

OPERATOR

Company: MULL DRILLING COMPANY, INC.
 Address: 1700 N WATERFRONT PKWY
 BLDG 1200
 WICHITA, KANSAS 67206-6637
 Contact Geologist: MARK SHREVE / TOBY ECK
 Contact Phone Nbr: 316-264-6366
 Well Name: JOY #1-1
 Location: NW SE SW SE S1 T16S R38W API: 15-203-20255-00-00
 Pool: WILDCAT Field:
 State: KANSAS Country: USA



DRILLING COMPANY, INC.
 WICHITA, KANSAS

Scale 1:240 Imperial

Well Name: JOY #1-1
 Surface Location: NW SE SW SE S1 T16S R38W
 Bottom Location:
 API: 15-203-20255-00-00
 License Number: 5144
 Spud Date: 5/3/2014 Time: 2:15 PM
 Region: WICHITA COUNTY
 Drilling Completed: 5/16/2014 Time: 6:20 AM
 Surface Coordinates: 396 FSL & 1852 FEL
 Bottom Hole Coordinates:
 Ground Elevation: 3419.00ft
 K.B. Elevation: 3428.00ft
 Logged Interval: 3600.00ft To: 5395.00ft
 Total Depth: 5395.00ft
 Formation: MARMATON, MORROW SAND
 Drilling Fluid Type: CHEMICAL / FRESH WATER GEL

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -101.4641055 Latitude: 38.6856505
 N/S Co-ord: 396 FSL
 E/W Co-ord: 1852 FEL

LOGGED BY

Company: SOLUTIONS CONSULTING, INC.
 Address: 108 W 35TH
 HAYS, KS 67601
 Phone Nbr: (785) 639-1337
 Logged By: Geologist Name: STEVE REED / HERB DEINES

CONTRACTOR

Contractor: DUKE DRILLING
 Rig #: 4
 Rig Type: MUD ROTARY
 Spud Date: 5/3/2014 Time: 2:15 PM
 TD Date: 5/16/2014 Time: 6:20 AM
 Rig Release: 5/17/2014 Time: 7:00 AM

ELEVATIONS

K.B. Elevation: 3428.00ft Ground Elevation: 3419.00ft
 K.B. to Ground: 9.00ft

NOTES

DUE TO LACK OF SIGNIFICANT SHOWS AND NEGATIVE RESULTS OF ALL DRILL STEM TESTS, DECISION WAS MADE TO PLUG AND ABANDON WELL

OPEN HOLE LOGGING PROVIDED BY: NABORS
 DUAL COMPENSATED POROSITY, DUAL INDUCTION, MICRORESISTIVITY, PE, AND SONIC LOGS WERE COMPLETED

DRILL STEM TESTING PROVIDE BY: TRILOBITE TESTING
 FOUR (4) CONVENTIONAL DRILL STEM TESTS COMPLETED

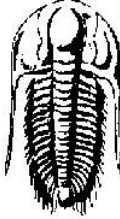
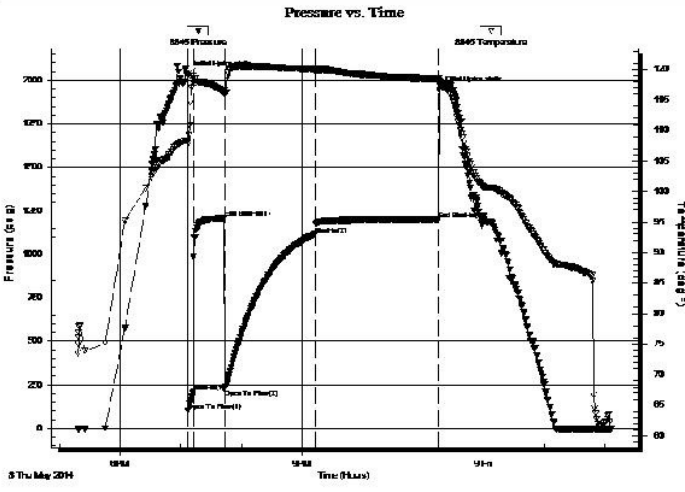
FORMATION TOPS SUMMARY AND CHRONOLOGY OF DAILY ACTIVITY

	WELL NAME		COMPARISON WELL	COMPARISON WELL
	JOY # 1-1		BRADFORD #1-1	LUCKY JACK #1-25
	API: 15-203-20255		API: 15-203-20136	API: 15-203-20202
FORMATION	SAMPLE TOPS	LOG TOPS	LOG TOPS (DATUM)	LOG TOPS (DATUM)
ANHYDRITE TOP	2645' (+783')	2648' (+780')	+784'	+833'
AHYDRITE BASE	2665' (+763')	2662' (+766')	+767'	+811'
TOPEKA	3831' (-403')	3830' (-402')	-408'	-380'
HEEBNER	4063' (-635')	4068' (-640')	-647'	-622'
LKC	4119' (-691')	4118' (-690')	-697'	-671'
MUNCIE CREEK	4294' (-866')	4304' (-876')	-884'	-852'
STARK	4391' (-963')	4394' (-966')	-977'	-949'
BKC	4491' (-1063')	4491' (-1063')	-1073'	-1037'
MARMATON	4555' (-1127')	4560' (-1132')	-1140'	-1100'
FORT SCOTT	4674' (-1246')	4680' (-1252')	-1248'	-1237'
CHEROKEE SHALE	4709' (-1281')	4714' (-1286')	-1300'	-1264'
ATOKA	4763' (-1335')	4763' (-1335')	-1354'	-1319'
MORROW SHALE	4874' (-1446')	4877' (-1449')	-1463'	-1421'
UPPER SANDSTONE	4882' (-1454')	4894' (-1466')	-1474'	NA
MISSISSIPPIAN	5000' (-1572')	5002' (-1574')	-1584'	-1542'
SPERGEN	5244' (-1816')	5252' (-1824')	NA	-1637'
RTD	5395' (-1967')	5397' (-1969')	-1665'	-1699'


SUMMARY OF DAILY ACTIVITY

- 5-3-14 R.U., spud @ 2:15pm, 8 5/8" surface casing set at 208' w/165 sxs common, 2% gel, 3% cc, WOC
- 5-4-14 408, drilling
- 5-5-14 2384, drilling
- 5-6-14 3295, drilling
- 5-7-14 3769, drilling, worked on draw works air compressor, replace washed mud pump head
- 5-8-14 4194, drilling, CFS @ 4253, short trip, CTCH, DST #1 4203 to 4253
- 5-9-14 4286, drilling, work on mud pump, CFS @ 4335, TOWB, strap 2.64 long to board, DST #2 4293 to 4335, CFS @ 4365
- 5-10-14 4406, drilling, CFS @ 4425, CFS @ 4535, CFS @ 4575, mini trip, CTCH, TOWB, DST #3 4537 to 4575
- 5-11-14 4575, work on rig, drilling
- 5-12-14 4820, drilling, CFS @4883, CFS @ 4889, CFS @4895, drop flat to find hole in pipe, TOWB, DST #4 4852 to 4895
- 5-13-14 4895, drilling, CFS @ 4990, CFS @ 5000, 5105 TOWB for hole in pipe
- 5-14-14 5169, TOWB for hole in pipe, CFS @ 5255, TOWB for hole in pipe, mud pump failure, TOWB, on bank
- 5-15-14 Wait on mud pump, install, replace head on new pump, resume drilling, TD 5395 @ 6:20am
- 5-16-14 5395, mini trip (5 stands), CTCH, TOWB for logging, prepare for plugging
- 5-17-14 release rig

DST #1 SUMMARY

 <p>TRILOBITE TESTING, INC.</p>	DRILL STEM TEST REPORT																																						
	Mull Drilling Co., Inc. 1700 N Waterfront PKWY Wichita, KS 67202 ATTN: Steve Reed	1-16s-38w Wichita co. Joy #1-1 Job Ticket: 57066 DST#:1 Test Start: 2014.05.08 @ 17:18:00																																					
GENERAL INFORMATION:																																							
Formation: LKC "E-F-G" Deviated: No Whipstock: ft (KB) Time Tool Opened: 19:07:15 Time Test Ended: 02:06:15		Test Type: Conventional Bottom Hole (Initial) Tester: Samuel Esparza Unit No: 71																																					
Interval: 4203.00 ft (KB) To 4253.00 ft (KB) (TVD) Total Depth: 4253.00 ft (KB) (TVD) Hole Diameter: 7.88 inches Hole Condition: Good		Reference Elevations: 3428.00 ft (KB) 3419.00 ft (CF) KB to GR/CF: 9.00 ft																																					
Serial #: 8845 Inside																																							
Press@RunDepth: 1115.90 psig @ 4204.00 ft (KB) Start Date: 2014.05.08 End Date: 2014.05.09 Start Time: 17:18:05 End Time: 02:06:15		Capacity: 8000.00 psig Last Calib.: 2014.05.09 Time On Btm: 2014.05.08 @ 19:07:00 Time Off Btm: 2014.05.08 @ 23:15:30																																					
TEST COMMENT: IF: BOB @ 2 min. IS: No Return. FF: BOB @ 2 min, FSI: No Return.																																							
Pressure vs. Time 		PRESSURE SUMMARY																																					
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Time (Min.)</th> <th>Pressure (psig)</th> <th>Temp (deg F)</th> <th>Annotation</th> </tr> </thead> <tbody> <tr><td>0</td><td>2033.44</td><td>108.36</td><td>Initial Hydro-static</td></tr> <tr><td>1</td><td>102.59</td><td>107.81</td><td>Open To Flow (1)</td></tr> <tr><td>6</td><td>213.53</td><td>118.49</td><td>Shut-In(1)</td></tr> <tr><td>37</td><td>1208.75</td><td>116.46</td><td>End Shut-In(1)</td></tr> <tr><td>37</td><td>227.09</td><td>115.94</td><td>Open To Flow (2)</td></tr> <tr><td>126</td><td>1115.90</td><td>119.95</td><td>Shut-In(2)</td></tr> <tr><td>248</td><td>1202.08</td><td>118.38</td><td>End Shut-In(2)</td></tr> <tr><td>249</td><td>1944.02</td><td>118.51</td><td>Final Hydro-static</td></tr> </tbody> </table>	Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation	0	2033.44	108.36	Initial Hydro-static	1	102.59	107.81	Open To Flow (1)	6	213.53	118.49	Shut-In(1)	37	1208.75	116.46	End Shut-In(1)	37	227.09	115.94	Open To Flow (2)	126	1115.90	119.95	Shut-In(2)	248	1202.08	118.38	End Shut-In(2)	249	1944.02	118.51	Final Hydro-static	
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation																																				
0	2033.44	108.36	Initial Hydro-static																																				
1	102.59	107.81	Open To Flow (1)																																				
6	213.53	118.49	Shut-In(1)																																				
37	1208.75	116.46	End Shut-In(1)																																				
37	227.09	115.94	Open To Flow (2)																																				
126	1115.90	119.95	Shut-In(2)																																				
248	1202.08	118.38	End Shut-In(2)																																				
249	1944.02	118.51	Final Hydro-static																																				
Recovery		Gas Rates																																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Length (ft)</th> <th>Description</th> <th>Volume (bbl)</th> </tr> </thead> <tbody> <tr><td>1890.00</td><td>OMCW 5o 5m 90w</td><td>26.51</td></tr> <tr><td>560.00</td><td>OWCM 5o 40w 55m</td><td>7.86</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		Length (ft)	Description	Volume (bbl)	1890.00	OMCW 5o 5m 90w	26.51	560.00	OWCM 5o 40w 55m	7.86										<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th> </th> <th>Chole (inches)</th> <th>Pressure (psig)</th> <th>Gas Rate (Mcf/d)</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Chole (inches)	Pressure (psig)	Gas Rate (Mcf/d)														
Length (ft)	Description	Volume (bbl)																																					
1890.00	OMCW 5o 5m 90w	26.51																																					
560.00	OWCM 5o 40w 55m	7.86																																					
	Chole (inches)	Pressure (psig)	Gas Rate (Mcf/d)																																				

DST #2 SUMMARY

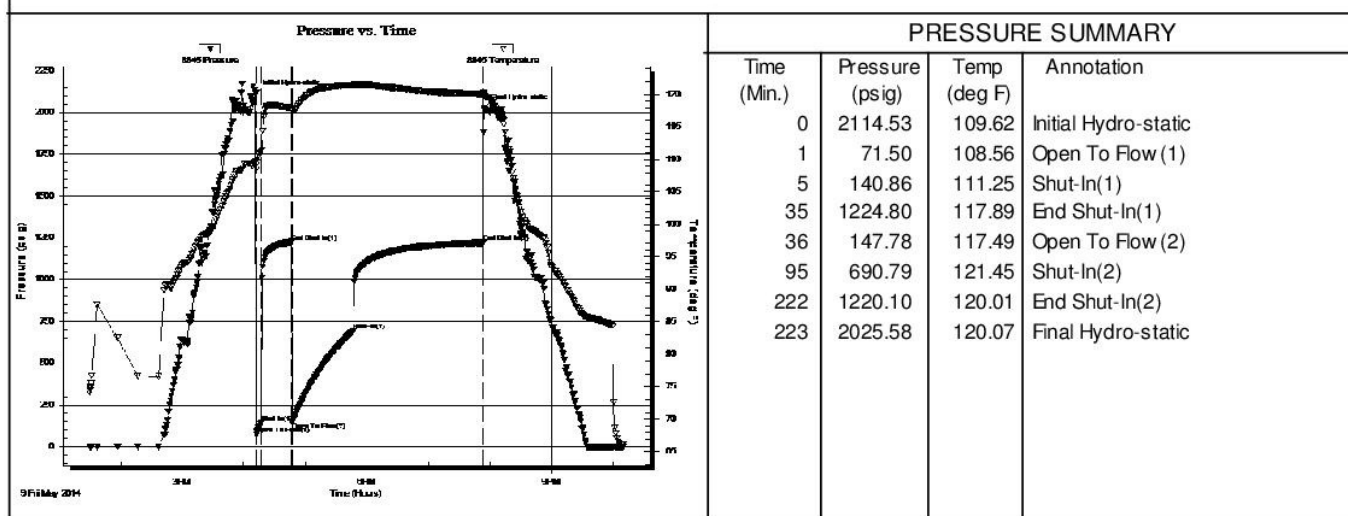
 TRILOBITE TESTING, INC.	DRILL STEM TEST REPORT	
	Mull Drilling Co., Inc. 1700 N Waterfront PKWY Wichita, KS 67202 ATTN: Steve Reed	1-16s-38w Wichita co. Joy #1-1 Job Ticket: 57067 DST#:2 Test Start: 2014.05.09 @ 13:30:00

GENERAL INFORMATION:

Formation: LCK " H "	Deviated: No Whipstock: ft (KB)	Test Type: Conventional Bottom Hole (Reset)
Time Tool Opened: 16:12:15	Time Test Ended: 22:10:15	Tester: Samuel Esparza
Unit No: 71	Interval: 4293.00 ft (KB) To 4335.00 ft (KB) (TVD)	Reference Elevations: 3428.00 ft (KB)
Total Depth: 4335.00 ft (KB) (TVD)	Hole Diameter: 7.88 inches Hole Condition: Good	3419.00 ft (CF)
		KB to GR/CF: 9.00 ft

Serial #: 8845 Inside	Press@RunDepth: 690.79 psig @ 4294.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2014.05.09	End Date: 2014.05.09	Last Calib.: 2014.05.09
Start Time: 13:30:05	End Time: 22:10:15	Time On Btm: 2014.05.09 @ 16:12:00
		Time Off Btm: 2014.05.09 @ 19:54:30


TEST COMMENT: IF: BOB @ 3 min.
 IS: No Return.
 FF: BOB @ 3 min.
 FSI: No Return.



<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">Recovery</th> </tr> <tr> <th>Length (ft)</th> <th>Description</th> <th>Volume (bbl)</th> </tr> </thead> <tbody> <tr><td>1635.00</td><td>MCW 10m 90w</td><td>22.93</td></tr> <tr><td>315.00</td><td>MCW 40m 60w</td><td>4.42</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> <p><small>* Recovery from multiple tests</small></p>	Recovery			Length (ft)	Description	Volume (bbl)	1635.00	MCW 10m 90w	22.93	315.00	MCW 40m 60w	4.42										<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Gas Rates</th> </tr> <tr> <th> </th> <th>Chole (inches)</th> <th>Pressure (psig)</th> <th>Gas Rate (Mcf/d)</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Gas Rates					Chole (inches)	Pressure (psig)	Gas Rate (Mcf/d)												
Recovery																																										
Length (ft)	Description	Volume (bbl)																																								
1635.00	MCW 10m 90w	22.93																																								
315.00	MCW 40m 60w	4.42																																								
Gas Rates																																										
	Chole (inches)	Pressure (psig)	Gas Rate (Mcf/d)																																							

Trilobite Testing, Inc Ref. No: 57067 Printed: 2014.05.10 @ 00:35:15

DST #3 SUMMARY

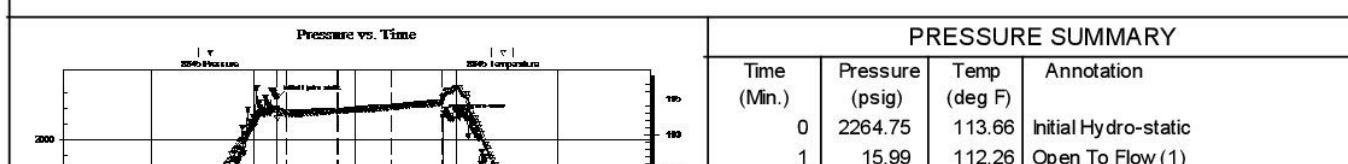
 TRILOBITE TESTING, INC.	DRILL STEM TEST REPORT	
	Mull Drilling Co., Inc. 1700 N Waterfront PKWY Wichita, KS 67202 ATTN: Steve Reed	1-16s-38w Wichita co. Joy #1-1 Job Ticket: 57068 DST#: 3 Test Start: 2014.05.11 @ 00:23:00

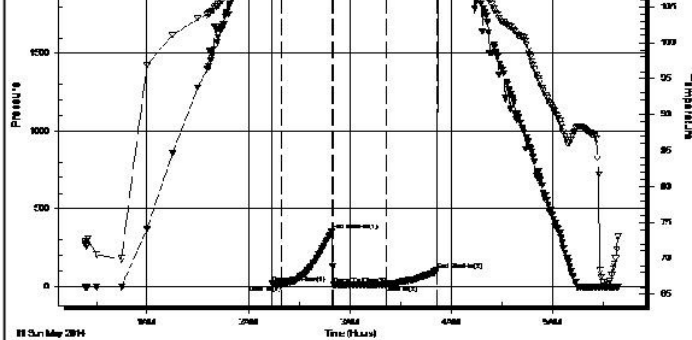
GENERAL INFORMATION:

Formation: Marmaton	Deviated: No Whipstock: ft (KB)	Test Type: Conventional Bottom Hole (Reset)
Time Tool Opened: 02:14:00	Time Test Ended: 05:38:45	Tester: Samuel Esparza
Unit No: 71	Interval: 4537.00 ft (KB) To 4575.00 ft (KB) (TVD)	Reference Elevations: 3428.00 ft (KB)
Total Depth: 4575.00 ft (KB) (TVD)	Hole Diameter: 7.88 inches Hole Condition: Good	3419.00 ft (CF)
		KB to GR/CF: 9.00 ft

Serial #: 8845 Inside	Press@RunDepth: 13.48 psig @ 4538.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2014.05.11	End Date: 2014.05.11	Last Calib.: 2014.05.11
Start Time: 00:23:05	End Time: 05:38:44	Time On Btm: 2014.05.11 @ 02:13:45
		Time Off Btm: 2014.05.11 @ 03:51:45

TEST COMMENT: IF: 1/4" Blow .
 IS: No Return.
 FF: No Blow .
 FSI: No Return.





6	14.23	113.05	Shut-In(1)
36	356.90	113.39	End Shut-In(1)
37	12.00	113.34	Open To Flow (2)
68	13.48	113.88	Shut-In(2)
98	101.93	114.47	End Shut-In(2)
98	2141.36	115.13	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
5.00	Mud 100m (Oil Scum On Top)	0.07

Gas Rates			
	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

Trilobite Testing, Inc

Ref. No: 57068

Printed: 2014.05.13 @ 11:10:53

DST #4 SUMMARY

	DRILL STEM TEST REPORT	
	Mull Drilling Co., Inc. 1700 N Waterfront PKWY Wichita, KS 67202 ATTN: Steve Reed	1-16s-38w Wichita co. Joy #1-1 Job Ticket: 57069 DST#:4 Test Start: 2014.05.12 @ 18:40:00

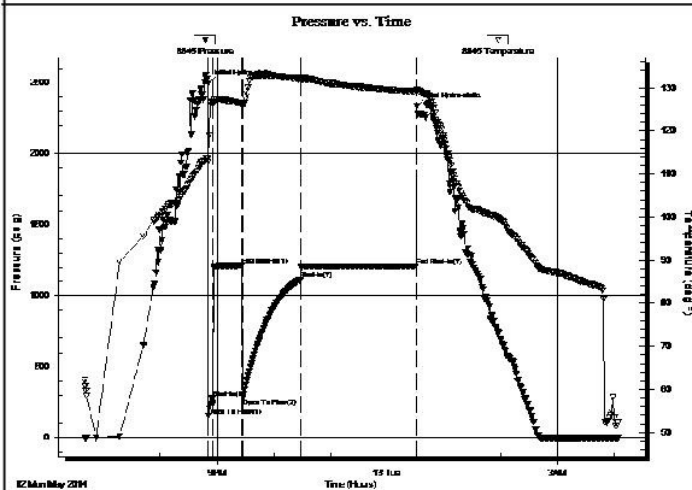
GENERAL INFORMATION:

Formation: **Morrow upper sand**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 20:50:15
 Time Test Ended: 04:05:00
 Interval: **4852.00 ft (KB) To 4895.00 ft (KB) (TVD)**
 Total Depth: 4895.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Samuel Esparza
 Unit No: 71
 Reference Elevations: 3428.00 ft (KB)
 3419.00 ft (CF)
 KB to GR/CF: 9.00 ft

Serial #: 8845 Inside

Press@RunDepth: 1114.06 psig @ 4853.00 ft (KB)
 Start Date: 2014.05.12 End Date: 2014.05.13
 Start Time: 18:40:05 End Time: 04:05:00
 Capacity: 8000.00 psig
 Last Calib.: 2014.05.13
 Time On Btm: 2014.05.12 @ 20:50:00
 Time Off Btm: 2014.05.13 @ 00:31:30

TEST COMMENT: IF: BOB @ 2 min.
 IS: No Return.
 FF: BOB @ 1 1/2 in.
 FS: No Return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2494.50	113.80	Initial Hydro-static
1	154.14	112.80	Open To Flow (1)
6	277.09	126.50	Shut-In(1)
37	1211.33	126.43	End Shut-In(1)
37	281.90	126.02	Open To Flow (2)
99	1114.06	132.23	Shut-In(2)
221	1209.04	129.21	End Shut-In(2)
222	2333.65	129.58	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
2020.00	MW 15m 85w	28.34
505.00	WCM 30w 70m	7.08

Gas Rates			
	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

Trilobite Testing, Inc

Ref. No: 57069

Printed: 2014.05.13 @ 06:07:36

ROCK TYPES

Cht	Lmst fw<7	shale, gry	Ss
Congl	Lmst fw7>	Carbon Sh	
Dolprim	shale, grn	shale, red	

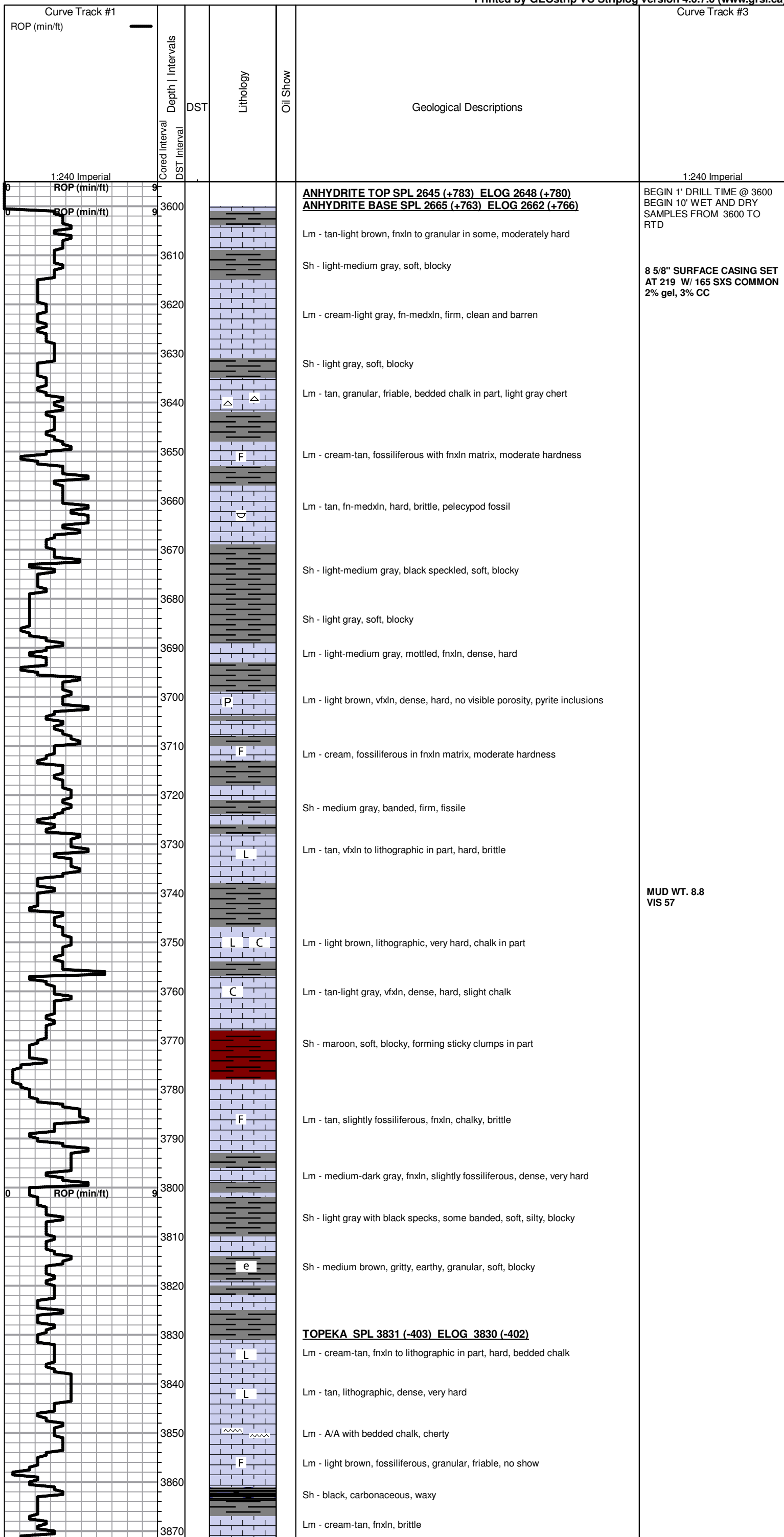
ACCESSORIES

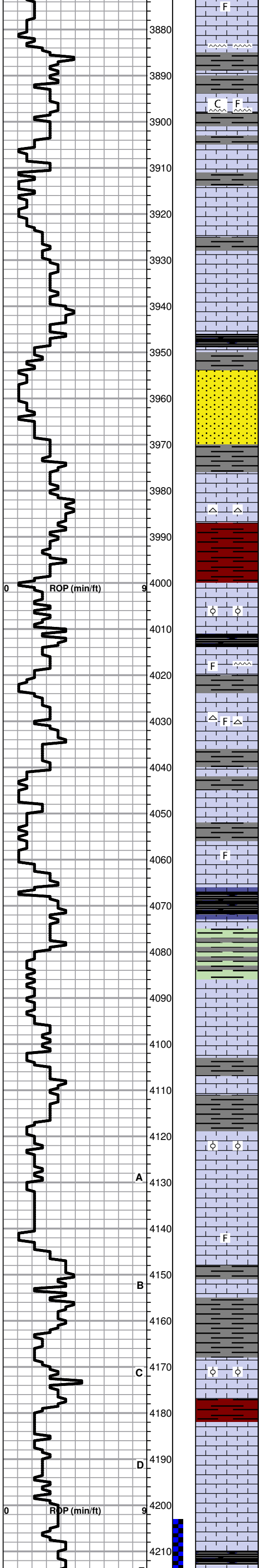
MINERAL	FOSSIL	STRINGER	TEXTURE
Chert, dark	Bryozoa	Chert	Chalky

P Pyrite
 △ Chert White
 Mc Mica

F Fossils < 20%
 ⊖ Oolite
 ⊔ Pelecypod
 × Sponge Spicules
 ⊕ Oomoldic

CX Cryptocrystalline
 e Earthy
 L Lithogr





Lm - light brown, fossiliferous, friable

Lm - tan, granular, brittle, bedded chalk, cherty

Sh - light gray, soft, sticky

Lm - tan, slightly fossiliferous, granular, brittle, cherty, chalky

Lm - cream fossiliferous, granular, brittle, bedded chalk in part

Lm - tan-light brown, medxn, brittle, clean and barren

Lm - tan, fnxn, hard, brittle, bedded chalk in part

Lm - cream-tan, granular, brittle

Sh - black, carbonaceous, waxy

Ss - light gray, sucrosic, well sorted, well rounded, friable, loosely cemented, NSFO, no odor

Lm - cream, fnxn, hard, dense

Lm - A / A, with white chert

Sh - reddish brown, gritty, soft, blocky

Lm - cream, oolitic, poorly developed, brittle, no visible porosity, no show

Sh - black, carbonaceous, waxy

Lm - light brown, fossiliferous, firm, limited porosity, cherty

Lm - tan, fossiliferous, no visible porosity, hard, white chert

Lm - light gray, fnxn, hard, dense

Lm - cream, medxn, easily crushed, limited porosity, no show

Lm - tan, dark fossil fragments in fnxn matrix, dense, hard

HEEBNER SPL 4063 (-635) ELOG 4068 (-640)

Sh - black, carbonaceous, waxy

Sh - greenish gray, soft, blocky, some sticky clumps

Lm - offwhite, granular, clean and barren, bedded chalk throughout

Lm - cream-offwhite, fnxn, hard, brittle

Lm - tan, fnxn, hard, no visible porosity

LKC SPL 4119 (-691) ELOG 4118 (-690)

Lm - tan, oolitic, poorly developed, low porosity, hard, brittle, no show

Lm - tan, fnxn, hard, bedded chalk, no visible porosity

Lm - tan, fnxn, slightly fossiliferous, hard

Sh - medium brown, soft, blocky

Lm - cream, oolitic, poorly developed, limited porosity, brittle

Sh - maroon, soft, sticky

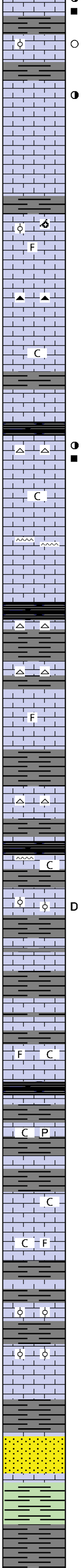
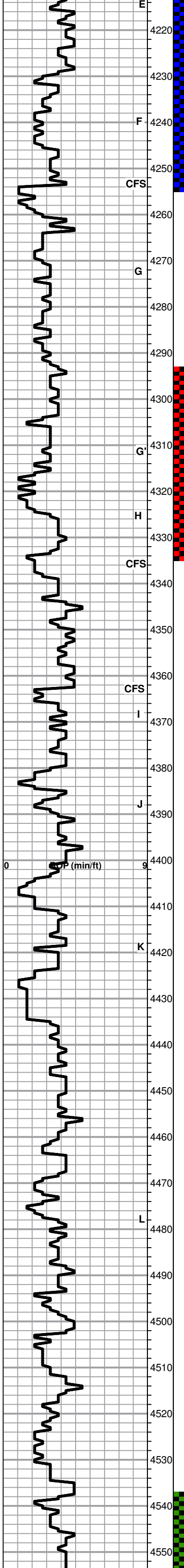
Lm - cream, fnxn, no visible porosity, dense, moderate hardness

Sh - black, carbonaceous, fissile

MUD WT. 8.9
 VIS. 52
 LCM: 2 LBS

MUD WT. 9.1
 VIS. 52
 LCM: 2 LBS

DST #1 4203 TO 4253, SEE
 HEADER FOR TEST
 SUMMARY



Lm - cream, fine pinpoint porosity, scattered dark brown stain, SFO, faint odor, UV fluorescence, chalky in part

4220 ○ Lm - cream, oolitic, scattered fine interxn porosity, light brown stain, NSFO, faint odor

4230 ● Lm - cream, fnxn with scattered vuggy porosity, light brown oil stain, SFO, faint odor, friable, chalky in part

F 4240 Lm - cream-tan, fnxn, scattered pinpoint porosity, slight stain, no odor, NSFO

4250 CFS

4260 Sh - dark gray, soft, blocky

○ Lm - cream, oolitic / oomoldic, highly porous, friable, clean and barren

F 4270 Lm - cream, fnxn, slightly fossiliferous, brittle, no show, bedded chalk in part

G 4280 ▲ ▲ Lm - A / A, gray chert

4290 □ C Lm - cream-light gray, fnxn, brittle, chalk in part

4300 **MUNCIE CREEK SPL 4294 (-866) ELOG 4304 (-876)**

Sh - black, carbonaceous, waxy

4310 △ △ ● Lm - cream-offwhite, fnxn with scattered pinpoint porosity, some chips with scattered dark black oil stain, SFO upon crush, UV fluorescence, streaming wet cut, no odor, bedded chalk in part, white chert

4320 □ C Lm - cream, granular, friable, very chalky, no shows

H 4330 Lm - light gray, vfxn, dense, very hard, cherty

CFS 4340

4350 Sh - black, carbonaceous, firm

△ △ Lm - light gray, fnxn, gritty appearance, dull, dense, very hard, white chert

4360 △ △ Lm - tan-medium brown, fnxn, dense, hard, opaque chert

CFS 4370 F Lm - cream-light gray, fossil clasts in fnxn matrix, dense, hard, brittle, bedded chalk in part

4380

J 4390 △ △ Lm - tan-light gray, slightly fossiliferous, medxn, brittle, slightly chalky, gray chert

STARK SPL 4391 (-963) ELOG 4394 (-966)

4400 □ C Sh - black, carbonaceous, fissile

○ Lm - tan-light gray, fossiliferous, granular, brittle, chalky, cherty

4410 D Lm - light gray-tan, oolitic, low porosity, brittle, few chips with gilsonitic stain, NSFO, no odor

4420 K Lm - tan, fine interxn porosity, dense, very hard, large amount of brown soft blocky shale

4430 Lm - cream-light gray, fossil fragments in fnxn matrix, well cemented, dense, hard

4440 F C Lm - cream, fnxn, slightly fossiliferous, dense, hard, chalky and barren

4450 Sh - black, carbonaceous, fissile

4460 C P Lm - light brown-gray, fnxn, dense, hard, chalky in part, pyrite

Lm - tan, vfxn, dense, hard, clean and barren

4470 C Lm - cream-tan, granular, friable, chalky

L 4480 C F Lm - tan, dull, fossiliferous, granular, brittle, chalky

4490 **BKC SPL 4491 (-1063) ELOG 4491 (-1063)**

Sh - light brown, soft, blocky

○ Lm - tan, oolitic, fine interxn porosity, dense, brittle, barren

○ Lm, cream-tan, oolitic, granular, brittle, no odor, NSFO

○ Lm - cream-tan, fnxn, scattered vuggy porosity, dense, brittle, NSFO, no odor

4520

4530 Ss - light green-gray clusters, very fine grained to sucrosic, well sorted, well rounded quartz, calcareous cement, well cemented, firm, no UV fluorescence, no odor, no show

4540 Sh - greenish gray, soft, blocky, gritty, some sticky clumps

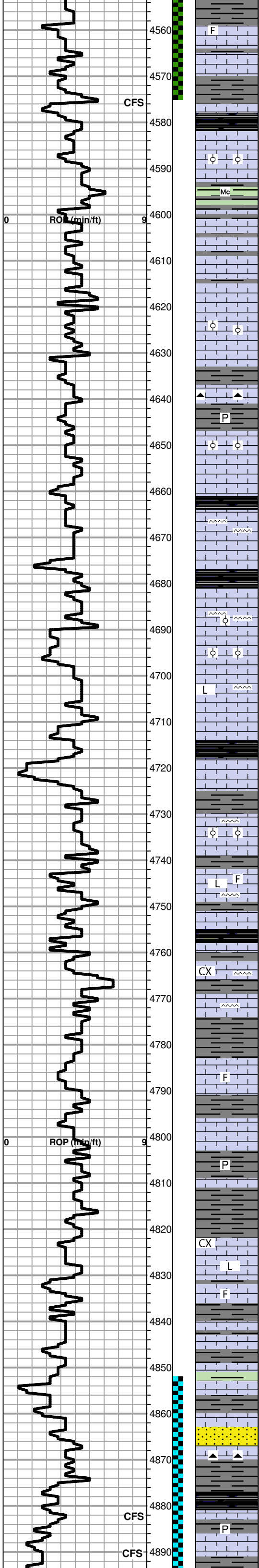
4550 Sh - dark gray, soft, blocky

MUD WT. 9.0
VIS. 54
LCM: 2 LBS

DST #2 4293 TO 4335, SEE
HEADER FOR TEST
SUMMARY

MUD WT. 9.0
VIS. 56
LCM: 2 LBS

DST #3 4537 TO 4575, SEE
HEADER FOR TEST
SUMMARY



MARMATON SPL 4555 (-1127) ELOG 4560 (-1132)

Lm - offwhite, fnxn, slightly fossiliferous, scattered pinpoint and vuggy porosity, dark brown oil stain, SFO upon crush, limited porosity, good UV fluorescence

Lm - light brown, scattered light brown stain, SFO upon crush, very tight, limited porosity

Sh - medium gray, soft, blocky

Sh - black carbonaceous, waxy

Lm - cream-medium brown, oolitic, glauconitic, no visible porosity, dense, very hard

Sh - dark greenish gray, soft, blocky, waxy with black micaceous specks

Sh - medium gray, firm, blocky

Lm - cream-light gray, microxn, dense, very hard

Lm - tan-light brown, oolitic, dense, very hard, limited porosity

Sh - dark gray, firm, blocky

Lm - dark brown, microxn, dense, very hard, black chert

Sh - dark gray, banded, fissile, pyrite

Lm - tan, oolitic, various sized oolites, no visible porosity, dense, hard

Lm, light-medium brown, microxn, dense, very hard

Sh - black, carbonaceous, waxy

Lm - medium brown, fine interxn porosity, dense, very hard, cherty

FORT SCOTT SPL 4674 (-1246) ELOG 4680 (-1252)

Sh - black, carbonaceous, firm, fissile

Lm - cream-light brown, slightly oolitic, no visible porosity, dense, hard, cherty

Lm - cream-tan, oolitic, granular, brittle, bedded chalk in part, no show

Lm - tan, fnxn to lithographic, dense, very hard, cherty

CHEROKEE SHALE SPL 4709 (-1281) ELOG 4714 (-1286)

Sh - black carbonaceous, firm, fissile

Lm - cream, fine interxn porosity, dense, very hard

Lm - tan-medium brown, oolitic with various sized oolites, secondary recrystallization, dense, very hard, no visible porosity, cherty

Sh - dark gray, firm, blocky

Lm - medium brown, vfxn to lithographic, slightly fossiliferous in some, dense, extremely hard, cherty

Lm - light-medium brown, microxn, dense, very hard

ATOKA SPL 4763 (-1335) ELOG 4763 (-1335)

Lm - tan-light brown, cryptoxn, dense, very hard, brittle, cherty

Lm - light-medium brown, vfxn, dense, hard, brittle, cherty

Lm - tan, dark fossil clasts in vfxn matrix, dense, very hard

Sh - dark gray-black, carbonaceous, fissile

Sh - dark gray, firm, blocky, pyrite

MORROW SHALE SPL 4874 (-1446) ELOG 4877 (-1449)

Lm - medium brown-dark gray, cryptoxn, dense, very hard

Lm - tan, lithographic, dense, very hard

Lm - cream-tan, fossiliferous, granular, firm, no show

Lm - dark gray, gritty, hard, brittle

Sh - green-black, banded, firm, fissile

Sh - dark gray-black, carbonaceous, firm

Ss - white, sucrosic, well sorted, well rounded, well cemented, hard

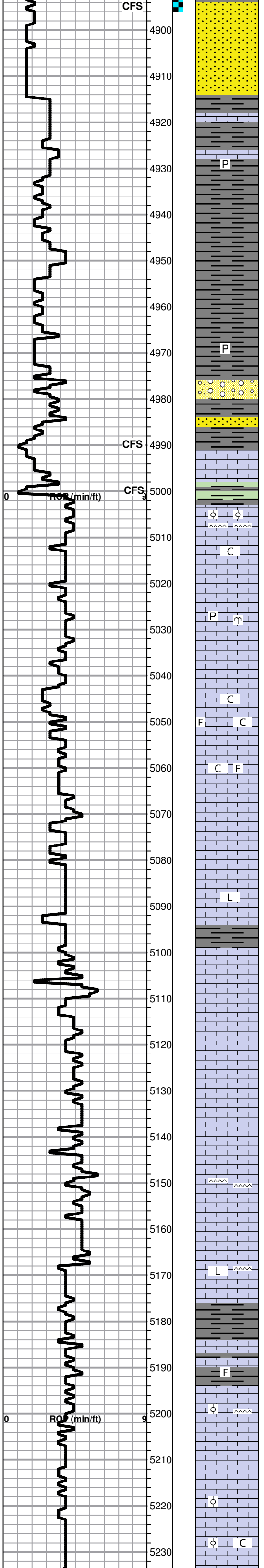
Lm - dark gray, dense, brittle, black chert

Sh - black, carbonaceous, waxy, some dark green, banded, firm, blocky

Sh - dark gray, soft, fissile, pyrite

MUD WT. 9.3
VIS. 60
LCM: 4 LBS

DST #4 4852 TO 4895, SEE
HEADER FOR TEST
SUMMARY



UPPER SANDSTONE SPL 4882 (-1454) ELOG 4894 (-1466)

Ss - light gray-green, very fine grained, well rounded, well sorted, glauconitic, well cemented, firm, some with clay matrix, NSFO, no odor, no fluorescence

Sh - dark gray, gritty, silty, very firm, blocky

Sh - medium-dark gray, firm, blocky, silty, pyrite

Sh - medium gray, soft, silty

Sh - light-medium gray, soft, sticky

Sh - light brown, earthy, gritty, silty, flakey

Sh - lime green, soft, waxy, pyrite

Conglomerate - various color and sizes of Lm and quartz well cemented, calcite cement, glauconite specks, dense, very hard

Ss - fine clear quartz grains, well rounded, well sorted, well cemented, tight, no shows

Lm - cream, clastic with varied quartz sized grains, well cemented, hard

Sh - light green-gray, soft, fissile

MISSISSIPPIAN SPL 5000 (-1572) ELOG 5002 (-1574)

Lm - medijm brown, oolitic, large oolites, friable

Lm - bright white, sandy quartz grains, sucrosic upon crush, friable, cherty

Lm - light gray, sandy, friable, chalky

Lm - white, sandy, friable, some chalk, pyrite, bryozoans

Lm - white, sandy, well cemented, firm, bedded chalk

Lm - A/A, with white sticky chalk, white wash

Lm - cream-tan, granular, fossil clasts, brittle, highly chalky

Lm - cream, fnxn-granular, sandy, slightly fossiliferous, chalky, brittle

Lm - cream, suboolitic, fine interxn porosity, brittle

Lm - cream-tan, fine interxn porosity, dense, brittle, bedded chalk in part

Lm - tan, fnxn to lithographic, hard, brittle

Lm - tan-light brown, hard, brittle

Lm - cream, lithographic, dense, very hard

Lm - medium brown, fine interxn porosity, dense, very hard

Lm - cream-tan, microxn, dense, very hard, bedded chalk in part

Lm - cream, microxn, dense, very hard, bedded chalk, cherty

Lm - light brown, lithographic, dense, very hard, bedded chalk in part, cherty

Sh - medium gray, firm, blocky

Lm - cream-tan, fossiliferous, dense, moderately hard, brittle

Lm - tan, oolitic, well cemented with recrystallized cement, hard, brittle, bedded chalk, chert

Lm - A/A

Lm - tan, oolitic, limited porosity, some chips with gilsonitic stain, bedded chalk throughout, brittle, NSFO

Lm - cream-tan, oolitic, tight, brittle, chalky

MUD WT. 9.3
VIS. 53
LCM: 4 LBS

HOLE IN PIPE

HOLE IN PIPE

