

**BEREXCO LLC**

**LILLIE 3-26**

**E/2 NW NE NW SEC 26 T1S R36W**

**RAWLINS COUNTY, KANSAS**

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## SUMMARY

The Berexco LLC Lillie 3-26 in Rawlins County, Kansas spud July 2, 2014 and reached a total depth of 4850' on July 12, 2014. Wellsite geological supervision commenced at 3000'. The primary objectives were the Pennsylvanian Missourian Lansing-Kansas City limestones which produce in East Fork field. Secondary zones of interests were the Permian Foraker and Virgilian Oread limestones. The Lillie 3-26 was drilled using seismic and nearby well control.

On-site evaluation was by drill stem testing after sample analysis and consideration of structural position. Six DSTs were run.

### **Foraker and Oread**

DST 1 in the Foraker recovered 205 ft of mud with a trace of oil, probably from 50 bbl of oil spotted at 3441'. The uppermost limestone was fossiliferous grainstone to mudstone with very good fluorescence and cut. Scattered black oil was present in a predominately tight limestone with occasional pin-point vugs and intercrystalline porosity. Wireline logs indicate potential production in the Foraker. The Berexco LLC Lillie 2-26 just to the west also had good oil shows and favorable wireline log values in the Foraker.

DST 2 in the Oread recovered 165 ft of oil and water cut mud. Samples were fossiliferous grainstone with traces of interparticle porosity, scattered oil staining, and good cuts. The test revealed the Oread is likely depleted from nearby production.

### **Lansing-Kansas City**

DST 3 in the Lansing A recovered 30 ft of mud with a trace of oil. Poor flow pressures and wireline logs confirmed the lack of effective porosity. Samples exhibited scattered vuggy and interparticle porosity with good spotty live black oil in vugs.

DST 4 in the Lansing B recovered 60 ft of oil cut mud and 527 ft of mud cut water with a trace of oil. The grainstone exhibited fair to poor porosity, abundant live black oil stain, and very good cuts.

DST 5 in the Lansing C recovered 2 ft of free oil and 120 ft of gassy oil cut mud. Recovery volumes were limited by lost circulation material plugging the test tool. Samples were very tight mudstone with no sample shows or porosity.

DST 6 in the combined Lansing D and E recovered 175 ft of gassy oil cut mud. Wireline logs indicate poor porosity in the E. Samples of the E were mudstone to packstone with scattered heavy oil specks and stain.

The Lansing F was nonporous limestone with no sample show or observed porosity. The Pawnee was not penetrated. 50 bbl of lease crude were spotted at 3441' to free a stuck drill string. 500 bbl of mud were lost after testing the Foraker at 3830'. Mud losses continued to TD; 18-20 lb/bbl LCM was required.

### **Oil Well Completion**

5 1/2" production casing was run to complete the Lillie 3-26 as an oil producer.

Peter J. Vollmer  
Consulting Wellsite Geologist, WPG #3369  
July 2014

Berexco LLC  
Lillie 3-26

## WELL DATA

OPERATOR: Berexco LLC  
2020 North Bramblewood Drive  
Wichita, Kansas 67206

WELL NAME: Lillie 3-26

SURFACE LOCATION: 330' FNL & 1880' FWL  
E/2 NW NE NW Sec. 26, T1S, R36W  
Rawlins County, KS

LATITUDE & LONGITUDE: 39.9436223, -101.3290071 (From State, calculated from footages)

BOTTOM HOLE LOCATION: Vertical hole

ELEVATIONS: 3294' GL      3307' KB

API NUMBER: 15-153-21030

BASIN: Mid-Continental Arch

FIELD: East Fork

HOLE SIZE: 12 1/4" to 310'; 7 7/8" to 4580'

CASING: 8 5/8" J-55 24# STC set to 310' KB

SPUD DATE: July 2, 2014

TD DATE: July 12, 2014

TOTAL DEPTH: 4580' Rig TD      4580' Log TD

LAST FORMATION: Pennsylvanian Lansing-Kansas City

WELL STATUS: Ran 5 1/2" production casing

OPERATOR  
REPRESENTATIVE: Dana Wreath - Vice President

WELLSITE GEOLOGIST: Peter J. Vollmer

**FORMATION TOPS**

Formation	Sample Top	Log Top	Log TVD	Log Datum
KB				3307
Pierre Sh	Cased	Cased	N/A	N/A
Niobrara Fm	N/A	1240	1240	+2067
Fort Hays Ls Mbr	N/A	1743	1743	+1564
Carlile Sh	N/A	1778	1778	+1529
Dakota	N/A	2146	2146	+1161
Cheyenne	N/A	2733	2733	+574
Blaine	N/A	2988	2988	+319
Stone Corral Anhydrite	3198	3201	3201	+106
Base Anhydrite	3232	3230	3230	+77
Chase Limestone	3409	3413	3413	-106
Neva	3681	3689	3689	-382
Red Eagle	3733	3736	3736	-429
Foraker	3798	3798	3798	-491
Wabaunsee	3948	3942	3942	-635
Topeka	4010	4012	4012	-705
Deer Creek Sand	4056	4054	4054	-747
Oread	4124	4126	4126	-819
Heebner Sh	4180	4186	4186	-879
Lansing-Kansas City				
"A"	4232	4231	4231	-924
"B"	4290	4288	4288	-981
"C"	4349	4348	4348	-1041
"D"	4393	4394	4394	-1087
"E"	4434	4438	4438	-1131
"F"	4473	4476	4476	-1169
TD Driller	4580			
TD Logger		4580	4580	-1273

## LITHOLOGY AND SHOWS

The following descriptions are interpretive. Rig crew members collected unlagged samples from 3500' to 4580' TD. Depths are rig depths except where noted as wireline.

3500' - 3528'	SHALE: light reddish brown to reddish orange, firm to soft, fissile to blocky, very silty, sandy in part, non to slightly calcareous.
3528' - 3544'	SANDSTONE: light gray to reddish brown, friable to firm, very fine grained grading to silt, sub rounded to rounded, well sorted, calcareous cement, occasional clay filled, no visible porosity, no shows.
3544' - 3597'	SHALE: reddish brown, firm to hard, fissile to blocky, very silty, sandy in part, non to slightly calcareous, trace tan Limestone.
3597' - 3613'	SILTSTONE: very light gray to white to light reddish brown, friable, very fine grained grading to silt, subrounded, well sorted, calcareous cement, clay fill, occasional grading to Shale, tight, no shows.
3613' - 3616'	ANHYDRITE: white to translucent, firm, micro granular.
3616' - 3681'	SHALE: reddish brown to light gray to greenish gray to dark gray, firm, blocky, very silty, non calcareous, fossil fragment, trace Limestone and SANDSTONE stringers.
NEVA	SAMPLE TOP: 3681'      LOG TOP: 3689'      SUBSEA: -382'
3681' - 3692'	LIMESTONE: white to light gray, firm to hard, chalky, fossil fragment, tight, no shows.
3692' - 3733'	SHALE: reddish brown, firm to soft, fissile to blocky, very silty, sandy in part, non to slightly calcareous, trace white Limestone.
RED EAGLE	SAMPLE TOP: 3733'      LOG TOP: 3736'      SUBSEA: -429'
3733' - 3761'	LIMESTONE: white to light gray, hard, cryptocrystalline to microgranular, occasional fossil fragment (Ostracods), clean, tight, no shows, interbedded SHALE: light gray to gray, stringers.
3761' - 3798'	SHALE: reddish brown, soft to firm, sub blocky, n calcareous, occasional silty, with interbedded LIMESTONE: white to light gray, firm to hard, cryptocrystalline, fossil fragment, tight, no shows.

### LITHOLOGY AND SHOWS

FORAKER	SAMPLE TOP: 3798'	LOG TOP: 3798'	SUBSEA: -491'
3798' - 3814'	LIMESTONE: cream to white to very light brown, firm, grainstone to mudstone, abundant fossil fragment, (Fusulinid, Brachiopod, Crinoid), scattered black oil specks and stain, trace pin to part vuggy porosity, occasional very fine intercrystalline porosity, even bright yellowish white fluorescence, immediate blooming and fast streaming yellowish white cuts, good show.		
3814' - 3833'	LIMESTONE: cream to white to light gray, firm to hard, microgranular texture, fossil fragment (Brachiopod), occasional dark gray Shale, occasional black oil specks, no visible porosity, occasional yellowish white fluorescence, trace slow streaming yellowish white cut, very poor show.		
3833' - 3843'	LIMY SANDSTONE: very light gray to white, friable, very fine grained, subrounded, well sorted, calcareous cement, clay fill, grading to SANDY LIMESTONE, black specks, tight to trace porosity, no shows.		
3843' - 3910'	SHALE: reddish brown, soft to firm, sub blocky, non calcareous, occasional silty, occasional light gray to white to light red Limestone stringers: cream, black algal stain.		
3910' - 3942'	SHALE: dark gray to black, firm, fissile to blocky, non calcareous, carbonaceous in part, fossil fragments (Brachiopod).		
3942' - 3948'	SHALE: light reddish brown, soft to firm, sub blocky to lumpy, non calcareous, clayey, occasional silty, thin gray Limestone partings.		
WABAUNSEE	SAMPLE TOP: 3948'	LOG TOP: 3942'	SUBSEA: -635'
3948' - 3964'	LIMESTONE: white to light gray with light reddish brown mottled, hard to firm, cryptocrystalline, chalky texture, light reddish brown SHALE partings, rare fossil fragment, tight, no shows.		
3964' - 3972'	LIMESTONE: white to light gray, hard to firm, packstone to wackestone, firm to hard, fossil fragment, occasional black oil specks, no visible porosity, bright yellowish white fluorescence, fair streaming yellowish white cuts, poor show.		
3972' - 4010'	SHALE: reddish brown, soft to firm, sub blocky, non calcareous, thin Limestone stringers and inclusions.		

### LITHOLOGY AND SHOWS

TOPEKA	SAMPLE TOP: 4010'	LOG TOP: 4012'	SUBSEA: -705'
4010' - 4022'	LIMESTONE: light gray to white, hard to firm, cryptocrystalline, fossil fragment (Fusulinids), sparry calcareous, clean, tight, no shows.		
4022' - 4032'	SHALE: gray, firm, sub blocky, non to slightly calcareous, dull, fossils (Brachiopod).		
4032' - 4056'	LIMESTONE: light gray to white, hard to firm, cryptocrystalline, fossil fragments, clear to opaque chert, clean, tight, no shows.		
DEER CREEK SAND	SAMPLE TOP: 4056'	LOG TOP: 4054'	SUBSEA: -747'
4056' - 4074'	SANDSTONE: light gray to very light gray, very friable to soft, very fine grained, well rounded, well sorted, weak calcareous cement, clay filled, plant remains, abundant loose grains, trace to poor porosity, no show.		
4074' - 4085'	SHALE: reddish brown, soft to firm, sub blocky, non calcareous, occasional silty, occasional light gray to white to light red Limestone stringers.		
4085' - 4096'	LIMESTONE: white to light red brown, mottled, firm to hard, mudstone, very chalky, very slightly argillaceous in part, occasional sandy, interbedded reddish brown Shale partings, black dead oil, tight, no shows.		
4096' - 4124'	SHALE: reddish brown, brownish maroon, mottled in part, soft to firm, blocky, occasional slightly calcareous, non to slightly silty in part, gummy, clayey to sticky.		
OREAD	SAMPLE TOP: 4124'	LOG TOP: 4126'	SUBSEA: -819'
4124' - 4140'	LIMESTONE: cream to white, firm to hard, mudstone to grainstone, rare ooliths, chalky in part, fossil fragment, tight to trace interparticle porosity, scattered black to dark brown live oil stain, bright yellowish white fluorescence. blooming yellowish white cuts, fair show decreasing with depth.		
4140' - 4160'	LIMESTONE: gray to light gray, firm to hard, mudstone, rare fossil, very chalky texture, light tan to opaque chert, tight, no show.		
4160' - 4164'	SHALE: gray black to dark gray, firm, sub fissile, carbonaceous, non to very slightly calcareous, pyrite.		
4164' - 4176'	LIMESTONE: gray to light gray, hard, mudstone, rare fossil, occasional slightly chalky texture, trace opaque chert, clear calcareous crystals, thin gray Shale partings, tight, no show.		

## LITHOLOGY AND SHOWS

HEEBNER SH	SAMPLE TOP: 4180'	LOG TOP: 4186'	SUBSEA: -879'
4176' - 4194'	SHALE: dark gray to black, hard to firm, fissile, slightly to very carbonaceous, non to slightly calcareous, fossil fragments (Brachiopod).		
4194' - 4232'	SHALE: light gray to light maroon to reddish brown, firm, blocky, n to slightly calcareous, occasional soft and clayey.		
LANSING- KANSAS CITY "A"	SAMPLE TOP: 4232'	LOG TOP: 4231'	SUBSEA: -924'
4232' - 4252'	LIMESTONE: white to cream, firm to hard, mudstone to grainstone, occasional interclasts and peloids, abundant fossil fragment, scattered black heavy oil stain, tight to poor interparticle porosity, occasional vuggy porosity with dark brown live oil, bright yellowish white fluorescence, instant blooming yellowish white cuts, with fast streaming yellowish white cuts, good show.		
4252' - 4254'	SHALE: gray to dark gray, firm, blocky, non to slightly calcareous.		
4254' - 4264'	SANDSTONE: white to light gray, firm to friable, very fine grained, well rounded, well sorted, calcareous cement, clay filled, clean, tight to trace porosity, no show.		
4264' - 4290'	SHALE: light gray to reddish brown to maroon, firm, blocky to fissile, non to slightly calcareous, very silty in part.		
LANSING- KANSAS CITY "B"	SAMPLE TOP: 4290'	LOG TOP: 4288'	SUBSEA: -981'
4290' - 4308'	LIMESTONE: white, firm to hard, packstone to grainstone, occasional oolites, fossil(Crinoid, Fusulinids), fair intergranular porosity and poor vuggy porosity, even to spotty live heavy black oil, bright yellowish white fluorescence, instant blooming yellowish white cuts, good show.		
4308' - 4312'	SHALE: dark gray to gray to black, firm, platy to fissile, slightly calcareous, fossil fragments, Limestone partings.		
4312' - 4329'	LIMESTONE: light brown to light gray, firm, argillaceous, fossil fragment, interbedded gray Shale, tight.		
4329' - 4334'	SHALE: gray, firm, platy, n to slightly calcareous, occasional fossil (Brachiopod), dull.		



## LITHOLOGY AND SHOWS

4334' - 4349' SHALE: reddish brown, firm to hard, blocky to fissile, non to slightly calcareous.

### LANSING- KANSAS CITY "C"

SAMPLE TOP: 4349' LOG TOP: 4348' SUBSEA: -1041'

4349' - 4366' LIMESTONE: white to light gray, firm, grainstone, fossil fragment (Fusilinid), rare ooliths, poor intergranular and vuggy porosity, spotty live black oil stain, bright yellowish white fluorescence, instant blooming bright yellowish white cuts, good show.

4366' - 4380' SHALE: dark gray to gray, firm, platy to fissile, slightly calcareous, dull, fossil fragment (Brachiopod), light gray Limestone stringers.

4380' - 4393' SHALE: dark gray, firm, sub fissile, non to slightly calcareous, pyrite.

### LANSING- KANSAS CITY "D"

SAMPLE TOP: 4393' LOG TOP: 4394' SUBSEA: -1087'

4393' - 4404' LIMESTONE: white to light tan, firm, packstone to mudstone, occasional ooliths heavily occluded with sparry calcite, fossil fragment (Crinoid), trace chert, tight, no show.

4404' - 4434' SHALE: dark gray to gray, firm, platy to fissile, slightly calcareous, very light brown Limestone partings.

### LANSING- KANSAS CITY "E"

SAMPLE TOP: 4434' LOG TOP: 4438' SUBSEA: -1131'

4434' - 4452' LIMESTONE: white to cream, hard to firm, mudstone to packstone, occasional pellet, fossil fragment, tight to poor vuggy and interparticle porosity, trace dark brown to black oil specks and stain, bright yellowish white fluorescence, occasional moderate blooming yellowish white cuts, fair show.

4452' - 4462' SHALE: dark gray to gray to black, firm, platy to fissile, slightly calcareous, occasional very carbonaceous.

4462' - 4473' SHALE: light gray, firm, platy, non to slightly calcareous, rare fossil (Brachiopod), dull.

### LITHOLOGY AND SHOWS

LANSING-  
KANSAS CITY "F"

SAMPLE TOP: 4473' LOG TOP: 4476' SUBSEA: -1169'

4473' - 4484'

LIMESTONE: cream to white to very light gray, firm to hard, mudstone, occasional fossil fragment, clean, dense, very tight, no shows.

4484' - 4490'

SHALE: dark gray to gray, firm, platy to fissile, slightly calcareous, occasional slightly carbonaceous.

4490' - 4508'

LIMESTONE: cream to white, firm to hard, mudstone to packstone, chalky in part, occasional ooliths, occasional black algal material, reddish brown Shale partings, tight, no shows.

4508' - 4528'

SHALE: reddish brown to light gray, soft to firm, sub blocky, non calcareous, occasional silty, occasional light gray to white Limestone stringers.

4528' - 4536'

LIMESTONE: white to light tan to light gray, hard, mudstone, occasional fossil, chalky in part, tight, no shows.

4536' - 4570'

SHALE: reddish brown, firm to hard, fissile to blocky, non to slightly calcareous, occasional Limestone stringers.

4570 - 4580' TD

LIMESTONE: cream to white, firm to hard, mudstone, chalky, with interbedded dark gray to reddish brown Shale partings, trace orange Chert, tight, no show.

**SERVICES**

CONTRACTOR:	Beredco Drilling Inc., Rig 2	
Toolpusher:	Milo Salinas	
DRILLING FLUIDS:	Morgan Mud, Inc.	McCook, ND
Mud Type:	Freshwater Chemical	308-340-5946
Engineer:	Dave Lines	
MUD LOGGING:	None	
WELLSITE GEOLOGY:	T. M. McCoy & Co., Inc. Peter J. Vollmer	Wilson, WY 307-733-4332
DRILL STEM TESTING:	Trilobite Testing, Inc. James Winder DST 1: 3752' - 3830' Foraker DST 2: 4090' - 4140' Oread DST 3: 4170' - 4260' LKC "A" DST 4: 4246' - 4310' LKC "B" DST 5: 4306' - 4370' LKC "C" DST 6: 4366' - 4460' LKC "D & E"	Hays, KS 785- 625-4778
DIRECTIONAL DRILLING:	None	
WIRELINE LOGS:	Pioneer Wireline Services RAG: Surface casing - TD Micro: 3100' - TD Jerrod Long	Hays, KS 785-625-3858