KANSAS GEOLOGICAL SOCIETY

BULLETIN

Volume 86 Number 5 September—October 2011

Established 1925

IN THIS ISSUE

KGS Shooting Clays

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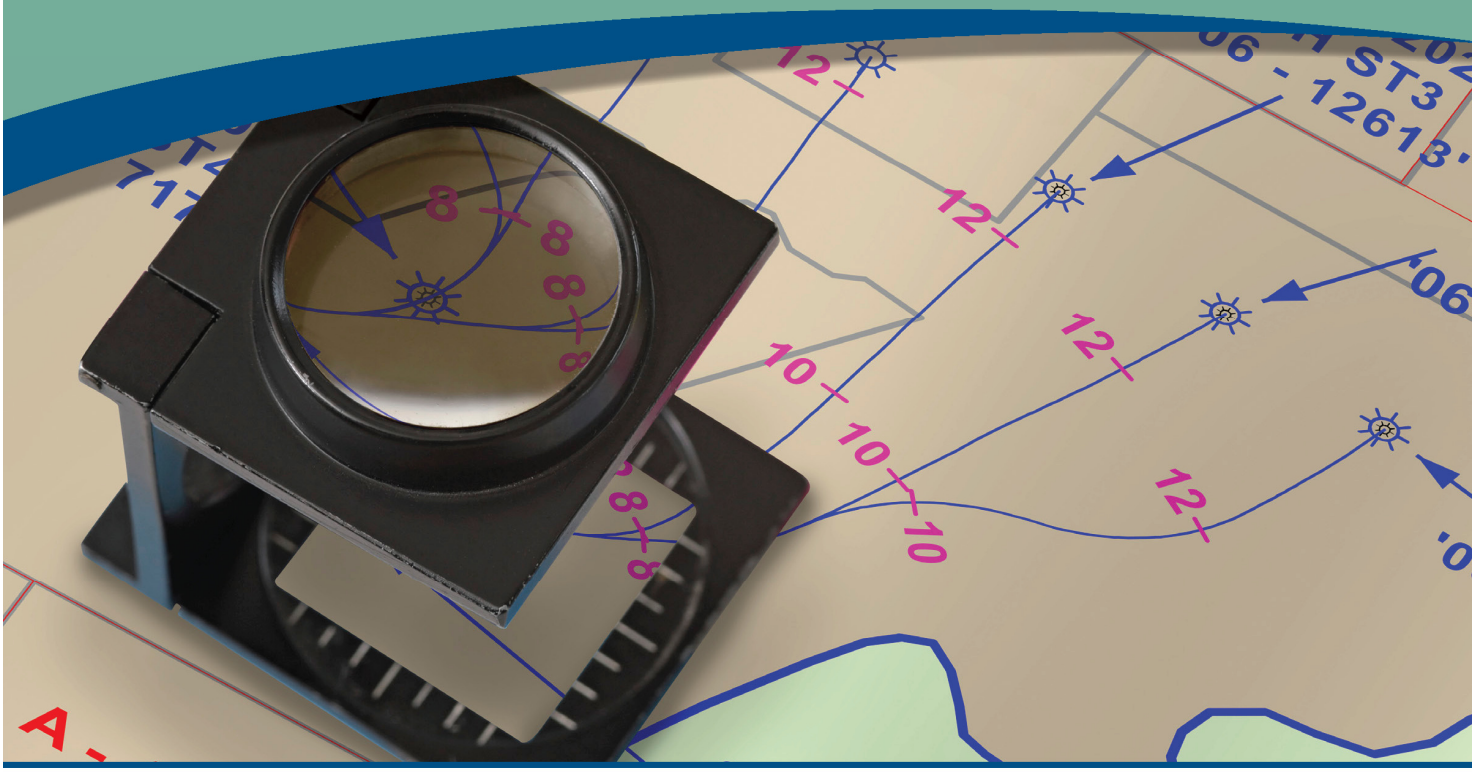

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Table of Contents

ON THE COVER:

Friday, October 7th will be the KGS Shooting Clays Tournament at Lynbrooke Sporting Clays South of Augusta, Kansas

See registration flyer inserted in this issue
Or On-Line at www.kgslibrary.com (look on the Events Tab)

CALL FOR PAPERS

The Kansas Geological Society Bulletin, which is published bimonthly both in hard-copy and electronic format, seeks short papers dealing with any aspect of Kansas geology, including petroleum geology, studies of producing oil or gas fields, and outcrop or conceptual studies. Maximum printed length of papers is 5 pages as they appear in the Bulletin, including text, references, figures and/or tables, and figure/table captions. Inquiries regarding manuscripts should be sent to Technical Editor Dr. Sal Mazzullo at salvatore.mazzullo@wichita.edu, whose mailing address is Department of Geology, Wichita State University, Wichita, Kansas 67260. Specific guidelines for manuscript submission appear in each issue of the Bulletin, which can also be accessed on-line at the Kansas Geological Society web site at http://www.kgslibrary.com

SOCIETY Technical Meetings

Fall 2011 Schedule

Sept. 6— Dave Edwards, Principal Engineer Geotechnical Services, Inc.— *"Installation & Design of the Bentonite Barrier Wall at Boeing Landfill"*

Sept. 20— Greg Armstrong, Sr. Environmental Scientist—Geotechnical Services, Inc.— *"Wichita WRAPS Program (Watershed Restoration & Protection Strategy)"*

Sept. 27— Doug Davis, President KGS— *"Are We Running Out of Fossil Fuels?"*

Oct. 14—Beau Morris— *"Sedimentology and Diagenesis of Mississippian (Kinderhookian and Osagean: Tournaisian and Visean) Buildups in Soutwest Missouri, Northwest Arkansas, and Northeast Oklahoma"*

Oct. 18—Dr. Roger Slatt, OU—TBA

Oct. 25—Dr. Stanley Paxton—USGS—TBA

Nov. 1—Don Steeples— *"Earthquakes"*

Nov. 15—TBA

Nov. 22—TBA

Dec. 6—TBA
Dec. 20—TBA
Dec. 27—TBA

Location for Technical Meetings

*All KGS technical presentations are held at 12:30 p.m. at the **Wichita Bar Association**, located at **225 N. Market**, ground floor conference room, unless otherwise noted.*

Note: For those geologists who need 30 points to renew their licenses, there will be a sign-in sheet at each presentation and also a certificate of attendance.

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The KGS *Bulletin* is published bi-monthly by the Kansas Geological Society, with offices at 212 North Market, Wichita, Kansas 67202 The purpose of the *Bulletin* is to keep members informed of the activities of the Society and to encourage the exchange and dissemination of technical information related to the Geological profession. Subscription to the *Bulletin* is by membership in the Kansas Geological Society. Limited permission is hereby given by the KGS to photocopy any material appearing in the *KGS BULLETIN* for the non-commercial purpose of scientific or educational advancement. The KGS, a scientific society, neither adopts nor supports positions of advocacy, we provide this and other forums for the presentation of diverse opinions and positions. Opinions presented in these publications do not reflect official positions of the Society.

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Bulletin committee members and PhD's in Paleontology are prohibited from entering.

The Kansas Geological Foundation has a Speaker's Bureau which provides speakers to organization, schools, etc. If you would have material you would like to present as a member of the Speaker's Bureau, please contact Bob Cowdery at 316-267-9030 or sbc@southwind.net

President's Letter

Dear Members,

Greetings fellow geologist, I hope that you have survived this long hot summer. As I writing this letter I have been checking the thermometer to see if the temperature will reach 100 degrees again for the 49th time. Even though it was 105 degrees we had a good turnout for this year's annual picnic. The picnic committee is reviewing and trying to determine if we should move the picnic to May in 2012. Please communicate to them your feelings about this topic with Marjorie, Rebecca, or any board member. I am in favor of trying a change.

As I had indicated in my previous letter, Randy Tetter and the Fishing Tournament Committee have moved the tournament to Pratt County Lake on September 16th. Also, the Sporting Clays Tournament is scheduled for October 7th. Sign-up sheets are posted in the library or you can telephone or fax in your desire to attend.

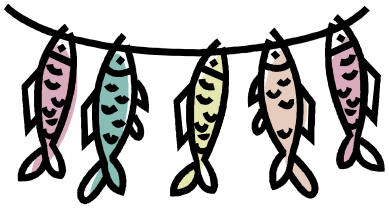
Bob Cowdery has returned from Pagosa Springs, and has his fall lecture program schedule nearly finished. His first lecture is September 6th with Dave Edwards of Geotechnical Services, will be talking about the environmental programs ongoing at Boeing Wichita.

Bob Cowdery and Larry Richardson are working on a continuing education class in Petroleum for Geo-Techs. This class will be offered in late October. Also, Dr. John Doveton, of the KGS, has agreed to teach a class in logging. This will be open to anyone in the society, and will also be available for credit for geology students through Wichita State. This class will probably be taught 2 hours a night for a week, in January prior to the beginning of spring semester. Again, Bob Cowdery will be developing this with Dr. Doveton.

I would like to invite all our members to the Regional AAPG Meeting October 1-4 in Oklahoma City this year. If you want to sign-up go to the AAPG website or the Oklahoma City Geological Society website. This should be a very good meeting this year. Besides the usual programs and papers, there will be a "Mississippian Symposium" all day Tuesday. Our own Sal Mazzullo and Brian Wilhite will be co-chairing this event. Let's teach our Oklahoma competitors about Mississippian Depositional Environments, and just maybe we can learn a few things from them.

Also, I would like to invite you to the library to see the memorial plaque placed there by the family of Craig Caulk. It is a beautiful plaque honoring a good geologist.
See you this fall!

Respectfully submitted,
Douglas V. Davis



KGS Fishing Tournament
September 16th

Will be held at the
Pratt County Lake

See the web site for the
registration flyer

ADVERTISER'S DIRECTORY

ADVERTISER'S RATES: 2011

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From The Manager

Dear Members,

Will summer temperatures ever cool down? I am sure we will be complaining about the cold soon enough but this has been an extraordinary summer.

The hot temperatures haven't slowed the oil patch down much. We remain very busy in the library, especially adding new members to the Society, paper library as well as the Walters Digital Library.

We are also seeing an end to the paper backlog of data that has flowed from the KCC to us. Operators are now required to submit their data electronically and this is helping all of us get the data in the files and on our web site in a much more efficient manner. There are always a few bugs to work out when a system changes as our has in Kansas but I think we will all appreciate this change once it is established and had time to prove itself.

We had a great picnic again this year, many thanks to Marj Noel for organizing! We have decided to change the time of year for the picnic. We are looking at possibly the first week in May, cooler temperatures and less conflict with such things as KIOGA's annual meeting. Let us know what you think as we are open for suggestions.

The next event will be the Bass Tournament which is being held at Pratt County Lake this year on Friday, September 16th. Randy Teter and Max Lovely are organizing this event. Then in a few more weeks, Friday, October 7th, we will have the KGS Annual Shooting Tournament. See the registration flyers for this event in this issue or pick one up in the library or get one on-line at www.kgslibrary.com (Events Tab).

The KGS will also have a booth at the AAPG Mid-Continent meeting in Oklahoma City Oct. 2,3, & 4th. Stop by the booth if you are attending—it's always nice to see our out-of-town members.

Respectfully submitted,

Rebecca Radford

Manager

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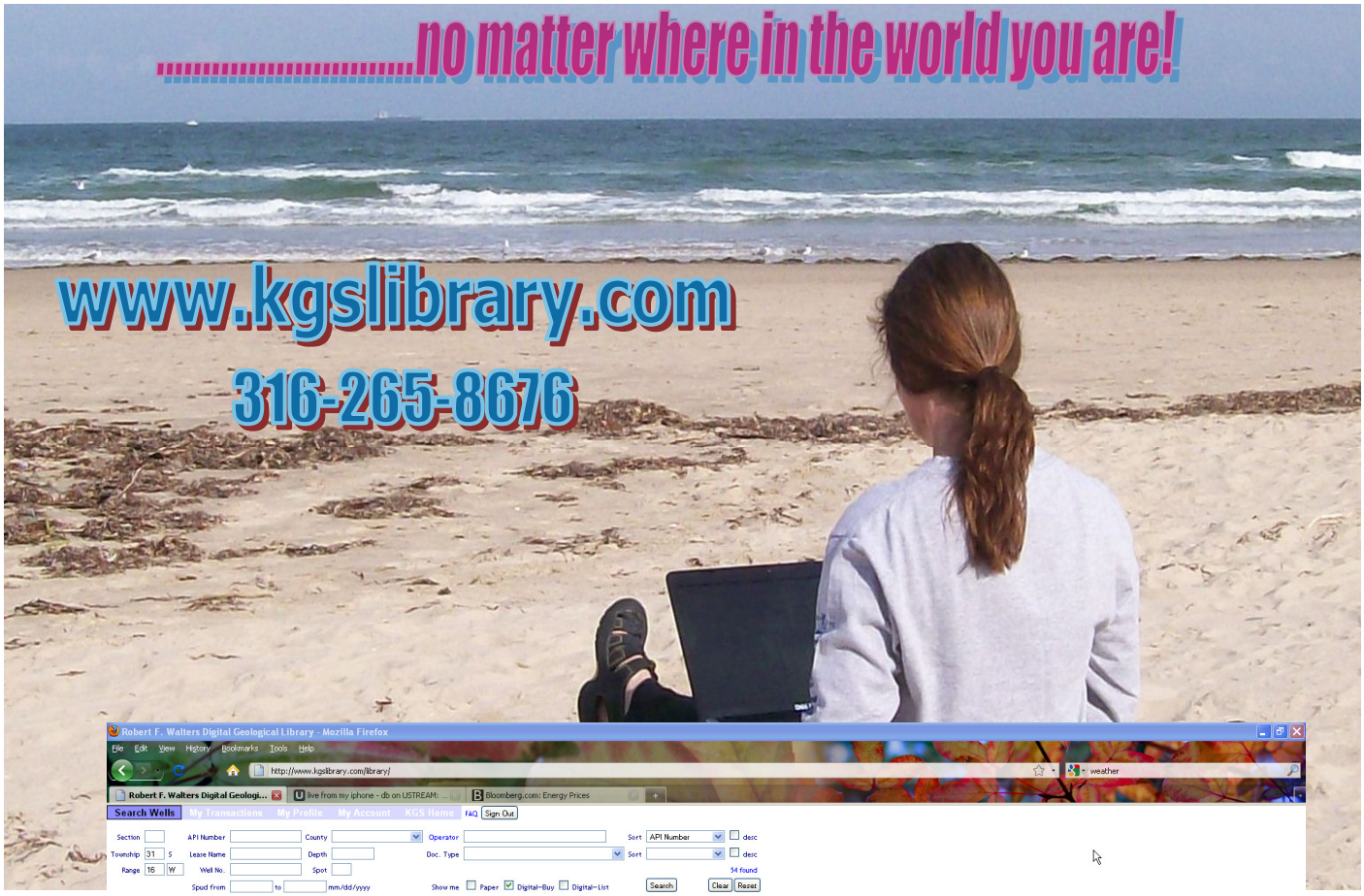

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The
2011 AAPG
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Terry Hollrah, General Chair:
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KGS Clay Shoot
Friday
October 7th

Lynbrooke Sporting
Clays Range

Starts at noon

See registration in this issue
Or
www.kgslibrary.com
Events Tab

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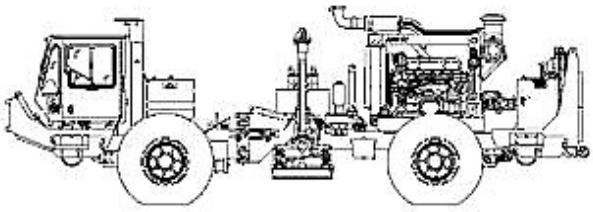

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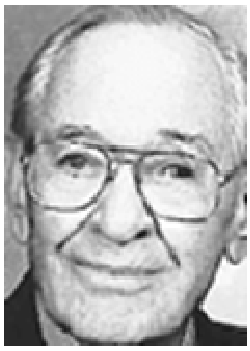
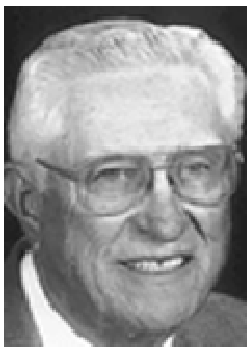
Memorials



Wayne E. Walcher

Walcher, Wayne E., 96, retired independent oil & gas producer/operator died Wednesday, July 13, 2011. Memorial service was held on Friday, July 22, at Plymouth Congregational Church in Wichita, KS. Wayne was born in a farm home in Sumner County, KS. His parents were George & Bessie Walcher. He attended a country school, graduated from Wellington High School, and graduated from Wichita University with a B.S. degree in geology. He worked his way through college during the economic depression years in Wichita by carrying a large newspaper route and working part time for Gulf Oil Co. In June 1941, he graduated from University of Illinois with a M.S. degree in geology. He was a petroleum geologist for Gulf Oil Co., Lario Oil Co., and J. M. Huber Corp. before becoming an independent consulting geologist in Wichita in 1949. In recent years he and his son, Doug, an engineer, have worked together operating oil & gas producing leases in Kansas. Wayne served a term as vice president of the Kansas Geological Society, and was a member for over 50 years. He held membership for more than 60 years in the American Association of Petroleum Geologists. He served on the national board of the Society of Independent Professional Earth Scientists. He and his wife, Jewell, have been members of Plymouth Congregational Church for over 50 years. Wayne was preceded in death by two brothers and two sisters. Survivors include: loving wife for 70 years, Jewell; son, Douglas A. Walcher (Patricia) of Andover, KS; daughter, Debra L. Hoyle (Greg) of Bellevue, WA; granddaughters, Kathryn Koch (Jeff) of McLouth, KS, and Julie Ramsey (Jim) of Scott City, KS; grandsons, Brian Phillips (Brittani) of Charlotte, NC, and Todd Phillips of Berkley, CA; four great grandchildren, several nieces, nephews and cousins. Memorials have been established with Plymouth Congregational Church, 202 N. Clifton Ave., Wichita, KS 67208; Kansas Geological Foundation, 212 N. Market, Ste. 100, Wichita, KS 67202; and Larksfield Health Care Center, 2828 N. Governeour, Wichita, KS 67226.



Henry F. Filson

Filson, Henry F. 83, retired Geologist - Geophysicist, passed away Thursday morning, July 28, 2011, with his family at his side. He was born in Tulsa, OK to Charlie and Verne (Langley) Filson. Hank graduated from Wichita East High School in 1946. He served in the US Marine Corp and then went on to earn his BS degree from Kansas State University. While at college, he was a member of the Alpha Tau Omega (ATO) fraternity. Besides enjoying his lifelong passions for Geological work and following K-STATE sports, he was involved in numerous hobbies / interests. Hank was an amateur radio operator, an instrument certified private pilot, amateur photographer, golfer, and avid bass fisherman. He was preceded in death by his daughter, Linda Marie and his parents. He is survived by: his wife of 60 years, Beverly (Pocock) Filson; daughter, Cheryl Baker and her husband, Jeff of Tulsa, OK; grandson, Brian Michael May of Tulsa, OK; granddaughter, Jamie Filson May, of Stillwater, OK; brother, Jim and his wife, Beth of Oklahoma City, OK; and nephews, nieces and their families. The service was held Tuesday, August 2, at Eastminster Presbyterian Church. Memorials have been established with the Kansas Geological Foundation, 212 N. Market, Wichita, KS, 67202 and Eastminster Presbyterian Church, 1958 N. Webb Rd., Wichita, KS 67226.

Memorials

Thomas E. Ray

Thomas Edward Ray 80, of Wichita, KS. passed away peacefully with his family by his side, Thursday, July 7, 2011, following complications from heart surgery at Galichia Heart Hospital. Funeral services were held on Wednesday, July 13, 2011 at Downing and Lahey Mortuary, followed with burial in Blackwell, OK. at the Blackwell Cemetery. Born May 11, 1931 in Ponca City, OK., to Glenn and Margarett Ray, Tom moved at a young age to Blackwell, OK where he grew up. Tom was a member of the Oklahoma National Guard and served his country in the Korean War as a forward observer from 1950-1952. Upon returning home from Korea, he met and married Erlene Morey in 1953, and earned his degree in Geology from Oklahoma A&M in 1956. He spent his 43 yr. career working in the oil and gas industry with Continental Oil Co., which included living 9 years on the Louisiana gulf coast, and Lario Oil and Gas in Wichita until his retirement in 1999.After retirement, Tom enjoyed golfing, listening to soft jazz, driving his boat on Lake of the Ozarks, and spending time with family. He also coached football for a time, at Highland Community College. He is preceded in death by his parents, Glenn and Margarett and his brother, Michael Ray. Survivors include daughter, Jennifer McLean (Steve), Lake Oswego, OR; daughter, Andrea Moore, Wichita, KS; grandchildren, Brittany and Keaton McLean, Lake Oswego, OR and Taylor Moore, Wichita, KS; sister, Sue Ray Dutton, Wichita, KS and brother, Robert Ray, Alpharetta, GA. A memorial has been established with the American Heart Association .

Kansas Geological Society Board Minutes

Condensed version for Bulletin

August 9, 2011 Mr. Doug Davis called the meeting to order at 11:31 a.m.

FINANCIAL REPORT/MANAGERS REPORT

- **A.** **Treasurer's Report-** Mrs. Noel presented us with the Treasurer's report for July 2011. Mrs. Noel noted a correction in the estimated interest for the month and for the year on the CD obtained from Relianz Bank in April. The interest earned had been computed on 12 months instead of the 13 month term of the CD. The earliest a CD will be maturing is December 22, 2011 at Kanza State Bank.
- **B.** **Manager's Report-** Mrs. Radford presented the Manager's Report for July 2011. Monthly income was $63,552.21 and expenses were $46,089.33, making the profit $17,462.88 for the month. Mrs. Radford noted that there is $14,244.14 in Accounts Receivable that is over 120 days due and that most of the amount is from two people. Mrs. Radford stated that on August 4th, there were 202 Walters Digital Library members.

OLD BUSINESS

- **A.** **Continuing Education** - Larry Richardson will teach a 1 or 2 day course in Subsurface Geology, based on the class that Larry is teaching at WSU. Bob Cowdery is scheduling the course for this fall.
- **B.** **WDL Committee** - Mrs. Noel reported the Kansas Geological Survey programmers are continuing to work on a link from their website to the WDL website that will provide a written list or paper data and a thumbnail image of digital data available for purchase.

NEW BUSINESS

- **A.** **KGS will host the 2013 AAPG Mid-Continent Section Meeting** – Alan DeGood & Doug Davis will be Co-Chairman for the meeting. The meeting will be at the Airport Hilton on September 7-10, 2013. The theme of the meeting will be "New Technology Integration - Mature Petroleum Regions"
- **B.** **Continuing Education** – Bob Cowdery is arranging for an Electrical Logging course that would be taught by John Doveton, with the Kansas Geological Survey.

ADJOURNMENT- *Mrs. Saenger moved to adjourn the meeting at 12:46 p.m. and the motion passed unanimously.*

Respectfully submitted, Robert Milford, Secretary

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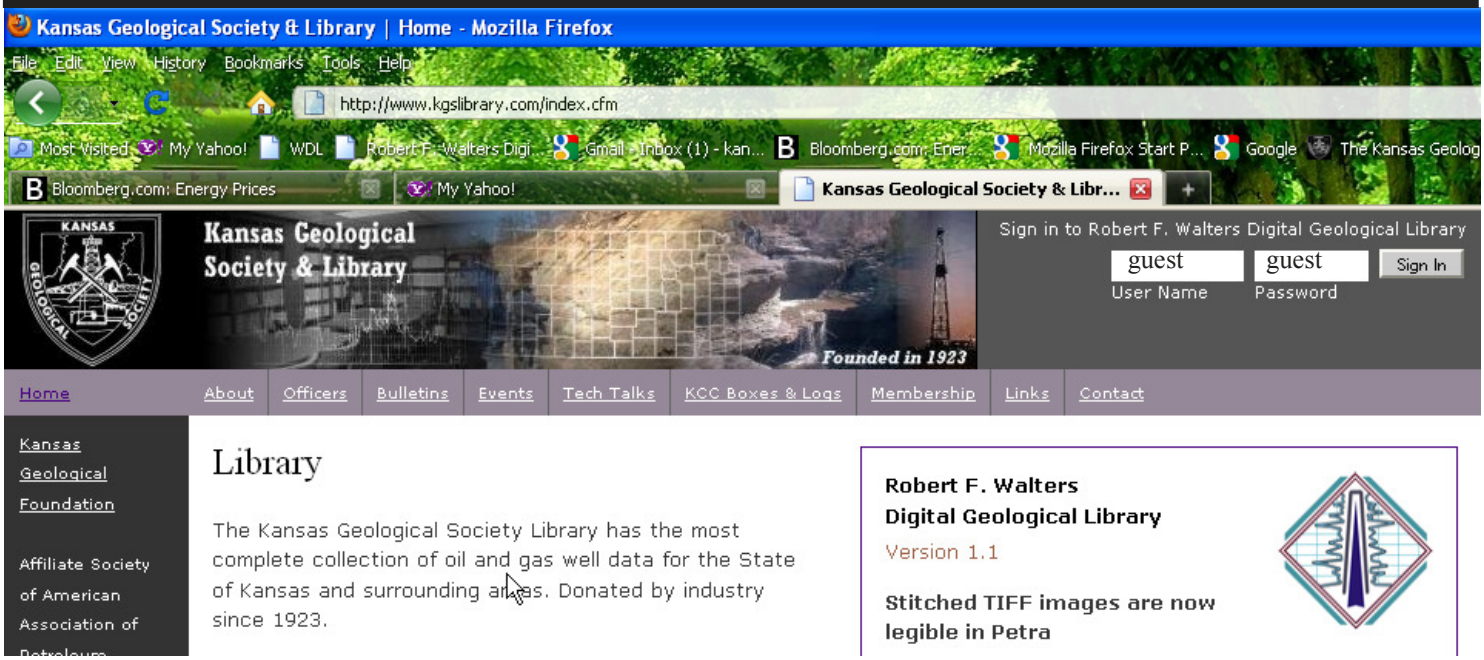

FYI
Are you aware??????

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A COMPARISON OF KARSTIFICATION IN THE EL DORADO OIL FIELD TO OTHER MAJOR ARBUCKLE OIL FIELDS IN KANSAS

Paul J. Ramondetta
Vess Oil Corp.
Wichita, Kansas

El Dorado is an areally large (40 mi^2), giant (>300 MMBO) oil field that is situated along the crest of the Nemaha Ridge in south-central Kansas (Figure 1) (Ramondetta, 1990). The Nemaha Ridge is a buried linear feature of regional geologic importance that strikes NNE-SSW and which stretches far to the northeast in Iowa and to the southwest toward Oklahoma City. Discovered in 1915, El Dorado Field continues to be a focus of exploration interest, activity, and innovation as it is still producing over 1400 BO per day. The field was discovered by mapping surface beds in the Permian Chase Group, which led to the drilling of the Stapleton #1 well in 1915 (Fath, 1921; Reeves, 1929). An earlier well was drilled that same year by the city of El Dorado, but it barely missed discovering oil because it was drilled along a narrow band of deep, unproductive sinkholes that separates two adjoining productive domes (Figure 2). The field has produced well over 306 million barrels of oil since its discovery, and that number is probably grossly understated as early flush production in 1916-1918 probably was not tabulated. The multiple pay zones in the field range in depth from 550-2700 ft.

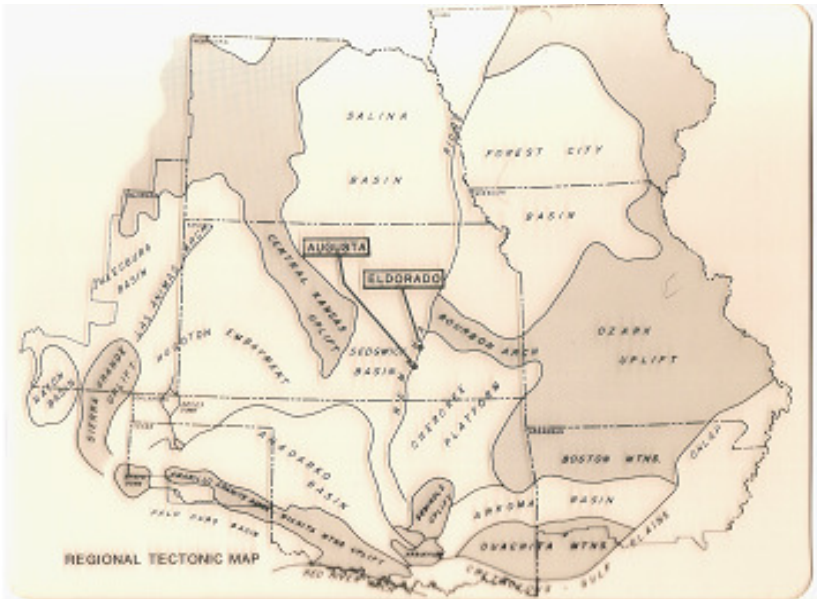

Figure 1. Location of El Dorado (and Augusta) oil fields along the Nemaha Ridge in Kansas.

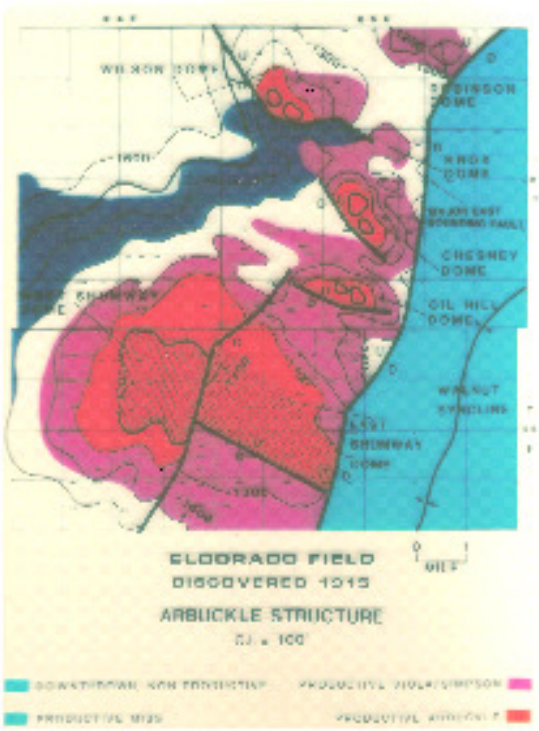

Figure 2. Geology of the El Dorado Field.

GEOLOGICAL HISTORY AND RESERVOIR DEVELOPMENT

Late Cambrian marine transgression over the flat, peneplaned Precambrian terrain resulted in the deposition of more than 600 ft of Arbuckle carbonates on the ancient granite basement in Kansas. Shallow marine carbonate sedimentation was cyclic, comprising stacked upward-shoaling cycles of roughly 3-15 ft thick or more (Franseen, 1994, 2000). Diagenesis, notably dolomitization, gave rise to good vuggy and intercrystalline porosity in the upper parts of individual cycles (Ramondetta, 1990). It is likely that periods of subaerial exposure occurred at the ends of some of these cycles, resulting in some associated karsting and dissolutional porosity development.

A major episode of erosion, subaerial weathering, and karstification occurred at the end of Arbuckle time, resulting in cavern and more associated porosity development. Approximately 70 ft of sandstone and shale were deposited during Simpson time (Middle Ordovician) on the eroded surface of the Arbuckle and filled in some of the karsted features such as sinkholes and caverns, and was then itself exposed. An additional 40-50 ft of Viola and Hunton carbonate rocks were later deposited on the partly eroded Simpson, and these rocks subsequently were exposed and eroded. All three Ordovician stratigraphic units (Arbuckle, Simpson, and Viola) are major producing horizons within El Dorado Field (Ramondetta, 1990).

The next round of marine deposition in the field area occurred during Mississippian (Kinderhookian and Osagean) time after a long period of subaerial exposure. These rocks total approximately 400 ft of carbonates and cherts. The region then underwent another long period of uplift and exposure as large fault blocks were uplifted and tilted, adding new structural definition to the region and forming the

domal areas recognized today (e.g., Chesney Dome, Wilson Dome, Robinson Dome, Shumway Dome, and Oil Hill Dome)(Figure 3). Ensuing erosion resulted in the entire previously-deposited Paleozoic section, and thick and areally irregular parts of the Arbuckle, to be removed along most of the domal areas. At least 1200 ft of pre-Pennsylvanian rocks had been deposited, and roughly 1000 ft of it was removed by erosion at the apex of the West Shumway Dome, which is the highest point in the El Dorado Field. Here there is less than 200 ft of lower Arbuckle strata on top of Precambrian granite basement. The weathered cherts of the Osagean strata are also important oil reservoirs that are preserved only in the lowest troughs between the various domes in the area.

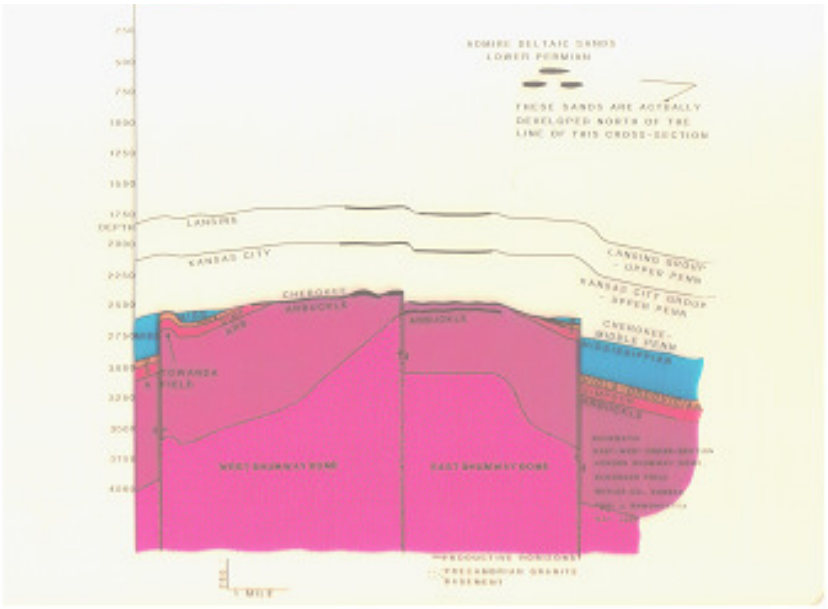

Figure 3. Cross-section of El Dorado Field.

A second major period of cavern and sinkhole development of Paleozoic carbonate rocks in the region reached a maximum during that long period of subaerial exposure from post-Osagean through pre-Desmoinesian time. ***This karsting cuts across structural grain*** and affected the entire pre-Pennsylvanian subcrop. This exposure enhanced fresh water invasions concentrated along bedding planes, joints, fractures and faults in the rocks and charged the pre-Pennsylvanian aquifers B which to this day are fresher than the connate waters above (Walters, 1958). Such karstification allows for extreme lateral and vertical communication throughout the Arbuckle reservoirs, and varying degrees of reservoir compartmentalization. ***There are all gradations between extreme karsting and separated unaffected bedded reservoirs in the section, with no two reservoirs being exactly the same***. In cavern systems, cave-roof collapse caused commonly highly permeable chaotic breakdown breccia to form, and such rocks contrast adjoining tight cave wall rock (Figures 4 and 5). Detailed facies classifications and descriptions of karsted Ordovician carbonates were done on Ellenburger outcrops in the Franklin Mountains around El Paso, Texas and in the subsurface Midland Basin (Kerans, 1988; Kerans et al., 1992), and they serve as analogs of such features in temporally correlative Arbuckle oil reservoirs in Kansas and Oklahoma. Extreme

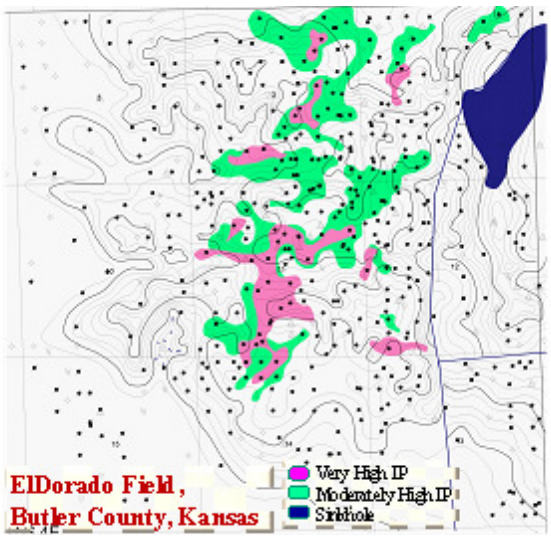

Figure 4. Map showing areas of moderate to very high permeability, and sinkholes, in the Arbuckle in El Dorado Field.

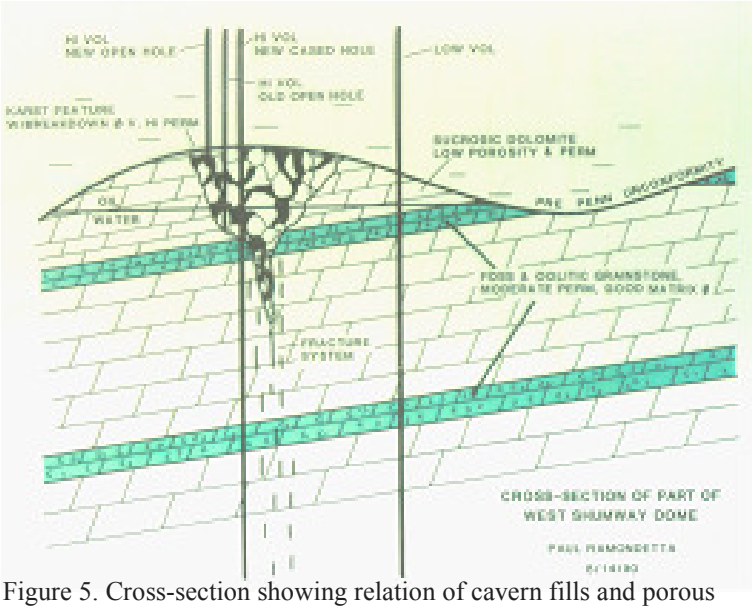

Figure 5. Cross-section showing relation of cavern fills and porous dolomites in El Dorado Field.

karstification and attendant dissolutional porosity development along the West Shumway Dome in El Dorado Field, for example, resulted in very high permeability in the Arbuckle. As a result, some early-drilled oil wells there had initial potentials in excess of 1000 BO/day to as high as 20,000 BO/day.

The resulting wide-open permeability system in the Arbuckle results in water production that cannot be pumped down with existing technology. In a sense, lakes of oil formed around flowing wells during the boom years of 1917-1918, and were soon replaced by huge volumes of oil-cut brine. Today, such wells operate with very high fluid levels that approach hydrostatic head of the reservoir, and with oil cuts of as little as 0.5%. These permeability conduits often are vertical and cut across bedding, and they make communication with bottom water in the reservoirs a certainty. Matrix porosity of the bedded dolomite reservoirs in the field can nonetheless slowly feed oil into the various dissolution-enhanced conduits in the reservoir system, thereby maintaining an economically viable oil cut for some wells that lasts many years. Incredibly, some of the original wells drilled in the field in 1917 are still producing oil as the powerful water-drive of the system continues to sweep oil laterally and vertically through the complex mosaic of collapsed karst caverns as well as the intercrystalline pore systems in the bedded dolomites in the field. Such reservoir dynamics explains the great longevity of the large Arbuckle oil fields of Kansas, for it is generally true that the depletion of iron from casing has been a more critical factor in well life than the depletion of oil from the reservoir. Hence, opportunities for re-drilling are present if first-generation wells had been previously abandoned because of bad casing, too much open-hole penetration, too much acid communication with bottom water, poor cement jobs, and so forth. ***Many Arbuckle re-drills have been successful over the years.***

The eroded and karsted complex of Mississippian and older Paleozoic rocks in the field area was buried and sealed beneath middle Pennsylvanian shales. A major northward migration of oil out of the Anadarko Basin occurred by the end of the Permian (Walters, 1958). The pre-Pennsylvanian angular unconformity throughout the southern midcontinent region was of great importance in this oil migration as it separates rocks of totally different age and character and provided a pathway for oil to move. Even associated connate waters have different chemical compositions and directions of flow and pressure below and above this unconformity.

COMPARISON TO OTHER ARBUCKLE OIL FIELDS IN KANSAS

The nature and style of pre-Pennsylvanian karstification of the Arbuckle is somewhat different between El Dorado Field and comparably large Arbuckle oil fields along the Central Kansas Uplift (CKU). Large karst-collapse valleys, for example, highly physically segment Arbuckle reservoirs/fields along the CKU but not so much in El Dorado Field. Along the CKU such collapsed valleys are filled with argillaceous Cherokee (Desmoinesian) deposits that form physical barriers across oil reservoirs (for example, Marcotte Field: Figure 6). Perhaps the greater depth of burial (past and present) along the CKU has been a factor in the development of such karst valleys. Another factor may be that the Mississippian cover over the Arbuckle in the El Dorado Field area took the brunt of post-Osagean to pre-Pennsylvanian erosion so that only the Mississippian is affected by such karst collapse valleys (that have since been eroded except in very low troughs). The preserved Mississippian section in low areas in El Dorado Field do have karst channels. In contrast, the CKU probably had little or no Mississippian cover prior to pre-Pennsylvanian karsting, so that karst valleys were incised directly into the Arbuckle. The length of time of this erosional episode must be fairly similar between El Dorado Field and the CKU, so it is reasonable to surmise that erosion of the Arbuckle had to be proportionately more extreme on the CKU. An exception to this general rule is the Gorham Field in Russell County on the CKU, which does not have karst valleys. It is an example of a field along the CKU in which practically all of the Arbuckle was eroded (Walters, 1991) as evidenced by local high basement hills along the pre-Pennsylvanian subcrop. Taken to the extreme, erosion collapse valleys will eventually coalesce until all that remains is a peneplaned granite basement.

The geomorphic karst cycle (Davis, 1930; Thornbury, 1969) defines the progression from a *youthful* carbonate upland during initial subaerial exposure, at which time a subsurface drainage system gradually replaces the surface drainage of down-cutting streams. These drainage systems are strongly influenced by the structure of the carbonate bedrock, including joint patterns. As the surface streams become more diverted into the subsurface, cavern development progresses until sinkholes and collapse channels dominate the *mature* landscape (such as along the CKU: Figure 6). An *old age* landscape is one in which the entire surface is peneplaned nearly to completely down to base level such as at Gorham Field, so that additional surface and subsurface erosion becomes minimal. Such an old age landscape can be rejuventated by uplift, and karsting may then resume provided that there are still carbonate rocks remaining to be dissolved.

Karsting results in compartmentalization within the Arbuckle, with varying oil-water contacts, although with surprisingly uniform reservoir pressure (roughly 850 psi in El Dorado Field). Apparently there are deeper pathways that tend to equalize pressure from below. Despite the overlying compartments that trap oil at variable subsurface depths. There is roughly 200 ft of oil-water contact relief across El Dorado, 70 ft across the Bemis field, and 50 ft across the Marcotte field.

Maximum depth of burial may be a factor in dertermining the maximum size of individual pore spaces in a given Arbuckle oil field. For example, polymer treatments have worked better in fields along the CKU than in El Dorado Field. Voids in high karst

areas such as at El Dorado field may be too large for polymers to set up as evidenced by their failure rate. In contrast, polymer treatment is widely used in Arbuckle fields along the CKU.

RELATIVE PRODUCTION

El Dorado Field has roughly 582 wells that produce 1450 BO/day for an average of 2.5 BO/day per well. The field has cumulatively produced in excess of 306.7 MMBO since 1915, which as indicated above, probably does not include three years of early flush production. Bemis-Shutts Field in Ellis County has 594 wells producing a total of 2950 BO/day for an average of 5 BO/day per well, and it has cumulatively produced 262.9 MMBO since 1928. Chase-Silica Field in Rice County has 588 wells producing 1860 BO/day for a per-well average of 3 BO/day, and it has produced a total of 280.4 MMBO since 1930. Marcotte Field in Rooks County (Figure 6) has 173 wells that produce 846 BO/day for a per-well average of 5 BO/day, and it has cumulatively produced 45.2 MMBO since 1944. Without question, Arbuckle reservoirs are vitally important economically in Kansas, they can be areally large, they can produce for a long time, and they can make prodigious amounts of oil.

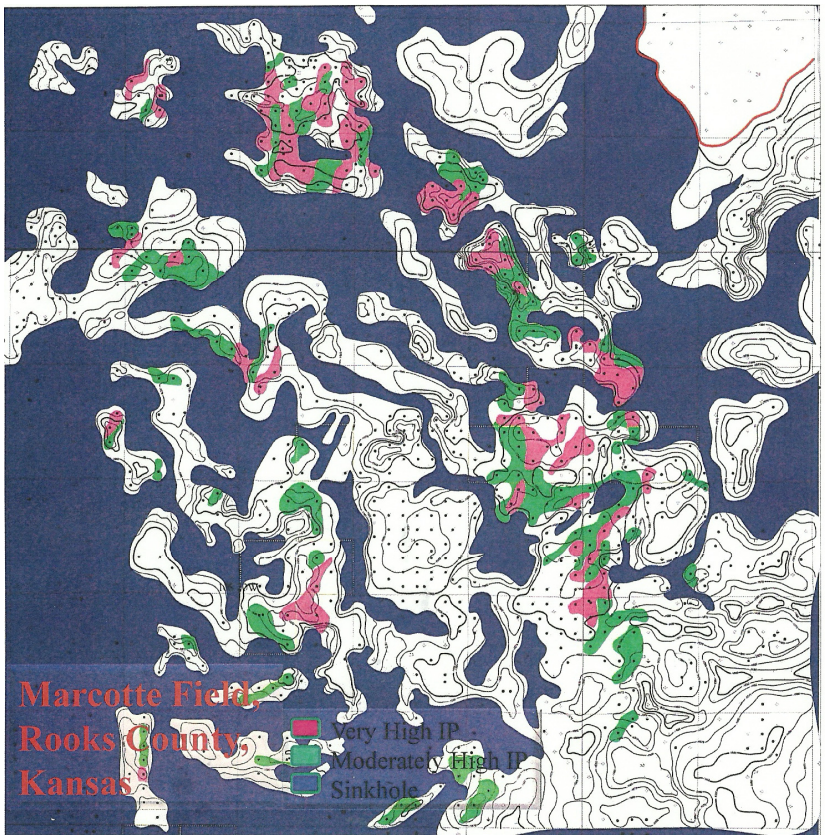

Figure 6. Marcotte Field in Rooks County

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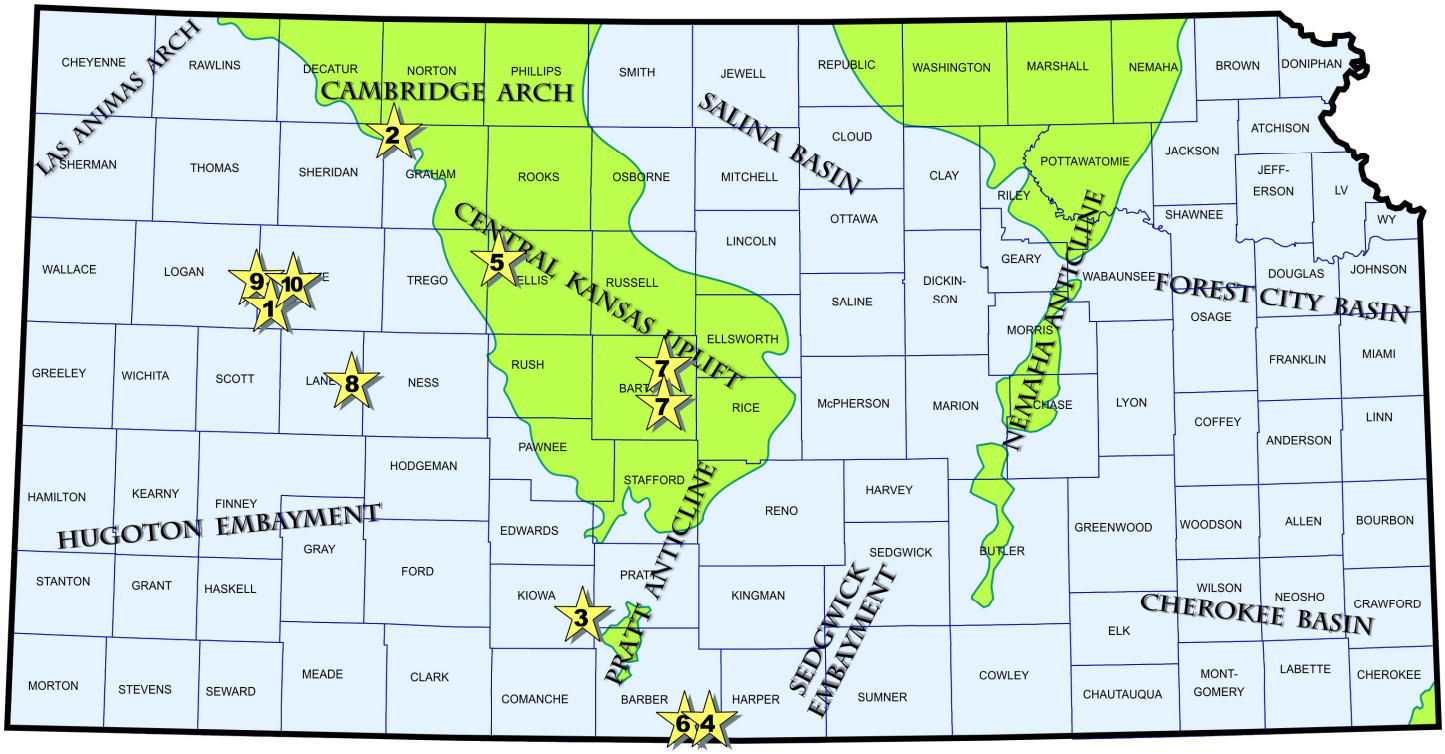
Exploration Highlights

By John H. Morrison, III
Independent Oil & Gas Service



(1) Lario Oil & Gas Company, Wichita (KS), has discovered Lansing-Kansas City and Cherokee (Johnson Zone) oil deposits at the Rebarchek No. 1-18, located in approximately SW SW SW of section 18- T14s- R31W, in Gove County. The wildcat well found new reservoir almost one mile northwest of the Thies Ranch field, which Lario also established in 2008 and produced nearly 29,000 barrels of oil from the LKC zones. Rotary total depth was obtained at 4,635 ft. Daily potential at the Rebarchek discovery is unknown. The new unnamed field is located about 19 miles southwest of Gove, Kansas near the Logan County line.

(2) Blueridge Petroleum Corporation, Enid (OK), has completed its No. 2-22 Schoen Trust as a Lansing-Kansas City oil producer in Graham County. The wildcat well is on pump producing an undisclosed amount of oil at site located in approximately NW NW NW in section 22-T6s- R25W, about 11 miles northwest of Morland, Kansas. Closest production in the vicinity lies over two miles away in the Allodium East field (LKC Oil). The new field has not been named.

(3) Lotus Operating Company LLC, Wichita (KS), has established a new unnamed oil and gas field in Kiowa County with the completion of the Wilcox No. 1, located in approximately NW NW SE in section 11- T29s- R16W. New reserves were found in the Mississippian formation. Total depth is 4,980 ft. No details have been reported on production volume. The new unnamed field is located over one mile from production in the Pyle North field, about six miles northeast of Belvidere, Kansas.

(4) AGV Corporation, Attica (KS), has discovered Mississippian oil deposits over one and one-quarter miles west of the Salty Creek oil and gas field in Barber County. The Spicer Lake No. 1, spotted in approximately NE NW SE of section 2- T34s- R10W, was completed for an undisclosed potential. Operator used Landmark Drilling tools to bottom the well at a total depth of 5,170 ft. The new unnamed field lies one mile south and three-quarters mile east of the town of Hazelton, Kansas.

(5) Murfin Drilling Company, Inc., Wichita (KS), is producing an unknown amount of oil from the Lansing-Kansas City formation at their No. 1-12 Hagen, located in approximately SE NW SW in section 12- T12s- R20w, Ellis County. The 3,950 ft. deep wildcat well was completed on pump in April this year. Discovery site is located over one and one-half miles east of Lansing-Kansas City, Marmaton and Arbuckle oil wells in the Sweet William field, and is about five and one-half miles northwest of Hyacinth, Kansas.

(6) Wildcat Oil & Gas LLC, Spivey (KS), has discovered new Marmaton oil reserves within the Landis field, which had previously produced oil from the Mississippian formation only. The No. 5 Liebl, drilled in approximately C S/2 N/2 NE SW in section 27- T34s- R11W, Barber County, is producing 50 barrels of oil, 200 barrels of water and 150 Mcf gas daily from Marmaton perforations at 4,547 to 4,569 ft. and Mississippian at 4,659 to 4,674 ft. total depth is 4,800 ft. Wellsite lies just over two miles northwest of Kiowa, Kansas.

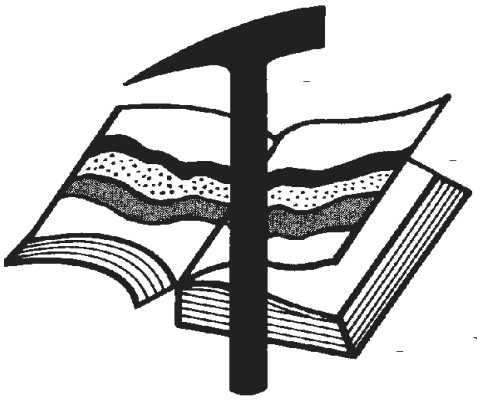
(7) RJM Company, Claflin (KS), is pumping 43 barrels of oil and 10 barrels of water per day at the Bones No. 1 in Barton County. The development well is producing crude from three separate zones in the Lansing-Kansas City from 3,062 to 3,227 feet overall. Rotary total depth is 3,420 ft. The well was drilled as a westerly stepout of the Huslig field at site located in approximately C S/2 NE SE SW in section 13- T17s- R12W, about one-quarter mile east of the town of Odin. Elsewhere in Barton County, RJM Company has also completed their Clifton Hammeke No. 1, located in approximately SE NW NE of section 2- T19s- R12W. The well is on pump making 35 barrels of oil and 33 barrels of water per day. Forty degree gravity oil is being produced from three zones in the Lansing-Kansas City from 3,168 to 3,321 feet overall. Total depth was measured at 3,480 feet. The well adds to production in the Bottoms field, about five miles northwest of Ellinwood, Kansas.

(8) Raymond Oil Company, Wichita (KS), has completed its Michaud Trust No. 2 in Lane County for 187 barrels of oil per day, no water. The well was drilled to a total depth of 4,725 feet at site located in approximately NW SW NE of section 21- T18s- R27W, or one mile north of the town of Alamota. Operator tapped the Cherokee Sand with a two-shot, limited entry perforation at 4,579 feet. The well is a development well within the Alamota West field.

(9) Shakespeare Oil Company, Salem (IL), has a new oil discovery over two and one-half miles northeast of the recently established Antelope Ridge field in western Gove County. The No. 1-23 Zerr Trust, spotted in approximately NW SE SE in section 23- T13s- R31W, was put on pump in late June at an undisclosed daily potential. The well had targeted the Lansing-Kansas City and Cherokee zones for exploration. Total depth was obtained in the Mississippian at 4,650 feet. The Antelope Ridge field produces oil from the LKC, Marmaton, Cherokee, Conglomerate and Morrow zones since its establishment in 2009 by Wichita-based Ritchie Exploration. The new field has not been named.

(10) In Gove County, **Ritchie Exploration, Inc**., Wichita (KS), has discovered Cherokee oil deposits nearly two miles northeast of the Antelope Ridge field in section 15- T13s- R31W. The firm's No. 1 Weber 15-C new unnamed pool discovery, located in about SW NE SW, was completed for an unknown potential in mid-June. Operator drilled the wildcat well to a total depth of 4,765 feet. Field area lies two and one-half miles south and thirteen miles west of Gove, Kansas.





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KANSAS GEOLOGICAL FOUNDATION INTEGRATION PROJECT

During Summer, 2011, final cleanup of the basement cages was completed. The "married set" of electric logs, geology reports, and completion reports, pulled from donations, now has approximately 100,000 documents waiting to be integrated into the Walters digital library and KGS's paper library. Nolan Mans and Meagan Haas have been integrating these documents into the libraries by comparing them against holdings in the digital library. As of the end of July, 8, 178 documents from the married set had been processed. 2,160 of these documents were not in our system, and these were forwarded to library staff for processing. 26% of the documents in the married set were added to the library's holdings. Also, 170 documents already in the digital library were sent to staff to replace bad digital images. The effort continues throughout the year with both integrators working part-time on the Foundations integration project.

It is expected that fully integrating all of these documents will take several years. The high percentage of logs and reports being added to the libraries so far confirms our belief that this project is well worth doing. The limiting factor has always been money. The Foundation board has never had the funds to properly fund a full scale effort, with two or more integrators dedicated full time to the effort. We appeal to the operators and geologists who benefit from the library to contribute money to the Foundation to continue the effort. As the Foundation is a 501(c)3 organization, all contributions are tax-deductible. Please specify that donations are for the well log integration effort, if that is your wish. We are deeply grateful to all who have supported this effort up to this point.

It will take a while to process the married set, plus recent donations. The documents in the married set, plus another set donated by Baker-Hughes, are available for prospecting upon request. If you suspect that a particular log or geology report which is not available in the files may be in the basement, talk to library staff and they will check for you.

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Richard Roby	03/04	2004
Ruth Bell Steinberg	2004	2004
Gordon Keen	03/04	2004
Lloyd Tarrant	05/04	2004
Robert J. “Rob” Dietterich	08/96	2004
Mervyn Mace	12/04	2004
Donald Hoy Smith	04/05	2005
Richard M. Foley	06/05	2005
Wayne Brinegar	06/05	2005
Charles B. Moore	09/96	2005
Jack Heathman	05/06	2006
Charles Kaiser	09/06	2006
Rod Sweetman	08/06	2006
Karl Becker	10/06	2006
Frank Hamlin	10/06	2006
Marvin Douglas	12/06	2006
Robert W. Hammond	04/07	2007
Eldon Frazey	04/07	2007
Pete Amstutz	05/07	2007
Charles Spradlin	05/07	2007
Donald R. “Bob” Douglass	09/07	2007
Vincent Hiebsch	11/07	2007
Glen C. Thrasher	03/08	2008
Peg Walters	06/08	2008
Theodore “Ted” Sandberg	07/08	2008
James Ralstin	11/08	2008
Earl Brandt	04/09	2009
Walter DeLozier	05/09	2009
Donald D. Strong	01/10	2010
John Stone	02/10	2010
Craig Caulk	03/10	2010
Joseph E. Moreland, Jr.	03/10	2010
Gene Garmon	03/10	2010
James F. Dilts	05/10	2010
Jerry Pike	05/10	2010
Donald Hollar	06/10	2010
Delbert Costa	08/10	2010
John Tanner	08/10	2010
William (Bill) Owen	09/10	2010
Harold (Hal) Brown	10/10	2010
Edmund G. Lorenz	11/10	2010
Thomas E. Black	05/11	2011
Wayne E. Walcher	07/11	2011
Henry F. Filson	07/11	2011
Thomas Ray	07/11	2011

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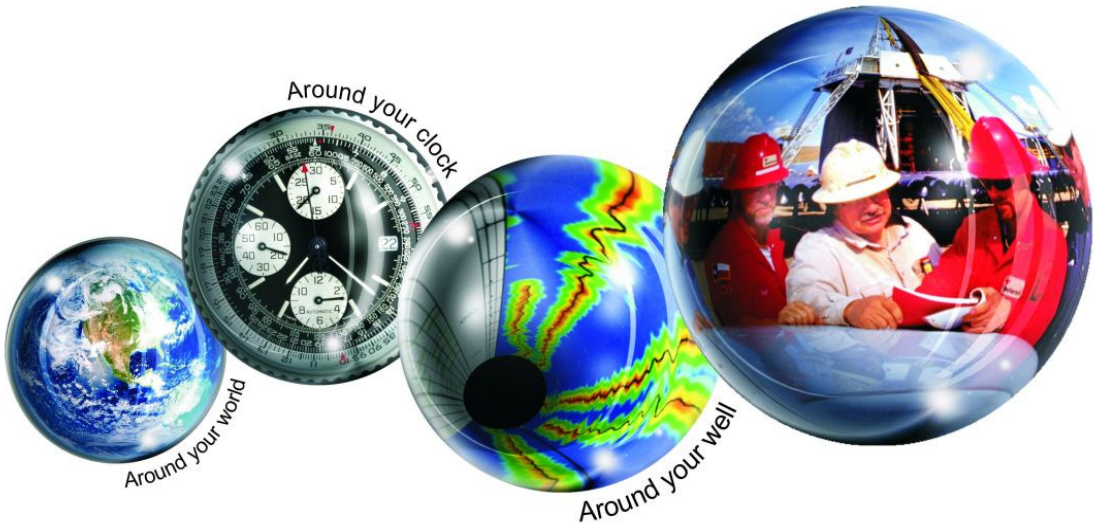

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KGS BULLETIN
September—October

September 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
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25	26	27 Tech Talk	28	29	30	

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Sun	Mon	Tue	Wed	Thu	Fri	Sat
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