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## Customer Information

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

**Geologist:** Teresa Malesardi  
Noble Energy Inc.

## Mud Logging Details

**Logger:** Robert Gulliksen & Brian Whitfield

**Log Interval:** 2500' MD to 6800' MD

**Start Date:** August 26, 2013

**Release Date:** September 3, 2013

## Well Information

**Well Name:** Wells Ranch USX  
AA27-69-1HN

**Location:** 27-6N-63W  
1369' FNL, 221' FWL

**County:** Weld  
**State:** Colorado

**Drilling Rig:** H&P 277

**Total Depth:** 11446' MD

**TD Date:** September 3, 2013

**Formation:** Niobrara B Chalk

**KB Elevation:** 4808'

**GR Elevation:** 4784'

**API Number:** 05-123-37138-0000

## ROCK TYPES

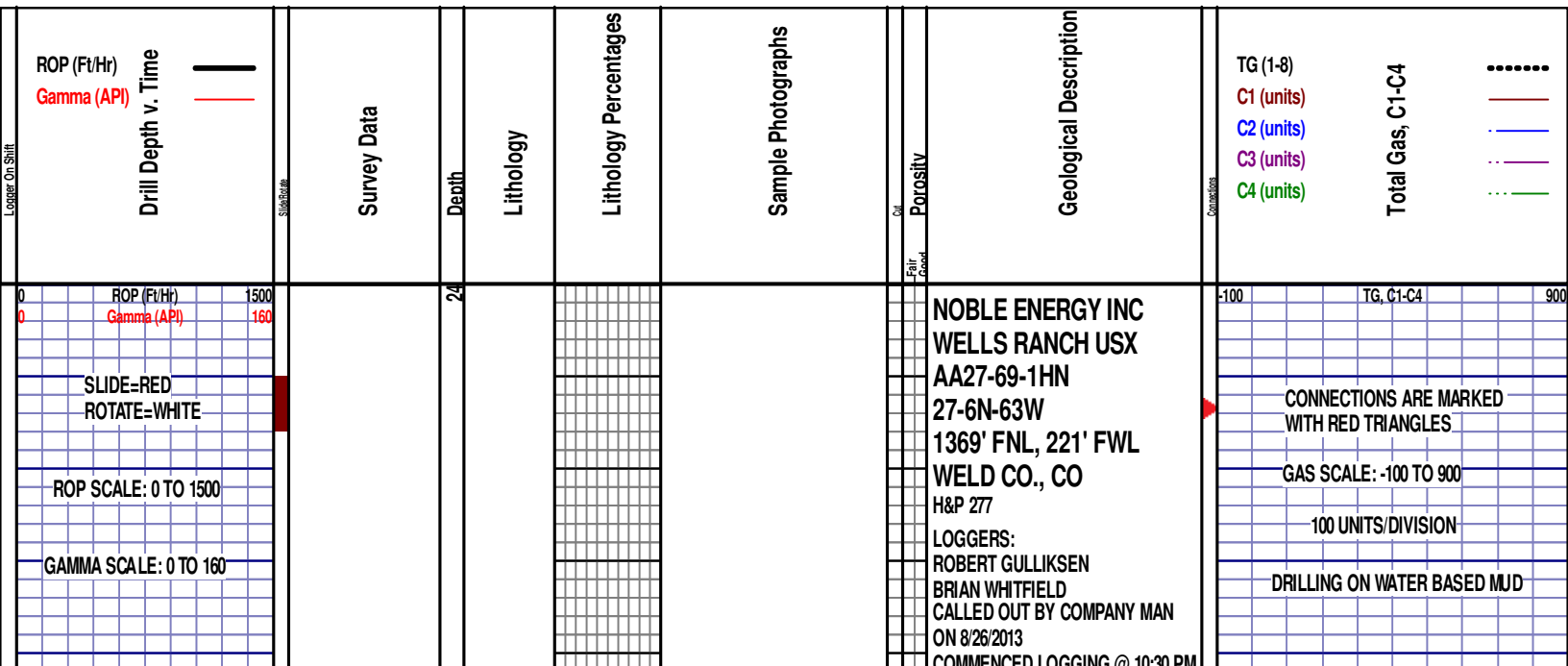
Anhy  
Bent  
Cht  
Clyst  
Coal  
Congl  
Dol

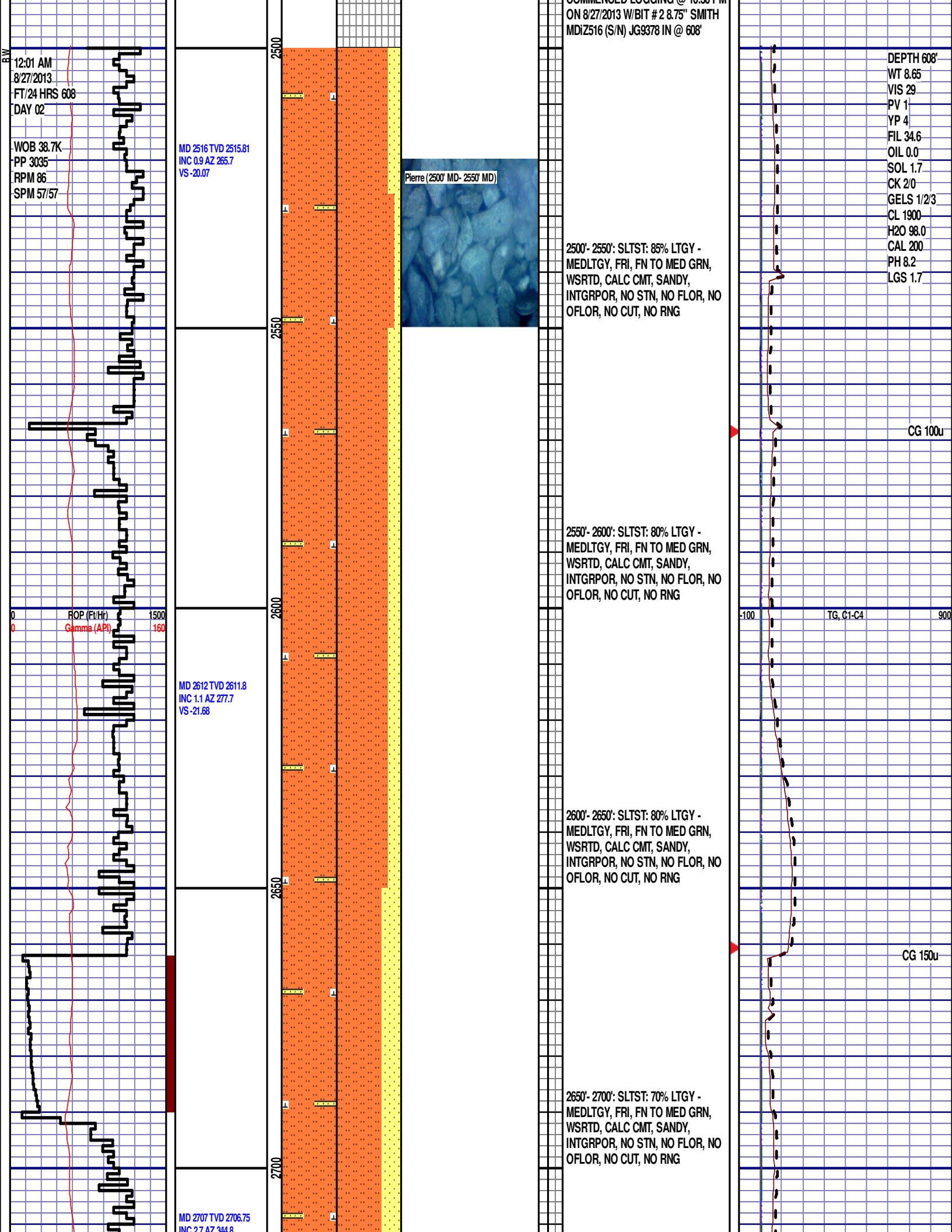
Gyp  
Igne  
Lmst  
Meta  
Mrlst  
Salt  
Shale

Shcol  
Chalk  
Slstst  
Ss  
Till  
gw  
Imywash

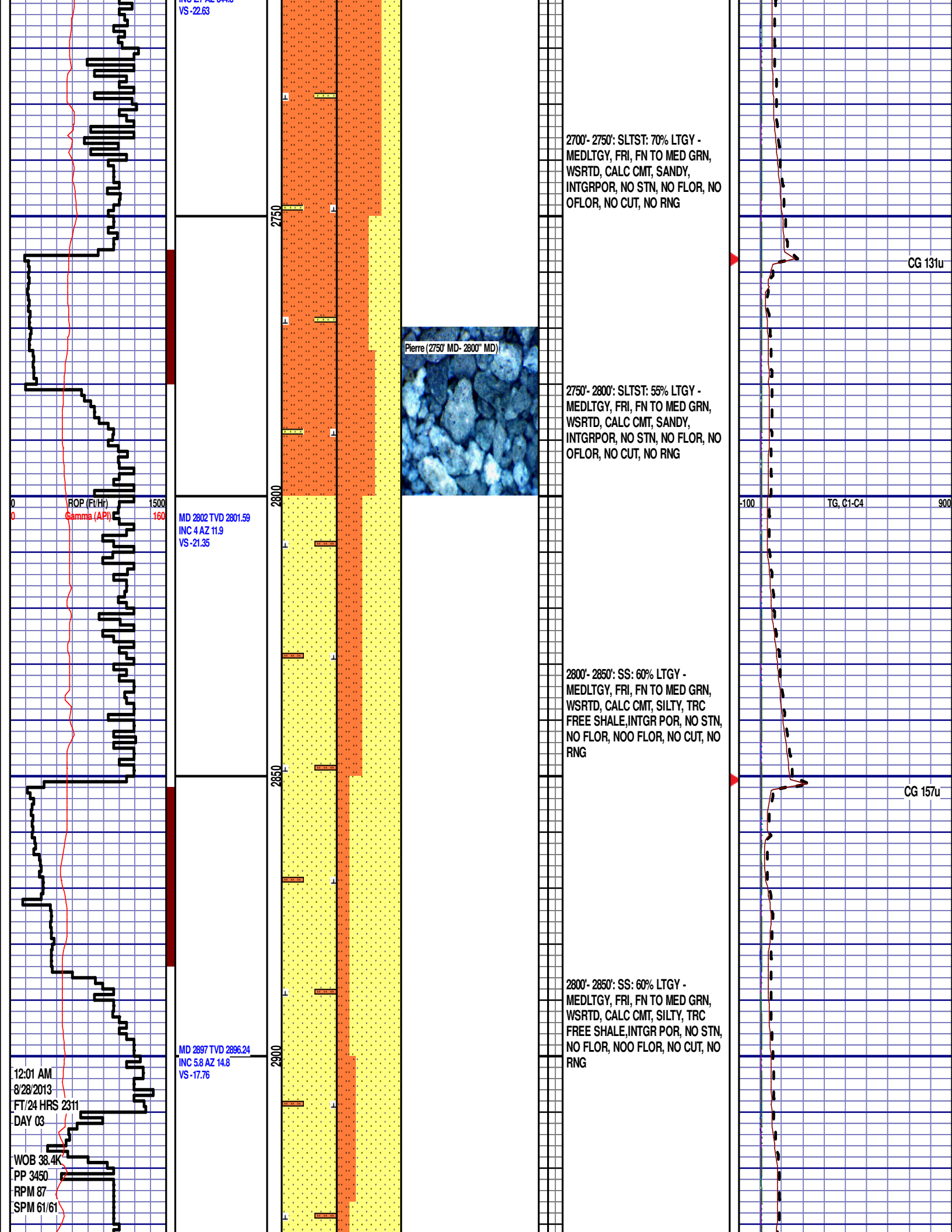
ogw  
olmywash  
oshly gw  
shly gw  
sdygw  
hvyrcbsh  
nosmpl

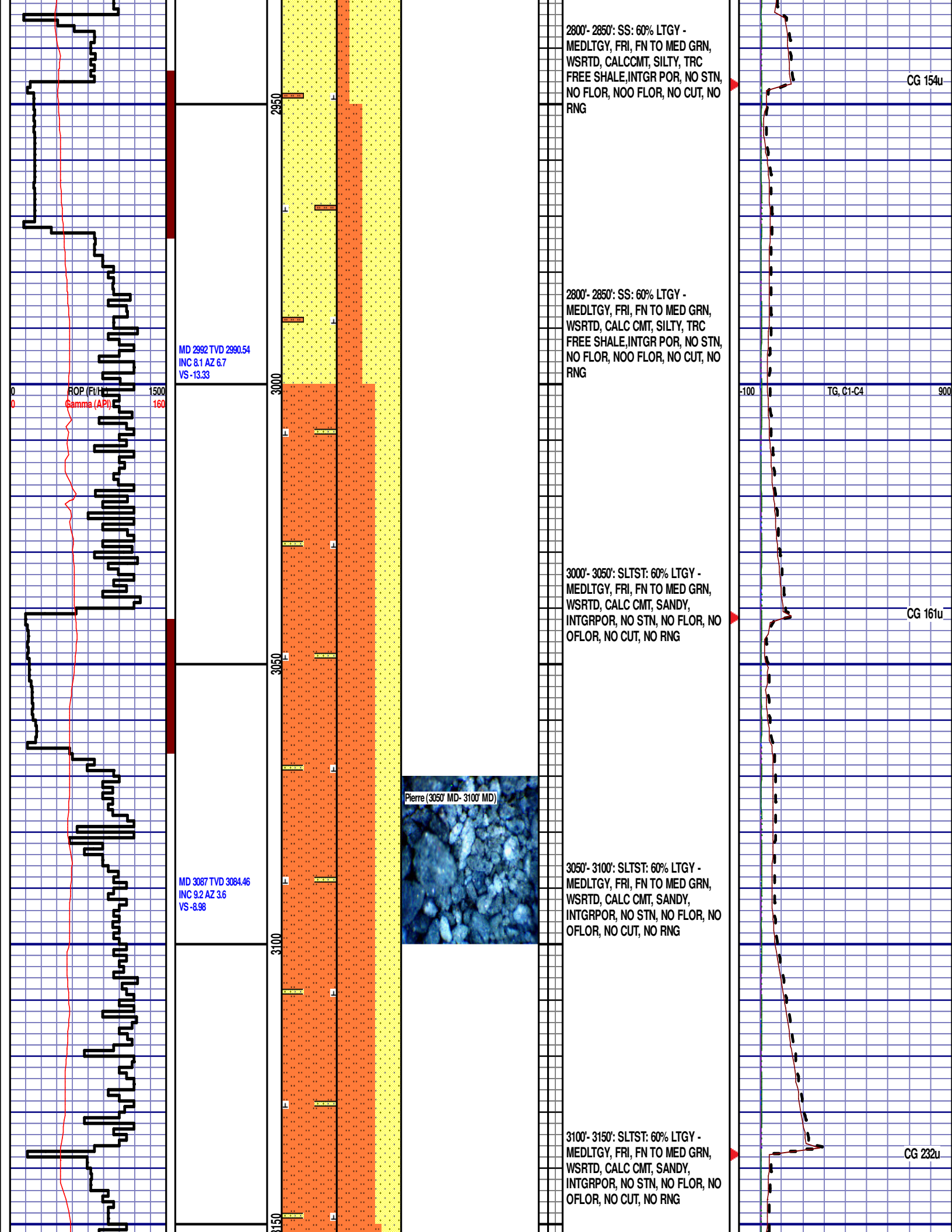
Lsdetrst  
sltst  
sdy sh

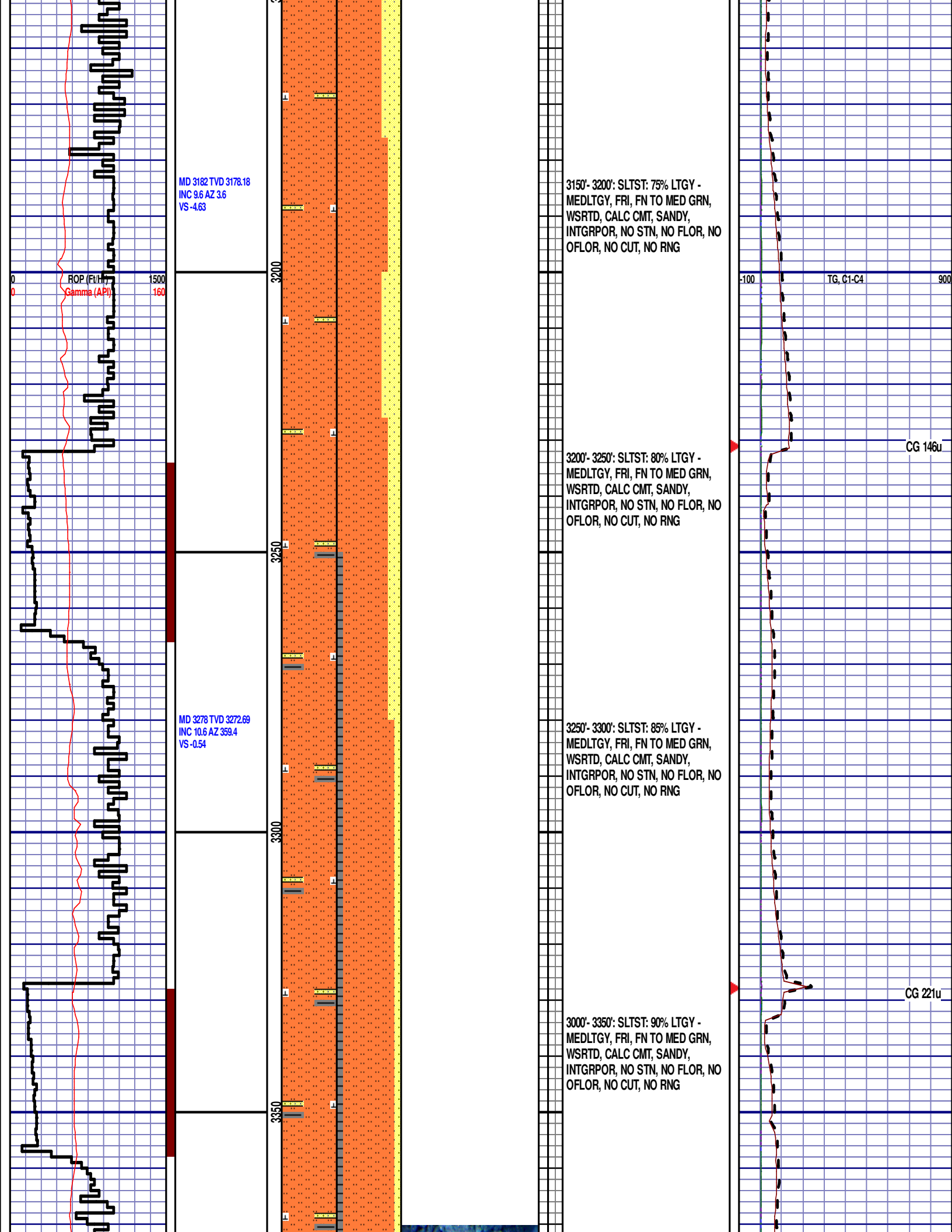




VS -22.63







MD 3373 TVD 3365.9  
INC 11.7 AZ 360  
VS 3.4



3350'- 3400': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN,  
WSRTD, CALC CMT, SANDY,  
INTGRPOR, NO STN, NO FLOR, NO  
OFLOR, NO CUT, NO RNG

3400'- 3450': SLTST: 95% LTGY -  
MEDLTGY, FRI, FN TO MED GRN,  
WSRTD, CALC CMT, SANDY,  
INTGRPOR, NO STN, NO FLOR, NO  
OFLOR, NO CUT, NO RNG

3450'- 3500': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN,  
WSRTD, CALC CMT, SANDY,  
INTGRPOR, NO STN, NO FLOR, NO  
OFLOR, NO CUT, NO RNG

3500'- 3550': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN,  
WSRTD, CALC CMT, SANDY,  
INTGRPOR, NO STN, NO FLOR, NO  
OFLOR, NO CUT, NO RNG

3550'- 3600': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN,  
WSRTD, CALC CMT, SANDY,

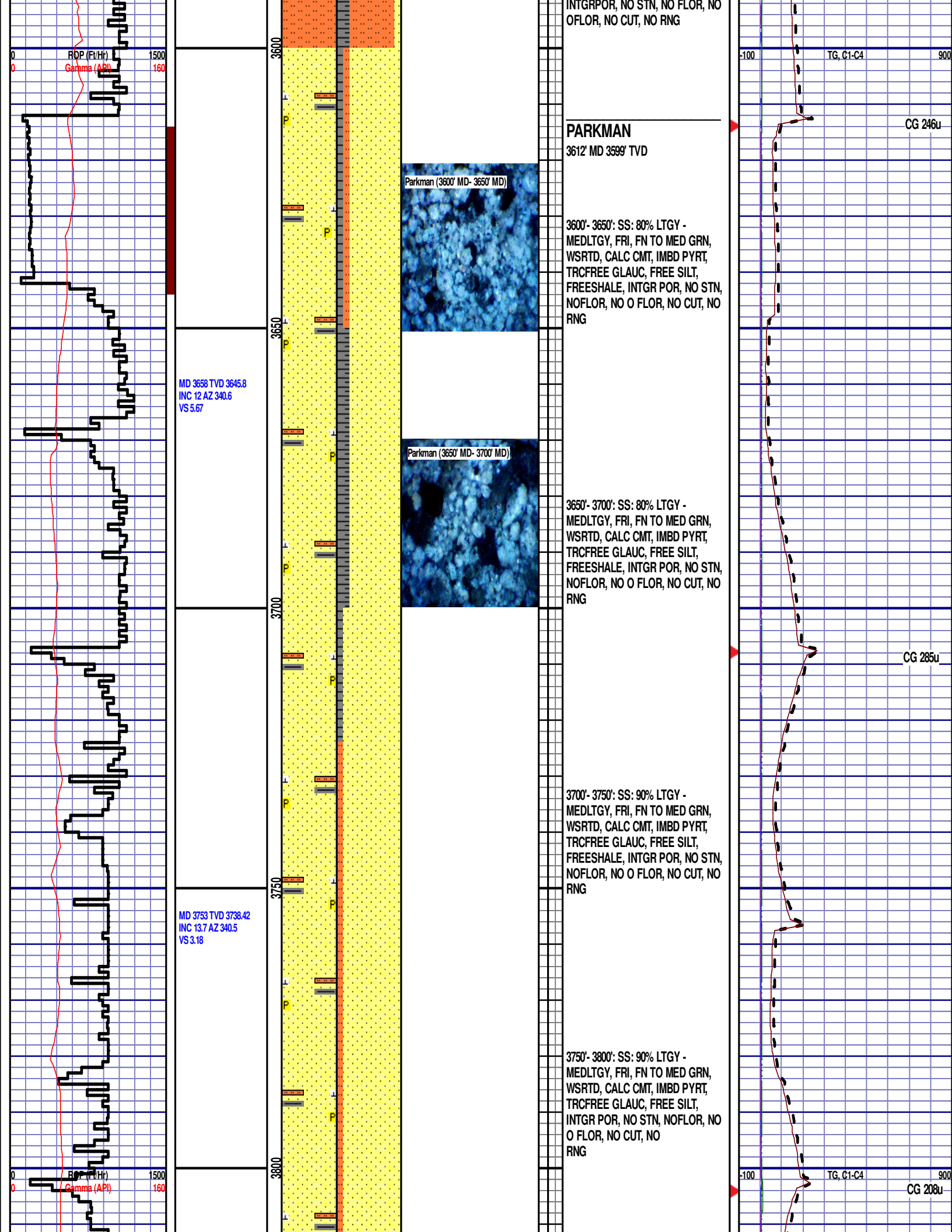
DEPTH 3544'  
WT 8.75  
VIS 28  
PV 1  
YP 4  
FIL 42.3  
OIL 0.0  
SOL 2.3  
CK 1/0  
GELS 1/23  
CL 2300  
H2O 97.4  
CAL 100  
PH 9.3  
LGS 11.0

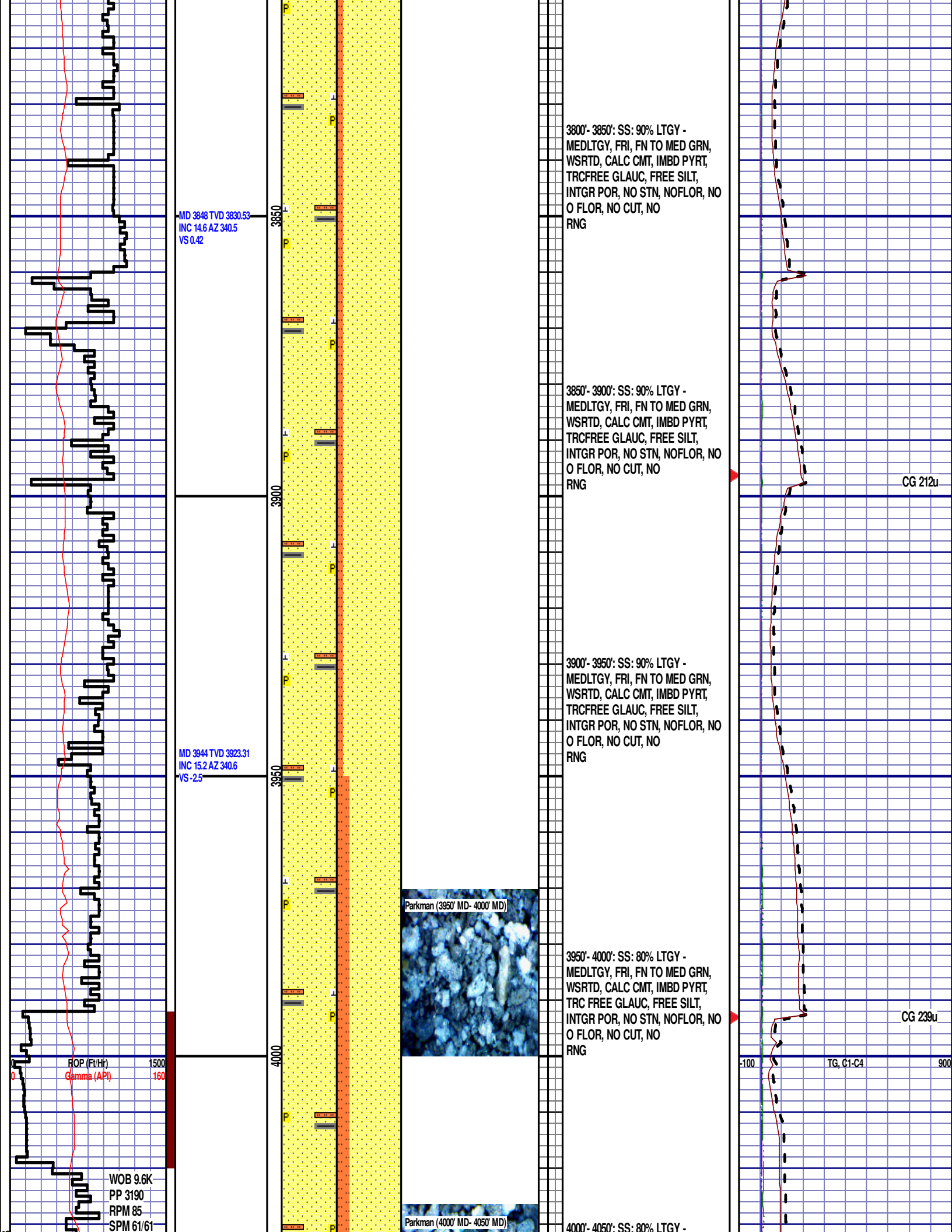
CG 177u

CG 297u

TG, C1-C4









MD 4039 TVD 4015.2  
INC 14.2 AZ 340.6  
VS -5.32

MD 4134 TVD 4107.5  
INC 13.2 AZ 348.6  
VS -6.45

MD 4229 TVD 4200.16  
INC 12.3 AZ 348.2  
VS -6.05

4050

4100

4150

4200

4250

Sussex (4050' MD- 4100' MD)

MEDLTGY, FRI, FN TO MED GRN,  
WSRTD, CALC CMT, IMBD PYRT,  
TRC FREE GLAUC, FREE SILT,  
INTGR POR, NO STN, NOFLOR, NO  
O FLOR, NO CUT, NO  
RNG

**SUSSEX**  
4062' MD 4038' TVD

4050'- 4100': SLTST: 85% LTGY -  
MEDLTGY, FRI, FN TO MED GRN,  
IMBD PYRT, TRC FREE GLAUC,  
SCAT FREE SH, NO STN, NOFLOR,  
NO O FLOR, NO CUT, NO  
RNG

4100'- 4150': SLTST: 80% LTGY -  
MEDLTGY, FRI, IMBD PYRT, IMBD  
GLAUC, SCAT FREE SH, INTGR  
POR, NO STN, NOFLOR, NO O  
FLOR, NO CUT, NO  
RNG

4150'- 4200': SLTST: 85% LTGY -  
MEDLTGY, FRI, FN TO MED GRN,  
IMBD PYRT, IMBD GLAUC, SCAT  
FREE SH, NO STN, NOFLOR, NO O  
FLOR, NO CUT, NO  
RNG

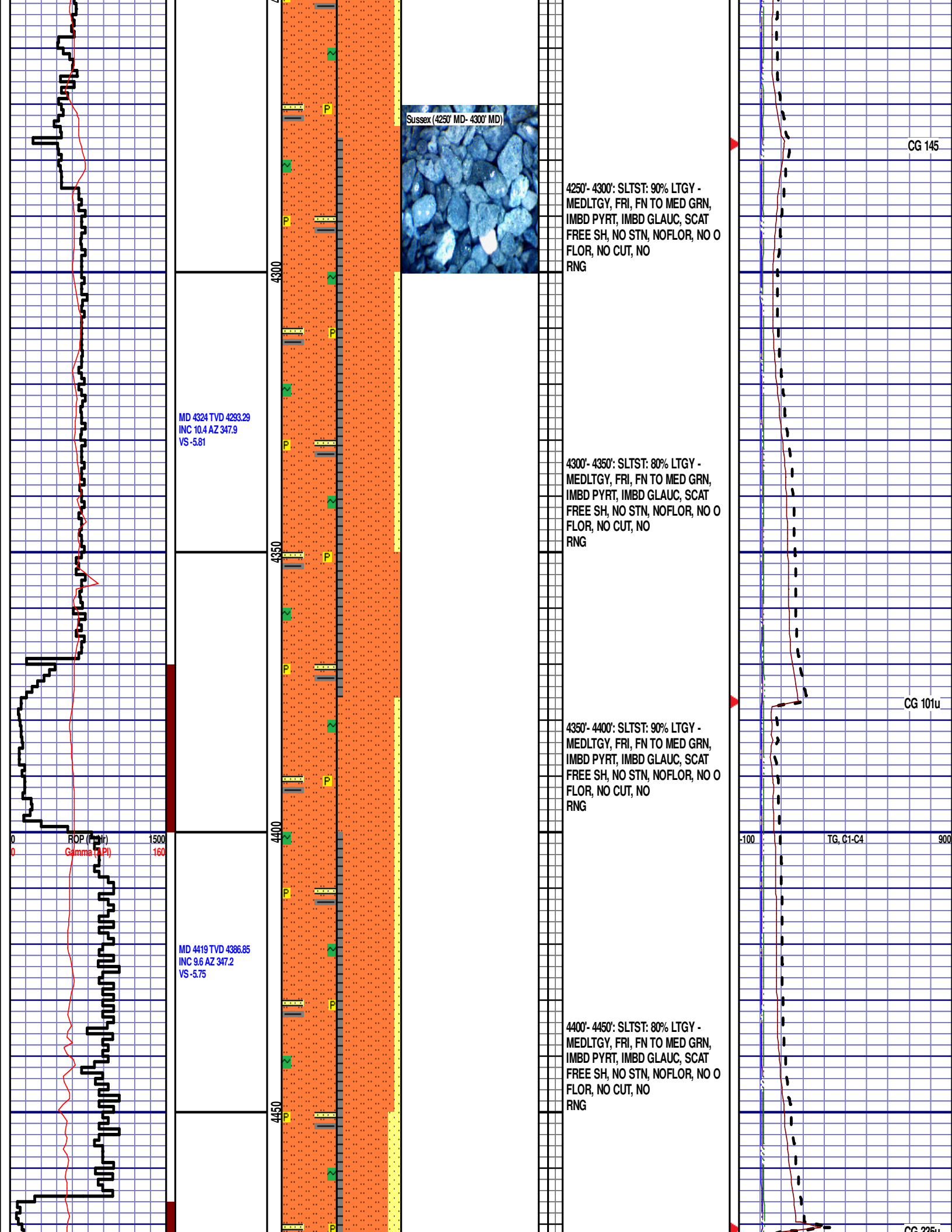
4200'- 4250': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN,  
IMBD PYRT, IMBD GLAUC, SCAT  
FREE SH, NO STN, NOFLOR, NO O  
FLOR, NO CUT, NO  
RNG

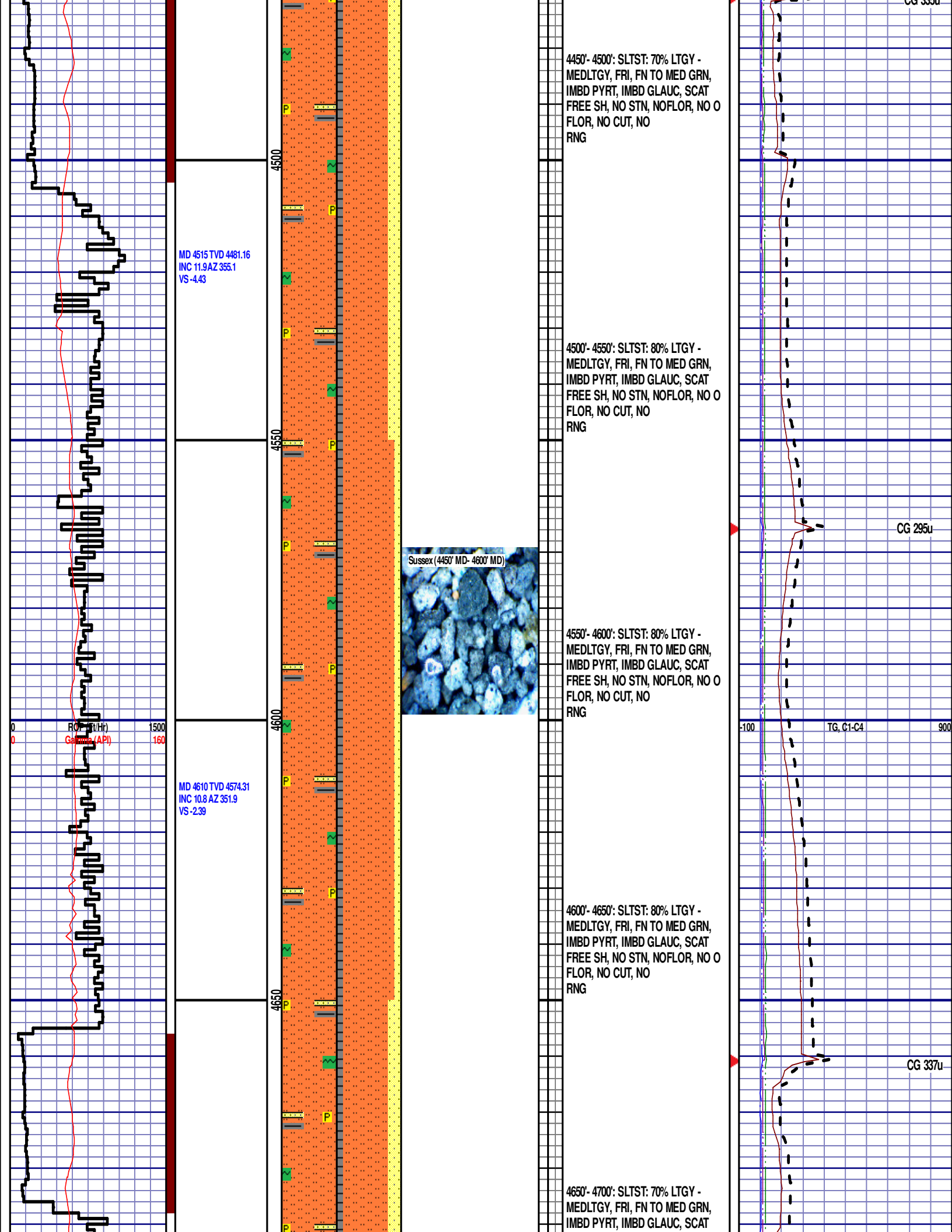
CG 226u

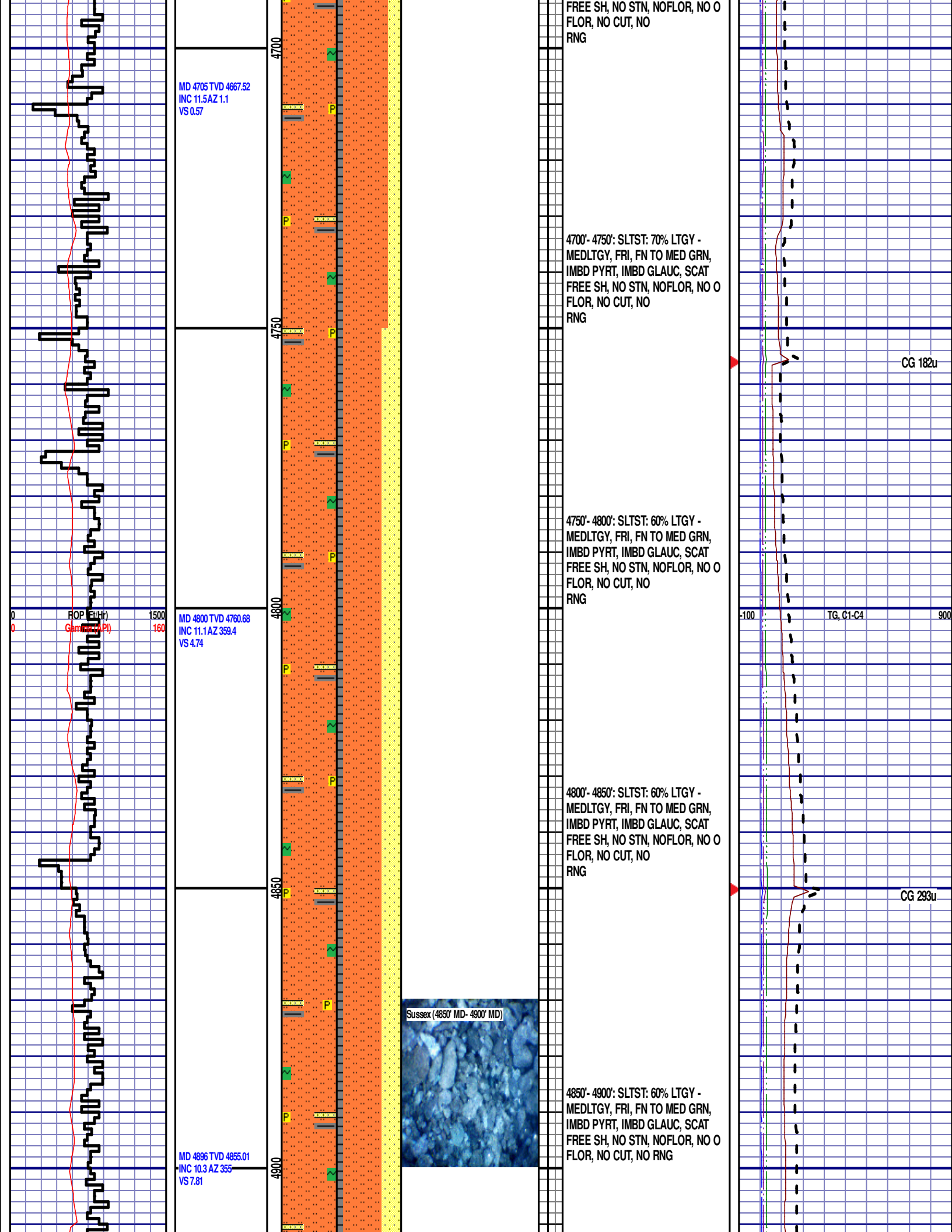
CG 209

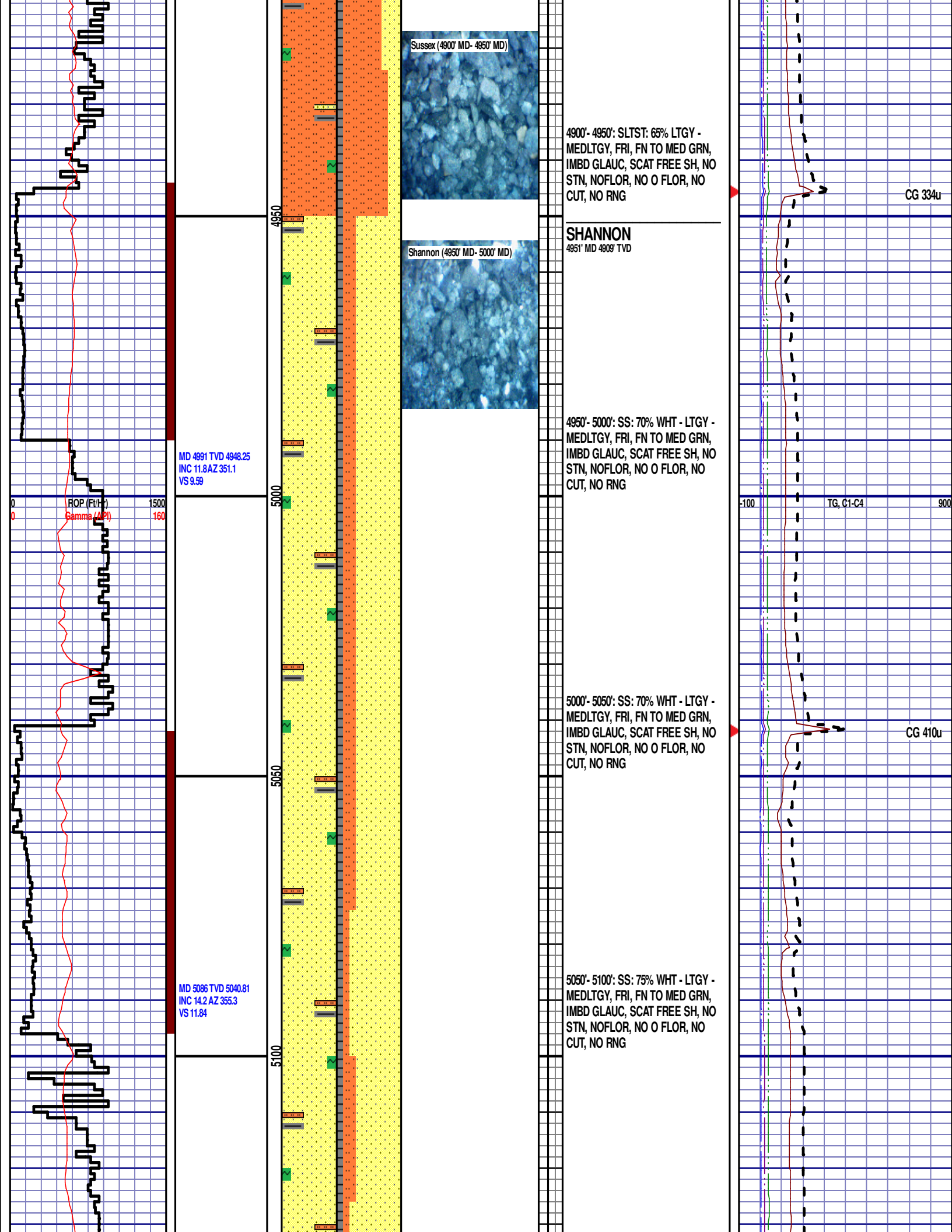
OP (Ft/Hr) 1500  
Gamma (API) 160

-100 TG, C1-C4 900

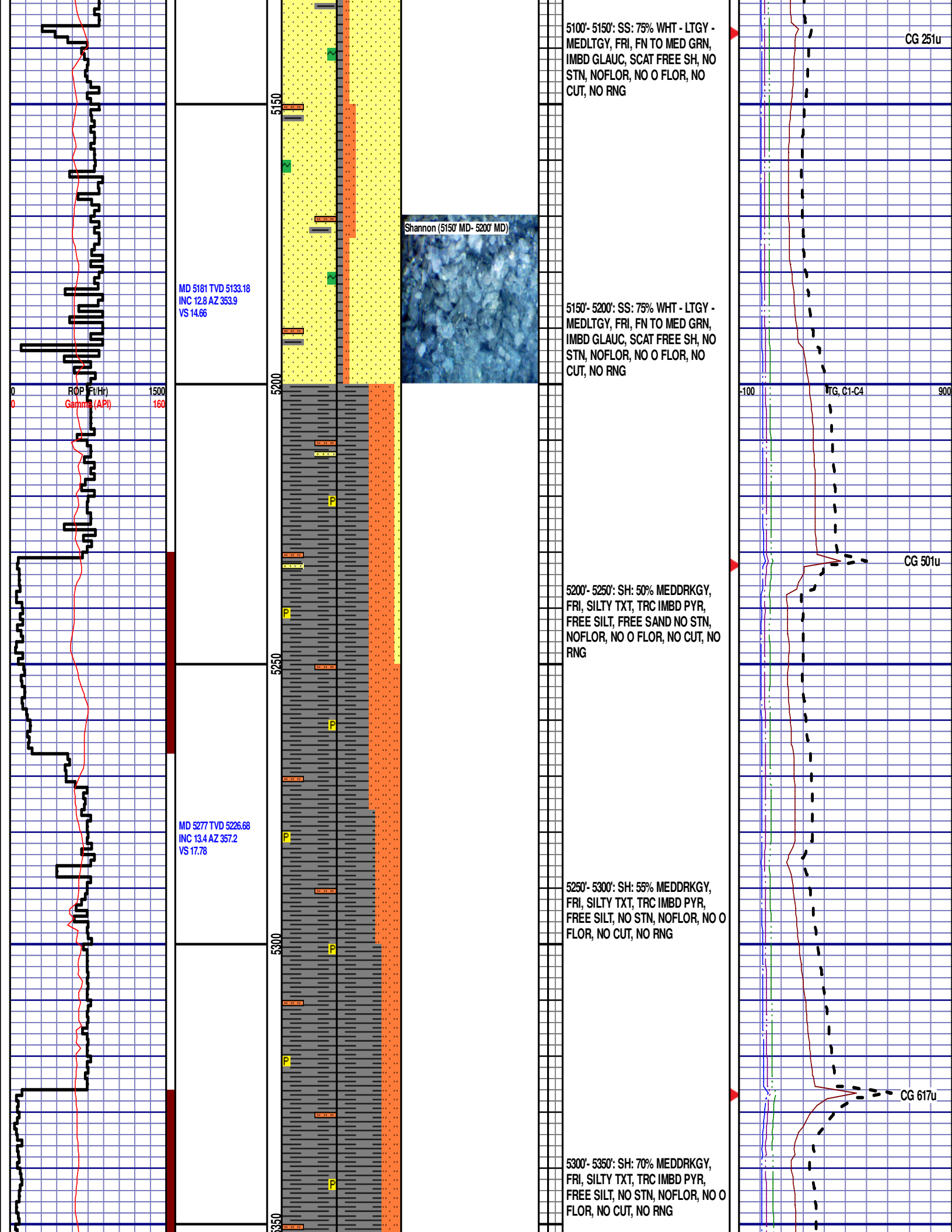


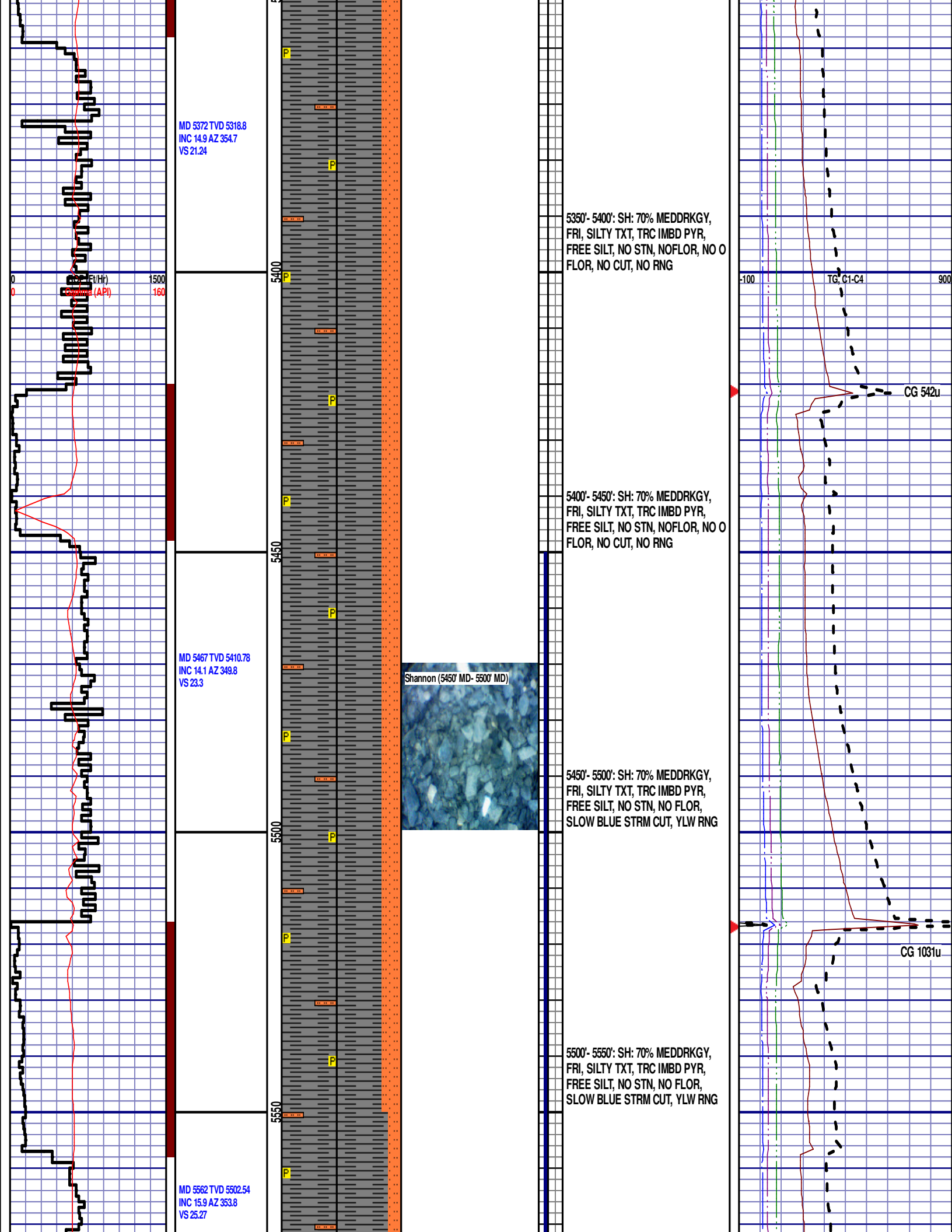


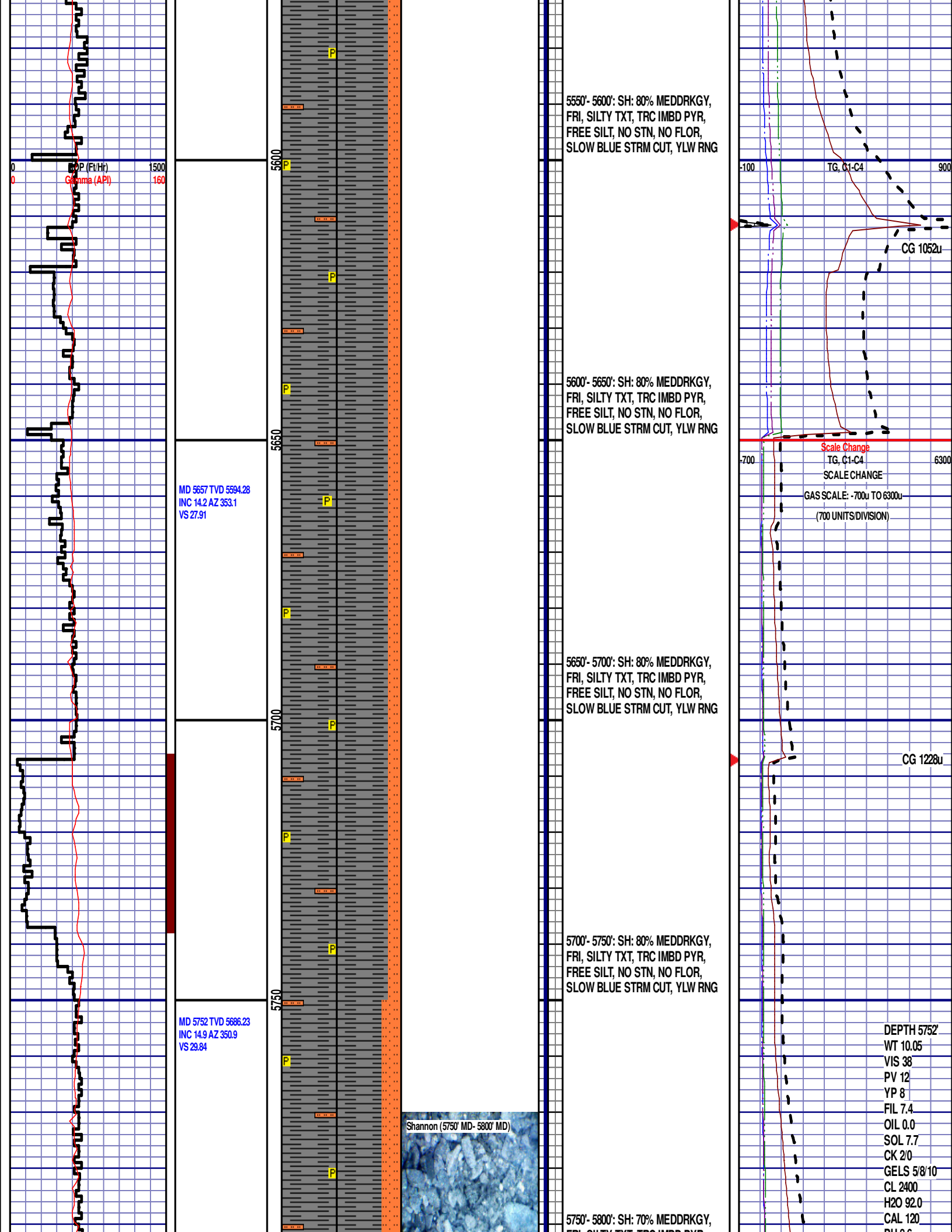


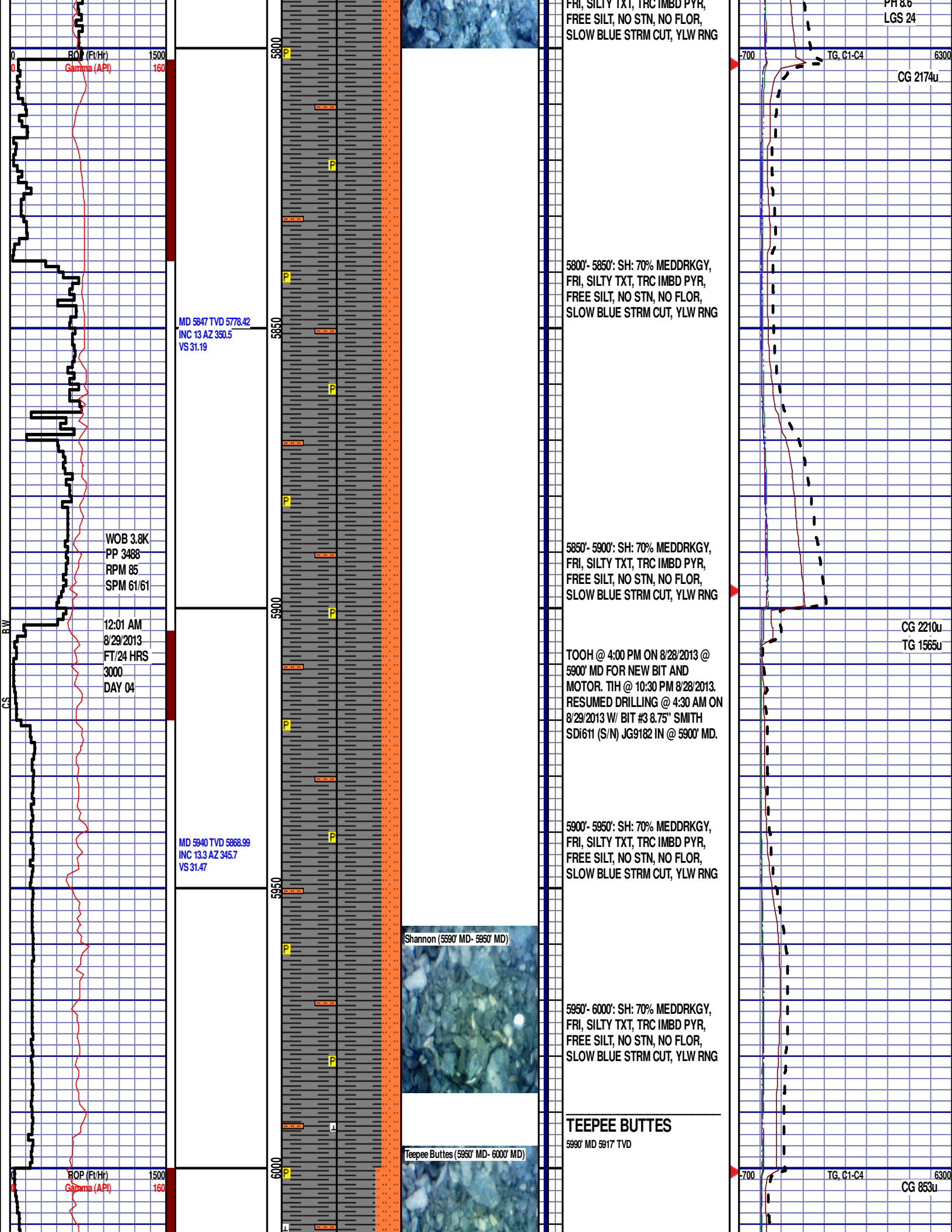


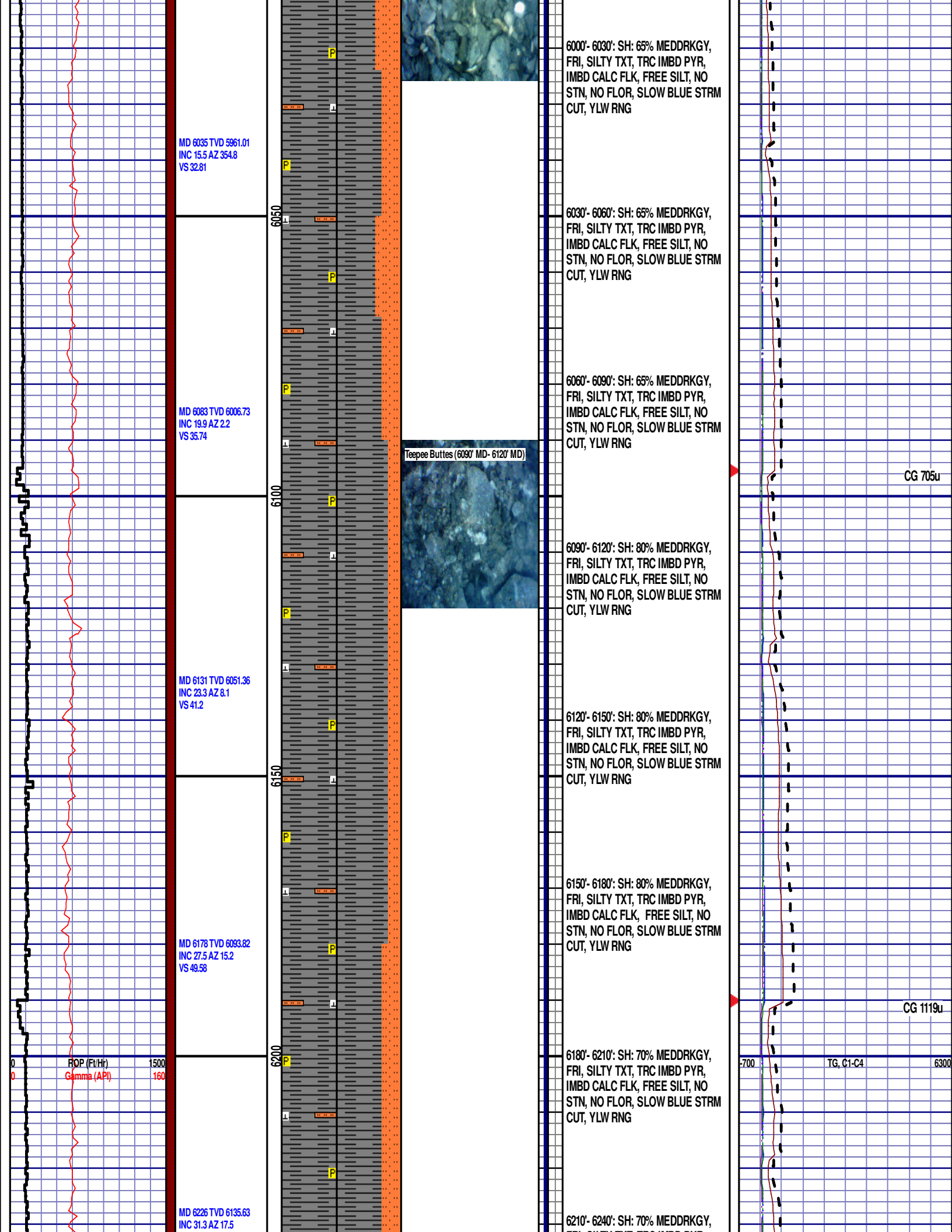




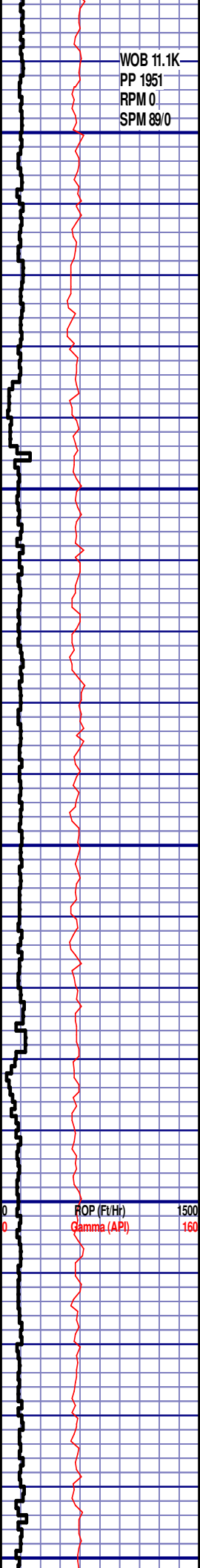












WOB 11.1K  
PP 1951  
RPM 0  
SPM 89/0

MD 6273 TVD 6174.74  
INC 36 AZ 19.5  
VS 74.53

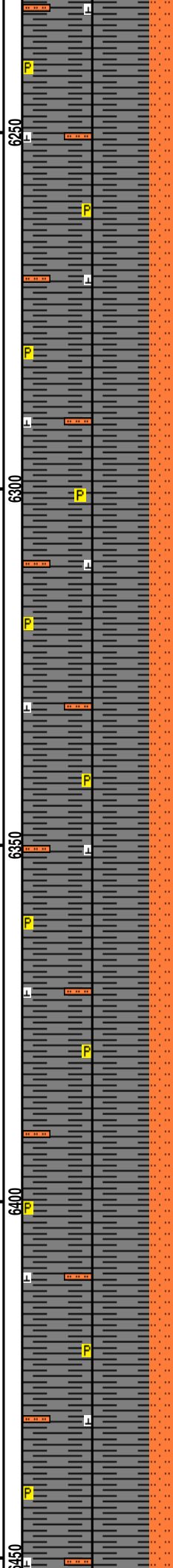
MD 6321 TVD 6212.83  
INC 39 AZ 24  
VS 91.06

MD 6368 TVD 6248.64  
INC 41.8 AZ 31.4  
VS 110.81

MD 6416 TVD 6284.05  
INC 43.2 AZ 38.4  
VS 134.73

ROP (Ft/Hr)  
Gamma (API)

1500  
160



6250

6300

6350

6400

6450



Teepee Buttes (6390' MD- 6420' MD)

FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, SLOW BLUE STRM  
CUT, YLW RNG

6240'- 6270': SH: 70% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, SLOW BLUE STRM  
CUT, YLW RNG

6270'- 6300': SH: 70% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, SLOW BLUE STRM  
CUT, YLW RNG

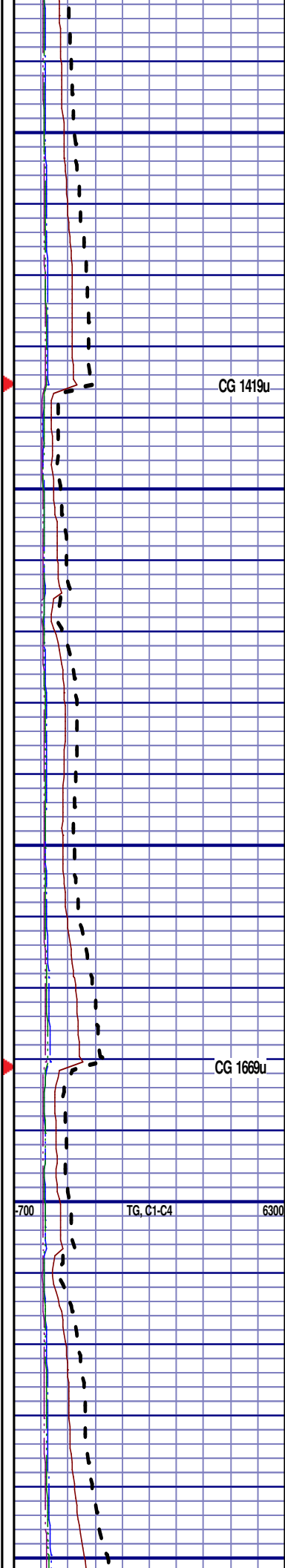
6300'- 6330': SH: 70% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6330'- 6360': SH: 70% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6360'- 6390': SH: 70% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6390'- 6420': SH: 70% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6420'- 6450': SH: 70% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG



CG 1419u

CG 1669u

700 TG, C1-C4 6300

MD 6464 TVD 6318.59  
INC 44.8 AZ 44.6  
VS 161.75

MD 6511 TVD 6351.48  
INC 46.4 AZ 50.1  
VS 190.82

MD 6559 TVD 6383.89  
INC 48.7 AZ 55.2  
VS 223

MD 6606 TVD 6414.08  
INC 51.4 AZ 60.2  
VS 256.92

MD 6654 TVD 6443.07  
INC 54.3 AZ 62.9  
VS 293.73

6450'- 6480': SH: 70% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6480'- 6510': SH: 80% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6510'- 6540': SH: 80% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6540'- 6570': SH: 80% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6570'- 6600': SH: 80% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6600'- 6630': SH: 80% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

6630'- 6660': SH: 80% MEDDRKGY,  
FRI, SILTY TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT, YLW RNG

CG 2197u

CG 1434u

TG, C1-C4

CG 1920u

