

WELLSITE GEOLOGIST'S REPORT

VERNON C. SCHRAG
CONSULTANT GEOLOGIST

Scale 1:240 (5"=100') Imperial

Well Name: Cleo #1-20
Location: NE SE SW SE SEC. 20-18s-30w
Licence Number: API: 15-101-22460
Spud Date: September 11, 2013
Surface Coordinates: 345' FSL & 1397' FEL

Region: Lane Co., KS
Drilling Completed: September 23, 2013

Bottom Hole Coordinates:
Ground Elevation (ft): 2891' K.B. Elevation (ft): 2898'
Logged Interval (ft): 3800' To: RTD Total Depth (ft): 4614'
Formation: Mississippi
Type of Drilling Fluid: Chemical Premix (Displaced)

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OPERATOR:

Company: Larson Engineering Inc.
Address: 562 West State Road 4
Olmits, KS 67564-8561

DRILLING CONTRACTOR:

H. D. Drilling, LLC, Rig #3

DP 4.5" XH (16.6#); DC 6.25" x 2.25" x 560', Kelly 40.30', Tool Joint 5.5"; Bit: JZ-HA20-Q, 7-7/8", jets 15-15-15; rpm 80, WOB 35k; Kelly Bushing 7' above ground level; LeWayne "Lew" Tresner (tool pusher).

CASING:

Set 8-5/8" casing at 276'
Set 5-1/2" production casing

CIRCULATION SYSTEM:

Continental EMSCO D-300, duplex, 6 x 14, 60-62 spm, Chemical, premix, displaced 3453'; earth pits, Morgan Mud, Inc., McCook, Neb., Cade Lines.

OPEN HOLE LOGS:

DN, DI (SP) (Run-1); ML (Run-2); No Sonic; 5" detail LTD-3600; 2" DI to surface casing; LogTech-Pioneer Wireline, Hays, KS, Dennis Kerr, Log total depth (4614') was two feet short to rotary total depth (4612').

DRILL STEM TEST #1:

LKC "B-zone": Interval: 3961-3983 (22'); Blow: weak surf thru IFP, no RB, no blow at 2nd open, but weak surf blow by end of FFP, no RB; Times: 5-15-30; Recovery: 20' OCM (30%O, 70%M); Pressures: HP: 1955-1917, SIP: 991-962, FP: 31-35, 37-41; BHT: 116 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #2:

LKC "H-zone": Interval: 4113-4135 (22'); Blow: weak incr to 1/2" IFP, no RB, weak incr to 3" FFP, no RB; Times: 5-15-30-60; Recovery: 100' TF, no GIP; 40' GO (100%O, 70' OSWM (15%W, 85%M), 240' WM (35%W, 65%M, Rw 0.221 at 55 F); Pressures: HP: 2126-2095, SIP: 546-495, FP: 22-72, 78-256; BHT: 127 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #3:

LKC "I-zone": Interval: 4160-4185 (25'); Blow: weak surf IFP, no RB, weak incr 1/2" FFP, surf RB died 14 min FSIP; Times: 5-15-30-60; Recovery: 30' SOCM (8%O, 92%M); Pressures: HP: 2053-2030, SIP: 846-837, FP: 13-17, 17-28; BHT: 114 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #4:

LKC "J-zone": Interval: 4202-4218 (16'); Blow: weak incr 1/4" IFP, no RB, weak surf blow FFP, no RB; Times: 5-15-15-30; Recovery: 10' OCM (20%O, 80%M); Pressures: HP: 2101-2057, SIP: 553-549, FP: 14-18, 18-23; BHT: 114 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #5:

LKC "K-zone": Interval: 4216-4232 (16'); Blow: weak incr 6" IFP, no RB, BOB 19 min FFP, no RB; Times: 5-15-30-60; Recovery: 312' TF, no GIP; 2' oil (100%O), 64' OSWM (15%W, 85%M), 240' WM (35%W, 65%M, Rw 0.221 at 55 F); Pressures: HP: 2126-2095, SIP: 546-495, FP: 22-72, 78-256; BHT: 127 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #6:

LKC "Middle Creek": Interval: 4256-4265 (9'); Blow: weak 1/2" IFP, no RB, weak 3/4" FFP, no RB; Times: 5-15-30-60; Recovery: 30' SOCM (7%O, 93%M); Pressures: HP: 2103-2064, SIP: 82-79, FP: 14-17, 18-25; BHT: 116 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #7:

LKC "L-zone": Interval: 4274-4287 (13'); Blow: weak incr 3" IFP, very weak surf RB, BOB 28 min FFP, no RB; Times: 5-15-30-60; Recovery: 245' TF, no GIP; 1' oil (100%O), 64' OSWM (30%W, 70%M), 180' MW (80%W, 20%M, Rw 0.22 at 45 F); Pressures: HP: 2167-2104, SIP: 460-454, FP: 21-49, 53-125; BHT: 128 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #8:

Pleasanton: Interval: 4299-4336 (37'); Blow: weak incr 2-1/2" IFP, no RB, weak incr 5" FFP, no RB; Times: 5-15-30-60; Recovery: 158' TF, no GIP; 40' WM (10%W, 90%M), 118' WM (40%W, 60%M, Rw 0.185 at 73 F, chloride 38k); Pressures: HP: 2109-2092, SIP: 694-724, FP: 18-29, 34-80; BHT: 124 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #9:

Marmaton: Interval: 4319-4360 (41'); Blow: weak incr 7" IFP, very weak RB ISIP, BOB 28 min FFP, 3-1/2" RB FSIP; Times: 5-15-30-60; Recovery: 208' TF, 90' GIP; 30' GO (25%G, 75%O, 36 grav.), 60' GCM (30%G, 35%O, 35%M), 118' HGOCM (15%G, 20%O, 65%M); Pressures: HP: 2157-2117, SIP: 606-587, FP: 26-63, 68-98; BHT: 117 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

DRILL STEM TEST #10:

Marmaton: Interval: 4359-4383 (24'); Blow: weak surf IFP, no RB, no blow FFP, no RB; Times: 5-15-15-30; Recovery: 1' SOCM (2%O, 98%M); Pressures: HP: 2173-2192, SIP: 125-273, FP: 17-18, 17-18; BHT: 113 F; Trilobite Testing, Inc., Scott City, KS, Chuck Smith.

