



7136 South Yale Avenue, Suite 414

Tulsa, Oklahoma 74136-6378

phone 918.925.9739

fax 866.534.4559

WWW.HZMUD.COM/25

Customer Information

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

Geologist: Renee Clackler
Noble Energy Inc.

Mud Logging Details

Logger: Ross Apodaca &
Dan King

Log Interval: 2500' MD to 6650' MD

Start Date: May 29, 2014

Release Date: June 6, 2014

Well Information

Well Name: Wells Ranch
AE30-63HNC

Location: 30-6N-62W
1048' FSL, 65' FWL

County: Weld
State: Colorado

Drilling Rig: H&P 277

Total Depth: 12007' MD

TD Date: June 6, 2014

Formation: Niobrara C Chalk

KB Elevation: 4776'

GR Elevation: 4752'

API Number: 05-123-38682-0000

ROCK TYPES

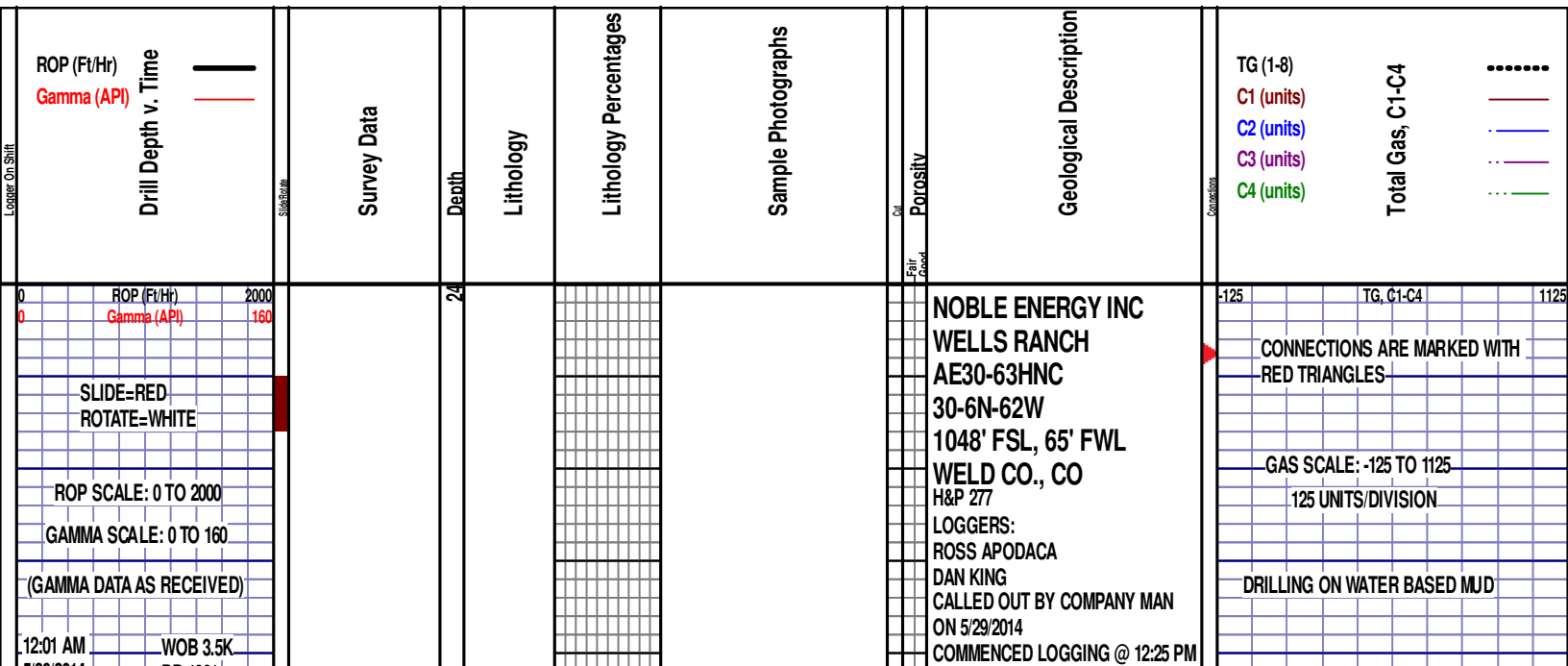
Anhy
Bent
Cht
Clyst
Coal
Congl
Dol

Gyp
Igne
Lmst
Meta
Mrlst
Salt
Shale

Shcol
Chalk
Slst
Ss
Till
gw
lmywash

ogw
olmywash
oshly gw
shly gw
sdygw
hvyrcbsh
nosmpl

Lsdetrit
sltst
sdy sh



5/30/2014 PP 1961
FT/24 HRS 0 RPM 0
DAY 02 SPM 66/66

RA

ROP (Ft/Hr)
Gamma (API)

MD 2528 TVD 2520.88
INC 10.99 AZ 338.09
VS 49.46

MD 2622 TVD 2613.07
INC 11.52 AZ 340.64
VS 56.22

2500
2550
2600
2650
2700

P

P

P

P

P

P

P

P

P

P

P

P

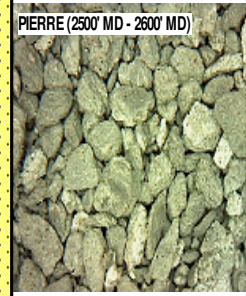
P

P

P

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PIERRE (2500' MD - 2600' MD)

ON 5/30/2014 @ 2500' MD W/ BIT #2,
8.75", SMITH MDI516, (S/N) JH5686 IN
@ 638' MD

PIERRE
1063' MD 1063' TVD

2500'- 2600': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
SANDY, INTGRPOR, NO STN, NO
MIN FLOR, NO O FLOR, NO CUT, NO
RNG

2600'- 2700': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
SANDY, INTGRPOR, NO STN, NO
MIN FLOR, NO O FLOR, NO CUT, NO
RNG

DEPTH 638'
WT 8.70
VIS 30
PH 7.8
FIL 30.2
CL 1700
CAL 40
H2O 97.6
OIL 0.0
LGS 13.72
GELS 2/3/4
PV 3
YP 5
CK 2/0
SOL 2.1

CG 182u

TG, C1-C4

CG 189u

MD 2716 TVD 2705.32
INC 10.64 AZ 338.53
VS 62.82

MD 2811 TVD 2798.46
INC 12.05 AZ 335.89
VS 70.39

MD 2905 TVD 2890.36
INC 12.22 AZ 334.22
VS 79.04

ROP (Ft/Hr)
Gamma (API)

2000
160

2750

2800

2850

2900

2700'- 2800': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
SANDY, INTGRPOR, NO STN, NO
MIN FLOR, NO O FLOR, NO CUT, NO
RNG

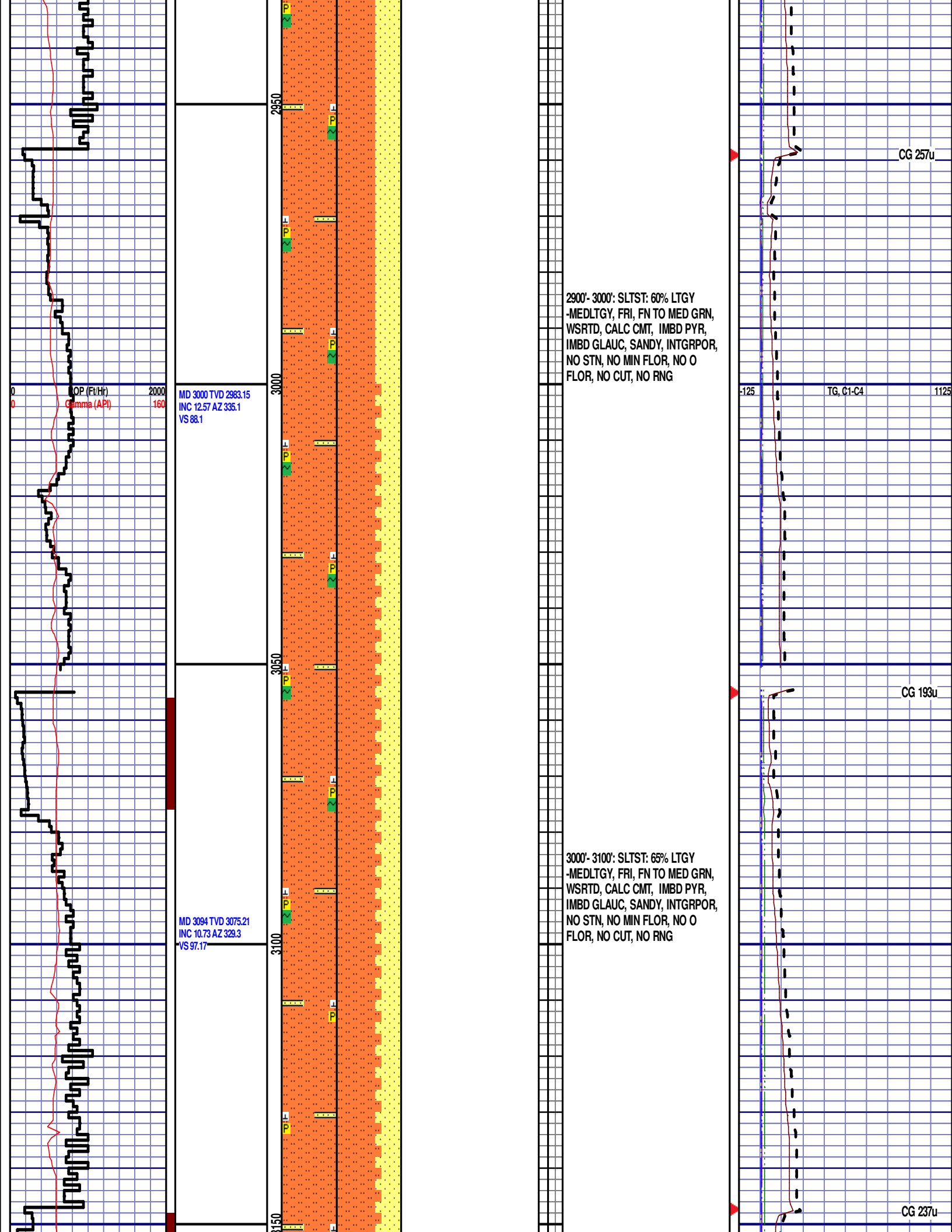


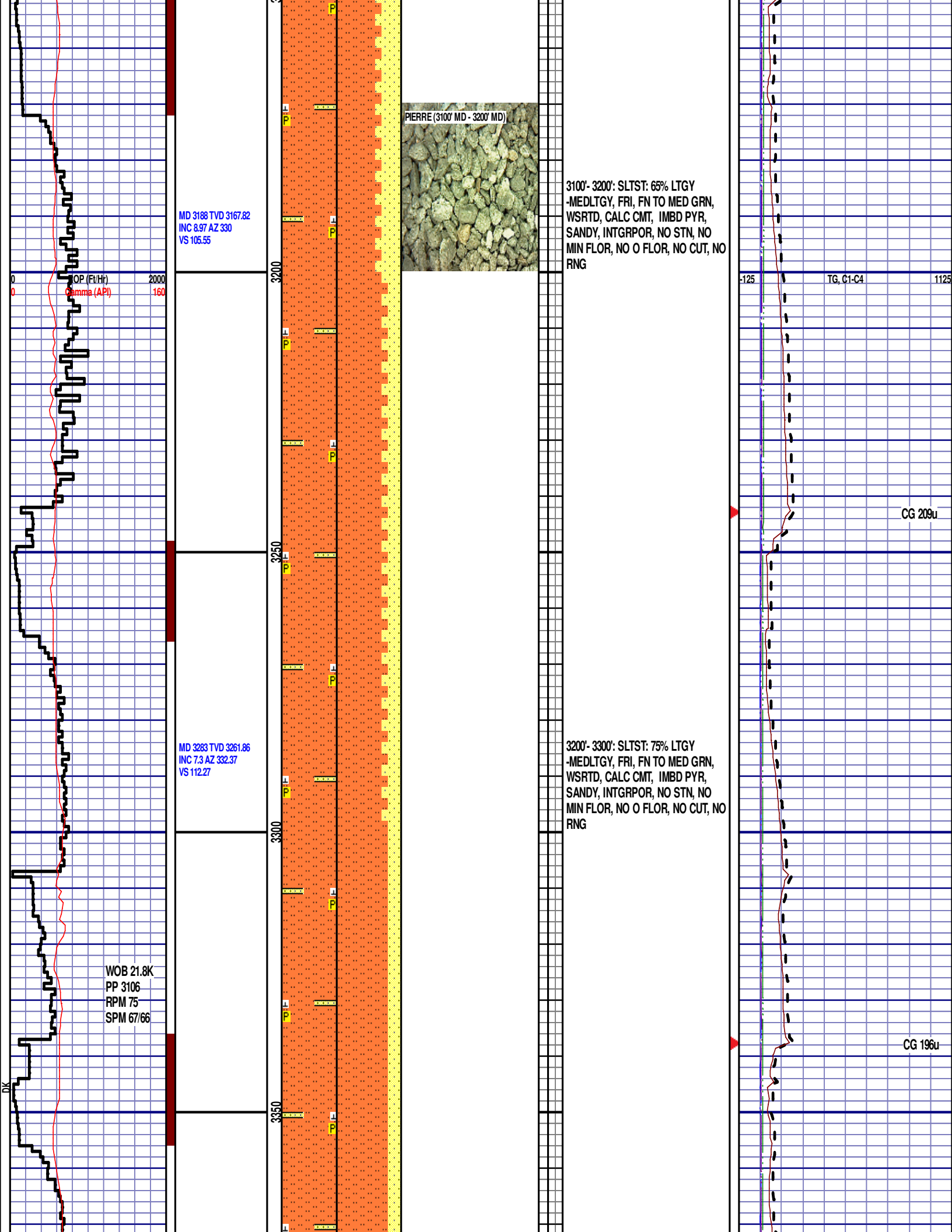
2800'- 2900': SLTST: 55% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

CG 141u

CG 175u

DEPTH 2867'
WT 8.75
VIS 30
PH 9.0
FIL 23.8
CL 1400
CAL 50
H2O 97.6
OIL 0.0
LGS 10.29
GELS 2/3/4
PV 3
YP 3
CK 1/0
SOL 2.1





MD 3378 TVD 3356.22
INC 5.98 AZ 332.2
VS 117.55

3300'- 3400': SLTST: 80% LTGY
-MEDLTGY - DRKGY, FRI, FN TO
MED GRN, WSRTD, CALC CMT,
IMBD PYR, SANDY, INTGRPOR, NO
STN, NO MIN FLOR, NO O FLOR,
NO CUT, NO RNG

MD 3472 TVD 3449.85
INC 4.22 AZ 326.66
VS 121.86

PIERRE (3400' MD - 3500' MD)

3400'- 3500': SLTST: 85% LTGY
-MEDLTGY - DRKGY, FRI, FN TO
MED GRN, WSRTD, CALC CMT,
IMBD PYR, SANDY, INTGRPOR, NO
STN, NO MIN FLOR, NO O FLOR,
NO CUT, NO RNG

PARKMAN
3534' MD 3511' TVD

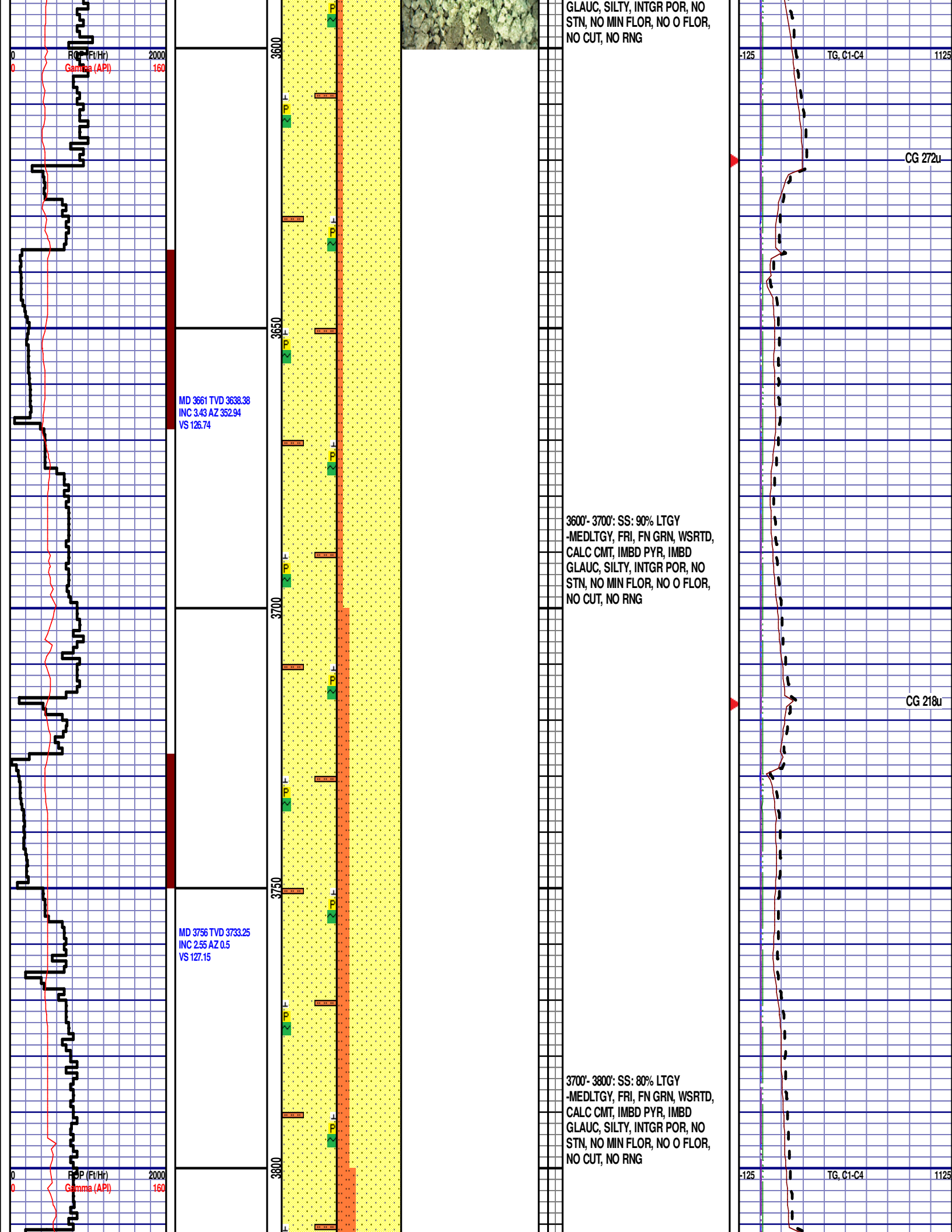
PARKMAN (3500' MD - 3600' MD)

3500'- 3600': SS: 90% LTGY
-MEDLTGY, FRI, FN GRN, WSRTD,
CALC CMT, IMBD PYR, IMBD

MD 3667 TVD 3544.59
INC 4.31 AZ 340.37
VS 125.09

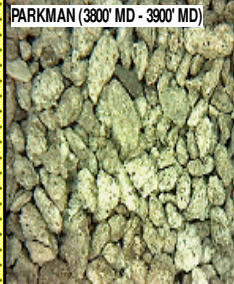
CG 400u

CG 227u



MD 3850 TVD 3827.17
INC 2.02 AZ 345.65
VS 127.61

PARKMAN (3800' MD - 3900' MD)



3800'- 3900': SS: 70% LTGY
-MEDLTGY, FRI, FN GRN, WSRTD,
CALC CMT, IMBD PYR, IMBD
GLAUC, SILTY, INTGR POR, NO
STN, NO MIN FLOR, NO O FLOR,
NO CUT, NO RNG

MD 3945 TVD 3922.13
INC 1.49 AZ 1.55
VS 128.05

3900'- 4000': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

ROP (Ft/Hr) 2000
Gamma (API) 160

MD 4040 TVD 4017.1
INC 1.32 AZ 8.76
VS 127.89

MD 4134 TVD 4111.07
INC 1.41 AZ 332.11
VS 128.3

MD 4228 TVD 4205.05
INC 1.41 AZ 355.75
VS 128.97

4000'- 4100': SLTST: 85% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

CG 250u

PARKMAN (4100' MD - 4200' MD)

4100'- 4200': SLTST: 75% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

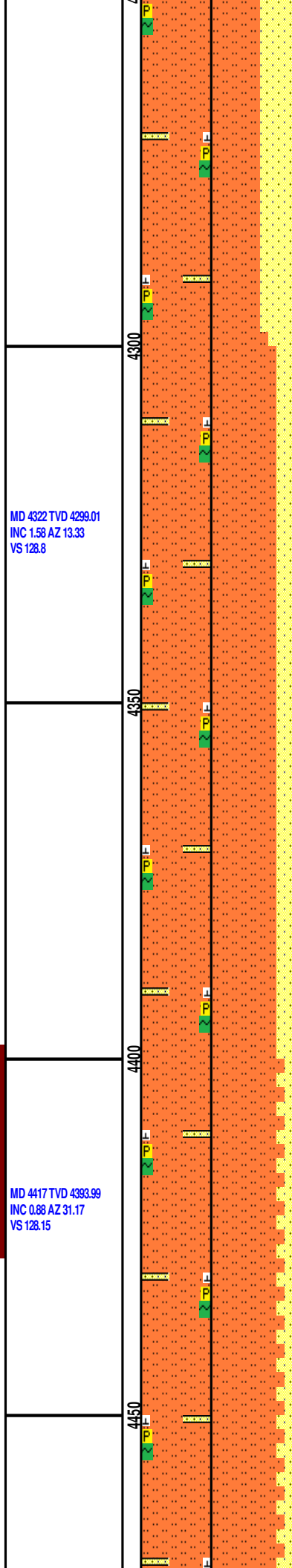
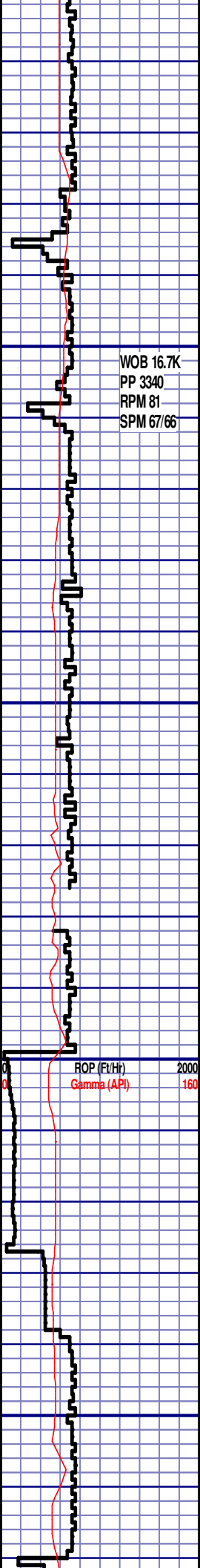
CG 226u

ROP (Ft/Hr)
Gamma (API)

2000
160

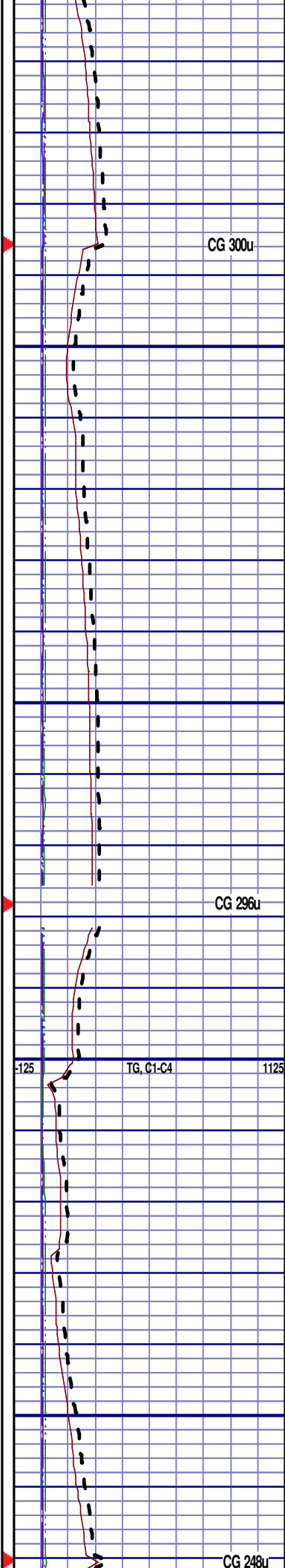
TG, C1-C4

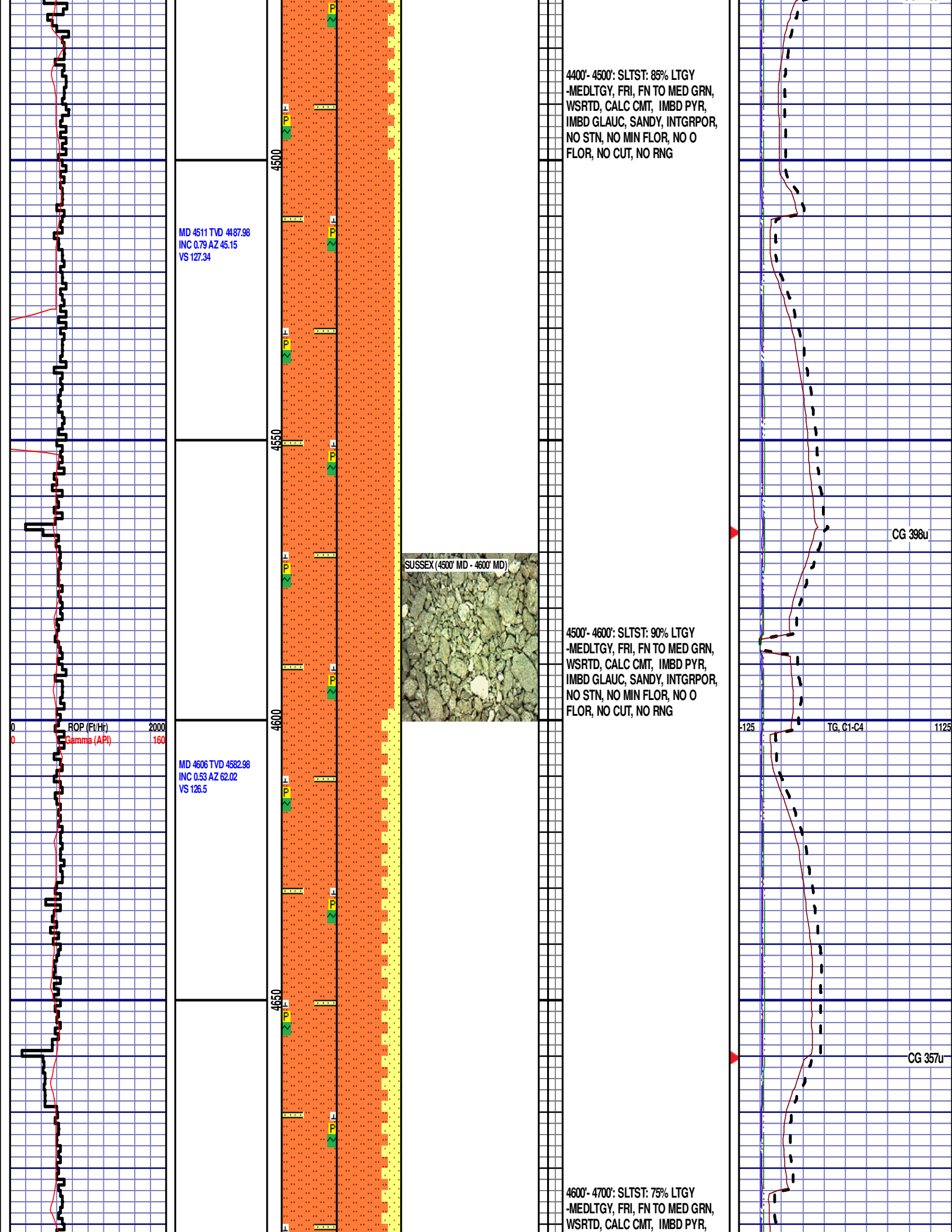
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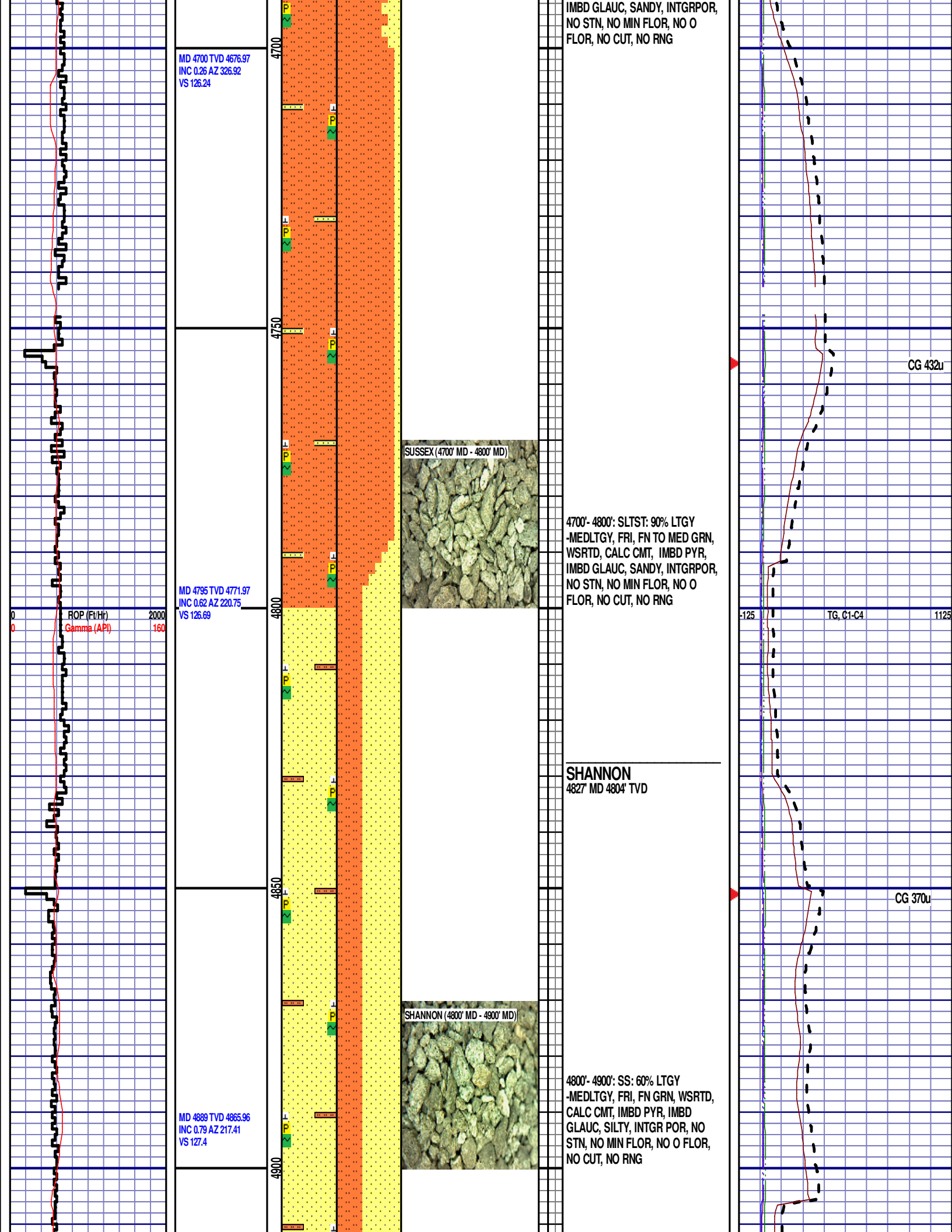


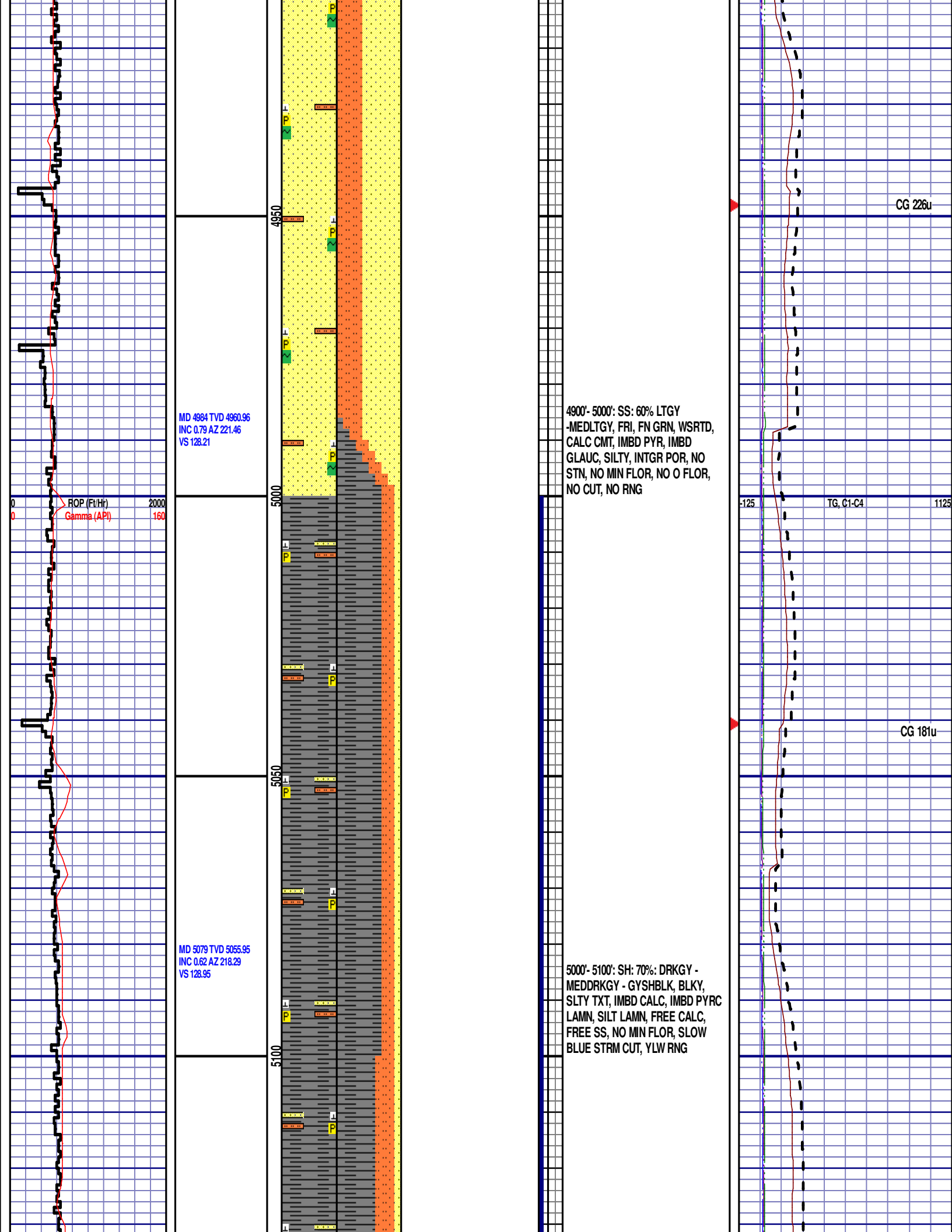
SUSSEX
4290' MD 4267' TVD
4200'- 4300': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

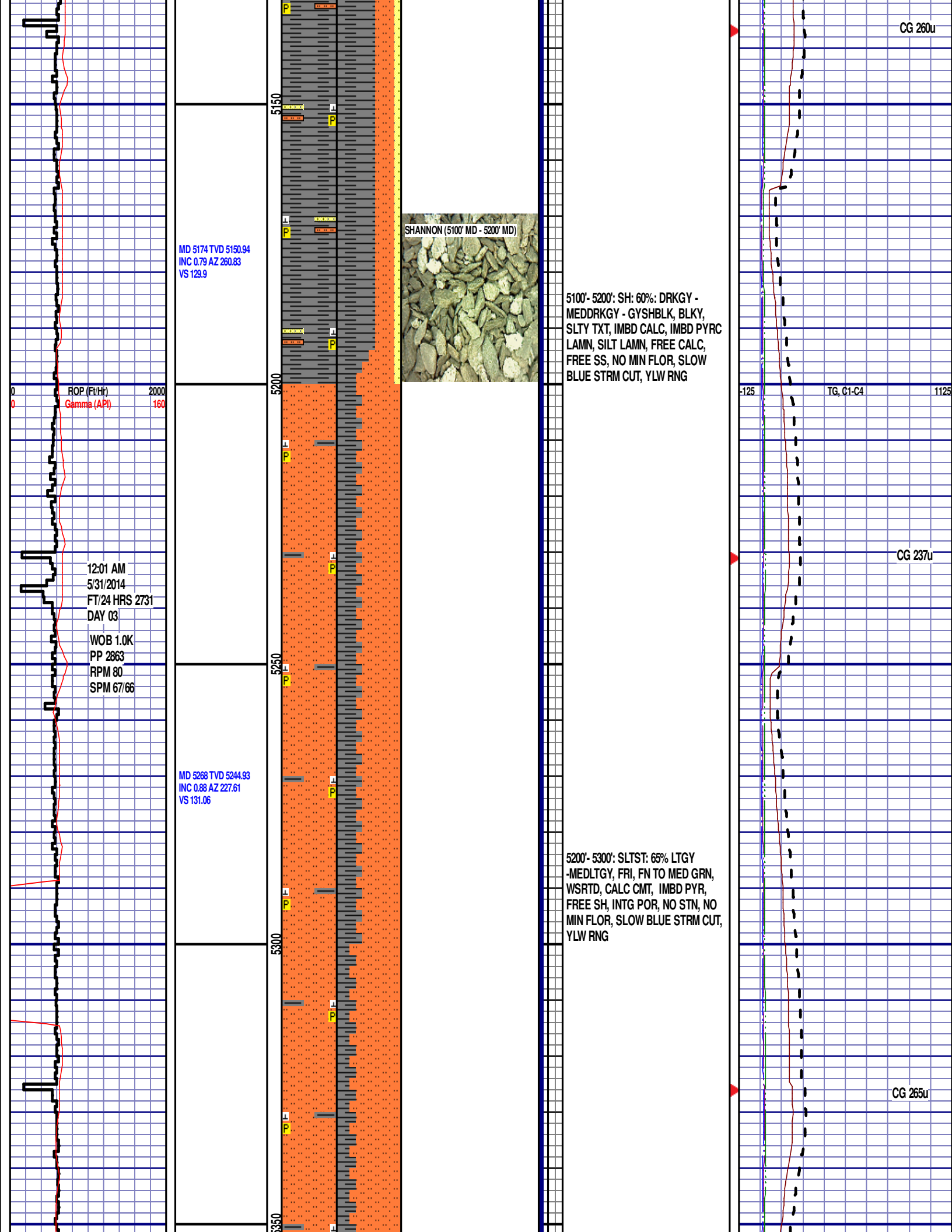
4300'- 4400': SLTST: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG











MD 5363 TVD 5339.92
INC 0.79 AZ 223.04
VS 132.03

ROP (Ft/Hr) 2000
Gamma (API) 160

MD 5458 TVD 5434.89
INC 2.02 AZ 211.08
VS 133.31

MD 5553 TVD 5529.84
INC 1.85 AZ 194.3
VS 134.5

5300'- 5400': SLTST: 75% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
FREE SH, INTG POR, NO STN, NO
MIN FLOR, SLOW BLUE STRM CUT,
YLW RNG

SHANNON (5400' MD - 5500' MD)

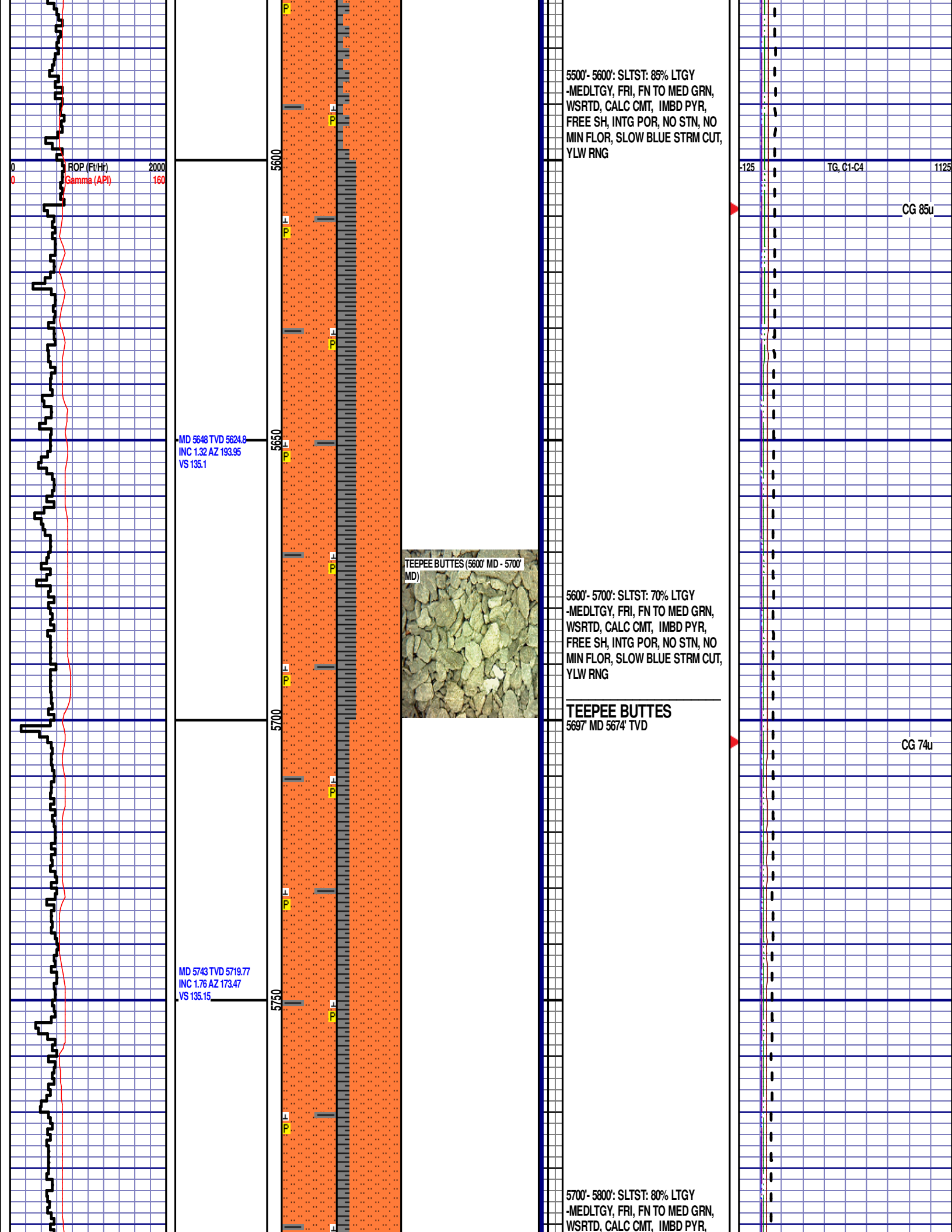


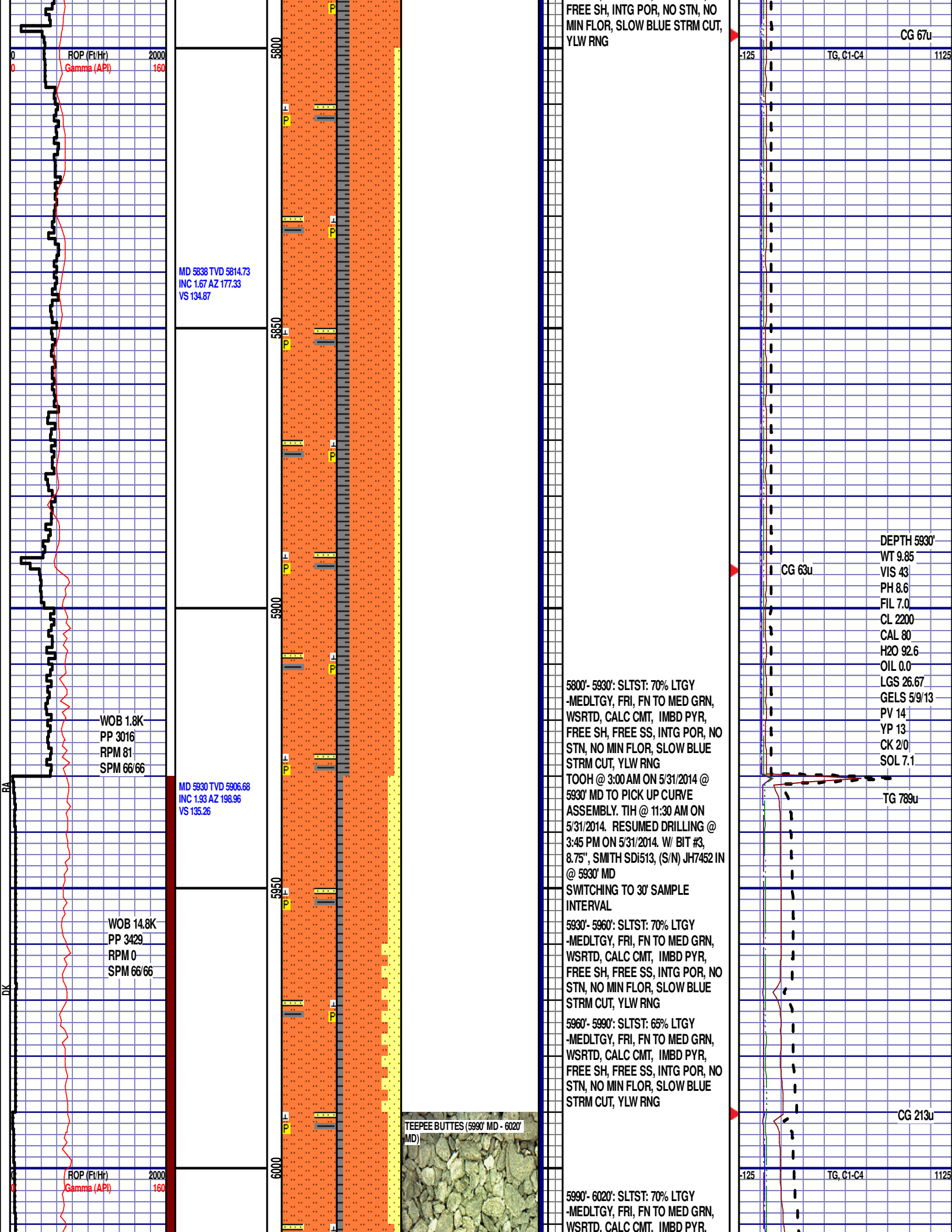
5400'- 5500': SLTST: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
FREE SH, INTG POR, NO STN, NO
MIN FLOR, SLOW BLUE STRM CUT,
YLW RNG

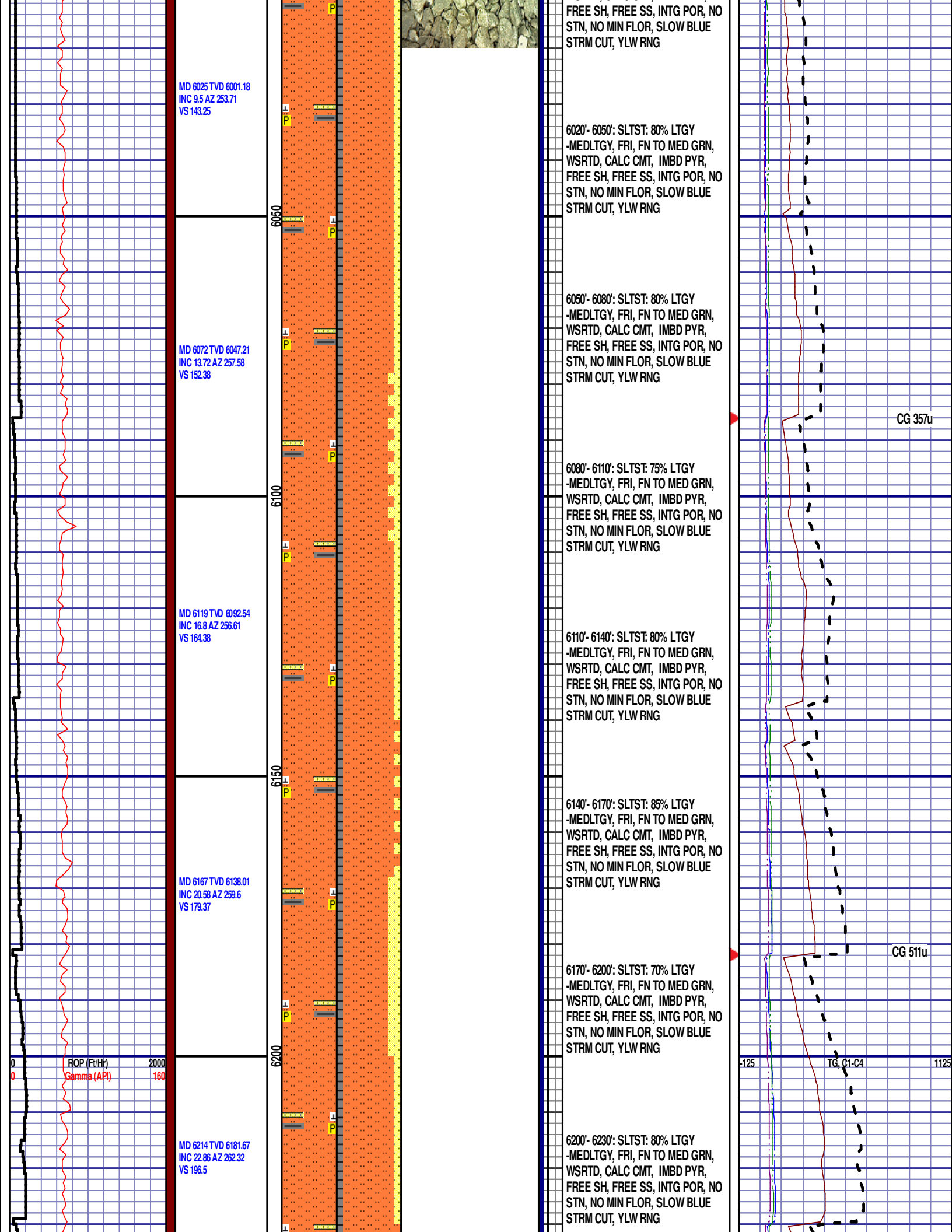
-125 TG, C1-C4 1125

CG 82u

CG 89u







WOB 15.3K
PP 3411
RPM 0
SPM 60/60

MD 6309 TVD 6267.06
INC 29.02 AZ 260.57
VS 237.44

ROP (Ft/Hr)
Gamma (API)

MD 6403 TVD 6345.94
INC 36.76 AZ 256.26
VS 287.14

6250

6300

6350

6400

6450

TEEPEE BUTTES (6290' MD - 6320' MD)

SHARON SPRINGS (6380' MD - 6410' MD)

NIOBRARA A CHALK (6440' MD - 6470' MD)

6230'- 6260': SLTST: 85% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
FREE SH, FREE SS, INTG POR, NO
STN, NO MIN FLOR, SLOW BLUE
STRM CUT, YLW RNG

6260'- 6290': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
FREE SH, FREE SS, INTG POR, NO
STN, NO MIN FLOR, SLOW BLUE
STRM CUT, YLW RNG

6290'- 6320': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
FREE SH, FREE SS, INTG POR, NO
STN, NO MIN FLOR, SLOW BLUE
STRM CUT, YLW RNG

6320'- 6350': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
FREE SH, INTG POR, NO STN, NO
MIN FLOR, SLOW BLUE STRM CUT,
YLW RNG

6350'- 6380': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
FREE SH, FREE BENT, INTG POR,
NO STN, 10% MIN FLOR, SLOW
BLUE STRM CUT, YLW RNG

SHARON SPRINGS

6398' MD 6342' TVD

6380'- 6410': SLTST: 80% LTGY-MEDLTGY, FRI,
FN TO MED GRN, WSRTD, CALC CMT, IMBD
PYR, FREE SH, FREE BENT, INTG POR, NO
STN, 10% MIN FLOR, BLUE STRM CUT, YLW
RNG

6410'- 6440': SLTST: 70% LTGY-MEDLTGY, FRI,
FN TO MED GRN, WSRTD, CALC CMT, IMBD
PYR, FREE SH, FREE BENT, INTG POR, NO
STN, 10% MIN FLOR, BLUE STRM CUT, YLW
RNG

Scale Change
TG, C1-C4

GAS SCALE CHANGE:
-600 TO 5400
(600 UNITS/ DIVISION)

CG 644u

CG 1972u

TG, C1-C4

GAMMA SCALE
CHANGE: 0-200

Scale Change
ROP (Ft/Hr)
Gamma (API)

12:01 AM

6/1/2014

FT/24 HRS

1281

DAY 04

WOB 24.8K

PP 3265

RPM 0

SPM 113/0

MD 6498 TVD 6417.05
INC 46.17 AZ 255.73
VS 347.81

MD 6592 TVD 6475.56
INC 56.72 AZ 258.63
VS 419.1

ROP (Ft/Hr)
Gamma (API)

NIOBRARA A CHALK

6459' MD 6388' TVD

6440'-6470': CHK: 80% (CaCO₃ 70%) PRED
LTGY - MEDGY - TR GYSHBLK, BLKY TO
SUBBLKY, FXLN TO CHLKY, SFT TO FRM,
IMBD CALC, SCAT FREE PYR, TRC FREE
BENT, 20% FREE MARL, MOD GYSHBLK STN,
10% MIN FLOR, IMMED BLUE STRM CUT,
YLW RING

6470'-6500': CHK: 70% (CaCO₃ 65%) PRED
LTGY - MEDGY - TR GYSHBLK, BLKY TO
SUBBLKY, FXLN TO CHLKY, SFT TO FRM,
IMBD CALC, SCAT FREE PYR, TRC FREE
BENT, 30% FREE MARL, MOD GYSHBLK STN,
10% MIN FLOR, IMMED BLUE STRM CUT,
YLW RING

6500'-6530': CHK: 70% (CaCO₃ 65%)
PRED LTGY - MEDGY - TR
GYSHBLK, BLKY TO SUBBLKY,
FXLN TO CHLKY, SFT TO FRM,
IMBD CALC, SCAT FREE PYR, TRC
FREE BENT, 30% FREE MARL, MOD
GYSHBLK STN, 10% MIN FLOR,
IMMED BLUE STRM CUT, YLW RING

NIOBRARA A MARL

6539' MD 6443' TVD

6530'-6560': MRL: 55% (CaCO₃ 45%)
MEDDRKGY - GYSHBLK, SOFT TO BRITTLE,
FREE CALC, SCAT PYRC
LAMN, IMBD CALC, 45% FREE CHK,
PRED LTGY - SCAT MEDGY, 10%
MIN FLOR, IMMED BLUE STRM CUT,
YLW RING

6560'-6590': MRL: 55% (CaCO₃ 45%)
MEDDRKGY - GYSHBLK, SOFT TO BRITTLE,
FREE CALC, SCAT PYRC LAMN, IMBD CALC,
45% FREE CHK, PRED LTGY - SCAT MEDGY,
10% MIN FLOR, IMMED BLUE STRM CUT,
YLW RING

NIOBRARA B CHALK

6601' MD 6480' TVD

6590'-6620': CHK: 70% (CaCO₃ 65%) PRED
LTGY - MEDGY - TR GYSHBLK, BLKY TO
SUBBLKY, FXLN TO CHLKY, SFT TO FRM,
IMBD CALC, SCAT FREE PYR, 30% FREE
MARL, MOD GYSHBLK STN, 10% MIN FLOR,
IMMED BLUE STRM CUT, YLW RING

6620'-6650': CHK: 70% (CaCO₃ 65%) PRED
LTGY - MEDGY - TR GYSHBLK, BLKY TO
SUBBLKY, FXLN TO CHLKY, SFT TO FRM,
IMBD CALC, SCAT FREE PYR, 30% FREE
MARL, MOD GYSHBLK STN, 10% MIN FLOR,
IMMED BLUE STRM CUT, YLW RING

END OF VERTICAL LOG @ 6650' MD
ON 6/1/2014, CONTINUED ON
HORIZONTAL LOG.

CG 2457u

CG 3616u

TG, C1-C4

