience.

In other chapter business, Chapter Chairman Dan Earl Duggan introduced the new officers for the 2015-2016 term: Dan Earl Duggan, chairman; Bob Leibrock, secretary; Jay Moore, treasurer; and Michael Morris, membership. He also thanked outgoing Chairman, Wayne Hoskins, for his years of service to the chapter, during which time the membership and meeting attendance grew significantly. Hoskins now serves as a National Director of SIPES.

The Fort Worth Chapter of SIPES did not meet during the summer.

Bob Leibrock
Secretary
DALLAS
The Dallas Chapter meetings are normally held on the third Tuesday of the month at the Dallas Petroleum Club.

After taking off in July and August, Billy Harris spoke at our September 15th luncheon. His topic was “Unconventional Technologies in Conventional and Tight Reservoirs – An Overview of Certain Plays.”

A relatively new application of horizontal drilling and completion technology is adding exploration and development opportunities in several North American basins. In Oklahoma, Wyoming, Colorado and the Permian Basin, operators have identified previously subcommercial areas that now can generate high rates of return. These areas are characterized by very low permeability rock, sometimes in a combination of both conventional and unconventional reservoirs that, when developed properly, can be very economically attractive.

Billy W. Harris has worked internationally and domestically in various roles and capacities in drilling, completion, and production operations, reservoir engineering, property valuation, and as an expert witness before regulatory bodies of several states, in civil litigation, and in federal court. He is currently a partner and the vice president of engineering for Elk River Resources in Midland, where he began his career with Conoco in 1978. Mr. Harris was employed for twenty-three years by Wagner & Brown, Ltd. of Midland as senior petroleum engineer, where much of his work was focused on tight gas and tight oil plays before helping form Elk River in October of 2013. Mr. Harris was a director on the SPE International Board from 2008-11, where he served on the Board Committee on Finance & Administration and chaired the Board Committee on Education and Professional Activities. He is currently in his fourth year as chairman of the SPE Liquids-Rich Basins Conference. He is an adjunct faculty member at New Mexico Institute of Technology and holds a B.S. degree in petroleum engineering from Colorado School of Mines.

John Stephens
Chairman

CHAPTER NEWS CONTINUED
CORPUS CHRISTI

Our July speaker was local entrepreneur, investor, businessman, radio personality, and historian Jim Moloney. He is an owner in Energy Gas Compression. He is the publisher and co-author with Murphy Givens of 1919 — The Storm and Corpus Christi — A History, and his Nueces Press has also published A Soldier’s Life, the autobiography of Daniel P. Whiting, and several books by Murphy Givens: Great Tales from the History of South Texas, Recollections of Other Days, and Columns 2009-2011.

Jim spoke to us about his latest publication (actually republication) of Perilous Trails of Texas, an autobiography by J.B. (Red) Dunn. Perilous Trails of Texas has been out of print for over eighty years. Murphy Givens, Jim Moloney and Nueces Press brought the book back to print with an updated edition. Perilous Trails provides a window into the lawless 1870s in South Texas. Bandit raids, cattle rustling and hide-peeling were prevalent. Texas ranger and vigilante retaliation followed. Red Dunn was a participant as a ranger and vigilante. His book brings this violent era to life.

Dan Steffens spoke to us in August. Dan Steffens is the founder and current president of the Energy Prospectus Group (EPG) based in Houston, Texas. The company focuses on energy related stocks.

Several factors influence the price of oil and gas stocks: supply/demand fundamentals, commodity prices, and geopolitical issues. Two of these affect oil and gas pricing directly.

Global demand continues to increase because of continuous population increase (7 billion now, soon to be 8 billion people), and these people’s desire for a higher standard of living. Higher standards of living are tied to higher energy consumption. Oil consumption is expected to rise by 41% by 2035, most of the new demand from developing economies.

New supplies will be more expensive to find and produce.

The world is still very dependent on oil from the Middle East, which is an area of uncertain political risk at this time. The growth of ISIS and the increasing power of Iran are both threats to Saudi Arabia and Middle East stability.

Only three countries have demonstrated the ability to increase oil production from 2013-16: USA, Canada, and Brazil. Eighteen of 21 oil-producing countries had declining oil production this year, ALL oil-producing countries will be in decline in 2016. The U.S. decline will be very big due to lag time between rig count drop and production drop.

In previous price drops it takes a 12-month period for oil prices to return to long-term trend line.

Many OPEC countries cannot survive at current oil prices.

Natural gas is still bearish for 2015 and becomes bullish in 2016. Oil trades globally, natural gas trades domestically (to date). Texas RRC reported a 1.5BCFPD decline in gas production from the fourth quarter of 2014 to the first quarter of 2015. Rig count drops will affect gas production similar to oil production. Both oil and gas production decline in U.S. should accelerate in Q4 2015.

State Representative Todd Hunter spoke to our SIPES group in September. Todd is a nine-term Texas State representative, and has been Chairman of the Calendars committee for three terms. The Calendars committee determines when and how legislation will be considered by Texas House members.

Todd discussed results of the 84th Legislative Session including legislation that affected fracing in Texas, transportation, natural resources, and desalination.

Todd has represented the oil and gas industry in exemplary fashion in Austin, and has worked diligently to keep other governmental agencies from expanding their role into our industry in the recent past.

Dawn Bissell, Secretary and Tony Hauglum, Vice Chairman
Reservoir Data

Productive Area: Approximately 2,240 acres
Average Completed Interval: 300 feet
Average Porosity: Less than 2%; some core porosity 5 to 15%
Permeability: Unknown, but usually high due to fractures and cooling joints
Type of Drive: Water
Oil Characteristics: Black 21.5° API, pour point 0 to 5° F, Sulfur 0.8%
Oil Column: 2,100 feet
Oil/Water Contact: Approximately +200 feet
Market Outlets: Truck to Nevada, Utah and California
Oil Source: Chainman shale (see Poole and Claypool, 1984)
Production: 14,435,759 BO (February 2015)

Structure

Figure 9 (shown on page 22) is contoured on the top of the Oligocene Garrett Ranch Group. The western boundary of the field is limited by down-to-the-basin normal faults, except in Section 14, T9N-R56E. The field is separated into several blocks by west-east and northwest-southeast normal faults. Figure 10 is a true-scale cross-section in the southern part of the field (see Figure 9 for line of section). Note the 1700-foot oil column. Well TS 1 (Northwest Exploration Trap Spring No. 1) is the discovery well that TD’d in Oligocene volcanic rocks at 6137 feet. Well TS 13 drilled 2700 feet of volcanic rocks and TD’d in Paleozoic rocks at 7956 feet.

Figure 10. West-east, true-scale cross-section through Trap Spring discovery well (TS1). See Figure 9 for line of section (Duey, 1979).

Reservoir Log

Figure 11 (shown on page 23) is the upper portion of the Trap Spring discovery well. The Neutron-Density cross-plot porosity over the “open hole” completion interval ranges from 6 to 15%. Duey (1979) reported that mud gas analyses had a maximum total of two units of gas to 4375 feet when free oil was observed on the pits. Three DSTs recovered oil within the “open hole” completion interval. The discovery well was completed in 1976 pumping 417 BOPD without any stimulation.

GRANT CANYON AND BACON FLAT OIL FIELDS

Geology

Exploration Method: Seismic surveys
Type of Trap: Structural
Producing Formation: Devonian Simonson and/or Guilmette(? dolomites
Gross Thickness and Lithology of Reservoir Rocks: Several hundred feet; vuggy, brecciated dolomite.
Other Significant Shows: Joana limestone

Discovery Well

Name: Northwest Exploration #1 Grant Canyon
Location: SW/4 NW/4 Sec. 21, T7N-R57E
Elevation: 4,751 feet
Date of Completion: September 11, 1983
Total Depth: 4,487 feet
Production Casing: 7” at 4,486 feet
Perforations: 4,374 - 92; 4,412 - 26 feet
Stimulation: None
Initial Potential: Flowed 1,816 BOPD
Bottom Hole Pressure: 1,852 psig at 4,340 feet from DST

Reservoir Data

Productive Area: Grant Canyon 300 acres; Bacon Flat 80 acres
Average Net Pay: Grant Canyon 900 feet; Bacon Flat 450 feet
Average Porosity: Both Grant Canyon and Bacon Flat have less than 4% matrix porosity; porosity is primarily due to fractures, vugs and caverns.
Permeability: Both fields - vary highly due to interconnected fractures, vugs and caverns
Type of Drive: Both fields bottom water
Oil Characteristics: Grant Canyon - 25 to 26 API; pour point 45 to 50° F; 0.67 to 0.88% sulfur. Bacon Flat - 28 API, pour point 50° F; 0.45% sulfur
Market Outlets: Trucked to Nevada, Utah and California
Oil/Water Contact: Grant Canyon +290 feet; Bacon Flat -660 feet
Oil Source: Chainman shale
Production: 21,407,317 BO (February 2015)

Structure (Johnson, 1994)

Figure 12 (shown on page 24) is contoured on top of the Devonian which is beneath the Valley Fill at both fields. This interpretation is based on well data and 2-D and 3-D seismic data. In both fields there are several hundred feet of “anticlinal” and fault closure. Both fields are located in high fault blocks within three miles west of the Grant Range. These Devonian dolomite reservoirs are “detached” or “slide” blocks that originally were in the Grant Range.

(Continued)
RAILROAD VALLEY NEVADA CONTINUED

Figure 9. Structure map of Trap Spring field on top of Garrett Ranch volcanics. Contour interval 500 feet (French, 1994a).
Northwest Explr. Trap Spring #1
NE SE Sec. 27, T9N-R56E
Comp. 1976 IPP 417 BOPD
Discovery Well open hole 4220-4853
KB 4756

<table>
<thead>
<tr>
<th>Induction</th>
<th>Neutron-Density</th>
<th>Sonic</th>
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<tr>
<td>Valley F1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D12</td>
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<tr>
<td>DST2</td>
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<tr>
<td>S1A</td>
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</tr>
</tbody>
</table>

Figure 11. DIL, N-D and Sonic logs for Northwest Exploration Trap Spring No. 1. See Figure 10 for location of TS 1.
Figure 12. Devonian structure (C.L. - 100 feet) map showing line of cross section A-A'. See Johnson, 1964 for seismic lines. Large circles show the location of wells No. 3 and 4 in Figure 14 (Johnson, 1994).

Figure 13. Northwest-southeast section A-A'. See Figure 12 for line of section (Johnson, 1994).
Figure 14. Neutron-Density logs of Mapco GC Nos. 3 and 4. See Figure 12 for well locations.
Figure 15. Map of Railroad Valley showing a) oil fields, b) structure contours on top of the Chainman formation, c) the “cooking pot” area of mature Chainman source rocks with vitrinite reflectance (Ro) greater than 0.7%, and d) possible generalized updip oil migration paths directed outward from the “cooking pot” toward known oil fields (Meissner, 1995).
Figure 13 is cross-section A-A’ which shows an interpretation by Johnson (1994). Note that both Devonian oil reservoirs are detachment blocks overlying younger Paleozoic rocks. The Chainman shale (regional source rock) is present beneath the Devonian at Grant Canyon and presumed to be below the Devonian at Bacon Flat. The Cretaceous Troy Granite is exposed three miles south of the fields. This intrusive is also present in the subsurface; the entire sedimentary section is interpreted to be a detachment over the granite.

Reservoir Logs

Figure 14 shows two typical Neutron-Density logs in the Grant Canyon field. The Devonian dolomite reservoir is immediately below the Valley Fill. The upper 50 feet in well No. 3 has over 20% Neutron-Density cross-over porosity which may be a cavern or “highly” fractured dolomite. Well No. 4, except for the top few feet with high porosity, has less than 5% cross-over porosity for 80 feet below the high porosity top. The DSTs in the upper part of both wells had oil-to-the-surface. The low porosity in Well No. 4 suggests that this dolomite reservoir is “highly” brecciated. Note the high initial flowing rates: No. 3 @ 2274 BOPD and No. 4 @ 1986 BOPD.

FUTURE EXPLORATION POSSIBILITIES

Conventional Prospects — several prospects may be found and developed on the flanks of the Railroad Valley basin. The best prospects are probably on the east flank between the one-well Currant field to the south of the Grant Canyon field. Other prospects may be found on the west flank from Trap Spring field south to Sans Spring. Useful exploration surveys for prospect lead areas include photogeology, soil gas surveys, gravity, magnetic and 2-D seismic surveys. To reduce risk, 3-D seismic surveys should be used to determine the initial exploration well locations.

Unconventional Prospects — the most prospective area is in the deepest part of the basin in the “cooking pot” area of mature Chainman shale source rocks with vitrinite reflectance (Ro) greater than 0.7% (Meissner, 1995). Figure 15 shows this “mature” area between Eagle Springs and Trap Spring field and extending south toward Sans Spring and Grant Canyon fields.

There is only one well that has drilled the entire Chainman shale section within this “cooking pot.” In 1985 and 1986 the Milestone/Meridian No. 32-29 Spencer-Federal (SW/4, Section 29, T9N-R57E) drilled the entire Chainman shale and TD’d in the Mississippian Joana limestone at 14,505 feet. French (1994b) detailed the prospect concept, drilling and testing of this well which produced 86 BO from mostly the Chainman shale. Mature source rocks were present in both the Sheep Pass formation and the Chainman shale.

Formations drilled in this well are:

<table>
<thead>
<tr>
<th>Formation</th>
<th>Depth</th>
<th>Thickness (feet)</th>
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</thead>
<tbody>
<tr>
<td>Valley Fill</td>
<td>Surface</td>
<td>9,510</td>
</tr>
<tr>
<td>Garrett Ranch Volcanics</td>
<td>9,510</td>
<td>1,058</td>
</tr>
<tr>
<td>Sheep Pass</td>
<td>10,568</td>
<td>828</td>
</tr>
<tr>
<td>Chainman shale</td>
<td>11,396</td>
<td>2,454</td>
</tr>
<tr>
<td>Joana limestone</td>
<td>13,850</td>
<td>655</td>
</tr>
<tr>
<td>Total Depth</td>
<td>14,505</td>
<td></td>
</tr>
</tbody>
</table>

This large unexplored area (approximately 27 sections) in the deeper portion of this basin with mature source rocks and 58 barrels of free oil will be a future target for a “resource” exploration program utilizing 2-D and 3-D seismic surveys, initial vertical wells and then horizontal wells.

CONCLUSIONS

The Railroad Valley Basin thus far has nine oil fields. Four of these fields — Eagle Springs, Grant Canyon and Kate Spring — have each produced over 2,000,000 BO. Grant Canyon with 21,407,314 BO is the largest. Common features of these fields are:

- Oil is sourced by mature formations (Sheep Pass and Chainman) in the deep part of the basin.
- Oil reservoirs are below (or near) unconformity “A” which separates the Valley Fill from older rocks.
- Top seals for the oil reservoirs are basal Valley Fill sediments in most fields. Trap Spring field is probably sealed by a volcanic tuff (ash flow) at the top of the Garrett Ranch Group.
- The best four fields have thick oil columns ranging from 300 to 2100 feet.

Many wells in the Railroad Valley Basin have produced oil at high sustained rates. The best well, Grant Canyon No. 4 produced at a rate of 4,700 BOPD for June 1991.

Railroad Valley Basin remains highly prospective for both conventional and non-conventional prospects.

Louis C. Bortz, #1698, is an independent petroleum geologist in Denver, Colorado. He can be reached at fdbortz@aol.com.

Note: References were listed in Part One of this article which was published in the August 2015 SIPES Quarterly.
A Look at Some of the Cool Tools
by B. Wayne Hoskins, #2661, Mapsnapper — Euless, Texas

As the new chair of the SIPES Board of Directors’ Technology Communications Committee, I would like to begin with an article about some of the most useful tools I use to handle data. This committee has outlined a series of articles over the next year to address Neurolog, Geographix, and web-based data.

Lee M. Petersen, #2838, of the Fort Worth Chapter stated in his SIPES Quarterly article several issues ago, “your toolbox is the most powerful asset a professional can have.” We spend a large amount of our time handling data. Estimates range from 25 to 80% depending upon the task at hand. Most of us now deal with digital data, ranging from well data, Geographical Information System (GIS) data, contouring, posting statistics, and so on.

A very powerful piece of software is GlobalMapper (Figure 1), distributed by Blue Marble, www.globalmapper.com. It licenses for five hundred dollars, and provides the most user-friendly manipulation of data of any other software. GlobalMapper imports and exports all recognized formats of data. It transforms from one projection to another with mathematically correct calculations, and takes no shortcuts like most other software does. GlobalMapper also provides a GPS interface that works interactively in the field. It has a fast learning curve and excellent tutorials. Any data may be searched by any attribute and highlighted on the screen. Attributes may be added to any element of data. If you find a bad elevation, just fix it! Any data may be manipulated on screen using the digitizing menu.

One of the most powerful features is choosing a mapping projection, which is typically not the same as any of the data to be loaded, with the first data loaded. All other data loaded, regardless of projection, is transformed into the host projection. I regularly have layers for a digital topographic map, digital aerial or satellite, well locations, contours, faults, land grid, lease data, digital elevation model, pipelines, and other hazards affecting the field operation all with different projections. Even text files containing coordinate information may be imported with a little formatting (see UltraEdit below), so that any miscellaneous data may be added. Export a prn file from spreadsheets and the same is true. Any of the data may be color coded and labeled. The list of features is way too long to detail here, but is shown on their website.

Once all the data is loaded, each layer may be exported in your favorite format in your projection for import to other software. This eliminates all the guess work.

Another piece of software is a powerful text editor I use almost daily, UltraEdit (Figure 2) from www.ultraedit.com. Cheap and will do anything to a text file. It will even

(Continued)
Figure 3.

Figure 4.

(Continued)
handle several thousand lines of data. Changes, reformatting, replacement, copy and paste of large blocks of data are a cinch.

If you are not familiar with Winzip, www.winzip.com, get it. Large amounts of data can be compressed and sent via e-mail without triggering spam or file type blockers. In Figure 3, 4.14 megabytes of data files, none of which will pass an e-mail filter, is compressed to 2.3 megabytes.

Didger by Golden Software is a handy tool for digitizing on the screen, www.goldensoftware.com. It imports most data types, but needs consistent projections and types (see GlobalMapper on page 28). I have recently retired both of my digitizers, a full table model and a desktop model. We now have any paper maps scanned at high resolution, import them to Didger, and generate digital products for land grid, property ownership from tax offices, and hand drawn contour maps (Figure 4).

Helpful hint: use a tethered mouse; the wireless kind are not precise enough.

I expect these tools will be useful to you. Any other suggestions are welcome and will be included in future articles; e-mail me at hoskins@Mapsnapper.com.

Wayne Hoskins

The SIPES Foundation Video Film Library at sipes.org includes over 150 titles available for streaming, dating from 1989 to 2015, with more added all the time! If you do not currently have an account on sipes.org and would like access, please contact the national office at sipes@sipes.org or (214) 363-1780
This year the SIPES Foundation received 14 applications for scholarships in earth science curriculums. While all candidates were well qualified, our budget limited us to the top ten as ranked on scholastic achievement, references, and financial need. We awarded these ten (10) scholarships for a total cash outlay of $26,500, from Foundation and chapter funding. A SIPES press release in late October detailed these results naming the individual winners, their major, and university affiliation.

The 2015 awards mark the 34th year of the SIPES Foundation scholarship program. From modest beginnings with one (1) scholarship awarded in 1982, we have managed to provide 235 individual scholarships to students pursuing degrees in earth science. While the details are not available (many of the early records prior to computerization have been shredded), I have estimated the SIPES Scholarship Program through 2015 to be in excess of $375,000 awarded to students. An impressive figure by anyone’s standards.

We have, however, managed to collect some statistics since 1997. During the past 19 years we have received a total of 480 student applications from 57 different universities. Almost 70% of these student applications (331) came from 25% (14) of the universities. These 14 universities also accounted for 66% of the total scholarships being awarded to students during this time period.

Most of these award-winning students come from universities in states that also host SIPES local chapters like Texas, Oklahoma, Colorado, and Louisiana, but some do not, such as West Virginia and Kansas. The top three in the list of 14, ranked by the number of student applications, are the University of Texas at Austin (76 applications), the University of Oklahoma (55), and the Colorado School of Mines (31).

When we look at the total number of awards presented, the lineup shifts slightly for the top three, with the University of Oklahoma in the top slot (19 scholarships awarded), followed by the Colorado School of Mines (14) and the University of Texas at Austin (12). The order, based on number of awards, shifts dramatically for the other 11 universities.

But things really get shaken up if we look at the percentage of scholarships awarded per applications submitted. The top three in this case include Rice University and the University of Louisiana at Lafayette (including the previous designation as the University of Southwestern Louisiana) with 50% winning scholarships, but only the Colorado School of Mines remained in the top three list with 45%. An interesting side note is that the University of Texas at Dallas moved up to 4th place on this list compared to 14th place in the ranking by number of applications submitted. So it’s not just about the number of applications the Foundation receives.

We do not have records of the number of applications submitted prior to 1997, but we do have award totals throughout the entire 34-year time span. When we look at total awards, the top five schools are Colorado school of Mines (21 scholarships), University of Oklahoma (20), University of Louisiana at Lafayette (14), University of Texas at Austin (13) and the University of Texas at Dallas (13). Additionally, the top 14 universities account for 60% of the total awards presented to students from the SIPES Foundation.

While these statistics suggest we are top-heavy in just a few schools, we find that a little over 80% of the universities with students submitting applications have received at least one (1) scholarship award. But nearly 30% of all these universities are represented by only a single (1) student application, and 35% of these single applications have been awarded scholarships. One caveat, in 2007 (see figures 1 and 2) there were only five (5) student applications resulting in only four (4) scholarships being awarded. This is not about what school you’re from, but about whether we get the applications to review. So it’s up to the membership to be sure that the universities continue to get their students to submit applications to the Foundation. From the university’s perspective, the more applications the better their chances of having a winner.

Figures 1 and 2 are graphs of the number of applications received per year and the number of scholarships awarded per year from the top 14 list. In Figure 1, we see that the trend in the total number of applications received from this list is decreasing over the last 19 years. But as Figure 2 illustrates, the number of awards granted are on the rise. This increase in awards is the expected result from our continued efforts to increase funding for the scholarship program, and additional contributions from the chapters. But if the number of applications continues to decline we may find ourselves in a position of being overfunded. So again, the membership needs to be sure to promote the scholarship program at any and all universities providing an earth science curriculum.

One last brief statistic compares the degree programs and the major curriculums. Over a 34-year history of awarding scholarships, 26% have been for Bachelor’s degrees, 50% for Master’s degrees, and 24% for Ph.D. degrees. Obviously, 

(Continued)
geology and engineering dominate the earth science curriculum, but there have been a few in the environmental, hydrology, and atmospheric fields, and recently one that was listed as museum/field methods. So we do take students from peripheral curriculums with a geoscience background. These peripheral studies are listed as the other category below.

So what does the distribution of the degree programs by earth science major show us? For Bachelor’s degrees, 50% are in a geologic curriculum (includes geophysics), 47% are in engineering, and 3% are in the other category. For Master’s degrees 88% are geologic, 10% engineering and 2% other. And for Ph.D. degrees 94% are geologic with the remaining 6% in engineering.

The decline in engineering scholarships with advanced degree appears anomalous, but is likely explained by the perceived lack of need for advanced degrees to pursue petroleum engineering careers. Similarly, the perceived need for a Master’s degree to pursue a geologic career explains the dominance for that degree level (50%) over the others.

While playing with statistics is fun and sometimes meaningful, I’ll let you draw your own conclusions from what I’ve presented here. For me the significance is that we have established a presence at many major universities across the country and potentially gathered recognition and perhaps some respect for our society. A follow-up analysis might be to see how many of these scholarship awardees have established successful careers in earth science, and how many have gone on to become SIPES Members.

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FOR IMMEDIATE RELEASE
October 16, 2015

Contact: Diane Finstrom – sipes@sipes.org
Dallas, Texas
Telephone 214-363-1780

Dallas, Texas – The SIPES Foundation, overseeing the scientific, educational and charitable programs of the Society of Independent Professional Earth Scientists, is pleased to announce that ten outstanding earth science and engineering students have been selected to receive scholarship awards this year. Applications were accepted from currently-enrolled, upper-division or graduate students who are U.S. citizens studying any field of earth science or engineering, and who have a cumulative grade point average of 3.5 or higher.

Receiving $3,000 awards from the Marvolene Speed Bennett and Carleton D. Speed, Jr. Endowed Fund; the Stephen E. Collins Memorial Scholarship Fund; and the Edward A. McCullough Endowed Fund are Jason A. Hallman, a master’s degree student in geology at the University of Kansas; Marie G. De los Santos, a master’s degree candidate in geoscience at the University of Arizona; and Eric S. Bergersen, a master’s degree student in geological sciences at the University of Texas at El Paso.

Receiving a $2,500 award funded by a gift from the SIPES Midland, Texas Chapter is Christopher R. Pate, a master’s degree student in geology at Sul Ross State University.

Also receiving $2,500 awards are Ani M. Pytlewski, a master’s degree student in geology at California State University Long Beach; Racha Trabelsi, a doctoral candidate in systems engineering with a concentration in petroleum engineering at the University of Louisiana at Lafayette; Kathryn N. Garrett, a master’s degree student in geology at the University of Oklahoma; Dustin T. Perriguy, an undergraduate student in earth and planetary science at the University of New Mexico; Lauren E. McGraw, an undergraduate student in geology at the University of Oklahoma; and Stephen J. Graham, a master’s degree candidate in geology at Rutgers University.

Since its founding in 1981, the SIPES Foundation has awarded scholarships to 225 promising earth science and engineering students. Funding for the 2015 awards was made possible through generous donations from SIPES Members; bequests from the Foundation’s endowed funds above; and from a designated gift from the SIPES Chapter in Midland, Texas. The SIPES Foundation also conducts and films educational seminars, contributes funding to earth science publications and continuing education programs, and maintains an extensive library of earth science films.

The Society of Independent Professional Earth Scientists is a national organization of more than 1200 self-employed geologists, geophysicists and engineers engaged primarily in domestic energy exploration and development. SIPES has twelve chapters located in oil and gas centers of the United States. Applications for the SIPES Foundation Earth Science Scholarships are available on the SIPES website annually after March 1.

###
SIPES Vision Statement

To be the pre-eminent organization for furthering the professional and business interests of independent practitioners of the earth sciences. In achieving this vision, emphasis will be placed on (1) professional competence, (2) professional business ethics, and (3) presenting a favorable, credible and effective image of the Society.

Adopted by the SIPES Board of Directors
September 21, 1990