

**BOP WEST, LLC**

P.O. Box 129  
WOOSTER, OHIO 44691  
330-264-8847  
FAX 330-264-4222



**GEOLOGICAL REPORT**  
DRILLING TIME & SAMPLE LOG

REPORT PREPARED BY FRANK S. MILLER (GEOSCIENTIST)

AP# 15-169-20-335

COMPANY: BOP West, LLC  
LEASE: Thiel #20-1  
FIELD: Hunter  
LOCATION: 1.361 FSL & 404 FWL  
SEC: 20 T1WSP 16S REF 1W  
COUNTY: Saline STATE: Kansas

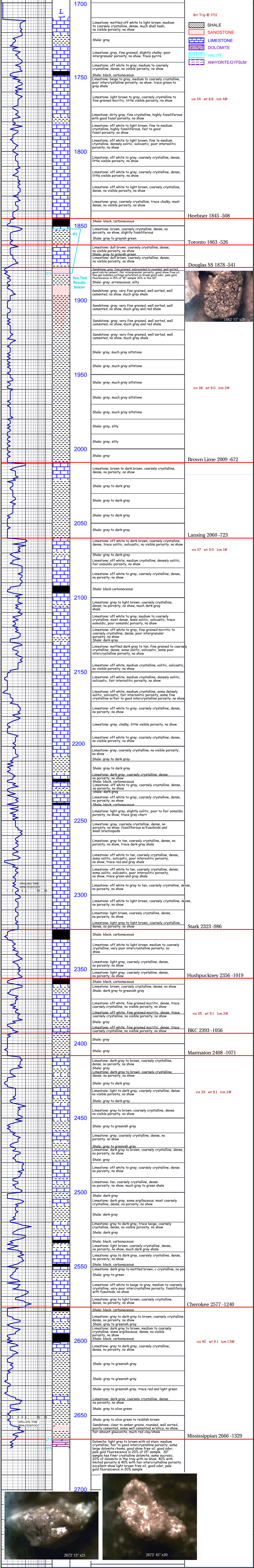
CONTRACTOR: C & G Drilling, Rig #2  
SPUD: 5-23-12 COMPLETION: 5-27-12  
SAMPLES SAVED FROM: 1700 TO RTD

ELEVATION: K.B. 1337  
D.F.: 1328  
DEPTH MEASURED FROM: 18  
LOG DITTING:

FORMATION	SAMPLE	ELOG	DATE	A. ELOG	B. ELOG	C. DT
Onset	1845	-508	-511	-507	-502	-492
Douglas SS	1878	-518	-523	-519	-514	-504
Brown	2009	-672	-669	-671	-666	-656
Lansing	2060	-723	-720	-722	-717	-707
Hushpuckney	2356	-1019	-1012	-1019	-1012	-1002
BKC	2393	-1056	-1051	-1057	-1051	-1041
Marmaton	2408	-1071	-1071	-1071	-1071	-1061
Cherokee	2577	-1240	-1233	-1239	-1233	-1223
Mississippian	2686	-1329	-1329	-1329	-1329	-1319
RTD	2682	-1383	-1377	-1377	-1377	-1367

REFERENCES:  
1. CROWN SERVICES INC. Televised Oil Well #3  
2. CROWN SERVICES INC. Televised Oil Well #3  
3. CROWN SERVICES INC. Televised Oil Well #3  
4. CROWN SERVICES INC. Televised Oil Well #3  
5. CROWN SERVICES INC. Televised Oil Well #3

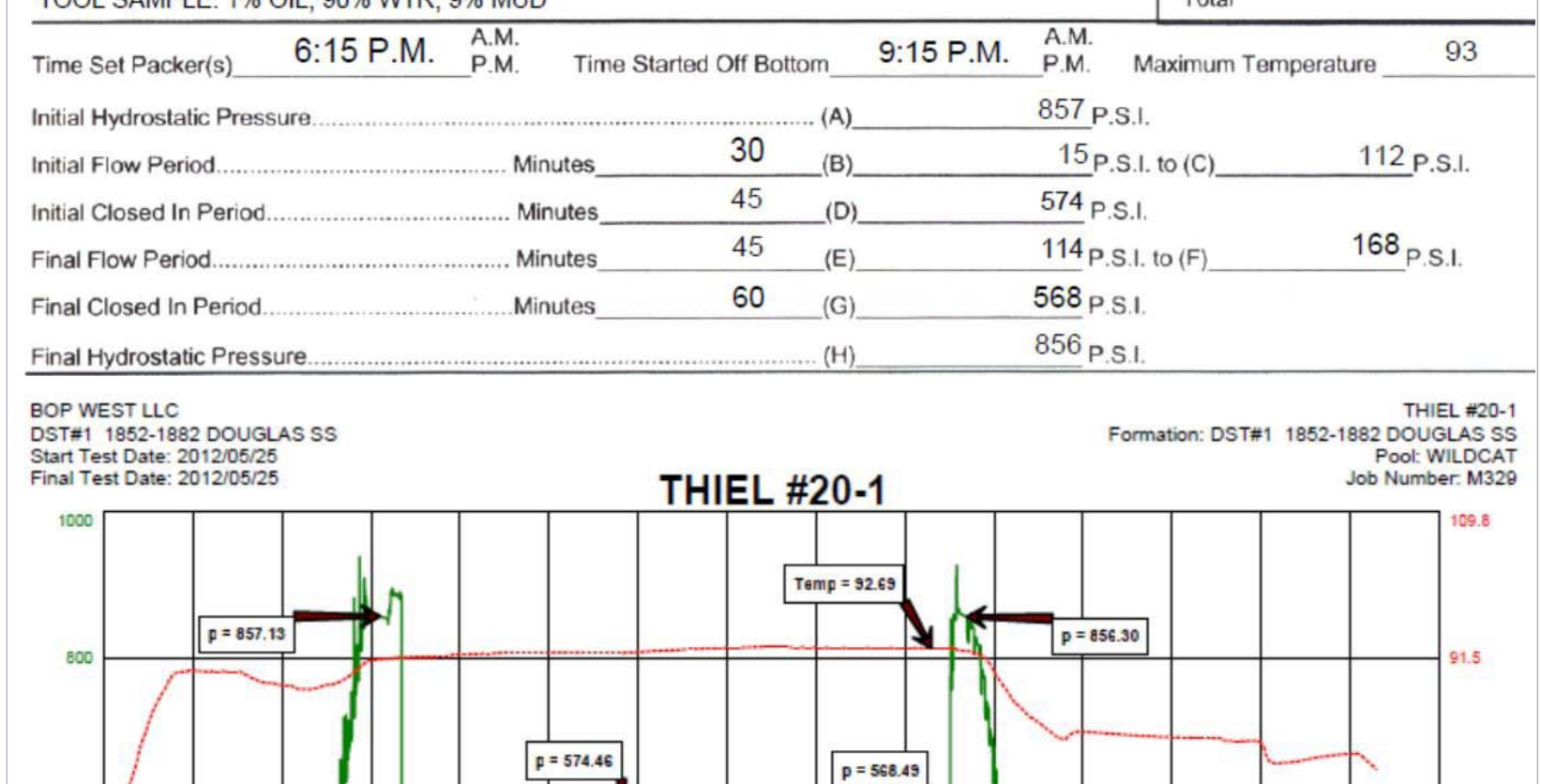
LOG SCALE: 1" = 100' (VERTICAL)  
1" = 15 MINUTES (HORIZONTAL)



**BOP West, LLC Thiel #20-1**  
1.361 FSL & 404 FWL 20-16S-1W  
Saline County, Kansas

**Comments:**  
Blow: 1st Open: GSB, BOB 18 MIN (NO BB)  
2nd Open: A WSB AFTER 1 MIN THAT INC TO BOB 27 MIN (NO BB)  
Recovered 394 ft. of SOSMW 96% WTR, 5% MUD W/ A THIN SCUM OF OIL (182' DP, 212' DC)  
Recovered 394 ft. of TOTAL FLUID  
Recovered \_\_\_\_\_ ft. of \_\_\_\_\_  
Recovered \_\_\_\_\_ ft. of CHLOR.38,000 PPM  
Recovered \_\_\_\_\_ ft. of PH:7.0  
Recovered \_\_\_\_\_ ft. of RW: .15 @ 85°  
Remarks: \_\_\_\_\_  
TOOL SAMPLE: 1% OIL, 90% WTR, 9% MUD  
Time Set Packer(s) 6:15 P.M. A.M. P.M. Time Started Off Bottom 9:15 P.M. A.M. P.M. Maximum Temperature 93  
Initial Hydrostatic Pressure \_\_\_\_\_ 857 P.S.I.  
Initial Flow Period \_\_\_\_\_ Minutes 30 (B) 112 P.S.I. to (C)  
Initial Closed In Period \_\_\_\_\_ Minutes 45 (D) 574 P.S.I.  
Final Flow Period \_\_\_\_\_ Minutes 45 (E) 114 P.S.I. to (F) 168 P.S.I.  
Final Closed In Period \_\_\_\_\_ Minutes 60 (G) 568 P.S.I.  
Final Hydrostatic Pressure \_\_\_\_\_ (H) 856 P.S.I.

BOP WEST LLC DST#1 1852-1882 DOUGLAS SS Formation: DST#1 1852-1882 DOUGLAS SS Pool: WILDCAT Job Number: M329



05/28/12 Moved in C&G Drilling. Spudded well @ 6:00 PM  
05/24/12 WOC @ 212' @ 7 AM. Drilled 12.25' hole to 212'. Ran 202' of 8.625" 23# casing. Set @ 212' KB.  
Consolidated Oil Well Services Cemented with 140 sacks + 3% CaCl, 2% gel, .25# Flocele / sack. Cement circulated.  
Plug down @ 1:10 AM 5/24/12. Will start under surface @ approximately 9 AM  
05/25/12 Drilling @ 1765' @ 7:06 AM. TOOH with PDC @ 1711'. Deviation 1/2 deg. @ 1711'. Mud vis 34, wt. 8.8, LCM 4#.  
05/26/12 Drilling @ 2086' @ 7:05 AM. Mud Vis 37 Wt. 9.1# LCM 1.5#. Douglas sand DST#1 1852-1882'. Times 30-45-45-60.  
Recovered 394' of slightly mud cut water with scum of oil in mud, 95% water 5% mud. Chlorides 38,000 PPM. IHP 857 PSIG, IFP 15-112 PSIG, ISIP 574 PSIG, FFP 114-168 PSIG, PSP 368 PSIG, PHP 856 PSIG. BHT 93 degrees.  
05/27/12 Servicing Rig @ 2644' @ 7:40 AM. Mud vis 40, wt. 9.1, LCM 1.5#. Premixing tank of mud to get mud in condition for DST or logging.  
05/28/12 RTD 2672'. D&S Casing Crews ran 64 Jts. (2665.84') 5.5" 14# casing + 2.60' packer shoe to 2670.46' by tally measurements. Latch down insert @ 2654'. Centralizers @ 2653', 2670', 2485', 240' by tally measurements. Filled casing @ 606' and 1658' going in. Circulated and set packer with 90 PSIG at TD. Consolidated pump 5 barrels water, 15 lbs water + 2 sx metasilicate as flush, 5 barrels water, 100 sx. THICK SET + 5# KOL-SEAL @ yield of 1.75 R3/sx. Displaced with 65.2 barrels of water. Good circulation throughout job. Final pumping pressure 700 PSIG. Bumped plug with 1200 PSIG. Plug down @ 7:54 PM 5/27/12.

NOTE: TD by the casing tally was 2744.66' or 2.66' deeper than the rotary TD of 2672'. Pipe is set 4.2' off bottom or 2667.8' rotary depths. ACO-1 and other slate red shale will show TD @ 2672' and casing @ 2668'. Casing could not be set higher to prevent a collar from being in the slips. To clear the slips with the collar would have possibly resulted in exposing the shale above the Mississippian.