Confidentiality Requested:
☐ Yes ☐ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1153115

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 # 4767
Name: Ritchie Exploration, Inc.
Address 1: 8100 E 22ND ST N # 700
Address 2: BOX 783188
City: WICHITA State: KS Zip: 67278 + 3188
Contact Person: John Niernberger
Phone: (316) 691-9500
CONTRACTOR: License # 5822
Name: Val Energy, Inc.
Wellsite Geologist: Dave Williams
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 #:

04/03/2013	04/13/2013	04/13/2013
Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date

API No. 15 - 15-057-20886-00-00
Spot Description: 35'N & 70'E of SWNESW
NE - SW - NE - SW Sec. 5 Twp. 26 S. R. 22 ☐ East ☑ West
1685 Feet from ☐ North / ☑ South Line of Section
1720 Feet from ☐ East / ☑ West Line of Section

Footages Calculated from Nearest Outside Section Corner:
☐ NE ☐ NW ☐ SE ☑ SW

GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Ford
Lease Name: Imel 5C Well #: 1
Field Name:
Producing Formation: none
Elevation: Ground: 2431 Kelly Bushing: 2441
Total Vertical Depth: 5000 Plug Back Total Depth:
Amount of Surface Pipe Set and Cemented at: 363 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: 14600 ppm Fluid volume: 1200 bbls
Dewatering method used: Evaporated

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: 07/30/2013
☑ **Confidential Release Date:** 07/30/2015
☑ **Wireline Log Received**
☑ **Geologist Report Received**
☐ **UIC Distribution**
ALT ☐ I ☑ II ☐ III **Approved by:** NAOMI JAMES **Date:** 07/30/2013

1153115

Operator Name: Ritchie Exploration, Inc. Lease Name: Imel 5C Well #: 1

Sec. 5 Twp. 26 S. R. 22 ☐ East ☑ West County: Ford

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 ☑ Yes ☐ No
(Attach Additional Sheets)

Samples Sent to Geological Survey ☑ Yes ☐ No

Cores Taken ☐ Yes ☑ No

Electric Log Run ☑ Yes ☐ No

List All E. Logs Run:

Dual Induction Log
Compensated Density/Neutron Log

☐ Log Formation (Top), Depth and Datum ☑ Sample

Name Top Datum

See Attached

CASING RECORD ☑ New ☐ 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
Surface	12.25	8.625	24	363	class A	225	2% ge., 3% cc

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
___ Perforate ___ Protect Casing ___ Plug Back TD ___ 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 *(Amount and Kind of Material Used)*	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

DISPOSITION OF GAS: ☐ Vented ☐ Sold ☐ Used on Lease
(If vented, Submit ACO-18.)

METHOD OF COMPLETION: ☐ Open Hole ☐ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)* ☐ Other *(Specify)* _____

PRODUCTION INTERVAL:

Mail to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202

RITCHIE
EXPLORATION, INC.
Wichita, Kansas

#1 Imel 5C
1685' FSL & 1720' FWL
35' N & 70' E of S2 NE SW Section 5-26S-22W
Ford County, Kansas
API# 15-057-20886-0000
Elevation: 2431' GL, 2441' KB

Sample Tops			Ref. Well
Anhydrite	N/A		
B/Anhydrite	N/A		
Stotler	3501'	-1060	+2
Heebner	4134'	-1693	-12
Lansing	4239'	-1798	-5
Muncie Shale	4421'	-1980	-8
LKC "H"	4436'	-1995	-8
Stark Shale	4520'	-2079	-5
Hush	4584'	-2143	-6
BKC	4614'	-2173	-3
Marmaton	4646'	-2205	-8
Altamont	4665'	-2224	-4
Pawnee	4752'	-2311	-12
Fort Scott	4781'	-2340	-10
Cherokee	4808'	-2367	-18
Lower Cherokee	4846'	-2405	-22
Huck	4878'	-2437	-22
Atoka	4890'	-2449	-22
Mississippian	4910'	-2469	-14
RTD	5000'	-2559	

P.O. Box 783188
Wichita, Kansas 67278-3188

(316) 691-9500
Fax (316) 691-9550
rei@ritchie-exp.com

8100 E. 22nd St. N., Bldg. 700
Wichita, Kansas 67226-2328

ALLIED OIL & GAS SERVICES, LLC

059336

Federal Tax I.D.# 20-5975804

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

SERVICE POINT: Great Bend, KS 4-14-13

DATE 4-14-13	SEC. 5	TWP. 26S	RANGE 22W	CALLED OUT	ON LOCATION	JOB START 12:30 AM	JOB FINISH 1:30 AM
LEASE Ine/sc	WELL # 1	LOCATION Spearville, KS 4S 3/4W 1W into				COUNTY Ford	STATE KS
OLD OR NEW (Circle one)							

CONTRACTOR VolEnergy #1 | OWNER
TYPE OF JOB Rotary Plug

HOLE SIZE		T.D.	
CASING SIZE		DEPTH	
TUBING SIZE		DEPTH	
DRILL PIPE	4 1/2	DEPTH	1540
TOOL		DEPTH	
PRES. MAX		MINIMUM	
MEAS. LINE		SHOE JOINT	
CEMENT LEFT IN CSG.	All		
PERFS.			
DISPLACEMENT	Freshwater		

EQUIPMENT

PUMP TRUCK # 398	CEMENTER Dustin Chambers
	HELPER Mike Scothorn / Charles Kinyon
BULK TRUCK # 344-170	DRIVER Joel Monahan
BULK TRUCK #	DRIVER

CEMENT

AMOUNT ORDERED 250 sks 60% class A 40% poz 4% gel 1/4 flo

COMMON	150	@ 17.90	2,685.00
POZMIX	100	@ 9.35	935.00
GEL	9	@ 23.40	210.60
CHLORIDE		@	
ASC		@	
flo seal	63	@ 2.97	187.11
		@	
		@	
		@	
		@	
		@	
		@	
		@	
HANDLING	269.2	@ 2.48	667.61
MILEAGE	11.23 X 45 X	2.60	1,314.58
		TOTAL	5,999.90

REMARKS:

Fill hole with Rig Mud
1. 1540 - 50 sks
2. 850 - 80 sks
3. 390 - 50 sks
4. 60 - 20 sks
5. RH - 30 sks
6. MH - 20 sks
Plug Down 1:00 AM

SERVICE

DEPTH OF JOB	1540		
PUMP TRUCK CHARGE			2249.84
EXTRA FOOTAGE		@	
MILEAGE	Hvm 45	@ 7.70	346.50
MANIFOLD		@	
	Lvm 45	@ 4.40	198.00
		@	
		TOTAL	2,794.34

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 8,793.74
DISCOUNT 2,198.43 IF PAID IN 30 DAYS
6,595.30

PRINTED NAME X Walter Purcell

SIGNATURE [signature]

Thank You!!

ALLIED OIL & GAS SERVICES, LLC 059330

Federal Tax I.D.# 20-5975804

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

SERVICE POINT: Grant Road, KS

DATE 4-7-13	SEC. 5	TWP. 26S	RANGE 22W	CALLED OUT	ON LOCATION	JOB START 5:00	JOB FINISH 6:30 pm
LEASE Fuel SC	WELL# 1		LOCATION Spearville 4S 3/4W			COUNTY Ford	STATE KS
OLD OR NEW (Circle one)			N into				

CONTRACTOR Val Energy #1
TYPE OF JOB Surface
HOLE SIZE 12¼ T.D.
CASING SIZE 8⅝ DEPTH 365
TUBING SIZE DEPTH
DRILL PIPE 4½ DEPTH
TOOL DEPTH
PRES. MAX MINIMUM
MEAS. LINE SHOE JOINT
CEMENT LEFT IN CSG. 20 ft
PERFS.
DISPLACEMENT 21.97

EQUIPMENT

PUMP TRUCK # 606 CEMENTER Dustin Chambers
HELPER Kevin Eddy
BULK TRUCK # 610-241 DRIVER Don Cooper
BULK TRUCK # DRIVER Charles Klayon
Patrick Helgerson

REMARKS:

Break Circulation with Rig pump
pump 5 bbls Fresh water Ahead
Mix 225 sks Class A 3%cc 2% gel
Displace 21.97 bbls Fresh water
Shut in
cement did circulate
Plug Down 5:45 pm
Rig Down

OWNER

CEMENT
AMOUNT ORDERED 225 sks Class A
3%cc 2% gel

COMMON	225	@ 17.90	4,027.50
POZMIX		@	
GEL	3	@ 23.40	70.20
CHLORIDE	8	@ 64.00	512.00
ASC		@	
HANDLING	241 X	@ 2.48	598.17
MILEAGE	11.04 X 45 X	2.60	1,291.68
		TOTAL	6,499.65

SERVICE

DEPTH OF JOB			
PUMP TRUCK CHARGE			1512.30
EXTRA FOOTAGE		@	
MILEAGE	Hum 45	@ 7.70	346.50
MANIFOLD		@	
	Hum 45	@ 4.40	198.00
		@	
		TOTAL	2,056.75

PLUG & FLOAT EQUIPMENT

	@	
	@	
	@	
	@	
	@	
	TOTAL	

CHARGE TO: Ritchie Exploration
STREET
CITY STATE ZIP

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.

PRINTED NAME X Walter Farrell

SIGNATURE X

Thank You!

SALES TAX (If Any)
TOTAL CHARGES 8,556.40
DISCOUNT 2,139.10 IF PAID IN 30 DAYS
6,417.30

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

Kansas
Corporation Commission

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

July 26, 2013

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

Re: ACO1
API 15-057-20886-00-00
Imel 5C 1
SW/4 Sec.05-26S-22W
Ford 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,
John Niernberger

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

Well Name:	**# 1 IMEL 5 C**		
Location:	**35' N. & 70' E. - SW - NE - SW of SEC. 5 - 26 S. - 22 W.**		
License Number:	**A.P.I. # 15-057-20,886-00-00**	**Region:**	**FORD CO., KS.**
Spud Date:	**04/03/2013**	**Drilling Completed:**	**04/13/2013**
Surface Coordinates:	**SPOT: 1685' FSL & 1720' FWL**		
Bottom Hole Coordinates:			
Ground Elevation (ft):	**2431'**	**K.B. Elevation (ft):**	**2441'**
Logged Interval (ft):	**363' To: 5008'**	**Total Depth (ft):**	**5010'**
Formation:	**MISSISSIPPIAN**		
Type of Drilling Fluid:	**CHEMICAL/ POLYMER/ GEL**		

Printed by MUD.LOG 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: DAVID P. WILLIAMS, P.G.
Company: DW Energy, LLC (DWE)
Address: 312 North Broadview Street
Wichita, Kansas 67208

Casing & Deviation

Ran 7 jts new 24# 8-5/8" surface casing. Tally at 351', set at 363'. Cemented with 225 sacks Class A, 3% cc, 2% gel. Allied Cementing. Cement did circulate. Plug down at 5:45 P.M. on 04/03/2013.

Deviation Survey's Taken: @ 363' = 1 degree; @ 4160' = 1 degree; @ 4734' = 1 degree; @ 5010' = 1 degree;

DSTs

~~~DST #1 4132'-4160'. Miss-Run. At 1100' Hit Bridge on TIH & Could Not Get DST Tool To Bottom.

~~~DST #2 4132'-4760'. Times: 30"'-45"-30"-45". Blow: IF= Weak Surface Blow/1/2"; FF= Weak Surface Blow Died/ 20" (Flushed Tool w/Surge Blowback But No Help).
Recovery:1' Mud (100%).
Pressures: IH=1977#; FH= 1967#; IF=4-6#; FF=5-7#; ISIP=14#; FSIP= 14#; Temp.=101 degrees F.

~~~DST #3 4654'-4734-. Times: 30"'-45"-"-60". Blow: IF= Weak Surface Blow/3/4""; FF= Weak Surface Blow .
Recovery:10' Mud (100%).
Pressures: IH = 2234#; FH= 2229#; IF= 9-10#; FF=11-11#; ISIP=39#; FSIP=27#; Temp.=108 degrees F.

~~~DST #4   4795'-4894'-. Times: 30"'-45"-45"-60". Blow:
IF= Weak Surface Blow/ 3/4"; FF= Weak Surface Blow/ 1 1/2".
Recover:15' Mud With Tr. Oil (100%M).
Pressures: IH=2320#; FH=2308#; IF=8-11#; FF=10-12#; ISIP=149#; FSIP=88#; Temp. =108 degrees F.

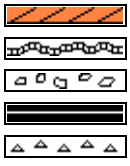
Comments

After review of all geologic samples as examined, structural corelation to offsetting prior drilled wells, combined with the fluid and pressures results from the drill stem test taken, it was determined by all parties that this well appears to be non-commercial and should be plugged and abandoned.

Respectfully submitted,

David P. Williams, P.G

ROCK TYPES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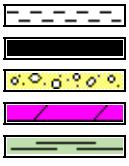
Cht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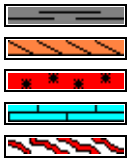
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Lmst
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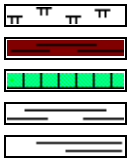
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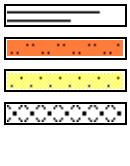
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Sltst
Ss
Till

ACCESSORIES

MINERAL

Anhy
Arggrn
Arg
Bent
Bit
Brecfrag
Calc
Carb
Chtdk
Chtlt
Dol
Feldspar
Ferrpel
Ferr
Glau
Gyp
Hvymin
Kaol
Marl
Minxl
Nodule
Phos
Pyr
Salt
Sandy
Silt
Sil
Sulphur
Tuff

FOSSIL

Algae
Amph
Belm
Bioclst
Brach
Bryozoa
Cephal
Coral
Crin
Echin
Fish
Foram
Fossil
Fuss
Gastro
Oolite
Oomold
Ostra
Pelec
Pellet
Pisolite
Plant
Strom

STRINGER

Anhy
Arg
Bent
Coal
Dol
Gyp
Ls
Mrst
Sltstn
Sltstrg
Ssstrg

TEXTURE

Boundst
Chalky
Cryxln
Earthy
Finexln
Grainst
Lithogr
Microxln
Mudst
Packst
Wackest

OTHER SYMBOLS

POROSITY
- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint
- Vuggy

SORTING
- Well
- Moderate
- Poor

ROUNDING
- Rounded
- Subrnd
- Subang
- Angular

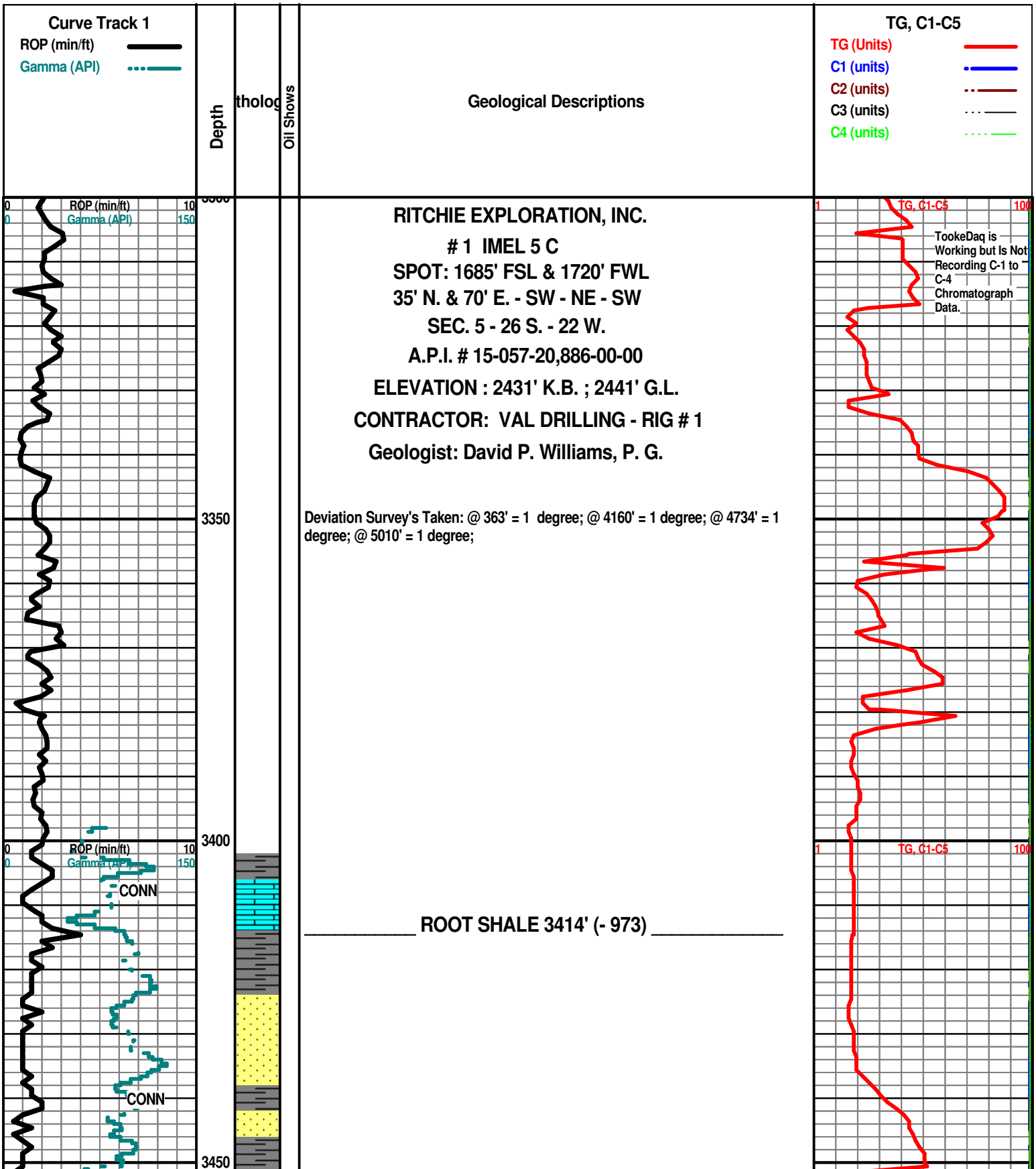
OIL SHOW
- Gas show

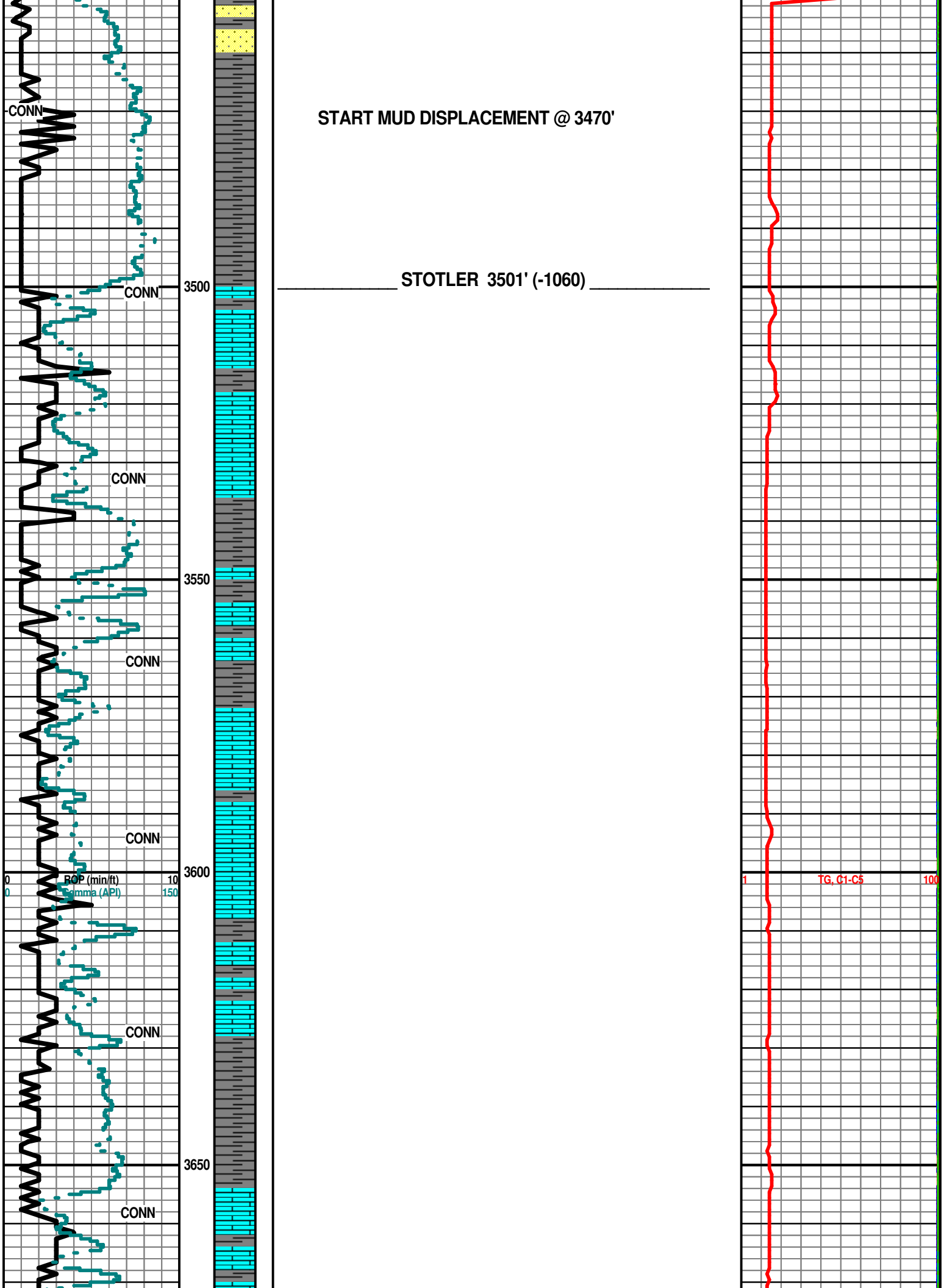
- Even
- Spotted
- Ques
- Dead

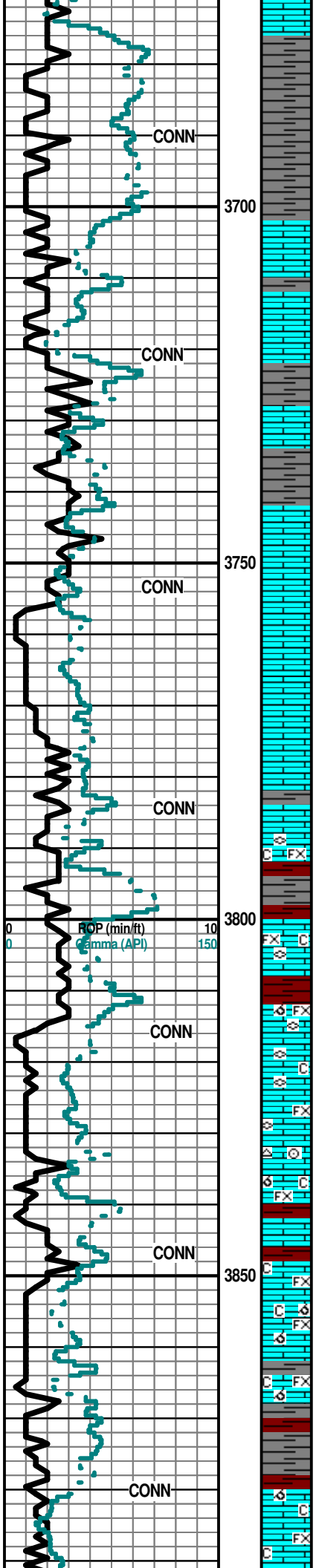
INTERVAL
- Gas show
- Core

- Dst
- Dst_alt

EVENT
- Rft
- Sidewall




START MUD DISPLACEMENT @ 3470'
STOTLER 3501' (-1060)
CONN
CONN
CONN
CONN
CONN
CONN
CONN
3500
3550
3600
3650
0
ROP (min/ft)
10
0
Gamma (API)
150
1
TG, C1-C5
100



Note: All samples have been lagged to depth by calculated time.

Begin 10' Sample Examination @ 3810'.

Ls Crm-Tan-Gry-Wht Fxln Fair Pin-Pt Ixln Por Grad Poor-Fair Granular Ixln Por Grad Dns Micrite Fos (Fuss) Chalk Wht Soft Sh Char -Gry -Maroon Soft No Odor No Stn No Flor NS

Ls Crm-Tan-Gry-Wht Fxln Fair Pin-Pt Ixln Por Grad Poor-Fair Granular Ixln Por Grad Dns Micrite Grad Poor OOM Por (1 Pcs) Poor Develop Poor Leaching Fos (Fuss) Chalk Wht Soft Sh Char -Gry -Maroon Soft No Odor No Stn No Flor NS

Ls Crm-Tan-Wht Fxln Fair Pin-Pt Ixln Por Grad Granular Fair Ixln Por Grad Dns Micrite Fos (Fuss) Chalk Wht Soft Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad Granular Fair Ixln Por Grad Poor OOM Por Poor InterOOM Por Poor Develop Poor Leaching Fos (Fuss Abd) Chalk Wht Soft Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Ls Wht-Crm-Tan Fxln Fair Pin-Pt Ixln Por Grad Poor OOM Por Poor InterOOM Por Poor Develop Poor Leaching Cht Wht-Gry Translu-Op Shp Vit Fos (Crin) Chalk Wht Soft Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

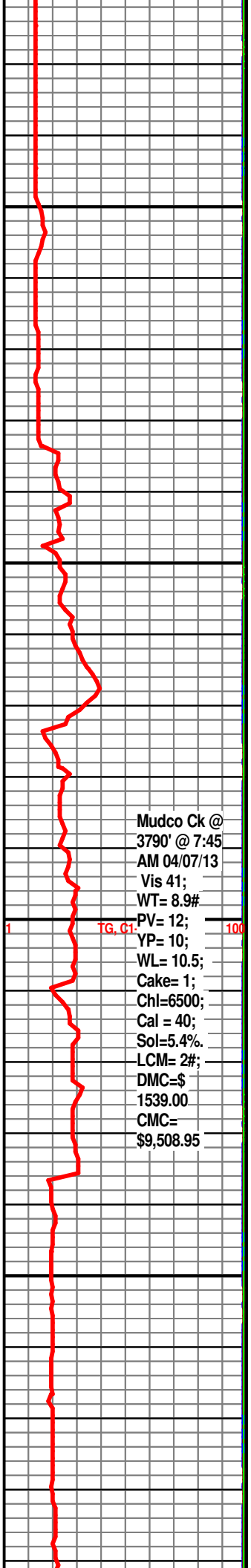
Ls Crm-Tan-Wht Fxln Fair Pin-Pt Ixln Por Grad Dns Micrite Chalk Wht Soft Sh Grn-Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Ls Tan-Crm-Wht Fxln Fair Pin-Pt Ixln Por Grad Poor OOL/OOM Por (w/OOL in pl) Poor InterOOL/OOM Por Poor Develop Poor Leaching Cht Wht-Gry Translu-Op Shp Vit Chalk Wht Soft Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

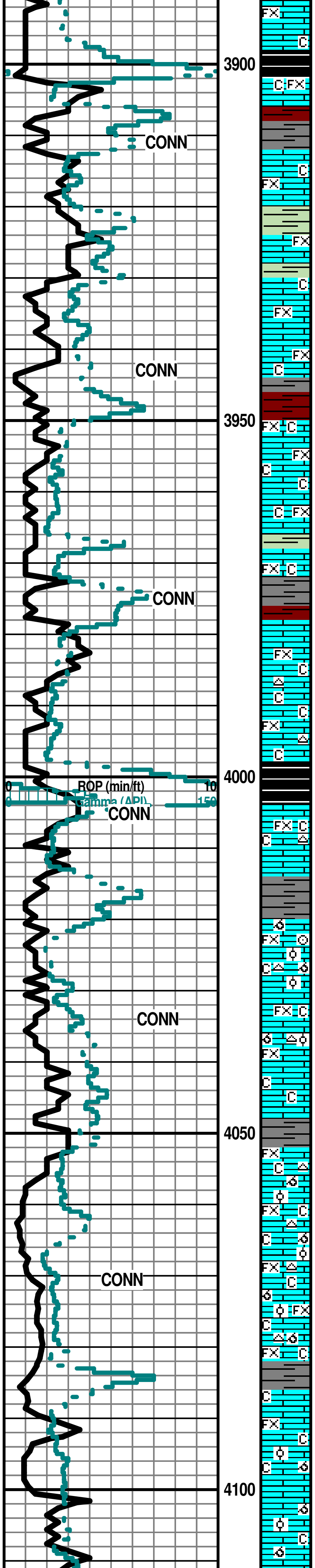
Ls Tan-Crm-Wht Fxln Fair Pin-Pt Ixln Por Grad Poor OOL/OOM Por (w/OOL in pl) Poor InterOOL/OOM Por Poor Develop Poor Leaching Cht Wht-Gry Op Shp Vit Chalk Wht Soft Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad Poor OOM Por Poor Develop Poor Leaching Cht Wht-Gry Op Shp Vit Chalk Inc Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Sh Char-Gry-Maroon Fissil Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad Poor OOM Por Poor Develop Poor Leaching Grad Dns Micrite Cht Wht- Gry Op Shp Vit Chalk Inc No Odor No Stn No Flor NS



Mudco Ck @ 3790' @ 7:45 AM 04/07/13
Vis 41;
WT= 8.9#
PV= 12;
YP= 10;
WL= 10.5;
Cake= 1;
Chl=6500;
Cal = 40;
Sol=5.4%.
LCM= 2#;
DMC=$ 1539.00
CMC= $9,508.95



Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad Poor OOL/OOM Por (w/OOL in pl) Poor InterOOL/OOM Por Poor Develop Poor Leaching Fos (Crin) Cht Wht-Gry Op Shp Vit Chalk Wht Soft Sh Blk Carb-Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad Dns Micrite Chalk Wht Soft Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad Dns Micrite Chalk Wht Soft Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad Dns Micrite Chalk Wht Soft Sh Char-Gry-Maroon Soft No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Mostly Dns Micrite Cht Wht-Gry Op Shp Vit Chalk Sh Char-Gry-Grn-Maroon-Red Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Mostly Dns Micrite Cht Wht-Gry Op Shp Vit Chalk Sh Char-Gry-Grn-Maroon-Red Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Mostly Dns Micrite Cht Wht-Gry Op Shp Vit Chalk V Abd Sh Char-Gry-Maroon-Red Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Mostly Dns Micrite Cht Wht-Gry Op Shp Vit Chalk V Abd Sh Char-Gry-Maroon-Red Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Mostly Dns Micrite Cht Wht-Gry Op Shp Vit Chalk V Abd Sh Char-Gry-Maroon-Red Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Mostly Dns Micrite Cht Wht-Gry Op Shp Vit Chalk V Abd Sh Char-Gry-Maroon-Red Soft-Fissil No Odor No Stn No Flor NS

Geologist on location @ (3990') 2:45 PM 4-7-13

Ls Wht-Crm Fxln Mostly Dns Micrite Cht Wht-Gry Op Shp Vit Chalk V Abd Sh Char-Gry-Maroon-Red Soft-Fissil No Odor No Stn No Flor NS

QUEEN HILL 3998' (- 1557)

Ls Wht-Crm Fxln Mostly Dns Micrite Cht Wht-Gry Op Shp Vit Chalk V Abd Sh Char-Gry-Maroon-Red Soft-Fissil No Odor No Stn No Flor NS

Sh Blk Carb-Char-Gry-Maroon Soft-Fissil Ls Wht- Crm Microxln Dns Micrite Fos (Crin) Cht Wht-Gry Op Shp Vit Chalk Wht Soft V Abd No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Poor OOL/OOM Por Poor Inter-OOL/OOM Por Poor Develop Poor Leaching Grad Dns Micrite Cht Wht-Gry Op Shp Vit Chalk Wht Soft V Abd Sh Blk Carb-Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm-Tan Fxln Poor OOL/OOM Por Poor Inter-OOL/OOM Por Poor Develop Poor Leaching Grad Dns Micrite Cht Wht-Gry Op Shp Vit Chalk Wht Soft V Abd Sh Blk Carb-Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Mostly Dns Micrite Poor OOL/OOM AA Cht AA Chalk AA V Abd Sh AA No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad OOL/OOM Por Poor Inter - OOL/OOM Por Poor Develop Poor Leaching Grad Dns Micrite Cht Wht Op Shp Vit Chalk Wht Soft Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

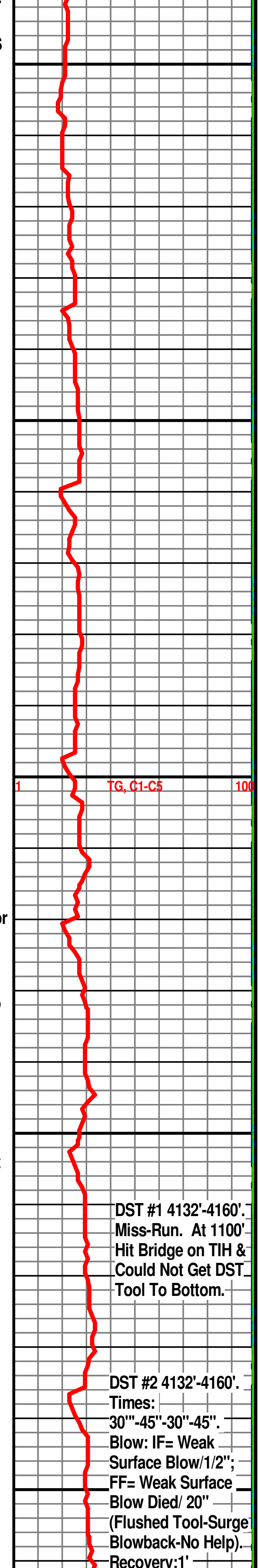
Ls Wht-Crm Fxln Poor OOL/OOM Por Poor Inter-OOL/OOM Por AA Poor Develop Poor Leaching Grad Dns Micrite Cht Wht Op Shp Vit Chalk Wht Soft V Abd Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair Pin-Pt Ixln Por Grad OOL/OOM Por Poor Inter - OOL/OOM Por Poor Develop Poor Leaching Grad Dns Micrite Cht Wht Op Shp Vit Chalk V Abd Wht Soft Sh Char-Gry-Grn-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Crm Fxln Poor Pin-Pt Ixln Por Grad Dns Micrite Chalk Wht Soft Abd Sh Char-Gry-Grn-Maroon Soft-Fissil No Odor No Stn No Flor NS

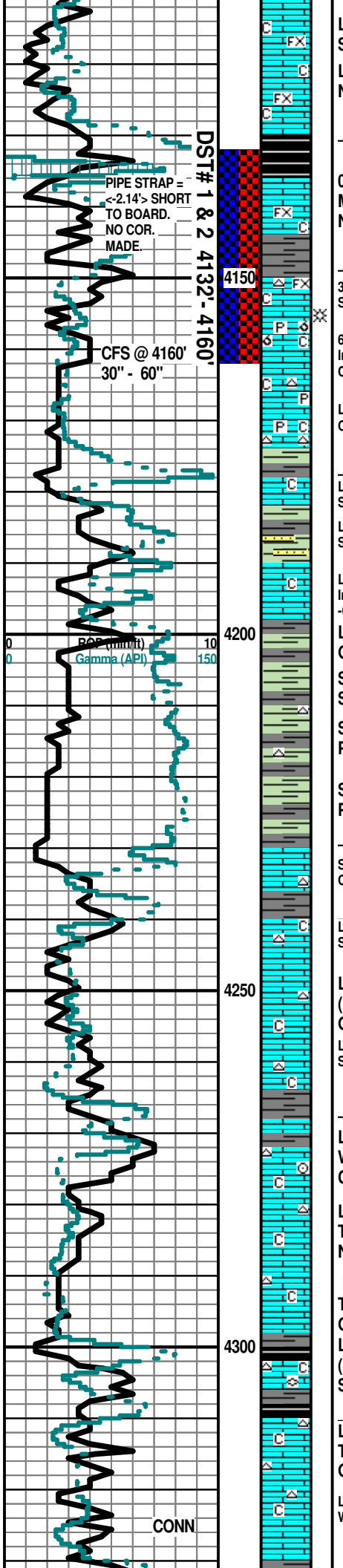
Ls Crm Fxln Poor Pin-Pt Ixln Por Grad Poor OOL/OOM Por Poor Inter- OOL/OOM Por Poor Develop Poor Leaching Grad Dns Micrite Chalk V Abd Wht Soft Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Crm Fxln Poor Pin-Pt Ixln Por Grad Dns Micrite Chalk V Abd Wht Soft Sh Blk Carb- Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS



DST #1 4132'-4160'. Miss-Run. At 1100' Hit Bridge on TIH & Could Not Get DST Tool To Bottom.

DST #2 4132'-4160'. Times: 30"'-45"-30"-45". Blow: IF= Weak Surface Blow/1/2"; FF= Weak Surface Blow Died/ 20" (Flushed Tool-Surge Blowback-No Help). Recovery:1'



Ls Crm-Tan-Wht Fxln Dns Micrite Grad Poor Ixln Pin-Pt Por Barren Cht Gry Op Shp Vit Chalk Wht Abd No Odor No Stn No Flor NS

Ls Crm-Tan-Wht Fxln Dns Micrite Grad Poor Ixln Pin-Pt Por Barren Chalk Wht Abd No Odor No Stn No Flor NS

HEEBNER 4130' (- 1689)

0" CFS @ 4160' Sh Blk Carb-Char-Gry-Maroon Fissil Ls Wht-Crm-Tan Fxln Dns Micrite Grad Poor Ixln Pin-Pt Por Barren Fos (Brach) Chalk Abd No Odor No Stn No Flor NS

TORONTO 4150' (- 1709)

30" CFS @ 4160' Ls Wht-Crm-Tan Fxln Dns Micrite Grad Poor Ixln Pin-Pt Por Barren Cht Wht-Gry Op Shp Vit Chalk Abd Sh Blk Carb -Char- Gry -Grn-Maroon Fissil No Odor No Stn No Flor NS

60" CFS @ 4160' Ls Wht-Crm-Tan Fxln Micrite Grad Poor Pin-Pt Ixln Por Grad Poor OOM Por (w/Pyr Inclus) Poor Leaching Poor Develop (w/SSG in 1 Pc w/2 Droplets SG Under Heat in Wtr) Pyr Mass Chalky Abd Sh AA No Stn Scat Tr Flor (Lt Grn) No Odor ? SSG

Ls Crm-Tan Fxln Poor-Fair Pin-Pt Ixln Por Grad Dns Micrite Cht Wht Op Shp Vit Chalk Wht Soft Sh Blk Carb-Char-Grn/Gry (w/Pyr Inclus)-Maroon Soft-Fissil No Odor No Stn No Flor NS

DOUGLAS 4178' (- 1737)

Ls Wht-Crm Fxln Poor-Fair Pin-Pt Ixln Por Grad Dns Micrite Cht Wht Op Shp Vit Fos (Brach) Chalk Wht Soft Sh Blk Carb-Char-Grn/Gry (w/Pyr Inclus)-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Poor-Fair Pin-Pt Ixln Por Grad Dns Micrite Cht Wht Op Shp Vit Fos (Brach) Chalk Wht Soft Sh Blk Carb-Char-Grn/Gry (w/Pyr Inclus)-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Poor-Fair Pin-Pt Ixln Por Grad Dns Micrite Qt Ss Crm Small FGrn Clusters (w/Pyr Inclus & CaCO3 Cmt Matrix Well Sort Well Rd Friable Pyr Mass Chalk Wht Soft Sh -Char-Grn/Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Poor-Fair Pin-Pt Ixln Por Grad Dns Micrite Chalk Wht Soft Sh Grn/Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Sh Char-Gry/Grn-Maroon Soft-Fissil Ls Crm-Tan-Gry Fxln Dns Micrite No Odor No Stn No Flor NS

Sh Char-Gry/Grn-Maroon Soft-Fissil Ls Crm-Tan Fxln Dns Micrite Grad Tr Poor Pin-Pt Ixln Por Cht Wht Op Shp Vit No Odor No Stn No Flor NS

Sh Char-Gry/Grn-Maroon Soft-Fissil Ls Crm-Tan Fxln Dns Micrite Grad Tr Poor Pin-Pt Ixln Por Cht Wht Op Shp Vit No Odor No Stn No Flor NS

IATAN 4230' (- 1789)

Sh Char-Gry/Grn-Maroon Soft-Fissil Ls Crm-Tan Fxln Dns Micrite Grad Tr Poor Pin-Pt Ixln Por Cht Wht Op Shp Vit No Odor No Stn No Flor NS

LANSING 4240' (- 1799)

Ls Wht-Crm-Tan Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Crm-Tan-Gry (Banded Wht) Op Shp Vit Chalk Wht Soft Sh Char- Grn/Gry -Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm-Tan Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Crm-Tan-Gry (Banded Wht) Op Shp Vit Chalk Wht Soft Sh Char- Grn/Gry- Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm-Tan Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Crm-Tan-Gry (Banded Wht) Op Shp Vit Chalk Wht Soft Sh Char-Grn/Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

LANSING "C" 4268' (- 1827)

Ls Wht-Crm-Tan Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Wht-Crm-Amber Translu-Op Shp Vit Fos (Crin) Chalk Wht Soft Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Wht -Amber Transl-Op Shp Vit Chalk Wht Soft Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

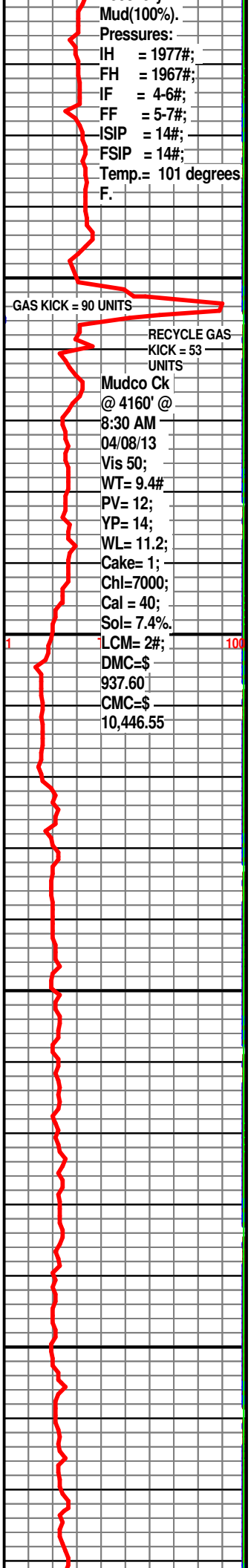
Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Amber- Gry Translu-Op Shp Vit Chalk Wht Soft Sh Char- Gry- Aqua Tr-Maroon Soft-Fissil No Odor No Stn No Flor NS

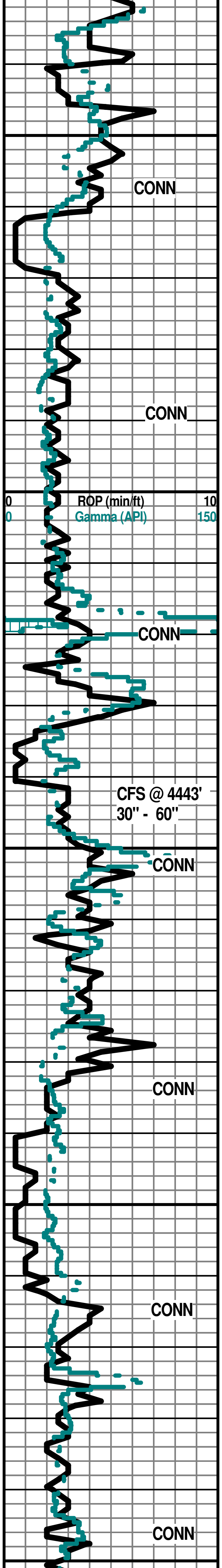
Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Amber-Gry (w/Fos (Fuss) Inclus) Translu-Op Shp Vit Chalk Wht Soft Sh Char-Grn/Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

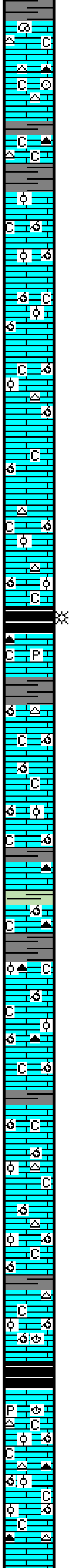
LANSING "D" 4310' (- 1869)

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Wht-Tan Translu-Op Shp Vit Chalk Wht Soft Sh Blk Carb-Char-Gry-Maroon Soft - Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Wht-Tan Translu-Op Shp Vit Chalk Wht Soft Sh Blk Carb-Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS







LANSING "E" 4334' (- 1893)

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite Cht Wht- Tan- Gry Translu- Op Shp Vit Fos (Gastro/Turritella) Chalk Wht Soft Sh Blk Carb- Char- Gry- Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite (w/Frac Por) Cht Amber Gry Translu-Op Shp Vit Fos (Crin) Chalk Wht Soft Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

LANSING "F" 4351' (- 1910)

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Dns Micrite (w/Frac Por) Cht Amber-Gry Translu-Op Shp Vit Chalk Wht Soft Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

LANSING "G" 4358' (- 1917)

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Poor-Fair OOL/OOM Por (w/OOL in Pl) Poor Develop Poor Leaching Chalk Wht V Abd Soft Sh Char-Gry-Maroon Soft - Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Poor-Fair OOL/OOM Por (w/OOL in Pl) Poor Develop Poor Leaching Grad Fair-Poor Pin-Pt Ixln Por Chalk Wht V Abd Soft Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair OOL/OOM Por (w/OOL in Pl) Poor Develop Poor Leaching Grad Fair-Poor Pin-Pt Ixln Por Dns Micrite Cht Amber Gry Translu-Op Shp Vit Chalk Wht V Abd Soft Sh Char-Gry-Maroon Soft-Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Dns Micrite Grad Tr OOM Por AA Chalk Wht Soft Sh Char-Gry-Maroon Soft - Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Poor-Fair OOL/OOM Por (w/OOL in Pl) Poor Develop Poor Leaching Cht Wht Op Shp Vit Fos (Fuss) Chalk Wht Soft Sh Char-Gry-Maroon Soft - Fissil No Odor No Stn No Flor NS

Ls Wht-Crm Fxln Fair-Poor Pin-Pt Ixln Por Grad Poor-Fair OOL/OOM Por (w/OOL in Pl) Poor Develop Poor Leaching Cht Wht Op Shp Vit Chalk Wht V Abd Soft Sh Char-Gry-Maroon Soft - Fissil No Odor No Stn No Flor NS

MUNCIE CREEK 4416' (- 1975)

30" CFS @ 4443' Sh Blk Carb Fissil Ls Crm-Tan-Wht Fxln Abd Good OOM Por (Tr OOL in pl) Good Develop Good Vug Leaching Grad Dns Micrite (w/Pyr Inclus) Barren Cht Wht-Drk Gry Translu-Op Shp Vit Chalky ? Min Flor No Odor No Stn NS

KANSAS CITY (DRUM) "H" 4431' (- 1990)

60: CFS @ 4443' Ls Crm-Tan-Wht Fxln Good OOM Por (Tr OOL in pl) Med-Good Develop Poor-Good Vug Leaching/Dissolu V Abd Grad Dns Micrite Chalky Barren Scat ? Min Flor (Lt Grn) No Odor No Stn NS

Ls Crm-Tan-Wht Fxln Good OOM Por (Tr OOL in pl) Med-Good Develop Poor-Good Vug Leaching/Dissolu V Abd Grad Dns Micrite Chalky Barren Scat ? Min Flor (Lt Grn) No Odor No Stn NS

Ls Crm-Tan-Wht Fxln Dns Micrite Barren Grad Tr/Good OOM Por AA Good Develop Good Vug Leaching Cht Gry-Amber Translu-Op Shp Vit Sh Gry-Grn-Char Fissil ? Min Flor No Odor No Stn NS

Ls Crm-Tan-Wht Fxln Dns Micrite Barren Grad Tr/Good OOM Por AA Good Develop Good Vug Leaching Cht Gry Op Shp Vit Sh Gry-Grn-Char Fissil ? Min Flor No Odor No Stn NS

KANSAS CITY (BLOCK) "I" 4466' (- 2025)

Ls Crm-Tan-Wht Fxln Dns Micrite Barren Grad Tr/Good OOM Por AA Good Develop Good Vug Leaching Cht Gry Op Shp Vit Sh Char-Gry-Grn Fissil ? Min Flor No Odor No Stn NS

Ls Crm-Tan-Wht Fxln Dns Micrite Barren Grad Tr/Good OOM Por AA Good Develop Good Vug Leaching Cht Gry Op Shp Vit Sh Char-Gry-Grn Fissil ? Min Flor No Odor No Stn NS

KANSAS CITY (DENNIS) "J" 4486' (- 2045)

Ls Tan-Crm-Wht Fxln Fair-Med OOM Por (Tr Med Ooids in pl w/ Tr Pyr Inclus) Fair-Med Develop Fair-Med Leaching (Tr Good Vug Leaching) Barren Cht Wht Op Shp Vit Chalk Abd Sh Blk Carb-Gry-Grn Soft-Fissil ? Min Flor No Odor No Stn NS

Ls Tan-Crm-Wht Fxln Fair-Med OOM Por (Tr Med Ooids in pl) Fair-Med Develop Fair-Med Leaching (Tr Good Vug Leaching) Barren Cht Wht Op Shp Vit Chalk Abd Sh Blk Carb-Gry-Grn Soft-Fissil ? Min Flor No Odor No Stn NS

Ls Tan-Crm-Wht Fxln Fair-Med OOM Por (Tr Med Ooids in pl) Fair-Med Develop Fair-Med Leaching (Tr Good Vug Leaching) Barren Cht Wht Op Shp Vit Chalk Abd Sh Blk Carb-Gry-Grn Soft-Fissil ? Min Flor No Odor No Stn NS

Ls Tan-Crm-Wht Fxln Fair-Med OOM Por (Tr Med Ooids in pl) Fair-Med Develop Fair-Med Leaching (Tr Good Vug Leaching) Barren Cht Wht Op Shp Vit Chalk Abd Sh Blk Carb-Gry-Grn Soft-Fissil ? Min Flor No Odor No Stn NS

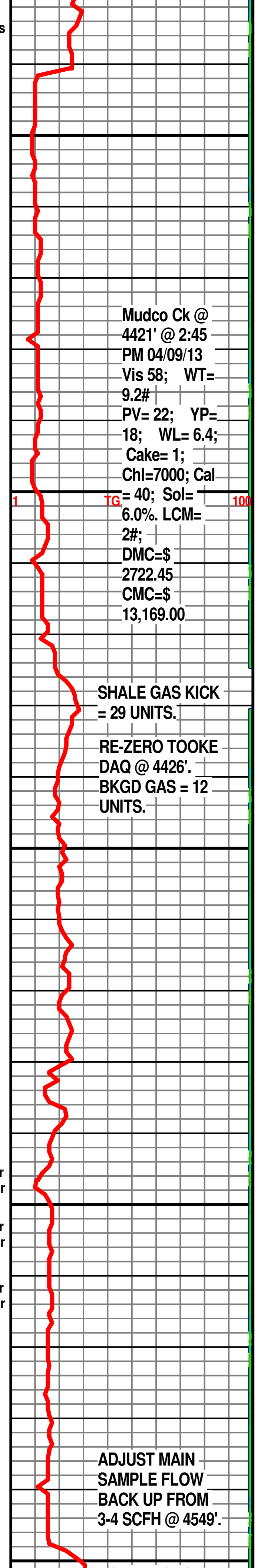
STARK SHALE 4523' (- 2082)

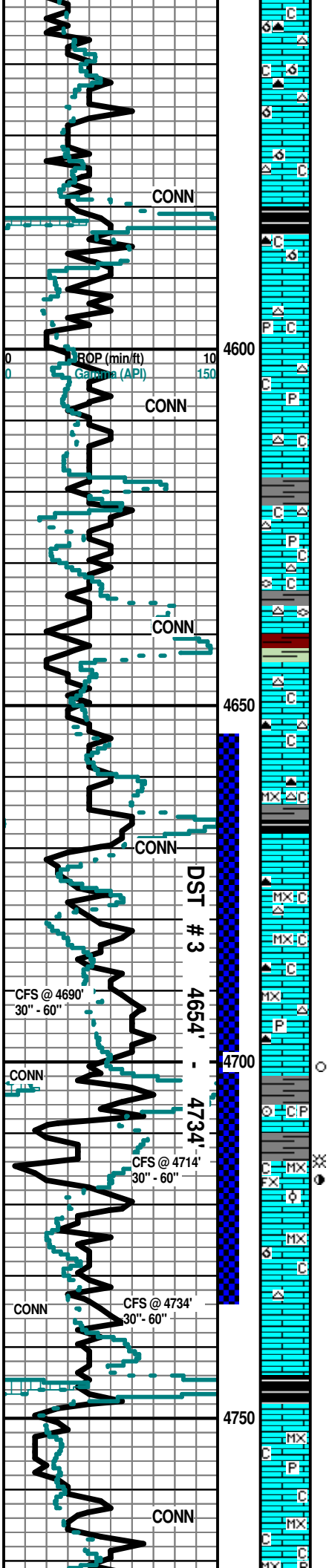
KANSAS CITY "SWOPE" (K) 4526' (- 2085)

Sh Blk Carb (w/Pyr Inclus)-Gry Fissil (w/SSG) Ls Ls Crm-Tan-Wht Fxln Fair OOM Por AA Cht AA Fos (Brach) Chalk Abd ? Min Flor No Odor No Stn NS

Ls Wht-Crm Fxln Poor-Good OOM Por (Tr Small-Med-Lg Ooids in pl) Poor-Good Develop Poor-Good Vug Leaching Cht Wht-Gry Translu-Op Shp Vit Chalky Sh Char-Gry Fissil ? Min Flor No Odor No Stn NS

Ls Wht-Crm Fxln Poor-Good OOM Por (Tr Small-Med-Lg Ooids in pl) Poor-Good Develop Poor-Good Vug Leaching Grad Dns Micrite (w/Pyr Inclus) Barren Cht Wht-Gry Translu-Op Shp Vit Chalky Sh Char-Grn/Gry Fissil ? Min Flor No Odor No Stn NS





Ls Wht-Crm Fxln Poor OOM Por Dec Poor Develop Poor Vug Leaching Tr Grad Dns Micrite Barren Cht Wht-Gry Translu-Op Shp Vit Chalky Sh Char-Gry Fissil ? Min Flor No Odor No Stn NS

Ls Wht-Crm Fxln Poor OOM Por Dec Poor Develop Poor Vug Leaching Tr Grad Dns Micrite Barren Cht Wht-Gry Translu-Op Shp Vit Inc Chalky Sh Char-Gry-Maroon Fissil ? Min Flor No Odor No Stn NS

_____ HUSHPUCKNEY SHALE 4580' (- 2139) _____

_____ KANSAS CITY "HERTHA" (L) 4583' (- 2142) _____

Ls Wht-Crm Fxln Dns Micrite Barren Grad Poor OOM Por Dec Tr Poor Develop Poor Vug Leaching Cht Wht-Gry Translu-Op Shp Vit Inc Chalky Sh Char-Gry-Maroon Fissil ? Min Flor No Odor No Stn NS

Ls Wht-Crm Fxln Dns Micrite Barren Cht Amber Translu Shp Vit Pyr Mass Sh Blk Carb-Gry-Char-Aqua Tr Fissil ? Min Flor No Odor No Stn NS

Ls Wht-Crm Fxln Dns Micrite Barren Cht Wht-Amber Translu Shp Vit Pyr Mass Sh Blk Carb-Gry-Char-Aqua Tr Fissil ? Min Flor No Odor No Stn NS

Ls Wht-Crm Fxln Dns Micrite Barren Cht Wht-Amber Translu Shp Vit Pyr Mass Sh Blk Carb-Gry-Char-Aqua Tr Fissil ? Min Flor No Odor No Stn NS

_____ BASE KANSAS CITY SHALE 4618' (- 2177) _____

Sh Char-Gry Fissil Ls Wht-Crm Fxln Dns Micrite Barren Cht Wht Op Shp Vit Chalky ? Min Flor No Odor No Stn NS

Ls Wht-Crm-Tan Fxln Dns Micrite Barren Cht Wht-Amber Translu Shp Vit Pyr Mass Chalky Sh Carb-Gry-Char-Aqua Tr Fissil ? Min Flor No Odor No Stn NS

Ls Wht-Crm-Tan Fxln Dns Micrite Barren Cht Wht Translu Shp Vit Chalky Sh Char-Maroon Fissil ? Min Flor No Odor No Stn NS

_____ MARMATON 4643' (- 2202) _____

Ls Wht-Crm-Tan Fxln Dns Micrite Barren Cht Wht-Amber Translu-Op Shp Vit Chalky Fos (Fuss) Sh Char-Gry Fissil ? Min Flor No Odor No Stn NS

Ls Wht-Crm-Tan-Gry Fxln Dns Micrite Barren Cht Wht Translu Shp Vit Chalky Inc Abd Sh Char-Maroon Fissil ? Min Flor No Odor No Stn NS

Ls Tan-Crm-Gry Fxln Dns Micrite Barren Cht Wht-Lt-Gry-Drk Gry Translu-Op Shp Vit Chalky Sh Char-Maroon Fissil ? Min Flor No Odor No Stn NS

Ls Tan-Crm-Gry Microxln Dns Micrite Barren Cht Wht-Lt-Gry-Drk Gry Translu Op Shp Vit Chalky Sh Char Fissil ? Min Flor No Odor No Stn NS

_____ ALTAMONT "A" 4678' (- 2237) _____

Ls Tan-Crm-Gry Fxln Dns Micrite Barren Cht Wht-Lt-Gry-Drk Gry Translu Op Shp Vit Chalky Sh Char Fissil ? Min Flor No Odor No Stn NS

30" CFS @ 4690' Ls Tan-Crm-Gry Microxln Dns Micrite Barren Grad Fxln Fair Ixln Vug Leached Por Barren Chalk Pyr Mass Sh Char- Gry- Grn -Red Soft-Fissil ? Min Flor No Stn No Odor NS

60" CFS @ 4690' Ls Tan-Crm-Gry Microxln Dns Micrite Barren Grad Fxln Fair Ixln Por Barren Cht Drk-Gry Translu-Op Shp Vit Chalk Sh Char- Gry- Grn -Red Soft-Fissil ? Min Flor No Stn No Odor NS

Ls Gry-Tan-Crm Microxln Dns Micrite Barren Grad Fxln Poor Ixln Por Barren Cht Lt Gry-Drk-Gry Translu-Op Shp Vit Pyr Mass Chalk Sh Char- Gry Soft-Fissil ? Min Flor No Stn No Odor NS

30" CFS @ 4714' Ls Tan-Crm Microxln Dns Micrite Barren Grad Fxln Fair Ixln Por Barren Chalk V Abd Fos (Crin) Sh Char-Gry (w/Pyr Inclus) Maroon Soft-Fissil ? Min Flor (Lt Grn) No Stn Faint Odor NS

_____ ALTAMONT "B" 4708' (- 2267) _____

60" CFS @ 4714' Ls Wht-Tan-Crm Microxln Dns Micrite Barren Grad Fxln Fair Ixln Por Barren Grad Fair OOM Por (1 Pc) Poor-Fair Leaching w/Vug Por Barren Chalk Abd Fos (Crin) Sh Blk Carb-Char-Gry AA ? Min Flor (Lt Grn) No Stn No Odor NS

_____ ALTAMONT "C" 4718' (- 2277) _____

Ls Tan-Crm Microxln-Fxln Fair Pin-Pt "Salt & Pepper" Ixln Por (w/SG & SFO in Wtr Under Heat) Pt Friable (w/Gillsonitic Blk Stn (12 Pcs)) Tr Fair Ixln Vug Por Grad Poor OOL Por (w/Small OOids in pl) Poor-Fair Dissolu Poor Leaching Sh AA No Odor Sli Tr Scat Flor (Lt Grn) (Gas & Oil Do Not Flor) Scatt Lt Brn Stn SG & SFO

30" CFS @ 4734' Ls Wht-Tan-Crm Microxln Dns Micrite Barren Grad Fair OOM Por (4 Pcs) Poor-Fair Leaching Por Poor Develop Barren Cht Wht-Amber Translu-Op Shp Vit Chalk Sh Char-Gry AA ? Min Flor (Lt Grn) No Stn ? Faint Odor NS

60" CFS @ 4734' Ls AA Microxln Dns Micrite Grad Fair OOM Por AA Poor Leaching Poor Develop Barren Cht Wht-Amber AA Chalk AA Sh Char-Gry AA ? Min Flor (Lt Grn) No Stn No Odor NS

_____ PAWNEE 4748' (- 2307) _____

Ls Wht-Crm-Tan Microxln Dns Micrite Grad Fair OOM Por Poor Leaching Poor Develop Barren Chalk Sh Blk Carb-Char-Gry-Maroon Fissil ? Min Flor (Lt Grn) No Stn No Odor NS

Ls Wht-Crm-Tan Microxln Dns Micrite Grad Fair OOM Por (w/Med OOids in pl) Poor - Fair Leaching Poor-Fair Develop Barren Chalk Abd Pyr Mass Sh Blk Carb - Char - Gry-Maroon Fissil ? Min Flor (Lt Grn) No Stn No Odor NS

Ls Wht-Crm-Tan Microxln Dns Micrite Barren Chalk V Abd Sh Blk Carb- Char- Gry (w/Pyr Inclus) Fissil ? Min Flor (Lt Grn) No Stn No Odor NS

SHALE GAS KICK= 36 UNITS.

BKGD GAS = 30 UNITS.

SHALE GAS KICK= 36 UNITS.

Mudco Ck @ 4690' @ 6:50 AM 04/10/13 Vis 53; WT= 9.35# PV= 15; YP= 15; WL= 9.2; Cake= 1; Chl= 5300; Cal = 20; Sol= 6.8%. LCM= 4#; DMC=$ 1611.30 CMC=$ 14,780.30

RE-ZERO TOOKE DAQ 2 4650'. BKGD GAS SET @ 12 UNITS.

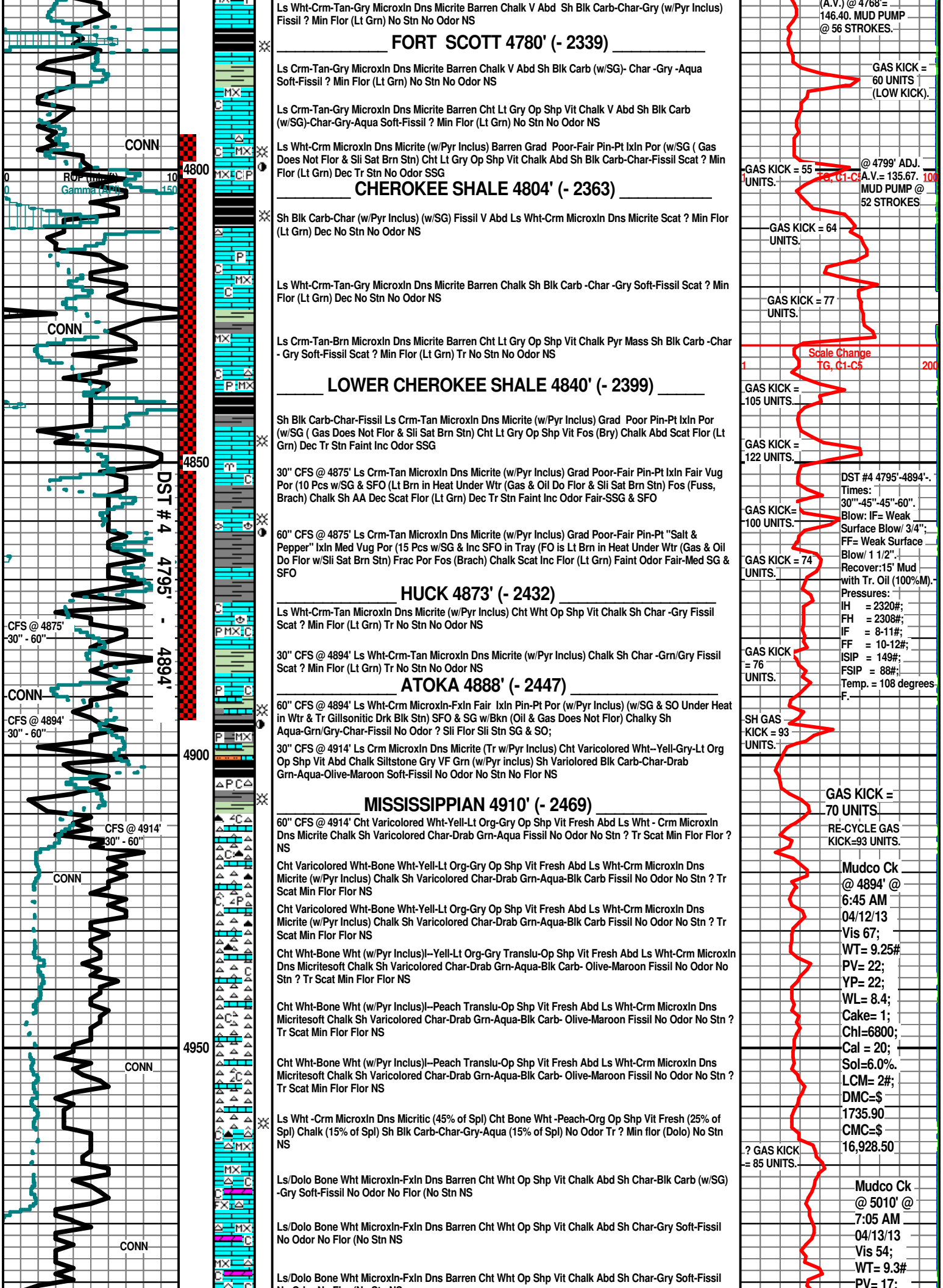
ADJUST MAIN SAMPLE FLOW BACK UP FROM 5-4 SCFH @ 4650'.

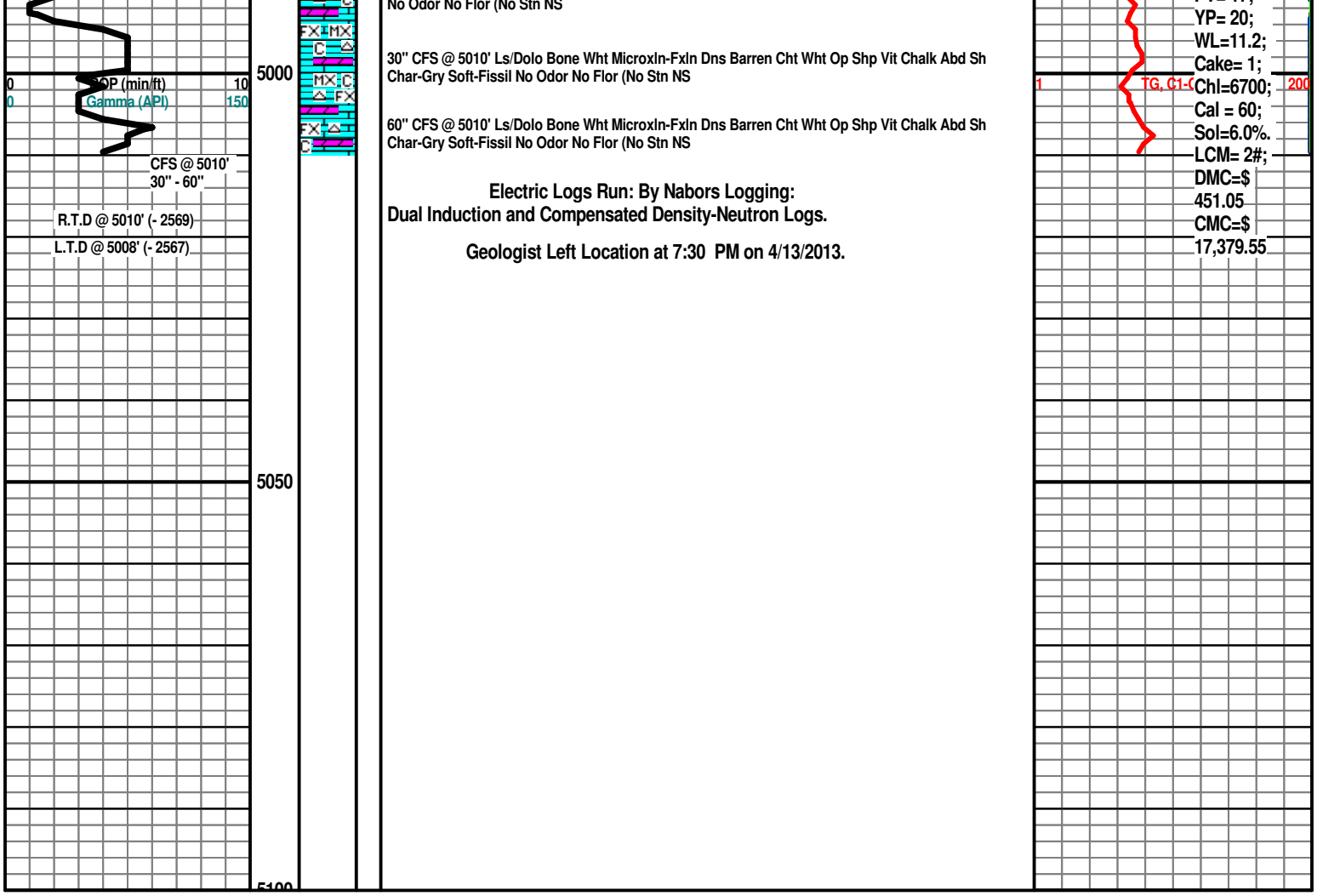
EARTHTECH ADJUST ANTIBOUNCE @ 60. Ck C1-C4 SETTINGS TookeDaq is Working but Is Not Recording Chromatograph Data.

Mudco Ck @ 4734' @ 6:50 AM 04/11/13 Vis 76; WT= 9.35# PV= 23; YP= 22; WL= 8.8; Cake= 1; Chl= 6800; Cal = 20; Sol= 6.7%. LCM= 3.5#; DMC=$ 412.30 CMC=$ 15,192.60

DST #3 4654'-4734-. Times: 30"'-45"'-45"'-60". Blow: IF= Weak Surface Blow/3/4"";. FF= Weak Surface Blow . Recovery:10' Mud (100%). Pressures: IH = 2234#; FH = 2229#; IF = 9-10#; FF = 11-11#; ISIP = 39#; FSIP = 27#; Temp.= 108 degrees F.

RE-ZERO TOOKEDAQ @ 4765'. BKGD GAS SET = 12 UNITS. ADJ. ANNULAR VELOCITY


CONN
4800
ROP (min/ft)
0
10
Gamma (API)
150
CONN
4850
DST # 4 4795' - 4894'
CFS @ 4875'
30" - 60"
CONN
CFS @ 4894'
30" - 60"
4900
CFS @ 4914'
30" - 60"
CONN
4950
CONN
CONN
Ls Wht-Crm-Tan-Gry MicroxIn Dns Micrite Barren Chalk V Abd Sh Blk Carb-Char-Gry (w/Pyr Inclus) Fissil ? Min Flor (Lt Grn) No Stn No Odor NS
FORT SCOTT 4780' (- 2339)
Ls Crm-Tan-Gry MicroxIn Dns Micrite Barren Chalk V Abd Sh Blk Carb (w/SG)- Char -Gry -Aqua Soft-Fissil ? Min Flor (Lt Grn) No Stn No Odor NS
Ls Crm-Tan-Gry MicroxIn Dns Micrite Barren Cht Lt Gry Op Shp Vit Chalk V Abd Sh Blk Carb (w/SG)-Char-Gry-Aqua Soft-Fissil ? Min Flor (Lt Grn) No Stn No Odor NS
Ls Wht-Crm MicroxIn Dns Micrite (w/Pyr Inclus) Barren Grad Poor-Fair Pin-Pt IxIn Por (w/SG (Gas Does Not Flor & Sli Sat Brn Stn) Cht Lt Gry Op Shp Vit Chalk Abd Sh Blk Carb-Char-Fissil Scat ? Min Flor (Lt Grn) Dec Tr Stn No Odor SSG
CHEROKEE SHALE 4804' (- 2363)
Sh Blk Carb-Char (w/Pyr Inclus) (w/SG) Fissil V Abd Ls Wht-Crm MicroxIn Dns Micrite Scat ? Min Flor (Lt Grn) Dec No Stn No Odor NS
Ls Wht-Crm-Tan-Gry MicroxIn Dns Micrite Barren Chalk Sh Blk Carb -Char -Gry Soft-Fissil Scat ? Min Flor (Lt Grn) Dec No Stn No Odor NS
Ls Crm-Tan-Brn MicroxIn Dns Micrite Barren Cht Lt Gry Op Shp Vit Chalk Pyr Mass Sh Blk Carb -Char - Gry Soft-Fissil Scat ? Min Flor (Lt Grn) Tr No Stn No Odor NS
LOWER CHEROKEE SHALE 4840' (- 2399)
Sh Blk Carb-Char-Fissil Ls Crm-Tan MicroxIn Dns Micrite (w/Pyr Inclus) Grad Poor Pin-Pt IxIn Por (w/SG (Gas Does Not Flor & Sli Sat Brn Stn) Cht Lt Gry Op Shp Vit Fos (Bry) Chalk Abd Scat Flor (Lt Grn) Dec Tr Stn Faint Inc Odor SSG
30" CFS @ 4875' Ls Crm-Tan MicroxIn Dns Micrite (w/Pyr Inclus) Grad Poor-Fair Pin-Pt IxIn Fair Vug Por (10 Pcs w/SG & SFO (Lt Brn in Heat Under Wtr (Gas & Oil Do Flor & Sli Sat Brn Stn) Fos (Fuss, Brach) Chalk Sh AA Dec Scat Flor (Lt Grn) Dec Tr Stn Faint Inc Odor Fair-SSG & SFO
60" CFS @ 4875' Ls Crm-Tan MicroxIn Dns Micrite (w/Pyr Inclus) Grad Poor-Fair Pin-Pt "Salt & Pepper" IxIn Med Vug Por (15 Pcs w/SG & Inc SFO in Tray (FO is Lt Brn in Heat Under Wtr (Gas & Oil Do Flor w/Sli Sat Brn Stn) Frac Por Fos (Brach) Chalk Scat Inc Flor (Lt Grn) Faint Odor Fair-Med SG & SFO
HUCK 4873' (- 2432)
Ls Wht-Crm-Tan MicroxIn Dns Micrite (w/Pyr Inclus) Cht Wht Op Shp Vit Chalk Sh Char -Gry Fissil Scat ? Min Flor (Lt Grn) Tr No Stn No Odor NS
30" CFS @ 4894' Ls Wht-Crm-Tan MicroxIn Dns Micrite (w/Pyr Inclus) Chalk Sh Char -Grn/Gry Fissil Scat ? Min Flor (Lt Grn) Tr No Stn No Odor NS
ATOKA 4888' (- 2447)
60" CFS @ 4894' Ls Wht-Crm MicroxIn-FxIn Fair IxIn Pin-Pt Por (w/Pyr Inclus) (w/SG & SO Under Heat in Wtr & Tr Gillsonitic Drk Blk Stn) SFO & SG w/Bkn (Oil & Gas Does Not Flor) Chalky Sh Aqua-Grn/Gry-Char-Fissil No Odor ? Sli Flor Sli Stn SG & SO;
30" CFS @ 4914' Ls Crm MicroxIn Dns Micrite (Tr w/Pyr Inclus) Cht Varicolored Wht--Yell-Gry-Lt Org Op Shp Vit Abd Chalk Siltstone Gry VF Grn (w/Pyr inclus) Sh Variolored Blk Carb-Char-Drab Grn-Aqua-Olive-Maroon Soft-Fissil No Odor No Stn No Flor NS
MISSISSIPPIAN 4910' (- 2469)
60" CFS @ 4914' Cht Varicolored Wht-Yell-Lt Org-Gry Op Shp Vit Fresh Abd Ls Wht - Crm MicroxIn Dns Micrite Chalk Sh Varicolored Char-Drab Grn-Aqua Fissil No Odor No Stn ? Tr Scat Min Flor Flor ? NS
Cht Varicolored Wht-Bone Wht-Yell-Lt Org-Gry Op Shp Vit Fresh Abd Ls Wht-Crm MicroxIn Dns Micrite (w/Pyr Inclus) Chalk Sh Varicolored Char-Drab Grn-Aqua-Blk Carb Fissil No Odor No Stn ? Tr Scat Min Flor Flor NS
Cht Varicolored Wht-Bone Wht-Yell-Lt Org-Gry Op Shp Vit Fresh Abd Ls Wht-Crm MicroxIn Dns Micrite (w/Pyr Inclus) Chalk Sh Varicolored Char-Drab Grn-Aqua-Blk Carb Fissil No Odor No Stn ? Tr Scat Min Flor Flor NS
Cht Wht-Bone Wht (w/Pyr Inclus)l--Yell-Lt Org-Gry Translu-Op Shp Vit Fresh Abd Ls Wht-Crm MicroxIn Dns Micritesoft Chalk Sh Varicolored Char-Drab Grn-Aqua-Blk Carb- Olive-Maroon Fissil No Odor No Stn ? Tr Scat Min Flor Flor NS
Cht Wht-Bone Wht (w/Pyr Inclus)l--Peach Translu-Op Shp Vit Fresh Abd Ls Wht-Crm MicroxIn Dns Micritesoft Chalk Sh Varicolored Char-Drab Grn-Aqua-Blk Carb- Olive-Maroon Fissil No Odor No Stn ? Tr Scat Min Flor Flor NS
Cht Wht-Bone Wht (w/Pyr Inclus)l--Peach Translu-Op Shp Vit Fresh Abd Ls Wht-Crm MicroxIn Dns Micritesoft Chalk Sh Varicolored Char-Drab Grn-Aqua-Blk Carb- Olive-Maroon Fissil No Odor No Stn ? Tr Scat Min Flor Flor NS
Ls Wht -Crm MicroxIn Dns Micritic (45% of Spl) Cht Bone Wht -Peach-Org Op Shp Vit Fresh (25% of Spl) Chalk (15% of Spl) Sh Blk Carb-Char-Gry-Aqua (15% of Spl) No Odor Tr ? Min flor (Dolo) No Stn NS
Ls/Dolo Bone Wht MicroxIn-FxIn Dns Barren Cht Wht Op Shp Vit Chalk Abd Sh Char-Blk Carb (w/SG) -Gry Soft-Fissil No Odor No Flor (No Stn NS
Ls/Dolo Bone Wht MicroxIn-FxIn Dns Barren Cht Wht Op Shp Vit Chalk Abd Sh Char-Gry Soft-Fissil No Odor No Flor (No Stn NS
Ls/Dolo Bone Wht MicroxIn-FxIn Dns Barren Cht Wht Op Shp Vit Chalk Abd Sh Char-Gry Soft-Fissil
(A.V.) @ 4768'= 146.40. MUD PUMP @ 56 STROKES.
GAS KICK = 60 UNITS (LOW KICK).
GAS KICK = 55 UNITS.
1
TG, C1-C5
100
@ 4799' ADJ. A.V.= 135.67. MUD PUMP @ 52 STROKES
GAS KICK = 64 UNITS.
GAS KICK = 77 UNITS.
Scale Change
1
TG, C1-C5
200
GAS KICK = 105 UNITS.
GAS KICK = 122 UNITS.
DST #4 4795'-4894'-. Times: 30"'-45"-45"-60". Blow: IF= Weak Surface Blow/ 3/4"; FF= Weak Surface Blow/ 1 1/2". Recover:15' Mud with Tr. Oil (100%M). Pressures: IH = 2320#; FH = 2308#; IF = 8-11#; FF = 10-12#; ISIP = 149#; FSIP = 88#; Temp. = 108 degrees F.
GAS KICK= 100 UNITS.
GAS KICK = 74 UNITS.
GAS KICK = 76 UNITS.
SH GAS KICK = 93 UNITS.
GAS KICK = 70 UNITS.
RE-CYCLE GAS KICK=93 UNITS.
Mudco Ck @ 4894' @ 6:45 AM 04/12/13 Vis 67; WT= 9.25# PV= 22; YP= 22; WL= 8.4; Cake= 1; Chl=6800; Cal = 20; Sol=6.0%. LCM= 2#; DMC=$ 1735.90 CMC=$ 16,928.50
? GAS KICK = 85 UNITS.
Mudco Ck @ 5010' @ 7:05 AM 04/13/13 Vis 54; WT= 9.3# PV= 17;


0
ROP (min/ft)
10
0
Gamma (API)
150
CFS @ 5010'
30" - 60"
R.T.D @ 5010' (- 2569)
L.T.D @ 5008' (- 2567)
5000
5050
5100
No Odor No Flor (No Stn NS
30" CFS @ 5010' Ls/Dolo Bone Wht Microxln-Fxln Dns Barren Cht Wht Op Shp Vit Chalk Abd Sh Char-Gry Soft-Fissil No Odor No Flor (No Stn NS
60" CFS @ 5010' Ls/Dolo Bone Wht Microxln-Fxln Dns Barren Cht Wht Op Shp Vit Chalk Abd Sh Char-Gry Soft-Fissil No Odor No Flor (No Stn NS
Electric Logs Run: By Nabors Logging:
Dual Induction and Compensated Density-Neutron Logs.
Geologist Left Location at 7:30 PM on 4/13/2013.
1
TG, C1-C
200
YP= 20;
WL=11.2;
Cake= 1;
Chl=6700;
Cal = 60;
Sol=6.0%.
LCM= 2#;
DMC=$
451.05
CMC=$
17,379.55