



Confidentiality Requested:

Yes No

KANSAS CORPORATION COMMISSION 1171250
OIL & GAS CONSERVATION DIVISION

Form ACO-1

August 2013

Form must be Typed
Form must be Signed
All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # _____

Name: _____

Address 1: _____

Address 2: _____

City: _____ State: _____ Zip: _____ + _____

Contact Person: _____

Phone: (_____) _____

CONTRACTOR: License # _____

Name: _____

Wellsite Geologist: _____

Purchaser: _____

Designate Type of Completion:

- New Well Re-Entry Workover
- Oil WSW SWD SIOW
- Gas D&A ENHR SIGW
- OG GSW Temp. Abd.
- CM (Coal Bed Methane)
- Cathodic Other (Core, Expl., etc.): _____

If Workover/Re-entry: Old Well Info as follows:

Operator: _____

Well Name: _____

Original Comp. Date: _____ Original Total Depth: _____

- Deepening Re-perf. Conv. to ENHR Conv. to SWD
- Plug Back Conv. to GSW Conv. to Producer
- Commingled Permit #: _____
- Dual Completion Permit #: _____
- SWD Permit #: _____
- ENHR Permit #: _____
- GSW Permit #: _____

Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date
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API No. 15 - _____

Spot Description: _____

_____ - _____ - _____ Sec. _____ Twp. _____ S. R. _____ East West

_____ Feet from North / South Line of Section

_____ Feet from East / West Line of Section

Footages Calculated from Nearest Outside Section Corner:

- NE NW SE SW

GPS Location: Lat: _____, Long: _____
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum: NAD27 NAD83 WGS84

County: _____

Lease Name: _____ Well #: _____

Field Name: _____

Producing Formation: _____

Elevation: Ground: _____ Kelly Bushing: _____

Total Vertical Depth: _____ Plug Back Total Depth: _____

Amount of Surface Pipe Set and Cemented at: _____ Feet

Multiple Stage Cementing Collar Used? Yes No

If yes, show depth set: _____ Feet

If Alternate II completion, cement circulated from: _____

feet depth to: _____ w/ _____ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: _____ ppm Fluid volume: _____ bbls

Dewatering method used: _____

Location of fluid disposal if hauled offsite:

Operator Name: _____

Lease Name: _____ License #: _____

Quarter _____ Sec. _____ Twp. _____ S. R. _____ East West

County: _____ Permit #: _____

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

- Confidentiality Requested
Date: _____
- Confidential Release Date: _____
- Wireline Log Received
- Geologist Report Received
- UIC Distribution
- ALT I II III Approved by: _____ Date: _____



1171250

Operator Name: _____ Lease Name: _____ Well #: _____

Sec. _____ Twp. _____ S. R. _____ East West County: _____

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <i>(Attach Additional Sheets)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Log	Formation (Top), Depth and Datum	<input type="checkbox"/> Sample
Samples Sent to Geological Survey	<input type="checkbox"/> Yes <input type="checkbox"/> No	Name	Top	Datum
Cores Taken	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Electric Log Run	<input type="checkbox"/> Yes <input type="checkbox"/> No			
List All E. Logs Run:				

CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate				
<input type="checkbox"/> Protect Casing				
<input type="checkbox"/> Plug Back TD				
<input type="checkbox"/> Plug Off Zone				

Did you perform a hydraulic fracturing treatment on this well? Yes No *(If No, skip questions 2 and 3)*

Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? Yes No *(If No, skip question 3)*

Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? Yes No *(If No, fill out Page Three of the ACO-1)*

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record <i>(Amount and Kind of Material Used)</i>	Depth

TUBING RECORD: Size: _____ Set At: _____ Packer At: _____ Liner Run: Yes No

Date of First, Resumed Production, SWD or ENHR. _____ Producing Method:
 Flowing Pumping Gas Lift Other *(Explain)* _____

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
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DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <i>(Submit ACO-4)</i> <input type="checkbox"/> Other <i>(Specify)</i> _____	PRODUCTION INTERVAL: _____ _____
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#1 Brooks 32C

1020' FSL & 1635' FWL

30' N & 15' W of NW SE SW Section 32-12S-28W

Gove County, Kansas

API# 15-063-22128-0000

Elevation: 2631' GL, 2639' KB

Sample Tops			Ref. Well
Anhydrite	2139'	+500	+1
B/Anhydrite	2178'	+461	-4
Stotler	3412	-773	-18
Heebner	3772'	-1133	-23
Lansing	3810'	-1171	-21
Muncie Shale	3958'	-1319	-30
Stark Shale	4040'	-1401	-24
Hush	4072'	-1433	-28
BKC	4096'	-1457	-20
Altamont	4138'	-1499	-26
Pawnee	4214'	-1575	-24
Myrick Station	4247'	-1618	-25
Fort Scott	4299'	-1660	-29
Cherokee Shale	4330'	-1691	-34
Johnson	4369'	-1730	-31
B/Johnson	4383'	-1744	-33
Mississippian	4409'	-1770	-35
RTD	4534'	-1895	

ALLIED OIL & GAS SERVICES, LLC 061758

Federal Tax I.D. # 20-8651475

REMIT TO P.O. BOX 93999
SOUTHLAKE, TEXAS 76092

SERVICE POINT:
Great Bend

DATE <u>8-19-13</u>	SEC. <u>32</u>	FWP. <u>12</u>	RANGE <u>28</u>	CALLED OUT	ON LOCATION	JOB START <u>7am</u>	JOB FINISH <u>7:30pm</u>
LEASE <u>Brooks</u>		WELL # <u>1</u>	LOCATION <u>Grove to center of town 2c</u>			COUNTY <u>Gove</u>	STATE <u>KY</u>
OLD OR NEW (Circle one)							

CONTRACTOR Open Discovery #1

TYPE OF JOB Surface

HOLE SIZE 12 1/2 T.D.

CASING SIZE 8 1/2 DEPTH 222.18

TUBING SIZE DEPTH

DRILL PIPE 4 1/2 DEPTH

TOOL DEPTH

PRES. MAX MINIMUM

MEAS. LINE SHOE JOINT

CEMENT LEFT IN CSG. 15 FT

PERFS.

DISPLACEMENT 13.18 bbls Freshwater

OWNER _____

CEMENT AMOUNT ORDERED 165 sks class A 3% cc 2% gel

EQUIPMENT

PUMP TRUCK CEMENTER Josh Isaac

366 HELPER Ben Newell

BULK TRUCK

610-112 DRIVER Don Casper

BULK TRUCK

DRIVER

COMMON	<u>165</u>	@ <u>17.90</u>	<u>2,953.50</u>
POZMIX		@	
GEL	<u>3</u>	@ <u>23.40</u>	<u>70.20</u>
CHLORIDE	<u>5</u>	@ <u>64.00</u>	<u>320.00</u>
ASC		@	
		@	
		@	
		@	
		@	
		@	
		@	
		@	
HANDLING	<u>178.29</u>	@ <u>2.48</u>	<u>442.93</u>
MILEAGE	<u>8.13 x 40x</u>	@ <u>2.60</u>	<u>845.52</u>
TOTAL			<u>4,631.25</u>

REMARKS:

On location, rig up, had safety meeting
Run 8 1/2 casing, break circulation with rig mud
Hook up cement pump
pump 5 bbls ahead
mix 165 sks class A 3% cc 2% gel
displace 13.18 bbls Fresh water and shut in
Cement did circulate
Rig down

SERVICE

DEPTH OF JOB	<u>222</u>		
PUMP TRUCK CHARGE		<u>1512.25</u>	
EXTRA FOOTAGE	@		
MILEAGE	<u>140m 40</u>	@ <u>7.70</u>	<u>308.00</u>
MANIFOLD	@		
	<u>140m 40</u>	@ <u>4.40</u>	<u>176.00</u>
	@		

TOTAL 1,996.25

CHARGE TO: Ritchie Exploration

STREET _____

CITY _____ STATE _____ ZIP _____

PLUG & FLOAT EQUIPMENT

	@		
	@		
	@		
	@		
	@		
TOTAL			_____

To: Allied Oil & Gas Services, LLC.
 You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

SALES TAX (If Any) _____

TOTAL CHARGES 6,627.50

DISCOUNT 1,524.32 IF PAID IN 30 DAYS

5,103.17

PRINTED NAME X CLIFF MAYFIELD

SIGNATURE X Cliff Mayfield

Thank you!!

8

ALLIED OIL & GAS SERVICES, LLC 054778

Federal Tax I.D.# 20-5975804

REMIT TO P.O. BOX 31
RUSSELL, KANSAS 67665

SERVICE POINT:

Russell, KS

DATE <u>8-29-13</u>	SEC. <u>32</u>	TWP. <u>12</u>	RANGE <u>28</u>	CALLED OUT	ON LOCATION	JOB START <u>10:00am</u>	JOB FINISH <u>10:50pm</u>
LEASE <u>Brooks</u>	WELL # <u>32C</u>	LOCATION <u>Gove KS 2E N into</u>			COUNTY <u>Gove</u>	STATE <u>KS</u>	
OLD OR NEW (Circle one) <u>NEW</u>							

CONTRACTOR Discovery Drilling #1
 TYPE OF JOB PTA
 HOLE SIZE 7 7/8 T.D. 4534
 CASING SIZE DEPTH
 TUBING SIZE DEPTH
 DRILL PIPE 4 1/2 16.6 DEPTH 2160
 TOOL DEPTH
 PRES. MAX MINIMUM
 MEAS. LINE SHOE JOINT
 CEMENT LEFT IN CSG.
 PERFS.
 DISPLACEMENT

OWNER

CEMENT AMOUNT ORDERED 220 60/40 49 gcl 1/2 #10

EQUIPMENT
 PUMP TRUCK CEMENTER Robert V
 # 417 HELPER Glenn G
 BULK TRUCK
 # 410 DRIVER Jac G
 BULK TRUCK
 # DRIVER

COMMON	<u>132</u>	@	<u>17.90</u>	<u>2362.80</u>
POZMIX	<u>28</u>	@	<u>9.35</u>	<u>822.80</u>
GEL	<u>7.57</u>	@	<u>23.40</u>	<u>177.14</u>
CHLORIDE		@		
ASC		@		
<u>50# 2-sx</u>		@	<u>2.97</u>	<u>148.50</u>
		@		
		@		
		@		
		@		
		@		
		@		
HANDLING	<u>235.93</u> <u>ft</u>	@	<u>2.48</u>	<u>585.16</u>
MILEAGE	<u>295.905</u> <u>1/2 m</u>	@	<u>2.60</u>	<u>769.35</u>
TOTAL				<u>4865.75</u>

REMARKS:

p1 25 sks @ 2160
p2 100 sks @ 1230
p3 40 sks @ 280
p4 10 sks @ 40
30 sks in Rathole
15 sks in Maise hole

Thank you

CHARGE TO: Ritchie Exploration
 STREET _____
 CITY _____ STATE _____ ZIP _____

SERVICE

DEPTH OF JOB	<u>2160</u>		
PUMP TRUCK CHARGE	<u>2483.59</u>		
EXTRA FOOTAGE	@		
MILEAGE	<u>30</u> <u>HVMJ</u>	@	<u>7.70</u> <u>231.00</u>
MANIFOLD	@		
<u>30</u> <u>LVMI</u>	@	<u>4.40</u>	<u>132.00</u>
	@		
TOTAL <u>2846.59</u>			

PLUG & FLOAT EQUIPMENT

<u>8 3/4</u> <u>wooden plug</u>	@	<u>64.80</u>	<u>64.80</u>
	@		
	@		
	@		
TOTAL <u>64.80</u>			

To: Allied Oil & Gas Services, LLC.
 You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

SALES TAX (if Any) _____
 TOTAL CHARGES 1156.85 7777.14
 DISCOUNT 1156.85 IF PAID IN 30 DAYS
net 6620.29

PRINTED NAME CLIFF MAY FIELD
 SIGNATURE Cliff Mayfield

Handwritten initials

Conservation Division
Finney State Office Building
130 S. Market, Rm. 2078
Wichita, KS 67202-3802



Phone: 316-337-6200
Fax: 316-337-6211
<http://kcc.ks.gov/>

Mark Sievers, Chairman
Thomas E. Wright, Commissioner
Shari Feist Albrecht, Commissioner

Sam Brownback, Governor

December 03, 2013

Peter Fiorini
Ritchie Exploration, Inc.
8100 E 22ND ST N # 700
BOX 783188
WICHITA, KS 67278-3188

Re: ACO1
API 15-063-22128-00-00
Brooks 32C 1
SW/4 Sec.32-12S-28W
Gove County, Kansas

Dear Production Department:

We are herewith requesting that the Well Completion Form ACO-1 and attached information for the subject well be held confidential for a period of two years.

Should you have any questions or need additional information regarding subject well, please contact our office.

Respectfully,
Peter Fiorini

HEADER

WellSight Systems

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

Well Name: #1 BROOKS 32C
Location: sec 32 - twp 12S - rge 28W GOVE COUNTY
License Number: API #15-063-22,128 Region: KANSAS
Spud Date: 19 AUG 2013 Drilling Completed: 29 AUG 2013
Surface Coordinates: 1,020 FSL & 1,635 FWL
30' N & 15' W of NW - SE - SW
Bottom Hole DEVIATION SURVEYS: 0.75 degree @ 232 ---- 1.0 degree @ 3,906 ---- no impression
Coordinates: @ 4,534 TD
Ground Elevation (ft): 2,631 K.B. Elevation (ft): 2,639
Logged Interval (ft): 3,300 To: 4,534 Total Depth (ft): 4,534
Formation: ADMIRE to MISSISSIPPIAN
Type of Drilling Fluid: chemical - displace @ 3,283
Printed by WellSight Log Viewer from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: Ritchie Exploration, Inc.
Address: P.O. Box 783188
Wichita, Kansas 67278-3188

GEOLOGIST

Name: Ted Jochems, Jr.
Company: Consulting Geologist
Address: 212 North Market ste 517
Wichita, Kansas 67202

COMMENTS

CONTRACTOR: Discovery Drilling rig #1
Cliff Mayfield, toolpusher
MUD: Andy's Mud (Ken Rupp)
DRILL STEM TESTS: Superior Testers (Jared Scheck)
ELECTRIC LOGS: Nabors (Jeff Groneweg)
CDL/CNL, DIL
SURFACE CASING: 8.625" @ 232
hole plugged and abandoned on 29 AUG 2013

DAILY PENETRATION

DATE	DEPTH		SPUD
19 AUG 2013			
20 AUG	704	0700 hrs	
21 AUG	2,375	" "	
22 AUG	3,290	" "	
23 AUG	3,850	" "	
24 AUG	3,942	" "	
25 AUG	4,012	" "	DST #2
26 AUG	4,121	" "	
27 AUG	4,285	" "	DST #4
28 AUG	4,354	" "	DST #5
29 AUG	4,534	" "	TD

DRILL STEM TEST #1

3,878 - 3,906 30 - 45 - 30 - 30 LKC E & F zones
 COMMENT: tool slid 2'
 IFP: very weak blow built to 1"
 ISIP: no blowback
 FFP: no blow - flushed tool (no help)
 ISIP: no blowback
 COMMENT: tester reports slight odor when breaking open tool
 REC: 30' DM (100% M)
 30' total fluid
 FP: 90 - 86# / 84 - 87#
 SIP: 985 - 796#
 HP: 1,969 - 1,902#
 BHT: 120 degrees F
 COMMENT: shut-in curves indicate poor permeability

DRILL STEM TEST #2

3,954 - 4,012 30 - 45 - 30 - 30 LKC H & I zones
 COMMENT: tool slid 8'
 IFP: weak blow built to 4.5"
 ISIP: no blowback
 FFP: no blow: flushed tool (no help)
 FSIP: no blowback
 REC: 45' DM (100% M)
 45' total fluid
 FP: 123 - 99# / 114 - 98#
 SIP: 1,077 - 846#
 HP: 2,050 - 1,969#
 BHT: 121 degrees F
 COMMENT: shut-in curves indicate poor permeability

DRILL STEM TEST #3

4,019 - 4,095 30 - 45 - 30 - 30 LKC J - K - L zones
 IFP: very weak surface blow built to 0.25"
 ISIP: no blowback
 FFP: no blow; flushed tool (no help)
 FSIP: no blowback
 REC: 10' DM (100% M)
 10' total fluid

10' total fluid

FP: 111 - 104# / 108 - 99#

SIP: 1,032 - 747#

HP: 2,117 - 2,020#

BHT: 120 degrees F

COMMENT: shut-in curves indicate very poor permeability

DRILL STEM TEST #4

4,204 - 4,285

30 - 45 - 30 - 30

PAWNEE and MYRICK STATION

IFP: weak blow built to 0.75"

ISIP: no blowback

FFP: no blow; flushed tool (no help)

ISIP: no blowback

REC: 15' DM (100% M)

15' total fluid

FP: 127 - 107# / 110 - 107#

SIP: 123 - 108#

HP: 2,246 - 2,119#

BHT: 121 degrees F

COMMENT: shut-in curves indicate no permeability

DRILL STEM TEST #5

4,275 - 4,354

30 - 45 - 30 - 30

FORT SCOTT and upper CHEROKEE LIMES

IFP: weak blow built to 0.25"

ISIP: no blowback

FFP: no blow; flushed tool (no help)

FSIP: no blowback

REC : 3' DM (100% M)

3' total fluid

FP: 119 - 102# / 103 - 100#

SIP: 112 - 99#

HP: 2,275 - 2,063#

BHT: 124 degrees F

COMMENT: shut-in curves indicate no permeability

MUD RECORD

displace @ 3,283

RPT	DEPTH	WT	VIS	FIL	pH	PV	YP	GELS	CHLOR	SOLIDS	BTMS UP
3	3,310	8.6	72	8.0	11.0	24	20	18/34	400	2.0%	32 min
4	3,876	8.9	53	7.6	10.0	21	13	18/34	800	4.3%	37 min
5	3,973	9.2	50	8.8	8.5	19	11	16/32	1,500	6.3%	38 min
6	4,040	9.3	59	8.0	9.0	20	14	18/39	2,000	6.8%	38 min
7	4,194	9.3	76	8.8	9.0	24	18	21/38	1,500	7.2%	39 min
8	4,285	9.3	60	8.8	9.0	22	14	20/39	1,500	7.2%	40 min
9	4,354	9.4	59	8.8	9.0	22	14	20/39	1,500	7.4%	41 min

ROCK TYPES

- Anhy
- Bent
- Brec
- Cht
- Clyst

- Coal
- Congl
- Dol
- Gyp
- Igne

- Lmst
- Meta
- Mrlst
- Salt
- Shale

- Shcol
- Shgy
- Sltst
- Ss
- Till

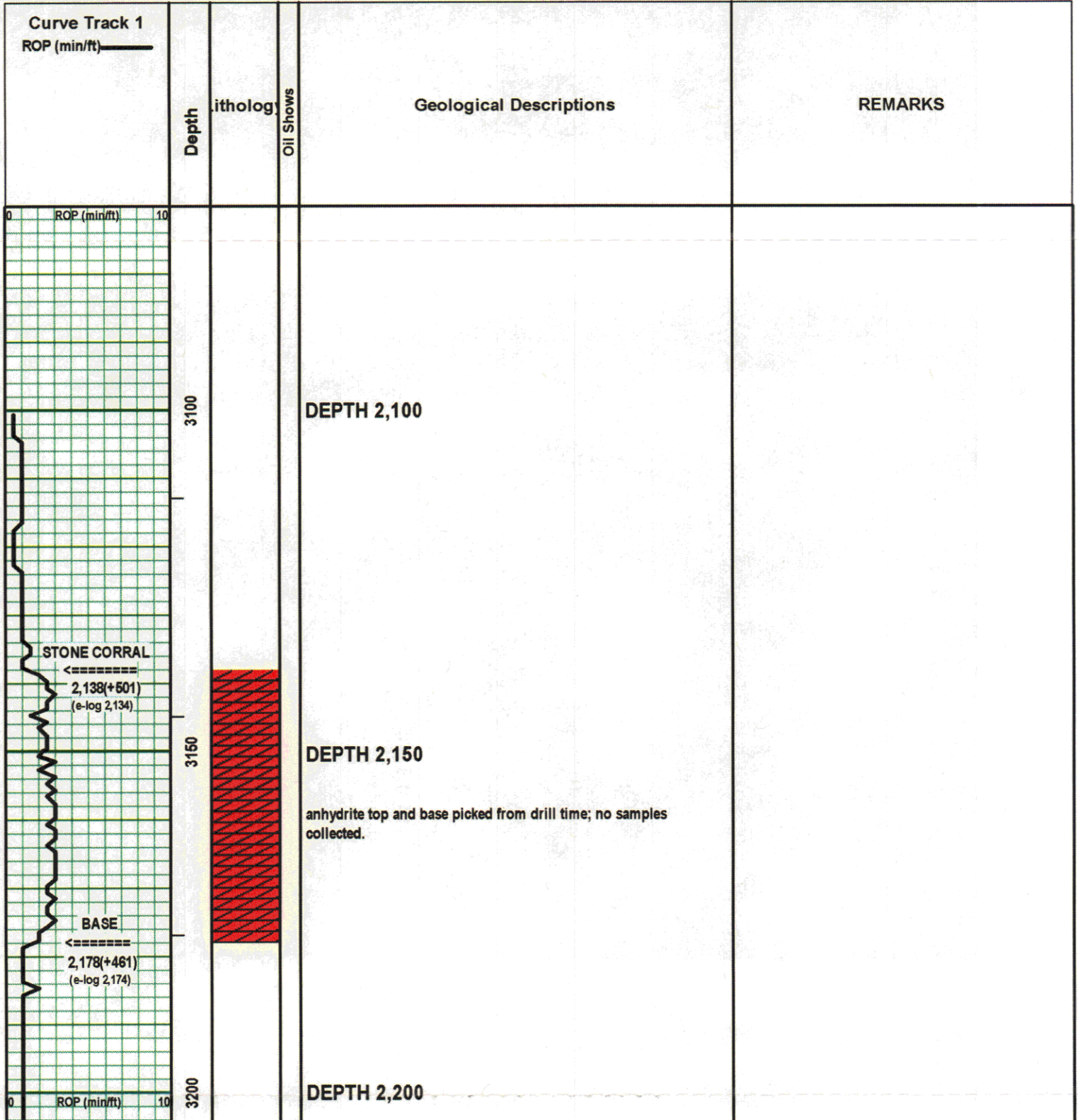
OTHER SYMBOLS

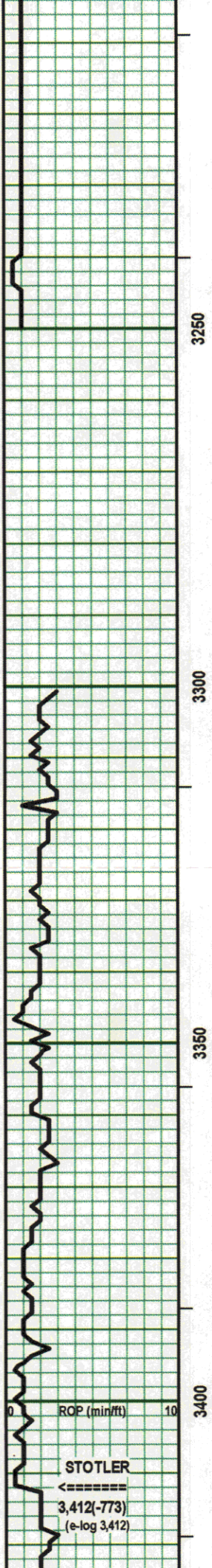
- #### OIL SHOW
- Even
 - Spotted
 - Ques

- Dead
- Gas

- #### INTERVAL
- Core
 - Dst

- #### EVENT
- Conn
 - Rft
 - Sidewall





3250

DEPTH 2,250

examine samples wet for color, shows & description; dry for porosity & dry stain. descriptions are lagged up to true depth using mud engineer's calculation for bottoms up.

3300

drilling with 17 drill collars (516')

3350

"cal floodd" is synonymous with "lithographic" or "dense." this is pervasive replacement by calcite.

"cal overgrths" includes calcite crusts (calcite analogue to tripolitic chert), druzy calcite, calcite veinlets and local recrystallization of larger fossils or clasts.

"rextlzd" = recrystallized.

"sil" = siliceous: introduction of moderate to abundant silica - original color and texture preserved.

"cht" describes very heavy silicification - original color and texture altered.

3400

displace @ 3,283

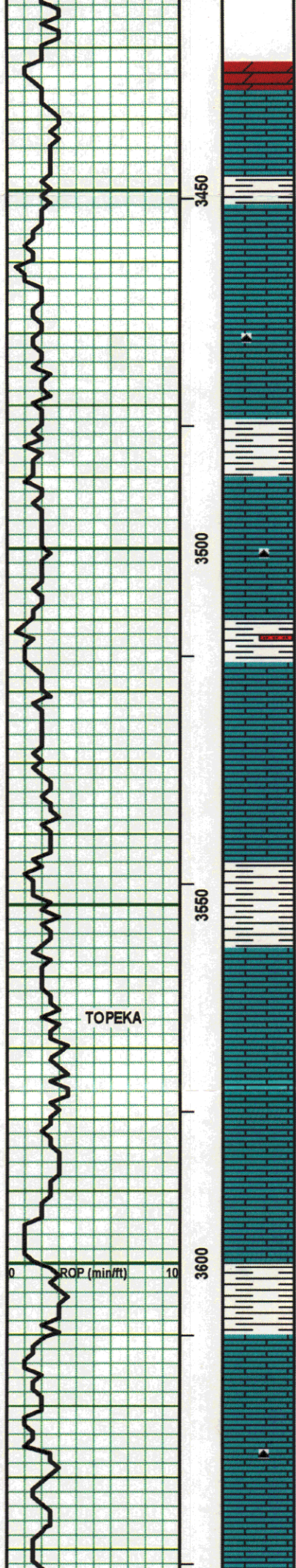
ROP (min/ft) 10

STOTLER

3,412(-773)

(e-log 3,412)

Stotler top picked from drill time: no samples collected.



DOL: off wht, vfgr xtln, sl sucr. v poor por. NS

LS: tan, microxtln, fossl, sl rextlzd, loc off wht & chalky. poor por. NS

SH: grn, gry & blk, argil, pyr, loc sdy, tr plant fragments.

LS: lt gry, microxtln, rextlzd, fossl, pelletal. poor por. tr minute brn stns (no odor), NSO

LS: crypt-microxtln, sl rextlzd, chalky (loc mushy). poor vis por. NS

LS: off wht to crm, microxtln, sl cal floodd, loc fossl, rare cht (wht, cryptxtln). v poor por. NS

LS: gry, microxtln, sl earthy, fossl (forams, bivalves, spines). v poor por. tr minute brn stns (no odor), NSO

SH: gry to grn, silty, argil, calc, sl fossl.

LS: off wht to crm, micro-vfgr xtln, loc cal floodd, fossl, loc sil. v poor por. NS

LS: gry, microxtln, wkly cal floodd, pelletal, fossl (forams & fusulinids). v poor por. NS

SH: grn, gry & red-brn, argil, gry stst stringers, earthy hematite.

LS: gry to brn, microxtln, wkly cal floodd, fossl, rare cht (crm, cryptxtln, fossl). v poor por. tr brn stns (no odor, no cut), NSO

LS: gry, microxtln, wkly cal floodd, cal crusts, fossl (forams & phylloid algae), loc earthy, v poor por. NS

SH: gry to blk, grn & red-brn, argil, loc v silty.

LS: off wht, microxtln, cal floodd, fossl (forams), loc chalky, rare glauc. v poor por. rare minute brn flecks (no odor, no cut), NSO

LS: crm, tan & lt gry, micro-vfgr xtln, cal floodd, loc chalky, fossl. v poor por. NS

LS: gry to brn, microxtln, cal floodd, minor cal crusts. no vis por. rare brn stns (no odor, no cut), NSO

LS: off wht to tan, microxtln, chalky, fossl. poor vis por. NS

SH: gry & grn > red-brn, argil, silty, tr py.

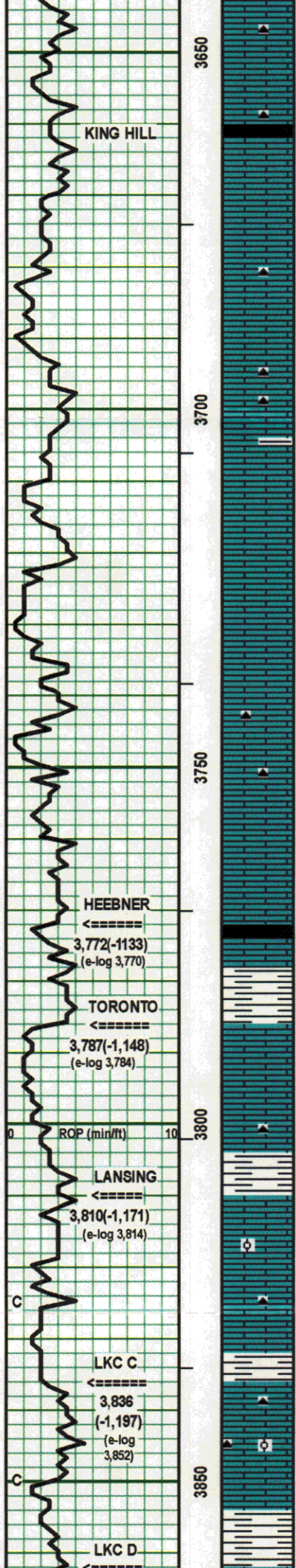
LS: crm to wht, microxtln, v chalky (loc mushy), abt forams, minor spines. poor vis por. NS

LS: crm & pale gry, microxtln, cal floodd, loc chalky, fossl, loc silcfd to cht (crm & orange, cryptxtln). poor por. NS

LS: crm & lt gry, microxtln, cal floodd, relict fossls, cal overarths

TOPEKA

ROP (min/ft)



LS: crm & lt gry, microxtln, cal floodd, relict fossls, cal overgrths, loc sil. no vis por. rare brn stns (no odor, no cut), NSO

LS: off wht to tan, micro-vfgr xtln, rextlzd, chalky, fossl, loc silcfd to cht (tan). poor vis por. NS

SH: dk gry, carb, earthy, cal incusions.

LS: crm, tan & lt gry, micro-vfgr xtln, rextlzd, chalky, relict fossls. poor vis por. NS

LS: crm, tan, brn & pale gry, micro-vfgr xtln, variably rextlzd and cal floodd, loc chalky. poor por. NS

abt sh cavings.

LS: crm, gry & brn, micro-vfgr xtln, rextlzd, chalky, loc silcfd to cht (brn, microxtln). poor vis por. NS

abt sh cavings.

vis 53 wt 9.3

LS crm to tan, microxtln, cal floodd, relict fossls, loc silcfd to cht (tan, cryptxtln). no vis por. NS

abt sh cavings.

LS: off wht to pale gry, microxtln, rextlzd, chalky, loc cal floodd, sh stringers (gry & blk, rarely carb). poor por. NS

LS: pale gry, microxtln, cal floodd, minor mgr cal overgrths. no vis por. NS

LS: crm & lt gry, microxtln, wkly cal floodd, widely chalky, relict forams, cal overgrths. no/poor vis por. NS

LS: crm, micro-vfgr xtln, rextlzd, chalky, relict forams. poor vis por. NS

abt sh cavings; tight connections.

LS: pale gry, microxtln, wkly cal floodd, blk & gry microxtln specular hematite. v poor por. NS

LS: crm to pale gry, microxtln, cal floodd, relict fossls, loc silcfd to cht (pale gry & wht, crypt-vfgr xtln, spicules). no vis por. NS

LS: crm to pale gry, micro-vfgr xtln, cal floodd, cal vnlt & overgrths, loc chalky, loc silcfd to cht (brn & wht, cryptxtln). poor por. NS

finely ground sample w/ drill steel shavings.

LS: pale gry & tan, microxtln, cal floodd, relict fossls. no vis por. NS

vis 55+ wt 9.3

work on pump.

SH: blk, carb, micac, cal inclusions.

LS: gry-brn, microxtln, cal floodd, cal crusts. no intxtln por, v poor ppt por. NS

SH: grn, gry & maroon, argil, loc silty, earthy hematite.

LS: wht, cryptxtln, v chalky (mushy), relict bivalves. poor vis por. NS

LS: crm, microxtln, wkly cal floodd, loc silcfd to cht (wht, cryptxtln, fossl). no vis por. NS

SH: dove gry, maroon & grn, argil, earthy hematite.

LS: crm, microxtln, cal floodd, loc ool, loc silcfd to cht (tan, cryptxtln, fossl). poor-fair intool por. rare brn stns (no odor), NSO

LS: wht, cryptxtln, v chalky (mushy), relict bivalves, loc silcfd to cht (wht, microxtln, fossl). no / poor vis por. NS

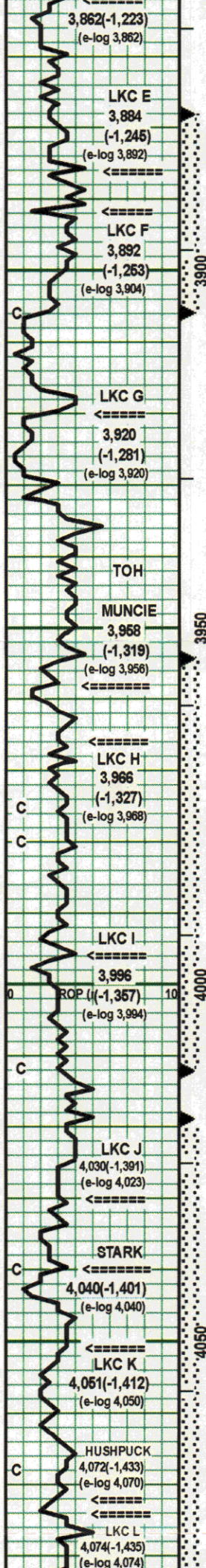
LS: wht, crypt-micro xtln, v chalky (mushy), relict bivalves. poor vis por. VSSG on brk (no odor), NSO

SH: red-brn > grn, micac, abt earthy hematite.

LS: crm & gry-brn, micro-vfgr xtln, cal floodd, cal over-grths, rare bivalves, loc silcfd (crm & orange, cryptxtln). no vis por. rare brn stns (no odor), NSO
siliceous & oolitic.

LS: crm to wht, crypt-micro xtln, rextlzd, v chalky. poor vis por. NS

SH: red-brn & grn, silty, earthy hematite, minor cal inclusions.



LS: wht to crm, crypt-microxtln, rextlzd, v chalky. poor vis por. NS

LS: off wht to pale gry, microxtln, cal floodd, cal crusts & overgrths, relict fossls. loc fair intxtln & ppt por. rare brn stns (no odor, no cut), NS

SH: gry, grn & red-brn, argil, silty, earthy hematite.
LS: pale gry, microxtln, cal floodd, cal crusts & overgrths, rarely sil. v poor por. NS

SH: gry, grn & red-brn.
LS: lt gry & lt brn, microxtln, cal floodd, cal crusts & over-grths, loc silofd to cht (lt brn, cryptxtln). v poor por. NS

LS: lt gry, vfgr-fgr xtn, druzi cal, cal crusts & overgrths, tr py. poor vis por. fair SO (tiny dk brn drplts, fair flash cut, no odor, patchy to satd dk brn dry stn)

LS: wht, crypt-microxtln, rextlzd, v chalky (often mushy), loc pyr. poor vis por. 1 show pc looks like secondary cal tested above. no stn, no odor, NS

SH: grn & red-brn.
LS: wht, crypt-microxtln, rextlzd, v chalky. poor vis por. no stn, no odor, NS. cal overgrths @ 3,930 w/ 2 pcs SSO (wk cut, no odor); poss cavings fm LKC F.

LS: pale gry, microxtln, hvly cal floodd, wk cal crusts, minor py & hematite. no vis por. NS

LS: pale gry to gry, microxtln, hvly cal floodd, minor cal crusts & druzi cal, rare vfgr py. no vis por. NS

LS: pale gry to gry, microxtln, hvly cal floodd, minor cal crusts, minor py, chalky @ base of unit. no vis por. NS

SH: blk, carb, micac, cal inclusions.
LS: brn, microxtln, hvly cal floodd, cal crusts. no vis por. minor brn stns (no odor), NSO

SH: gry, grn & red-brn, silty, earthy hematite.
LS: gry & brn, microxtln, cal floodd, loc rextlzd & chalky, cal crusts, minor secondary cal, loc cht (tan & gry, cryptxtln). no/poor vis por. minor brn stns (1 pc fair cut), no odor.

LS: pale to lt gry, microxtln, cal floodd, pelletal, loc rextlzd & chalky w/ cal overgrths. no/poor vis por. no odor, NS

LS: lt gry to gry & off wht, microxtln, cal floodd, cal crusts & overgrths, druzi cal, chalky partings, minor py. no vis por. no odor, NS

SH: gry, argil, sl micac. stringer of SS (gry, vfgr-fgr, friable, calc, NS)
DOL: crm to tan, vfgr, sucr, druzi dol. v poor intxtln por, some vug/ppt por. fair SO (brn, wk flash cut, no odor, FO in tray, patchy to satd brn dry stn)

LS: crm, microxtln, cal floodd, relict fossls. no vis por. no odor, NS
LS: crm to pale gry, microxtln, cal floodd, cal crusts, loc silofd to cht (crm, orange & wht, cryptxtln, relict fossls, blk & brn hematite). no vis por. NS

LS: brn-gry, microxtln, cal floodd, cal crusts, loc silofd to cht (orange, cryptxtln, relict fossls). no vis por. 1 pc w/ minute blk flecks (questionable cut, no odor), NSO

SH: gry, argil, micac, minor py, cal inclusions.
LS: off wht to tan, microxtln, cal floodd, loc cht (wht, cryptxtln, relict fossls). no intxtln por, rare vugs. 2 pcs w/ VSSO (v wk cut, no odor, patchy brn dry stn)

LS: wht, v chalky. poor vis por. NS
LS: lt gry to tan, microxtln, cal floodd, cal crusts, druzi cal, loc cht (gry, pyr). poor por, minor vugs. SSO (wk cut, wk odor, patchy brn dry stn).

SH: blk, carb, micac, cal inclusions + gry grn & maroon, argil.
LS: dk brn-gry, microxtln, hvly cal floodd, cal crusts, forams. NVP NS

LS: tan, micro-vfgr xtn, rextlzd, loc chalky, loc cal floodd, cal crusts, druzi cal, abt relict fossls. poor intxtln por, minor vug/ppt por. SSO (brn, wk-fair odor, wk-fair cut, patchy to satd lt brn dry stn)

LS: gry, microxtln, cal floodd, pelletal, loc cht (gry, cryptxtln, fossil). no vis por. NS

SH: blk, carb, micac.
LS: dk brn, microxtln, hvly cal floodd, ool, cal crusts, loc cht (smoky, cryptxtln). no vis por. NS

SH: gry, grn & maroon, argil, earthy hematite.

25 stand short trip before test. pulled tight on TOH, cleaned hole & CTCH again.

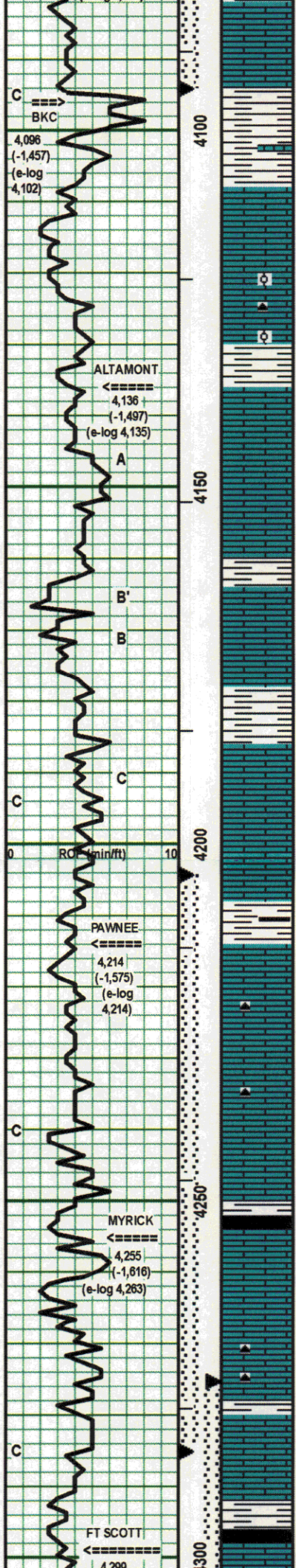
DST #1
3,878 - 3,906
REC 30' DM
SIP 985 - 796#
details above

strap @ 3,906
strap 3,929.98
board 3,929.81
strap long 0.17'

TOH @ 3,942 to count stands due to suspected problem with TIH after DST. count agreed w/ board: drill breaks are real.

DST #2
3,954 - 4,012
REC 45' DM
SIP 1,077 - 846#
details above

DST #3
4,019 - 4,095
REC 10' DM
SIP 1,032 - 747#
details above



LS: crm to tan, micro-vfgr xtl, cal floodd, cal crusts, relict forams. 1 show pc is caving fm LKC K. no odor, NS

LS: gry, microxtln, cal floodd, cal crusts, crinoids, loc sl rextlzd. no vis por. 1 show pc in 60 min spl believed to be caving. NSO

SH: gry, grn & maroon, argil (often mushy), silty, pyr, loc sdy, plant fragments, earthy hematite.

stringer(s) of LS: maroon & off wht, microxtln, hematitic. no vis por. NS

LS: lt gry, micro-vfgr xtl, cal floodd, sandd, loc chalky, abt specular hematite inclusions & vnlts, cal crusts & druzy cal. poor vis por. NS

LS: crm to tan & brn, microxtln, cal floodd, loc chalky, loc abt forams (?ool?), druzy cal & cal inclusions. no / poor vis por. NS

SH: grn, gry & maroon, argil (often mushy), silty, pyr, rock pebbles.

LS: brn, microxtln, cal floodd, cal crusts, minor relict fossis, chalky partings. no / poor vis por. NS

LS: gry & brn, microxtln, cal floodd, cal crusts & overgrths, abt earthy hematite vnlts. no vis por. NS

LS: gry > brn, microxtln, cal floodd, cal crusts, chalky partings, minor earthy hematite, tr py, tr limonite stn. no / poor vis por. NS

SH: gry, v argil (mushy) & red-brn, earthy hematite.

LS: gry, wht & maroon, crypt-microxtln, v chalky, loc cal floodd, abt earthy hematite. poor vis por. NS

LS: gry & brn, microxtln, cal floodd, cal crusts, druzy cal, abt earthy hematite vnlts & patches, chalky partings. no/poor vis por. NS

SH: red-brn & grn, argil (mushy), abt earthy hematite, loc sdy.

LS: crm to tan & gry, microxtln, cal floodd, loc chalky, cal crusts, abt earthy hematite. no/poor vis por. NS

LS: gry & crm, microxtln, cal floodd, cal crusts. NVP. 1 pc w/ poss vvwk cut (no odor), NSO

LS: crm, tan and gry, microxtln, cal floodd, cal crusts & overgrths, tr cht (wht & brn, cryptxtln), tr amts of hmt, py & limonite. no vis por. NS

LS: crm, brn & gry, microxtln, cal floodd, cal crusts, chalky partings. no / poor vis por. NS

SH: gry, grn & red-brn, argil, silty, loc blk, carb, micac.

LS: crm, microxtln, cal floodd. secondary cal. poor intxtln, fair vug por. VSSO (minute blk & brn flecks, no odor, good cut, patchy brn dry stn, 3 - 4 show pcs)

LS: gry-brn, microxtln, cal floodd, minor cal crusts, loc silcfd to cht (smoky, wht & orange, cryptxtln). NVP NS

LS: gry-brn, microxtln, cal floodd, tr py, loc silcfd to cht (smoky, crypt-microxtln). no vis por NS

LS: gry-brn & off wht, microxtln, cal floodd, minor cal crusts. no vis por. NS

LS: off wht, microxtln, chalky sandd (vfgr), poor vis por. NS

LS: off wht & gry-brn, microxtln, cal floodd. poor por. 1 show pc (prob caving) ?NSO?

flood of shales: all colors & textures.

SH: blk, carb, micac.

LS: dk brn, microxtln, hvly cal floodd, cal crusts & overgrths, relict fossis. no vis por. NS

LS: crm, microxtln, rextlzd, chalky, secondary cal. poor vis por. 2 pcs w/ SSO (brn, fnt odor, fair cut, patchy to satd brn dry stn)

LS: crm, microxtln, cal floodd, cal overgrths, loc cht (wht & brn, cryptxtln, fossil). no vis por. NS

LS: crm & gry, microxtln, cal floodd, loc cht (smoky & brn, cryptxtln, relict fossis). no vis por. NS

SH: gry & blk, argil, carb, micac.

LS: crm, gry & off wht, microxtln, cal floodd. no vis por. NS

flood of shales

LS: off wht & gry, microxtln, cal floodd, minor secondary cal, minor hematite. no vis por. NS flood of shales.

SH: variegated. flood of shales in spl (mostly blk sh).

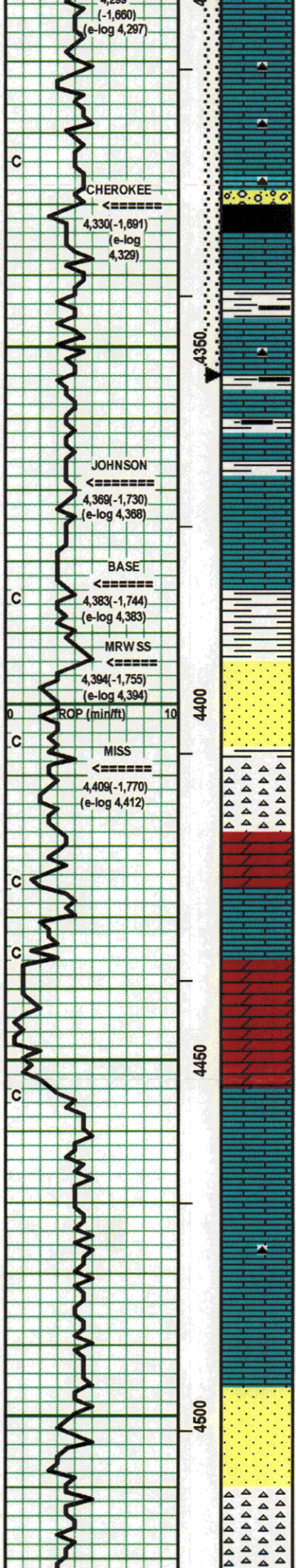
SH: blk, carb, micac, nodules.

LS: brn & tan, microxtln, cal floodd, cal crusts, druzy cal. tr py, loc

lost packer on TOH -prob drlg rubber for a few feet.

DST #
4,204 - 4,285
REC 16' DM
SIP 123 - 108#
details above

10 stand short trip before DST #4



silcfd to cht (brn & tan, cryptxtln, bryozoans). no intxtln por, loc wk vug por. 1 pc VSSO (minute brn drpfts, fnt odor, wk cut, patchy lt brn dry stn)

LS: brn, microxtln, cal floodd, cal crusts, druzi cal, loc chalky. no / poor vis por. 4 wk show pcs a/a (?cavings?), NSO

LS: tan to gry, microxtln, cal floodd, loc chalky, loc cht (gry & brn, cryptxtln, fossi, hematitic). no / poor vis por. NS

LS: lt brn, microxtln, cal floodd, cal crusts, druzi cal, loc silcfd to cht (brn, cryptxtln). no vis por. NS

CONG: grn & gry, shaley, abt rock pebbles.

SH: blk, carb, micac, cal inclusions (wht & pink).

LS: gry & tan, microxtln, cal floodd, druzi cal, cal crusts, tr glauc. no intxtln por, loc fair vug por. 2-3 pcs VSSO (minute brn drpfts, wk cut, poss fnt odor, patchy lt brn dry stns).

SH: gry, grn & red-brn, argil, pyr, loc carb, loc micac, earthy hmt.

LS: lt brn & lt gry, microxtln, cal floodd, cal crusts, druzi cal, loc fossi, loc cht (brn & gry, cryptxtln). no vis por. 1 pc w/ poss wk brn dry stn, no odor, NSO

SH: gry, grn & red-brn, argil, loc silty & micac, tr py, earthy hmt. loc blk & carb.

LS: wht to off wht, microxtln, cal floodd, wk cal crusts. NVP. NS

SH: gry, blk, grn & red-brn, loc carb.

LS: off wht to lt gry, microxtln, cal floodd, minor cal crusts, tr blk hematite. no vis por. NS

LS: off wht, gry & lt brn, microxtln, cal floodd, wk cal crusts, chalky partings, minor druzi cal. no / poor vis por. tr minute brn stns (no odor, no cut), NSO

LS: crm to wht, microxtln, cal floodd, minor cal crusts, chalky partings (relict bivalves). no / poor vis por. minor minute brn stns (no odor, no cut, no dry stn), NSO

SH: red-brn, maroon, yel, gry & grn, v silty, loc v argil (mushy), earthy & specular hematite, rock pebbles, minor limonite stn.

SS: wht, vfgr gran, rndd, clay matrix, sl friable, loc sil cmt (sl quartzitic), minor earthy hematite & limonite, tr hvy mineral grns, 1 bivalve cast. v poor por. no odor, NS

poorer sort (vfgr-fgr-mgr) & glauc @ base of unit.

SH: gry, grn, red-brn, maroon & yel, argil, rock pebbles, abt earthy & specular hmt.

CHT: crm & pale yel, microxtln, loc fossi, original texture preserved, loc clr w/ druzi qtz. no vis por, no odor, NS

DOL: dk tan, micro-vfgr xtln, suor, druzi dol, fgr-mgr rhombs. good vug por, no odor, no cut, NS

LS: crm to tan, microxtln, cal floodd, loc chalky, mgr grains. no / poor vis por. rare brn stns, (no odor, no cut), NSO

LS: crm to tan, microxtln, chalky, loc cal floodd, mgr grains, loc dol. no / poor vis por. no odor, NS

DOL: brn, vfgr xtln, suor, mgr rhombs, loc fgr-cgr clr druzi qtz, bryozoan & crinoid casts, bright yel min fluor, loc pyr. good to excellent vug por. poss stringer(s) of SS (wht, vfgr, rndd, no por, NS). no stns, no odor, no cut, no dry stn, NS

LS: crm, microxtln, wkly cal floodd, grainstn (fossils & clasts), loc chalky, minor druzi cal. poor vis por. rare brn stns (no odor, no cut), NS

LS: wht & blk, micro-fgr xtln, cal floodd + rextlzd + chalky pelletal, grainstn txt, relict fossis (incl bivalves), loc pyr. no/poor por. NS

LS: wht & blk, micro-fgr xtln, cal floodd + rextlzd + chalky grainstn (fossils, pellets & rock clasts), bivalve casts, loc silcfd to cht (wht & blk, cryptxtln, v fossi). v poor vis por. rare blk stns (no odor, no cut), NSO

LS: crm to peach, microxtln, cal floodd, abt relict fossis, minor glauc. no vis por. NS

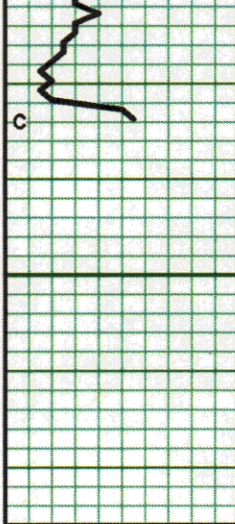
LS: wht & blk, microxtln, rextlzd, loc chalky, loc earthy, abt relict fossis (forams, bivalve casts). v poor vis por. NS

SS: gry, vfgr gran, sbrndd, sil cmt, 1% hvy mins. v poor por. NS

SS: gry, vfgr gran, rndd, cal cmt, sil vnfts. v poor por. NS

CHT: lt blue to wht, crypt-vfgr xtln, partly silcfd SS a/a, partly silcfd spicular & fossi ls. no vis por. minor brn stns (no odor, no cut, ?hematite?), NSO

DST #5
4,275 - 4,364
REC 3' DM
SIP 112 - 99#
details above



4550



CHT a/a: tripolitic crusts, bndd cht, py, wht sil vnlt. NS

increase tripolitic cht @ drill brk; prob fractured. NS

flood of blk carb sh in spl presumed to be cavings.

RTD 4,534

LTD 4,535

vis 40 wt 9.3

15 stand short trip before TOH for logs.