



# EMPIRICA

*The Surface Logging Company*

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Greengroup 14A SWD

**Location** Sec 14, T27S, R12W

**State** Kansas

**County** Pratt

**Country** United States

**Rig Number** Duke 10

**API Number** 15-151-22421

**AFE #** 131880

**Region** Gulf

**Spud Date** 10-26-2013

**Drilling Completed** 11/13/2013

**Surface Coordinates** 156' FNL & 2338' FWL of Sec 14, T27s, R12W

**Ground Elevation** 1861

**K.B. Elevation** 10

**Logged Interval** 430 To 5331

**Total Depth** 5331

**Formation** Arbuckle

**Type of Drilling Fluid** Water Based

## Operator

**Company** Seneca Resources Corp.

**Address** McCandless Corporate Center  
5800 Corporate Drive, Suite 300  
Pittsburgh, PA 15237

## Geologist

**Name** Paul Campbell/ Dan Dage/ Sam Morris

**Company** Empirica Surface Logging

**Address** 609 Westland Drive  
Edmond, OK 73013

## Other

Product Description                      Regular 2 Man Logging Service  
 Logging Began: 10-25-2013  
 Released: 11-13-2013

Equipment                                      M Logger: #321  
 Powerware: Geofield #224

Calibration                                    Standard Calibration for Redbox  
 Total Gas & Chromatograph

## Core Information

**Contractor** Intertek Westport Labs

**Core #** 1

**Formation** Hushpuckney through the Mississippian

**Core Intervals**

From	To	Cut	Recovered
4120.0	4175.0	55.0	55.0
4176.0	4197.0	21.0	21.0
4197.0	4204.0	7.0	7.0
4204.0	4231.0	27.0	26.0
4231.0	4235.0	4.0	3.0

**Bit Type** Corel CP 613

**Size** 8.75"

**Coring Time** 8.56 Hrs

## Rock Types

<ul style="list-style-type: none"> <li> UNKNOWN</li> <li> ANHYDRITE</li> <li> GYPSUM</li> <li> SALT</li> <li> SIDERITE or LIMONITE</li> <li> LIMESTONE</li> </ul>	<ul style="list-style-type: none"> <li> DOLOMITE</li> <li> CHERT</li> <li> COAL</li> <li> MARLSTONE</li> <li> CLAYSTONE</li> <li> SHALE</li> </ul>	<ul style="list-style-type: none"> <li> SHALE GRAY</li> <li> SHALE COLORED</li> <li> SILTSTONE</li> <li> SANDSTONE</li> <li> CONGLOMERATE</li> <li> BRECCIA</li> </ul>	<ul style="list-style-type: none"> <li> TILL</li> <li> BENTONITE</li> <li> TUFF</li> <li> IGNEOUS</li> <li> METAMORPHIC</li> </ul>
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## Accessories

### Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHIOIID
- BRYOZOA
- CEPHALOPOD
- CORAL
- CRINOID
- F FOSSIL
- GASTROPOD
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET
- PISOLITE
- PLANT REMAINS
- PLANT SPORES
- SCAPHOPOD
- STROMATOPOROOID

- ARGILLACEOUS
- ARGILLITE GRAIN
- B BENTONITE
- BITUMINOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- CHTLT
- COAL - THIN BEDS
- DOLOMITIC
- GLAUCONITE
- GYPSIFEROUS
- HEAVY MINERAL
- K KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- P PYRITE
- SALT CAST
- SANDY

### Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSUM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (CALC) STRG
- MARLSTONE (DOL) STRG
- SANDSTONE STRINGER

- 👁 ECHINOID
- 🐟 FISH
- 🪨 FORAMINIFERA

## Minerals

- 👁 ANHYDRITIC

- + FELDSPAR
- FERRUGINOUS PELLETT
- 👁 FERRUGINOUS

- 👁 SILICEOUS
- 👁 SILTY
- 👁 TUFFACEOUS

- SHALE STRINGER
- 👁 SILTSTONE STRINGER

## Other Symbols

### Oil Show

- 👁 DEAD
- EVEN
- 👁 QUESTIONABLE
- 👁 SPOTTED STAINING

### Porosity

- 👁 EARTHY
- 👁 FENESTRAL
- 👁 FRACTURE
- 👁 INTERCRYSTALLINE
- 👁 INTEROOLITIC

- 👁 MOLDIC
- 👁 ORGANIC
- 👁 PINPOINT
- 👁 VUGGY

### Engineering

- 👁 BIT
- 👁 CONNECTION (LEFT)
- 👁 CONNECTION (RIGHT)
- 👁 CONNECTION GAS
- 👁 CORE - LOST
- 👁 CORE - RECOVERED
- 👁 DST INTERVAL

- 👁 FAULT
- 👁 FORMATION TOP
- 👁 GAS SHOW
- 👁 MN DEPTH
- 👁 NORMAL FAULT
- 👁 OIL SHOW
- 👁 OVERTURNED STRATA
- 👁 REVERSE FAULT
- 👁 SIDEWALL CORE (LEFT)
- 👁 SIDEWALL CORE (RIGHT)
- 👁 SLIDE
- 👁 SURVEY
- 👁 TRIP GAS

- 👁 WIRELINE TESTED - LEFT
- 👁 WIRELINE TESTED - RT

### Rounding

- 👁 ANGULAR
- 👁 ROUNDED
- 👁 SUBANG
- 👁 SUBRND

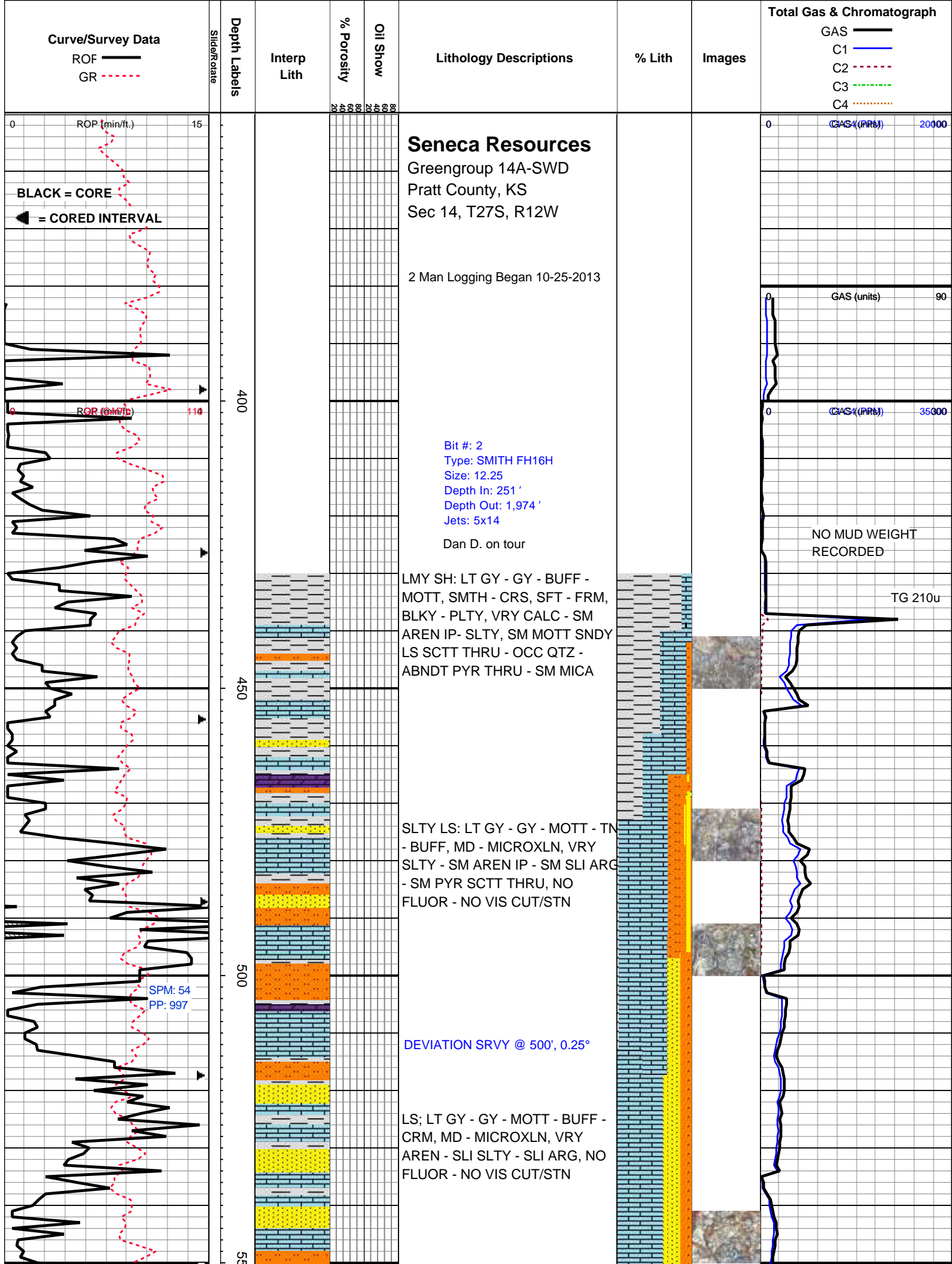
### Textures

- 👁 BOUNDSTONE
- 👁 CHALKY
- 👁 CRYPTOXLN

- 👁 EARTHY
- 👁 FINELYXLN
- 👁 GRAINSTONE
- 👁 LITHOGRAPHIC
- 👁 MICROXLN
- 👁 MUDSTONE
- 👁 PACKSTONE
- 👁 WACKESTONE

### Sorting

- 👁 MODERATE
- 👁 POOR
- 👁 WELL



**Curve/Survey Data**

ROF ———  
GR - - - - -

Slide/Rate

Depth Labels

Interp Lith

% Porosity

Oil Show

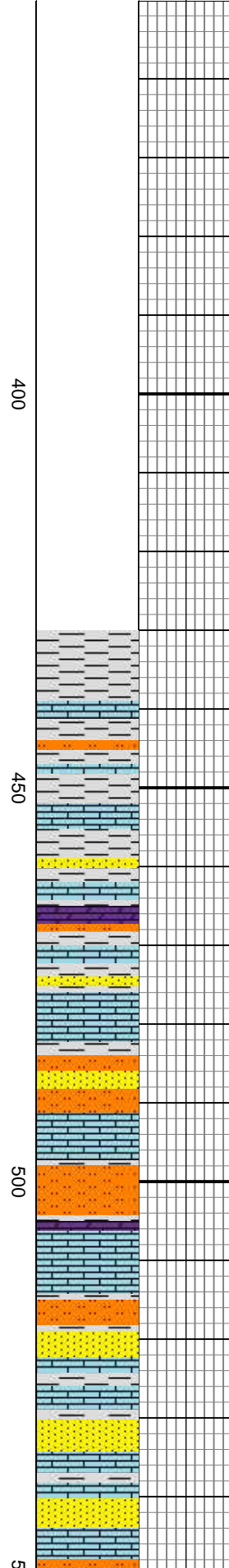
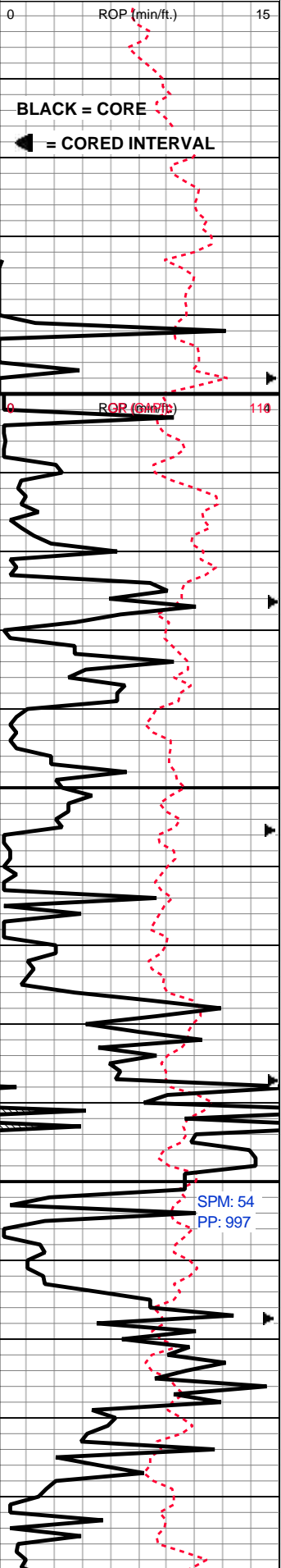
Lithology Descriptions

% Lith

Images

**Total Gas & Chromatograph**

GAS ———  
C1 ———  
C2 - - - - -  
C3 - · - · -  
C4 · · · · ·



**Seneca Resources**  
Greengroup 14A-SWD  
Pratt County, KS  
Sec 14, T27S, R12W

2 Man Logging Began 10-25-2013

Bit #: 2  
Type: SMITH FH16H  
Size: 12.25  
Depth In: 251'  
Depth Out: 1,974'  
Jets: 5x14

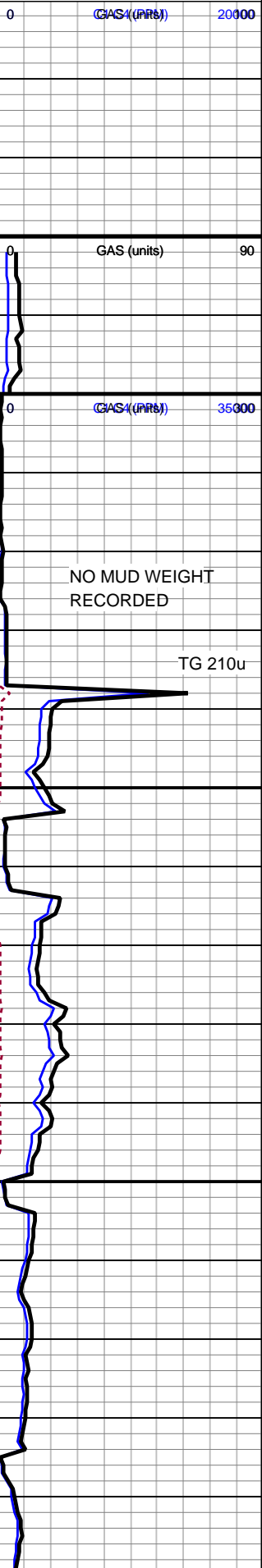
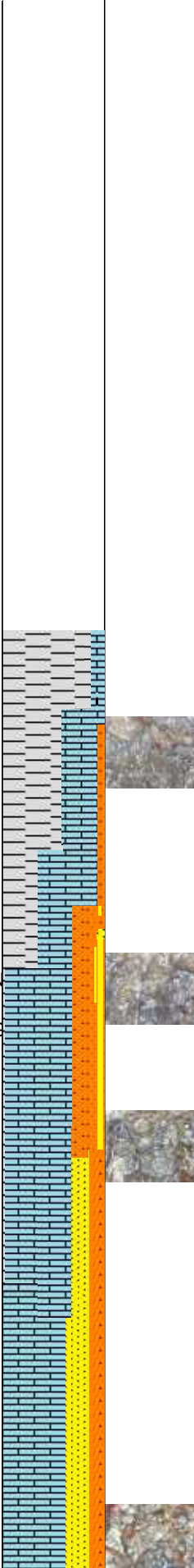
Dan D. on tour

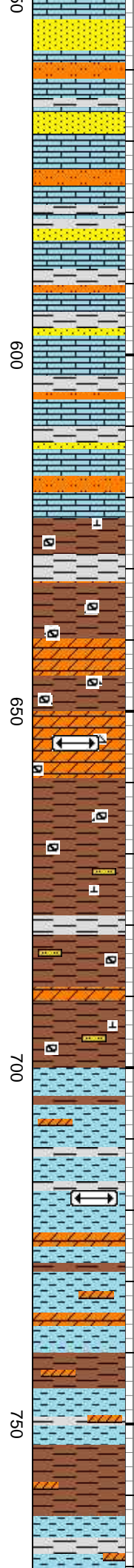
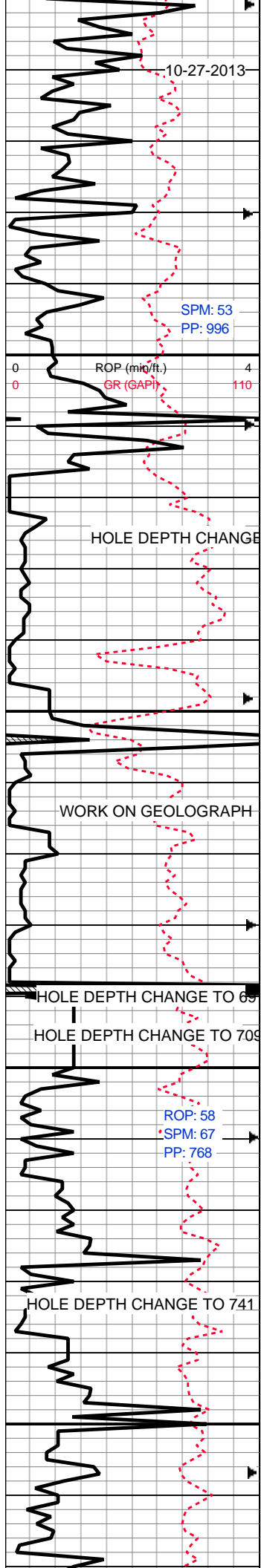
LMY SH: LT GY - GY - BUFF - MOTT, SMTH - CRS, SFT - FRM, BLKY - PLTY, VRY CALC - SM AREN IP- SLTY, SM MOTT SNDY LS SCTT THRU - OCC QTZ - ABNDT PYR THRU - SM MICA

SLTY LS: LT GY - GY - MOTT - TN - BUFF, MD - MICROXLN, VRY SLTY - SM AREN IP - SM SLI ARG - SM PYR SCTT THRU, NO FLUOR - NO VIS CUT/STN

DEVIATION SRVY @ 500', 0.25°

LS; LT GY - GY - MOTT - BUFF - CRM, MD - MICROXLN, VRY AREN - SLI SLTY - SLI ARG, NO FLUOR - NO VIS CUT/STN





LS: LT GY - GY - MOTT - BUFF - TN - CRM, MD - MICROXLN, SM AREN IP - SM SLI SLTY IP - SM SLI ARG IP - OCC DOL SM RD SH SCTT THRU, NO FLUOR - NO VIS CUT/STN

LS: LT GY - GY - MOTT - BUFF - TN - CRM, MD - MICROXLN, SM AREN IP - SM SLI SLTY IP - SM SLI ARG IP - OCC DOL SM RD SH SCTT THRU, NO FLUOR - NO VIS CUT/STN

PAUL C. ON TOUR

**STONE CORRAL @ 640' MD**

SH: RED-TAN, GY, SFT, RTHY LSTR, SM TXT, PLTY-AMOR, ARG; ANHY: FRM-HD, OFF WHI-TRNSL, OCC FIB XLS; CHT PBLES, LT YL-TRSNL, OPQ, V HD, W RNDD; TRC CAL XLS

SH: RED-TAN, GY, SFT, RTHY LSTR, SM TXT, PLTY-AMOR, ARG; ANHY: SFT-FRM, OFF WHI-TRNSL, OCC FIB XLS; TRC CHT PBLES, LT YL-TRSNL, OPQ, V HD, SB RNDD, TRC SLTS

**NINNESCAH SHALE @ 700' MD**

CLY: LT GY-BL, V SFT, WXY LSTR, SM TXT, SL WTR SNS; SH: RED-TAN, GY, SFT, RTHY LSTR, SM TXT, PLTY-AMOR, ARG; ANHY: SFT-FRM, OFF WHI-TRNSL, OCC FIB XLS; TRC CONGL STRNGS

CLY: LT GY-BL, V SFT, WXY LSTR, SM TXT, SL WTR SNS; SH: PRED LT RED-TAN, GY, SFT, RTHY LSTR, SM TXT, PLTY-AMOR, ARG; TRC ANHY: SFT-FRM, OFF WHI-TRNSL, OCC FIB XLS

GAS (units) 300  
C1-C4 (PPM) 35000

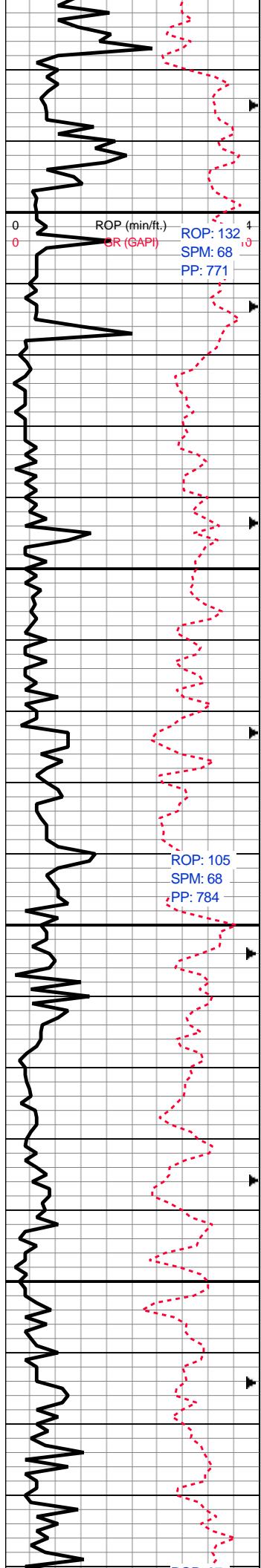
CG14u

MW/VIS: 8.4/23

ZERO FILAMENTS

MW: 9.4  
VIS: 28  
YP: 2  
PV: 3  
GELS: 1/2/0  
FIL: 99  
H2O: 92  
SOL: 7.6  
PH: 11  
CHL: 4,500  
CAL: 800





SH: PRED LT RED-TAN, GY, SFT, RTHY LSTR, SM TXT, PLTY-AMOR, ARG; CLY: LT GY-BL, V SFT, WXY LSTR, SM TXT, SL WTR SNS; TRC ANHY

NO SAMPLES COMING OVER SHAKERS, POOR SAMPLE QUALITY

SH: PRED LT RED-TAN, GY, SFT, RTHY LSTR, SM TXT, PLTY-AMOR, ARG; CLY: LT GY-BL, V SFT, WXY LSTR, SM TXT, SL WTR SNS; TRC ANHY

CATCHING SAMPLES FROM CELLAR PUMP, POOR SAMPLE QUALITY

SH: PRED LT RED-TAN, GY, SFT, RTHY LSTR, SM TXT, PLTY-AMOR, ARG; CLY: LT GY-BL, V SFT, WXY LSTR, SM TXT, SL WTR SNS; TRC ANHY

SH: PRED LT RED-TAN, GY, SFT, RTHY LSTR, SM TXT, PLTY-AMOR, ARG; CLY: LT GY-BL, V SFT, WXY LSTR, SM TXT, SL WTR SNS; TRC ANHY

CATCHING SAMPLES FROM CELLAR PUMP, POOR SAMPLE QUALITY

SH: PRED LT RED-TAN, GY IP, SFT, RTHY LSTR, SM TXT, BLKY-AMOR, OCC SB PLTY, OCC SLTY; ANHY: CRM-OFF WHI, TRNSL IP, SFT-OCC FRM, OCC FIB XLS; TRC CLY

DEVIATION SRVY @ 994', 0.5°

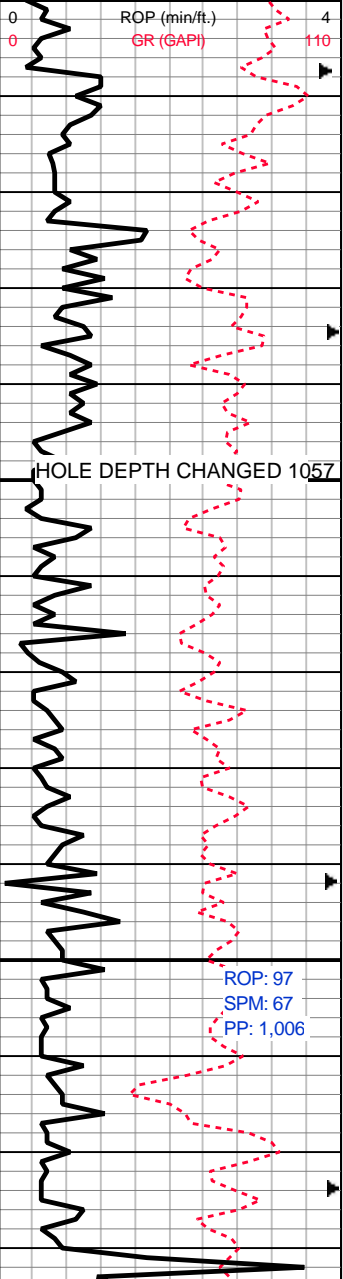
GAS (units) 300  
C1-C4 (PPM) 35000

CG 19U

GAS TEST AT TRAP 41u

ROP: 87  
SPM: 68  
PP: 1,007

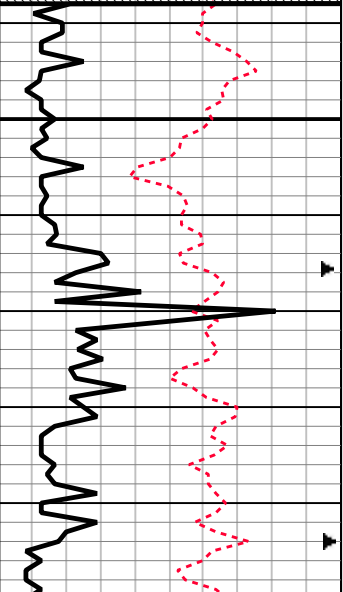
ROP (min/ft.) 4  
GR (GAPI) 110



HOLE DEPTH CHANGED 1057

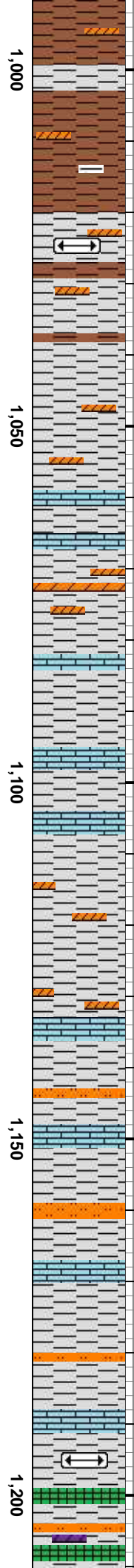
ROP: 97  
SPM: 67  
PP: 1,006

HOLE DEPTH CHANGED 1162



ROP: 91.2

ROP (min/ft.) 4  
GR (GAPI) 110



SH: PRED LT RED-TAN, GY IP,  
SFT, RTHY LSTR, SM TXT,  
BLKY-AMOR, OCC SB PLTY,  
OCC SLTY; ANHY: CRM-OFF  
WHI, TRNSL IP, SFT-OCC FRM,  
OCC FIB XLS; TRC CLY

**WELLINGTON SH @ 1024' MD**  
+++++

SH: PRED GY-DRK GY, OCC RD  
& LT GY-CRM, SL WXY-RTHY  
LSTR, PRES SM TXT, OCC SLTY,  
CALC; ANHY: CRM-OFF WHI,  
TRNSL IP, SFT-OCC FRM, CR  
SLN; TRC CLY; TRC LS

SH: PRED GY-DRK GY, OCC RD  
& LT GY-CRM, SL WXY-RTHY  
LSTR, PRES SM TXT, OCC SLTY,  
CALC; LS: LT GY-GY, SFT, CR  
XLN; ANHY: CRM-OFF WHI,  
TRNSL IP, SFT-OCC FRM, CR  
SLN; TRC CLY

SH: PRED GY-DRK GY, OCC RD  
& LT GY-CRM, SL WXY-RTHY  
LSTR, PRES SM TXT, OCC SLTY,  
CALC; LS: LT GY-GY, SFT, CR  
XLN; ANHY: CRM-OFF WHI,  
TRNSL IP, SFT-OCC FRM, CR  
SLN; TRC CLY

Dan D. on Tour

SH: LT GY- GY, OCC RD - CRM,  
WXY, SLTY, SM CALC/LMY IP -  
OCC AREN - TRC DOL - W/ LT  
GY - CRM LS SCTT THRU, NO  
FLUOR

**HUTCHINSON SALT @ 1195' MD**  
+++++

SALTY SH; LT GY - GY - CRM -

GAS (units) 300  
C1-C4 (PPM) 35000

GAS (units) 300  
C1-C4 (PPM) 35000



SPM: 66  
PP: 1,033

ROP: 95.7  
SPM: 62  
PP: 1,293

10-28-2013

ROP (min./ft.)  
GR (GAPI) 110

ROP: 72  
SPM: 66  
PP: 1,074

HOLE DEPTH CHANGED 1373

1,250  
1,300  
1,350  
1,400

OFF WH - WH, SMTH - CRS, SFT  
- FRM, BLKY - PLTY - FLKY,  
SALTY IP - SILTY IP - W/ THIN  
INTBD HAL THRU - DOL SCTT  
THRU  
SALTY SH; LT GY - GY - CRM -  
OFF WH - WH, SMTH - CRS, SFT  
- FRM, BLKY - PLTY - FLKY, LESS  
SALTY - MRE SILTY - W/ THIN  
INTBD HAL THRU - DOL SCTT  
THRU

SALTY SH; LT GY - GY - CRM -  
OFF WH - WH, SMTH - CRS, SFT  
- FRM, BLKY - PLTY - FLKY,  
SALTY IP - SILTY IP - W/ THIN  
INTBD HAL THRU - DOL SCTT  
THRU

SALTY SH; LT GY - GY - CRM -  
OFF WH - WH, SMTH - CRS, SFT  
- FRM, BLKY - PLTY - FLKY,  
SALTY IP - SILTY IP - W/ THIN  
INTBD HAL THRU - DOL SCTT  
THRU

SALTY SH; LT GY - GY - RD -  
CRM - OFF WH - WH, SMTH -  
CRS, SFT - FRM, BLKY - PLTY -  
FLKY, SALTY IP - SILTY IP - W/  
THIN INTBD HAL THRU - DOL  
SCTT THRU

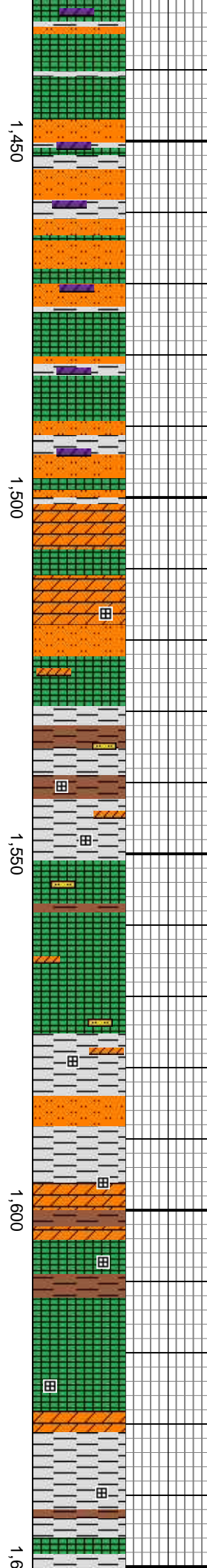
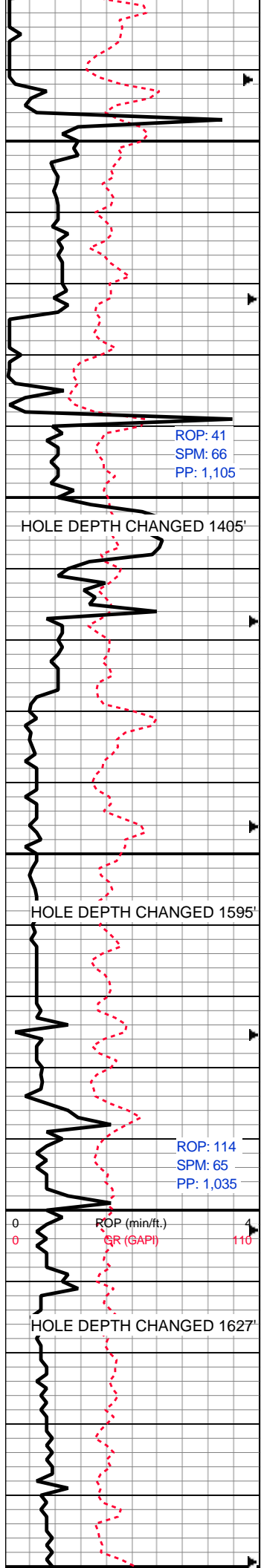
SALTY SH; LT GY - GY - RD -  
CRM - OFF WH - WH, SMTH -  
CRS, SFT - FRM, BLKY - PLTY -

MW: 9.3  
VIS: 29

GAS (units) 300  
C1-C4 (PPM) 35000







FLKY, SALTY IP - SILTY IP - W/  
THIN INTBD HAL THRU - DOL  
SCTT THRU

SALTY SH; LT GY - GY - RD -  
CRM - OFF WH - WH, SMTH -  
CRS, SFT - FRM, BLKY - PLTY -  
FLKY, SALTY IP - SILTY IP - W/  
THIN INTBD HAL THRU - DOL  
SCTT THRU

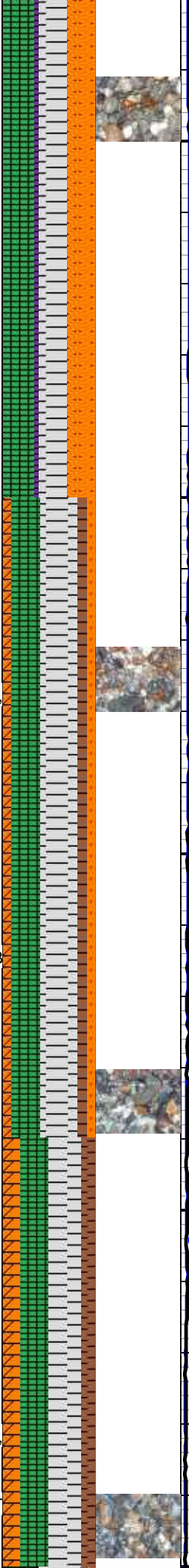
Paul C. on

DEVIATION SRVY @ 1500', 0.25°

SH: LT GY-GY, RED, SB  
BLKU-SB PLTY, AMOR, OCC FIS,  
PRED SFT-OCC FRM, WXY  
LSTR, OCC RTHY LSTR, SM TXT,  
OCC INTG W/ ANHY; SALT:  
CRM-OFF WHT & TRNSL, PRED  
SFT, RGH TXT; ANHY: OFF  
WHI-LT GY, FRM-OCC HD, SM  
TXT, OCC FIB XLS.

SH: LT GY-GY, RED, SB BLKU-SB  
PLTY, AMOR, OCC FIS, PRED  
SFT-OCC FRM, WXY LSTR, OCC  
RTHY LSTR, SM TXT, OCC INTG  
W/ ANHY; SALT: CRM-OFF WHT  
& TRNSL, PRED SFT, RGH TXT;  
ANHY: OFF WHI-LT GY,  
FRM-OCC HD, SM TXT, OCC FIB  
XLS.

SH: LT GY-GY, RED, SB  
BLKU-SB PLTY, AMOR IP, OCC  
FIS, PRED SFT-OCC FRM, WXY  
LSTR, OCC RTHY LSTR, SM TXT,  
OCC INTG W/ ANHY; SALT:  
CRM-OFF WHT & TRNSL, PRED  
SFT, CR XLN; ANHY: OFF WHI-LT  
GY, FRM-OCC HD, SL RGH TXT,  
OCC FIB XLS.



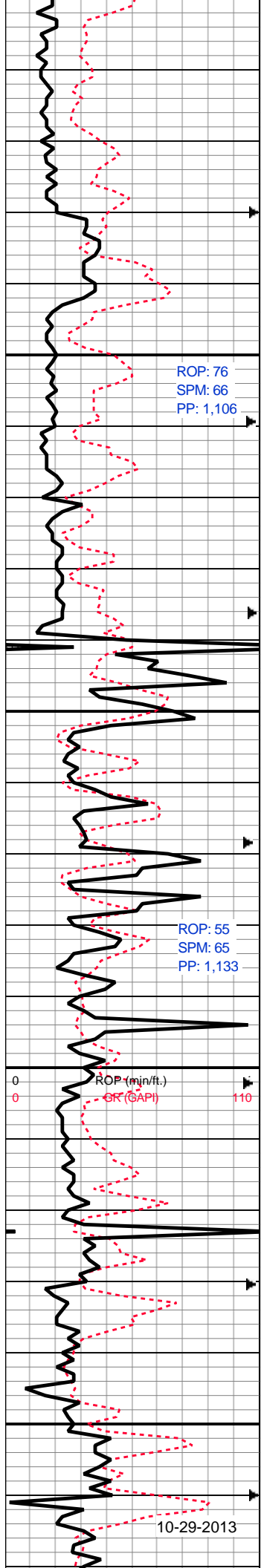
MW: 9.3  
VIS: 28

Ran 30 bbl sweep

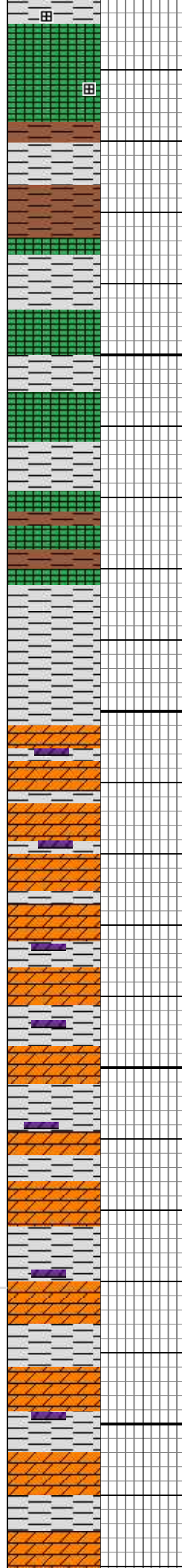
MW: 9.6

MW: 9.6  
VIS: 28  
YP: 2  
PV: 3  
GELS: 1/2/0  
FIL: 99  
H2O: 91.6  
SOL: 1.9  
PH: 8.5  
CHL: 115,000  
CAL: 2,440

GAS (units) 0 to 300  
C1-C4 (PPM) 0 to 35000



50  
1,700  
1,750  
1,800  
1,850



SH: LT GY-GY, RED IP, SFT-FRM  
OCC HD, SL WXY-RTHY LSTR,  
SL RGH TXT, OCC SL SLTY;  
SALT: PRES TRNSP-OFF WHI,  
SFT, BRIT, CR XLN-SUC, OCC  
INTG W/ SH.

SH: LT GY-GY, RED IP, SFT-FRM  
OCC HD, SL WXY-RTHY LSTR,  
SL RGH TXT, OCC SL SLTY;  
SALT: PRES TRNSP-OFF WHI,  
SFT, BRIT, CR XLN-SUC, OCC  
INTG W/ SH.

**LOWER WELLINGTON @  
1707' MD**

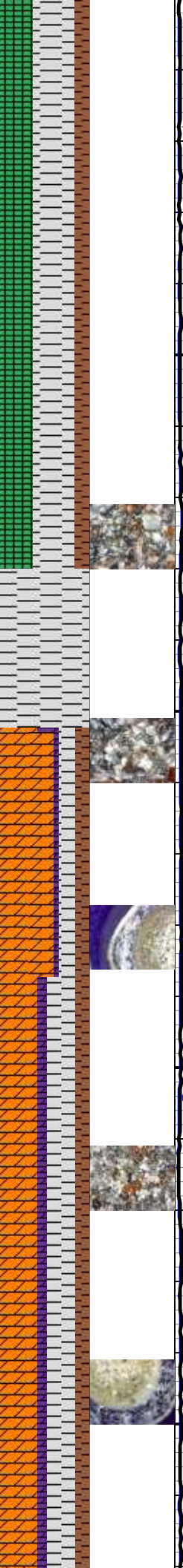
Dan D.

ANHYD: OFF WH - WH - FRSTD -  
OPQ - TN -CLR/TRNSL, SM LT  
GY SH THRU - OCC RD SH -  
ABNDT DOL THRU - OCC PP  
PYR - OCC SLTSTN

ANHYD: OFF WH - WH - FRSTD -  
OPQ - TN -CLR/TRNSL, SM LT  
GY SH THRU - OCC RD SH -  
ABNDT DOL THRU - OCC PP  
PYR - OCC SLTSTN

ANHYD: OFF WH - WH - FRSTD -  
OPQ - TN -CLR/TRNSL, SM LT  
GY SH THRU - OCC RD SH -  
ABNDT DOL THRU - OCC PP  
PYR - OCC SLTSTN - INCRS RD  
SH

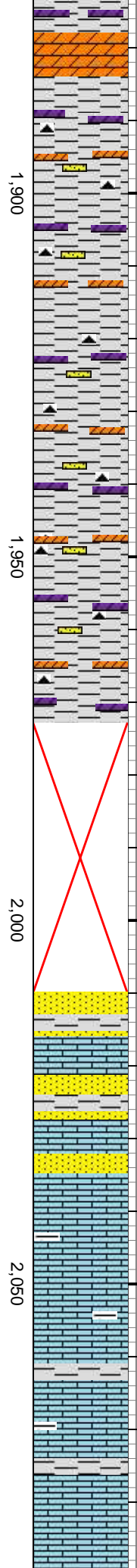
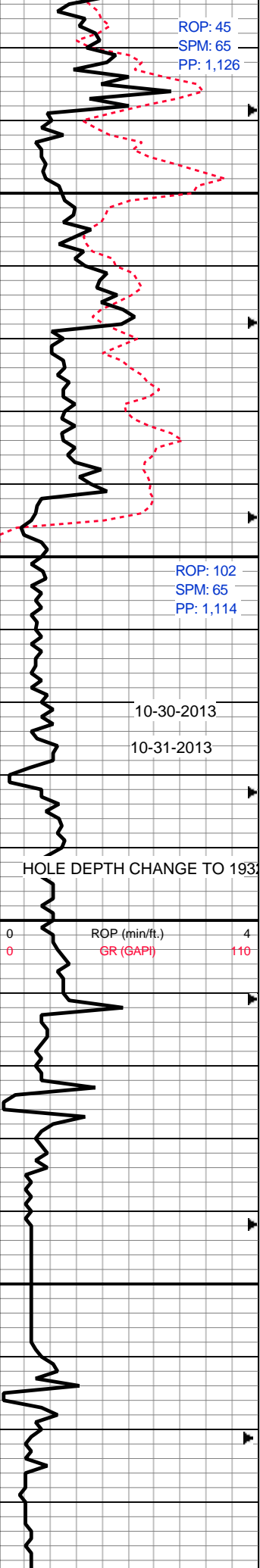
SHLY ANHYD: OFF WH - WH -  
FRSTD -



MW: 9.6

GAS (units) 300  
C1-C4 (PPM) 35000

MW: 9.6



FRSTD - OPQ - TN - CLR/TRNSL,  
 LT GY SH THRU - OCC RD SH -  
 ABNDT DOL THRU - OCC  
 SLTSTN

**CHASE GROUP @ 1,890' MD**

SH: LT GY - GY - RD - TNSH,  
 SMTH - RGH, SFT - FRM, PLTY -  
 FLKY - BLKY, SLTY - SLI AREN -  
 SLI CALC - OCC GY/TNSH CHRT  
 - ABNDT DOL - OCC ANHY - OCC  
 WH/OFF WH CHRT/SIL  
 NODULES

SH: LT GY - GY - RD - TNSH,  
 SMTH - RGH, SFT - FRM, PLTY -  
 FLKY - BLKY, SLTY - SLI AREN -  
 SLI CALC - OCC GY/TNSH CHRT  
 - ABNDT DOL - OCC ANHY

**15 Stand Short Trip**  
**Run 50 bbl Sweep**

**Strap out of hole for logs**  
**(1,974' MD)**

Bit #: 3  
 Type: SMITH D54  
 Size: 8.75  
 Depth In: 1,974'  
 Hours: 7 hrs  
 Jets: 5X14s  
 S/N: M51516MSPX

P CAMPBELL ON

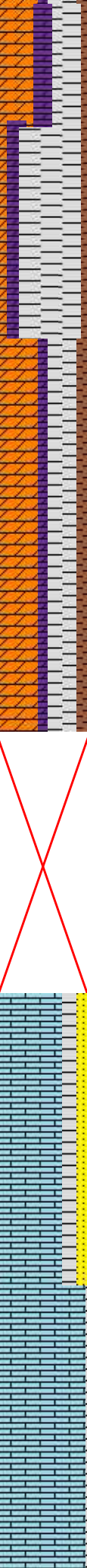
**CEMENT**

**DEVIATION SRVY @ 2000', 0.5°**

SS: OFF WHT-TRNSL, OCC  
 CRM, VFG, BRIT-FRM, SB  
 SNG-ANG, MOD SRTD P CMNT,  
 SL CALC (VERY FINE  
 CUTTINGS); LS: CRM-OFF WHT  
 & MOT, SFT-FRM, CR XLN, NO  
 VIS POR; SH: LT GY-GRN, DLL  
 RTHY LSTR, BLKY, SM TXT,  
 AMOR; 30% DLL YL FLUOR,  
 NSOC

LS: CRM-OFF WHT, GY-LT GY &  
 MOT IP, FRM-OCC HD, MC XLN,  
 PRED SUC, SL RGH TXT; TRC  
 GY SH

LS: CRM-OFF WHT, GY-LT GY &



MW: 9.6  
 VIS: 30

**Run 40 bbl Sweep**

MW: 8.5  
 VIS: 28  
 YP: 3  
 PV: 2  
 GELS: 1/2/0  
 FIL: 99  
 H2O: 98.5  
 SOL: 1.2  
 PH: 8.5  
 CHL: 1,800  
 CAL: 200

GAS (units) 300  
 C1-C4 (PPM) 35000

BG 17u

CG 43u

BG 34u

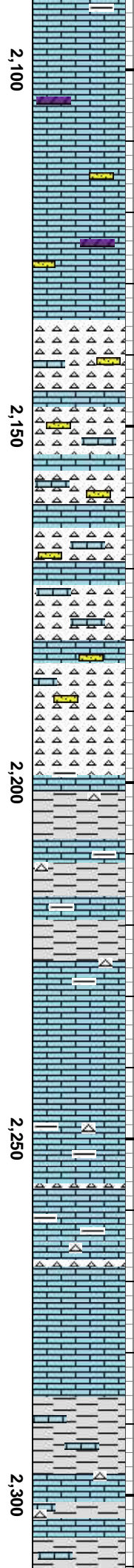
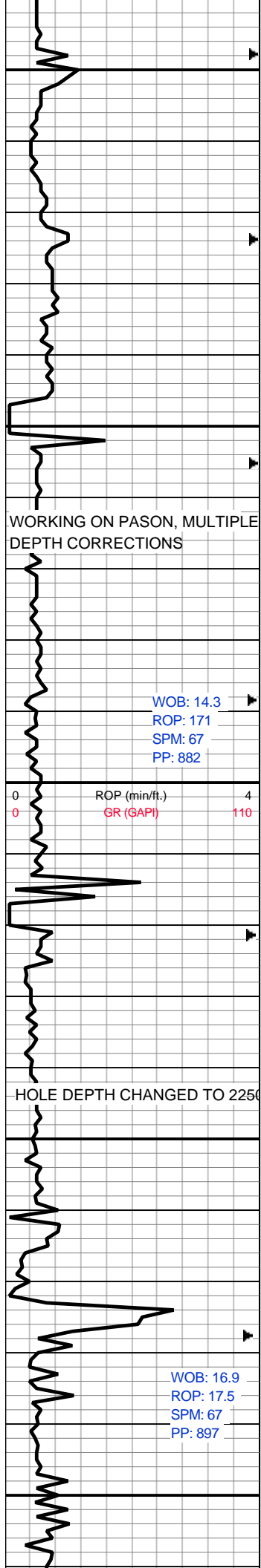
BG 34u

DTG 30u

HOLE DEPTH CHANGE TO 1933

ROP (min/ft.) 4  
 GR (GAPI) 110





MOT IP, FRM-OCC HD, MC XLN, PRED SUC, SL RGH TXT; TRC GY SH

LS: CRM-OFF WHT, GY-LT GY & MOT IP, FRM-OCC HD, MC XLN, PRED SUC, SL RGH TXT; TRC DOL AND UNCONS SS; SL LT YL FLUOR, NSOC

LS: CRM-OFF WHT, GY-LT GY & MOT IP, FRM-OCC HD, MC XLN, PRED SUC, SL RGH TXT; CHT: OFF WHT-CRM, TRNSL, OCC W/ DRK INCL, FRM-HD, PRED TRIP; TRC POR

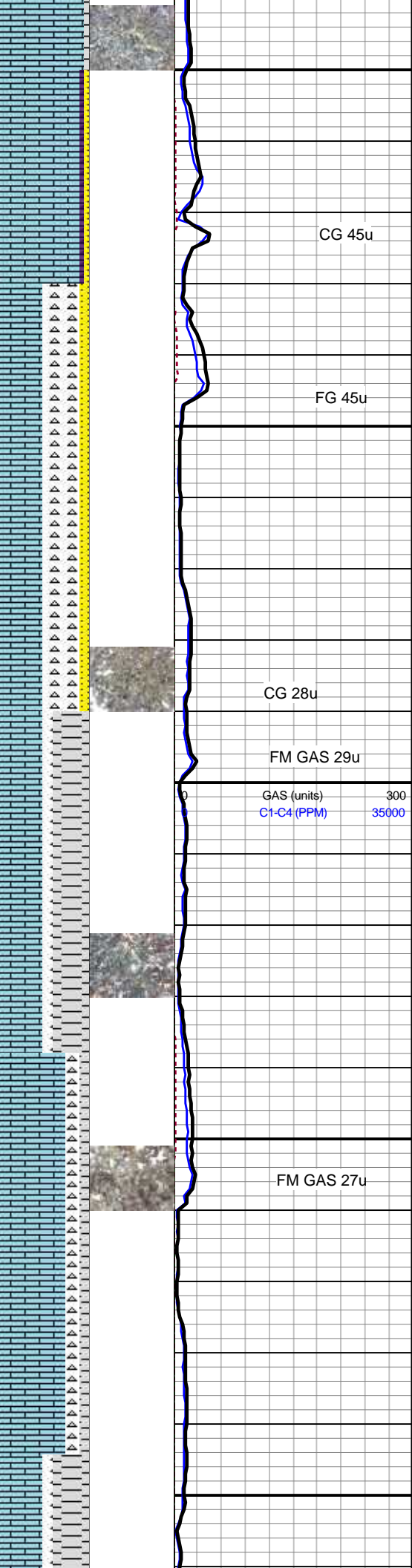
LS: CRM-OFF WHT, GY-LT GY & MOT IP, FRM-OCC HD, MC XLN, PRED SUC, SL RGH TXT; CHT: OFF WHT-CRM, TRNSL, OCC W/ DRK INCL, FRM-HD, PRED TRIP; TRC POR; 70% LT YL FLUOR, NSOC

PAUL C. OFF

LS: CRM-OFF WHT, GY-LT GY & MOT IP, FRM-OCC HD, MC XLN, PRED SUC, SL RGH TXT; CHT: OFF WHT-CRM, TRNSL, OCC W/ DRK INCL, FRM-HD, PRED TRIP; TRC POR; 70% LT YL FLUOR, NSOC

LS: CRM-OFF WHT, GY-LT GY & MOT IP, MOD FRM-FRM, MCXLN-V/F XLN, CHNKY-OCC PLTY, OCC FREE CAL, OCC LAM/IMBD CHT, TR LT BRN SPOT STAIN, TR PP POR, 60% PALE YEL FLUOR, NSOC

LS: CRM-OFF WHT, GY-LT GY & MOT IP, MOD FRM-FRM, MCXLN-V/F XLN, CHNKY-OCC PLTY, OCC FREE CAL, TR LT





BRN SPOT STAIN, TR PP POR,  
60% PALE YEL FLUOR, NSOC

CG 15u

FM GAS 27u

LS: CRM-OFF WHT, GY-LT GY &  
MOT IP, MOD FRM-FRM,  
MCXLN-V/F XLN, CHNKY-OCC  
PLTY, OCC FREE CAL, TR LT  
BRN SPOT STAIN, TR PP POR,  
60% PALE YEL FLUOR, NSOC

CON GAS 21u

MW: 8.7  
VIS: 90  
YP: 19  
PV: 23  
GELS: 10/23  
FIL: 8  
H2O: 97  
SOL: 2.7  
PH: 10.5  
CHL: 1,800  
CAL: 40

LS: CRM-OFF WHT, GY-LT GY &  
MOT IP, MOD FRM-FRM,  
MCXLN-V/F XLN, CHNKY-OCC  
PLTY, OCC FREE CAL, TR LT  
BRN SPOT STAIN, TR PP POR,  
60% PALE YEL FLUOR, NSOC

WOB: 16.4  
ROP: 86.2  
SPM: 67  
PP: 925

ROP (min/ft.) 4  
GR (GAPI) 110

GAS (units) 300  
C1-C4 (PPM) 35000

LS: CRM-OFF WHT, GY-LT GY,  
OCC WHT, MOD FRM-FRM,  
MCXLN-V/F XLN, CHNKY-OCC  
PLTY, OCC FREE CAL, TR LT  
BRN SPOT STAIN, TR PP POR,  
40% PALE YEL FLUOR, NSOC

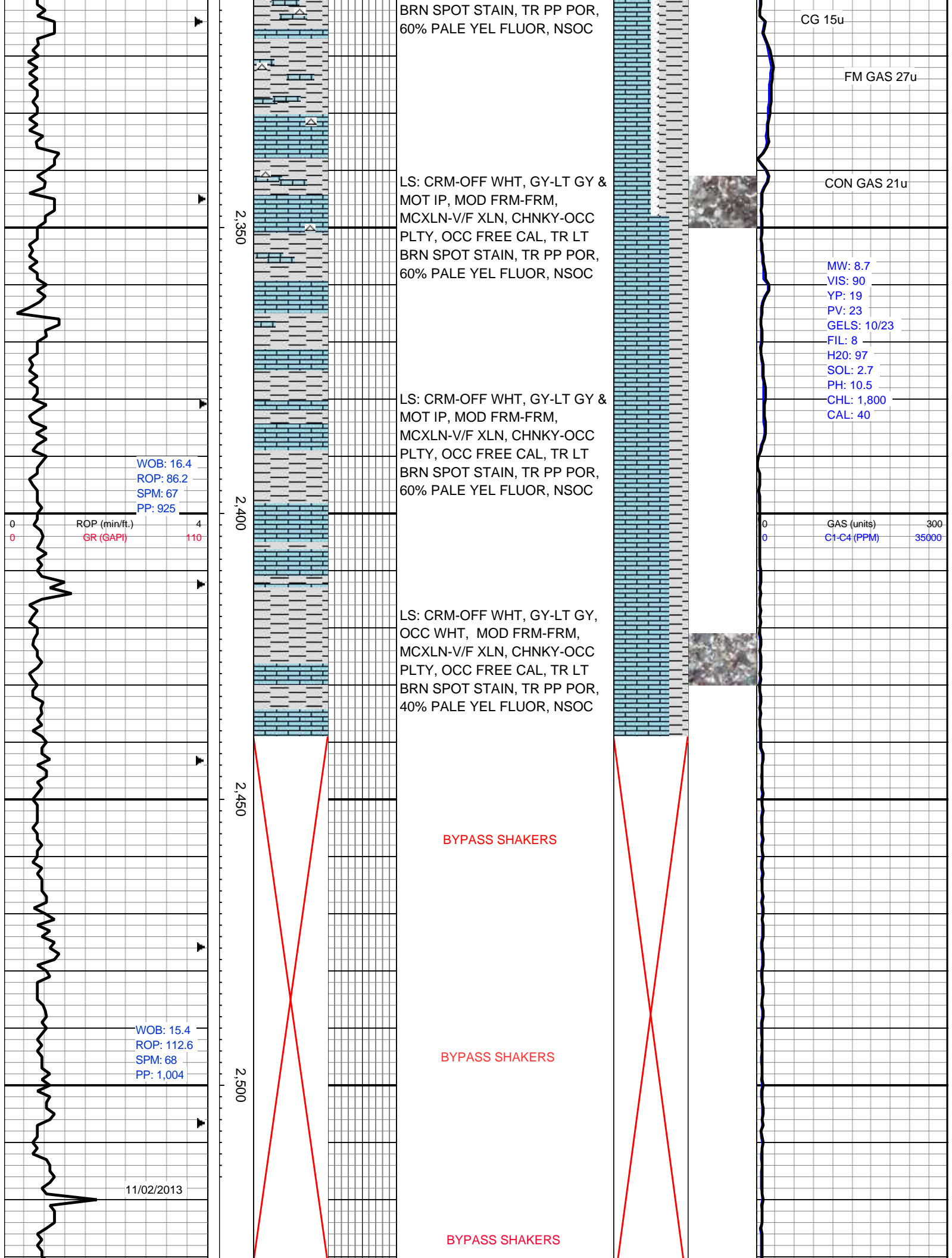
BYPASS SHAKERS

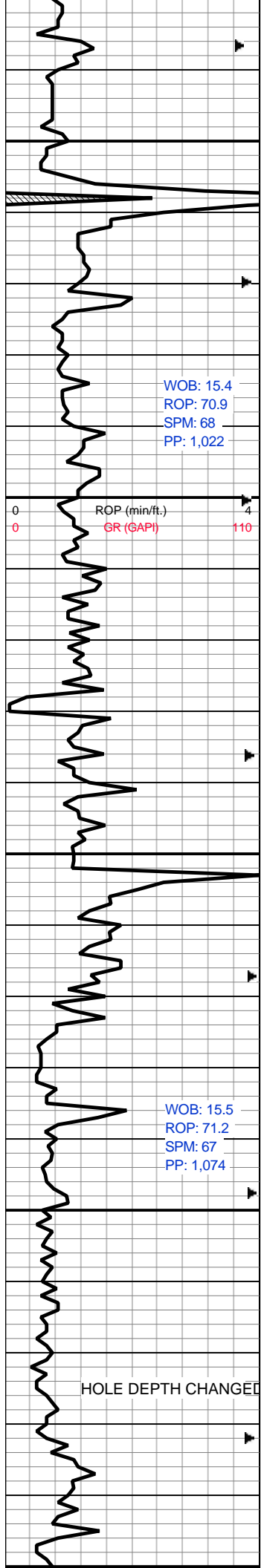
BYPASS SHAKERS

WOB: 15.4  
ROP: 112.6  
SPM: 68  
PP: 1,004

11/02/2013

BYPASS SHAKERS





WOB: 15.4  
 ROP: 70.9  
 SPM: 68  
 PP: 1,022

WOB: 15.5  
 ROP: 71.2  
 SPM: 67  
 PP: 1,074

2,550

2,600

2,650

2,700

2,7

LS: CRM-OFF WHT, GY-LT GY,  
 OCC WHT, MOD FRM-FRM,  
 MCXLN-V/F XLN, CHNKY-OCC  
 PLTY, OCC FREE CAL, TR LT  
 BRN SPOT STAIN, TR PP POR,  
 40% PALE YEL FLUOR, NSOC

LS: CRM-OFF WHT, GY-LT GY,  
 OCC WHT, MOD FRM-FRM,  
 MCXLN-V/F XLN, CHNKY-OCC  
 PLTY, OCC FREE CAL, TR LT  
 BRN SPOT STAIN, TR PP POR,  
 30% PALE YEL FLUOR, NSOC

LS: CRM-OFF WHT, GY-LT GY,  
 OCC TN-LT-BRN, MOD  
 FRM-FRM, MCXLN-V/F XLN,  
 CHNKY-OCC PLTY, OCC FREE  
 CAL, TR LT BRN SPOT STAIN,  
 TR PP POR, 20% PALE YEL  
 FLUOR, NSOC

LS: CRM-OFF WHT, GY-LT GY,  
 OCC TN-LT-BRN, MOD  
 FRM-FRM, TR PINK MOT,  
 MCXLN, OCC V/F-F XLN,  
 CHNKY-OCC PLTY, OCC FREE  
 CAL, TR LT BRN SPOT STAIN,  
 TR PP POR, 20% PALE YEL  
 FLUOR, NSOC

LS: CRM-OFF WHT, GY-LT GY,  
 OCC TN-LT-BRN, MOD  
 FRM-FRM, TR PINK MOT,  
 MCXLN, OCC V/F-F XLN,  
 CHNKY-OCC PLTY, OCC FREE  
 CAL, OCC SLTY SH, TR LT BRN  
 SPOT STAIN, TR PP POR, 20%  
 PALE YEL FLUOR, NSOC

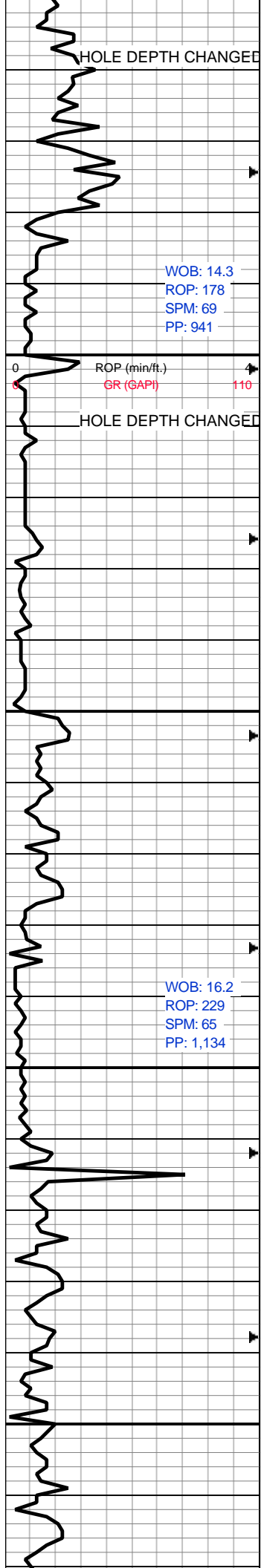
PAUL C. ON



GAS (units) 300  
 C1-C4 (PPM) 35000

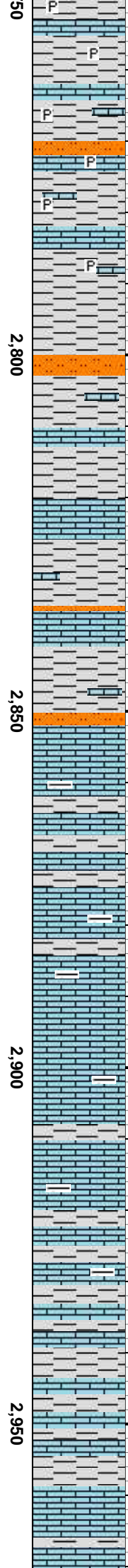
MW : 8.7  
 VIS: 50

HOLE DEPTH CHANGED



WOB: 14.3  
 ROP: 178  
 SPM: 69  
 PP: 941

WOB: 16.2  
 ROP: 229  
 SPM: 65  
 PP: 1,134



SH: LT GY-GY, OCC DRK GY, FRM, SB BLKY-SB PLTY, AMOR IP, RTHY-SL METALIC LSTR, PRED RGH TXT, SLTY; LS: CRM-LT TAN, OFFF WHI IP, OCC MOT, CR XLN, FRM-HD, SM TXT; SLTST: LT GY, SFT-RFM, AGR, INTG W/ SH; ABNDT FREE & INTRBD PYR

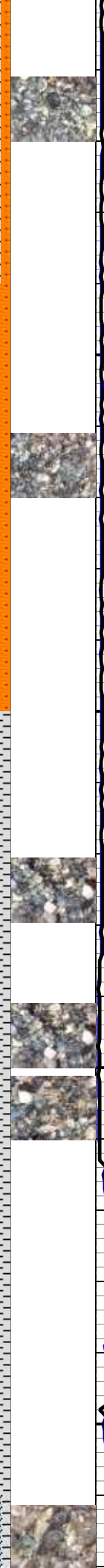
SH: LT GY-GY, OCC DRK GY, FRM, SB BLKY-SB PLTY, AMOR IP, RTHY-SL METALIC LSTR, PRED RGH TXT, SLTY; LS: CRM-LT TAN, OFFF WHI IP, OCC MOT, CR XLN, FRM-HD, SM TXT; SLTST: LT GY, SFT-RFM, AGR, INTG W/ SH

SH: LT GY-GY, OCC DRK GY, FRM, SB BLKY-SB PLTY, AMOR IP, RTHY-SL METALIC LSTR, PRED RGH TXT, SLTY; LS: CRM-LT TAN, OFFF WHI IP, OCC MOT, CR XLN, FRM-HD, SM TXT

SH: LT GY-GY, OCC DRK GY, FRM, SB BLKY-SB PLTY, AMOR IP, RTHY-SL METALIC LSTR, PRED RGH TXT, SLTY; LS: CRM-LT TAN, OFFF WHI IP, OCC MOT, CR XLN, FRM-HD, SM TXT; 50% LT GLD FLUOR, NSOC

SH: LT GY-GY, OCC DRK GY, FRM, SB BLKY-SB PLTY, AMOR IP, RTHY-SL METALIC LSTR, PRED RGH TXT, SLTY; LS: CRM-LT TAN, OFFF WHI IP, OCC MOT, CR XLN, FRM-HD, SM TXT; 50% LT GLD FLUOR, NSOC

LS: CRM-LT TAN, OFFF WHI IP, OCC MOT, CR XLN, FRM-HD, SM



GAS (units) 300  
 C1-C4 (PPM) 35000

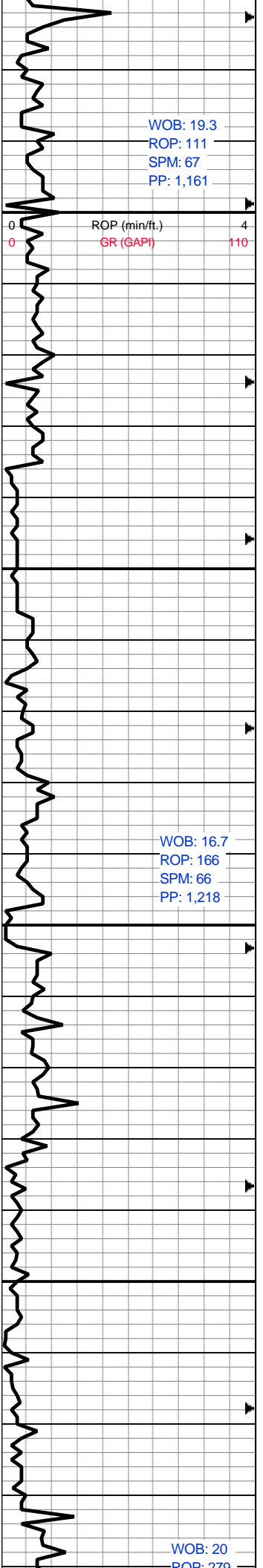
CG 10u

STOPPED BYPASSING SHAKERS

CG 15u

CG 22u





WOB: 19.3  
 ROP: 111  
 SPM: 67  
 PP: 1,161

ROP (min/ft.) 4  
 GR (GAPI) 110

WOB: 16.7  
 ROP: 166  
 SPM: 66  
 PP: 1,218

WOB: 20  
 ROP: 270

3,000

3,050

3,100

3,150

P  
 P  
 P  
 P  
 P

TXT, NO VIS POR; SH: LT GY-GY  
 OCC DRK GY, FRM, SB BLKY-SB  
 PLTY, AMOR IP, RTHY-SL  
 METALIC LSTR, PRED RGH TXT,  
 SLTY; 20% LT GLD FLUOR,  
 NSOC

DEVIATION SRVY @ 3000', 1.5°

LS: CRM-LT TAN, OFF WHI IP,  
 OCC MOT, CR XLN, FRM-HD, SM  
 TXT, NO VIS POR; SH: LT GY-GY  
 OCC DRK GY, FRM, SB BLKY-SB  
 PLTY, AMOR IP, RTHY-SL  
 METALIC LSTR, PRED RGH TXT,  
 SLTY; 20% LT GLD FLUOR,  
 NSOC

LS: CRM-LT TAN, OFF WHI IP,  
 OCC LT BWN & MOT, CR XLN,  
 FRM-HD, SM TXT, NO VIS POR;  
 SH: LT GY-GY, OCC DRK GY,  
 FRM, SB BLKY-SB PLTY, AMOR  
 IP, RTHY-SL METALIC LSTR,  
 PRED RGH TXT, SLTY; 40% LT  
 GLD FLUOR, NSOC

LS: PRED LT TAN & MOD,  
 CRM-LT GY IP, FRM-HD, OCC  
 SFT, MMC XLN-CR XLN, SUC IP,  
 SM TXT, NO VIS POR; SH: LT  
 GY-GY, OCC DRK GY, FRM, SB  
 BLKY-SB PLTY, AMOR IP,  
 RTHY-SL METALIC LSTR, PRED  
 RGH TXT, SLTY; 40% LT GLD  
 FLUOR, NSOC

LS: PRED LT TAN & MOD,  
 CRM-LT GY IP, FRM-HD, OCC  
 SFT, MMC XLN-CR XLN, SUC IP,  
 SM TXT, NO VIS POR; SH: LT  
 GY-GY, OCC DRK GY, FRM, SB  
 BLKY-SB PLTY, AMOR IP,  
 RTHY-SL METALIC LSTR, PRED  
 RGH TXT, SLTY; 40% LT GLD  
 FLUOR, NSOC

LS: PRED BWN-LT TAN, GY &  
 MOT IP, OFF WHI-CRM IP,  
 FRM-BRIT, OCC HD, MC XLN-CR  
 XLN, PRED SM TXT, NO VIS POR  
 SH: LT GY-GY, OCC DRK GY,  
 SFT-FRM, SB BLKY-PLTY, SPLTY  
 IP, FIS, RGH TXT, SL SLTY IP;  
 ABND FREE PYR

CG 27u

CG 27u

GAS (units) 300  
 C1-C4 (PPM) 35000

CG 24u

CG 27u

CG 33u

BYPASSING SHAKERS

CG 12u



ROP: 279  
SPM: 67  
PP: 1,243

ROP (min/ft.) 4  
GR (GAPI) 110

**TOPEKA LS @ 3203' MD**



LS: PRED CRM-LT TAN, GY & MOT IP, OFF WHI-CRM IP, FRM-BRIT, OCC HD, MC XLN-CR XLN, PRED SM TXT, NO VIS POR TRC SH; 60% WK DLL YL FLUOR, NSOC

LS: PRED CRM-LT TAN, GY & MOT IP, OFF WHI-CRM IP, FRM-BRIT, OCC HD, MC XLN-CR XLN, PRED SM TXT, NO VIS POR TRC SH; 60% WK DLL YL FLUOR, NSOC

LS: PRED CRM-LT TAN, GY & MOT IP, OFF WHI-CRM IP, FRM-BRIT, OCC HD, MC XLN-CR XLN, PRED SM TXT, NO VIS POR TRC SH; 60% WK DLL YL FLUOR, NSOC

LS: PRED CRM-LT TAN, GY & MOT IP, OFF WHI-CRM IP, BRIT-CC HD, MC XLN-CR XLN, PRED SM TXT, NO VIS POR; TRC SH; 30% WK DLL YL FLUOR, NSOC

LS: PRED CRM-LT TAN, GY & MOT IP, OFF WHI-CRM IP, BRIT-CC HD, MC XLN-CR XLN, PRED SM TXT, NO VIS POR; TRC SH; 30% WK DLL YL FLUOR, NSOC

FG 31u

GAS (units) 300  
C1-C4 (PPM) 35000

**DONE BYPASSING SHAKERS**

BG 47u

CG 47u

DTG 35u

CG 26u

CG 24u

MW: 9.4  
VIS: 60  
YP: 20  
PV: 14  
GELS: 6/21/0  
FIL: 7.8  
H2O: 92  
SOL: 7.7  
PH: 10.5  
CHL: 2,000  
CAL: 40

CG 53u

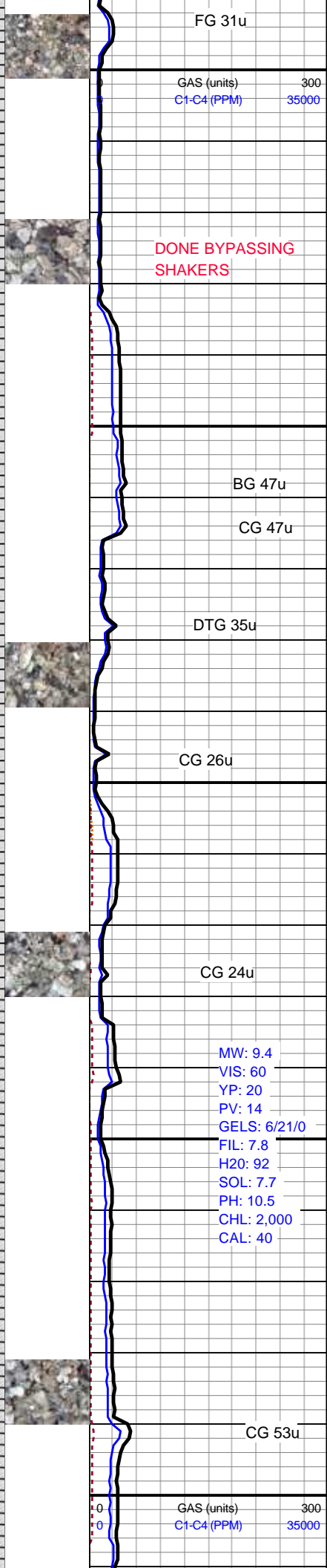
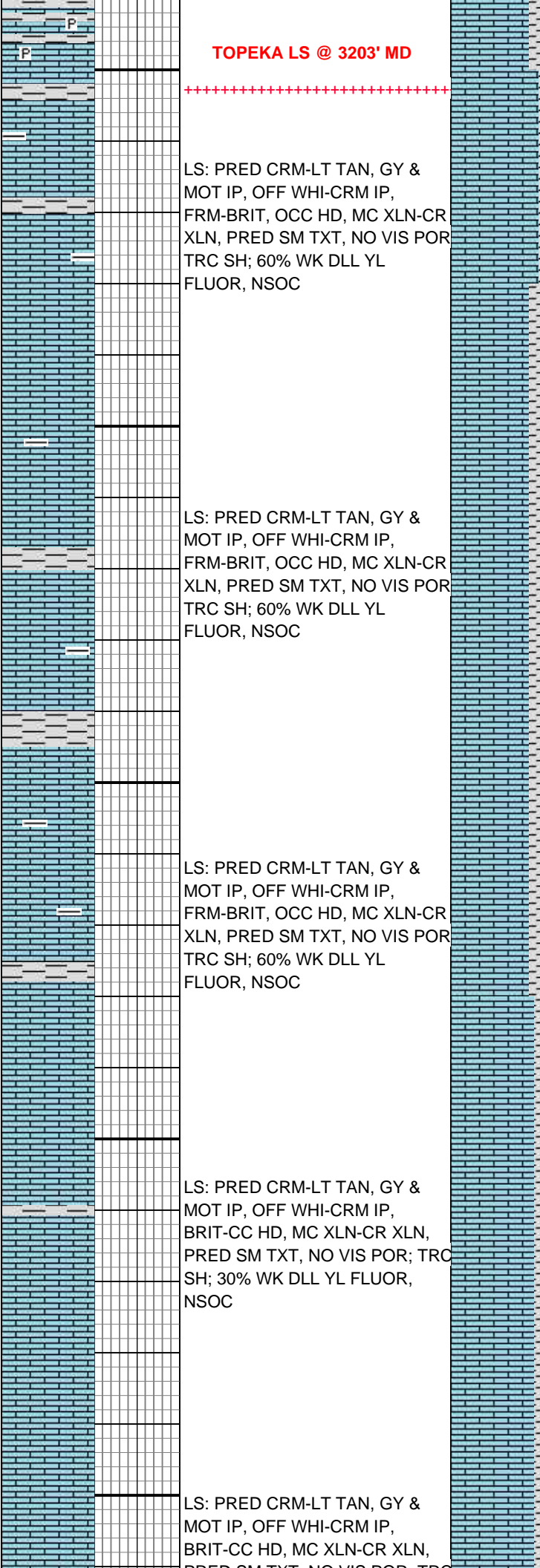
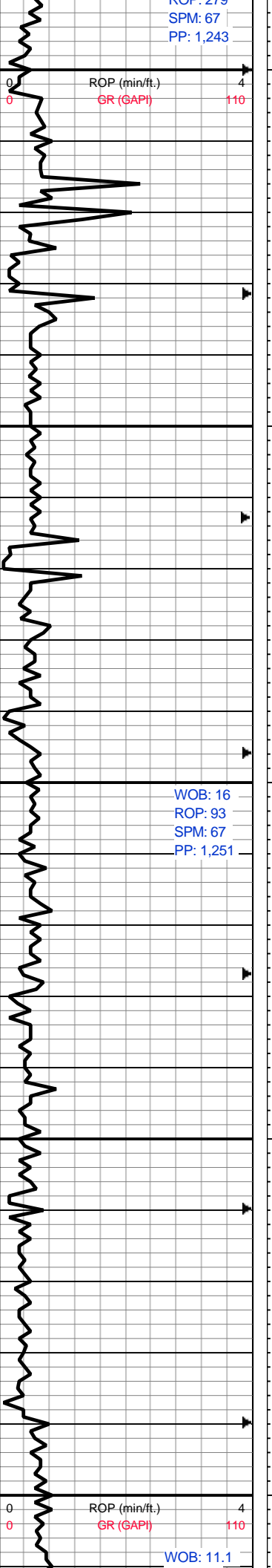
GAS (units) 300  
C1-C4 (PPM) 35000

WOB: 16  
ROP: 93  
SPM: 67  
PP: 1,251

WOB: 11.1

ROP (min/ft.) 4  
GR (GAPI) 110

3,200  
3,250  
3,300  
3,350  
3,400



ROP: 77  
SPM: 66  
PP: 1,201

PRED SM TXT, NO VIS POR; TRC  
SH; 50% DLL YL FLUOR, NSOC

CG 49u

LS: PRED CRM-LT TAN, GY &  
MOT IP, OFF WHI-CRM IP,  
BRIT-CC HD, MC XLN-CR XLN,  
PRED SM TXT, NO VIS POR; TRC  
SH; 50% DLL YL FLUOR, NSOC

CG 38u

MW : 9.4  
VIS: 58

MAX BG 285u

SH: DRK GY-BLK, SFT-SL BRIT,  
PLTSPLTY, V FIS, WXY LSTR, SL  
SLTY, V CARB, TRC EMBDD PYR;  
LS: PRED CRM-LT TAN, GY & MOT IP  
OFF WHI-CRM IP, BRIT-CC HD, MC  
XLN-CR XLN, PRED SM TXT, NO VIS  
POR;TRC PYR ANC CAL XLS; SFSO

ROP: 65  
SPM: 67  
PP: 1,241

**BASE HEEBNER SHALE @ 3522' MD**

LS: PRED CRM-LT TAN, GY &  
MOT IP, OFF WHI-CRM IP,  
FRM-BRIT, OCC HD, MC XLN-CR  
XLN, PRED SM TXT, NO VIS POR  
TR SH; 20% WK DLL YL FLUOR,  
NSOC

MAX FM 500u

**TORONTO @ 3548' MD**

**DOUGLAS @ 3570' MD**

CG 282u

LS: PRED CRM-LT TAN, GY &  
MOT IP, OFF WHI-CRM IP,  
FRM-BRIT, OCC HD, MC XLN-CR  
XLN, PRED SM TXT, NO VIS POR  
TR SH; 20% WK DLL YL FLUOR,  
NSOC

CG 264u

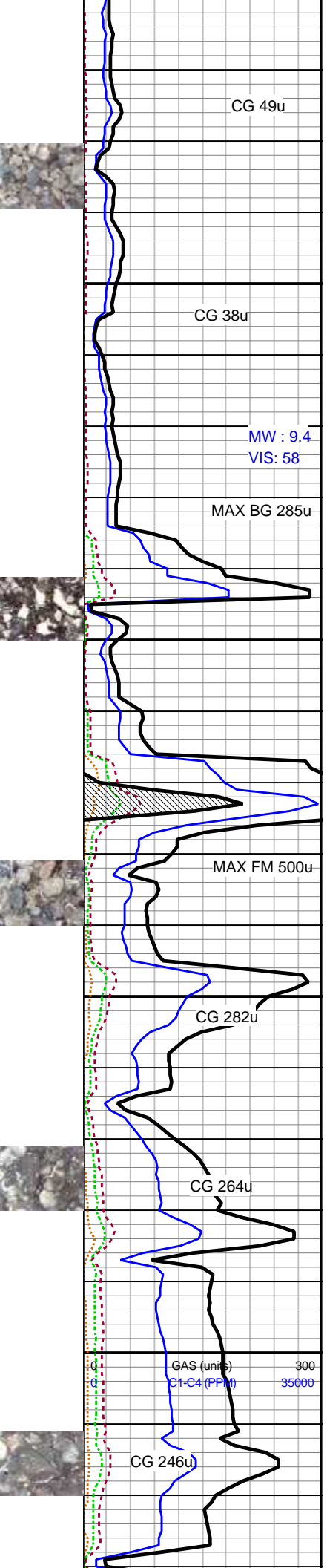
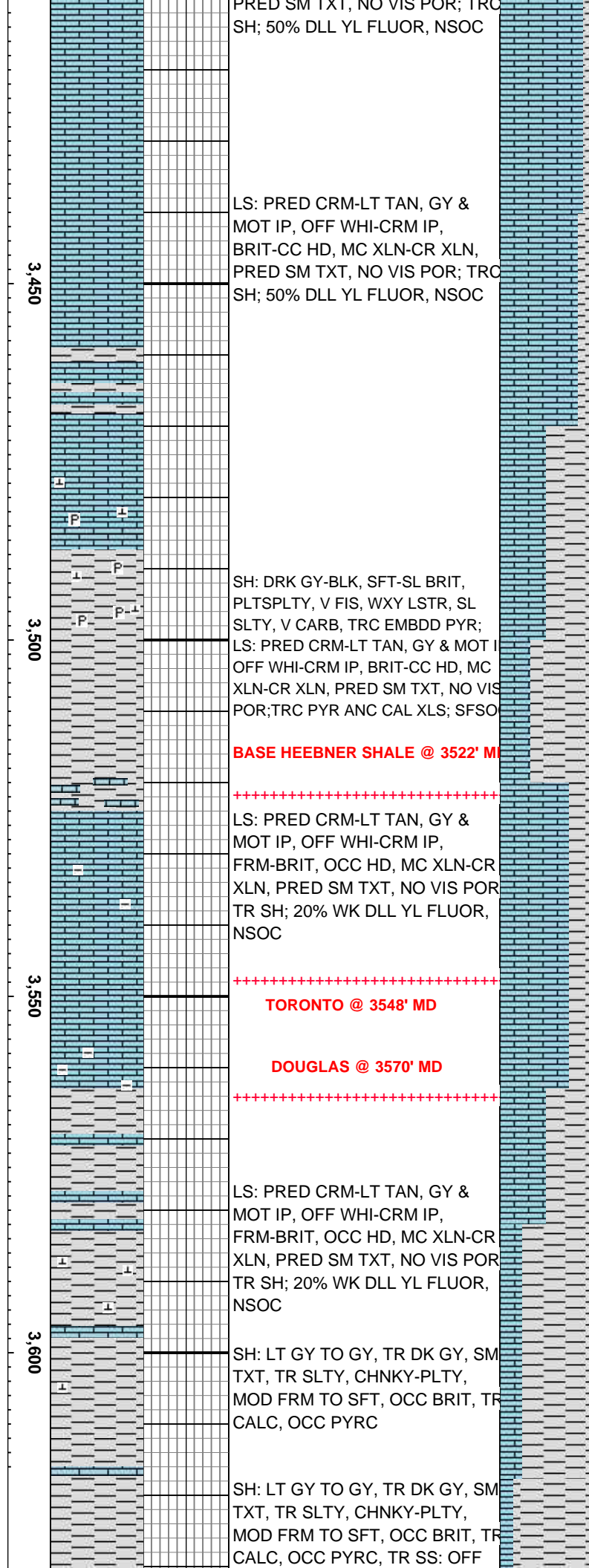
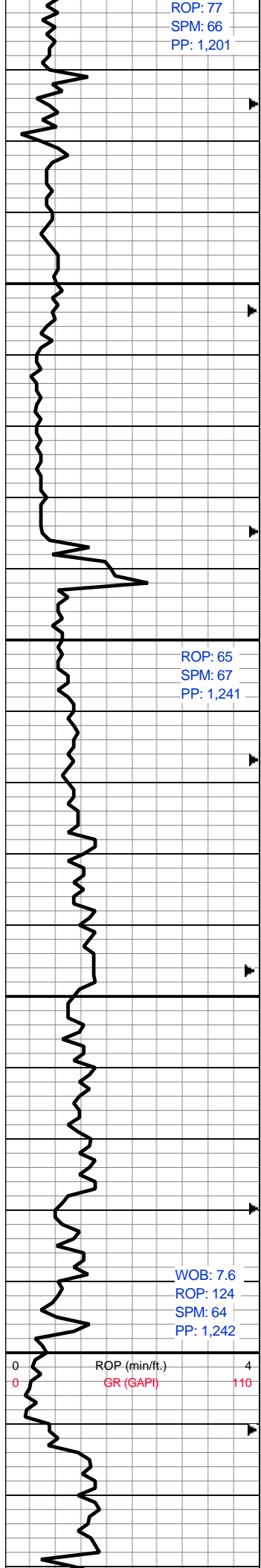
WOB: 7.6  
ROP: 124  
SPM: 64  
PP: 1,242

SH: LT GY TO GY, TR DK GY, SM  
TXT, TR SLTY, CHNKY-PLTY,  
MOD FRM TO SFT, OCC BRIT, TR  
CALC, OCC PYRC

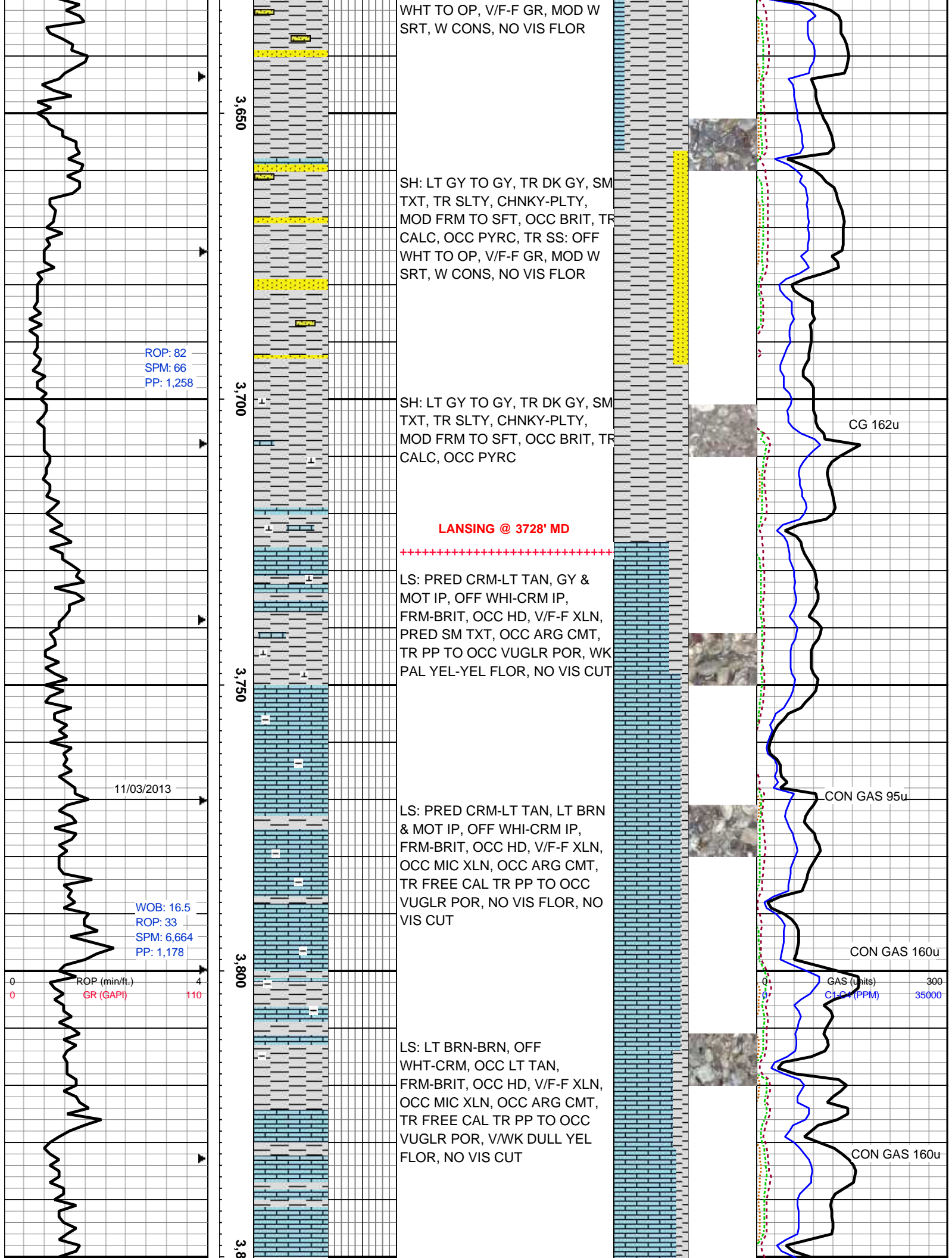
GAS (units) 300  
C1-C4 (PPM) 35000

SH: LT GY TO GY, TR DK GY, SM  
TXT, TR SLTY, CHNKY-PLTY,  
MOD FRM TO SFT, OCC BRIT, TR  
CALC, OCC PYRC, TR SS: OFF

CG 246u







WHT TO OP, V/F-F GR, MOD W SRT, W CONS, NO VIS FLOR

SH: LT GY TO GY, TR DK GY, SM TXT, TR SLTY, CHNKY-PLTY, MOD FRM TO SFT, OCC BRIT, TR CALC, OCC PYRC, TR SS: OFF WHT TO OP, V/F-F GR, MOD W SRT, W CONS, NO VIS FLOR

SH: LT GY TO GY, TR DK GY, SM TXT, TR SLTY, CHNKY-PLTY, MOD FRM TO SFT, OCC BRIT, TR CALC, OCC PYRC

**LANSING @ 3728' MD**

LS: PRED CRM-LT TAN, GY & MOT IP, OFF WHI-CRM IP, FRM-BRIT, OCC HD, V/F-F XLN, PRED SM TXT, OCC ARG CMT, TR PP TO OCC VUGLR POR, WK PAL YEL-YEL FLOR, NO VIS CUT

LS: PRED CRM-LT TAN, LT BRN & MOT IP, OFF WHI-CRM IP, FRM-BRIT, OCC HD, V/F-F XLN, OCC MIC XLN, OCC ARG CMT, TR FREE CAL TR PP TO OCC VUGLR POR, NO VIS FLOR, NO VIS CUT

LS: LT BRN-BRN, OFF WHT-CRM, OCC LT TAN, FRM-BRIT, OCC HD, V/F-F XLN, OCC MIC XLN, OCC ARG CMT, TR FREE CAL TR PP TO OCC VUGLR POR, V/WK DULL YEL FLOR, NO VIS CUT

ROP: 82  
SPM: 66  
PP: 1,258

11/03/2013

WOB: 16.5  
ROP: 33  
SPM: 6,664  
PP: 1,178

ROP (min/ft.) 0 4  
GR (GAPI) 0 110

CG 162u

CON GAS 95u

CON GAS 160u

GAS (Units) 300  
C1-C4 (PPM) 35000

CON GAS 160u

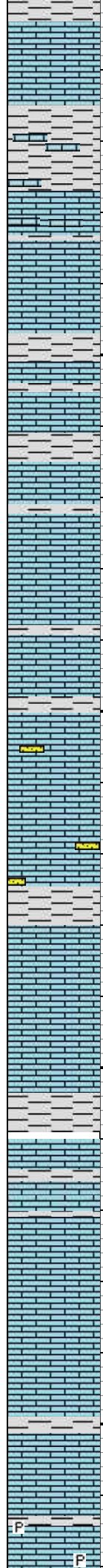
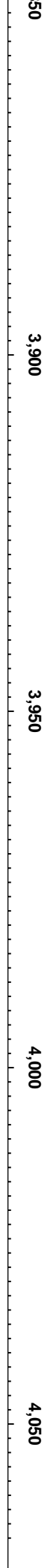
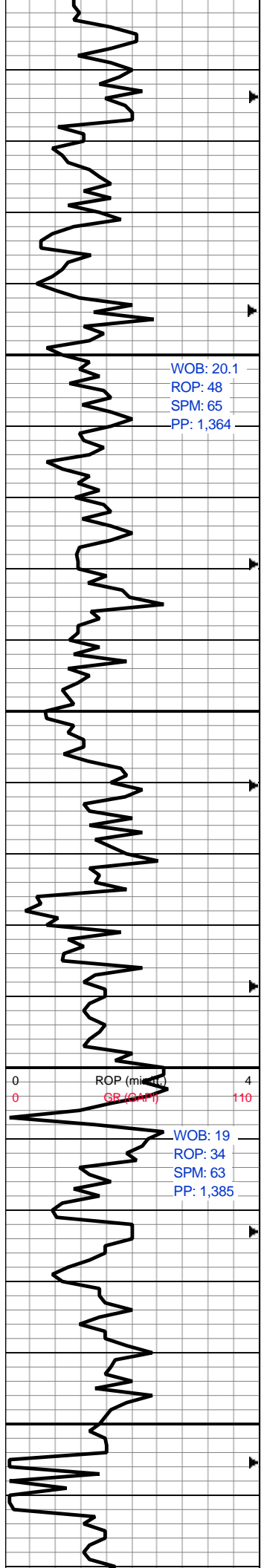
3,650

3,700

3,750

3,800

3,818



LS: LT BRN-BRN, OFF WHT-CRM, OCC LT TAN, FRM-BRIT, OCC HD, V/F-F XLN, OCC MIC XLN, OCC ARG CMT, TR FREE CAL, OCC ASPHC SPOT STAIN, TR PP TO OCC VUGLR POR, V/WK DULL YEL FLOR, NO VIS CUT

PAUL C. ON  
LS: LT BRN-TAN, PCC OFF WHT-CRM, LT GY & MOT IP, FRM-BRIT, OCC HD, MIC XLN-CR XLN, OCC ARG CMT, NO VIS POR; SH: GYT-DRK GY; SFT-FRM, OCCBRIT, PLTY-SPLTY, FIS, SL WXY LSTR, PRED SM TXT, CARB IP, OCC INTRBDD PYR; TRC FREE PYR

LS: PRED OFF WHT-CRM, LT GY & MOT IP, FRM-BRIT, OCC HD, MIC XLN-CR XLN, OCC ARG CMT, NO VIS POR; TRC SH

LS: LT BRN-TAN, OCC CRM-T GY & MOT, FRM -OCC HD, MIC XLN-CR XLN, OCC ARG CMT, NO VIS POR; SH: GYT-DRK GY; SFT-FRM, OCCBRIT, PLTY-SPLTY, FIS, SL WXY LSTR, PRED SM TXT, CARB IP, OCC INTRBDD PYR; TRC UNCONS SS

**STARK @ 3975' MD**

**SWOPE LS @ 3980' MD**

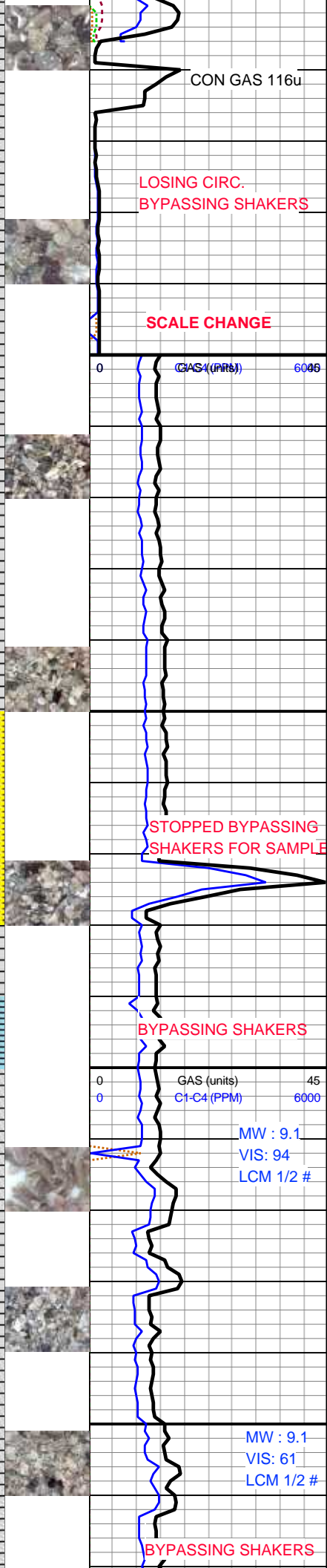
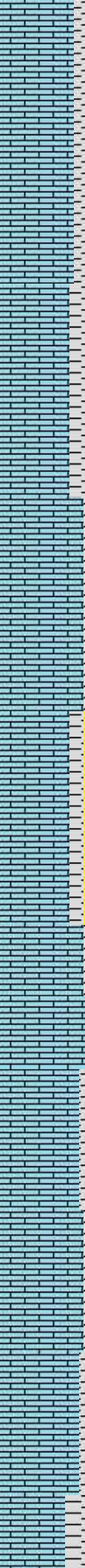
LS: CRM-LT TAN, OFF WHT-LT GY & MOT, FRM-HD, OCC BRIT, CR XLN-SL SUC, NO VIS POR; SH: PRED GY, FRM-BRIT, PLTY-SPLTY, FIS, SL CARB IP; NSFOC

**HUSHPUCKNEY @ 4003' MD**

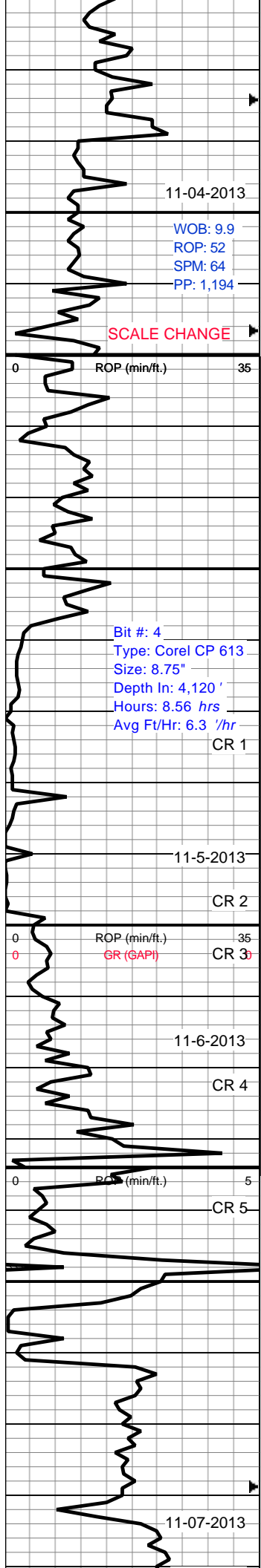
LS: CRM-LT TAN, GY & MOT, FRM-HD, OCC BRIT, CR XLN-SL SUC, NO VIS POR; SH: PRED GY, FRM-BRIT, PLTY-SPLTY, FIS, SL CARB IP; NSFOC

LS: CRM-LT TAN, GY & MOT, FRM-HD, OCC BRIT, CR XLN-SL SUC, NO VIS POR; SH: PRED GY, FRM-BRIT, PLTY-SPLTY, FIS, SL CARB IP; NSFOC

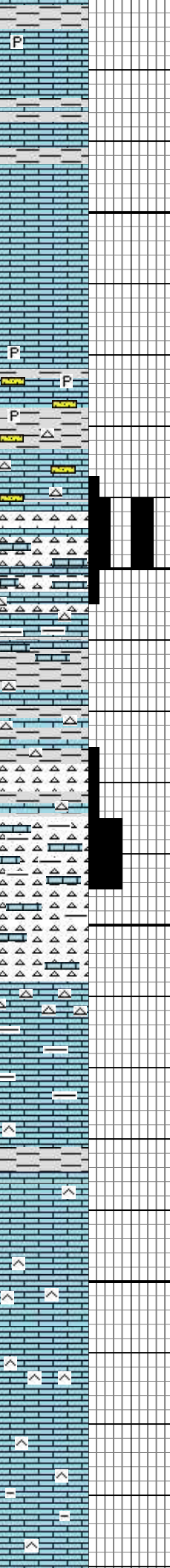
LS: CRM-LT TAN, GY & MOT, FRM-HD, OCC BRIT, CR XLN-SL SUC, NO VIS POR; SH: PRED GY, FRM-BRIT, PLTY-SPLTY, FIS, SL CARB IP; NSFOC







4,100  
4,150  
4,200  
4,250



GT, FRM-BRIT, PLTY-SPLTY, FIS TRC PYR

LS: CRM-LT TAN, GY & MOT, FRM-HD, OCC BRIT, CR XLN-SL SUC, NO VIS POR; SH: PRED LT GY-GY, FRM-BRIT, SB PLTY-SB BLKY, RTHY LSTR, SL RGH XTX, TRC PYR

**T.D. FOR CORES @ 4120' MD, 11-03-13 @ 11:42 HRS**

LS: CRM-LT TAN, OCC BRN-GY & MOT, FRM-HD, CR XLN, SM TXT; SH LT GY-GY, SFT, SB BLKY-PLTY, FIS-OCC SPLTY IP, SL RGH TXT, SLTY IP; CHT: OFF WHT-TRNSL, OFF TAN-AMBR, MC XLN, FRM-HD, OCC V HD NODULES, TRIP IP, TRC PP POR; TRC UNCONS SS

+++++

**CHEROKEE @ 4126' MD**

LS: CRM-LT TAN, OCC BRN-GY & MOT, FRM-HD, CR XLN, SM TXT; CHT: OFF WHT-TRNSL, OFF TAN-AMBR, OCC BLUSH HD CHAL CHT, MC XLN, FRM-HD, OCC V HD NODULES, TRIP IP, OCC ASPHLTC SPOT STAIN, TR PP POR, NO VIS FLOR

SH: LT GY TO GY, TR DK GY, SM TXT, TR SLTY, CHNKY-PLTY, MOD FRM TO SFT, OCC BRIT, TR CALC, OCC LS: OFF WHT-CRM, MOD FRM, PLTY, OCC SILC, OCC CHT: HRD OFF WHT-TRNSL, NO VIS FLOR

+++++

**MISSISSIPPIAN CHAT @ 4178' MD**

CHT: CRM-OFF WHT, OCC GY & MOT, FRM-HD, CONC FRAC, TRC PP POR; LS: CRM-LT TAN, OCC BRN-GY & MOT, FRM-HD, CR XLN, SM TXT; SH LT GY-GY, SFT, SB BLKY-PLTY, FIS-OCC SPLTY IP, SL RGH TXT, SLTY IP; SL LT YL FLUOR, NSOC

11-6-2013

LS: LY GY-GY, BRN, PRED HD, MC XLN-CR XLN, OCC HEALED FRAC PLANES, TRC CHT, TRC GN SH; TRC EMBDD PYR

4235', PULL FINAL CORE 11-6-2013 @ 13:21 HRS

**MISSISSIPPIAN LS @ 4235' MD**

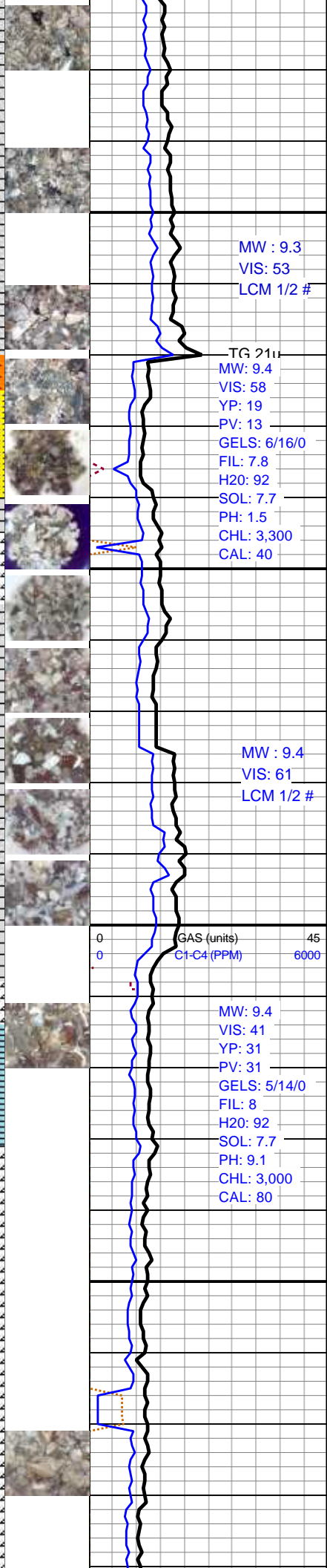
+++++

Bit #: 6  
Type: DSH 616D  
Size: 8.75  
Depth In: 7,235'  
Jets: 6x12s

LS: LT TAN TO LT GY, OCC OFF WHT TO CRM, MOD FRM TO OCC HRD, OCC CRMBLY, MICRO TO V/FN XLN, MSTLY PLTY, TR CHNKY, SM SIL CMT, TR DK SPOT STAIN, NO ODOR, NO FLOR, NO CUT, NO RES RING

11-07-2013

LS: LT TAN TO LT GY, OCC OFF WHT TO CRM, MOD FRM TO OCC HRD, OCC CRMBLY



MW : 9.3  
VIS: 53  
LCM 1/2 #

TG 211  
MW: 9.4  
VIS: 58  
YP: 19  
PV: 13  
GELS: 6/16/0  
FIL: 7.8  
H2O: 92  
SOL: 7.7  
PH: 1.5  
CHL: 3,300  
CAL: 40

MW : 9.4  
VIS: 61  
LCM 1/2 #

MW: 9.4  
VIS: 41  
YP: 31  
PV: 31  
GELS: 5/14/0  
FIL: 8  
H2O: 92  
SOL: 7.7  
PH: 9.1  
CHL: 3,000  
CAL: 80

WOB: 11.8  
SPM: 63  
PP: 1,043

4,300  
4,350  
4,400  
4,450  
4,500

OCC HRD, OCC CRMBLY,  
MICRO TO V/FN XLN, MSTLY  
PLTY, TR CHNKY, SM ARG CMT,  
OCC SIL CMT, TR DK SPOT  
STAIN, NO ODOR, NO FLOR, NO  
CUT, NO RES RING

LS: LT TAN TO LT GY, OCC OFF  
WHT TO CRM, MOD FRM TO  
OCC HRD, OCC CRMBLY,  
MICRO TO V/FN XLN, MSTLY  
PLTY, TR CHNKY, SM ARG CMT,  
OCC SIL CMT, TR DK SPOT  
STAIN, NO VIS FLOR

+++++

**CHATTANOOGA SHALE @ 4339'**

SH: LT GY TO GY, TR DK GY, SM  
TXT, CHNKY-PLTY, MOD FRM TO  
SFT, OCC BRIT, TR CALC, OCC  
PYR

SH: LT GY TO GY, TR DK GY, SM  
TXT, CHNKY-PLTY, MOD FRM TO  
SFT, OCC BRIT, TR CALC, OCC  
PYR

+++++

**VIOLA LIMESTONE @ 4384'**

+++++

LS: LT TAN TO CRM, OCC OFF  
WHT TO WHT, MOD FRM TO  
FRM, OCC CRMBLY, MICRO TO  
V/FN XLN, MSTLY PLTY, TR  
CHNKY, OCC ARG CMT, TR  
WHT ANG HRD CHT, TR DK  
SPOT STAIN, OCC PP POR, TR  
PALE YEL FLOR, NO VIS CUT  
PAUL C. ON

LS: BWN-LT TAN, MC  
XLN-CR-XLC, PRED FRM, RGH  
TXT; SS: PRED LT BWN,  
CRM-OFF WHT IP, VFG, SB  
RND-SBANG, P SRTD, MOD  
CMNT, CALC

LS: BWN-LT TAN, MC  
XLN-CR-XLC, PRED FRM, RGH  
TXT, SANDY; DOL:LT BRN-TAN;  
CRM-OFF WHT & MOT IP, MC  
XLN-SUC, FRM-BRIT, OCC HD,  
OCC ARG, RGH TXT; TRC CHT

SS: OFF WHT, BRN, OCC  
TRNSL, F GR, MOD-W SRTD,  
MOD CONS, SL CALC; LS:  
BWN-LT TAN, MC XLN-CR XLC,  
FRM, RGH TXT, SANDY; DOL: LT  
BRN-TAN, CRM-LT GY, MC  
XLN-SUC, FRM-HD, RGH TXT;  
TRC GY SH; FREE PYR; 30% LT  
YI FI UOR

+++++

**SIMPSON SH @ 4489' MD**

SH: LT GY-GY, PRED SFT,  
PLTY-FIC, SPLTY IP, SL WXY  
-RTHY LSTR, SM TXT, SL WTR  
SNS; TRC LS



MW : 9.3  
VIS: 51

WOB: 16.7  
ROP: 27.1  
SPM: 63  
PP: 1,074

ROP (in ft)  
GR (GAPI)

GAS (units) 45  
C1-C4 (PPM) 6000

STOPPED  
BYPASSING  
SHAKERS

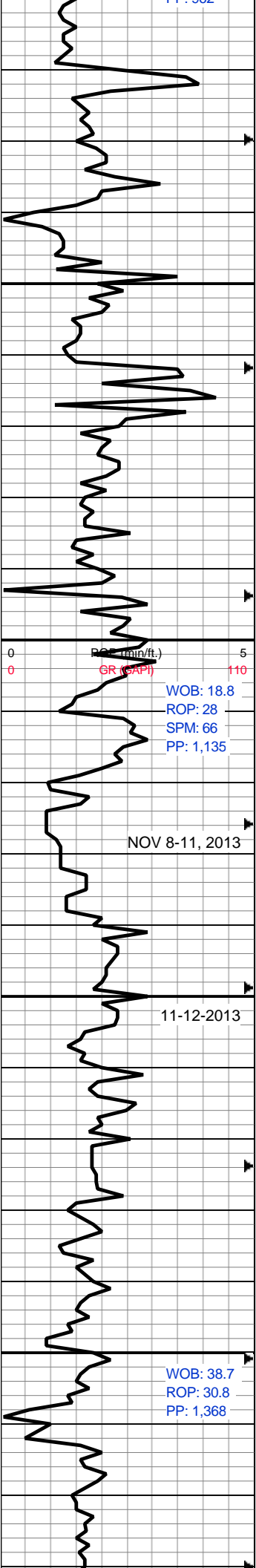
BUTANE TEST @ TRAP 68u

BG 15u

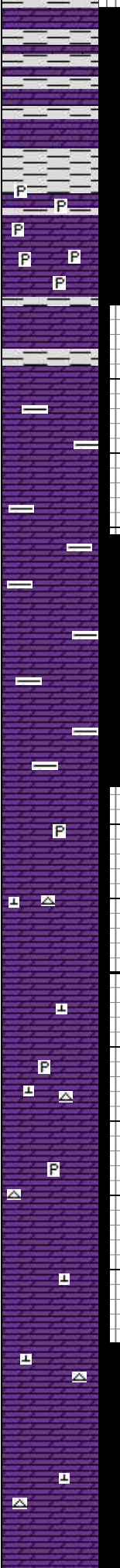
MW : 9.4  
VIS: 55

WOB: 16.2  
ROP: 6.4  
SPM: 60  
PP: 962





4,550  
4,600  
4,650  
4,700



DOL: CRM-LT TAN, OCC LT BRN, SUC, CR XLN, PRED LS RGH TXT, OCC SM TXT, SL TRC VIS POR; SH: LT GY-GY, PRED SFT, PLTY-FIC, SPLTY IP, SL WXY -RTHY LSTR, SM TXT, SL WTR SNS; TRC LS; 70% LT GLD FLUOR

**ARBUCKLE @ 4550' MD**

+++++  
DOL: CRM-LT TAN, OCC LT BRN, SUC, CR XLN, SL RGH TXT, OCC SM TXT, SL TRC VIS POR; SH: LT GY, GN, OCC BLK, PRED SFT, PLTY-FIC, SPLTY IP, SL WXY -RTHY LSTR, SM TXT, SL WTR SNS, INTRBD PYR; TRC FREE PYR; 30% LT YL FLUOR

DOL: PRED CRM-OFF WHT, OCC LT BRN, CHKY, OCC SUC, CR XLN, SL RGH TXT, OCC SM TXT, SL TRC VIS POR; TRC SH; 50% LT YL FLUOR

DOL: PRED CRM-OFF WHT, OCC LT BRN, CHKY, OCC SUC, CR XLN, SL RGH TXT, OCC SM TXT, SL TRC VIS POR; TRC SH; 30% LT YL FLUOR

**T.D. @ 4625' ON 11-7-2013 @ 14:50 HRS FOR LOGS AND CASING**

**E-LOG TD 10' HIGHER THAN RIG DEPTH**

Bit #: 7  
Type: Smith PDC  
Size: 63,125  
Depth In: 4,625'  
Jets: 5x14s

DOLO: OFF WHT TO CRM, TR GY, TR LT BRN, OCC TRANSL, MOD FRM TO FRM, OCC HRD, V/FN TO FN XLN, CHNKY, TR PLTY, TR MASS PYR, OCC FREE CALC, OCC OPQ TO WHT OCC GY BLCKY ANG CHERT, OCC ASPHLT SPOT STAIN, NO ODOR, PP POR, OCC VUG POR, SCAT PAL YEL FLOR, NO VIS CUT

DOLO: OFF WHT TO CRM, TR GY, TR LT TAN, MOD FRM TO FRM, OCC HRD, V/FN TO FN XLN, CHNKY, TR PLTY, OCC FREE CALC, OCC OPQ TO WHT OCC GY BLCKY ANG CHERT, OCC ASPHLT SPOT STAIN, NO ODOR, PP POR, OCC VUG POR, SCAT PAL YEL FLOR, NO VIS CUT



BG 14u

MW : 9.0  
VIS: 52

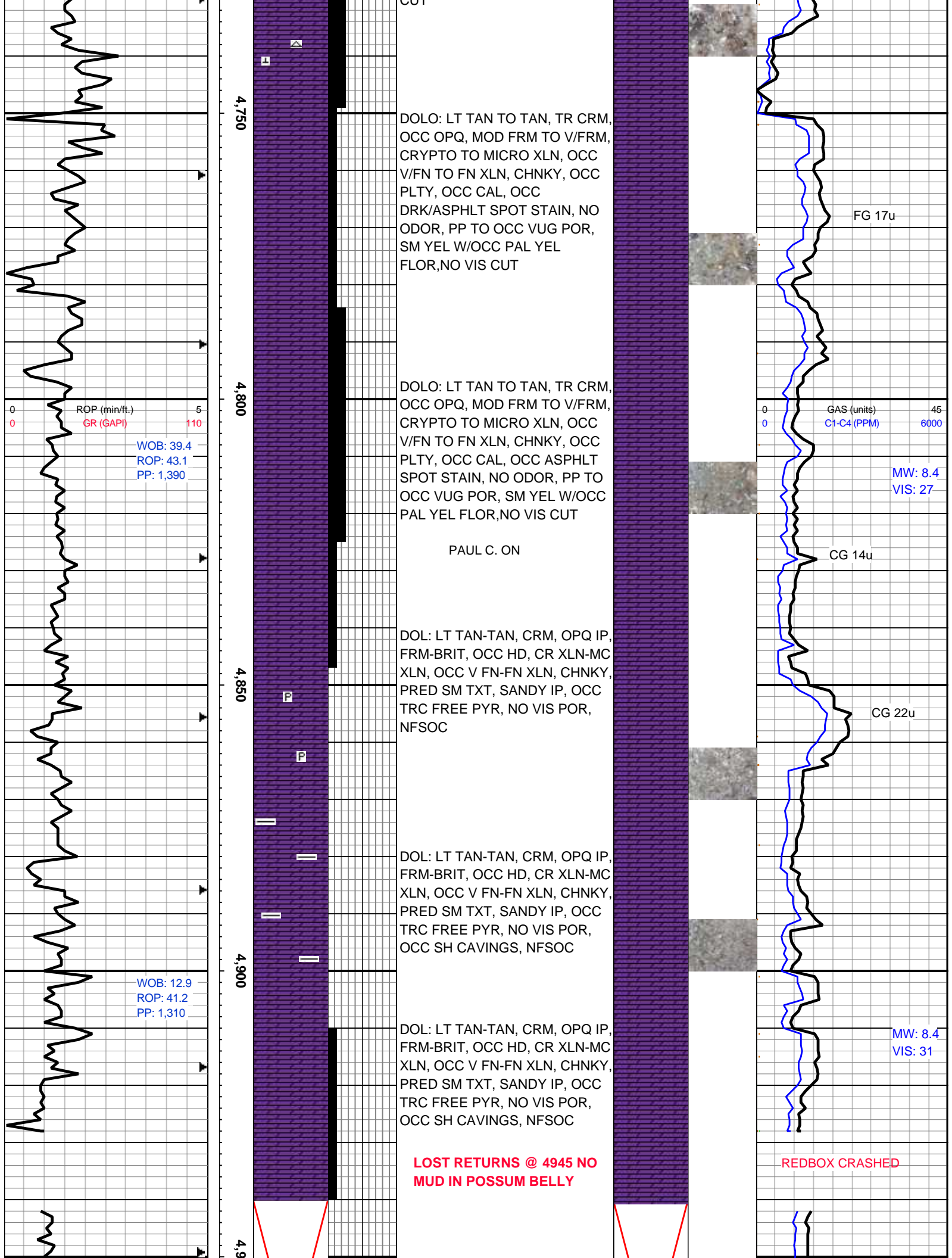
GAS (units) 45  
C1-C4 (PPM) 6000

Nuke Redbox and Calibrate

CG 13u

FG 17u





4,750

DOLO: LT TAN TO TAN, TR CRM,  
 OCC OPQ, MOD FRM TO V/FRM,  
 CRYPTO TO MICRO XLN, OCC  
 V/FN TO FN XLN, CHNKY, OCC  
 PLTY, OCC CAL, OCC  
 DRK/ASPHLT SPOT STAIN, NO  
 ODOR, PP TO OCC VUG POR,  
 SM YEL W/OCC PAL YEL  
 FLOR,NO VIS CUT

FG 17u

4,800

ROP (min/ft.) 5  
 GR (GAPI) 110  
 WOB: 39.4  
 ROP: 43.1  
 PP: 1,390

DOLO: LT TAN TO TAN, TR CRM,  
 OCC OPQ, MOD FRM TO V/FRM,  
 CRYPTO TO MICRO XLN, OCC  
 V/FN TO FN XLN, CHNKY, OCC  
 PLTY, OCC CAL, OCC ASPHLT  
 SPOT STAIN, NO ODOR, PP TO  
 OCC VUG POR, SM YEL W/OCC  
 PAL YEL FLOR,NO VIS CUT

GAS (units) 45  
 C1-C4 (PPM) 6000

MW: 8.4  
 VIS: 27

PAUL C. ON

CG 14u

4,850

DOL: LT TAN-TAN, CRM, OPQ IP,  
 FRM-BRIT, OCC HD, CR XLN-MC  
 XLN, OCC V FN-FN XLN, CHNKY,  
 PRED SM TXT, SANDY IP, OCC  
 TRC FREE PYR, NO VIS POR,  
 NFSOC

CG 22u

4,900

DOL: LT TAN-TAN, CRM, OPQ IP,  
 FRM-BRIT, OCC HD, CR XLN-MC  
 XLN, OCC V FN-FN XLN, CHNKY,  
 PRED SM TXT, SANDY IP, OCC  
 TRC FREE PYR, NO VIS POR,  
 OCC SH CAVINGS, NFSOC

WOB: 12.9  
 ROP: 41.2  
 PP: 1,310

DOL: LT TAN-TAN, CRM, OPQ IP,  
 FRM-BRIT, OCC HD, CR XLN-MC  
 XLN, OCC V FN-FN XLN, CHNKY,  
 PRED SM TXT, SANDY IP, OCC  
 TRC FREE PYR, NO VIS POR,  
 OCC SH CAVINGS, NFSOC

MW: 8.4  
 VIS: 31

**LOST RETURNS @ 4945 NO  
 MUD IN POSSUM BELLY**

**REDBOX CRASHED**

4,9

MW: 8.5  
VIS: 28  
YP: 2  
PV: 3  
GELS: 1/2/0  
FIL: 99  
H2O: 98.5  
SOL: 1.2  
PH: 8.5  
CHL: 1,800  
CAL: 200

WOB: 12.3  
ROP: 44  
PP: 1,080

ROP (min/ft.) 5  
GR (GAPI) 110

**PARTIAL RETURNS, POOR  
SAMPLE QUALITY**

DOL: LT TAN-TAN, CRM, OPQ IP,  
PRED SFT, OCC FRM-BRIT, CR  
XLN-MC XLN, OCC V FN-FN XLN,  
CHNKY, PRED SM TXT, SANDY  
IP, TRC INTG POR, NFSOC

DOL: LT TAN-TAN, CRM, OPQ IP,  
PRED SFT, OCC FRM-BRIT, CR  
XLN-MC XLN, OCC V FN-FN XLN,  
CHNKY, PRED SM TXT, SANDY,  
TRC INTG POR, SL LT YL  
FLUOR, NSOC

DOL: LT TAN-TAN, CRM, OPQ IP,  
PRED SFT, OCC FRM-BRIT, CR  
XLN-MC XLN, OCC V FN-FN XLN,  
CHNKY, PRED SM TXT, SANDY,  
TRC INTG POR, SL LT YL  
FLUOR, NSOC

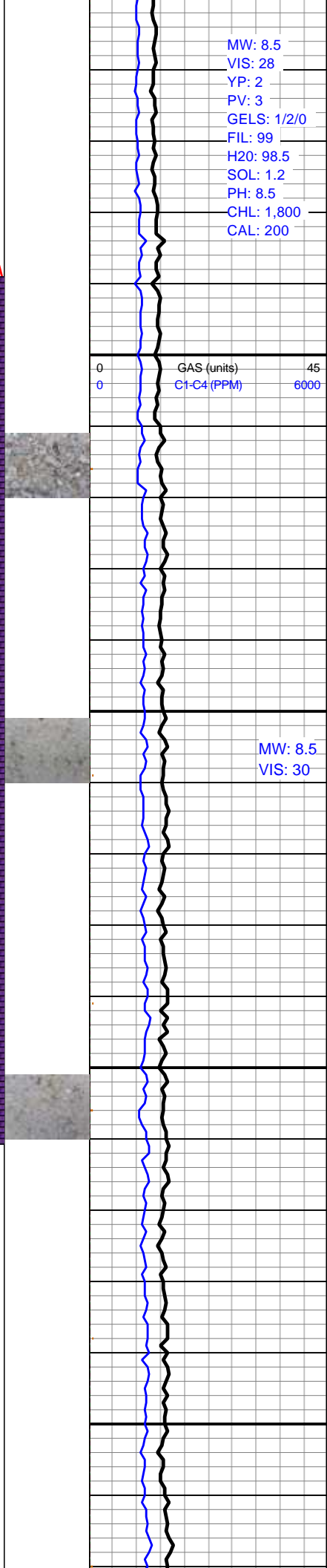
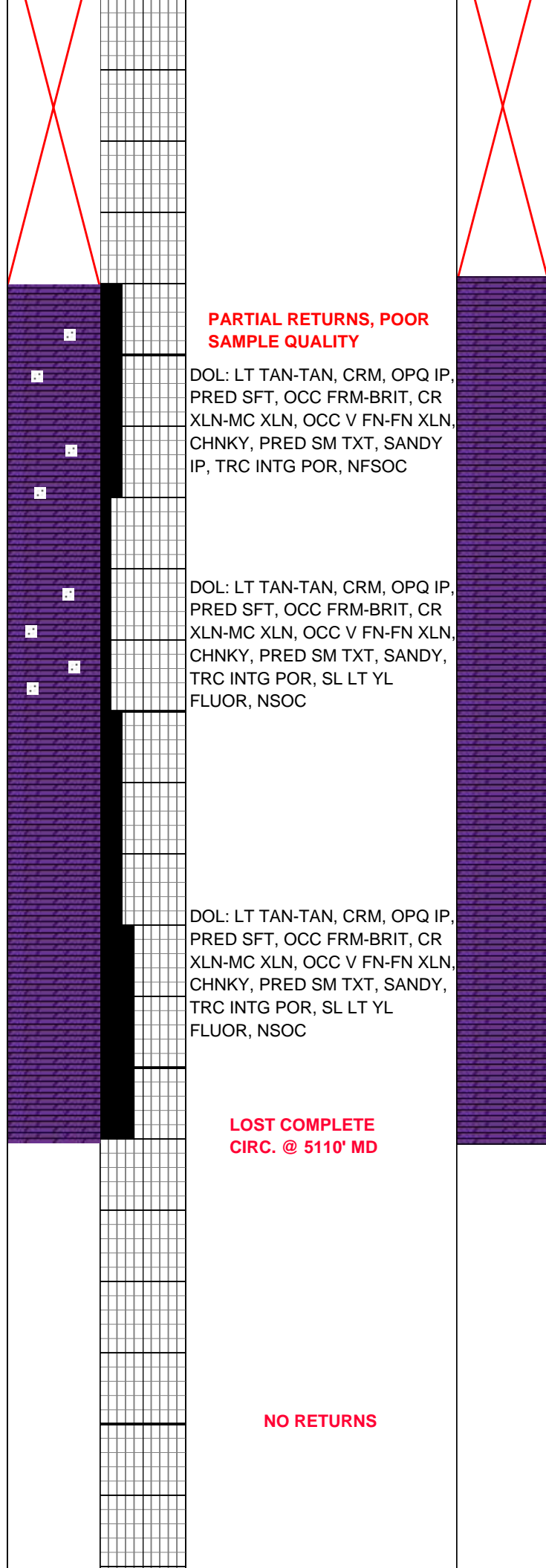
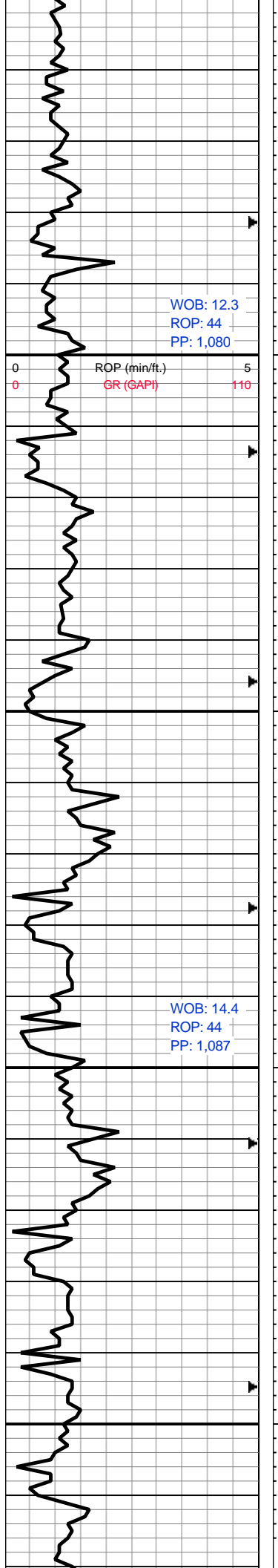
**LOST COMPLETE  
CIRC. @ 5110' MD**

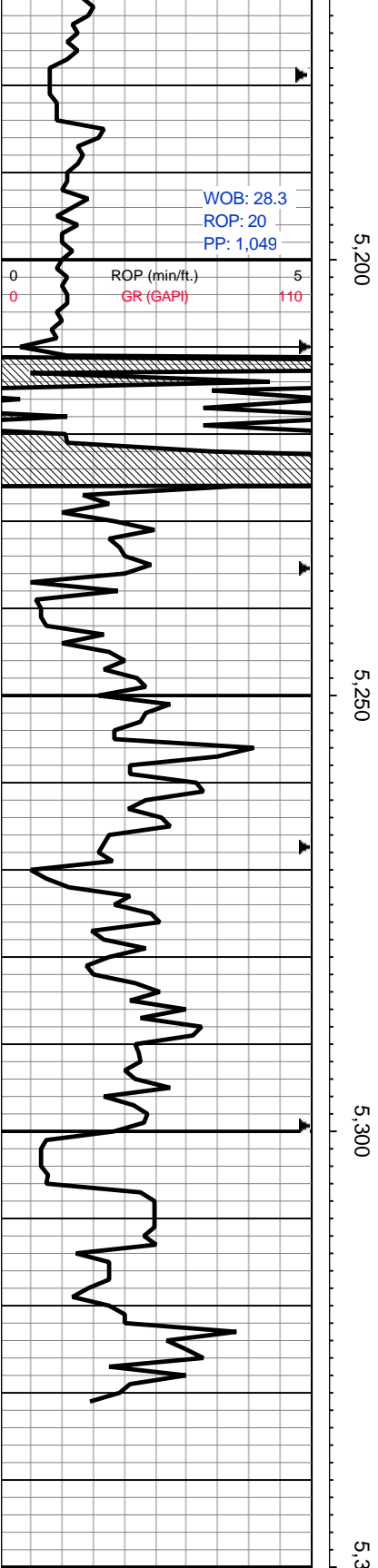
**NO RETURNS**

GAS (units) 45  
C1-C4 (PPM) 6000

MW: 8.5  
VIS: 30

50  
5,000  
5,050  
5,100  
5,150





**NO RETURNS**

**TOOH FOR NEW  
BIT @ 5222' MD**

Bit #: 8  
 Type: Helios  
 Size: 6.12  
 Depth In: 5,222 '  
 S/N: D159258

**NO RETURNS**

**THE GREENGROUP 14A  
 SWD REACHED FINAL TD  
 @ 5331' ON 11-13-2013 @  
 12:00 hrs**

8 SAMPLE BOXES, 2 WITH CORE CUTTINGS

**THANK YOU FOR USING  
 EMPIRICA SURFACE  
 LOGGING**

