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 CONSULTING GEOLOGIST
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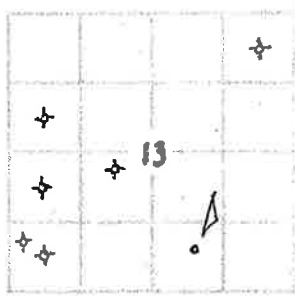
GEOLOGIST'S REPORT
 DRILLING TIME AND SAMPLE LOG

COMPANY L. D. DRILLING, INC.
 LEASE #1-13 KNOTTS
 FIELD PSAFF EAST
 LOCATION 690' FSL & 1867' FEL
 SEC. 13 TWP. 19s RGE. 23w
 COUNTY NESS STATE KANSAS
 CONTRACTOR L. D. DRILLING, INC.
 SPUD 9-22-17 COMP 9-30-17
 RTD 4450 LTD 4450
 MUD WT 3520 TYPE MUD CHEMICAL

ELEVATIONS
 KB 2195
 DF _____
 GL 2190
 Measurements Are All From 2195 KB
 CASING SURFACE 8 5/8" @ 244'
 PRODUCTION _____
 ELECTRICAL SURVEYS
 DUAL IND, DENS-N. MICRO SONIC

SAMPLES SAVED FROM 3600 TO 4450
 DRILLING TIME KEPT FROM 3500 TO 4450
 SAMPLES EXAMINED FROM 3600 TO 4450
 GEOLOGICAL SUPERVISION FROM 3800 TO 4450
 GEOLOGIST ON WELL KIM B. SHOEMAKER

FORMATION TOPS	LOG	SAMPLES
ANHYDRITE	1472+723	1474+721
B/ANH.	1514+681	1513+682
HEEBNER	3670-1475	3671-1476
LANSING	3718-1523	3718-1523
B/KC	4066-1871	4065-1870
PAWNEE	4148-1953	4148-1953
FORT SCOT	4228-2033	4227-2032
CNERDKEE	4252-2057	4250-2055
MISSISSIPPI 'U'. WARSAW	4318-2123	4320-2125
MISS. OSAGE	4347-2152	4348-2153



API: 15-135-25975

REMARKS

9-22-17 SPUD
 9-23 @ 247'
 9-24 @ 1700'
 9-25 @ 2640'
 9-26 @ 3265'
 9-27 @ 3925'
 9-28 @ 4214'
 9-29 @ 4312'
 9-30 @ 4340'
 10-1 @ 4450'

LEGEND

- Anhydrite
- Soil
- Sandstone
- Shale
- Gyps. sh.
- Limestone
- Co. Limestone
- Shift
- Dolomite



SAMPLE DESCRIPTIONS

REMARKS

ANHYDRITE 1474 + 721

B/ANH. 1513 + 682

LITHOLOG

1500

1550

1550

Mud Check ✓ @ 3412

WT: 30

WT: 98

WT: 110

Calc: 76000

3500

3600

3700

Samples are Lagged

Δ wt

ls. Th. to foss. calcitic.

ls. wt. foss. - ls. wt. calby

ls. wt. to foss. calcitic

HEEBNER 3671-1976

Sh. Sil. Calc.

ls. wt. G. Sil. Foss.

Sh. G. G.

ls. wt. Foss. vs. sil. calby

ls. wt. vs. foss. sil. calby

Sh. Sil. Calc.

LANSING 3718-1523

ls. wt. Sil. Foss. Sil. A

Sh. Sil. Calc.

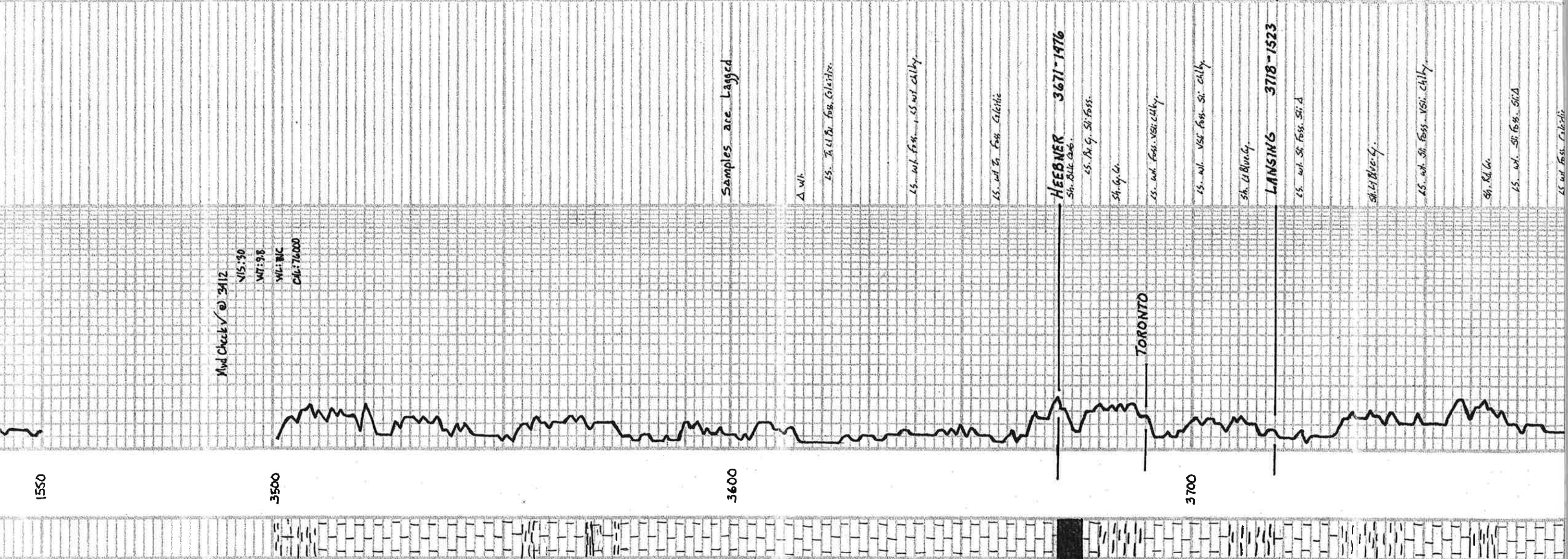
ls. wt. Sil. Foss. vs. sil. calby

Sh. Sil. Calc.

ls. wt. Sil. Foss. Sil. A

ls. wt. Foss. Calcitic

TORONTO



3800

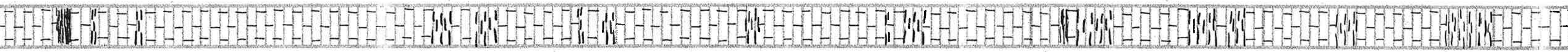
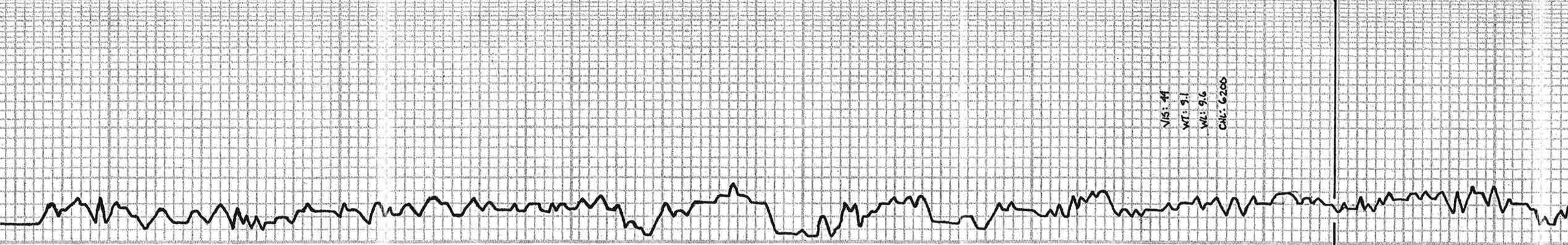
3900

4000

4100

LS. wt. Foss. Calotte
 LS. wt. Shi. Foss. Chilly
 Sh. Gy. LS. Rel. Gy. VSI Foss.
 LS. wt. VSI Foss.
 A Rel. wt
 LS. wt. Shi. Foss. SIA
 LS. wt. Shi. Foss. rel. Shi. Chilly
 A. wt.
 LS. wt. VSI Foss. Shi. Chilly
 LS. wt. Shi. Foss. SIA Calotte
 Sh. Gy. LS. Rel. Gy. VSI Foss.
 Sh. DE Gy.
 LS. To Gy. VSI A VSI Foss.
 LS. To VSI Foss.
 Sh. Rel. DE Gy.
 A Gy. To
 LS. wt. 001-000. Shi. Calotte
 LS. To Gy. VSI Foss. SIA
 Sh. Gy. DE Gy.
 LS. wt. 614. 000. Shi. rel. Shi. Calotte
 A DE Gy.
 LS.
 Sh. Gy. 614.
 LS. wt. 001. 000. Shi. Chilly
 LS. 41. 01. VSI A
 Sh. Rel. Carb.
 Sh. Rel. Gy.
 LS. wt. VSI Foss. Chilly
 Sh. DE Gy. Gy.
 Sh. DE
 LS. wt. Shi. Foss. Shi. Chilly
 A wt.
 LS. Shi. VSI A
B/KC 4065-1870
 Sh. Rel.
 LS. Rel. VSI Foss.
 LS. To Shi. SIA
 Sh. Rel. Macrom. Gy.
 LS. Rel. Shi. Chilly
 LS. wt. Shi. Foss. Calotte

V/S: 44
 WT: 91
 WL: 96
 CIL: 6200



Sh. G. G.
 15. Lt. Bl. V. Silt. Fr. Coarse
 15. wt. V. Silt. Fr. V. Silt. Ch. G.

PAWNEE 4198-1953
 15. G. Bl. V. Silt. Fr.

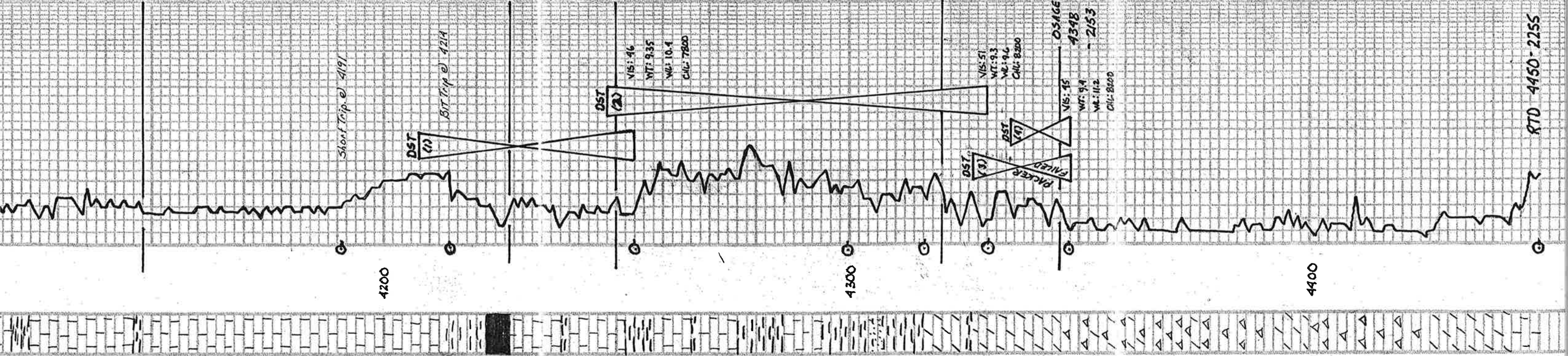
15. Tan G. V. Silt. Fr.
 15. Tan G. V. Silt. Fr.
 15. Tan G. V. Silt. Fr.
 15. Tan G. V. Silt. Fr.

FORT SCOTT 4227-2032
 15. Lt. Bl. Fr. Silt. Fr. No. 10 of 14 Bl. Fr. Silt. Fr. V. Silt. Fr. V. Silt. Fr.
 15. Tan G. Fr. Silt. Fr. No. 10 of 14 Bl. Fr. Silt. Fr. V. Silt. Fr. V. Silt. Fr.

CHEROKEE 4250-2055
 Sh. Blk. Carb.
 15. Tan G. Fr. Silt. Fr. No. 10 of 14 Bl. Fr. Silt. Fr. V. Silt. Fr. V. Silt. Fr.
 15. Tan G. Fr. Silt. Fr. No. 10 of 14 Bl. Fr. Silt. Fr. V. Silt. Fr. V. Silt. Fr.

MISSISSIPPI 'U' 4320-2125
 Dol. w/ Lt. G. V. Fr. Silt. Fr. No. 10 of 14 Bl. Fr. Silt. Fr. V. Silt. Fr. V. Silt. Fr.
 Dol. w/ Lt. G. V. Fr. Silt. Fr. No. 10 of 14 Bl. Fr. Silt. Fr. V. Silt. Fr. V. Silt. Fr.

OSAGE 4348-2153
 Dol. w/ Lt. G. V. Fr. Silt. Fr. No. 10 of 14 Bl. Fr. Silt. Fr. V. Silt. Fr. V. Silt. Fr.
 Dol. w/ Lt. G. V. Fr. Silt. Fr. No. 10 of 14 Bl. Fr. Silt. Fr. V. Silt. Fr. V. Silt. Fr.



DST (1) 4208-4254
 15. Blk. Carb. Surface Blow
 2nd OPEN: 11" 11" 21/2 min.
 30-30-30-30
 Rec. 3' Mud (100% M.)
 FP: 11-12 12-13"
 SIP: 52"
 Temp: 115°F

DST (2) 4248-4330
 15. Blk. Carb. Blow built to 13 1/4"
 2nd OPEN: Surface Blow
 30-30-30-30
 Rec. 10' Clean Oil 38.8 Gr. @ 60"
 20' HOCM (26% Oil, 74% M.)
 1F: 30"
 FP: 13-20
 21-22"
 SIP: 282-82"
 Temp: 113°F

DST (3) 4327-4348
 MIS-RUN
 PACKER FAILED
 WARSAW?
 DST (4)

DST (4) 4335-4348
 15. Blk. Carb. Blow built to 1"
 2nd OPEN: Surface Blow
 30-30-30-30
 Rec. 10' Mud
 FP: 10-13 14-15"
 SIP: 1240-1210"
 Temp: 118°F

Tool Sample:
 100% Mud
 w/ Trace Oil