

KANSAS GEOLOGICAL SOCIETY

# BULLETIN

Volume 83 Number 4

July-August 2008

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Photo from this year's KGS Golf Tournament at Hidden Lakes Golf Course—Derby, Kansas More photos are on page 24

#### **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 <a href="mailto:salvatore.mazzullo@wichita.edu">salvatore.mazzullo@wichita.edu</a>, 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 <a href="http://www.kgslibrary.com">http://www.kgslibrary.com</a>

## **SOCIETY Technical Meetings**

## There will be no technical meetings during the summer months. Meetings will resume in September.

(below are the fall dates & scheduled talks as of date of this printing)

#### FALL 2008

Sept. 16—Scott Sears, IACX

Sept. 23

Sept. 30

Oct. 7

Oct. 21—David Chernicky, New Dominion

Oct. 28

Nov. 4

Nov. 18

Nov. 25

Dec. 2

Dec. 16

Dec. 30

#### **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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salvatore.mazzullo@wichita.edu (316) 978-7211

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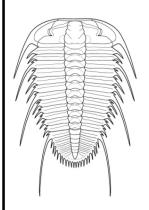
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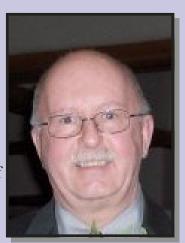
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## **President's Letter**

Dear Members,

Here we are going into summer and vacation time for many of us. Fuel prices have reached an all time high with prices a dollar more per gallon of gasoline than we paid one year ago. One report I saw was a positive for the oil industry: it stated "drill more wells at home" - a plan many of us are trying to do. Rain delays and cost increases have made most of us look at the bottom line a little harder but with crude oil prices at record highs almost daily, it is not too difficult to get excited about drilling.



When we think of higher oil prices it is obvious many things are following this climb. Most obvious is at the fuel pump but higher costs are passed along with this cost. It cost more to drill, more to haul, more to eat and supply prices continue to go up.

The Kansas Geological Library has started to feel the trickle down of price increases. Paper costs are going up fast and the library lives on a steady diet of paper as exploration continues at a frantic pace. There is a slight misconception that the library makes money directly as the oil price goes up: **not true**. The library maintains their small profit by selling more data. This brings us to the current dilemma: when should the library raise prices and how much should the prices be raised? No one wants to pay more, but for the library to maintain its high quality of work and to stay solvent, something must be done and the board is looking at a variety of options. All of the options include some type of price increase.

On a more fun note: many thanks to David Barker for running this years KGS Golf Tournament. Approximately 130 golfers came out for the event and even though it was rained out about half-way through, reports are that it was still a good time.

Be sure to mark your calendar for our next event, the KGS Picnic which will be held on Friday, August 15th this year and will be at All Star Sports West again. Come out for some good food and bingo!

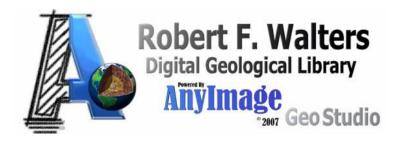
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**Ernie Morrison** 

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## From The Manager

Dear Members,

What a good way to start summer....with a golf tournament! Even though it rained, it didn't stop you all from having a good time anyway. The only really bad part was that we did not get to eat Pat Kane's cooking (Log-Tech). But thank goodness for those hotdogs at the turn (National Oil & IMA)! Dave Barker and his committee, Jerry Mason, Chuck



Latham, Patrick Cox, Ron Schraeder, & Jon T. Williams did a wonderful job. If you didn't attend this year, you missed out on some dynamite cinnamon rolls.

Our next event will be the KGS Annual Picnic. Please mark your calendar for Friday, August 15th. That is the Friday before KIOGA convention starts so if you are coming to town for KIOGA, please come one day earlier and join us at the picnic. (See inserted flyer or on-line, go to EVENTS). Marj Crane of Woolsey, is the chair of the picnic this year & I know it will be another outstanding event so please plan to attend.

The library is very busy, as you can imagine. We are still processing new data from the KCC as well as Operator donated data. We have added another 5 file cabinets to the East log files and will be adding at least that many to the West log files.

September 19th & 20th, the KGS will be hosting the 4th Annual Energy Library Conference here in Wichita. This conference is an opportunity for energy libraries to get together, share ideas and work on issues such as archiving & preserving their data. The libraries that you all use are a valuable tool in our industry and we want to make sure they can all stay alive and healthy. Some of the libraries are small and have a staff of one to two people and not a lot of budget to send someone to this conference. If as an individual or a company, you would want to help support this conference monetarily, please contact me. We hope to get as many libraries represented as possible. In year's past, we have had libraries from Texas, Wyoming, Montana, Louisiana, along with our friends in Oklahoma City & Tulsa who have helped sponsor this conference.

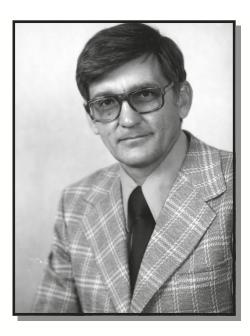
Enjoy your summer—it will be over before you know it!

Respectfully submitted,

**Rebecca Radford**Manager

## **Member Profile**

## William Petersen



This is a profile of a geologist that should have been compiled at a far earlier date. He is truly a "Kansas Geologist" having spent his entire geological career following graduation from Wichita University, which spans 55 years working in Wichita although he did spend two years in Colorado pursuing another activity.

Bill was born in Chicago on November 25, 1927 where his father was a building contractor. His father had arrived with Bill's grandparents who were Danish immigrants. Bill's mother was an immigrant from Germany. Surviving siblings are: Bernice, Tom, and Dick. The family later moved to a farm in Iowa.

Bill commenced grade school in Chicago, but with the family's move to Iowa he finished elementary school there. He graduated from Audubon High School in 1946.

Following graduation, he joined the United States Navy with his earliest training at the naval base in San Diego. Most of his service time was in California where he served as a hospital corpsman. Following his discharge in 1948, he enrolled in Iowa State Teachers College now University of Northern Iowa. During the summer of 1949, while working for the Forest Service in Idaho and Montana, he became interested in geology. In the fall of 1949, he transferred to Parsons College in Fairfield, Iowa. There he encountered an outstanding professor of Geology, Doctor Palmer who knew of Dr. Ver Wiebe at Wichita University. Bill later transferred and completed his degree there in 1953. Drs. Ver Wiebe and Berg were

very helpful in finding Bill employment with Lion Oil Co. While at the Wichita University, Bill had as classmates a number of individuals who later became prominent geologists in the Wichita area. These included among others: Orvie Howell, Joe Slinkard, Ron Mercer, Glen Rupe, Charley Shanks, Al Stude and Jim Thompson.

In 1953, Bill married Billie Courter in Wichita. They will be celebrating their 55<sup>th</sup> Wedding Anniversary this year. They have four children: Bob a geologist in Wichita and his wife Maria, William who is retired, Kathy married to Rev. John Rydina, and Carol, whose husband, Aryln Smith, was involved in law enforcement.

While enrolled at Wichita University, Bill worked for Lion Oil Company where Thornton Anderson was in charge. After graduation, Bill obtained full-time employment with Lion. Fellow employees were, Elton Gore, Dick Foley and Tom Burns. Bill believes that Thornton, Elton, and Dick helped him early in his career and had a big influence on that career.

Bill continued with Lion until 1955 when Jim Thompson and Bob Watchous talked him into going to work for Rocket Drilling Company. While at Rocket, Scott Ritchie and Harvey Gough came on board - good guys to work with. Bill was with Rocket until 1958 when he entered the consulting field for two years. Bill then left Wichita and moved to Colorado Springs where he was involved with a relative in the electronic business. Even though he was engaged in a business other than oil in Colorado Springs, he continued to work on prospects. On a trip to Wichita, he was in Petroleum Inc.'s office showing a deal and while he was there, Pierce Musgrove called looking for a wellsite geologist for a well in Meade County and after that Orvie Howell called him to "sit on a well". With all this activity Bill made the decision to move back to Wichita, which he did in 1962.

Ev Wieble called him to work for O.A. Sutton. There he worked with Bob Gebhardt, Bill Romig and Arden Ratzlaff among others. Bill worked at O. A. Sutton until 1967 and then went back into consulting. Later in 1967, Gene Unruh called him to work for PMI and he worked there until 1976 when he once again entered the consulting field. Since that time he has been a consultant and presently works with his son, Bob, on prospects.

Looking back on a very interesting and complete career, Bill doesn't haven't any doubts that if he had it to do over he would be a petroleum geologist. His advice to a young geologist entering the field is "Pay attention, but don't believe everything you hear, follow your gut instincts and avoid herd mentality, and remember its lots of fun looking for oil and gas."

While pursuing his career, Bill has been active in the Lutheran Church and he also served in the 50's as a councilman in Derby. Recreationally he likes to travel and although he was an all-round athlete while attending Parsons College he now confines those activities to golf.

Bill does not plan to completely retire and as previously mentioned he continues to work on prospects with his son. It is rumored that he is the "expert" on Phillips County.

This has been the profile of another of the outstanding geologists that Kansas and specifically the Wichita area has produced over the years.

The KGS welcomes you to submit your vacation photos of geologic interest. Submission of photos implies permission to publish in the KGS Bulletin. Please send your submissions with titles or captions and date of the photograph to Rebecca at the KGS Library by mail or e-mail:

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## **Kansas Geological Foundation Items for Sale**

The Foundation is holding a Silent Bid process for the following items:

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- ♦ Bausch & Lomb Binocular Microscope, 10X, older, one of the oculars is bad (maybe just dirty), wooden box —starting bid = \$50.00
- ◆ Black Light Box—wooden—works fine (scope fits into box) starting bid = \$50.00

Also for sale but not in the bid process: **Wooden Drafting Table**—2 drawers—60"x 38"x 37"(h) - Matted top, Metal Chair—Good Condition \$250.00 (call library for more information on this one)

To place your bid, call or email the Kansas Geological Society 316-265-8676 manager@kgslibrary.com

Or

There is a bid sheet in the KGS library to write your name & bid

Bids will be due Friday, July 25th, 2008 by 4:00 PM

(If you want to know the standing of your bid, you will have to call the library)

## James Gundersen\_



Dr. Gundersen was born Dec. 20, 1925 in Oak Park, Ill. to John and Helen Jacobson Novotny. Dr. Gundersen served his country honorably in the United States Army during World War II. He retired from Wichita State University as a Geology Professor and was a member of the Geological Society of America and the American Mining Institute. Survivors include his loving wife, Rae C. Gundersen of the family home; two sons, James Gundersen of St. Charles, Mo., Karl Gundersen of St. Louis, Mo.; a daughter, Elyse McBride of Madison, Wis. Other survivors include six grandchildren.

A Memorial Service was held on Saturday, April 26, 2008 at 3 PM in Baca's Chapel of Prayer, 300 E. Boutz Road, Las Cruces, N.M. with Reverend Nancy Anderson officiating. In lieu of flowers, donations may be made to the Alzheimer Association of New Mexico, 101 N. Alameda, Las Cruces, NM 88001.

The following is a story recounted by Dr. Lee Gerhard

I met Jim Gundersen floating down the Colorado River though Grand Canyon nearly 40 years ago. We were both participants in a National Science Foundation program to provide field explorations to professors from small universities and colleges. I was an Associate Professor of Geology at Southern Colorado State College (now Colorado State-Pueblo) and Jim was chair of the

Department of Geology at Wichita State University.

Long days in the hot dry field were followed by long evenings of geological story telling and debate. Jim and I got into extended conversations about geology, the environment, and the courts. He was a serious man, not so much given to humor as to clinical debate.

Although Jim was a mineralogist, a field in which I had only a cursory interest. I was fascinated with his stories about the trials over asbestos mining and contamination in Minnesota. Little did I know then that his stories were prophetic about the future use of science in public policy. The courts decided in that case that asbestos was one mineral, and was exceedingly harmful to humans. Although a case is made that amphibole asbestos can cause lung damage and is harmful, the resulting loss of use of long fiber Chrysotile asbestos and the extreme costs of removing all asbestos from public buildings and other uses has cost the country huge amounts of money and scared many, while denying the benign use of the soft long fibers as a effective insulator. Although this scary scenario continues, the ensuing radon, Alar, and NORM scares have gradually faded away from public view.

Jim and I stayed in touch over the next few years. Shortly thereafter I got an opportunity to visit WSU and give a lecture, finding a nice warm atmosphere and some really competent faculty. I didn't see Jim again until I returned to Kansas in 1987, and had the opportunity revisit WSU and renew my acquaintance with Jim. I learned much about conflicts between the legal system and science from him.







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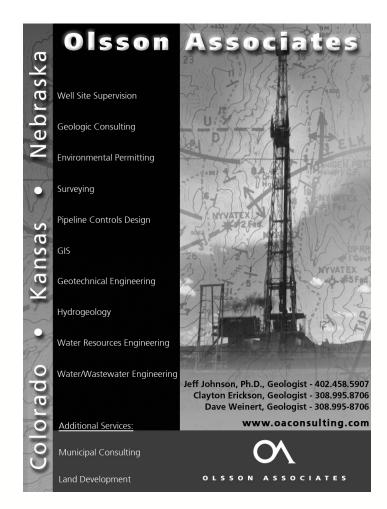
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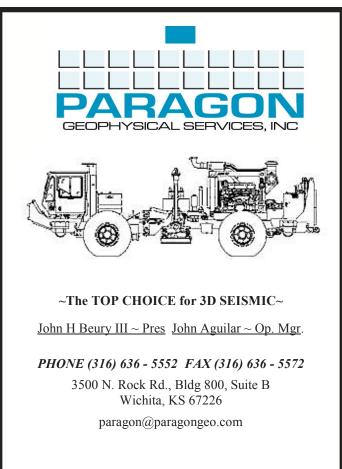
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#### HYDRODYNAMIC ENTRAPMENT OF OIL AND GAS

Toby Elster Consulting Geologist Wichita, Kansas 67202

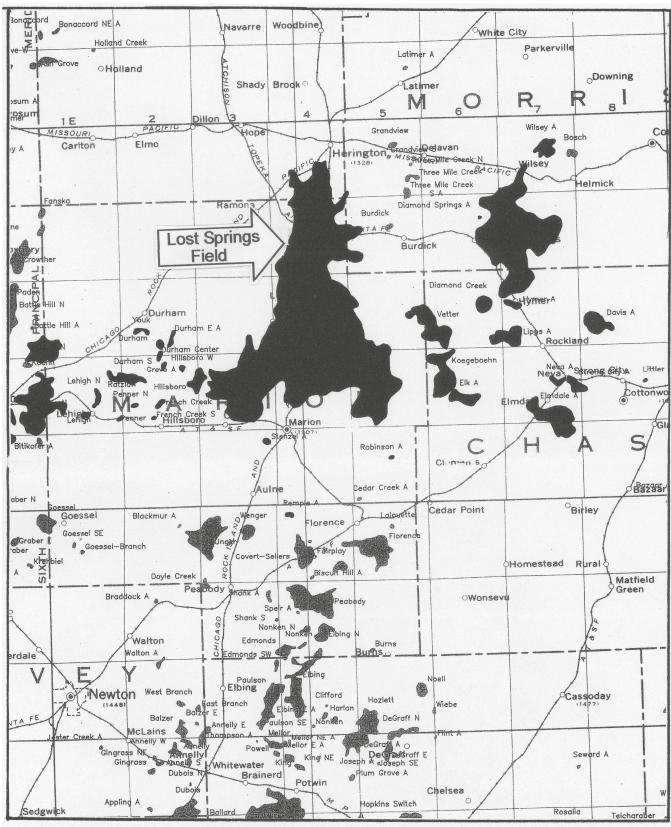
Does one want to be driven to ultimate distraction? If so, then explore for hydrodynamically-trapped oil and gas fields. What are we talking about? Probably one of the largest hydrodynamic entrapments of hydrocarbons in the Hugoton Gas Field of southwest Kansas. It stretches from slightly below mid-Kansas southward through the Panhandle of Oklahoma and through the Anadarko Basin part of the Texas Panhandle. The field produces gas from the dolomite formations of the Chase Group (Lower Permian). The producing area is the west flank of the Anadarko Basin and the Hugoton Embayment where the rocks commence a gentle up-dip to the north into Nebraska. The source of the hydrocarbons was the deeper portion of the Anadarko Basin of western Oklahoma. The gas migrated out of the depths of the basin and into the porous and permeable dolomite formations. As the gas moved up-dip, water was displaced until the gas supply was exhausted. Drilling up-dip of the gas limits one finds the same formations, but now water bearing, with no geological reason for the gas not to have continued to migrate up-dip. The only structural feature involved is the original u-dipping rocks. There has to be an answer to why the gas stopped moving up-dip through the porous and permeable formations.

The explanation is better understood and visualized by downgrading to a much smaller and common occurrence. The Nichols Pool of Kiowa County (T29S-R18W) drove me to distraction wondering why it was there and how one would look for a similar field. The Pool produced from a typical Mississippian chert in the area. No structure was involved except for the regional up-dipping rocks to the north, and even that was not determinable in the small area of the production. The top of the Mississippian is structurally flat. I remember mapping the area, tearing up the maps and starting over, not finding any answers that would even give me a clue to pursue my analysis.

I read a paper by a professor who had studied a large Canadian basin's extensive sandstone reservoir. He explained why the panorama of the basin's hydrocarbon accumulation in the numerous individual reservoirs found the gas reservoirs in the deep portions of the basin, the crude oil reservoirs up-dip of the gas reservoirs, and the highest reservoirs were water bearing. What came to me, since water migrates the oil and gas, is that the water also flowed in the same reservoirs. His paper explained how, as the water, gas and oil flowed into the first entrapment from the deep part of the basin. The specific gravity of the fluids separated in the reservoir as usual. As more gas filled the reservoir it would force the heavier fluids to spill out and noctinue migrating up-dip. When the supply of gas was exhausted, the crude oil would then fill the higher reservoir and force the water out until the crude oil supply was exhausted. Then one would find what gas was carried along, crude oil and water in the uppermost reservoirs. When the hydrocarbons were exhausted, then water filled the upper reservoirs. How the Nichols Field came to be now had an explanation.

There are no homogeneous reservoirs except over very small areas. Porosity and permeability varies considerably, caused by the dissolution and chemical reactions that created the porosity and permeability. Therefore, there are barriers to the flow of the water. That causes, like a dam across a river, the water against the barrier to slow the flow, with the result that a high pressure area forms. On the other side of the barrier, which has less water, a lower pressure area instead forms. If the water is carrying hydrocarbons, then they will accumulate in the lower pressure area and separate as to their specific gravity. The supply of hydrocarbons available will determine the size of the "bubble" that forms, or if any is spilled out and continues to the next (up-dip) site of entrapment. Most of these fields so formed, if not all, have been discovered by drilling for other reasons, usually hoping to find an anticlinal accumulation

A case study is the large Lost Springs Field in Marion County and the surrounding area. The oil, and not surprisingly some gas, are found on the south end of the field, down-dip of the oil. The field extends from the south one-third of T16S-R4E, through the north one-half of T19S-R4E. The central part of the Field is approximately one range (6 miles) wide. At the south end the Field is two



ranges wide (12 miles) from the east half of R3E extending through the west half of R5E. The production comes from the Mississippian "chat" reservoir with an erosional surface. The chat zone in the north is 50-60 feet thick. Two main porous zones

with permeability channels are present, which carry most of the fluid in the field. The entire chat zone can carry shows of oil, and the minute porous streaks undoubtedly carry oil as well. This is true of the surrounding area and up-dip to the north in T14S. Some small chat pools have been discovered to the north and east of the northern tip of the Lost Springs field. They have indicated the same characteristics as the "parent" field – the same type of rocks, an erosional Mississippian surface, and oil and water-bearing reservoirs. *Brief History of the Lost Springs Field* – Early drilling in the area commenced around 1950 and lasted into the 1960s, then tapered off. Stagnant crude oil price was the reason for limited drilling. Nearly all the wells produced water from their inception or early in the life of the well. Disposal wells were a necessity and the only formations that could take the quantities of produced water were the Hunton and Arbuckle. Initial oil production of the better wells in the field was 40-50 BOPD.

Drilling resumed in the late 1970s and 1980s. Where the operators were prepared to handle their produced water, the leases were economical to produce. It was rumored at the time that some of the wells would only produce water for 2-3 months before any oil showed up. Most believed that the formation had to be de-watered before oil could be brought in from the surrounding area. Probably as much oil came from oil seepage of the surrounding more impermeable chat as by the process of removing the water, which lowered the pressure in the main porous channels and thereby allowed the oil to move into the more permeable channels to be moved with the water.

Production from the Lost Springs Field varied considerably by lease – from production of only a few thousand barrels of oil to a maximum of 600,000 BO per lease. Many of the lesser-producing leases can be attributed to early abandonment because the operators couldn't dispose of the water economically. I recall Mayfield, Smith and Jennings (Chuck, Edgar and?, respectively), who operated a lease in the southern part of the Field. They ran into water disposal problems, and drilled a disposal well into the granite. It would swallow all the water they put into it, so they turned it into a commercial venture and disposed of all the water from many of the leases in the Field. I'm sure they kept many wells producing long after those that may have been abandoned otherwise.

So to return to the beginning of this paper, how does one prospect for hydrodynamic entrapments of hydrocarbons? I wish I knew, because I'm sure that if one prepares for the expected water production such traps can be desirable economic pursuits. I'd suggest looking in an area where these hydrocarbon entrapments have occurred, and look for signs where there is evidence of hydrocarbons having migrated through the area. Should one discover such a field, be prepared to dispose of the produced water in an economical way so as to recover all the crude oil or gas that is recoverable. The dynamics of fluid in the reservoir is no different than that of a water-driven anticlinal trap, except that the water will probably come sooner in the wells of a hydrodynamic entrapment.

Author's Note: this paper was taken from articles, scout cards, and the author's observations and experience



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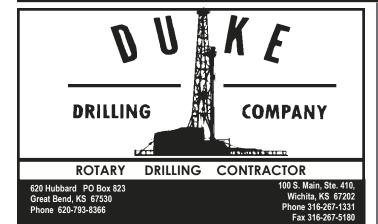
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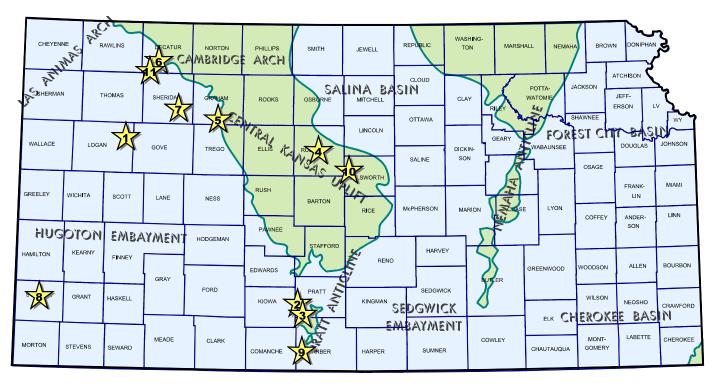
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## **Exploration Highlights**

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



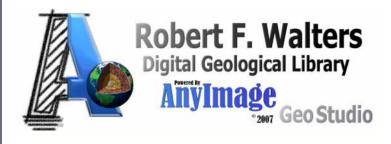
- (1) Murfin Drilling Company, Inc. has discovered Mississippian oil reserves at the Smith #1-30 in Logan County. The new unnamed pool opener was drilled in the C SE SW of section 30-T12s-R32W, nearly two and one-quarter miles southeast of the El Kader (Lansing-Kansas City oil) Field. Rotary total depth is 4750 ft. Production information is not available.
- (2) Mississippian oil deposits have been discovered by Lotus Operating Company, LLC. at the Curtis #1, located in the S/4 of section 31- T28s- R15W, Pratt County. The wildcat well found new reserves nearly three-quarters mile north of Cherokee and Mississippian oil production in the Pyle Northeast Field, across the county line in Kiowa County. The new unnamed field lies about six miles southwest of Cullison, Kansas. First production commenced at the end of March '08.
- (3) Lansing-Kansas City oil has been added as new pay to a new unnamed oil field recently discovered by Ponderosa Witching, LLC. in Pratt County. The #1 Epp Trust, NW/4 of section 34-T29s-R15W, first produced oil from the Maquoketa formation in May this year. After declining to 3 barrels of oil per day, operator has plugged-back and re-completed the well in the Lansing–Kansas City zone. The well was placed back on production in early June '08 at an undisclosed rate. Total depth is 4857 ft.
- (4) A new oil field has been established in Russell County by John O. Farmer, Inc. Oil deposits were found in the Lansing-Kansas City 'C' limestone formation at the firm's Shaffer A #1, spotted in the SE/4 of section 36- T13s- R13W, about one-quarter

- mile west of the city limits of Bunker Hill, Kansas. The 3415 ft. deep well was completed on May 15, 2008 for an unknown amount of production. Site lies one mile north of established wells in the Bunker Hill Field.
- (5) Coral Production Corp. has opened a new unnamed oil field in Graham County with the completion of the Cronn #18-3. The well is located in the NW/4 of section 18- T10s- R23W, nearly three-quarters mile southwest of the Hoof West Field. Operator completed the well on April 25, 2008 at an undisclosed production rate with pay coming from the Lansing-Kansas City zones. The new field has not been named.
- (6) Murfin Drilling Company has discovered Lansing-Kansas City oil reserves at their Ritter #1-20 new pool opener in Decatur County. Located in approximately C NE NE of section 20- T5s-R29W, about 9 miles southwest of the town of Dresden, the well was completed on May 7, 2008 for an undisclosed amount of production. Company rotary tools drilled the well to a total depth of 4200 ft. Site lies in the vicinity of the five other recent LKC oil discoveries made by Murfin in the past year.
- (7) In Sheridan County, Murfin Drilling Company has found Lansing-Kansas City limestone oil deposits at a very remote site located several miles from closest known production in the county. The #1-33 Haas-Goetz Unit, spotted in approximately the C S/2 N/2 of section 33- T9s- R27W, is producing an unknown amount of crude effective May 13, 2008. The new unnamed field is situated over three miles south of the Och

Southeast (1972) and the McFadden South (1985) fields where the Shawnee and LKC zones also have been productive. The Haas-Goertz well was drilled to a total depth of 4480 ft. Field area is located about ten miles southeast of Hoxie, Kansas.

- (8) Kenneth S. White, dba/ White Exploration, Inc., has drilled and completed an exploratory well one mile north of the Morrow Sand oil trend in the Johnson City Townsite oil field, just north of the town of Johnson City, Kansas. The #1 Blackstone E Unit, spotted in the NE/4 of section 23- T28s-R41W, Stanton County, was finaled this month as a commercial oil well with daily potential not reported. The wildcat pool opener was drilled to a total depth of 5575 ft. The new field has not been given a name.
- (9) Osage Resources, LLC continues to explore and develop Mississippian oil reserves on the Osage lease in Barber County. The firm has just completed their second Mississippian new pool discovery well, the #114 Osage, located in approximately C NE NE of section 15- T33s- R15W, for a undisclosed production rate. The well found oil deposits nearly three-quarter mile northwest of the #112 Osage in section 14, which Osage Resources completed as a Mississippian gas well and field stepout of the Aetna Gas Area Field earlier this year. This is Osage Resources' fourteenth successful Mississippian completion in the county. Operator bottomed the discovery well at a total depth of 5573 ft. The field has not been named.
- (10) Lansing-Kansas City oil reserves have been discovered by Mai Oil Operations, Inc. at the Charvat #2, located in the SW/4 of section 30- T15s- R10W, in Ellsworth county. The well has been placed on the pump for an undisclosed rate at site seven miles south of Wilson, Kansas. The wildcat well found oil deposits nearly three-quarter mile northwest of Mai's Charvat #30-1 in the SE/4 of section 30, which established the new Stoltenberg Northwest Field (Arbuckle oil) in February this year. The well also lies one and one-quarter miles southwest of Mai's Charvat-Malar Unit, NW/4 of section 29, which also produced oil from the LKC limestones and was recognized as the Stoltenberg North pool opener earlier this year.
- (11) McCoy Petroleum Corporation has discovered new Lansing -Kansas City oil deposits over three-quarter mile southeast of the recently established Chipmunk oil field in Decatur County. New reserves were found on the Albers A lease, located in the SE/4 of section 26- T5s- R29W, where the #1-26 well first started pumping an undisclosed amount of oil on May 16, 2008. The wildcat well was drilled to a total depth of 4202 ft. by loggers measurements. Murfin Drilling was contractor. The new unnamed field lies about six and one-half miles southwest of the town of Dresden, Kansas.





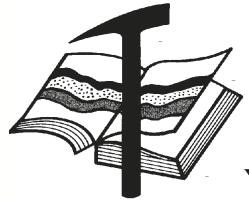
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