From: **Ann Raney** annraney@icloud.com
Subject: RaneyPray4FINAL.PDF
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To: annraney@me.com

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ROGER L. MARTIN

INDEPENDENT PETROLEUM GEOLOGIST 316-250-6970

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY RANEY OIL COMPANY, LLC.

LEASE PRAY #4

FIELD CABIN VALLEY

LOCATION 315' FSL & 2458' FWL (2777'FEL) (~SE-SE-SW/4)

SECTION 31 TOWNSHIP 33S RANGE 06E

COUNTY COWLEY STATE KANSAS

ELEVATIONS

KB 1272' GL 1259'

Measurements Are All From KB: 1272'

API 15-035-24702-00-00

CONTRACTOR DUKE DRILLING, RIG #7

SPUD 04/08/2019 COMP 04/16/2019

RTD 3556' (-2284) LTD 3558' (-2286)

ELECTRICAL SURVEYS

ELI: CDL/CNL/PE & DIL; & MEL & SONIC

4 DST's by TRILOBITE TESTING

CASING

SURFACE New 8&5/8"x24# set @ 310'KB w/200sxClassA;3%CaCl;2%gel;1/4#Floceal

PRODUCTION New 5&1/2"x17#/ft set@ ~3551'KB w/200sx ELITE#4430; see REMARKS

FORMATION TOPS	LOG	SAMPLES
HEEBNER SH	1497' (-225)	
STALNAKER SS	1862' (-590)	
LAYTON SS	2283' (-1011)	2280' (-1008)
KANSAS CITY	2422' (-1150)	2420' (-1148)
DODDS CREEK SS	2434' (-1162)	2431' (-1159)
MARMATON	2670' (-1398)	2669' (-1397)
PAWNEE	2732' (-1460	2731' (-1459)
FT.SCOTT	2769' (-1497)	2769' (-1497)
CHEROKEE	2806' (-1534)	2806' (-1534)
EROSIONAL MISSISSIPPIAN	3059' (-1787)	3059' (-1787)
MISSISSIPPIAN CHERT POROSITY	3068' (-1796)	3069' (-1797)
MISSISSIPPIAN LIMESTONE	3077' (-1805)	3076' (-1804)
KINDERHOOK SH	3480' (-2208)	3479' (-2207)
CHATTANOOGA/WOODFORD SH	3500' (-2228)	3500' (-2228)
ARBUCKLE	3537' (-2265)	3535' (-2263)
TOTAL DEPTH (LTD/RTD)	3558' (-2286)	3556' (-2284)

CHRONOLOGY

04/08/19; 7am; MIRU-mix mud; drill RH; Spud 12&1/4" hole @ 9:30pm; Bit#1;HTC;12&1/4"#5275116;jet:5-14 WOB:4--8K; RPM:120; ROP~52.5'/hr

04/09/19; Drld to 315'; SHS;TOH@~6:00am Running 8&5/8" surf.csg @~7:00am

Deviation/Straight Hole Survey (SHS)~3/4deg@315'

Ran 7jts new 8&5/8"x24# csg (295.61') set @ 310'KB w/200sx Class A, 3%CaCl, 2%gel, 1/4#Floceal/sk; cmt did circ; plug dwn @ 8:45am on 04/09/19; by ELITE.

Drld plug @ 4:45pm on 04/09/19.

04/10/19; Drlg @~1200' @~7:00am; Bit#2;HTC;7&7/8" DP506 (PDC) jets:5--15; WOB:4--6K; RPM:120; PP:550; GPM:343 (BPM~8.17) SPM:56; ROP:90.76'/hr(TFPH76)

MdWt:9.0; Vis:29; SHS;1deg @ 491' & 1deg @804'

04/11/19; CFS/SHS@2250'@~6:00am; Drlg@~6:45am B#2;AA;WOB:6K;RPM:120; PP:650; GPM:343; SPM:56 ROP:80.6'/hr; (TFPH:75) SHS:3/4deg @ 1239'; 3/4deg @ 1617'; 1deg @ 1930'; 1&1/4deg @ 2243'

04/12/19; CTCH@2473' after DST#1;(Drld 223'~24hrs) B#2;WOB:6-10K;RPM:120;PSI:700;GPM:343;SPM:56 ROP:65.89'/hr (TFPH:63.81) SHS:1&1/4deg@2473'

04/13/19; Drlg@3195'@~6:00am (Drld~722'/24hrs) B#2;WOB:6-10K;RPM:120;PSI:750;GPM343;SPM:56; ROP:59.7'/hr (TFPH:58.35) SHS:1deg@2805'

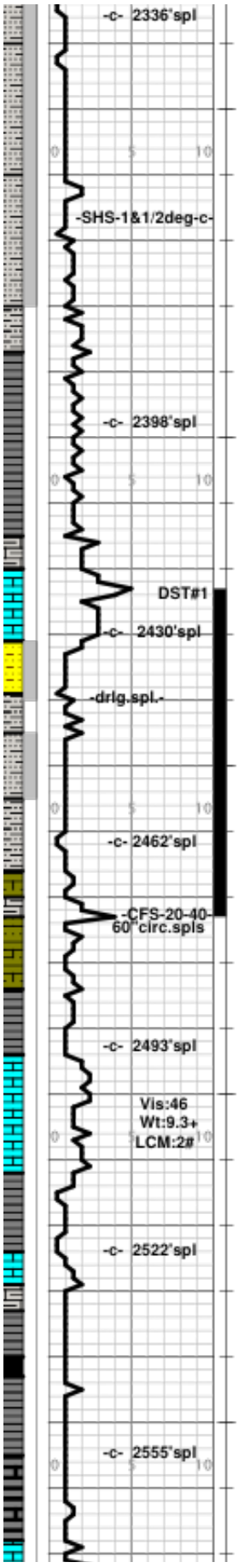
04/14/19; Drlg @3440'@~7:00am; (DST#2@3210') (Drld~245'~24hrs) Bit#2;AA; WOB:12-16K; RPM:120; PSI:725; GPM:343; SPM:56; ROP~60'/hr;TFPH~59.3 Lost~50bbls Drlg Md@3350'-3370'; SHS:1deg@3210'

04/15/19; CFS @ 3539' @~7:00am; (DST#3@3510') (Drld~99'~24hrs) Bit#2;HOB:5&3/4hrs; WOB:12-16K; RPM:120;PSI:625; SPM:50; ROP~59'/hr;TFPH~58.25 SHS; 1&3/4deg@3510'

04/16/19;CTCH@RTD:3556' LTD:3558' see Remarks

REMARKS: 04/16/19; CTCH @ RTD:3556' / LTD:3558' after DST#4; & E-Logs; ELI: 1st run: DIL & CDL/CNL/PE; 2nd run: SONIC & MEL (SHS: 1&3/4 deg @ RTD:3556') LDDP to run csg. Ran 83 jts new 5&1/2" x 17#/ft; L/S 8Rnd LTC production casing; (Tally=3447.80'+=3.50' Basket Shoe) = 3551.30' Total. Tagged bottom with landing joint; Set Basket Shoe/csg @ ~3551'KB; @ 900 PSI. Pumped 15bbl fresh water ahead; Mixed 200sx Thick Set cement w/ 2# Phenoseal/sk, 1/4% CFL-115 @ 13.8#/gal. Yield~1.65=~59bbl slurry. Wash out pump & lines; shut down. Released latch down plug; Displaced plug to seat w/ 84 bbls of fresh water (first 40 bbls was city water w/ KCl). Final pumping pressure =~1000 PSI. Bump Plug to~1500 PSI; wait 2 minutes; Released pressure; Float & Plug Held. Good circ throughout cementing. Plug Down @~10:30pm on 04/16/19. Plugged Rat Hole w/20sx. (By ELITE;Ticket#4430) Set slips & released rig @~11:00pm on 04/16/19. PBTD@~3502'. Centralizers on Jt#1{cent#1@~3502') & Jt#4{cent#2@~3370') & Jt#5{cent#3@~3315') & Jt#6{cent#4@~3280'); Jt#9{cent#5@~3145'); Jt#10{cent#6@~3100'); Jt#18{cent#8@~2757') Jt#28{cent#9@~2330') Jt#38{cent#10@~1890'). Baskets ~middle of Jt#3{bskt#1@~3435') top of Jt#7{bskt#2@~3233') & top of Jt#29{bskt#3@~2293'). Production casing set for a completion in the Mississippian System (DST#2 interval). Recommend review of Ft.Scott, Pawnee, & Dodds Creek SS before abandonment. Respectfully submitted, Roger L Martin, Geologist @ Well-site (print length~87")

POROSITY / DRILLING TIME MIN/FT / DST	SAMPLE DESCRIPTION	REMARKS	
connection2180 Vis:51 Wt:9.2 LCM:2#	{2212'spl} Pred SH:dk-gy-bk, subcarb to carb; sm calc.	**No Shows of Oil {NSO) in Kelly Down (KD) wet samples{spls) & re-washed & dried spls by &RLM; examined from ~500' to 2180'KD.**	
-2200	{2243'KD.spl} SH:AA; incrs calc- sm Lmy.		
0 5 10 {connecton}-c-			
	{2243'circ.spls} Trc Sd Clust:gy-tn; Vfn-fnGr'd, pr-Fr-visbl-Poro; NS;NF;NC.		
	Rare{Rr) LS:Lt-gy, micro-xln{ux) & argil-Mdst; Vpr-NVP; NS;		
	& Silts-Mdst:gy, sm micac, sm sndy, Vsl pyrtc.		
-CFS-20-40"SHS-c-	{2260'drlg&circ.spls} incrs Silts-Mdst:Lt-gy, calc, w/ Trc Sd Clust:AA; NS; & SH:AA.		
-2250			
0 5 10 -CFS-20-40"spls	{2269'drlg&circ.spls} Abndt Silts-Mdst:AA; incrs calc-Lmy, micac; & SH:gy-bk-fiss, subcarb- Rr-carb.		
-CFS-20-40"spls			
-CFS-20-40"spls-c-	2275'circ&2295'drlg.spls} V-abndt Silts-Mdst: Lt-md-gy, micac, sm calc, sm sndy; Trc Sd Clust:AB; NS; NF; NC.		**Mud-Co Report#4 04/11/19@10:15am Drlg @ 2287' Wt:9.3+ Vis:43 PV:12 YP:13 pH:11.0 WL:7.2 CT:1/32" Alka:1.0 Cl:1,100ppm Ca:60 Solids:7.1% LCM: 2#/bbl**
	{2295'+20min.circ.spl} SS: Abndt (>30%) Sd Clust: Lt-gy-wh-bf, Vfn-fnGr'd, Very rare {Vrr) prt mdGr'd, Rnd'd-Subanglr, micac, silty, shly, well cmt'd to fribl w/ Fr-Gd Porosity {Poro) No Show (NS) No Fluorecence (NF) No Cut (NC) No Odor {NO). {40min.spl} Sd Clust:AA; incrs fribl w/ Fr-Gd Poro; NS; NF; NC; NO.	**2280' (-1008) LAYTON SS NSO**	
-CFS-20-40"spls			
-2300	{2306'KellyDown{KD)spl} ~20% Sd Clust:AA; NS; NF; NC; NO; (&SH:AA).		
0 10 -c- 2306'spl			
	{2336'KD.spl} VAbndt {~90%} Sd Clusters: bf-gy-wh, pred VfnGr'd, silty, micac, subfribl to fribl w/ Fr-Gd Poro; NS; NF; NC; & sm Vfn-fnG'd, Rnd'd-subanglr w/ Fr-VGd Poro; NS; NF; NC; NO.		
	{2367'KD.spl} VAbndt Sd Clust:AA; gy-wh-bf, incrs Vfn-fnGr'd w/ Fr-VGd-lGr-Poro; NS; NF; NC; NO; sm VfnGr'd-		



silty-shly w/ pr-visbl-Poro; NS; NF; NC; NO.

{2398'KD.spl} SS- decrs to <30%Sd-Clust:AA; abndt Vfn-fnGr'd, micac-sitly, Vrr prt-md-Crs-Gr'd; well cmt'd to fribl w/ sm Fr-VGd Poro; NS; NF; NC; NO; sm Sndy-Silts (&SH:AA).

{2430'KD.spl} incrs to ~50% Sd Clust:AA & Sndy-Silts; pred gy, Vfn-fnGr'd; Vrr prt mdGr'd, micac; sm Fr-VGd Poro; & sm Vpr-pr-visbl-Poro; NS; NF; NC; NO.

{2430'KD.spl.cont'd} & SH: dk-gy-bk

{2440'drlg.spl} LS:wh-gy-tn, dn & prt chlky; & ux-fnX; pred Vpr-NVP; NS.

{2462'KD&2473'drlg&+20min.spls} SS- Sd Clust: Lt-gy-bf-wh, w/ sm tn-STN; pred VfnGr'd, & sm Vfn-fnGr'd, Rnd'd-subanglr, well cmt'd to fribl; ~40%>30% w/ Fr-VGd Poro w/ Sl-Fr-SFO & mot-sat- yel-wh-FLR & Lt-tn-STN, & Sl-Fr-Cut, Fr Odor.

{2473'+40min.circ.spl} SS~10% Sd Clust:AA; fribl w/ Fr-Gd-IGr-Poro w/ Sl-Fr SFO & Cut, mot-sat-FLR & STN, Sl Odor; Abndt Silty-Sd Clust.& Sndy-Silts: Lt-gy-wh, pred Vpr-pr-visbl-Poro & pred barren.

{2473'+60min.circ.spl} Pred Silts: Lt-md-gy, sm Sndy, micac; (sm SH:AA)
(Vrr Sd Clust:AA; Trc SFO-FLR-STN-Cut)
sm argil-LS-Mdst-silty-micac.

2493'KD.spl} sm argil-silty-LS-Mdst-micac.
Pred Silts: Lt-gy, micac, sm calc & sm Mdst.

{2524'KD.spl} Silts:AA & SH:gy-bk-subcarb to bk-carb;

{2524'KD.spl-cont'd} Abndt LS:wh-tn-gy, prt chlky, prt dn, & ux-fnX; & Wkst-Pkst; pred Vpr-pr-visbl-Poro w/ NSO; sm dull MNRL,FLR w/ NC;

{2524'KD.spl-cont'd} ~30% SH:gy-bk-subcarb & sl-incrs-bk-carb.

2555'KD.spl} sm LS:dk-Lt-gy, dn & argil-Mdst & ux-dn, Vpr-NVP; NS.

2555'KD.cont'd} Abndt {~60% ~70%} SH:dk-gy-bk, sm calc & Lmy, Vrr pyrtc, subcarb to Rr-carb.

2586'KD.spl}~30%-~40% LS:gy-tn-wh, pred dn; pr-NVP;

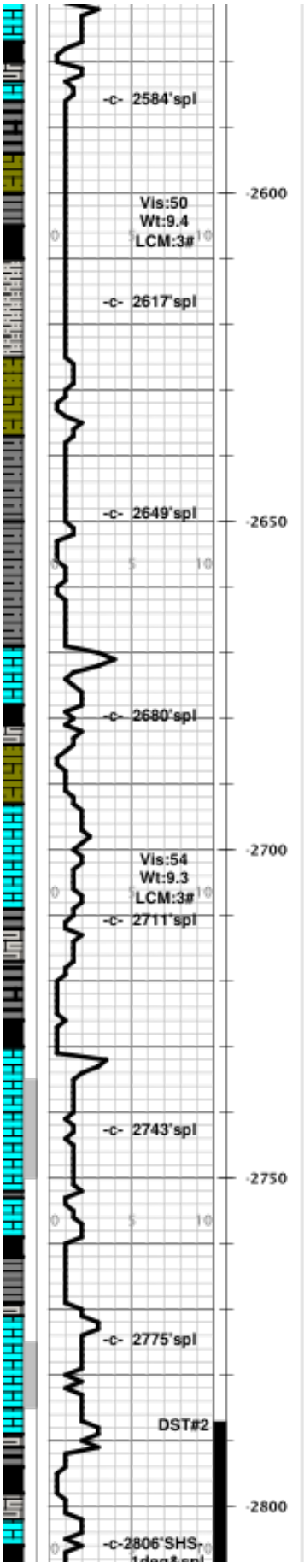
2420' (-1148)
KANSAS CITY

2431' (-1159)
DODDS CRK SS
(Sl-Fr SFO)
(Slight to Fair Show Free Oil)

(Sl-Fr SFO)

DST#1-DoddsCrkSd
2423'--2473'
30-45-30-60min
IF:Wk--Strong blow BOB--11min. cont'd build--65"
ISI: 2&1/2"Blow Back (BB)
FF: Strong Blow thru-out -->185"
FSI: Strong BB; built to 35"
Rec: ?GIP
95'GSOSWCM (9%Gas, 7%Oil, 7%Water,77%M)
245'GOSMCW (1%Gas, 1%Oil, 87%Water, 11%M)
335' Total Fluid
Tool Spl: 4%Oil, 68%Water;28%Mud
Rw:0.144@34deg.F
Corrected Rw:0.054 ohms@102degF
Cl~125,000ppm
IHP:1222
IFP: 31--115
ISIP: 739
FFP: 91--153
FSIP: 741
FHP: 1175
Temp:102deg.F

Mud-Co Report#5



sm chlky; NSO.

{2617'KD.spl} Sl incrs bk-carb-SH;
& LS:gy-bn, dn-ux; Vpr-NVP; NS.

{2649'KD.spl} VAbndt SH:bk-subcarb, sm calc & Lmy;

& bk-carb;

{2649'KD.spl.cont'd} & Silts-Mdst: Lt-md-gy, & gn-gy, sm calc; Vpr-NVP; NSO.

{2680'KD.spl} SH:dk-gy-bk, Rr-bk-carb;
& Silts: gn-gy, Vfnly Sndy.

{2710'KD.spl} Abndt (~50%) LS:dk-Lt-gy-tn-wh, prt dn-ux, prt chlky; Vrr Vpr-pr-visbl-Poro: pp-vug & IGr.Poro w/ NSO; & SH:AA- bk-carb.

{2743'KD.spl} incrs SH:gy-bk, sm calc, sm subcarb to carb; & sm Silts:gn-gy.

{2743'KD.spl.cont'd} & LS:AA, & dn-argil, & tn-bn-gy-wh, ux-fnX, pred Vpr-NVP; NSO.

{2775'KD.spl} LS:gy-tn-wh, pred dn-ux, sm prt chlky; sm argil-shly; pred Vpr-NVP w/ NSO.

{2775'KD.spl.cont'd} Abndt SH:AA; dk-gy-bk-subcarb to carb, sm Vcarb.

{2775'KD.spl.cont'd} Very rare {Vrr} LS:cm-tn-gy, ux-fnXln, w/ Vpr-pr-visbl-Poro: pin-point{pp} u-IXP w/ VSl-SFO & VSl-milky-Cut, Trc FLR & STN w/ VSl-milky-Cut, VSI Odor.

{2806'KD.spl} LS:AA, pred dn & argil w/ Vpr-NVP; Vrr (<5%) SFO-FLR-STN-Cut;

{2806'KD.spl.cont'd} SH:AA; incrs bk-carb- Vcarb.

{2806'KD&circ.spls} LS:gy-tn-wh, pred dn-ux, & prt chlky, sm ux-fnXln, & mot-Wkst-Pkst; Vrr (<5%) Vpr-pr-visbl-Poro: pp & IGr & IXP w/ spt'd FLR & STN & VSI-SI-SFO & milky Cut, Trc Odor; Vsl Cherty: gy-tn-vit, sharp.

{2837'KD.spl} decrs LS:AA; pred dn & argil
(Trc LS w/Poro-Trc SFO-FLR-STN-Cut-AA)
SH:bk-carb-Vcarb;

{2837'KD.spl.cont'd} LS:gy-tn-wh, pred dn & argil Mdst & ux-dn; pred Vpr-NVP & Barren.

2669' (-1397)
MARMATON

2731' (-1459)
PAWNEE

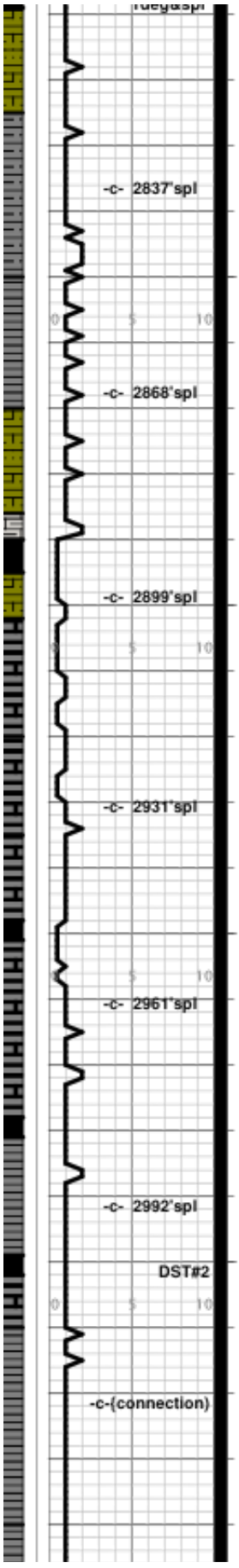
{VSISFO)

2769' (-1497)
FORT SCOTT

{VSI-SISFO)

2806' (-1534)
CHEROKEE

04/12/19@10:30am
Drlg @ 2572'
Wt:9.4 Vis:50
PV:17 YP:16
pH:11.0 WL:7.2
CT:1/32" Alka:1.2
Cl:2,200ppm Ca:60
Solids:7.7%
LCM: 3#/bbl
ECD: 9.73 #/gal.



{2868'KD.spl} Pred Silts-Mdst & SH:AA.

{2899'KD.spl} VAbndt SH: sharp incrs bk-subcarb to Vcarb.

2931'KD.spl} SH:gy-bk, & gn-gy, sm calc & Lmy; & sm LS: gy-tn, dn-ux & argil-shly-Mdst; pred Vpr-NVP w/ NSO.

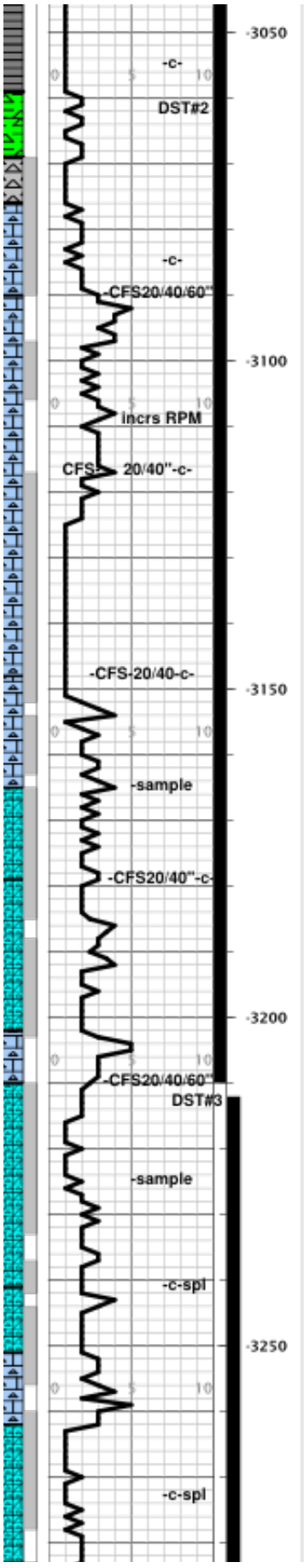
2961'KD.spl} SH:AA; sm calc & Lmy & subcarb to carb; Rr bk-Vcarb; sm LS:gy, dn-ux & argil-Mdst, sm pyrtc.

2991'KD.spl} SH & Mdst: Lt-md-dk-gy, sm micac.

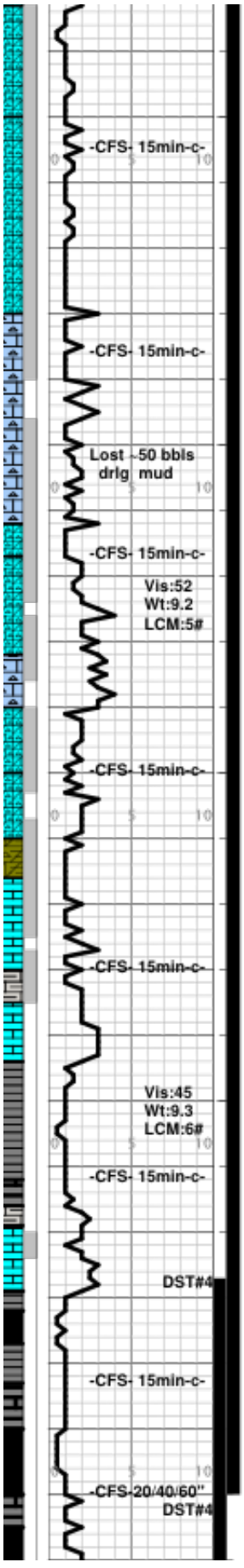
3055'KD.spl} Very rare {Vrr} Coal, & sm bk carb SH.

3055'KD.spl.cont'd} Pred SH: gy-bk, & dk-Lt-gn-gy, & bk carb.

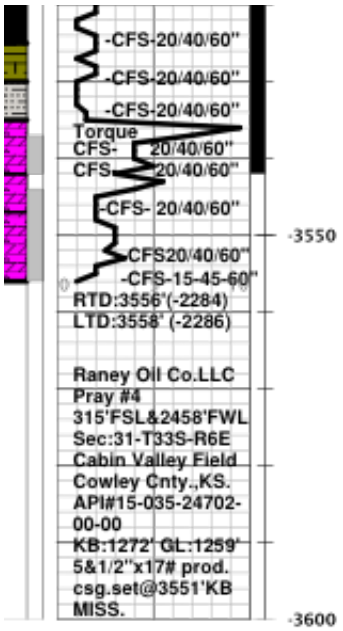
3085'KD.spl} Pred SH: mrn-rd-violt; Lt-dk-gn-gy, sm bk.



3085'KD.spl.cont'd} <5% CHERT: Lt-gy-bf-wh,sharp- sl wthr'd, mot- sl fos, sm Lmy; Trc Tripolitic Chert w/Fr-Gd Poro; Trace {Trc} Fluorescence{FLR} & Trc Show Free Oil {Trc SFO} Trc Oil Stain (Trc O.STN) Vsl Odor. 3090'circ.spls} :>50% MISS; ~30%CHERT: cm-gy-bf, sl Wthr'd to Tripolc w/ Fr-Gd Poro: IGr- Tripolc Poro & aprnt Frc.Edgs; ~10% w/FLR & Sl-Fr SFO & spt'd to sat Lt-tn-bn O.STN & milky Cut, Vrr Gd visbl Tripolc Poro w/ sat FLR & O.STN & Fr SFO & Fr-Gd Cut; & LS:wh-cm, chlky & subchlky- Wkst-Pkst, & micro-xln{ux} to prt fnXln{fnX); Vpr-pr visbl Poro: pin point (pp) IGr, & sm aprnt Frac Poro; Vrr FLR, VSISFO & Cut; Trc Tripolitc Chert w/ VGd Poro w/sat.O.STN, FrSFO; Gd Cut, Sl Odor.	**EROS. MISS. 3059' (-1787) {Trc Show Free Oil) 3069' (-1797) MISS.CHERT Poro. {Sl-Fr SFO) 3076' (-1804) MISSISSIPPIAN LS {Very Slight Show Free Oil {VSISFO)**	
3117'KD&circ.spls} LS: wh-gy-bf-tn, sm V.chlky, & subchlky, sm mot-Pkst-Grst; Cherty:wh-cm-gy, blu-gy, sm mot- fos; Rr u-Frac's & Edges w/ brt FLR & SISFO & Cut, Vrr <5% Tripolic-Wthr'd Chert w/ subsat tn-bn-O.STN; Sl-Fr SFO & Fr-Gd Cut, Fr Odor; (Abndt SH in spls).	**{Sl-Fr SFO)**	**DST#2; MISS 2787'--3210' 30-45-60-90min IF:Wk-->Fr blow building to 11" ISI:No Blow Back FF: Wk-->Strong blow; built to 22" FSI: NBB Rec: ?? GIP 230' GBSOCM (2%Gas, 4%Oil, 94%Mud) Tool Sample: 7% Gas, 3%Oil, 90% Mud IHP: 1581 IFP: 223--278 ISIP: 949**
3148'KD&Circ.spls} LS: wh-cm-bf-tn, sm chlky & subchlky, & sm mot-granlr-fragmntl, prt silic, & Cherty; sm ux-fnX- dolomc & Cherty; pred Vpr-pr visbl Poro; sm aprnt Frac.Poro; <5% w/ FLR & Trc SFO & Cut, Trc Tripolc-Wthr'd Chert w/ Gd visbl Poro w/ sat FLR & O.STN & SFO & Cut, Sl Odor (~40% SH cavings).	**{VSI-Sl SFO)** **{VSI-Sl SFO)**	
3165'drlg.spl} LS: As Above (AA) incrs wh-chlky; Wkst-Pkst & Grst w/ pr-Fr visbl Poro & aprnt Poro; <5% w/ FLR-SFO-Cut.	**{VSI SFO)**	**FFP: 288--318 FSIP: 981 FHP: 1561 Temp:111deg.F**
3179'KD&Circ.spl} Dolomitic LS {DLS} dk-Lt-gy, micro-xln {ux} to Vfnxln w/ Vpr-pr visbl Inter-Xln-Porosity {IXP) & sm aprnt Frac.Poro- u-Frac & Edges w/ FLR & VSISFO & Cut; Trc Grst w/ Gd visbl Poro w/ FLR-SFO-STN-Cut, Trc Tripolc-Wthr'd Chert w/ Gd Poro w/ FLR-SFO-STN-Cut, VSI Odor.	**{VSI SFO)** **{VSI SFO)** **{VSI SFO)**	**Mud-Co Report#6 04/13/19@10:30am CTCH for DST#2 Wt:9.3+ Vis:54 PV:20 YP:20 pH:11.0 WL:7.2 CT:1/32" Alka:1.2 Cl:1,700ppm Ca:60 Solids:7.0% LCM: 4#/bbl**
3200'drlg&3210'KD&Circ.spls} LS-DLS: cm-bf-gy, ux-Vfnxln, sm Vsl argil; sm semi-chlky, sm sl fos- Wkst-Pkst; sl Cherty: cm-blu-gy, & tn, opq, sl fos, sharp; Vrr u-Frac's & Edges w/ FLR & VSISFO & Cut; Trc Pkst-Grst w/ Poro-SFO-FLR-STN & Cut (Trc Tripolc Chert:AA w/SFO-FLR-STN-Cut).	**{VSI SFO)**	
LS: cm-gy-tn, mot- Pkst, sm wh-chlky & subchlky- fos, sm sl dolomc; Sl Cherty; Vpr-pr visbl Poro; Trc u-Frac's & Edges w/ FLR- Trc SFO & Cut, Vsl Odor.	**{Trc SFO)**	
3225'drlg&3241'KD.spls} LS: wh-chlky, & wh-gy-tn, subchlky, & ux-Vfnxln, sm sl dolomc; sm mot- Wkst-Pkst; Cherty: wh-cm-blu-gy, opq, fos, V.rare (Vrr) <5% w/ pp-vug Poro & IGr & IXP w/ spt'd FLR & VSISFO & VSI milky Cut; Trc Odor.	**{VSI SFO)**	
3271'KD.spl} LS-DLS: dk-Ltgy-bn, gy-tn, ux-Vfnxln, sm silic, sm dolomc; Cherty:cm-blu-gy, sm mot-fos, opq-transl, sm Qtzc; Trc u-Frac's & Edges & Vpr-pr visbl.IGr & IXP w/ FLR & Trc SFO {u-spots Free Oil on break) Trc milky Cut & Resid.Cut, Trc Odor; sm argil- sl shly.	**{Trc SFO)** **{Trc SFO)**	
3305'KD.spl} DLS: dk-md-gy, gy-bn, gy-bk, ux-Vfnxln, sl silic, sm argil-shly- bk carb SH Lamin; Trc u-Frac's & Edges w/ Frly bright{brt) FLR & VSISFO & VSI milky Cut & Resid.Cut; Trc Odor on brk.	**{VSI SFO)**	**DST#3; MISS. 3212'--3510' 30-60-60-120min IF: Wk-->Fr Blow Built to 5" ISI: NBB FF: Wk-->Fr Blow Built to 5" FSI: NBB Rec: 75' Mud 120' MCW (89%Water,**



3305'+15min.circ.spl} DLS: AA; incrs dk-gy-bn-bk, ux-Vfnxln, dn hd, sl silic, prt argil-shly- sm bk carb SH Lamin;Trc u-Frac's & Edges & sl 2nd ReX w/FLR, Trc SFO(u-spts F.Oil on brk) Trc milky-Resid.Cut; Trc Odor on brk.	{Trc SFO)	11%Mud) 195' Total Fluid Tool Sample: 52%Water 48%Mud
	{Trc SFO)	Rw of DST Wtr: 0.211o@59deg.F Corrected Rw:0.11 ohms@116deg.F
3336'KD} LS-DLS: dk-gy-bn-bk, & dk-Lt-gy, ux-fnXln, pred dn, prt argil-shly-bk carb & gy SH Lamin (sl incrs in argil-shly as compared to abv) sm sl silic; Trc u-Frac's & Edges & 2nd ReX w/ FLR & Trc SFO- u-spts F.Oil, Trc milky-Resid.Cut, Trc Odor on brk.	{Trc SFO)	IHP: 1713 IFP: 155--187 ISIP: 1143 FFP: 192--237
3336'+15min.circ.spl} LS-DLS:AA; ux-VfnXln, argil LS-DLS, sm shly, Trc u-Frac's & Edges w/ FLR & Trc SFO & Cut AA. Trc Odor on brk.	{Trc SFO)	FSIP: 1135 FHP: 1697 Temp:116 deg.F
3667'KD.spl} LS-DLS: gy-bn-bk, & dk-md-gy, ux-VfnXln, sm sl silic, sm dk-gy-bk- argil-shly w/ bk carb SH; Trc u-Frac's & aprnt Frac-Edges & Vpr visbl IXP & 2nd ReX w/ FLR; Trc SFO- u-spts F.Oil on brk, & Trc milky & Resid. Cut; Trc Odor on brk.	{Trc SFO)	
3667'+15min.circ.spl} LS: sharp incrs dk-gy-bn to bk, ux-VfnXln dn hd silic to V.silic, & Cherty: tn-gy-bn-bk, opq, vit, sharp; Trc u-Frac's & Edg's & 2nd ReX w/ FLR, Trc SFO- u-spt'd F.Oil on brk, Trc Resid.Cut, Trc Odor on brk.	{Trc SFO)	
3400'KD.spl} LS: dk-gy-bk, & Vdk-gy-bn, ux-VfnX- sm Vsl 2nd ReX, sm sl dolomc; sl Cherty; incrs argil-shly w/ bk carb SH; Vpr-pr visbl Poro: u-IXP Trc FLR & u-spts-SFO on brk & Resid.Cut, Trc u-Frac's & Edges w/ FLR & Trc SFO-u-spts on brk, Trc milky &Resid.Cut;Trc Odor on brk.	{Trc SFO)	
3400'+15min.circ.spl} LS: dk-md-gy, & dk-gy-bn-bk, ux-VfnX, sm silic, sm dolomc, sm argil-shly; Sl Cherty; Trc u-Frac's & Edges w/ FLR; Trc SFO- u-spts F.Oil on brk, Trc milky & Resid.Cut, Trc Odor on brk.	{Trc SFO)	
3430'KD.spl} LS-DLS: sm silic-dn-AA; &~30%LS: wh-cm-gy, ux- Rr fnX- 2nd ReX; sm dolomc - subchlky & chlky; & tn-gy-bn, ux-VfnX- 2nd ReX, silic & dolomc; Trc u-Frac's & Edges & 2nd ReX w/ FLR & Trc SFO- u-spts on brk; Trc milky Cut & Resid.Cut on brk.	{Trc SFO)	Mud-Co Report#7 04/14/19@5:45am Drlg @ 3400' Wt:9.2+ Vis:45 PV:16 YP:18 pH:11.0 WL:7.2 CT:1/32" Alka:1.0 Cl:1,800ppm Ca:60
3430'+15min.circ.spl} LS: gy-wh, prt chlky, sm Mdst & sm Wkst-Pkst- sl fos, sm sl argil;Trc u-Frac's & Edges & Vpr-pr visbl Poro w/ FLR & Trc SFO- u-spts on brk; & Resid.Cut.	{Trc SFO)	Solids:6.3% LCM: 6#/bbl
3462'KD.spl} LS: gy-wh, & tn-cm, sm mot, ux- dn, & sm argil- Mdst- Wkst & sm Pkst, Rr pyrtc; sm shly; pred Vpr-NVP; Trc Vpr visbl Poro w/ FLR & Trc SFO & Resid.Cut.	{Trc SFO)	
3462'+15min.circ.spl} Sharp incrs SH (~70%SH) (~30%LS:AA) Pred SH: gn-gy, dk-gy, sm calc & Lmy SH; & sm gy argil LS- Mdst.		
3493'KD.spl} ~40% SH: AA; & dk-gy-bk subcarb to carb, sm calc & Lmy SH & argil-shly LS- sm pyrtc.		
3493'KD.spl.cont'd&15min.circ.spl} ~60% LS: gy-tn-wh, pred dn- hd- crypto-ux, & dn Mdst-Wkst, Rr prt chlky; sm granulr Pkst; pred Vpr-pr visbl Poro: u-Frac's & Edges & u-IGr.Poro; Trc FLR, Trc SFO- u-spts F.Oil on brk & Resid.Cut; >99%Barren w/ Vpr-NVP; VSI Odor.	{Trc SFO)	
3493'+15min.circ.spl.cont'd} Sharp incrs in SH (~25%SH) SH: bk subcarb to V.carb- sm vit.	3479' (-2207) KINDERHOOK SH	
3510'spl} V.Abndt (~80%) SH: bk subcarb to V.carb, sm calc ReX- in Frac.seams, Rr Pyrtc.		
3510' circ.spls} SH:AA, pred bk carb- V.carb, sharp incrs Pyrtc, sm calc & Lmy SH.	3500' (-2228) "Chattanooga" WOODFORD	DST#4: ARB. 3477'--3542' 30-30-30-30min. IF: Wk blow; built to 2" ISI: NBB FF: Wk blow; built to 2"
3525'KD.spl} >50% SH: pred bk carb- V.carb, sm gn-gy SH.35		
3525'+20&40min.circ.spls} >90% SH: pred bk carb-V.carb, & gy-bn-bk subcarb. (incrs LS:AA in 1hr circ.spl).		



3530'circ.spls} SH:pred bk subcarb to V.carb & Pyrtc.

3534'circ.spls} Pred SH:AA; Vrr Sd Clusters: cm-gy, Vfn-fnG'd, silty, pr-Fr Poro Trc O.STN.
3539'circ.spls}ARB}DOLO:cm-gy, ux-fnXln, pred dn to pr visbl IXP; Vrr Sl-FrSFO&Cut, Spt'd O.STN;Vsl Odr.
3542'circ.spls}DOLO:tn-gy, fn-mdXln-Rhombic-2ndReX Vrr euhedral X's Vrr Fr-Gd IXP & vug Poro w/ Sl-FrSFO-STN-FLR-Cut, Vsl Odr; Sl Cherty. (After DST#4}
3547'circ.spls}Dolo:bf-tn,cm,ux-mdXln-sucro-Rhombc 2nd ReX; Fr-Gd IXP & vug Poro; pred Barren; Trc SFO-FLR-STN-Cut, Trc Odor. (3553'&3556'circ.spls}Dolo:bf-tn-gy, fn-MdXln, sm Rhombic & sucro w/ abndt Fr-Gd IXP & vug Poro, >99%Barren (Trc SFO-STN-FLR-Cut;AA) Cherty: wh-blu-gy, opq to transl, sm mot-fos, sm Qtzc- 2nd ReX.

3535' (-2263)
ARBUCKLE
(Sl-Fr SFO)

(Trc SFO)

FSI: NBB
Rec: 75' Mud
Tool Sample: ~100%Drlg.Mud
IHP: 1683
IFP: 20--40
ISIP: 1366
FFP: 42--60
FSIP: 1358
FHP: 1666
Temp:109deg.F

RTD:3556'(-2284)
LTD:3558' (-2286)

Raney Oil Co.LLC
Pray #4
315'FSL&2458'FWL
Sec:31-T33S-R6E
Cabin Valley Field
Cowley Cnty.,KS.
API#15-035-24702-00-00
KB:1272' GL:1259'
5&1/2"x17# prod. csg.set@3551'KB for MISS.

Mud-Co Report#8
04/15/19@11:45am
DST#4 @ 3542'
Wt:9.3 Vis:49
PV:14 YP:15
pH:11.0 WL:7.2
CT:1/32" Alka:1.0
Cl:1,600ppm Ca:60
Solids:6.3%
LCM: 4.5#/bbl
ECD: 9.58#/gal