



7136 South Yale Avenue, Suite 414

Tulsa, Oklahoma 74136-6378

phone 918.925.9739

fax 866.534.4559

WWW.HZMUD.COM

Customer Information

Operator: Noble Energy Inc  
1625 Broadway  
Suite 2200  
Denver, Colorado 80202

Geologist: Cassidy Miller  
Noble Energy Inc

Mud Logging Details

Logger: Ryan Bless & Casey  
Sensecqua  
Log Interval: 2500' MD to 6800' MD  
Start Date: June 10, 2013  
Release Date: June 16, 2013

Well Information

Well Name: Wells Ranch AE05-67HN

Location: 6-6N-62W  
1374' FNL, 65' FEL

County: Weld  
State: Colorado

Drilling Rig: H&P 321  
Total Depth: 11166' MD  
TD Date: June 16, 2013  
Formation: Niobrara C Chalk  
KB Elevation: 4963'  
GR Elevation: 4933'  
API Number: 05-123-36977

ROCK TYPES

- Anhy
- Bent
- Brec
- Cht
- Clyst
- Coal
- Congl

- Dol
- Gyp
- Igne
- Chk
- Lmst
- Meta
- Mrlst

- Salt
- Shale
- Shcol
- Siltysh
- Sltst
- Ss
- Till

- gw
- lmywash
- ogw
- olmywash
- oshly gw
- shly gw
- sdygw

- hvycrbsh
- nosmpl
- Lsdetrit
- sltst
- sdy sh
- Cement

Drill Depth v. Time		Survey Data	Photographs	Lithology %	Lithology	Geological Descriptions	Total Gas, C1-C4	
ROP (Ft/Hr)	Gamma (API)						TG (units)	C1-C4 (units)
0	550					NOBLE ENERGY INC WELLS RANCH AE05-67HN 6-6N-62W 1374' FNL, 65' FEL WELD CO., CO H&P 321 LOGGERS: RYAN BLEESS CASEY SENSECQUA CALLED OUT BY COMPANY MAN ON 6/10/2013 COMMENCED LOGGING @ 2500'	-125	1125
SLIDE=RED ROTATE=WHITE  ROP SCALE: 0 TO 550  GAMMA SCALE: 0 TO 300						CONNECTIONS MARKED WITH RED TRIANGLES  GAS SCALE: -125u TO 1125u (125 UNITS/DIVISION)  DRILLING ON WBM		

12:01 AM  
6/11/2013

WOB 15.8K  
PP 3112  
RPM 60  
SPM 67/67

MD 2506 TVD 2505.96  
INC 1.05 AZ 49.43  
VS 1.35

2500

2550

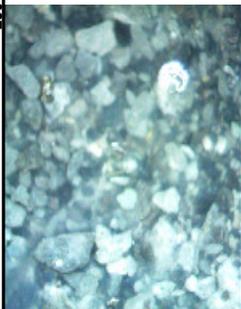
2600

2650

2700

MD 2601 TVD 2600.93  
INC 1.92 AZ 48.62  
VS 3026

MD 2696 TVD 2695.78  
INC 4.3 AZ 62.92  
VS 7.72



MD @ 5:30PM ON 6/11/2013 W/BIT  
#1 8.75" SMITH MDIZ516 S/N  
JG9378 IN @ 631' MD

### PIERRE

CAME IN BEFORE LOGGING  
DEPTH

SS: 70% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, SILTY,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SS: 80% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, SILTY,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SS: 70% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, SILTY,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SS: 70% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, SILTY, INTGR POR, NO  
STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG

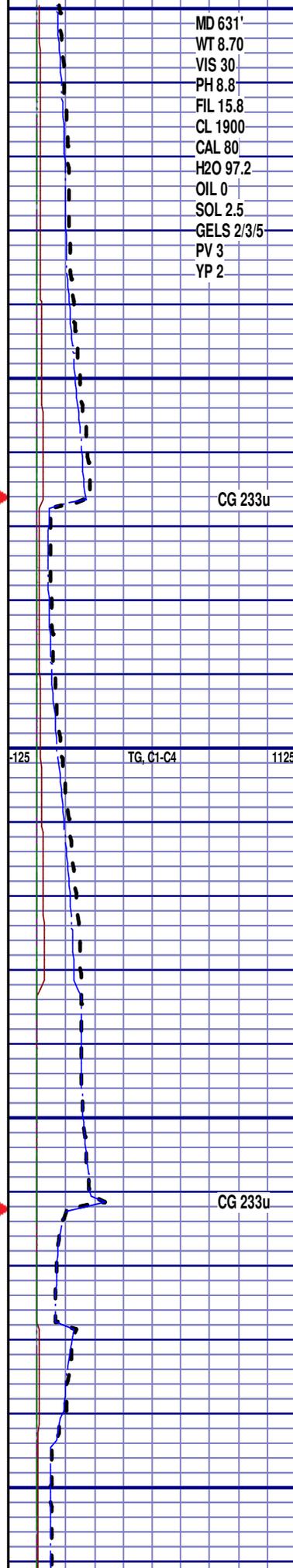
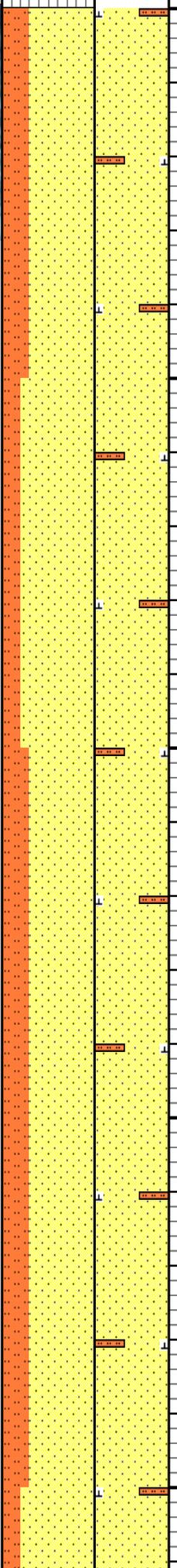
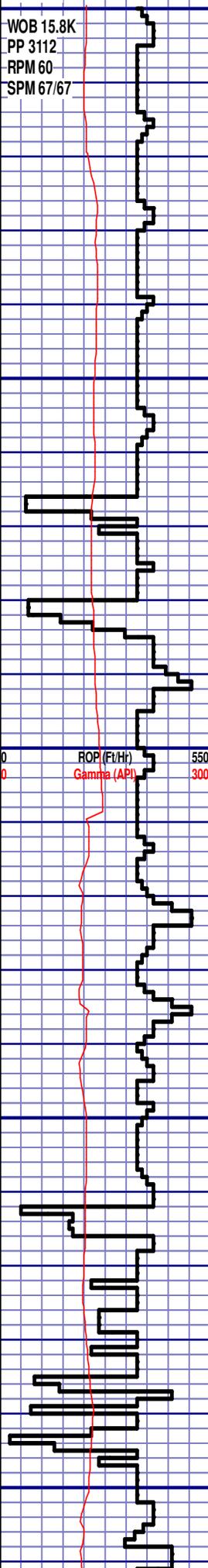
MD 631'  
WT 8.70  
VIS 30  
PH 8.8  
FIL 15.8  
CL 1900  
CAL 80  
H2O 97.2  
OIL 0  
SOL 2.5  
GELS 2/3/5  
PV 3  
YP 2

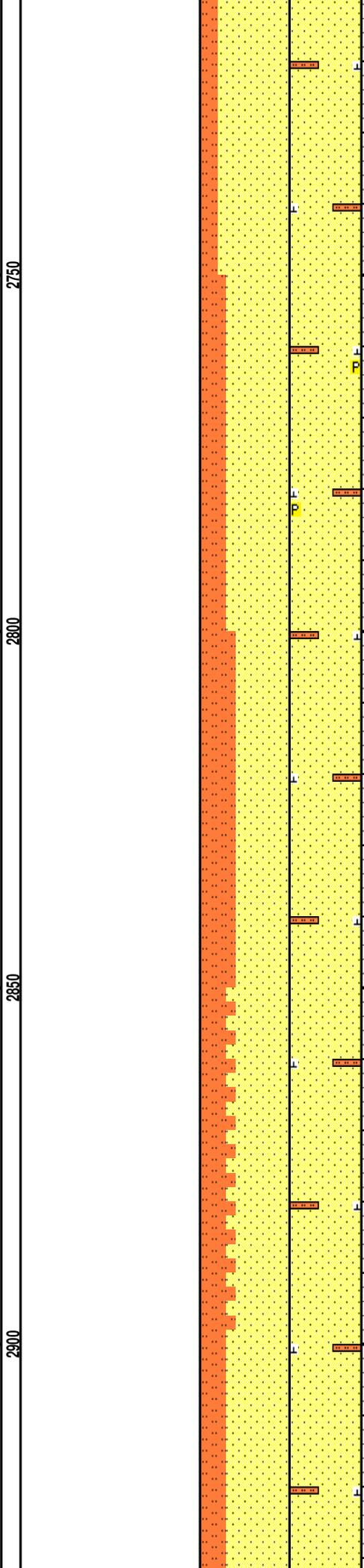
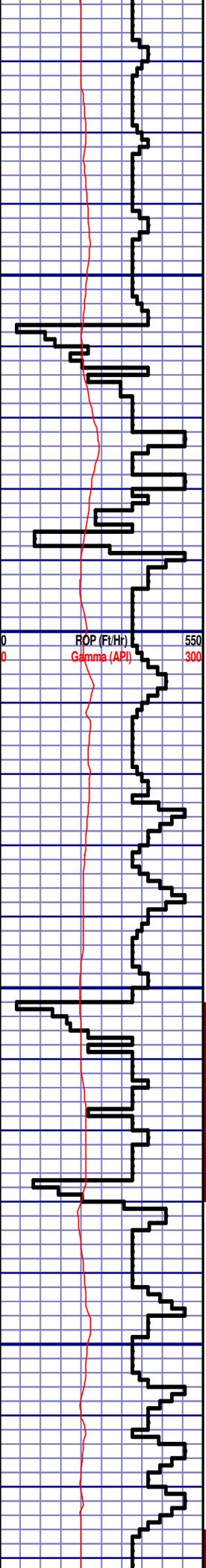
CG 233u

-125 TG, C1-C4 1125

CG 233u

ROR (Ft/Hr) 550  
Gamma (API) 300



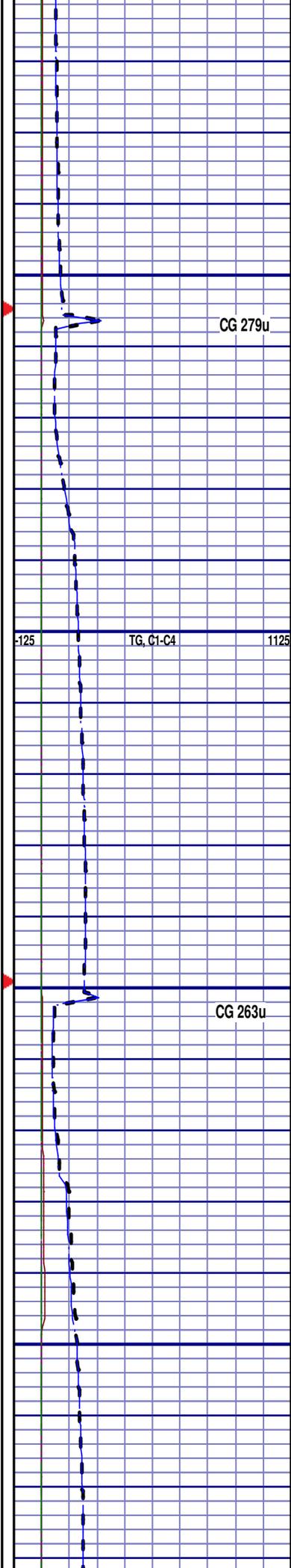


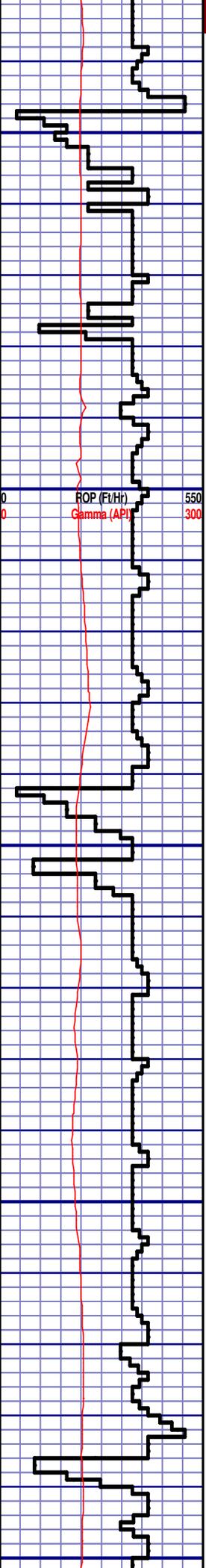
SS: 80% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, SILTY, INTGR POR, NO  
STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG

SS: 70% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, FREE PYR, SILTY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SS: 60% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, SILTY, INTGR POR, NO  
STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG

SS: 65% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, SILTY, INTGR POR, NO  
STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG

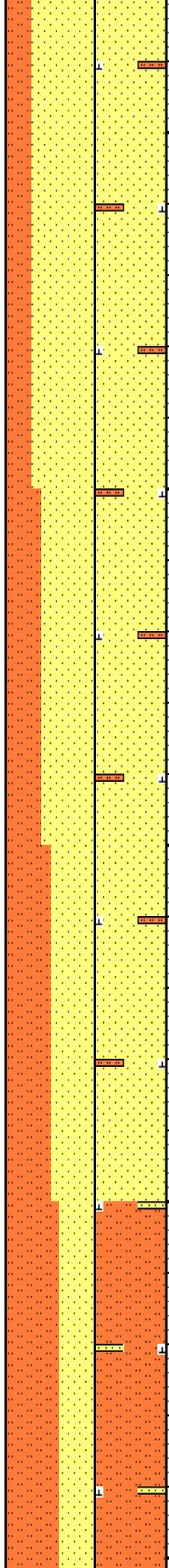




MD 2980 TVD 2976.68  
 INC 11.85 AZ 66.56  
 VS 42.28

MD 3075 TVD 3069.43  
 INC 13.13 AZ 67.69  
 VS 65.49

2950  
 3000  
 3050  
 3100  
 3150



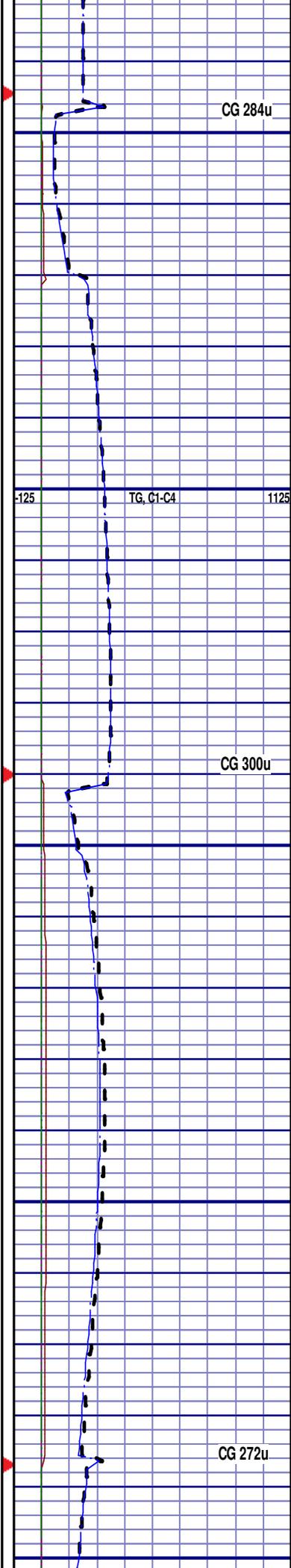
SS: 70% LTBL - MODBN - SCAT  
 MODGN, PRED LSEY TO MOD  
 CONS, MED TO CRS GRN, ANG,  
 MODY SRTD, CALC CMT, IMBD RK  
 FRAGS, SILTY, INTGR POR, NO  
 STN, NO FLOR, NO O FLOR, NO  
 CUT, NO RNG

SS: 70% LTBL - MODBN - SCAT  
 MODGN, PRED LSEY TO MOD  
 CONS, MED TO CRS GRN, ANG,  
 MODY SRTD, CALC CMT, IMBD RK  
 FRAGS, SILTY, INTGR POR, NO  
 STN, NO FLOR, NO O FLOR, NO  
 CUT, NO RNG

SS: 60% LTBL - LTGY, PRED LSEY  
 TO MOD  
 CONS, MED TO CRS GRN, ANG,  
 MODY SRTD, CALC CMT, IMBD RK  
 FRAGS, SILTY, INTGR POR, NO  
 STN, NO FLOR, NO O FLOR, NO  
 CUT, NO RNG

SS: 50% LTBL - LTGY, PRED LSEY  
 TO MOD  
 CONS, MED TO CRS GRN, ANG,  
 MODY SRTD, CALC CMT, IMBD RK  
 FRAGS, SILTY, INTGR POR, NO  
 STN, NO FLOR, NO O FLOR, NO  
 CUT, NO RNG

SLTST: 60% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, SANDY, INTGR  
 POR, NO STN, NO FLOR, NO O  
 FLOR, NO CUT, NO RNG

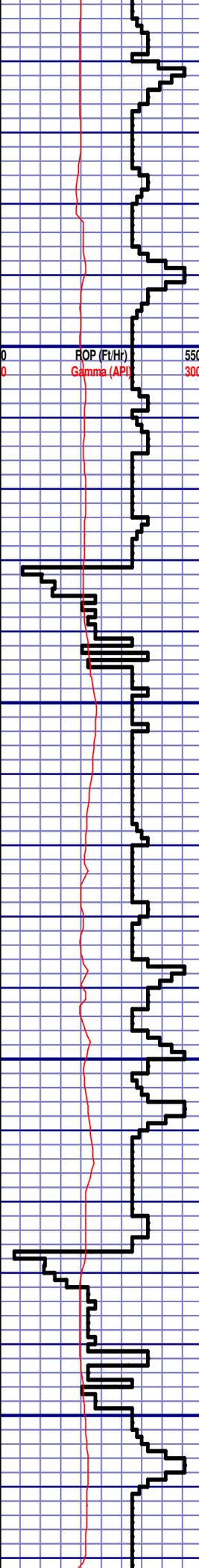


CG 284u

CG 300u

CG 272u

-125 TG, C1-C4 1125

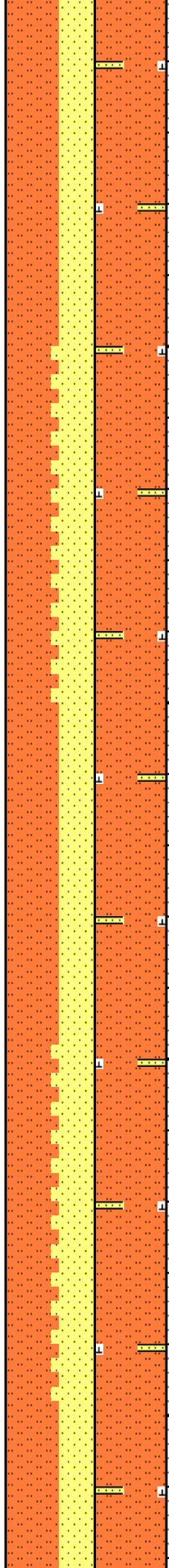


MD 3170 TVD 3161.9  
INC 13.38 AZ 67.04  
VS 85.89

MD 3265 TVD 3254.82  
INC 10.55 AZ 64.05  
VS 104.12

MD 3360 TVD 3348.62  
INC 7.64 AZ 62.85  
VS 117.8

3200  
3250  
3300  
3350

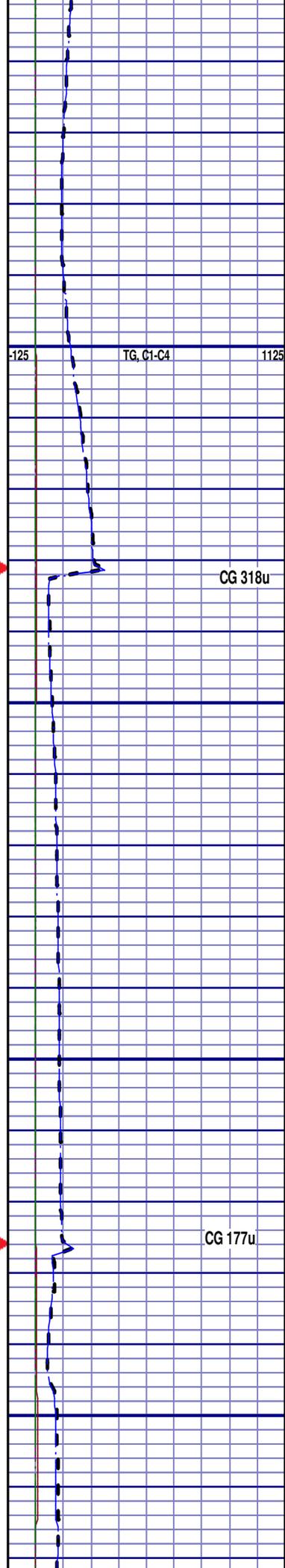


SLTST: 60% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SLTST: 55% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SLTST: 60% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

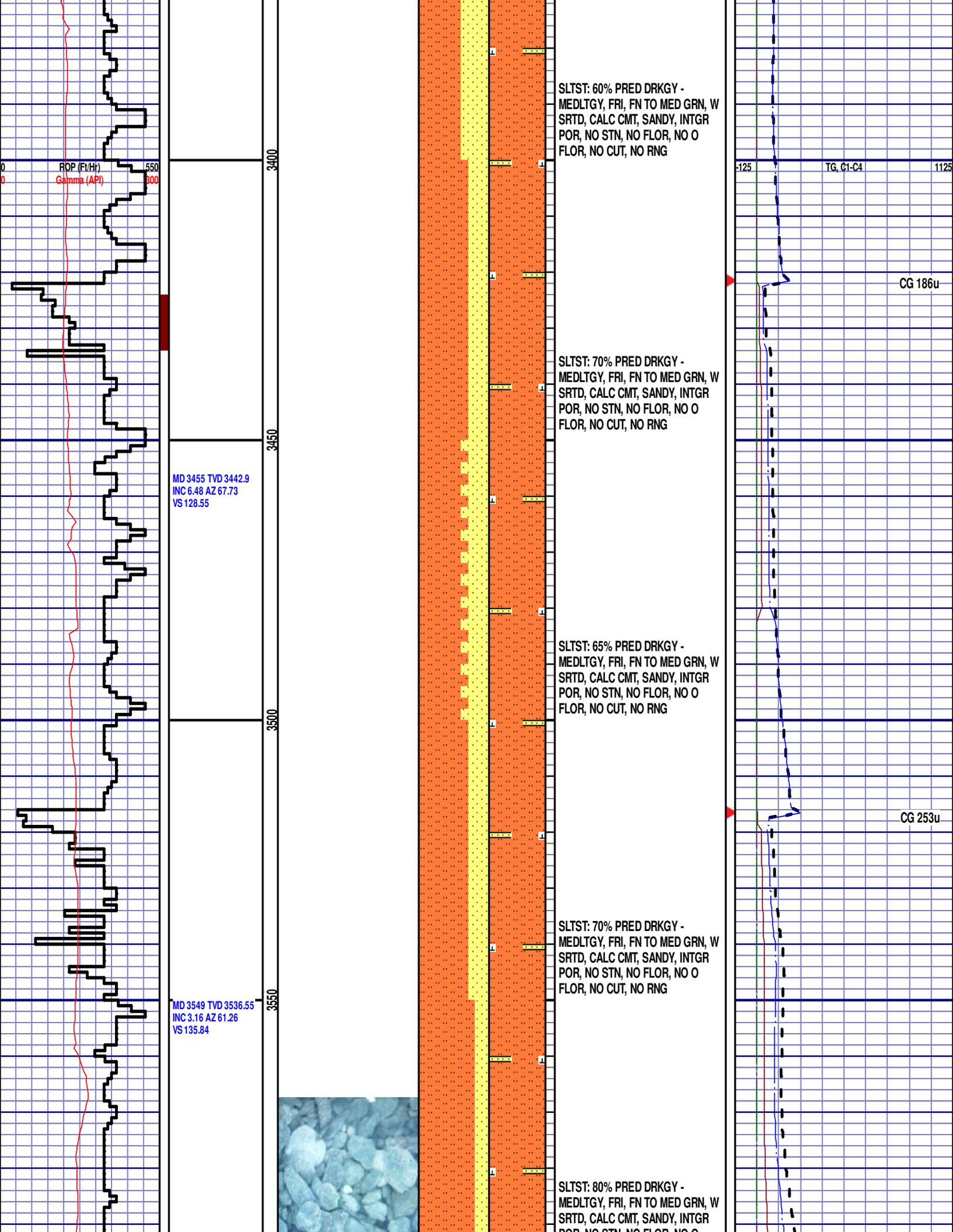
SLTST: 55% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

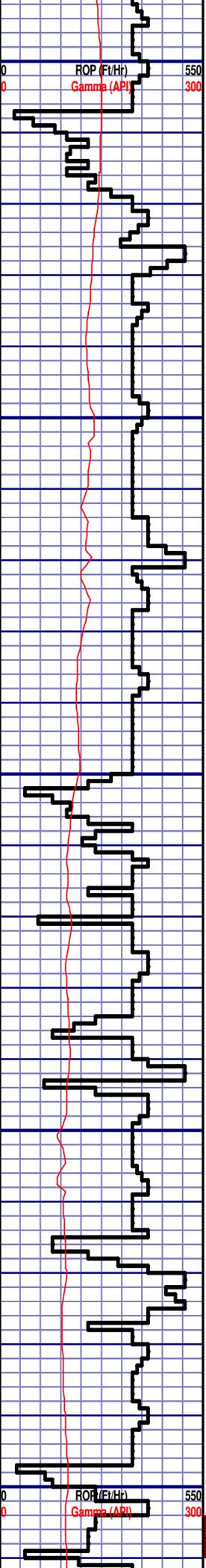


1125 TG, C1-C4 1125

CG 318u

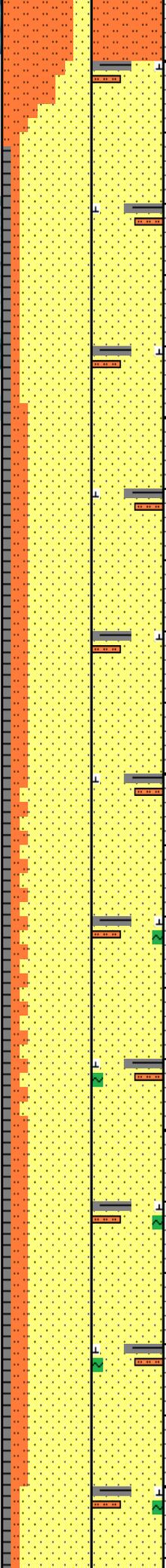
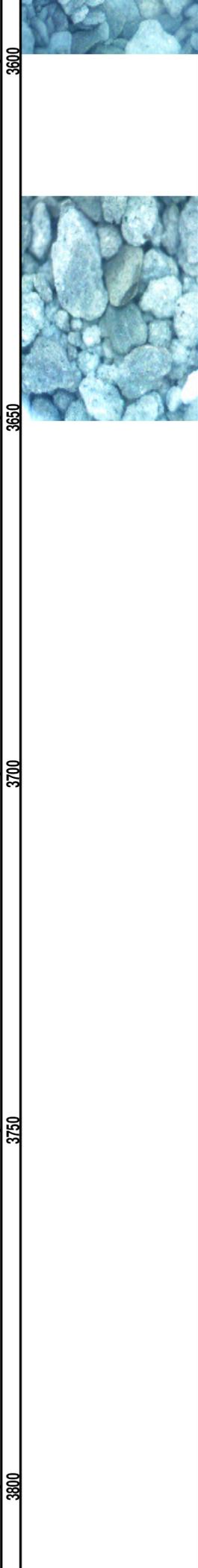
CG 177u





MD 3644 TVD 3631.46  
INC 2.01 AZ 59.45  
VS 139.65

MD 3739 TVD 3726.42  
INC 1.18 AZ 21.8  
VS 141.51



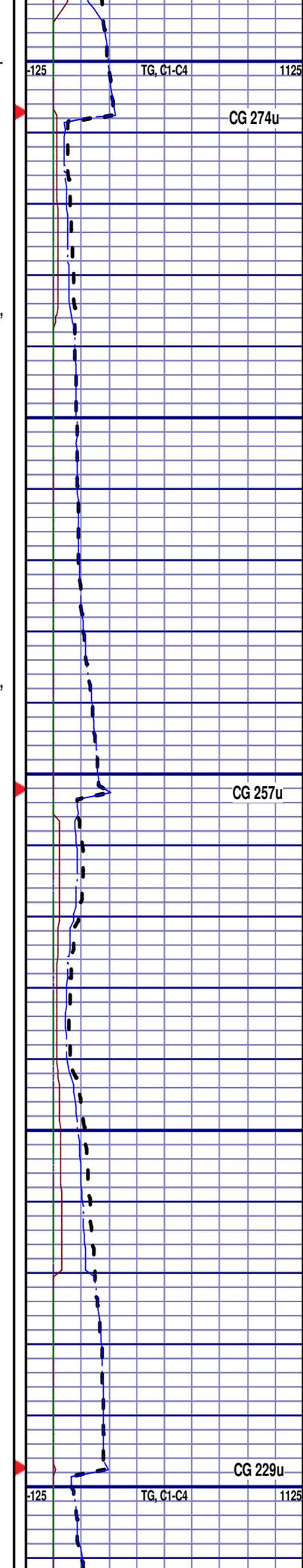
**PARKMAN**  
3600' MD 3587' TVD

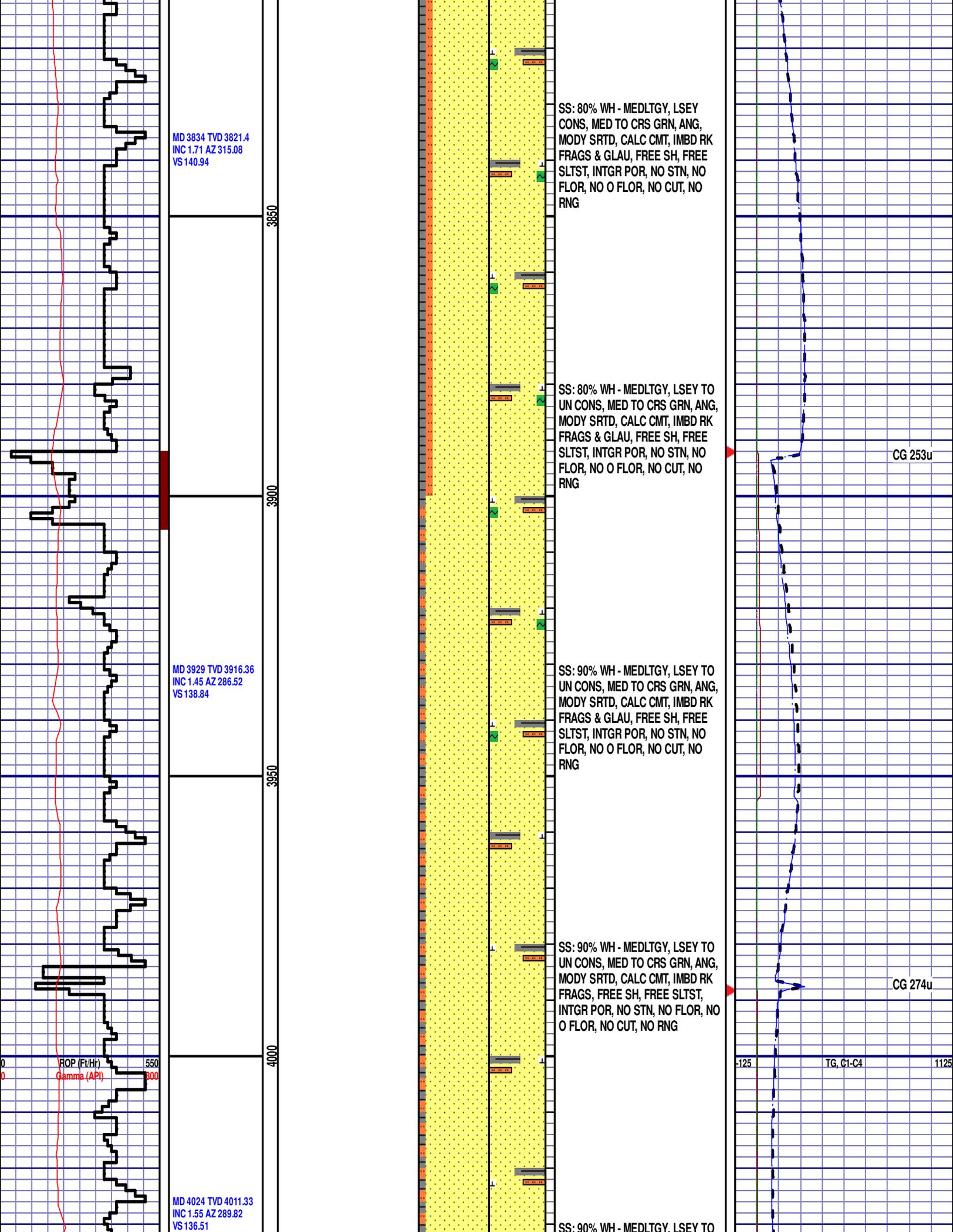
SS: 80% MEDLTGY, PRED LSEY TO MOD CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, FREE SH, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SS: 70% MEDLTGY, PRED LSEY TO MOD CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, FREE SH, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SS: 75% WH - MEDLTGY, LSEY CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS & GLAU, FREE SH, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SS: 70% WH - MEDLTGY, LSEY CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS & GLAU, FREE SH, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG





MD 3834 TVD 3821.4  
 INC 1.71 AZ 315.08  
 VS 140.94

3850

SS: 80% WH - MEDLTGY, LSEY  
 CONS, MED TO CRS GRN, ANG,  
 MODY SRTD, CALC CMT, IMBD RK  
 FRAGS & GLAU, FREE SH, FREE  
 SLTST, INTGR POR, NO STN, NO  
 FLOR, NO O FLOR, NO CUT, NO  
 RNG

MD 3929 TVD 3916.36  
 INC 1.45 AZ 286.52  
 VS 138.84

3900

SS: 80% WH - MEDLTGY, LSEY TO  
 UN CONS, MED TO CRS GRN, ANG,  
 MODY SRTD, CALC CMT, IMBD RK  
 FRAGS & GLAU, FREE SH, FREE  
 SLTST, INTGR POR, NO STN, NO  
 FLOR, NO O FLOR, NO CUT, NO  
 RNG

CG 253u

ROP (Ft/Hr) 550  
 Gamma (API) 800

3950

SS: 90% WH - MEDLTGY, LSEY TO  
 UN CONS, MED TO CRS GRN, ANG,  
 MODY SRTD, CALC CMT, IMBD RK  
 FRAGS & GLAU, FREE SH, FREE  
 SLTST, INTGR POR, NO STN, NO  
 FLOR, NO O FLOR, NO CUT, NO  
 RNG

MD 4024 TVD 4011.33  
 INC 1.55 AZ 289.82  
 VS 136.51

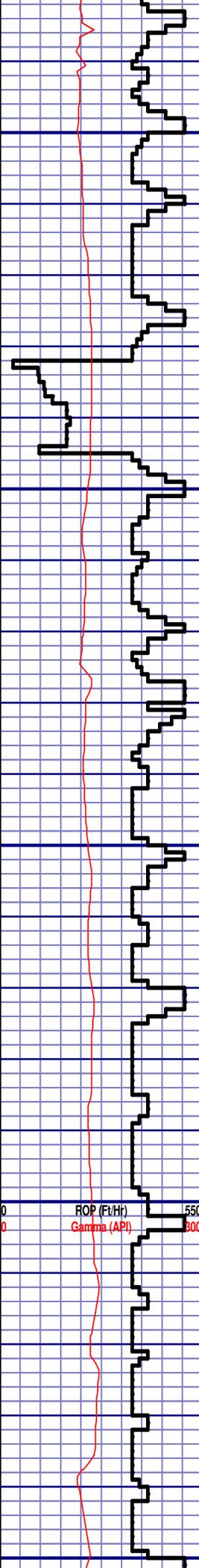
4000

SS: 90% WH - MEDLTGY, LSEY TO  
 UN CONS, MED TO CRS GRN, ANG,  
 MODY SRTD, CALC CMT, IMBD RK  
 FRAGS, FREE SH, FREE SLTST,  
 INTGR POR, NO STN, NO FLOR, NO  
 O FLOR, NO CUT, NO RNG

CG 274u

-125 TG, C1-C4 1125

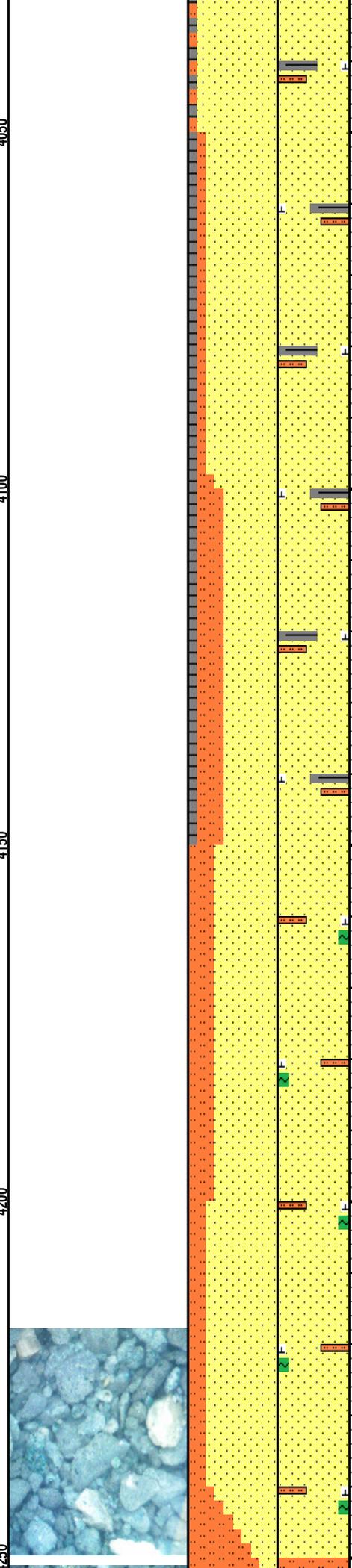
SS: 90% WH - MEDLTGY, LSEY TO



4050  
4100  
4150  
4200  
4250

MD 4119 TVD 4106.31  
INC 0.9 AZ 292.72  
VS 134.64

MD 4214 TVD 4201.3  
INC 0.36 AZ 318.55  
VS 133.78



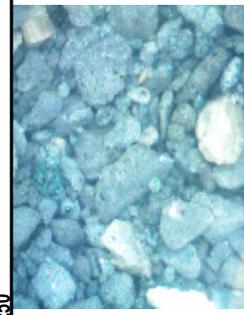
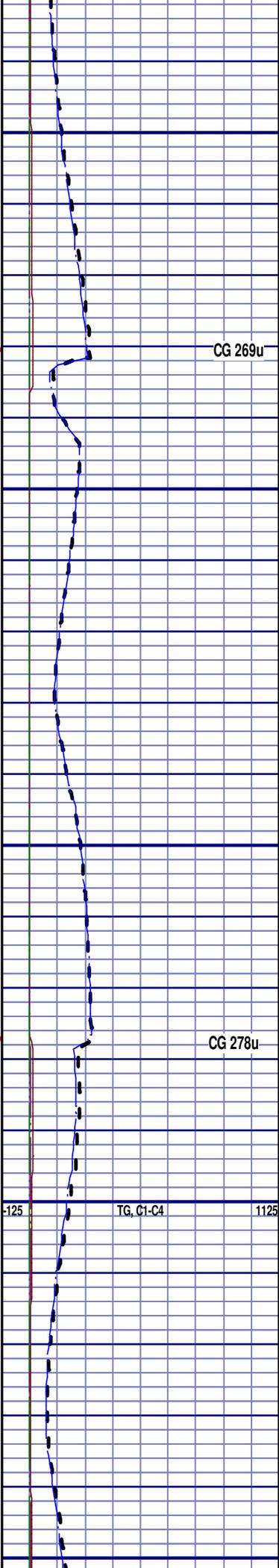
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, FREE SH, FREE SLTST,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SS: 80% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, FREE SH, FREE SLTST,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

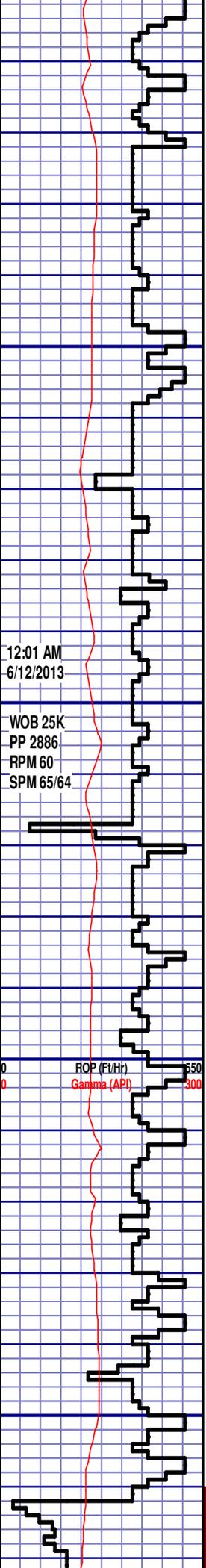
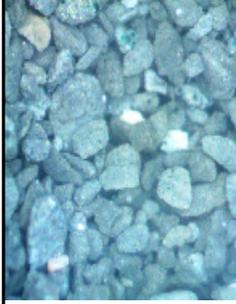
SS: 60% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, FREE SH, FREE SLTST,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SS: 70% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, & GLAU, FREE SLTST,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SS: 80% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, & GLAU, FREE SLTST,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG



SUSSEX  
4250' MD 4237' TVD



MD 4309 TVD 4296.3  
INC 0.57 AZ 303.75  
VS 133.21

MD 4403 TVD 4390.29  
INC 1.02 AZ 343.37  
VS 132.62

4300

4350

4400

4450

SLTST: 80% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SLTST: 90% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SLTST: 80% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SLTST: 70% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

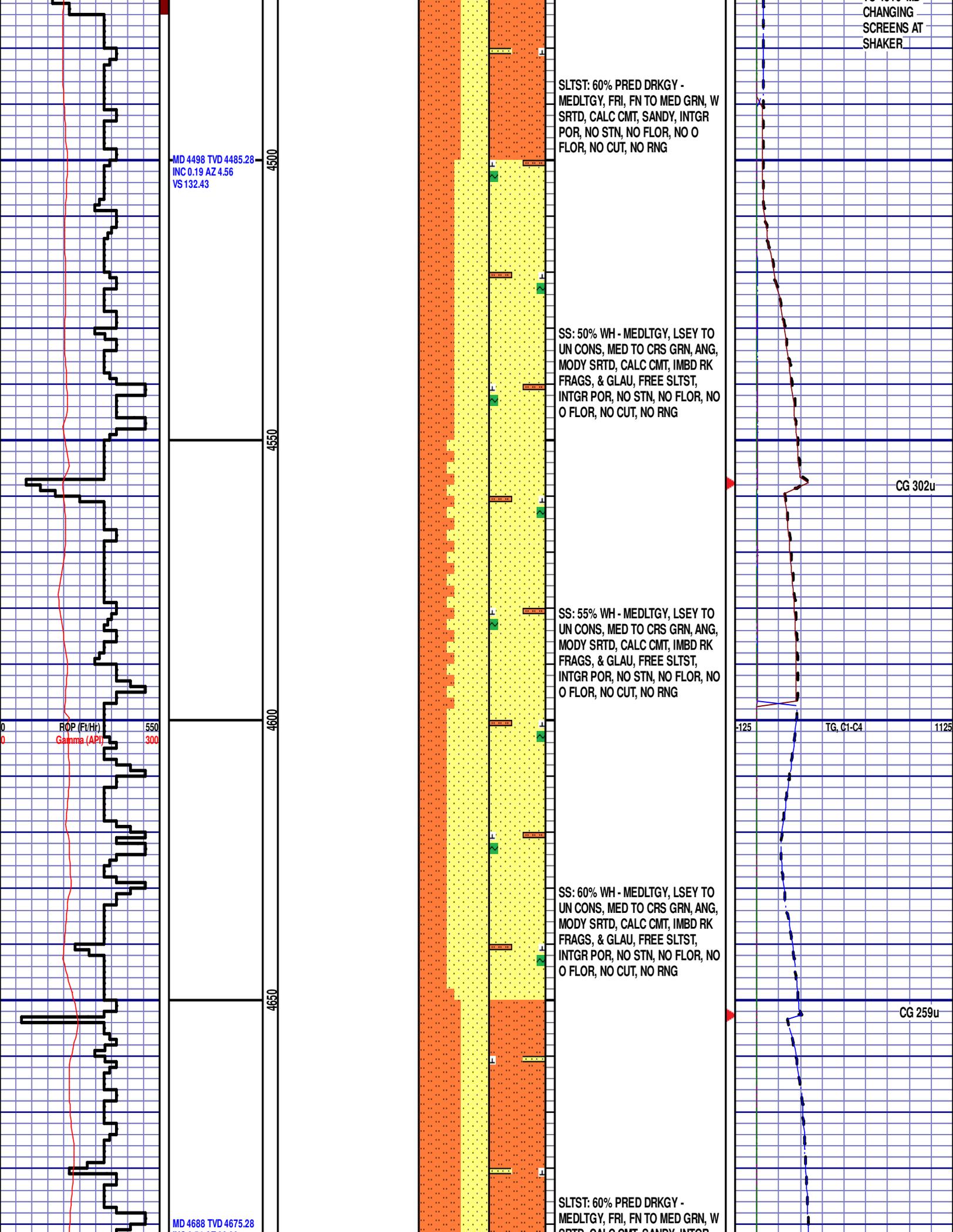
CG 185u

CG 217u

-125 TG, C1-C4 1125

CG N/A  
NO GAS DATA  
FROM 4370' MD  
TO 4510' MD

CHANGING  
SCREENS AT  
SHAKER



MD 4498 TVD 4485.28  
INC 0.19 AZ 4.56  
VS 132.43

SLTST: 60% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SS: 50% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, & GLAU, FREE SLTST,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SS: 55% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, & GLAU, FREE SLTST,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SS: 60% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, & GLAU, FREE SLTST,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

SLTST: 60% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR

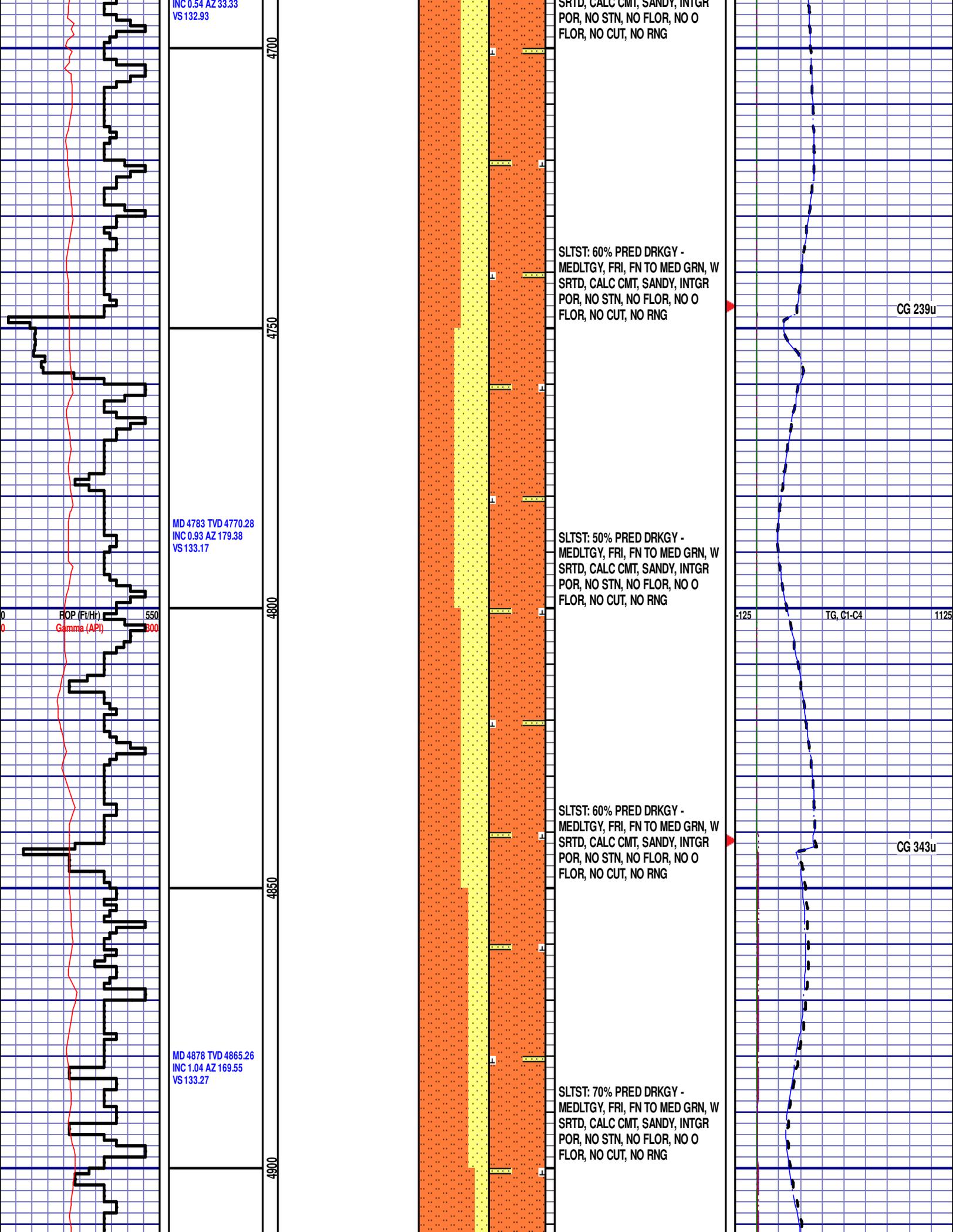
MD 4688 TVD 4675.28

ROP (Ft/Hr) 550  
Gamma (API) 300

-125 TG, C1-C4 1125

CG 302u

CG 259u



INC 0.54 AZ 33.33  
VS 132.93

4700

SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SLTST: 60% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

CG 239u

MD 4783 TVD 4770.28  
INC 0.93 AZ 179.38  
VS 133.17

4750

SLTST: 50% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

SLTST: 60% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

CG 343u

ROP (ft/hr) 550  
Gamma (API) 300

4800

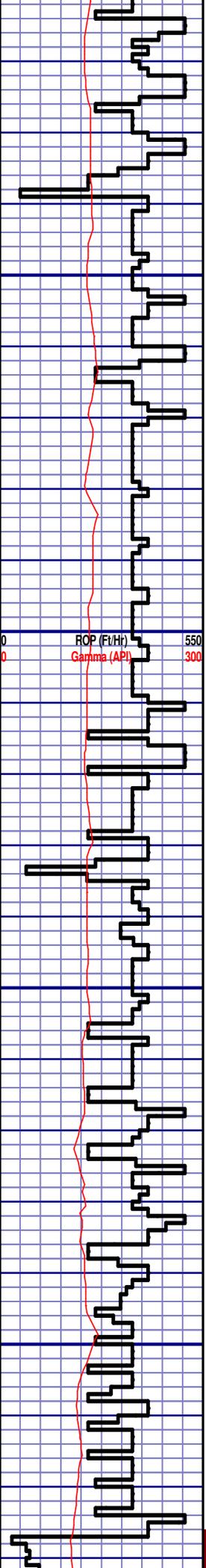
-125 TG, C1-C4 1125

MD 4878 TVD 4865.26  
INC 1.04 AZ 169.55  
VS 133.27

4850

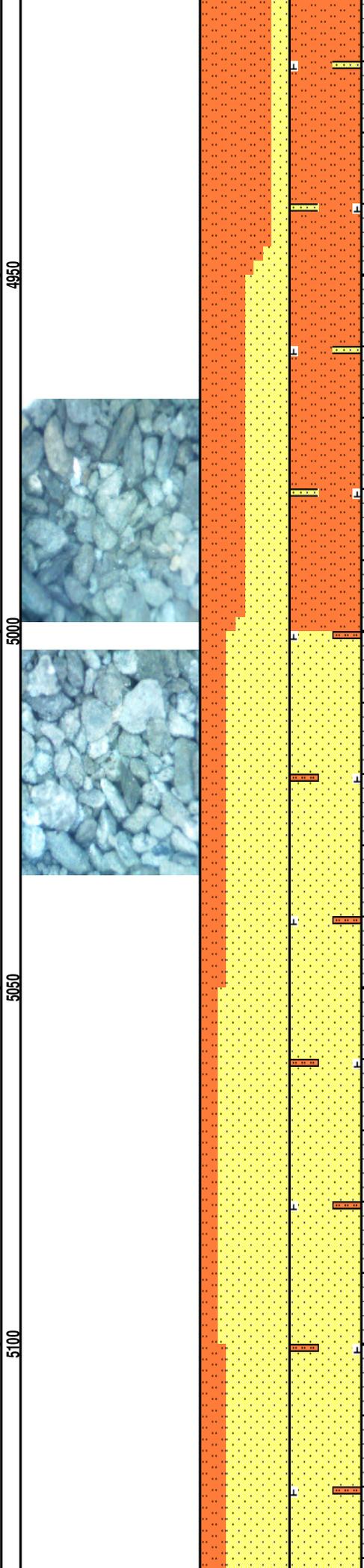
SLTST: 70% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

4900



MD 4973 TVD 4960.24  
INC 1.38 AZ 173.76  
VS 133.48

MD 5068 TVD 5055.21  
INC 1.36 AZ 166.12  
VS 133.79



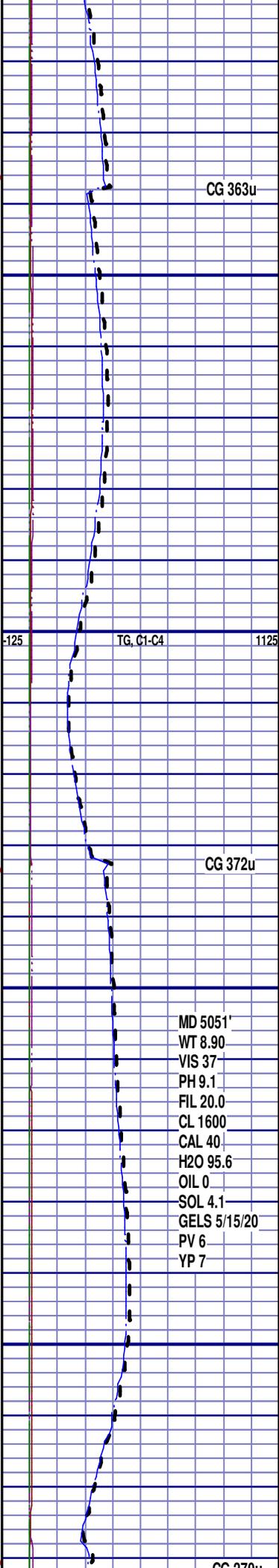
SLTST: 80% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

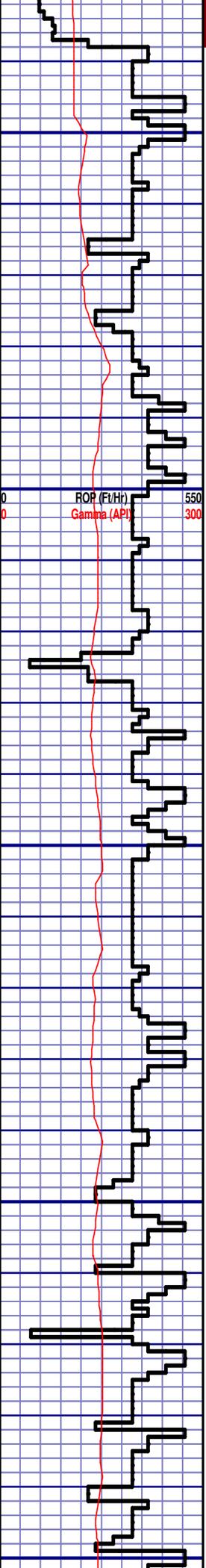
SLTST: 50% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

**SHANNON**  
5000' MD 4987' TVD

SS: 70% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, FREE SLTST, INTGR POR,  
NO STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG

SS: 80% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, FREE SLTST, INTGR POR,  
NO STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG





MD 5163 TVD 5150.2  
 INC 0.17 AZ 163.37  
 VS 134.06

MD 5258 TVD 5245.2  
 INC 0.13 AZ 7.43  
 VS 134.11

5150  
 5200  
 5250  
 5300  
 5350

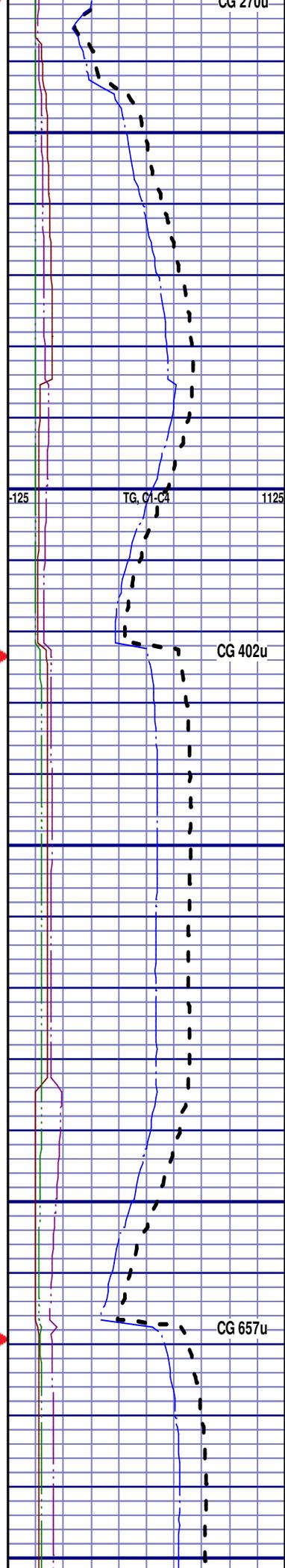
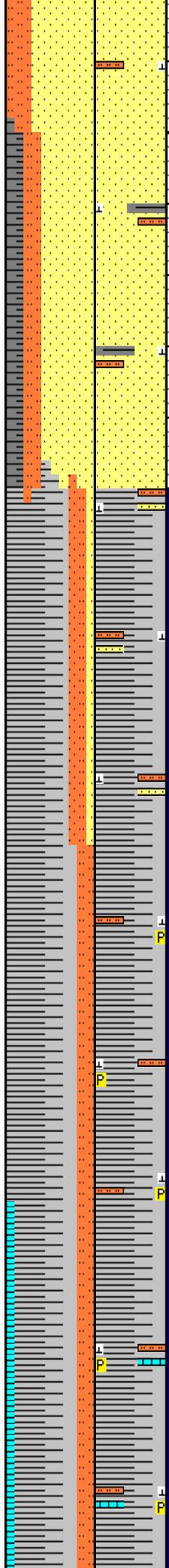
SS: 70% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SS: 60% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, FREE SLTST, FREE SH, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SLTY SH: 70% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD SLTST & SS LAMN, FREE CAL, NO STN, NO FLOR, SLOW LZY CUT, FNT DRKYL RNG

SLTY SH: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD SLTST, FREE CAL, FREE PYR, NO STN, NO FLOR, SLOW LZY CUT, FNT DRKYL RNG

SLTY SH: 70% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD SLTST, FREE LS, FREE CAL, FREE PYR, NO STN, NO FLOR, SLOW LZY CUT, FNT DRKYL RNG



CG 402u

CG 657u

MD 5353 TVD 5340.2  
INC 0.1 AZ 247.41  
VS 134.05

ROP (Ft/Hr)  
Gamma (API)

550  
300

MD 5447 TVD 5434.2  
INC 0.47 AZ 140.38  
VS 134.21

MD 5542 TVD 5529.2  
INC 0.46 AZ 136.51  
VS 134.7

5400

5450

5500

5550

SLTY SH: 70% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST, FREE LS, FREE CAL,  
FREE PYR, NO STN, NO FLOR,  
SLOW LZY CUT, FNT DRKYL RNG

SLTY SH: 80% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST & SS LAMN, FREE  
CAL, FREE PYR, NO STN, NO  
FLOR, SLOW LZY CUT, FNT DRKYL  
RNG

SLTY SH: 70% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST & SS LAMN, FREE  
CAL, FREE PYR, NO STN, NO  
FLOR, SLOW LZY CUT, FNT DRKYL  
RNG

SLTY SH: 80% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST & SS LAMN, FREE  
CAL, FREE PYR, NO STN, NO  
FLOR, SLOW LZY CUT, FNT DRKYL  
RNG

-125 TG, C1-C4 1125

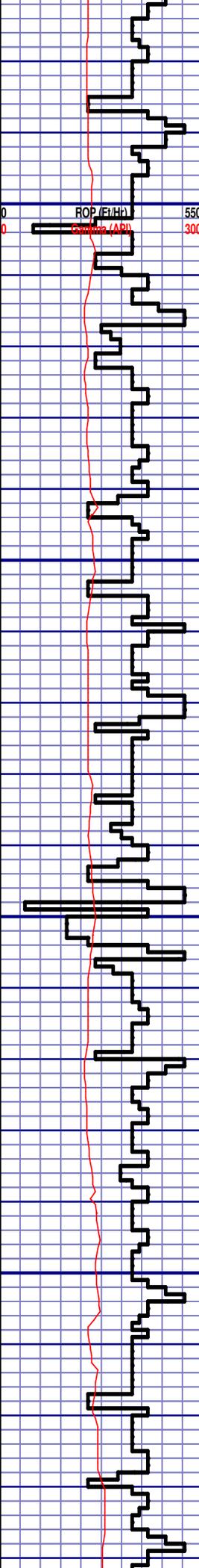
CG 761u

-350 TG, C1-C4 3150

Scale Change

SCALE: -350 TO  
3150 (350  
UNITS/DIVISION)

CG 1145u

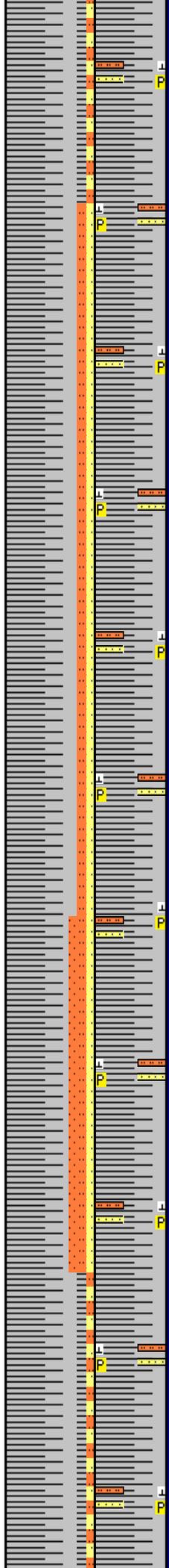


ROP (ft/hr) 550  
Gamma (API) 300

MD 5637 TVD 5624.2  
INC 0.45 AZ 158.97  
VS 135.07

MD 5732 TVD 5719.19  
INC 0.43 AZ 135.86  
VS 135.43

5600  
5650  
5700  
5750



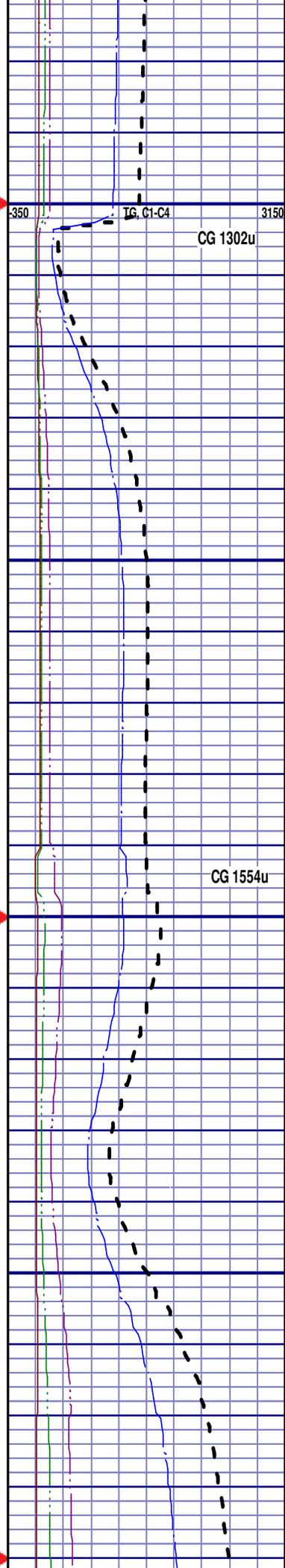
SLTY SH: 90% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST & SS LAMN, FREE  
CAL, FREE PYR, NO STN, NO  
FLOR, SLOW LZY CUT, FNT DRKYL  
RNG

SLTY SH: 80% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST & SS LAMN, FREE  
CAL, FREE PYR, NO STN, NO  
FLOR, SLOW LZY CUT, FNT DRKYL  
RNG

SLTY SH: 80% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST & SS LAMN, FREE  
CAL, FREE PYR, NO STN, NO  
FLOR, SLOW LZY CUT, FNT DRKYL  
RNG

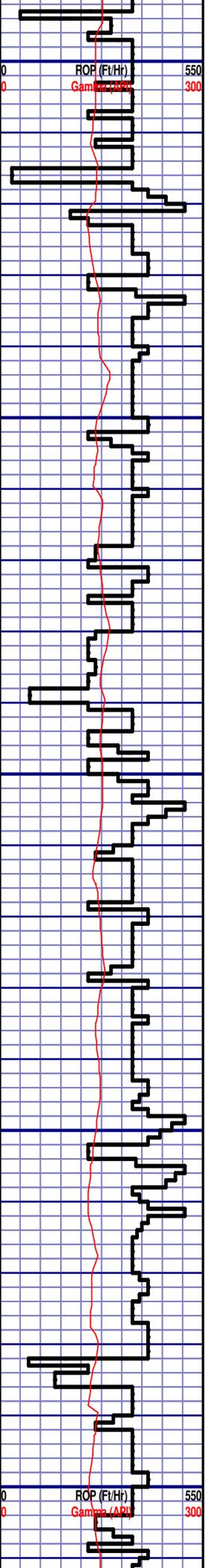
SLTY SH: 70% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST & SS LAMN, FREE  
CAL, FREE PYR, NO STN, NO  
FLOR, SLOW LZY CUT, FNT DRKYL  
RNG

SLTY SH: 90% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
IMBD SLTST & SS LAMN, FREE



TG, C1-C4 3150  
CG 1302u

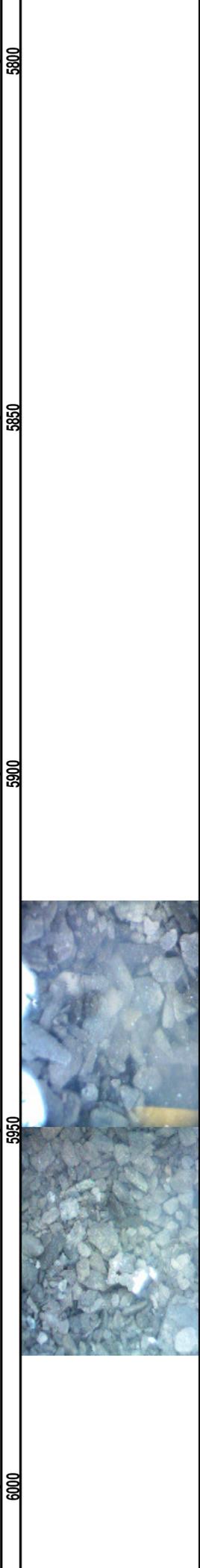
CG 1554u



MD 5827 TVD 5814.19  
 INC 0.39 AZ 142.07  
 VS 135.87

MD 5922 TVD 5909.19  
 INC 0.1 AZ 346.37  
 VS 136.04

MD 5965 TVD 5952.19  
 INC 0.07 AZ 174.1  
 VS 136.03



CAL, FREE PYR, NO STN, NO  
 FLOR, SLOW LZY CUT, FNT DRKYL  
 RNG

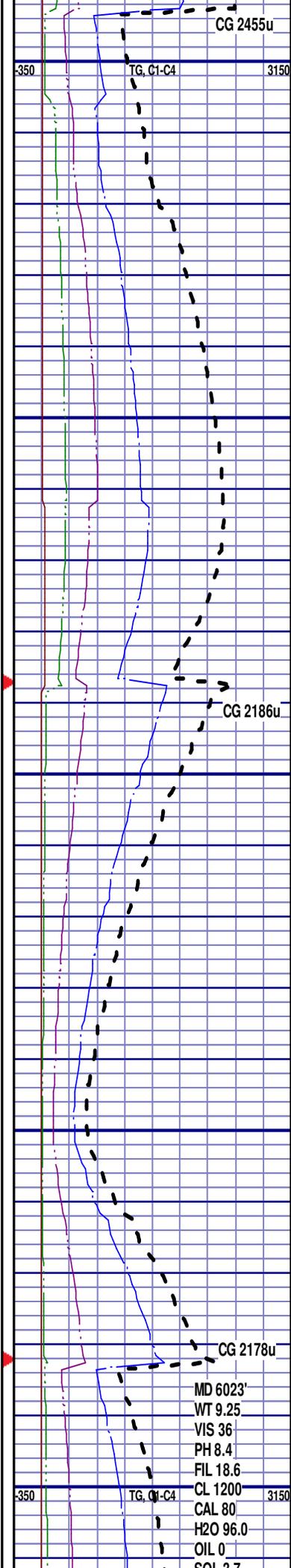
SLTY SH: 80% MEDDRKGY -  
 MEDLTGY, BLKY TO SUBBLKY,  
 GRTY TO SLTY TXT, FRM TO BRIT,  
 IMBD SLTST & SS LAMN, FREE  
 CAL, FREE PYR, NO STN, NO  
 FLOR, SLOW LZY CUT, FNT DRKYL  
 RNG

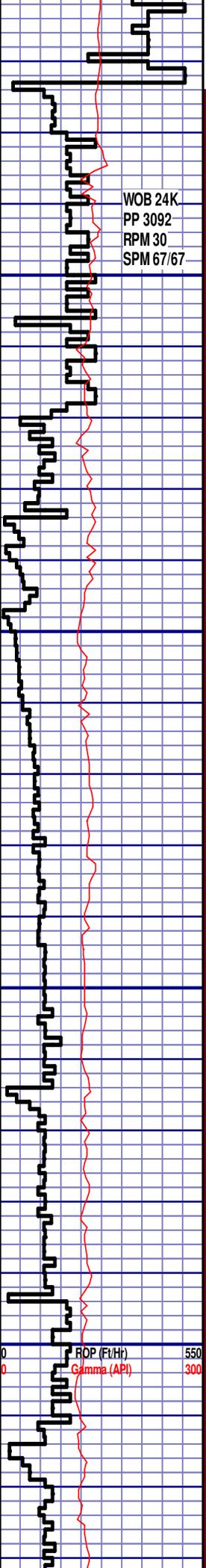
SLTY SH: 70% MEDDRKGY -  
 MEDLTGY, BLKY TO SUBBLKY,  
 GRTY TO SLTY TXT, FRM TO BRIT,  
 IMBD SLTST & SS LAMN, FREE  
 CAL, FREE PYR, NO STN, NO  
 FLOR, SLOW LZY CUT, FNT DRKYL  
 RNG

SLTY SH: 70% MEDDRKGY -  
 MEDLTGY, BLKY TO SUBBLKY,  
 GRTY TO SLTY TXT, FRM TO BRIT,  
 IMBD SLTST & SS LAMN, FREE  
 CAL, FREE PYR, NO STN, NO  
 FLOR, SLOW LZY CUT, FNT DRKYL  
 RNG

**TEEPEE BUTTES**  
 5950' MD 5937' TVD

SLTST: 60% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRD, CALC CMT, SANDY, FREE  
 SLTY SH, INTGR POR, NO STN, NO  
 FLOR, NO O FLOR, SLOW LZY  
 STRM, LT BRIYL RNG





MD 6028 TVD 6015.19  
 INC 0.5 AZ 145.2  
 VS 136.19

WOB 24K  
 PP 3092  
 RPM 30  
 SPM 67/67

MD 6110 TVD 6097.14  
 INC 3.08 AZ 97.97  
 VS 138.53

MD 6158 TVD 6144.86  
 INC 8.89 AZ 91.26  
 VS 143.5

MD 6204 TVD 6190.04  
 INC 12.75 AZ 89.67  
 VS 152.13

6050  
 6100  
 6150  
 6200

TOOH @ 6:00AM ON 6/12/13 AT  
 6023' MD FOR CURVE ASSEMBLY.  
 TIH @ 11:15AM ON 6/12/13.  
 RESUMED DRILLING @ 4:15PM ON  
 6/12/13 W/ BIT #2 8.75"  
 SCHLUMBERGER SDI611 S/N  
 JH0417 IN @ 6023' MD  
 SLTST: 60% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, SANDY, FREE  
 SLTY SH, INTGR POR, NO STN, NO  
 FLOR, NO O FLOR, SLOW LZY  
 STRM, LT BRIYL RNG

SLTST: 60% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, FREE SLTY SH,  
 INTGR POR, NO STN, NO FLOR, NO  
 O FLOR, SLOW LZY STRM, LT  
 BRIYL RNG

SWITCHING TO 30FT SAMPLE  
 INTERVAL

SLTY SH: 60% MEDDRKGY -  
 MEDLTGY, BLKY TO SUBBLKY,  
 GRTY TO SLTY TXT, FRM TO BRIT,  
 IMBD SLTST LAMN, FREE SS, FREE  
 CAL, FREE PYR, NO STN, 10%  
 FLOR, FNT BLSHWT O FLOR, SLOW  
 LZY CUT, FNT DRKYL RNG

SLTST: 60% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, FREE SLTY SH,  
 INTGR POR, NO STN, 10% FLOR,  
 FNT BLSHWT O FLOR, SLOW LZY  
 STRM, MOD BRIYL RNG

SLTST: 60% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, SS LAMN, FREE  
 SLTY SH, INTGR POR, NO STN, 5%  
 FLOR, FNT BLSHWT O FLOR, SLOW  
 LZY STRM, MOD BRIYL RNG

SLTST: 55% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, SS LAMN, FREE  
 SLTY SH, INTGR POR, NO STN, 5%  
 FLOR, FNT BLSHWT O FLOR, SLOW  
 LZY STRM, MOD BRIYL RNG

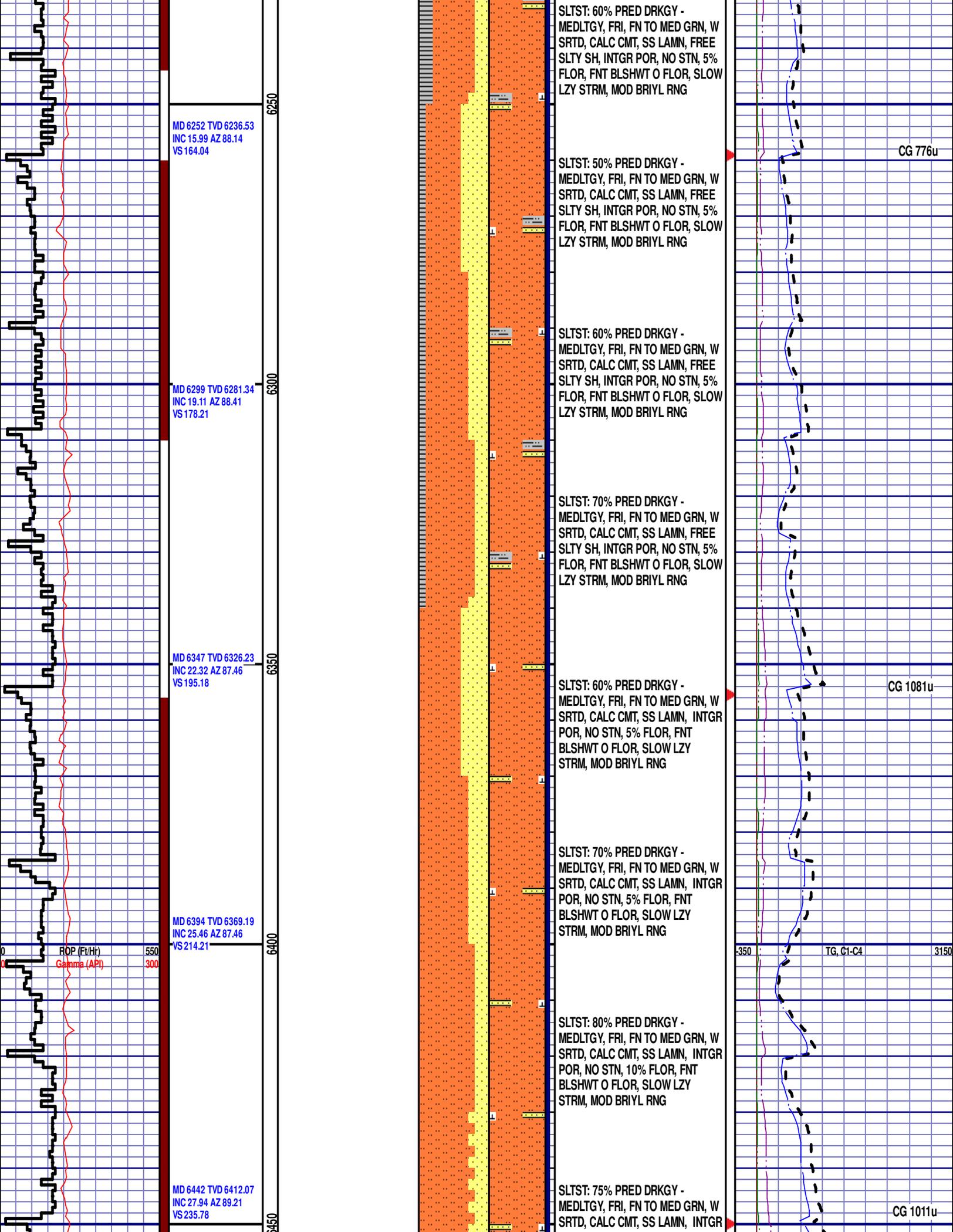
SOL 3.7  
 GELS 3/17/26  
 PV 7  
 YP 7

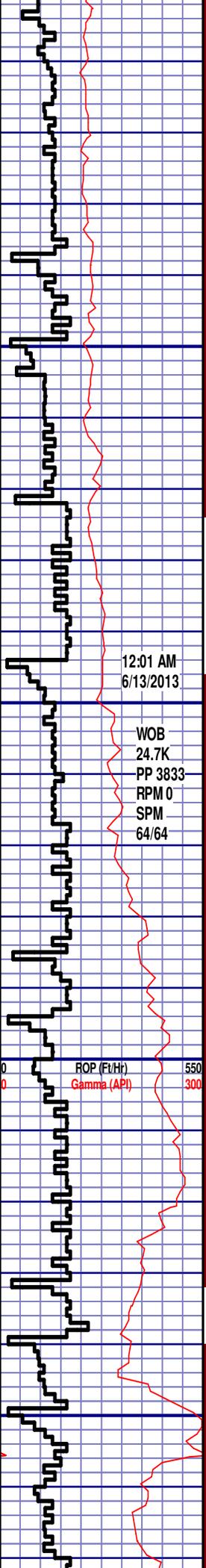
TRIP GAS 1796u  
 PIPE TALLY  
 CHANGE

CG 828u

CG 654u

350 TG, C1-C4 3150





MD 6489 TVD 6452.8  
 INC 31.92 AZ 88.48  
 VS 259.22

MD 6537 TVD 6493.01  
 INC 34.25 AZ 86.18  
 VS 285.41

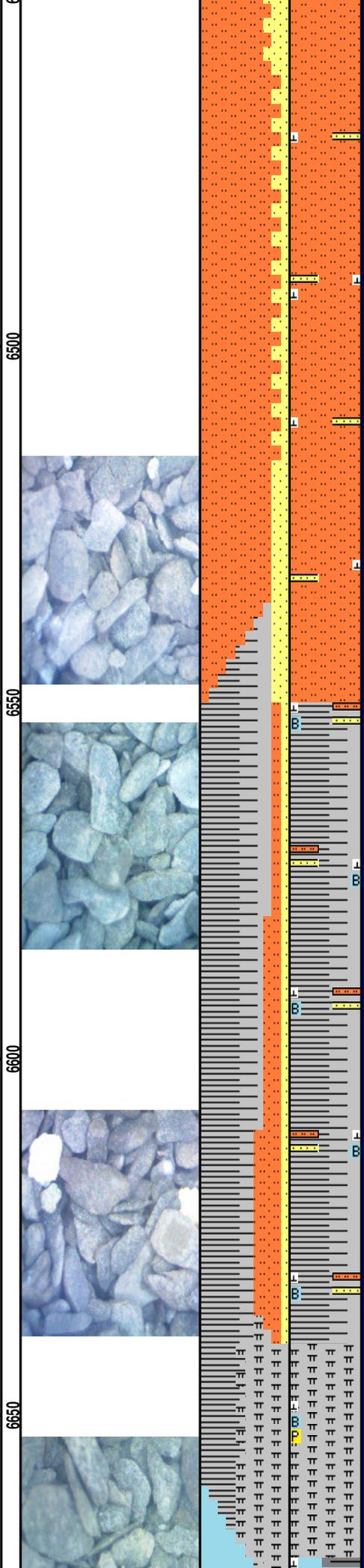
12:01 AM  
 6/13/2013

WOB  
 24.7K  
 PP 3833  
 RPM 0  
 SPM  
 64/64

MD 6584 TVD 6530.71  
 INC 39.04 AZ 85.67  
 VS 313.44

ROP (Ft/Hr) 550  
 Gamma (API) 300

MD 6632 TVD 6566.8  
 INC 43.42 AZ 86.67  
 VS 345.05



POR, NO STN, 10% FLOR, FNT  
 BLSHWT O FLOR, SLOW LZ  
 STRM, MOD BRIYL RNG

SLTST: 85% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, SS LAMN, INTGR  
 POR, NO STN, 10% FLOR, FNT  
 BLSHWT O FLOR, SLOW LZ  
 STRM, MOD BRIYL RNG

SLTST: 85% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, SS LAMN, INTGR  
 POR, NO STN, 10% FLOR, FNT  
 BLSHWT O FLOR, SLOW LZ  
 STRM, MOD BRIYL RNG

SLTST: 80% PRED DRKGY -  
 MEDLTGY, FRI, FN TO MED GRN, W  
 SRTD, CALC CMT, SS LAMN, INTGR  
 POR, NO STN, 10% FLOR, FNT  
 BLSHWT O FLOR, SLOW LZ  
 STRM, MOD BRIYL RNG

**SHARON SPRINGS**  
 6550' MD 6503' TVD

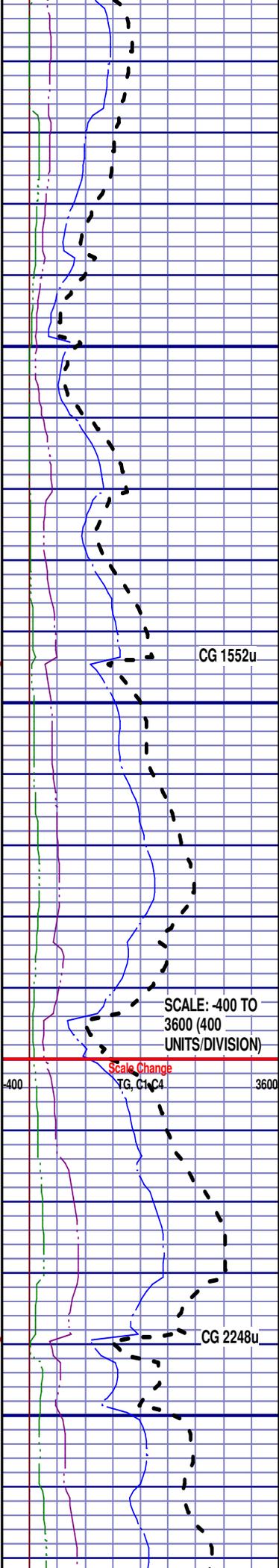
SLTY SH: 80% MEDDRKGY -  
 MEDLTGY, BLKY TO SUBBLKY,  
 GRTY TO SLTY TXT, FRM TO BRIT,  
 IMBD SLTST & SS LAMN, FREE  
 CAL, FREE BENT, NO STN, 15%  
 FLOR, NO O FLOR, FAST STRMG  
 CUT, FNT DRKYL RNG

SLTY SH: 70% MEDDRKGY -  
 MEDLTGY, BLKY TO SUBBLKY,  
 GRTY TO SLTY TXT, FRM TO BRIT,  
 IMBD SLTST & SS LAMN, FREE  
 CAL, FREE BENT, NO STN, 15%  
 FLOR, NO O FLOR, FAST STRMG  
 CUT, FNT DRKYL RNG

SLTY SH: 60% MEDDRKGY -  
 MEDLTGY, BLKY TO SUBBLKY,  
 GRTY TO SLTY TXT, FRM TO BRIT,  
 IMBD SLTST & SS LAMN, FREE  
 CAL, FREE BENT, NO STN, 20%  
 FLOR, NO O FLOR, FAST STRMG  
 CUT, FNT DRKYL RNG

**NIORARA**  
 6640' MD 6572' TVD

MRL: 45% MEDDRKGY - DRKGY,  
 BLKY TO SUBBLKY, FXLN TO  
 CHLKY, FRM TO FRI, CHK FRMWRK, IMBD  
 CAL, FREE PYR, FREE BENT, TT - PP POR, NO  
 STN, 10% LTOR FLOR, FNT BLSHWT O  
 FLOR, IMMED STRMG CUT, BRIYL RNG

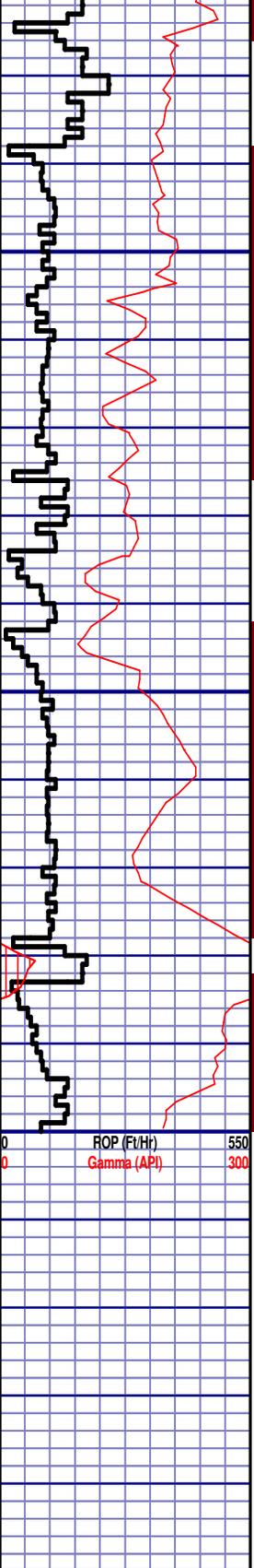


CG 1552u

SCALE: 400 TO  
 3600 (400  
 UNITS/DIVISION)

Scale Change  
 TG, C1, C4

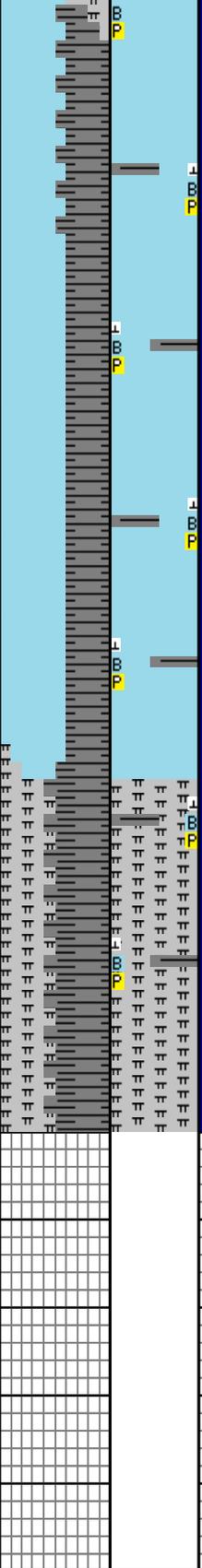
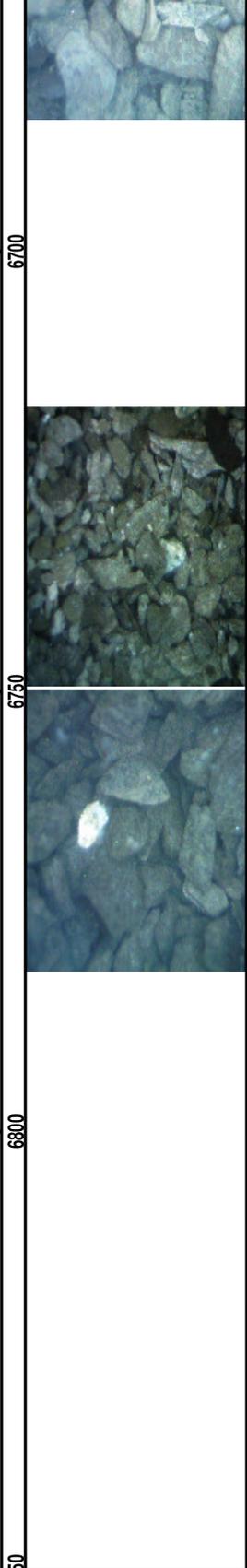
CG 2248u



MD 6679 TVD 6600.07  
 INC 46.46 AZ 88.85  
 VS 378.24

MD 6727 TVD 6631.47  
 INC 51.79 AZ 89.33  
 VS 414.52

MD 6774 TVD 6658.43  
 INC 58.17 AZ 89.27  
 VS 452.98



**NIOBRARA A CHALK**  
 6670' MD 6594' TVD

CHK: 55% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM, CHK FRMWRK, IMBD PYRC SPEC, OCC FREE CAL, FREE BENT, FREE SH, NO STN, 10% LTOR FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

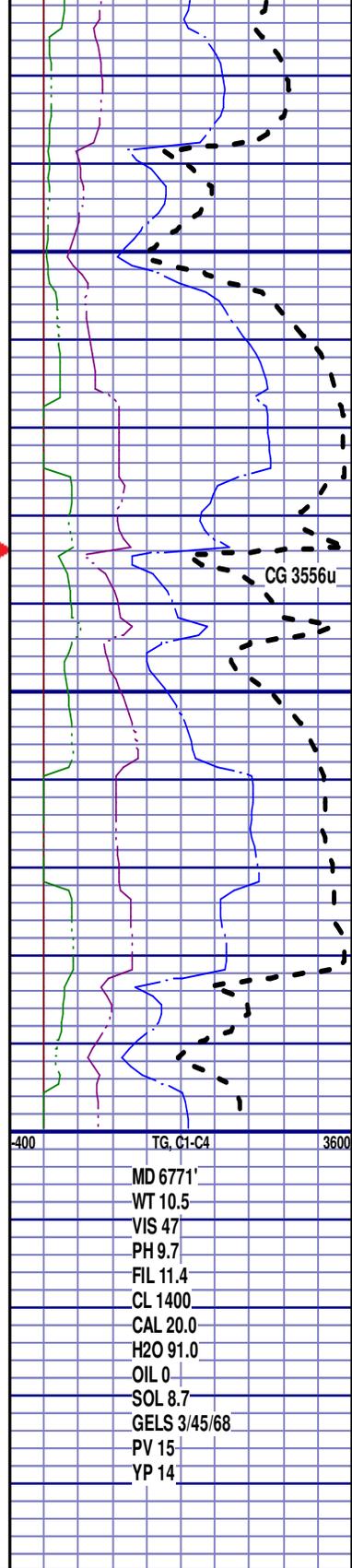
CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM, CHK FRMWRK, IMBD PYRC SPEC, OCC FREE CAL, FREE SH, 10% LTOR FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM, CHK FRMWRK, IMBD PYRC SPEC, OCC FREE CAL, FREE SH, 10% LTOR FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

**NIOBRARA A MARL**  
 6750' MD 6645' TVD

MRL: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, NO STN, FNT BRILGN FLOR, MOD BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

END OF VERTICAL LOG @ 6800'  
 MD ON 6/13/2013, CONTINUED ON HORIZONTAL LOG



MD 6771'  
 WT 10.5  
 VIS 47  
 PH 9.7  
 FIL 11.4  
 CL 1400  
 CAL 20.0  
 H2O 91.0  
 OIL 0  
 SOL 8.7  
 GELS 3/45/68  
 PV 15  
 YP 14