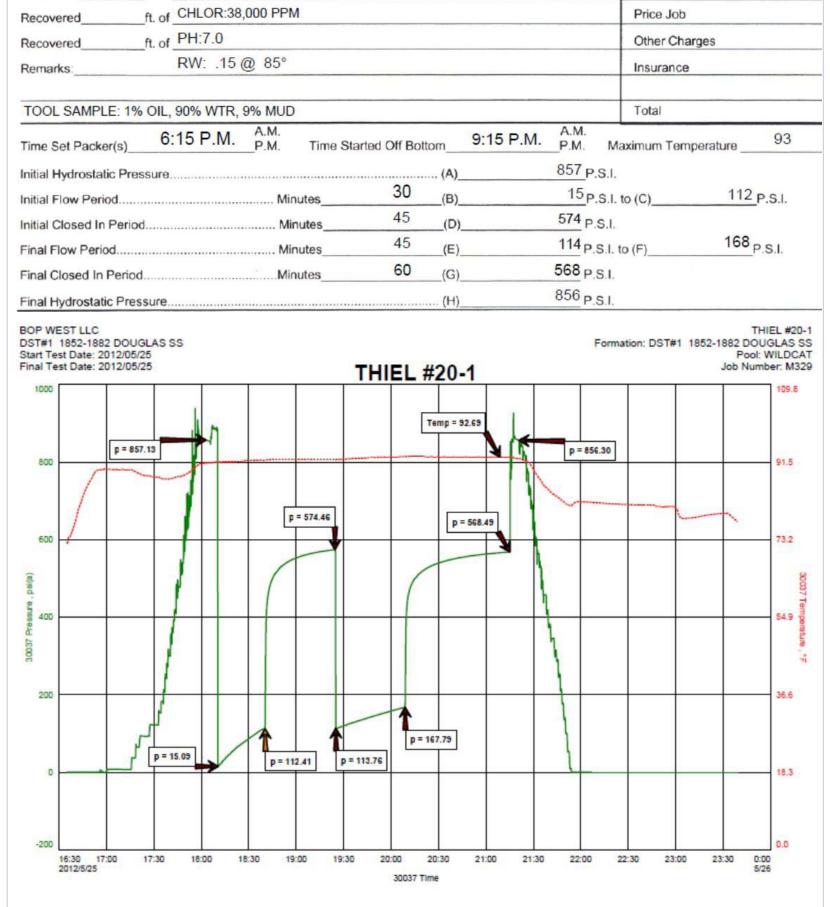
Marmaton2408-107Cherokee2577-124Mississippian2666-132RTD2672-133A. C SW NE SE 19-16S-1W, Teichgraeber Oil, Agin #3B. C NE SW 20-16S-1W, Deep Rock, Community #3C. C SW NE SW 20-16S-1W, Glacier Pet, Hunter #6	Oread1845Heebner1845Douglas SS1878Brown2009Lansing2060Stark2323Hushpuckney2393	COMPANY BOP West, I LEASE Thiel #20- FIELD Hunter LOCATION 1,361 FNL & 40 SEC 20 TWSP 16S COUNTY Saline STAI CONTRACTOR C & G Drillin SPUD 5-23-12 COMP SAMPLES SAVED FROM 1700	INDEPENDENT PETROLEUM PRODUCERS BOP WEST, LLC P.O. Box 129 Wooster, Ohio 44691 330-264-8847 FAX 330-263-4222 BANDERICANS TIME & DRILLING TIME &
-1071 -1240 -1329 -1335 -1335 -13 -13 -13 -13 -13 -13 -13 -13 -13 -13	-508 -541 -672 -723 -1019 -1056	<u>LC</u> 1 04' FWL RGE 1W FE Kansas FE Kansas 5-27-12 5-27-12 10 RTD	INT PETROLEUM PRODUCERS WEST, LLC P.O. BOX 129 OSTER, OHIO 44691 330-264-8847 AX 330-263-4222 GEOLOGICAL REPORT DRILLING TIME & SAMPLE LOG REPORT PREPARED BY FRANK S. MIZE/GEOLOGIST
- <u>∞</u> 377 122 177	-507 -502 -492 -539 -533 -523 -671 -660 -523 -723 -719 -719 -987 -981 -981 -1019 -1012 -1057	ELEVATION K.B. 1337 D.F. 1328 G.L. 1328 DEPTH MEASURED FROM KI Log Drilling $$ Surface 8 5/8" @ 212 w/140 sx Production $\frac{5}{1/2}$ " @ 2668' w/100 sx Electric Logs None A. ELOG B. ELOG C. DT	API # 15-169-20,335
			Si the second se
	L 1700	Limestone: mottled off white to light brown, medium	Bit Trip @ 1711'
		to coarsely crystalline, dense, much shell hash, no visible porosity, no show Shale: gray Limestone: gray, fine grained, slightly chalky, poor intergranular porosity, no show, trace pyrite Limestone: off white to gray, medium to coarsely crystalline, dense, no visible porosity, no show Shale: black, carbonaceous	SHALE SANDSTONE LIMESTONE DOLOMITE HALITE ANHYDRITE/GYPSUM
		Limestone: beige to gray, medium to coarsely crystalline, poor intercrystalline porosity, no show, trace green to gray shale Limestone: light brown to gray, coarsely crystalline to fine grained micritic, little visible porosity, no show Limestone: dirty gray, fine crystalline, highly fossiliferous with good fossil porosity, no show Limestone: off white to light brown, fine to medium crystalline, highly fossiliferous, fair to good	vis 34 wt 8.8 lcm 4#
		fossil porosity, no show Limestone: off white to light brown, fine to medium crystalline, densely oolitic, oolicastic, poor interoolitic porosity, no show Limestone: off white to gray, coarsely crystalline, dense, little visible porosity, no show Limestone: off white to gray, coarsely crystalline, dense, little visible porosity, no show	
	1850	Limestone: off white to light brown, coarsely crystalline, dense, no visible porosity, no show Limestone: gray, coarsely crystalline, trace chalky, most dense, no visible porosity, no show Shale: black, carbonaceous Limestone: brown, coarsely crystalline, dense, no porosity, no show, slightly fossiliferous	Heebner 1845 -508
	See Test Results Below	Shale: gray to grayish green Limestone: dull brown, coarsely crystalline, dense, no visible porosity, no show Shale: gray to grayish green Limestone: dull brown, coarsely crystalline, dense, no visible porosity, no show Sandstone: gray fine grained. subrounded to rounded well sorted. good calcite cement, fair intergranular porosity, good show free oil, few gas bubbles, cuttings saturated on break good odor, pale gold fluorescence in 15% of 15" sample 30% in the 30". Shale: gray, arrenaceous, silty	Toronto 1863 -526 Douglas SS 1878 -541
	1900	Sandstone: gray, very fine grained, well sorted, well cemented, no show, much gray shale Sandstone: gray, very fine grained, well sorted, well cemented, no show, much gray and red shale Sandstone: gray, very fine grained, well sorted, well cemented, no show, much gray and red shale Sandstone: gray, very fine grained, well sorted, well cemented, no show, much gray shale	<u>1882' 15" x20</u>
	1950	Shale: gray, much gray siltstone Shale: gray, much gray siltstone Shale: gray, much gray siltstone Shale: gray, much gray siltstone	vis 38 wt 9.0 lcm 2#
	2000	Shale: gray, much gray siltstone Shale: gray, much gray siltstone Shale: gray, silty Shale: gray, silty	
		Shale: gray Limestone: brown to dark brown, coarsely crystalline, dense, no porosity, no show Shale: gray to dark gray Shale: gray to dark gray	Brown Lime 2009 -672
	2050	Shale: gray to dark gray Shale: gray to dark gray Limestone: off white to dark brown, coarsely crystalline, dense, trace oolitic, oolicastic, no visible porosity, no show Shale: gray to dark gray	Lansing 2060 -723 vis 37 wt 9.0 lcm 1#
		Limestone: off white, medium crystalline, densely oolitic, fair oomoldic porosity, no show Limestone: off white to gray, coarsely crystalline, dense, no porosity, no show Shale: black carbonaceous Limestone: gray to light brown, coarsely crystalline, dense, no porosity, no show, much dark gray shale	
		Limestone: off white to gray, medium to coarsely crystalline, most dense, some oolitic, oolicastic, trace oomoldic, poor oomoldic porosity, no show Limestone: off white to gray, fine grained micritic to coarsely crystalline, dense, poor intergranular porosity, no show Shale: dark gray Limestone: mottled dark gray to tan, fine grained to coarse crystalline, dense, some oolitic, oolicastic, some poor intercrystalline porosity, no show Limestone: off white, medium crystalline, oolitic, oolicastic,	
	2150	Limestone: off white, medium crystalline, densely oolitic, oolicastic, fair interoolitic porosity, no show Limestone: off white, medium crystalline, some densely oolitic, oolicastic, fair interoolitic porosity, some fine crystalline w/fair to good intercrystalline porosity, no show Limestone: off white to gray, coarsely crystalline, dense, no porosity, no show	
		Limestone: gray, chalky, little visible porosity, no show Limestone: off white to gray, coarsely crystalline, dense, no visible porosity, no show Limestone: gray, coarsely crystalline, no visible porosity, no show Shale: gray to dark gray Shale: gray to dark gray	
	2250	Limestone: dark gray, coarsely crystalline, dense, no porosity, no show Shale: black, carbonaceous Limestone: off white to gray, coarsely crystalline, dense, no porosity, no show Shale: dark gray Limestone: off white to gray, coarsely crystalline, dense, no porosity, no show Shale: black, carbonaceous Limestone: light gray, slightly oolitic, poor to fair oomoldic porosity, no show, trace gray chert Limestone: gray, coarsely crystalline, dense, no porosity, no show, fossiliferous w/fusulinids and small brachiopods	
		small brachiopods Limestone: gray to tan, coarsely crystalline, dense, no porosity, no show, trace dark gray shale Limestone: off white to tan, coarsely crystalline, dense, some oolitic, oolicastic, poor interoolitic porosity, no show, trace red and gray shale Limestone: off white to tan, coarsely crystalline, dense, some oolitic, oolicastic, poor interoolitic porosity, no show, trace green and gray shale	
DRILLING TIME MINUTES/FOOT 1 2 3 4 5 10 15		Limestone: off white to gray to tan, coarsely crystalline, de no porosity, no show Limestone: off white to light brown, coarsely crystalline, de no porosity, no show Limestone: light brown, coarsely crystalline, dense, no porosity, no show Limestone: light gray to light brown, coarsely crystalline, dense, no porosity, no show Shale: black, carbonaceous	
	2350	Limestone: off white to light brown, medium to coarsely crystalline, very poor intercrystalline porosity, no show Limestone: light gray, coarsely crystalline, dense, no porosity, no show Limestone: light gray, coarsely crystalline, dense, no porosity, no show Shale: black, carbonaceous Limestone: brown, coarsely crystalline, dense, no show Shale: dank area to carsely crystalline, dense, no show	Hushpuckney 2356 -1019
	2400	Shale: dark gray to greenish gray Limestone: off white, fine grained micritic, dense, trace coarsely crystalline, no visible porosity, no show Limestone: off white, fine grained micritic, dense, trace coarsely crystalline, no visible porosity, no show Shale: gray Limestone: off white, fine grained micritic, dense, trace coarsely crystalline, no visible porosity, no show Shale: gray	vis 35 wt 9.1 lcm 2# BKC 2393 -1056
		Shale: gray Limestone: dark gray to brown, coarsely crystalline, dense, no porosity, no show Shale: gray Limestone: dark gray to brown, coarsely crystalline, dense, no porosity, no show Shale: gray to dark gray Limestone: light to dark gray, coarsely crystalline, dense no visible porosity, no show Shale: gray to dark gray	Marmaton 2408 -1071 vis 39 wt 9.1 lcm 2#
	2450	Shale: gray to dark gray Limestone: gray to brown, coarsely crystalline, dense no visible porosity, no show Shale: gray to greenish gray Limestone: gray, coarsely crystalline, dense, no porosity, no show <u>Shale: gray to greenish gray</u> Limestone: dark gray to brown, coarsely crystalline, dense, no porosity, no show	
	2500	Shale: gray Limestone: off white to gray, coarsely crystalline, dense no porosity, no show Limestone: tan, coarsely crystalline, dense no porosity, no show, much gray to green shale Shale: dark gray Limestone: dark gray, some argillaceous, most coarsely crystalline, dense, no porosity, no show	
		Shale: dark gray Limestone: gray to dark gray, trace beige, coarsely crystalline, dense, no visible porosity, no show Shale: dark gray Shale: black, carbonaceous Limestone: light brown, coarsely crystalline, dense, no porosity, no show, much dark gray shale Limestone: gray to dark gray, coarsely crystalline, dense, no porosity, no show Shale: black, carbonaceous	
		Limestone: dark gray to mottled brown, c crystalline, no por Shale: gray to green Limestone: off white to beige to gray, medium to coarsely crystalline, very poor intercrystalline porosity, fossiliferou with fusulinids, no show Limestone: gray to light brown, coarsely crystalline, dense, no porosity, no show Shale: black, carbonaceous Limestone: gray to dark gray to brown, coarsely crystalline dense, no porosity, no show	; Cherokee 2577 -1240
	2600	dense, no porosity, no show Shale: gray to greenish gray Limestone: dark gray to brown, medium to coarsely crystalline, some argillaceous, dense, no visible porosity, no show Shale: black, carbonaceous Limestone: gray to dark gray, coarsely crystalline, dense, no porosity, no show Shale: gray to greenish gray	vis 40 wt 9.1 lcm 1.5#
1 2 3 4 5 10 15 DRILLING TIME MINUTES/FOOT	2650	Shale: gray to greenish gray Shale: gray to greenish gray, trace red and light green <u>Limestone: dark gray, coarsely crystalline, dense,</u> no porosity, no show Shale: gray to olive green Shale: gray to olive green to reddish brown Sandstone: clear to amber grains, rounded, well sorted, poorly cemented, some well cemented w/silica, no show,	
		Dolomite: light gray to brown with oil stain, medium crystalline, fair to good intercrystalline porosity, some large dolomite rhoms, good show free oil, good odor, pale gold fluorescence in 20% of 15" sample. 30" sample has finer crystalline dolomite, some sucrosic, 20% of dolomite in the tray with no show, 40% with limited porosity & 40% with fair intercrystalline porosity excellent show light brown free oil, good odor, pale gold fluorescence in 20% sample	Mississippian 2666 -1329
	2700		
BOP West, LLC Thiel #20-1 1,361' FSL & 404' FW		2672' 45" x20 1337 KB	
Saline County, Kan Comments: Blow: 1st Open: GSB, 2nd Open: A WS Recovered	BOB 18 MIN B AFTER 1 MIN 1		BB) BB) DC)
Recoveredft.	of of of Of Of PH:7.0		Price Job



BOP West LLC Thiel #20-1 API # 15- 169-20335 Drilling Report 1361' FSL 404' FWL Sec 20-16S-01W Saline Co., Kansas Elevation GL1328 KB1337 DATE

05/23/12 Moved in C&G Drilling. Spudded well @ $6{:}00\ \text{PM}$

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, FSIP 568 PSIG, FHP 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 @ 2654', 2570', 2486', 2401 by tally measurements'. Filled casing @ 606' and 1658' going in. Circulated and set packer with 900 PSIG at TD. Consolidated pump 5 barrels water, 15 bbls water + 2 sx metasilicate as flush, 5 barrels water, 100 sx. THICK SET + 5# KOL-SEAL @ yield of 1.75 ft3/sx. Displaced with 65.2 barrels of water. Good circulation throughout job. Final pumping pressure 700 PSIG. Bumped plug with 1200 PSIG. Plug held. 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 state reports 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 Mississippi.