

**OPERATOR**

Company: Younger Energy Company  
 Address: 9415 E. Harry  
 Suite 403, Bldg. 400  
 Wichita, KS 67207

Contact Geologist:  
 Contact Phone Nbr: 316-681-2542  
 Well Name: Johnston #4  
 Location: Sec. 34 - T21S - R15W  
 API: 15-145-21827-0000  
 Pool:  
 State: Kansas

Field: Hurray North  
 Country: USA



Scale 1:240 Imperial

Well Name: Johnston #4  
 Surface Location: Sec. 34 - T21S - R15W  
 Bottom Location:  
 API: 15-145-21827-0000  
 License Number: 30705  
 Spud Date: 11/10/2017 Time: 5:45 PM  
 Region: Pawnee County  
 Drilling Completed: 11/17/2017 Time: 5:50 AM  
 Surface Coordinates: 965' FNL & 1420' FEL  
 Bottom Hole Coordinates:  
 Ground Elevation: 1966.00ft  
 K.B. Elevation: 1974.00ft  
 Logged Interval: 3200.00ft To: 3980.00ft  
 Total Depth: 3980.00ft  
 Formation: Arbuckle  
 Drilling Fluid Type: Chemical/Fresh Water Gel

**SURFACE CO-ORDINATES**

Well Type: Vertical  
 Longitude: -98.954170  
 Latitude: 38.186533  
 N/S Co-ord: 965' FNL  
 E/W Co-ord: 1420' FEL

**LOGGED BY**

***Keith Reavis***  
*Consulting Geologist*

Company: Keith Reavis, Inc.  
 Address: 3420 22nd Street  
 Great Bend, KS 67530

Phone Nbr: 620-617-4091  
 Logged By: KLG #136

Name: Keith Reavis

**CONTRACTOR**

Contractor: Duke Drilling Company  
 Rig #: 2  
 Rig Type: mud rotary  
 Spud Date: 11/10/2017 Time: 5:45 PM  
 TD Date: 11/17/2017 Time: 5:50 AM  
 Rig Release: Time:

## ELEVATIONS

K.B. Elevation: 1974.00ft  
K.B. to Ground: 8.00ft

Ground Elevation: 1966.00ft

### NOTES

It was determined after analysis of the DST and electrical log data that the Johnston #4 would be non-commercial. The operator did run and cement 5 1/2" production casing. The well will be used for injection/enhanced recovery in the Simpson Sand.

A Bloodhound gas detection system operated by Bluestem Labs was employed on this well. ROP and gas data from said system, as well as gamma ray and caliper curves from the electrical log suite, were imported into this report.

The samples were saved and will be available for review at the Kansas Geological Survey Well Sample Library located in Wichita, KS.

Respectfully submitted,  
Keith Reavis

## daily drilling report

DATE	7:00 AM DEPTH	REMARKS
11/14/2017	3743	geologist Keith Reavis on location @ 3435 ft, 0010 hrs, drilling ahead Queen Hill, Heebner, Toronto, Douglas, Lansing, Base KC, conglomerate, Viola, cfs in Viola @ 3842, TOH w/PDC bit, stuck @ 2000 ft, rig up hammer and spot fresh oil, no help, wait on wire line tools overnight
11/15/2017	3842	rig up Perf Tech, free point, shoot and back off, TOH with drill pipe, rig up A & A Fishing Tools, run in with hydraulic jars, got loose, TOH w/bit, run in hole with button bit
11/16/2017	3890	finish TIH w/bit, ctch, re-condition mud system, resume drilling Simpson shale and Simpson Sand, show warrants test, TOH for DST #1, conduct and complete DST #1 successful test, TIH w/bit, resume drilling, Simpson
01/10/1900	3980	drill and cfs, Simpson, Arbuckle, rathole to TD of 3980 ft, rig up ELI, conduct logging operations, off location 1230 hrs

## well comparison sheet

DRILLING WELL					COMPARISON WELL				COMPARISON WELL				
Younger - Johnston #4 965' FNL & 420' FEL Sec. 34-T21S-R15W  1974 KB					F&M - Johnston #1 NE NW NE Sec. 34-T21S-R15W  1969 KB				F&M - Johnston #2 NW NE NE Sec. 34-T21S-R15W  1972 KB				
													Structural Relationship
Formation	Sample	Sub-Sea	Log	Sub-Sea	Log	Sub-Sea	Sample	Log	Log	Sub-Sea	Sample	Log	
Queen Hill	3262	-1288	3260	-1286	3254	-1285	-3	-1		3258	-1286	-2	
Heebner	3366	-1392	3362	-1388	3358	-1389	-3	1		3361	-1389	-3	1
Douglas	3399	-1425	3394	-1420	3392	-1423	-2	3		3395	-1423	-2	3
Brown Lime	3474	-1500	3471	-1497	3467	-1498	-2	1		3472	-1500		3
Lansing	3485	-1511	3480	-1506	3477	-1508	-3	2		3481	-1509	-2	3
Lansing G	3568	-1594	3568	-1594	3562	-1593	-1	-1		3568	-1596	2	2
Stark	3669	-1695	3668	-1694	3665	-1696	1	2		3666	-1694	-1	
Base KC	3714	-1740	3716	-1742	3708	-1739	-1	-3		3712	-1740		-2
Conglomerate	3782	-1808	3788	-1814	3780	-1811	3	-3		3780	-1808		-6
Viola	3800	-1826	3804	-1830	3799	-1830	4			3800	-1828	2	-2
Simpson	3844	-1870	3844	-1870	3840	-1871	1	1		3843	-1871	1	1
Simp upper sd	3887	-1913	3876	-1902	3857	-1888	-25	-14		3867	-1895	-18	-7
Simp lower sd	no pick		3914	-1940	3896	-1927		-13		3892	-1920		-20
Arbuckle	3927	-1953	3920	-1946	3904	-1935	-18	-11		3896	-1924	-29	-22
Total Depth	3980	-2006	3979	-2005	3908	-1939	-67	-66		3899	-1927	-79	-78



### DRILL STEM TEST REPORT

Younger Energy Company

34-21s-15w

9415 E Harry St 403 bldg 400

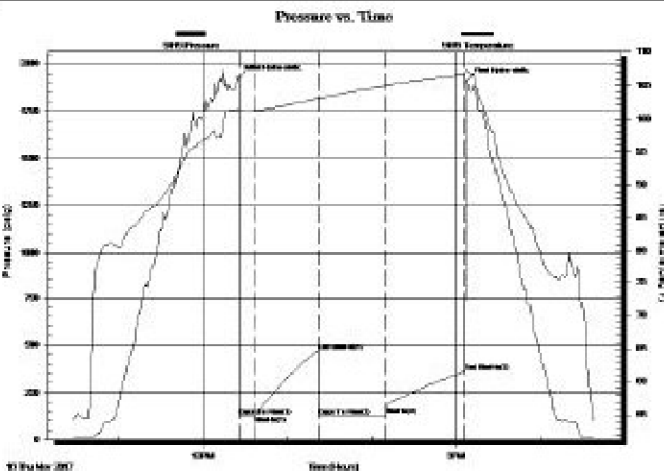
Johnston #4

### GENERAL INFORMATION:

**Formation:** Simpson  
**Deviated:** No **Whipstock:** ft (KB)  
**Test Type:** Conventional Bottom Hole (Initial)  
**Time Tool Opened:** 12:48:00 **Tester:** Gene Budig  
**Time Test Ended:** 17:00:00 **Unit No.:** 1  
**Interval:** 3710.00 ft (KB) To 3890.00 ft (KB) (TVD) **Reference Elevations:** 1972.00 ft (KB)  
**Total Depth:** 3890.00 ft (KB) (TVD) 1964.00 ft (CF)  
**Hole Diameter:** 7.88 inches **Hole Condition:** Fair **KB to GR/CF:** 8.00 ft

**Serial #: 9119** **Outside**  
**Press@RunDepth:** 360.26 psig @ 3884.84 ft (KB) **Capacity:** 5000.00 psig  
**Start Date:** 2017.11.16 **End Date:** 2017.11.16 **Last Calb.:** 2017.11.16  
**Start Time:** 10:28:00 **End Time:** 16:38:00 **Time On Btm:** 2017.11.16 @ 12:25:30  
**Time Off Btm:** 2017.11.16 @ 15:07:30

**TEST COMMENT:** 1st Opening 10 Minutes Weak blow built to 2 inches  
 1st Shut-in 45 Minutes no blow back  
 2nd Opening 45 Minutes weak blow built to 1 inch decreased and died in 27 minutes  
 2nd Shut-in 60 Minutes no blow back



### PRESSURE SUMMARY

Time (Mn.)	Pressure (psig)	Temp (deg F)	Annotation
0	1925.40	101.41	Initial Hydro-static
1	124.46	101.00	Open To Flow (1)
12	127.89	101.14	Shut-in (1)
57	468.30	103.00	End Shut-in (1)
57	127.15	102.96	Open To Flow (2)
105	133.03	104.93	Shut-in (2)
161	360.26	106.73	End Shut-in (2)
162	1911.78	107.45	Final Hydro-static

### Recovery

Length (ft)	Description	Volume (bbl)
15.00	Drilling mud	0.21

### Gas Rates

Choke (Inches)	Pressure (psig)	Gas Rate (M cfd)

### ROCK TYPES

Cht	Dolprim	Lmst fw7>	Carbon Sh	Ss
Cht vari	sdymst	shale, gm	shale, red	
Chtcongl	Lmst fw<7	shale, gry	Shcol	

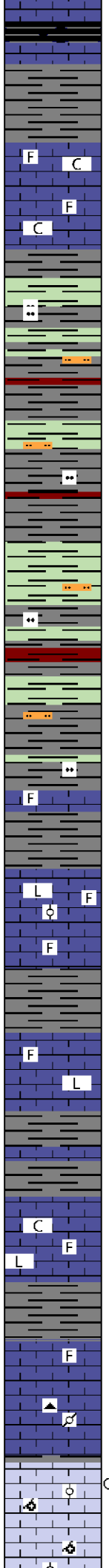
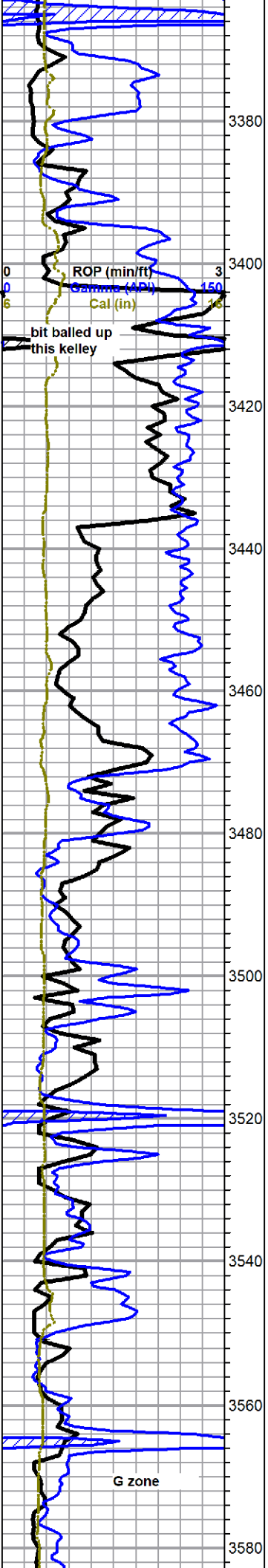
### ACCESSORIES

<b>MINERAL</b> ▲ Chert, dark ▽ Dolomitic P Pyrite ** Silty	<b>FOSSIL</b> ∪ Bioclastic or Fragmental F Fossils < 20% ∅ Oolite ⚡ Pellets ⚡ Oomoldic	<b>STRINGER</b> ● Sandstone ○ Siltstone	<b>TEXTURE</b> C Chalky L Lithogr
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### OTHER SYMBOLS

<b>Oil Show</b> ● Good Show ● Fair Show	<b>DST</b> ■ DST Int ■ DST alt
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**Heebner 3366 -1392**  
shale, black carbonaceous

**Toronto 3383 -1409**  
limestone, white to light gray, chalky fossiliferous to dense cryptocrystalline fossiliferous, poor visible porosity, no shows

**Douglas 3399 -1425**  
gray and green silty shale, some red shale, trace gray/green siltstone

**Brown Lime 3474 -1500**  
limestone, tan to brown, cryptocrystalline, dense, fossiliferous, no show

**Lansing 3485 -1511**  
limestone, light gray to cream, some tan, cryptocrystalline, fossiliferous to lithographic, trace very fine oolitic, poor visible porosity, no shows

limestone, light gray to cream, some tan, cryptocrystalline, fossiliferous to lithographic, poor visible porosity

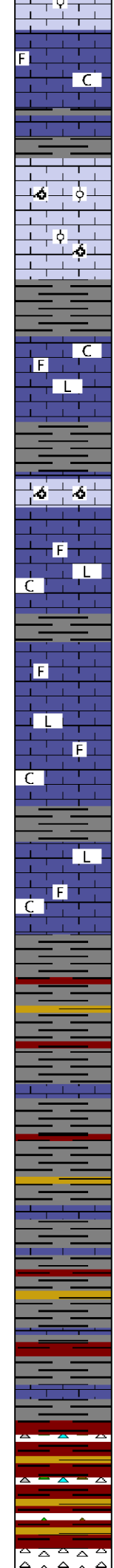
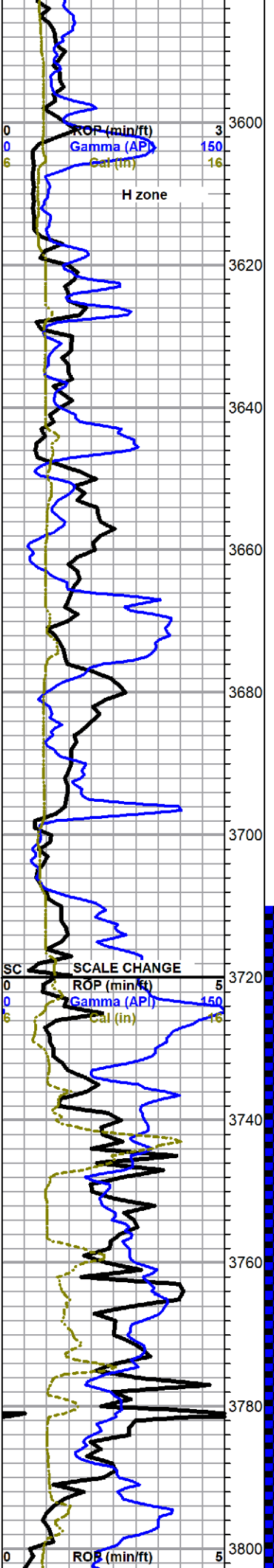
limestone, white to light gray and cream, cryptocrystalline, lithographic to fossiliferous, chalky in part, no shows

limestone a.a., with mottled gray pelletal to fossiliferous limestone, scattered gray fossiliferous chert, no shows

limestone, light gray, oomoldic to oolitic, some fair oomold porosity, with cryptocrystalline vuggy lithographic to fossiliferous, trace black stain, trace sheen and small oil droplets, no odor, poor fluorescence, fair blueish cut

0	Total Gas (units)	100
0	C1 (units)	100
0	C2 (units)	100
0	C3 (units)	100
0	C4 (units)	100

work on pump @ 3435'  
re-adjust extractor



limestone, light gray, oolitic to oomoldic, some good porosity, questionable spotty stain (from above?), poor fluorescence, no odor

limestone, white to cream and gray, mostly cryptocrystalline, some chalky, lithographic to fossiliferous, no shows

limestone a.a. with limestone, light gray, oomoldic, large mold and vugs, barren

**Stark Shale 3669 -1695**

limestone, white to gray, cryptocrystalline, fossiliferous to lithographic, mostly dense, abundant chalk, no shows

limestone, a.a.

**Base KC 3714 -1740**

mixed gray, red, mottled and lavender shales, mostly limestone in samples, mixed stringers

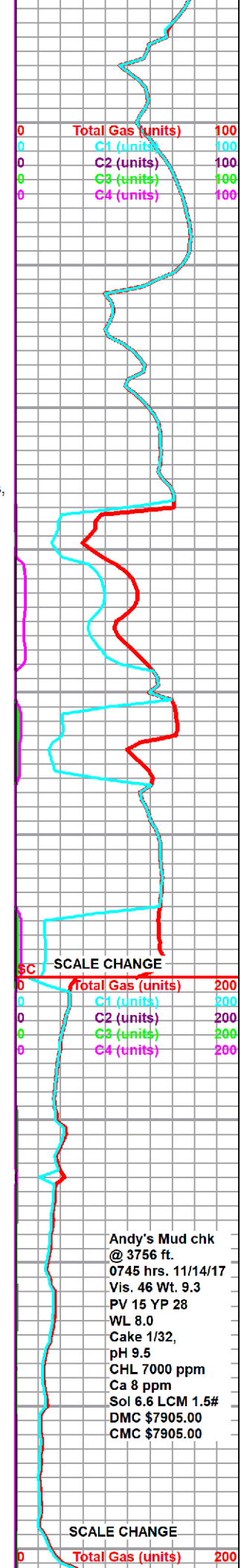
Begin 10 ft wet and dry samples

3790 sample, increasing shales, samples finer, traces orange chert

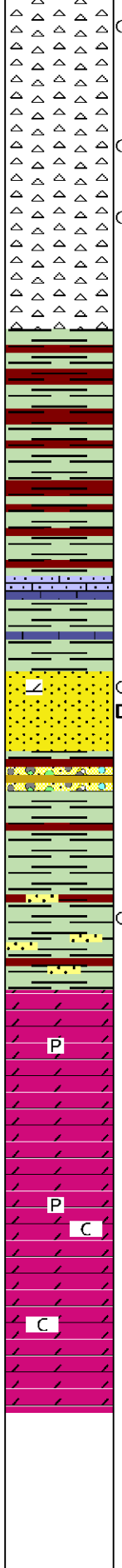
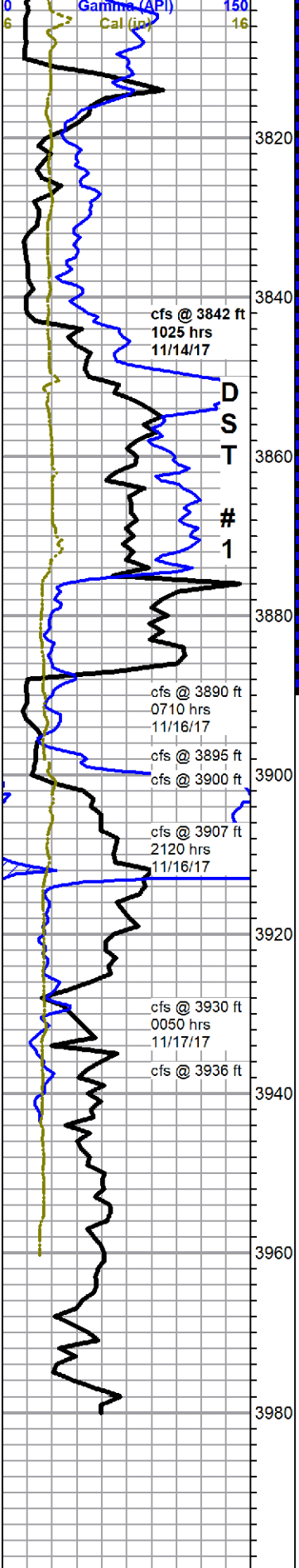
**Conglomerate 3782 -1808**

3820 sample shale and limestones a.a., marked increase chalk in samples, grades to shaley conglomerate, red, olive and other mixed shales and limestone, yellow and orange chert, no shows

**Viola 3800 -1826**



Andy's Mud chk @ 3756 ft.  
 0745 hrs. 11/14/17  
 Vis. 46 Wt. 9.3  
 PV 15 YP 28  
 WL 8.0  
 Cake 1/32,  
 pH 9.5  
 CHL 7000 ppm  
 Ca 8 ppm  
 Sol 6.6 LCM 1.5#  
 DMC \$7905.00  
 CMC \$7905.00



chert, white to cream, fresh to slightly weathered, some light staining, some scattered stained tripolitic, slight show free oil droplets, no odor, poor fluorescence

**Simpson 3844 -1870**  
shale, red to maroon and green

3880 sample significant influx cherts from above, some bleeding oil

3890 sample, a.a. with dense brown/olive nodular limestones, maroon/white mottled chalky and sandy limestone, mushy olive shales

**U. Simpson Sand 3887 -1913 (Log 3876 -1902)**  
sandstone, quartz to white, trace arkosic, very fine to fine grain, mostly well sorted, rounded, friable, dolomitic, trace pyrite, good porosity, very fine grain sands (mostly in 30 min sample) light stain, show heavy free oil, poor fluorescence, dull yellow cut, fine grain sands (mostly 60 min sample) black tarry to gilsonitic stain to barren, no oil on break, poor fluorescence, blueish cut, odor masked from contaminated mud

3900 cfs, shaley congl (brick red, brittle, green, lavender, w/orange, brick red and yellow chert, abundant loose sand, large globules flakey gilsonite)

3907 30 min green and turquoise waxy shale, with brick red shale

shale a.a. with: sandstone stringers, a.a., slight stain, more pyritic, slight show stringy oil on break, poor fluorescence, good cut on break only

**L. Simpson Sand Log top 3914 -1940**

**Arbuckle 3927 -1953 (Log 3920 -1946)**  
dolomite, light gray, crypto-microcrystalline, sub-rhombic to sub-lithographic, pyritic, some vuggy porosity, some sandy, dolomite, dark gray, cherty, cryptocrystalline, arenaceous, very dense, no shows, still carrying some sand as described above

light gray dolomites a.a. with abundant light gray rhombic, scattered intercrystalline porosity, some caliche, no shows

dolomite, light gray to cream, microcrystalline, rhombic to recrystallized sub-rhombic, some good solutions vugs, moderate caliche in samples, no shows

rotary TD 3980 ft @ 0550 hrs 11/17/17  
ELI Wireline Log TD 3979 ft  
complete logging operation @ 1200 hrs

