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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 6550' MD

Start Date: April 17, 2014

Release Date: April 22, 2014

Well Information

Well Name: Wells Ranch
AA35-62-1HNA

Location: 35-6N-63W
643' FSL, 178' FWL

County: Weld
State: Colorado

Drilling Rig: H&P 277

Total Depth: 10975' MD

TD Date: April 22, 2014

Formation: Niobrara A Chalk

KB Elevation: 4764'

GR Elevation: 4740'

API Number: 05-123-38667-0000

ROCK TYPES

Anhy
 Bent
 Cht
 Clyst
 Coal
 Congl
 Dol

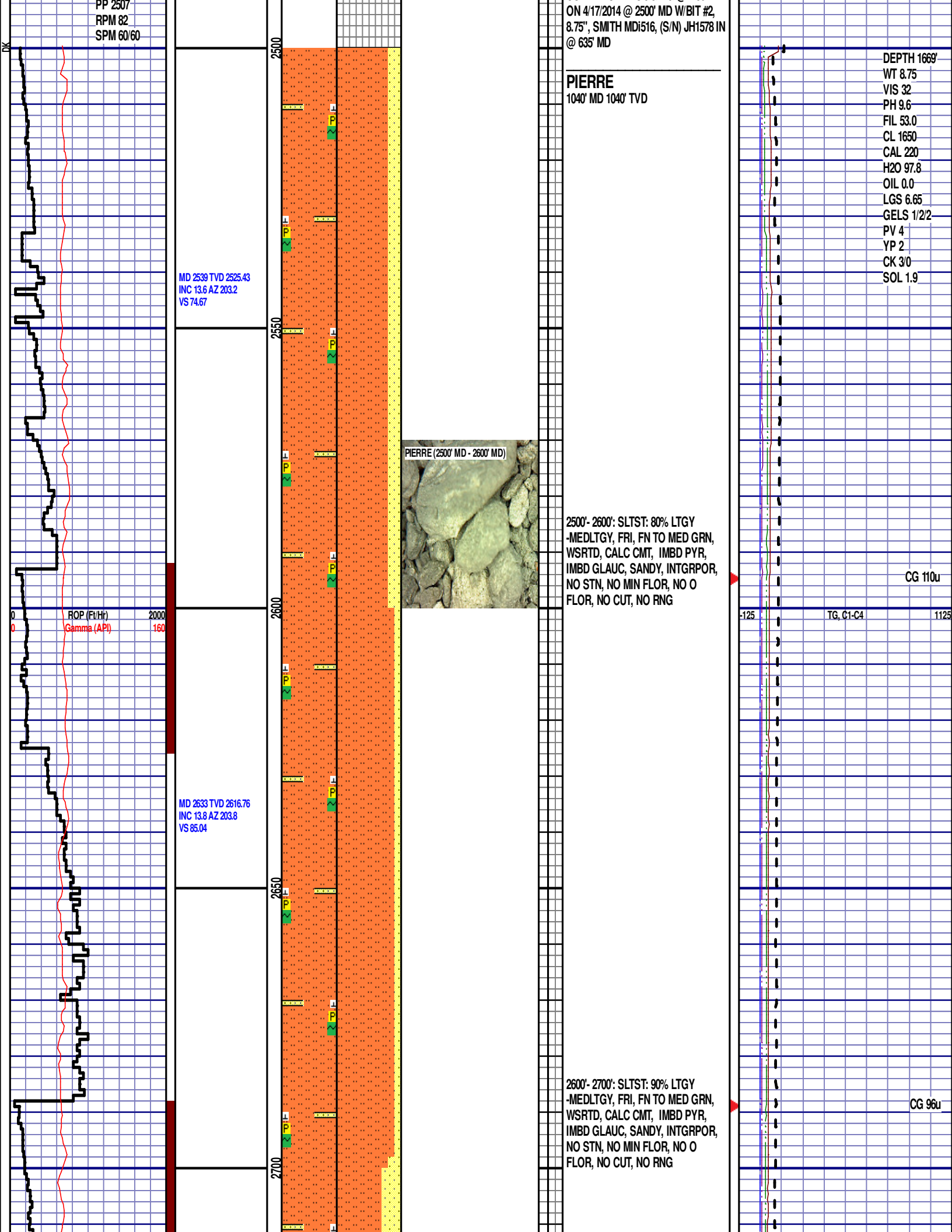
Gyp
 Igne
 Lmst
 Meta
 Mrlst
 Salt
 Shale

Shcol
 Chalk
 Slst
 Ss
 Till
 gw
 Imywash

ogw
 olmywash
 oshly gw
 shly gw
 sdygw
 hvycrbsh
 nosmpl

Lsdetrit
 sltst
 sdy sh

ROP (Ft/Hr) Gamma (API)	Drill Depth v. Time	Survey Data	Depth	Lithology	Lithology Percentages	Sample Photographs	Porosity	Geological Description	TG (1-8) C1 (units) C2 (units) C3 (units) C4 (units)	Total Gas, C1-C4
0 0	ROP (Ft/Hr) Gamma (API)		24					NOBLE ENERGY INC WELLS RANCH AA35-62-1HNA 35-6N-63W 643' FSL, 178' FWL WELD CO., CO H&P 277 LOGGERS: ROSS APODACA DAN KING CALLED OUT BY COMPANY MAN ON 4/17/2014 COMMENCED LOGGING @ 7:30 PM	-125 TG, C1-C4 1125	
	SLIDE=RED ROTATE=WHITE								CONNECTIONS ARE MARKED WITH RED TRIANGLES	
	ROP SCALE: 0 TO 2000 GAMMA SCALE: 0 TO 160 (GAMMA DATA AS RECEIVED)								GAS SCALE: -125 TO 1125 125 UNITS/DIVISION	
	WOB 23.0K								DRILLING ON WATER BASED MUD	



MD 2728 TVD 2709.08
INC 13.5 AZ 198.3
VS 94.63

2750

2800

2850

2900

ROP (Ft/Hr)
Gamma (API)

2000
160

MD 2823 TVD 2801.42
INC 13.7 AZ 201.2
VS 103.73

WOB 6.1K
PP 2132
RPM 1
SPM 60/59

MD 2918 TVD 2893.47
INC 14.9 AZ 200.1
VS 113.61

2700'- 2800': 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

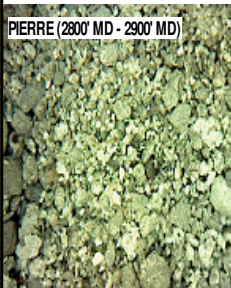
CG 82u

-125

TG, C1-C4

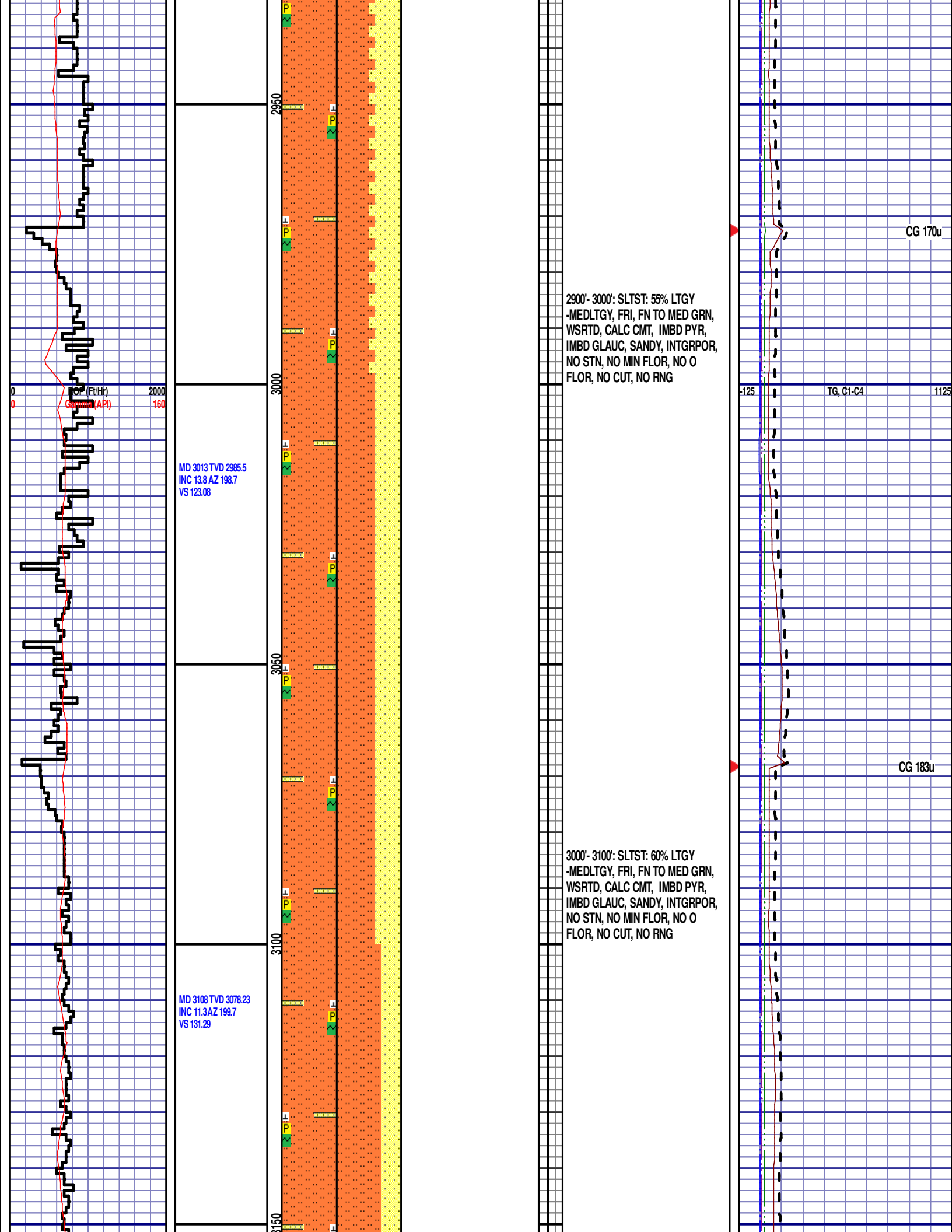
1125

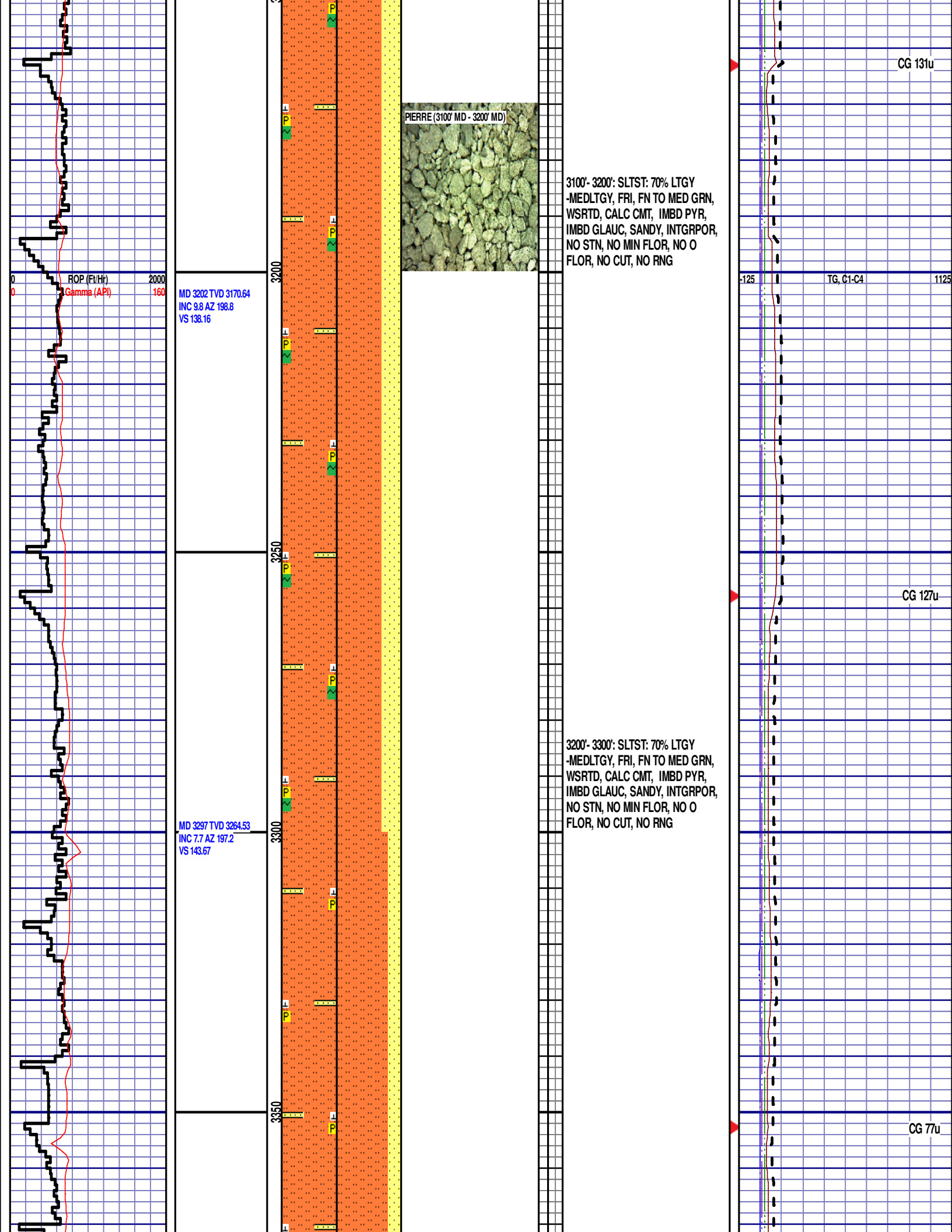
PIERRE (2800' MD - 2900' MD)

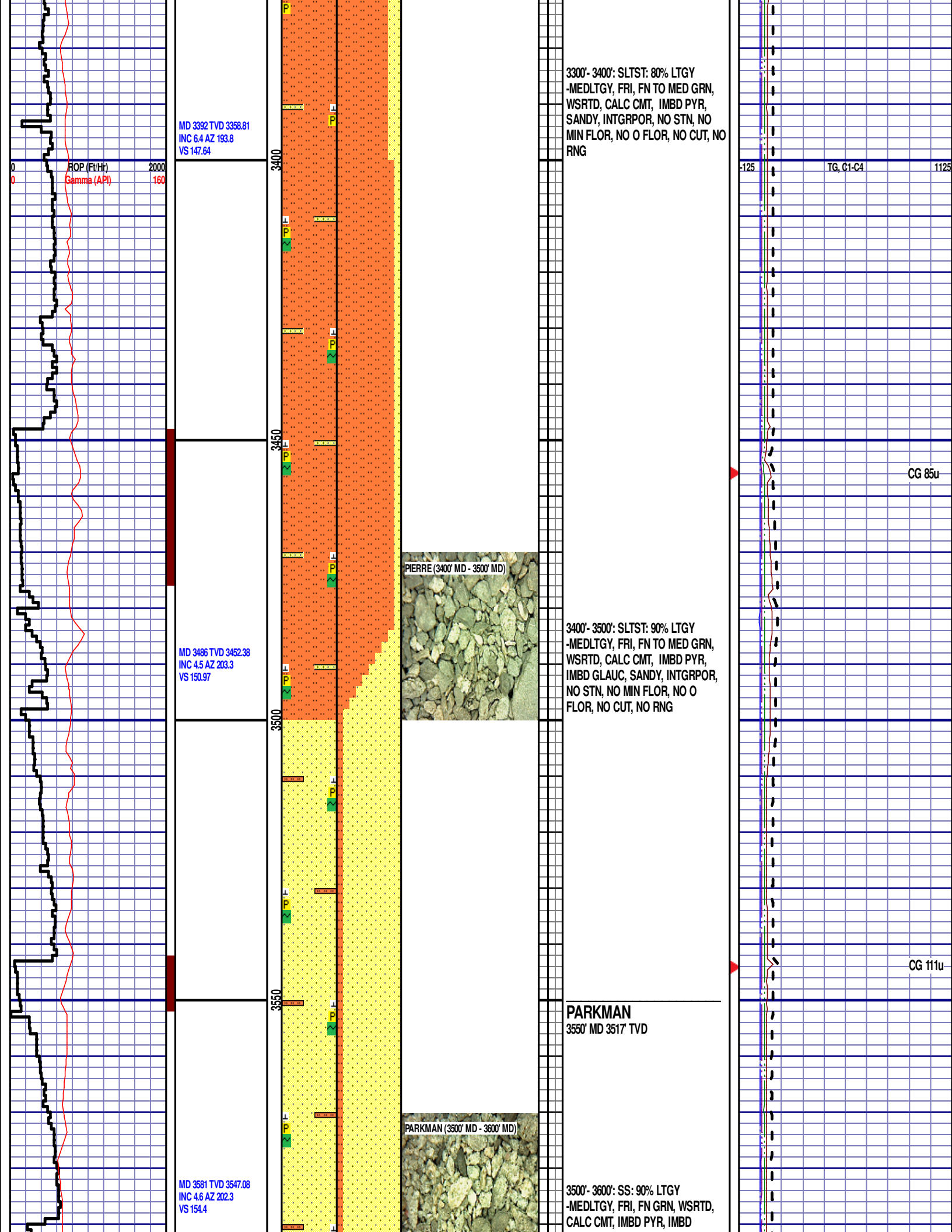


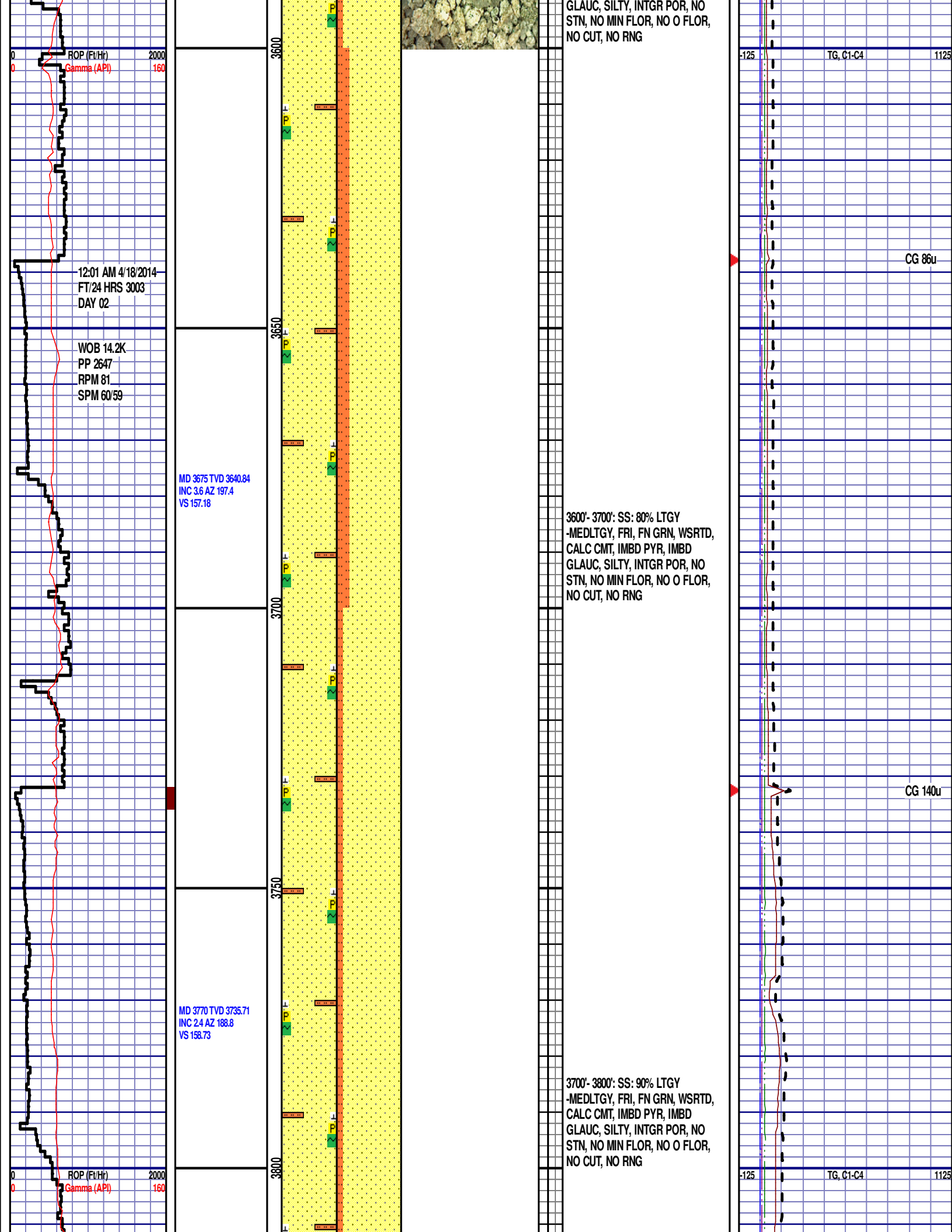
2800'- 2900': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

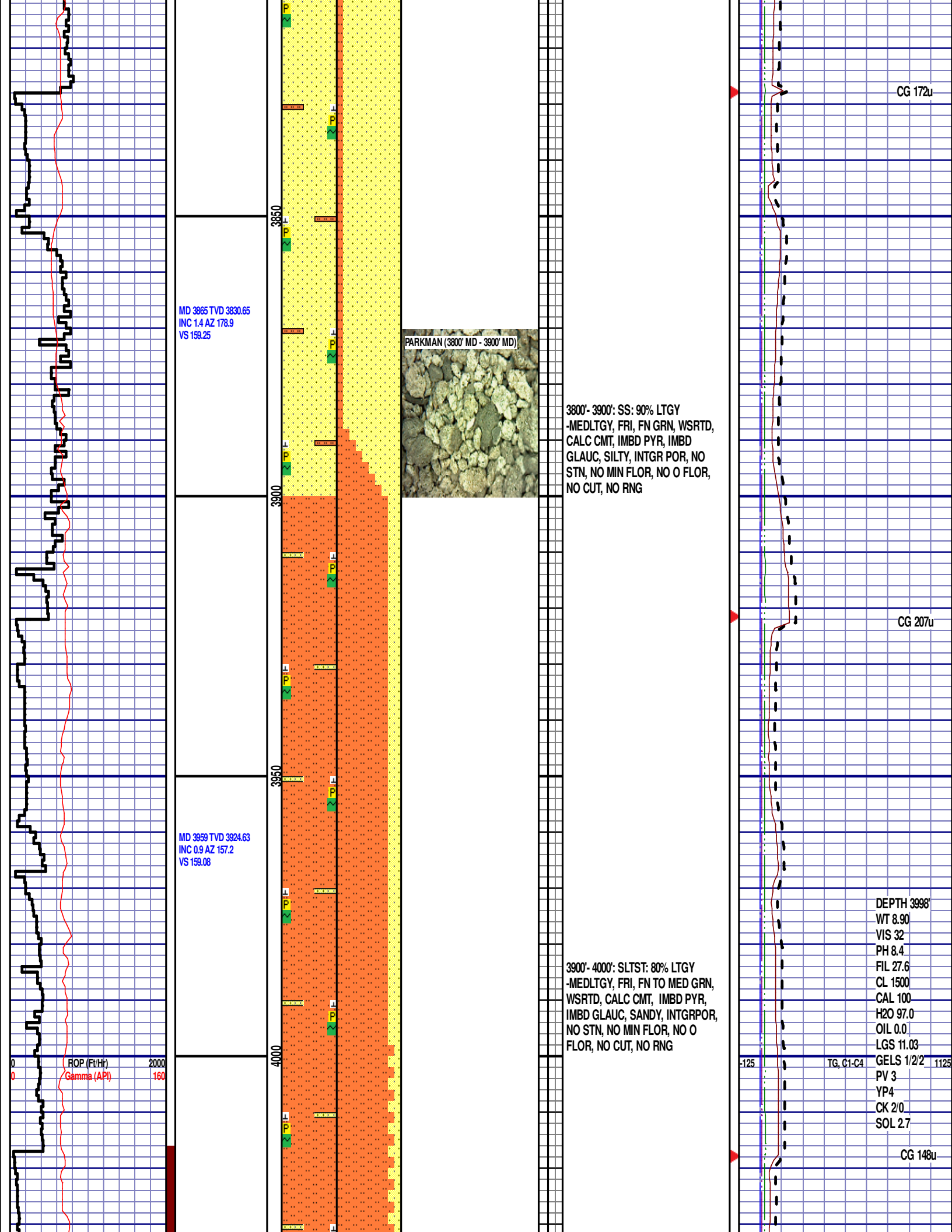
CG 76u











MD 4054 TVD 4019.62
INC 0.8 AZ 107.1
VS 158.22

MD 4149 TVD 4114.61
INC 1.2 AZ 69.8
VS 156.65

MD 4244 TVD 4209.59
INC 1 AZ 109.4
VS 154.93

ROP (Ft/Hr)
Gamma (API)

2000
160

4050
4100
4150
4200
4250

PARKMAN (4100' MD - 4200' MD)



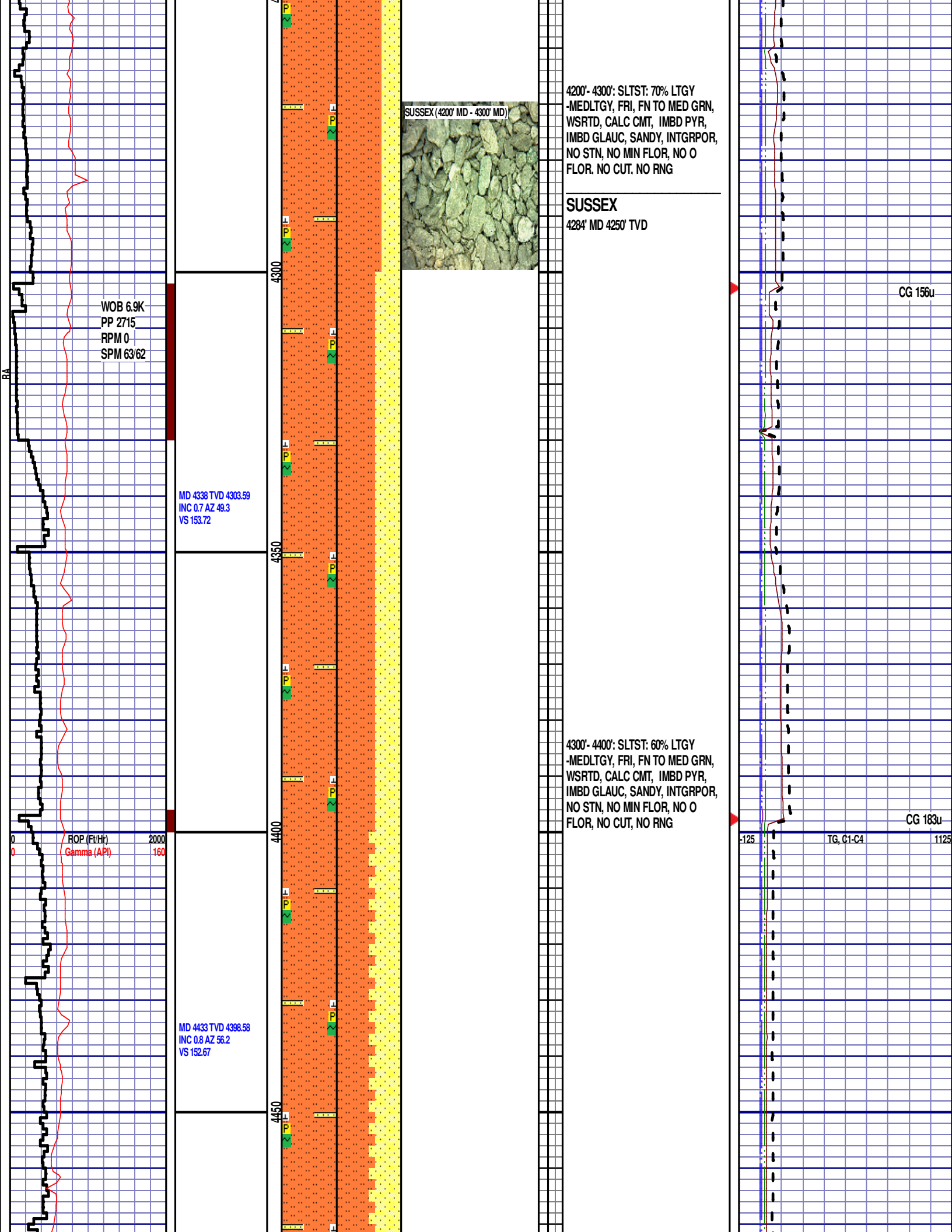
4000'- 4100': SLTST: 85% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

4100'- 4200': SLTST: 90% 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 149u

TG, C1-C4

CG 144u



WOB 6.9K
PP 2715
RPM 0
SPM 63/62

MD 4338 TVD 4303.59
INC 0.7 AZ 49.3
VS 153.72

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

MD 4433 TVD 4398.58
INC 0.8 AZ 56.2
VS 152.67

SUSSEX (4200' MD - 4300' MD)



4200'- 4300': 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

SUSSEX

4284' MD 4250' TVD

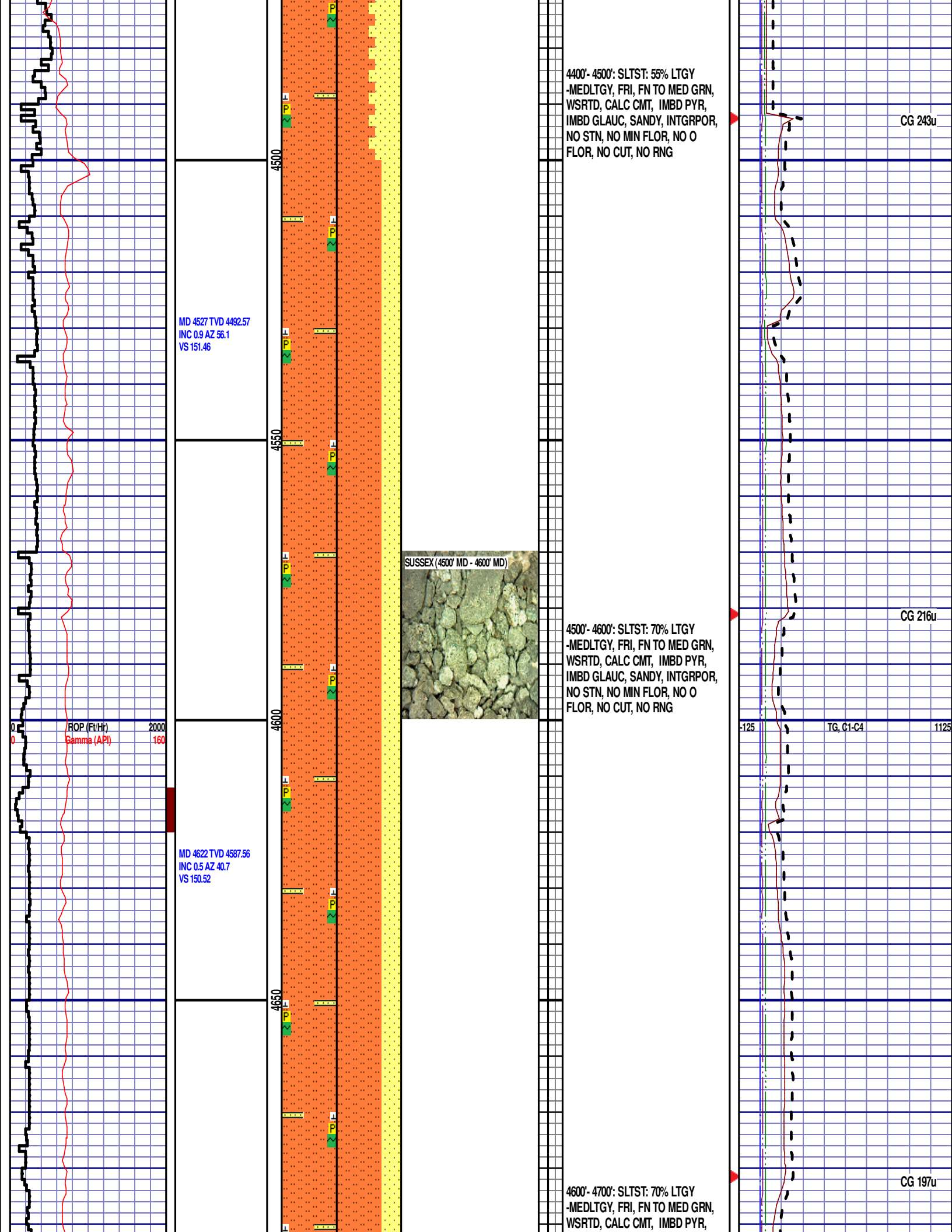
4300'- 4400': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

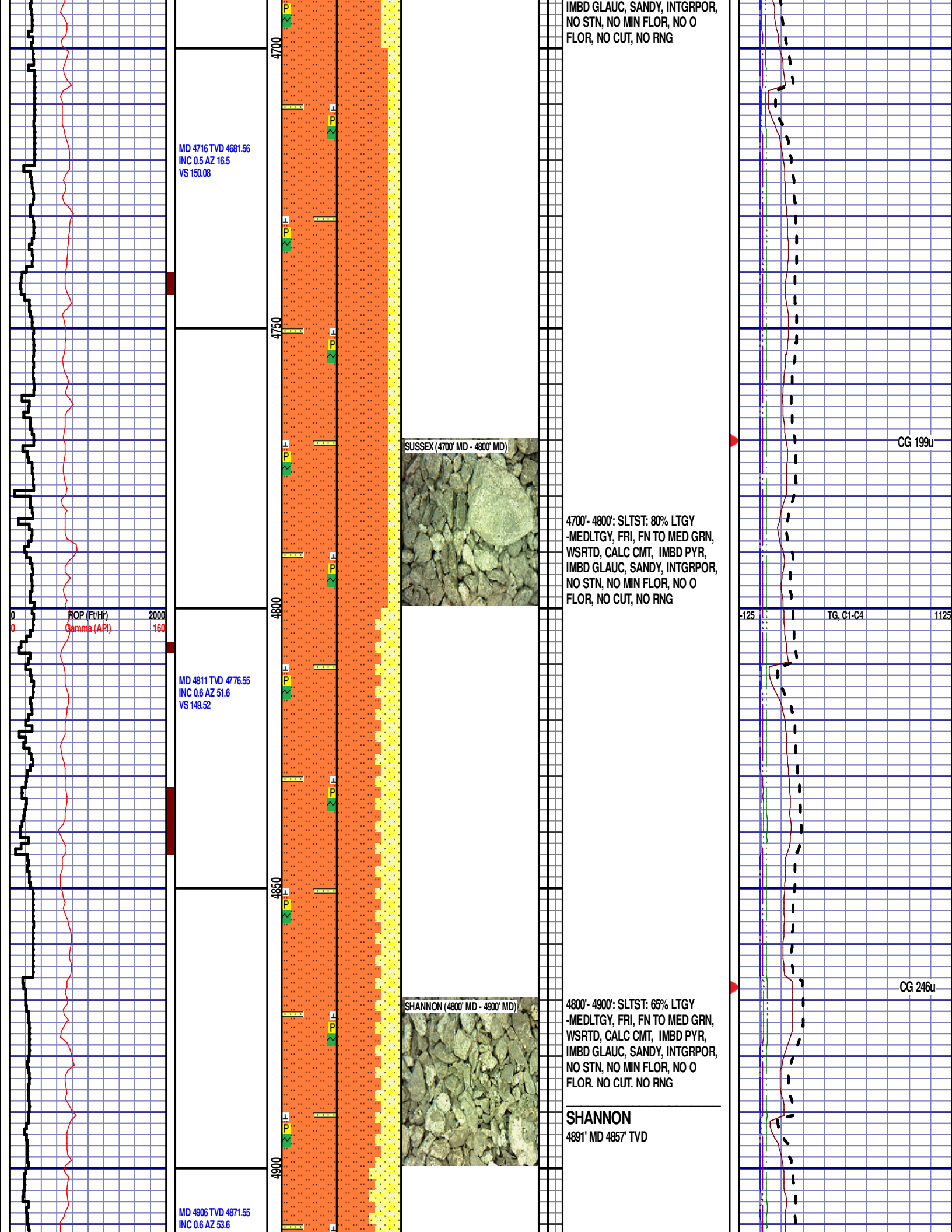
CG 156u

CG 183u

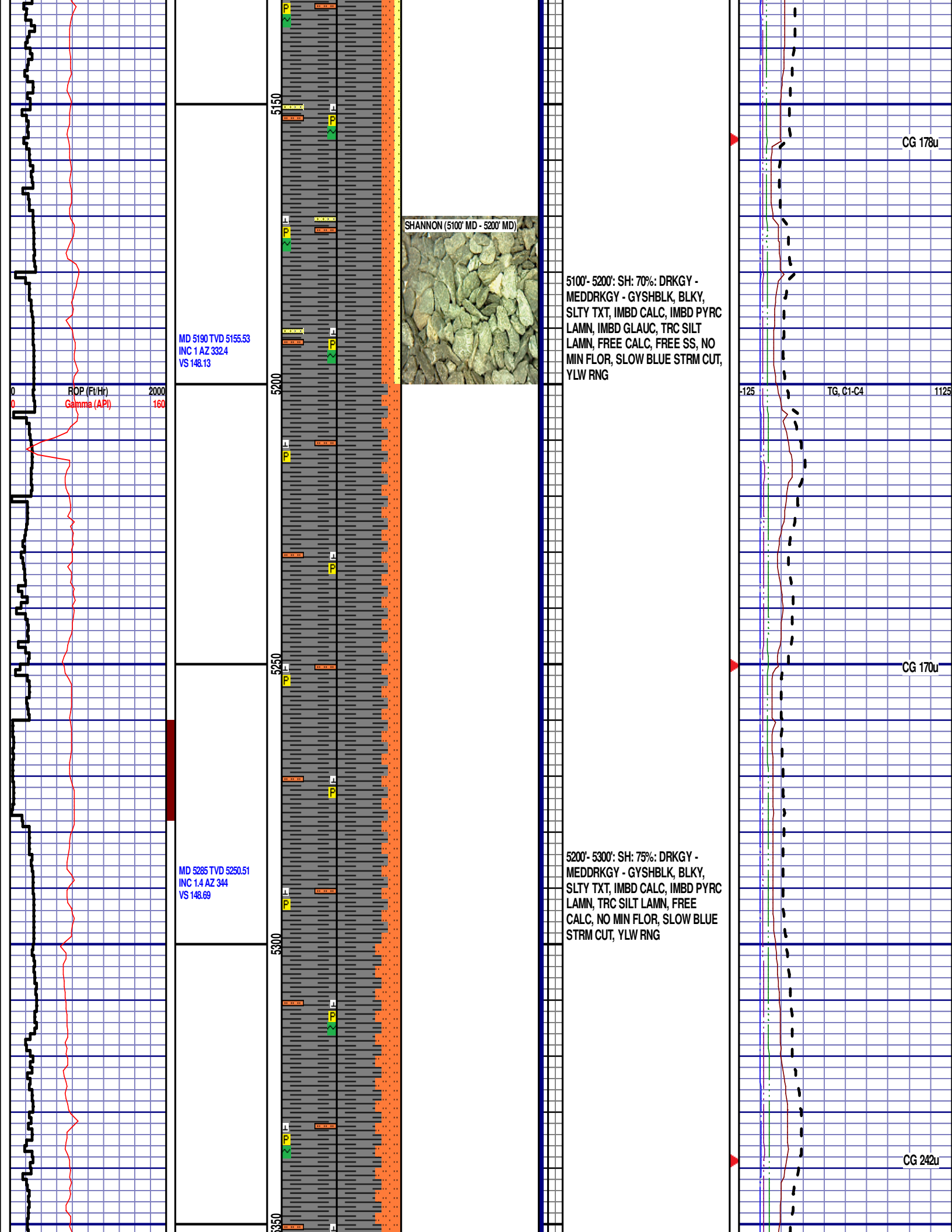
TG, C1-C4

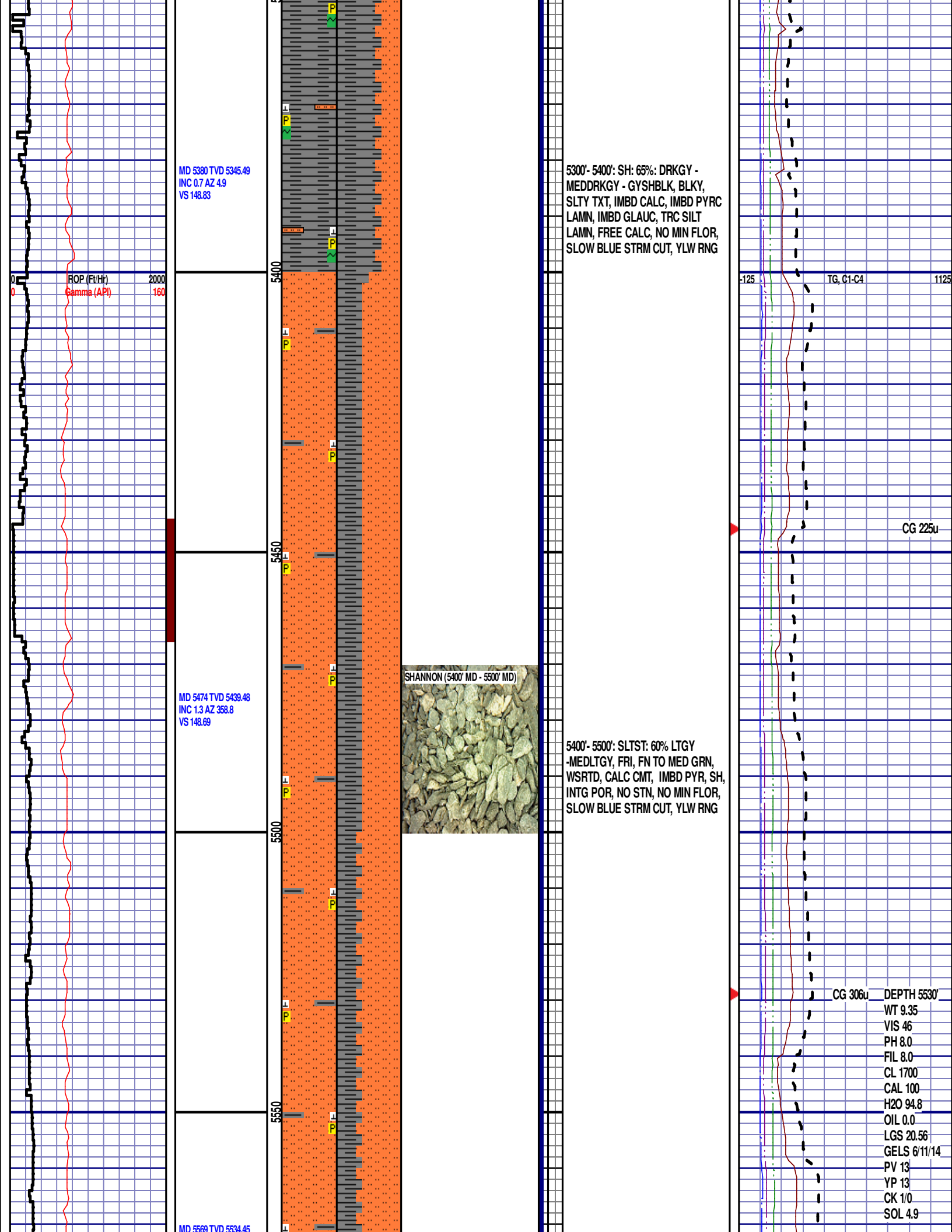
1125





5000'- 5100': SH: 60%: DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, IMBD CALC, IMBD PYRC
LAMN, IMBD GLAUC, TRC SILT
LAMN, FREE CALC, FREE SS, NO
MIN FLOR, SLOW BLUE STRM CUT,
YLW RNG





INC 1.3 AZ 331.7
VS 149.07

ROP (Ft/Hr)
Gamma (API)

2000
160

5600

5650

5700

5750

MD 5663 TVD 5628.42
INC 1.7 AZ 331.5
VS 150.07

WOB 5.5K
PP 3700
RPM 0
SPM 64/64

MD 5758 TVD 5723.38
INC 1.8 AZ 335.1
VS 151.62

5500'- 5600': SLTST: 65% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

5600'- 5700': SLTST: 85% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

5700'- 5800': SLTST: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

SHANNON (5700' MD - 5800' MD)

TG, C1-C4

CG 772u

CG 436u

INC 1.3 AZ 331.7
VS 149.07

ROP (Ft/Hr)
Gamma (API)

2000
160

MD 5663 TVD 5628.42
INC 1.7 AZ 331.5
VS 150.07

WOB 5.5K
PP 3700
RPM 0
SPM 64/64

MD 5758 TVD 5723.38
INC 1.8 AZ 315.1
VS 151.62

5500'- 5600': SLTST: 65% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

5600'- 5700': SLTST: 85% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

5700'- 5800': SLTST: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

SHANNON (5700' MD - 5800' MD)

INC 1.3 AZ 331.7
VS 149.07

ROP (Ft/Hr)
Gamma (API)

2000
160

MD 5663 TVD 5628.42
INC 1.7 AZ 331.5
VS 150.07

WOB 5.5K
PP 3700
RPM 0
SPM 64/64

MD 5758 TVD 5723.38
INC 1.8 AZ 315.1
VS 151.62

SHANNON (5700' MD - 5800' MD)

5500'- 5600': SLTST: 65% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

5600'- 5700': SLTST: 85% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

5700'- 5800': SLTST: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

TG, C1-C4

CG 772u

CG 436u

INC 1.3 AZ 331.7
VS 149.07

ROP (Ft/Hr)
Gamma (API)

2000
160

MD 5663 TVD 5628.42
INC 1.7 AZ 331.5
VS 150.07

WOB 5.5K
PP 3700
RPM 0
SPM 64/64

MD 5758 TVD 5723.38
INC 1.8 AZ 315.1
VS 151.62

SHANNON (5700' MD - 5800' MD)

5500'- 5600': SLTST: 65% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

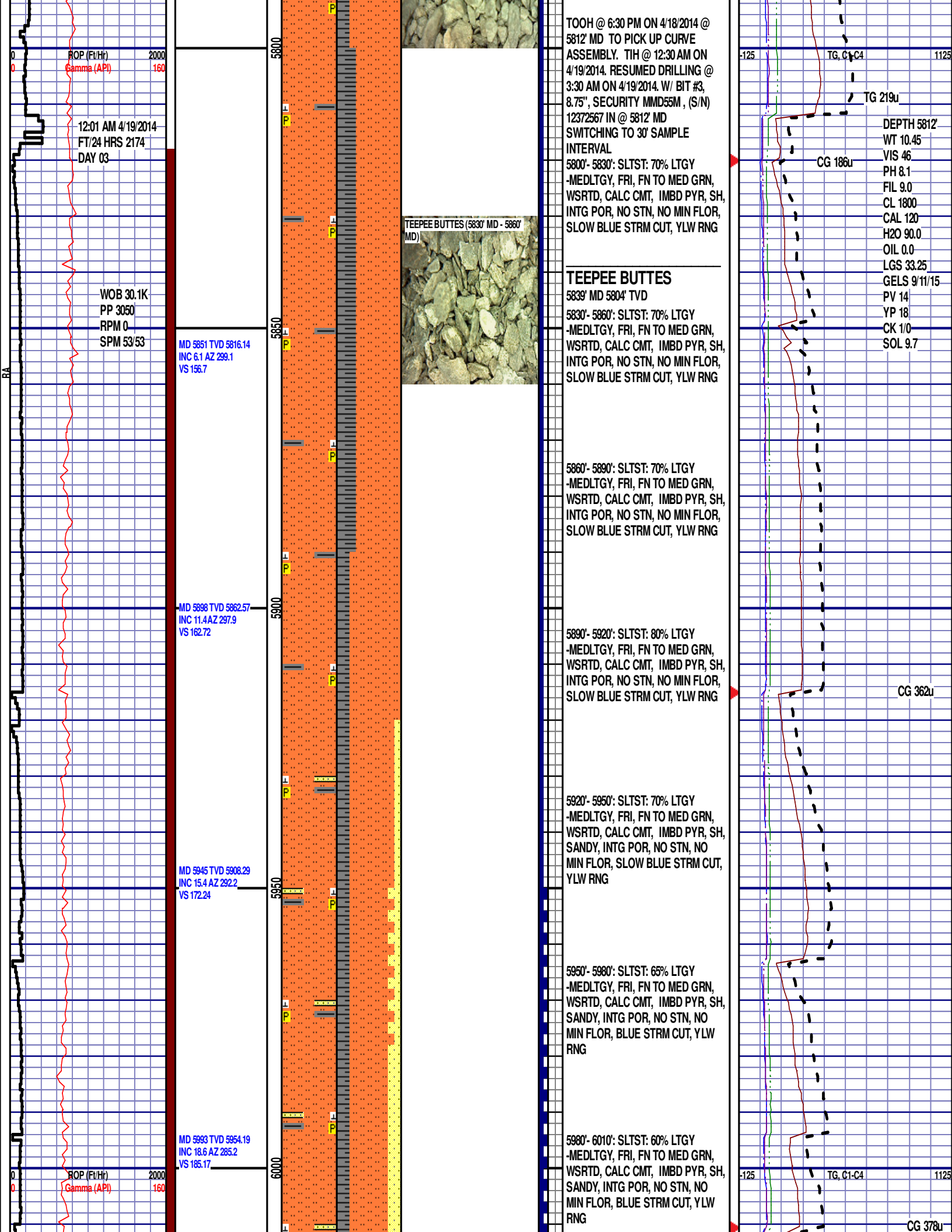
5600'- 5700': SLTST: 85% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

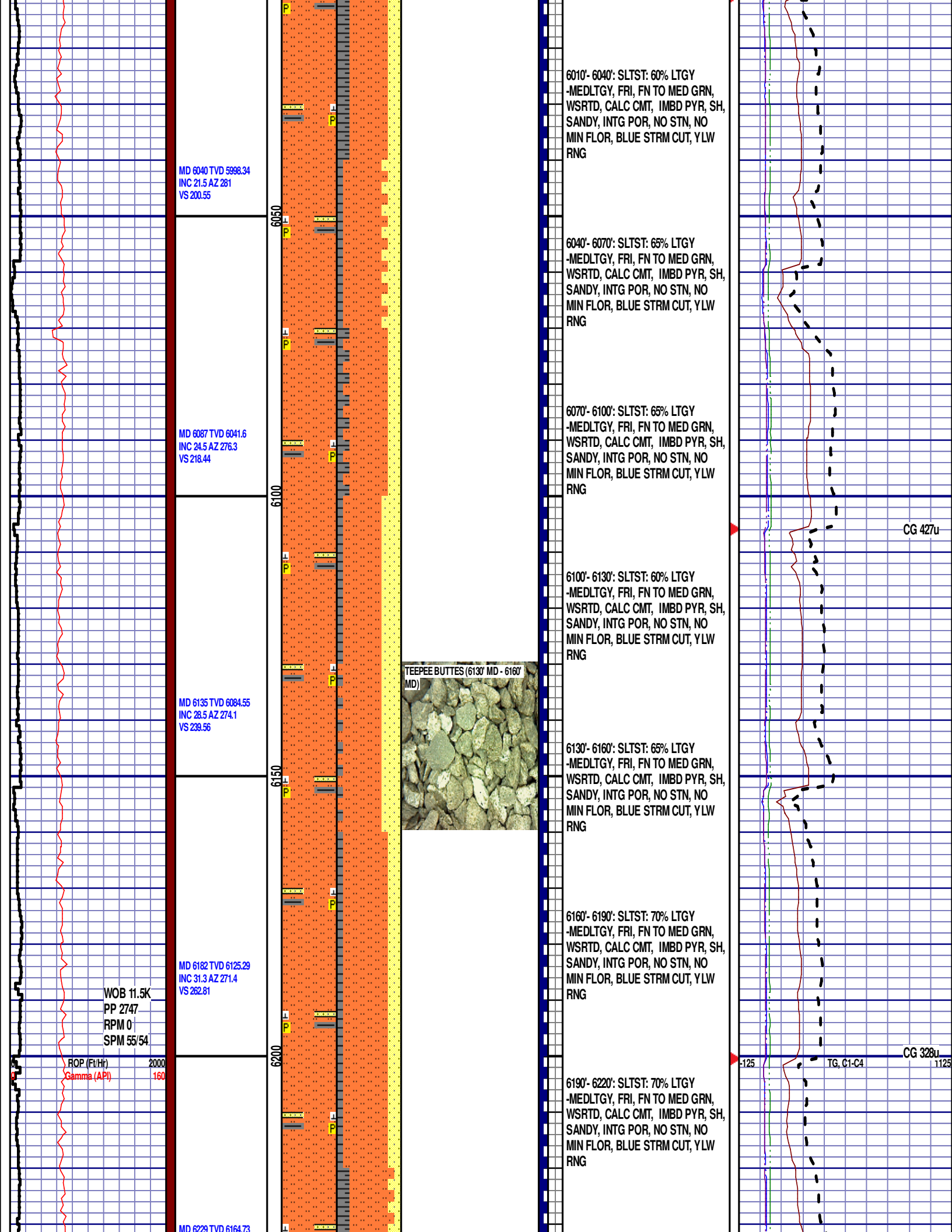
5700'- 5800': SLTST: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
SLOW BLUE STRM CUT, YLW RNG

TG, C1-C4

CG 772u

CG 436u





INC 34.6 AZ 269.9
VS 288.28

MD 6277 TVD 6203.18
INC 38.9 AZ 267.9
VS 316.94

MD 6324 TVD 6238.97
INC 41.9 AZ 267.2
VS 347.39

MD 6372 TVD 6273.78
INC 45.1 AZ 268.8
VS 380.39

MD 6419 TVD 6306.01
INC 48.3 AZ 271.4
VS 414.49

ROP (Ft/Hr)
Gamma (API)

2000
160

6250

6300

6350

6400

6450

6220'- 6250': SLTST: 65% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
SANDY, INTG POR, NO STN, NO
MIN FLOR, BLUE STRM CUT, YLW
RNG

6250'- 6280': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
SANDY, INTG POR, NO STN, NO
MIN FLOR, BLUE STRM CUT, YLW
RNG

6280'- 6310': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
SANDY, INTG POR, NO STN, NO
MIN FLOR, BLUE STRM CUT, YLW
RNG

6310'- 6340': SLTST: 65% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
SANDY, INTG POR, NO STN, NO
MIN FLOR, BLUE STRM CUT, YLW
RNG

6340'- 6370': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
SANDY, INTG POR, NO STN, NO
MIN FLOR, BLUE STRM CUT, YLW
RNG

6370'- 6400': SLTST: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
TR SS, INTG POR, NO STN, NO MIN
FLOR, BLUE STRM CUT, YLW RNG

6400'- 6430': SLTST: 75% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
NO O FLOR, BLUE STRM CUT, YLW
RNG

6430'- 6460': SLTST: 75% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,

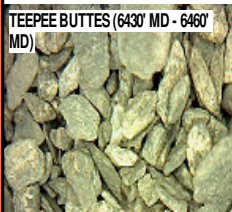
CG 492u

CG 702u

Scale Change
TG, C1-C4

GAS SCALE CHANGE:
-300 TO 2700
(300 UNITS/ DIVISION)

TEEPEE BUTTES (6430' MD - 6460'
MD)



MD 6466 TVD 6336.41
INC 51.1 AZ 273.4
VS 450.08

MD 6514 TVD 6365.02
INC 55.7 AZ 272.2
VS 488.31

6500

6550

00



INTG POR, NO STN, NO MIN FLOR,
NO O FLOR, BLUE STRM CUT, YLW RNG

6460'- 6490': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
TR SS, INTG POR, NO STN, NO MIN
FLOR, BLUE STRM CUT, YLW RNG

6490'- 6520': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
BLUE STRM CUT, YLW RNG

6520'- 6550': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, SH,
INTG POR, NO STN, NO MIN FLOR,
BLUE STRM CUT, YLW RNG

END OF VERTICAL LOG @ 6550' MD
ON 4/19/2014, CONTINUED ON
HORIZONTAL LOG.

CG 1050u

DEPTH 6545'
WT 10.85
VIS 48
PH 9.8
FIL 9.8
CL 1850
CAL 100
H2O 87.8
OIL 0.0
LGS 46.18
GELS 8/14/15
PV 16
YP 13
CK 2/0
SOL 11.9