Confidentiality Requested:
☑ Yes ☐ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1193016

Form ACO-1
August 2013
Form must be Typed
Form must be Signed
All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # 34318
Name: BEREXCO LLC
Address 1: 2020 N. Bramblewood
Address 2:
City: Wichita State: KS Zip: 67206 + 1094
Contact Person: Rodney Reynolds
Phone: (316) 265-3311
CONTRACTOR: License # 34317
Name: BEREDCO LLC
Wellsite Geologist: Peter J. Volmer
Purchaser: Central Crude Corporation

Designate Type of Completion:

☑ New Well ☐ Re-Entry ☐ Workover

☑ Oil ☐ WSW ☐ SWD ☐ SIOW
☐ Gas ☐ D&A ☐ ENHR ☐ SIGW
☐ OG ☐ GSW ☐ Temp. Abd.
☐ CM *(Coal Bed Methane)*
☐ Cathodic ☐ Other *(Core, Expl., etc.)*:

If Workover/Re-entry: Old Well Info as follows:

Operator:
Well Name:
Original Comp. Date: Original Total Depth:

☐ Deepening ☐ Re-perf. ☐ Conv. to ENHR ☐ Conv. to SWD
☐ Plug Back ☐ Conv. to GSW ☐ Conv. to Producer

☐ Commingled Permit #:
☐ Dual Completion Permit #:
☐ SWD Permit #:
☐ ENHR Permit #:
☐ GSW Permit #:

12/26/2013	12/31/2013	03/03/2014
Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date

API No. 15 - 15-153-20969-00-00
Spot Description:
_ - SE - SE - NE Sec. 22 Twp. 1 S. R. 36 ☐ East ☑ West
2310 Feet from ☑ North / ☐ South Line of Section
330 Feet from ☑ East / ☐ West Line of Section

Footages Calculated from Nearest Outside Section Corner:
☑ NE ☐ NW ☐ SE ☐ SW

GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*

Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84

County: Rawlins
Lease Name: Michael Well #: 7-22
Field Name: East Fork
Producing Formation: Lansing/KS City & Oread
Elevation: Ground: 3175 Kelly Bushing: 3188
Total Vertical Depth: 4450 Plug Back Total Depth: 4383
Amount of Surface Pipe Set and Cemented at: 310 Feet
Multiple Stage Cementing Collar Used? ☐ Yes ☑ No
If yes, show depth set: Feet
If Alternate II completion, cement circulated from:
feet depth to: w/ sx cmt.

Drilling Fluid Management Plan
(Data must be collected from the Reserve Pit)

Chloride content: 700 ppm Fluid volume: 1500 bbls
Dewatering method used: Evaporated

Location of fluid disposal if hauled offsite:

Operator Name:
Lease Name: License #:
Quarter Sec. Twp. S. R. ☐ East ☐ West
County: Permit #:

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

☑ **Confidentiality Requested**
Date: 03/21/2014
☑ **Confidential Release Date:** 03/20/2016
☑ **Wireline Log Received**
☑ **Geologist Report Received**
☐ **UIC Distribution**
ALT ☑ **I** ☐ **II** ☐ **III** **Approved by:** NAOMI JAMES **Date:** 03/21/2014

1193016

Operator Name: BEREXCO LLC Lease Name: Michael Well #: 7-22

Sec. 22 Twp. 1 S. R. 36 ☐ East ☑ West County: Rawlins

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken ☐ Yes ☑ No
(Attach Additional Sheets)

Samples Sent to Geological Survey ☑ Yes ☐ No

Cores Taken ☐ Yes ☑ No

Electric Log Run ☑ Yes ☐ No

List All E. Logs Run:

Radiation Guard Log
Microresistivity Log

☑ Log Formation (Top), Depth and Datum ☐ Sample

Name Attached | Top Attached | Datum Attached

CASING RECORD ☑ New ☐ Used
Report all strings set-conductor, surface, intermediate, production, etc.

Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives
Surface	12.25	8.625	23	310	Common	225	3% cc, 2% gel
Production	7.875	5.50	15.5	4442	Lite & Common	700	3/4# floseal, 10%salt,3%gel, 5# gilsonite

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
___ Perforate ___ Protect Casing ___ Plug Back TD ___ Plug Off Zone	-			
	-			

Did you perform a hydraulic fracturing treatment on this well? ☐ Yes ☑ No *(If No, skip questions 2 and 3)*

Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? ☐ Yes ☐ No *(If No, skip question 3)*

Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? ☐ Yes ☐ No *(If No, fill out Page Three of the ACO-1)*

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record *(Amount and Kind of Material Used)*	Depth
4	4319 - 4326 (LKC)	750 gals 15% MCA, 3% solvent	4319 - 4326
4	4225 - 4259 (LKC)	500 gals 15% MCA, 3% solvent	4225 - 4259
4	4228 - 4234 (LKC)	750 gals 15% MCA, 3% solvent	4228 - 4234
4	4166 - 4178 (LKC)	500 gals 15% MCA, 3% solvent	4166 - 4178
4	4003 - 4008 (Oread)	500 gals 15% MCA, 3% solvent	4003 - 4008

TUBING RECORD: Size: 2.875 Set At: 4335 Packer At: no pkr

Liner Run: ☐ Yes ☑ No

Date of First, Resumed Production, SWD or ENHR. 03/03/2014

Producing Method: ☐ Flowing ☑ Pumping ☐ Gas Lift ☐ Other *(Explain)* _____

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
	398	0	214		

DISPOSITION OF GAS:
☐ Vented ☐ Sold ☐ Used on Lease
(If vented, Submit ACO-18.)

METHOD OF COMPLETION:
☐ Open Hole ☑ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☑ Commingled *(Submit ACO-4)*
☐ Other *(Specify)* _____

PRODUCTION INTERVAL:
4003 - 4326

Mail to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202

Form	ACO1 - Well Completion
Operator	BEREXCO LLC
Well Name	Michael 7-22
Doc ID	1193016

Tops

Name	Top	Datum
Anhydrite	3089	+99
Anhydrite (base)	3120	+68
Neva	3571	-383
Foraker	3678	-490
Topeka	3894	-706
Deer Creek	3932	-744
Oread	4004	-816
Heebner	4045	-957
Lansing/KS City A	4106	-918
LKC B	4166	-978
LKC C	4228	-1040
LKC D	4264	-1076
LKC E	4316	-1128
LKC F	4354	-1166
RTD	4450	-1262
LTD	4454	-1266

Form	ACO1 - Well Completion
Operator	BEREXCO LLC
Well Name	Michael 7-22
Doc ID	1193016

Casing

Purpose Of String	Size Hole Drilled	Size Casing Set	Weight	Setting Depth	Type Of Cement	Number of Sacks Used	Type and Percent Additives
Surface	12.25	8.625	23	310	Common	225	3% cc, 2% gel
Production	7.875	5.50	15.5	4442	Lite & Common	700	3/4# floseal, 10%salt,3 %gel, 5# gilsonite

WELL FILE

ALLIED OIL & GAS SERVICES, LLC 062121

Federal Tax I.D. # 20-8651475

REMIT TO P.O. BOX 93999
SOUTHLAKE, TEXAS 76092

SERVICE POINT: Oakley, KS

DATE	SEC.	TWP.	RANGE	CALLED OUT	ON LOCATION	JOB START	JOB FINISH
12-26-13	22	1	36		3:00 pm	6:30pm	7:30 pm

LEASE	WELL #	LOCATION	COUNTY	STATE
Michael	1-22	Brandsby N70 A.A, 6W to Bothwell Farmhouse, North	Rawlins	KS

OLD OR (NEW) (Circle one)

CONTRACTOR Beredco 2
TYPE OF JOB Surface
HOLE SIZE 12 1/4 T.D. 311'
CASING SIZE 8 3/8 DEPTH 310.75
TUBING SIZE DEPTH
DRILL PIPE DEPTH
TOOL DEPTH
PRES. MAX MINIMUM
MEAS. LINE SHOE JOINT
CEMENT LEFT IN CSG. 15'
PERFS.
DISPLACEMENT 18.93 bbl

OWNER same

CEMENT
AMOUNT ORDERED 225 sks Com 3% CC 2% Gel

EQUIPMENT

PUMP TRUCK # 431 CEMENTER LaRue E. Heath
HELPER Kelly Gabel
BULK TRUCK # 818/287 DRIVER Adam Flippse
BULK TRUCK # DRIVER

COMMON	225 sks	@ 17.70	4,022.50
POZMIX		@	
GEL	4 sks	@ 23.90	93.60
CHLORIDE	8 sks	@ 64.00	512.00
ASC		@	
HANDLING	243.3 sks	@ 2.45	603.38
MILEAGE	11 ton x 50 x 2.60		1443.00
		TOTAL	6738.48

REMARKS:
Mix 225 sks cement
Displace with water
Cement Did circulate
Thank you

SERVICE

DEPTH OF JOB	310.75		
PUMP TRUCK CHARGE			1512.25
EXTRA FOOTAGE		@	
MILEAGE	MIHU 50	@ 7.70	385.00
MANIFOLD	Swedge	@ 225.00	NC
MILU	50	@ 4.40	NC
		@	
		TOTAL	1897.25

CHARGE TO: Beredco 2
STREET
CITY STATE ZIP

PLUG & FLOAT EQUIPMENT

	@	
	@	
	@	
	@	
	@	
	TOTAL	

To: Allied Oil & Gas Services, LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

SALES TAX (If Any)
TOTAL CHARGES 8,636.73
DISCOUNT 2,418.28 IF PAID IN 30 DAYS
6,218.44 Net

PRINTED NAME Mayo Salinas
SIGNATURE

ALLIED OIL & GAS SERVICES, LLC

CEMENTING LOG

STAGE NO.

Date 12-26-13 District Oakley, ks Ticket No. 62121
Company Berexco Rig Beredco 2
Lease Michael Well No. 7-22
County Rawlins State KS
Location 22-1-36 Field
Beardsley 1W to AA, 6W to Farmhouse 2E 1/2 2 3/4 gel

CASING DATA: Conductor ☐ PTA ☐ Squeeze ☐ Misc ☐
Surface ☑ Intermediate ☐ Production ☐ Liner ☐
Size 8 5/8 Type New Weight 23# Collar

Casing Depths: Top KB Bottom 310.75

Drill Pipe: Size Weight Collars
Open Hole: Size 12 1/4 T.D. 311 ft. P.B. to ft.

CAPACITY FACTORS:
Casing: Bbls/Lin. ft. .0864 Lin. ft./Bbl.
Open Holes: Bbls/Lin. ft. Lin. ft./Bbl.
Drill Pipe: Bbls/Lin. ft. Lin. ft./Bbl.
Annulus: Bbls/Lin. ft. Lin. ft./Bbl.
Bbls/Lin. ft. Lin. ft./Bbl.
Perforations: From ft. to ft. Amt.

CEMENT DATA:
Spacer Type:
Amt. Sks Yield ft³/sk Density PPG

LEAD: Pump Time hrs. Type Class A 2% CC
Excess
Amt. 225 Sks Yield 1.36 ft³/sk Density 15.02 PPG
TAIL: Pump Time hrs. Type
Excess
Amt. Sks Yield ft³/sk Density PPG
WATER: Lead gals/sk Tail gals/sk Total Bbls.

Pump Trucks Used 431-Kelly
Bulk Equip. 318/287 - Adam

Float Equip: Manufacturer
Shoe: Type Depth
Float: Type Depth
Centralizers: Quantity Plugs Top Btm.
Stage Collars
Special Equip.
Disp. Fluid Type Water Amt. 18.93 Bbls. Weight PPG
Mud Type Weight PPG

COMPANY REPRESENTATIVE
CEMENTER LaRue

TIME AM/PM	PRESSURES PSI DRILL PIPE CASING	ANNULUS	FLUID PUMPED DATA TOTAL FLUID	Pumped Per Time Period	RATE Bbls Min.	REMARKS
						Held Safety meeting
2:30						Start water
						Start cement 225 sks
						weigh cement 37 mins 15 #
						Stop cement
				30		Wash up pump & lines
2:50				15.93		Displace with water
						Cement did circulate
						Hold Safety meeting
						Thank you

Mylo Skinner

FINAL DISP. PRESS: PSI BUMP PLUG TO PSI BLEEDBACK BBLS.

THANK YOU

WELL FILE

ALLIED OIL & GAS SERVICES, LLC 062126

Federal Tax I.D. # 20-8651475

REMIT TO P.O. BOX 93999
SOUTHLAKE, TEXAS 76092

SERVICE POINT: Oakley KS

DATE 12/31/13	SEC. 22	TWP. 1	RANGE 36	CALLED OUT	ON LOCATION	JOB START 7:00 am	JOB FINISH 8:30 am
LEASE Michael	WELL # 2-22		LOCATION McDonald N TO AA 3/4 E to Old Farm Stead N-E-N-E into			COUNTY Hamilton	STATE KS
OLD OR NEW (Circle one)							

CONTRACTOR Beredco 2
TYPE OF JOB Prod.
HOLE SIZE 7 7/8 T.D.
CASING SIZE 5 1/2 15.5/15.6 DEPTH
TUBING SIZE DEPTH
DRILL PIPE 4 1/2 DEPTH 4490'
TOOL DEPTH
PRES. MAX MINIMUM
MEAS. LINE SHOE JOINT
CEMENT LEFT IN CSG.
PERFS.
DISPLACEMENT

OWNER Same

CEMENT
AMOUNT ORDERED 450 4% WR 1/4# Flo Seal
250 Com 10% salt 2% gel 5# Gilsonite

EQUIPMENT

PUMP TRUCK CEMENTER Alan Ryan
#423-281 HELPER Kevin Ryan
BULK TRUCK
818 DRIVER Thomas (TWS)
BULK TRUCK
396 DRIVER Eddie (TWS)

COMMON	250 ~~250~~	@ 17.50	4375.00
POZMIX		@	
GEL	5 sks	@ 23.40	117.00
CHLORIDE		@	
~~ASC~~ ALW	450 sk	@ 15.75	7087.50
Salt	26 sk	@ 26.25	682.50
Gilsonite	1250 lb	@ .98	1225.00
Flo Seal	338 lb	@ 2.97	1003.86
WFR 2	128 gal	@ ~~8.00~~ 2.38	304.64
		@	
		@	
		@	
		@	
HANDLING 825.3		@ 2.40	2046.24
MILEAGE 2 sx/mile 33.957 Ton			4414.41
		TOTAL	21845.01

REMARKS:

Ran Csg Circulate mix 200 sk WR mix 150 sk
WR + 415 sk ALW 1/4 Flo Seal 5 1/2 Tail w/ 250
Com 10% salt 2% gel 5# Gilsonite. Wash Truck + Circ, Displace
Plug w/ 104.5 BBL H2O w/ 1900 PSI Lift.
Land Plug @ 2200 PSI. Float Held
Cement DID circulate 20 BBL

Thank You Alan, Kevin
Thomas, Eddie

SERVICE

DEPTH OF JOB			
PUMP TRUCK CHARGE			2765.25
EXTRA FOOTAGE		@	
MILEAGE 50 mile		@	385.00
MANIFOLD Head		@ ~~200.00~~	n/c
Extra Hose	50 mile	@ 4.00	n/c
		@	
		TOTAL	3150.25

CHARGE TO: Jesens
STREET
CITY STATE ZIP

PLUG & FLOAT EQUIPMENT

AFU Float Shoe	1	@	232.00
Latch Down Assembly	1	@	184.00
Centralizers	11	@ 37.00	407.00
Ric. Scratchers	20	@ 46.00	920.00
W Basket		@	394.29
		TOTAL	2137.29

To: Allied Oil & Gas Services, LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

SALES TAX (If Any)
TOTAL CHARGES 27,137.05
DISCOUNT 6,999.93 IF PAID IN 30 DAYS
20,137.11 Net.

PRINTED NAME
SIGNATURE Ed Jones

ALLIED OIL & GAS SERVICES, LLC

CEMENTING LOG

STAGE NO.

Date 12/31/17 District Oakley Ticket No. 062126
Company Berexco Rig Beredco 2
Lease Michael Well No. 2-22
County Rawlins State KS
Location Field

CASING DATA: Conductor ☐ PTA ☐ Squeeze ☐ Misc ☐ Surface ☐ Intermediate ☐ Production ☒ Liner ☐

Size 5 1/2 Type New Weight 15 1/2 Collar

Casing Depths: Top KB Bottom 44

Drill Pipe: Size 4 1/2 Weight Collars
Open Hole: Size 7 7/8 T.D. ft. P.B. to ft.

CAPACITY FACTORS:

Casing:	Bbls/Lin. ft. .0238	Lin. ft./Bbl.
Open Holes:	Bbls/Lin. ft.	Lin. ft./Bbl.
Drill Pipe:	Bbls/Lin. ft.	Lin. ft./Bbl.
Annulus:	Bbls/Lin. ft.	Lin. ft./Bbl.
	Bbls/Lin. ft.	Lin. ft./Bbl.

Perforations: From ft. to ft. Amt.

CEMENT DATA:
Spacer Type: WFR II
Amt. 12 BBL Sks Yield ft³/sk Density PPG

LEAD: Pump Time hrs. Type ALW 1/4 Flo
Excess
Amt. 450 Sks Yield ft³/sk Density PPG

TAIL: Pump Time hrs. Type Com 10% Salt 2% gel 5# Gilsonite
Excess
Amt. 250 Sks Yield ft³/sk Density PPG

WATER: Lead gals/sk Tail gals/sk Total Bbls.

Pump Trucks Used 423-281
Bulk Equip. 818 396

Float Equip: Manufacturer
Shoe: Type Depth
Float: Type Depth
Centralizers: Quantity Plugs Top Btm.
Stage Collars
Special Equip.
Disp. Fluid Type H_2O Amt. Bbls. Weight PPG
Mud Type Weight PPG

COMPANY REPRESENTATIVE Ed Haves

CEMENTER [signature]

TIME AM/PM	PRESSURES PSI: DRILL PIPE CASING	PRESSURES PSI: ANNULUS	FLUID PUMPED DATA: TOTAL FLUID	FLUID PUMPED DATA: Pumped Per Time Period	FLUID PUMPED DATA: RATE Bbls Min.	REMARKS
						On location SFTY Mtg set up
						Break Circulate
						Mix WFR II
						Mix 20 SK RH
						Mix 15 SK MH
						Mix 415 SK Comm 5 1/2 ALW
						Mix 250 SK Com 10% salt 2% gel 5# Gilsonite
						Wash up
						Displace Plug w/ H_2O
	200			20.0		
	300			40.0		
	500			50.0		
	700			60.0		
	900			70.0		
	1000			80.0		
	1500			90.0		
	1700			100.0		
	1900			104.5		
	2000					Land Plug
						Float Held Job Complete
						Cement Did Circulate

FINAL DISP. PRESS: PSI BUMP PLUG TO PSI BLEEDBACK BBLS. THANK YOU

BEREXCO LLC

MICHAEL 7-22

SE SE NE SEC 22 T1S R36W

RAWLINS COUNTY, KANSAS

SUMMARY

The Berexco LLC Michael 7-22 in Rawlins County, Kansas spud December 26, 2013 and reached a total depth of 4450' on December 30, 2013. The test drilled rathole below the Lansing-Kansas City F zone but did not penetrate the Pennsylvanian Pawnee. Wellsite geological supervision commenced at 3000'. The primary objective was the Pennsylvanian Missourian Lansing-Kansas City carbonate benches, which produce in the East Fork field. A secondary zone of interest was the Virgilian Oread Limestone. The Michael 7-22 was drilled using seismic and nearby well control.

Because the Michael 7-22 was drilled as a 10-acre infill well, no DSTs were run. A PDC bit was run from surface casing to total depth. No lost circulation was encountered. A second "wiper trip" was made after wireline logs only reached 2218' on the first logging run. Several tight zones were encountered on the second attempt but logs went to bottom.

Evaluation of the primary zones of interest was by sample analysis. Drill rate was not always a good indicator of formation changes and sample correlation was difficult at times.

Oread Limestone and Lansing-Kansas City

The Oread samples were fossiliferous packstone with fair interparticle porosity, scattered oil staining, and good cuts.

The Lansing A exhibited fair moldic and interparticle porosity with spotty black oil, good sample cuts and fluorescence. Wireline logs showed good porosity. The Lansing B was fossiliferous packstone and mudstone with poor to trace vuggy porosity, live black oil staining, and fair cuts. Wireline logs revealed tight to poor limestone porosity. The Lansing C samples exhibited good cut and fluorescence in grainstone with fair moldic porosity. Spotty live black oil staining was evident. The Lansing D limestone exhibited good fluorescence and cuts but poor porosity. The Lansing E was packstone with black heavy oil staining and fair intergranular and poor vuggy porosity. The Lansing F was nonporous limestone with no sample shows.

Oil Well Completion

5 ½" production casing was run to complete the Michael 7-22 as an oil producer.

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

WELL DATA

OPERATOR:	Berexco LLC 2020 North Bramblewood Drive Wichita, Kansas 67206
WELL NAME:	Michael 7-22
SURFACE LOCATION:	2310’ FNL & 330’ FEL SE SE NE Sec 22, T1S, R36W Rawlins County, Kansas
LATITUDE & LONGITUDE:	39.9527397, -101.3369867
BOTTOM HOLE LOCATION:	Vertical Hole
ELEVATIONS:	3175’ GL 3188’ KB
API NUMBER:	15-153-20969
BASIN:	Mid-Continental Arch
FIELD:	East Fork
HOLE SIZE:	12 ¼” to 310’; 7 7/8” to 4450’
CASING:	8 5/8” J-55 24# STC set to 310’ KB
SPUD DATE:	December 26, 2013
TD DATE:	December 30, 2013
TOTAL DEPTH:	4450’ Rig TD 4454’ Log TD
LAST FORMATION:	Pennsylvanian Lansing-Kansas City
WELL STATUS:	Ran 5 ½” production casing for oil well completion
OPERATOR REPRESENTATIVE:	Dana Wreath - Vice President
WELLSITE GEOLOGIST:	Peter J. Vollmer

FORMATION TOPS

Formation	Sample Top	Log Top	Log TVD	Log Datum
KB				3188
Pierre Sh	Cased	Cased	N/A	N/A
Niobrara Fm	N/A	1092	1092	+2096
Fort Hays Ls Mbr	N/A	1626	1626	+1562
Carlile Sh	N/A	1666	1666	+1522
Dakota	N/A	2223	2223	+965
Cheyenne	N/A	2600	2600	+588
Blaine	N/A	2930	2930	+258
Stone Corral Anhydrite	3089	3089	3089	+99
Base Anhydrite	3121	3120	3120	+68
Neva	3565	3571	3571	-383
Foraker	3675	3678	3678	-490
Topeka	3903	3894	3894	-706
Deer Creek Sand	3934	3932	3932	-744
Oread	4012	4004	4004	-816
Heebner Sh	4045	4045	4045	-857
Lansing-Kansas City				
"A"	4106	4106	4106	-918
"B"	4163	4166	4166	-978
"C"	4228	4228	4228	-1040
"D"	4271	4264	4264	-1076
"E"	4310	4316	4316	-1128
"F"	4354	4354	4354	-1166
TD Driller	4450			
TD Logger		4454	4454	-1266

LITHOLOGY AND SHOWS

The following descriptions are interpretive. Rig crew members collected unlagged samples from 3500’ to 4540’ TD. Depths are rig depths except where noted as wireline.

3500’ - 3526’	SHALE: red, firm to hard, subfissile to blocky, very silty, sandy in part, non to slightly calcareous, trace tan LIMESTONE.
3526’ - 3544’	LIMESTONE: white to light gray, firm to hard, chalky, fossil fragment, tight, no shows.
3544’ - 3565’	SHALE: red, firm to hard, subfissile to blocky, very silty, sandy in part, non to slightly calcareous.

NEVA	SAMPLE TOP: 3565’	LOG TOP: 3571’	SUBSEA: -383’

3565’ - 3576’	LIMESTONE: gray to dark gray, firm to hard, cryptocrystalline, black algal stain, chalky, tight, no shows.
3576’ - 3614’	SHALE: red brown, soft to firm, blocky, n to slightly calcareous, occasional silty, with interbedded LIMESTONE: white to light gray, firm to hard, cryptocrystalline, tight, no shows.
3614’ - 3656’	SHALE: red brown to grayish green, firm, blocky, silty, Limestone stringers.
3656’ - 3675’	SHALE: red brown, soft to firm, sub blocky, n calcareous, occasional silty.

FORAKER	SAMPLE TOP: 3675’	LOG TOP: 3678’	SUBSEA: -490’

3675’ - 3690’	LIMESTONE: white to light gray, firm to hard, cryptocrystalline, chlky, fossil fragment, trace black oil stain, dull yellowish white fluorescence, slow streaming yellowish white cuts from tight Limestone, no visible porosity, poor show.
3690’ - 3696’	SHALE: gray to grayish green, firm, blocky, non to slightly calcareous, fossil fragments.
3696’ - 3712’	LIMESTONE: white to light gray, firm to hard, cryptocrystalline, chalky, fossil fragment, algal stain, slightly sandy at base, tight, no shows.
3712’ - 3718’	SANDSTONE: white, friable, very fine grained, subangular, well sorted, calcareous cement, clay fill, tight to trace porosity, no shows.

LITHOLOGY AND SHOWS

3718’ - 3756’	LIMESTONE: white, firm, chalky, tight, with SHALE: gray to grayish green, firm, blocky, non to slightly calcareous, fossil fragments.
3756’ - 3806’	SHALE: reddish brown, soft to firm, subblocky, non calcareous, occasional silty.
3806’ - 3834’	SHALE: dark gray to black, firm, fissile to blocky, non calcareous, carbonaceous in part, fossil fragments (Brachiopods).
3834’ - 3868’	LIMESTONE: light gray to white, hard to firm, cryptocrystalline, fossil fragment, gray Shale stringers, tight, no shows.
3868’ - 3903’	SHALE: brownish red, soft to firm, blocky, non to slightly calcareous, occasional LIMESTONE: white to light gray, hard, cryptocrystalline, fossil fragments, tight, no shows.

TOPEKA	SAMPLE TOP: 3903’	LOG TOP: 3894’	SUBSEA: -706’

3903’ - 3912’	LIMESTONE: light gray to white, hard to firm, cryptocrystalline, fossil fragments, sparry calcareous fill, trace black oil stain, tight, bright yellowish white fluorescence, good streaming yellowish white cuts, fair show.
3912’ - 3920’	SHALE: gray, firm, platy, non to slightly calcareous, subwaxy, plant remains.
3920’ - 3934’	LIMESTONE: light gray to white, hard to firm, cryptocrystalline, fossil fragments, trace opaque chert, tight, no shows.

DEER CREEK SAND	SAMPLE TOP: 3934’	LOG TOP: 3932’	SUBSEA: -744’

3934’ - 3952’	SANDSTONE: light gray to light brown, friable to soft, very fine grained, well rounded, well sorted, calcareous, predominant clay filled, plant remains, abundant loose grains, no visible porosity, no show.
3952’ - 4012’	SHALE: reddish brown, maroon, light gray, mottled in part, soft to firm, blocky, non calcareous, occasionally moderately to very silty in part.

OREAD	SAMPLE TOP: 4012’	LOG TOP: 4004’	SUBSEA: -816’

4012’ - 4030’	LIMESTONE: cream to white, firm to hard, wackestone to packstone, chalky in part, fossil fragment, occasional peloids, tight to fair interparticle and vuggy

LITHOLOGY AND SHOWS

	porosity, scattered black to dark brown live oil stain, bright yellowish white fluorescence, immediate blooming milky yellowish white cuts, good show.
4030’ - 4045’	LIMESTONE: white to light gray, very hard, cryptocrystalline, slightly siliceous, fossil fragments, tight, no shows.

HEEBNER SH.	SAMPLE TOP: 4045’	LOG TOP: 4045’	SUBSEA: -857’

4045’ - 4054’	SHALE: grayish black to dark gray, firm, sub fissile, carbonaceous, non to very slightly calcareous.
4054’ - 4106’	SHALE: gray, firm, platy, non to slightly calcareous, fossil fragments.

LANSING- KANSAS CITY “A”	SAMPLE TOP: 4106’	LOG TOP: 4106’	SUBSEA: -918’

4106’ - 4120’	LIMESTONE: white to cream to very light gray, firm to hard, mudstone to grainstone, peloids, fossil fragments, trace black heavy oil stain, trace to fair interparticle porosity, bright yellowish white fluorescence, fair show.
4120’ - 4126’	SHALE: gray to dark gray, firm, blocky, non to slightly calcareous.
4126’ - 4134’	SANDSTONE: white to light brown, hard to friable, very fine grained, well rounded, well sorted, calcareous cement, clay filled, occasional black heavy oil specks, predominantly tight, bright yellowish white fluorescence, slow diffuse yellowish white cut, poor show.
4134’ - 4163’	SHALE: gray to light gray, firm, blocky, non to slightly calcareous.

LANSING- KANSAS CITY “B”	SAMPLE TOP: 4163’	LOG TOP: 4166’	SUBSEA: -978’

4163’ - 4180’	LIMESTONE: white, firm, packstone, fossil(Crinoids, Fusulinids), poor intergranular and vuggy porosity, spotty heavy black oil, bright yellowish white fluorescence, good diffuse yellowish white cut, good show.
4180’ - 4190’	SHALE: dark gray, firm, platy, slightly calcareous in part, carbonaceous material.

LITHOLOGY AND SHOWS

4190’ - 4228’	LIMESTONE: white to light gray, firm, cryptocrystalline, gray Shale partings, fossil fragments (Brachiopods), tight, no show.

LANSING-
KANSAS CITY “C” SAMPLE TOP: 4228’ LOG TOP: 4228’ SUBSEA: -1040’

4228’ - 4242’	LIMESTONE: white, firm, grainstone, very fossil, fair intergranular and vuggy porosity, spotty live black heavy oil, free oil in vugs, dull yellowish white fluorescence, blooming yellowish white cuts, good show.
4242’ - 4248’	SHALE: dark gray, firm, blocky, slightly calcareous.
4248’ - 4254’	LIMESTONE: white to dark gray, mottled in part, hard to firm, grainstone, fossils, trace intergranular porosity, occasional live black oil, patchy yellowish white fluorescence, fair milky yellowish white cut, fair show.
4254’ - 4271’	SHALE: dark gray to black, firm, blocky, calcareous, carbonaceous in part.

LANSING-
KANSAS CITY “D” SAMPLE TOP: 4271’ LOG TOP: 4264’ SUBSEA: -1076’

4271’ - 4294’	LIMESTONE: white, firm to hard, packstone to mudstone, fossil fragments, poor to trace intergranular porosity, rare spotty black oil, bright yellowish white fluorescence, blooming yellowish white cuts, fair show.
4294’ - 4310’	SHALE: dark gray, firm, blocky, occasional white chalky Limestone partings.

LANSING-
KANSAS CITY “E” SAMPLE TOP: 4310’ LOG TOP: 4316’ SUBSEA: -1128’

4310’ - 4326’	LIMESTONE: white, firm, mudstone to packstone, fossil fragments, secondary clear calcareous crystals in vugs, poor intergranular and occasional vuggy porosity, scattered black heavy oil stain, bright yellowish white fluorescence, dull yellowish white diffuse cut, good show.
4326’ - 4332’	SHALE: dark gray, firm, sub fissile, non calcareous, slightly carbonaceous.
4332’ - 4354’	SHALE: gray, firm, platy, non to slightly calcareous, trace fossil, dull luster.

LITHOLOGY AND SHOWS

LANSING- KANSAS CITY "F"	SAMPLE TOP: 4354'	LOG TOP: 4354'	SUBSEA: -1166'

4354' - 4370'	LIMESTONE: cream to white, firm to hard, mudstone to wackestone, scattered fossil fragments, trace black dead oil, very tight, no shows.
4370' - 4402'	SHALE: dark gray, firm, blocky, slightly to non calcareous, fossil fragments, with LIMESTONE: gray to white, firm to hard, mudstone, occasional fossil fragments, calcite crystals, tight, no show.
4402' - 4450' TD	SHALE: dark gray, firm, platy, non to very slightly calcareous, fossil fragments, interbedded white chalky Limestone.

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.	Wilson, WY
	Peter J. Vollmer	307-733-4332
DRILL STEM TESTING:	None	
DIRECTIONAL DRILLING:	None	
WIRELINE LOGS:	Pioneer Wireline Services	Hays, KS
	RAG: Surface casing - TD	785-625-3858
	Micro: 3500’ to TD	
	Engineer: Chris Desaire	