



7136 South Yale Avenue, Suite 414

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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: Brian Whitfield &
Tom Denney

Log Interval: 2500' MD to 6850' MD

Start Date: December 25, 2013

Release Date: December 31, 2013

Well Information

Well Name: Wells Ranch
AA21-65HN

Location: 21-6N-63W
1712' FNL, 424' FEL

County: Weld
State: Colorado

Drilling Rig: H&P 277

Total Depth: 10932' MD

TD Date: December 31, 2013

Formation: Niobrara C Chalk

KB Elevation: 4751'

GR Elevation: 4727'

API Number: 05-123-37810-0000

ROCK TYPES

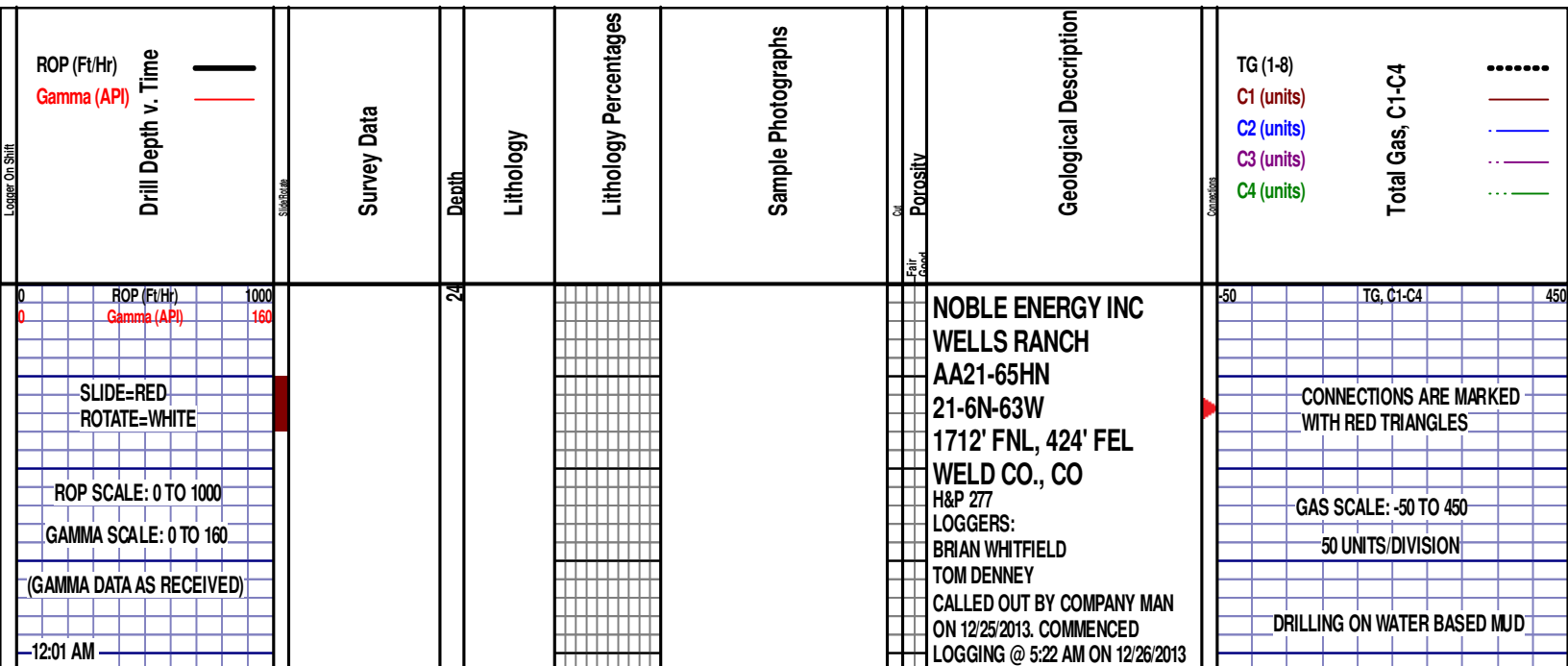
Anhy
Bent
Cht
Clyst
Coal
Congl
Dol

Gyp
Igne
Lmst
Meta
Mrlst
Salt
Shale

Shcol
Chalk
Slst
Ss
Till
gw
Imywash

ogw
olmywash
oshly gw
shly gw
sdygw
hvyrcbsh
nosmpl

Lsdetrit
sltst
sdy sh



12/26/2013
FT/24 HRS 364
DAY 02
WOB 36.9K
PP 2572
RPM 82
SPM 0/113

MD 2536 TVD 2535.96
INC 0.9 AZ 349.8
VS 6.29

MD 2631 TVD 2630.95
INC 0.5 AZ 328.3
VS 6.4

@ 2500' MD W/BIT #2, 8.75",
HALLIBURTON/MMD56, (S/N)
12347578 IN @ 934' MD

PIERRE
1018' MD 1018' TVD
(BEFORE LOGGING DEPTH)

DEPTH 1663'
WT 9.00
VIS 29
PH 11.3
FIL 61
CL 1800
CAL 120
H2O 96.5
OIL 0.0
LGS 13.36
GELS 1/2/3
PV 4
YP 2
CK 1/0
SOL 3.2



2500'- 2600': SLTST: 50% 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

CG 61u

TG, C1-C4

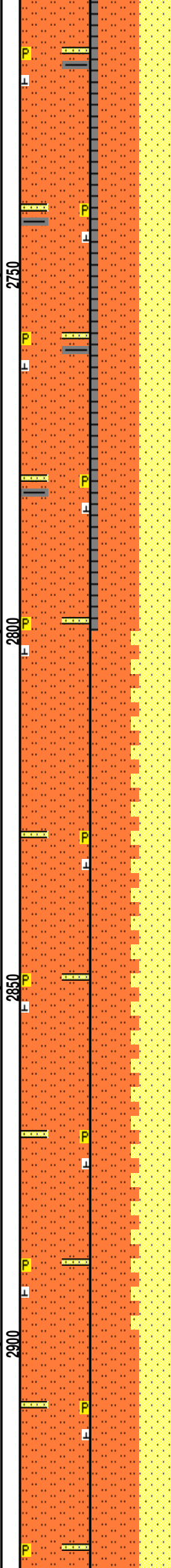
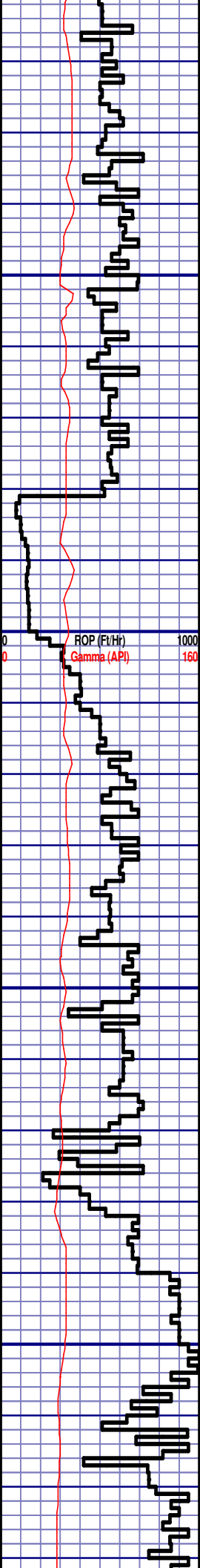
2600'- 2700': SLTST: 55% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
SANDY, INTGRPOR, NO STN, NO
MIN FLOR, NO O FLOR, NO CUT, NO
RNG

CG 77u

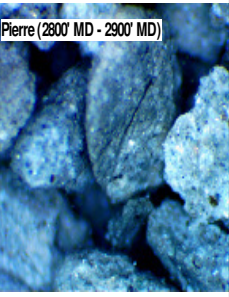
MD 2725 TVD 2724.94
INC 0.5 AZ 323.9
VS 6.69

MD 2820 TVD 2819.94
INC 0.9 AZ 170.3
VS 6.9

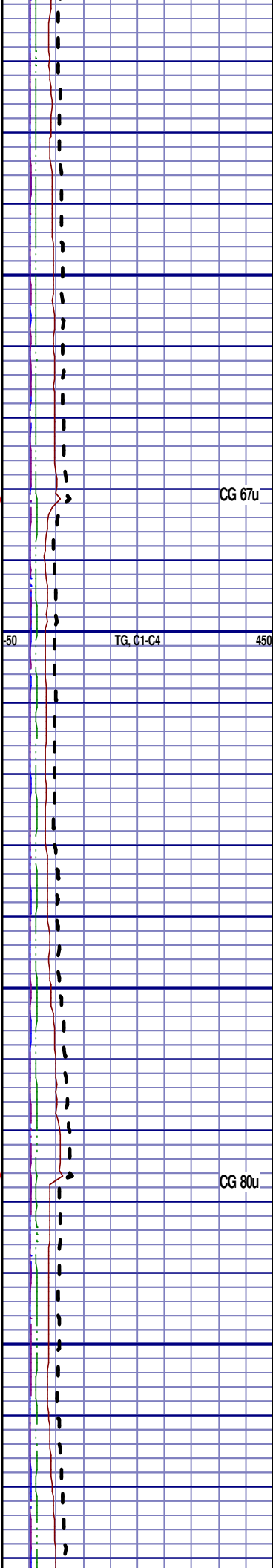
MD 2914 TVD 2913.93
INC 1.1 AZ 158.5
VS 6.8

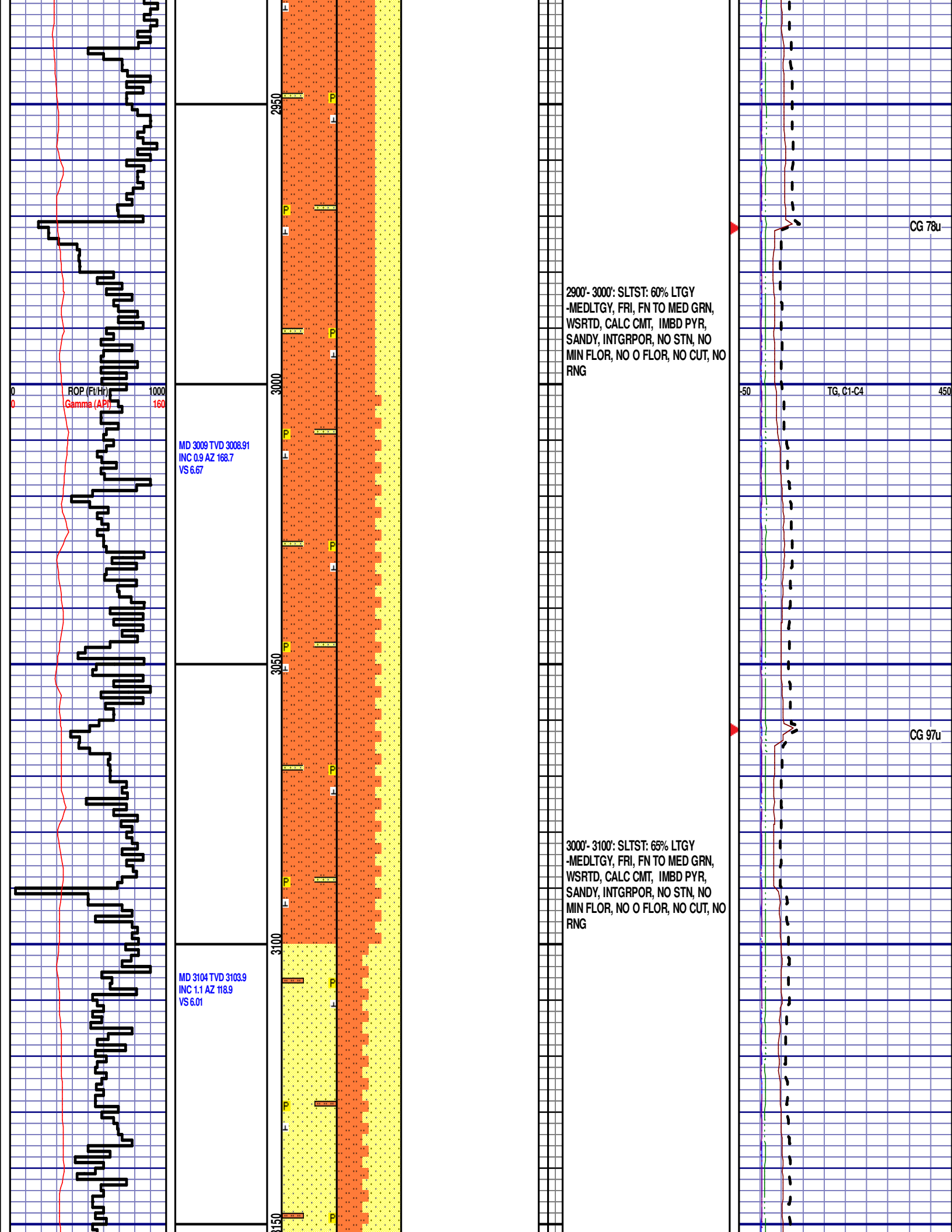


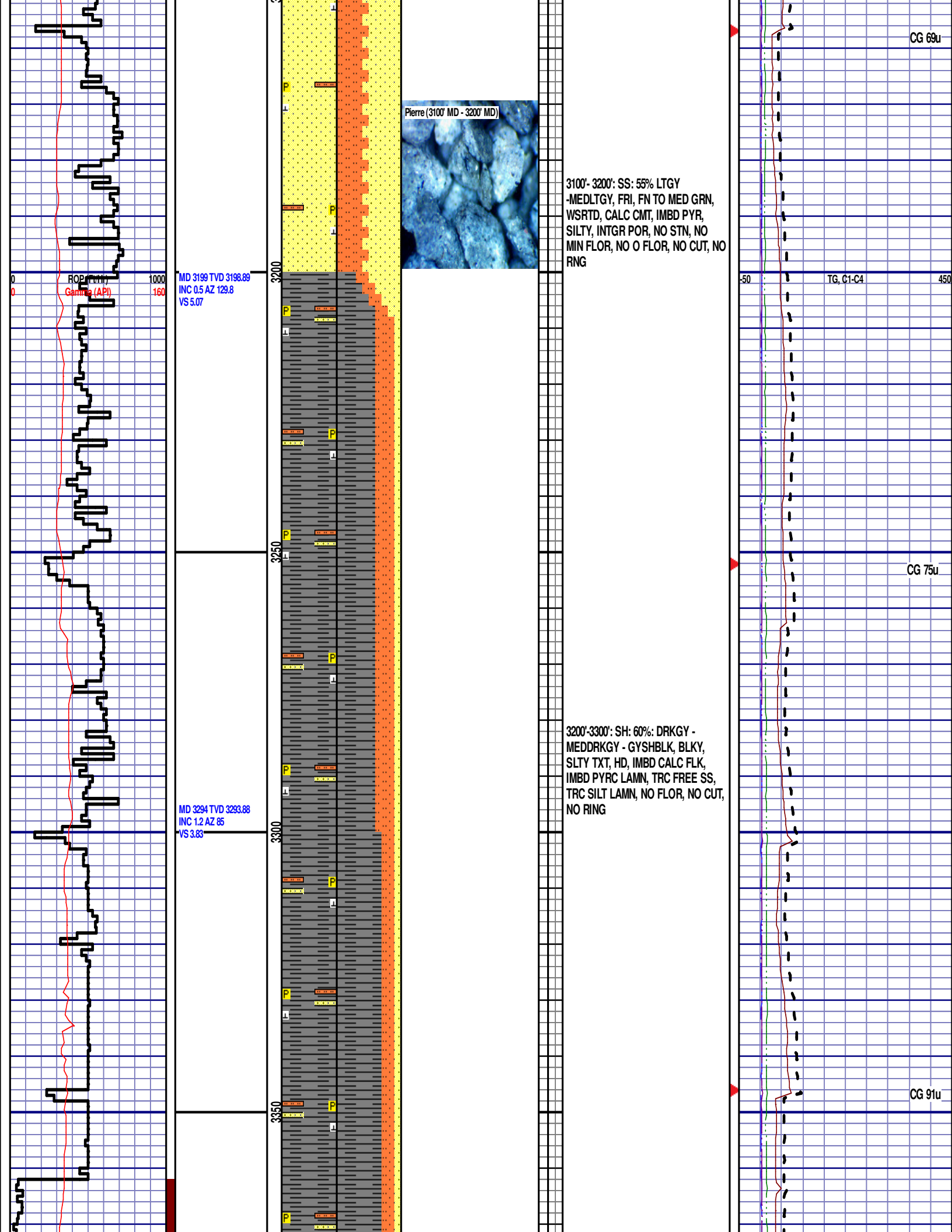
2700'- 2800': SLTST: 50% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
SANDY, INTGRPOR, NO STN, NO
MIN FLOR, NO O FLOR, NO CUT, NO
RNG



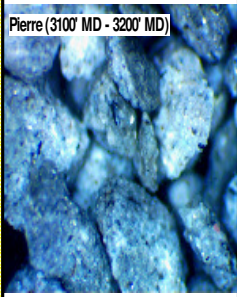
2800'- 2900': SLTST: 55% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
SANDY, INTGRPOR, NO STN, NO
MIN FLOR, NO O FLOR, NO CUT, NO
RNG







CG 69u



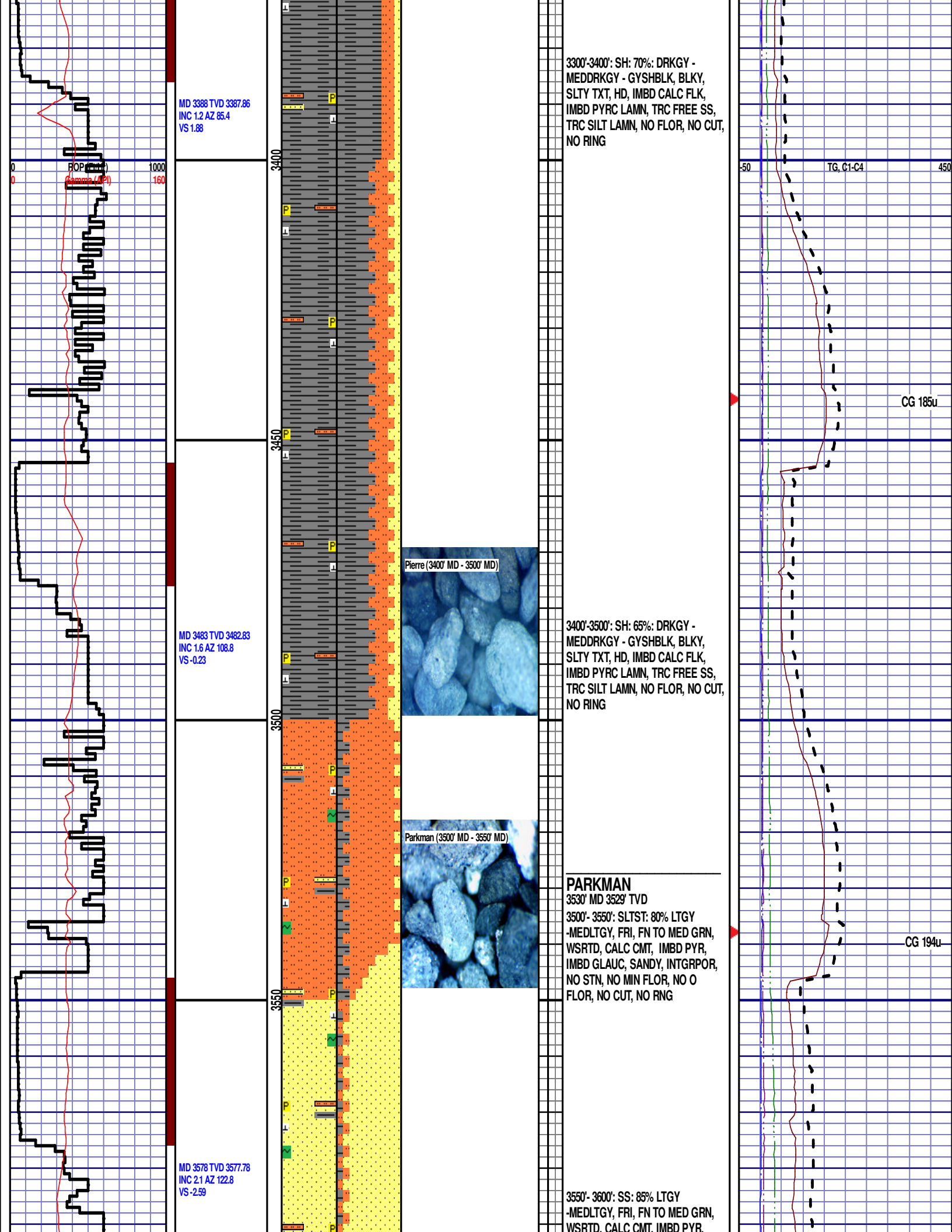
3100'- 3200': SS: 55% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
SILTY, INTGR POR, NO STN, NO
MIN FLOR, NO O FLOR, NO CUT, NO
RNG

TG, C1-C4

CG 75u

3200'-3300': SH: 60%: DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, HD, IMBD CALC FLK,
IMBD PYRC LAMN, TRC FREE SS,
TRC SILT LAMN, NO FLOR, NO CUT,
NO RING

CG 91u



MD 3388 TVD 3387.86
INC 1.2 AZ 85.4
VS 1.88

MD 3483 TVD 3482.83
INC 1.6 AZ 108.8
VS -0.23

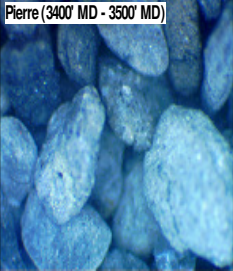
MD 3578 TVD 3577.78
INC 2.1 AZ 122.8
VS -2.59

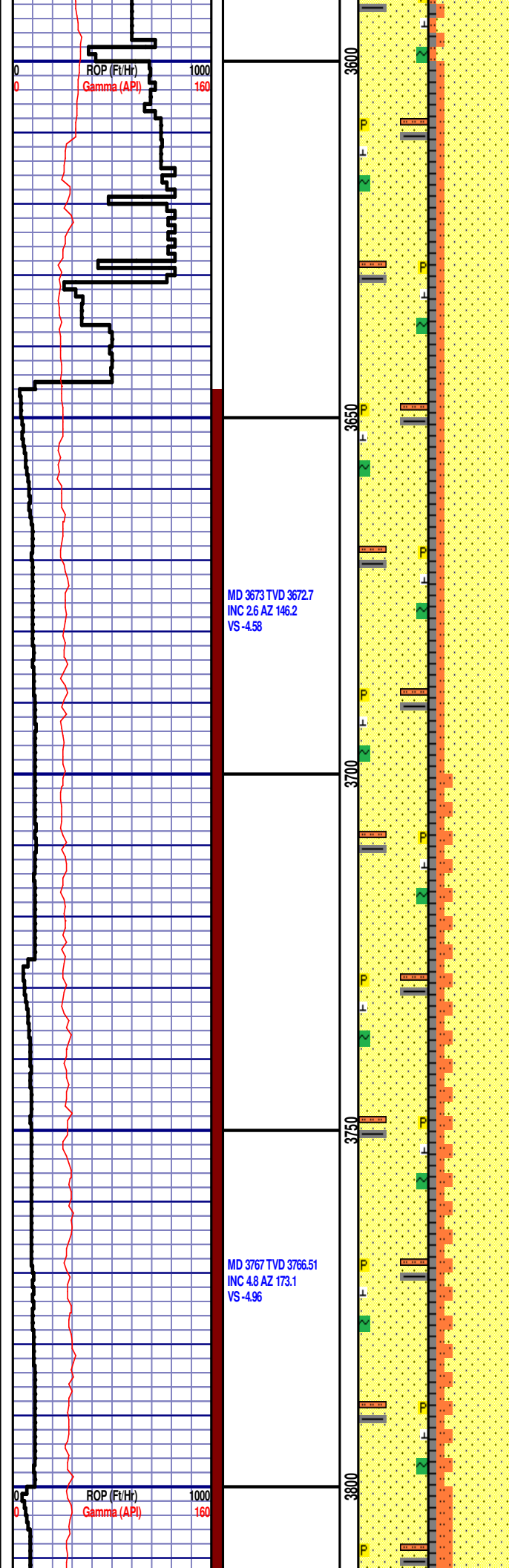
3300'-3400': SH: 70% DRKGY - MEDDRKGY - GYSHBLK, BLKY, SLTY TXT, HD, IMBD CALC FLK, IMBD PYRC LAMN, TRC FREE SS, TRC SILT LAMN, NO FLOR, NO CUT, NO RING

3400'-3500': SH: 65% DRKGY - MEDDRKGY - GYSHBLK, BLKY, SLTY TXT, HD, IMBD CALC FLK, IMBD PYRC LAMN, TRC FREE SS, TRC SILT LAMN, NO FLOR, NO CUT, NO RING

PARKMAN
3530' MD 3529' TVD
3500'- 3550': SLTST: 80% LTGY -MEDLTGY, FRI, FN TO MED GRN, WSRD, CALC CMT, IMBD PYR, IMBD GLAUC, SANDY, INTGRPOR, NO STN, NO MIN FLOR, NO O FLOR, NO CUT, NO RING

3550'- 3600': SS: 85% LTGY -MEDLTGY, FRI, FN TO MED GRN, WSRD, CALC CMT, IMBD PYR.

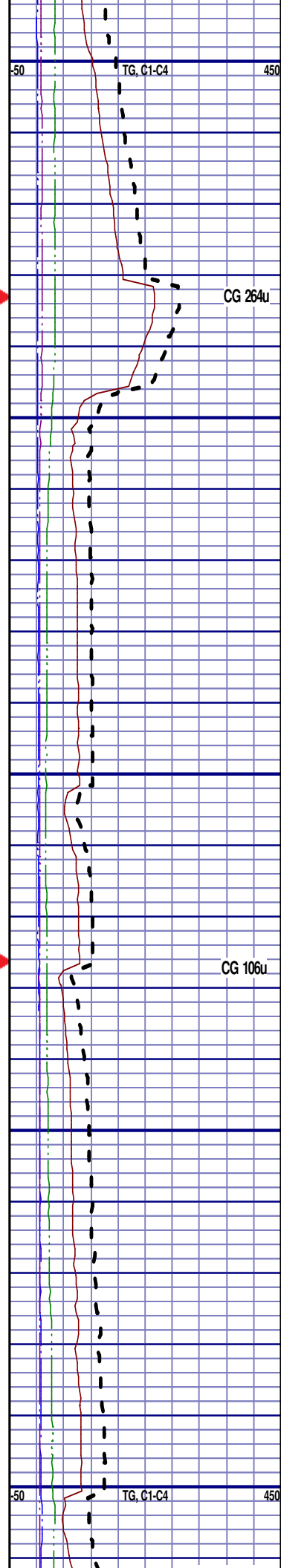


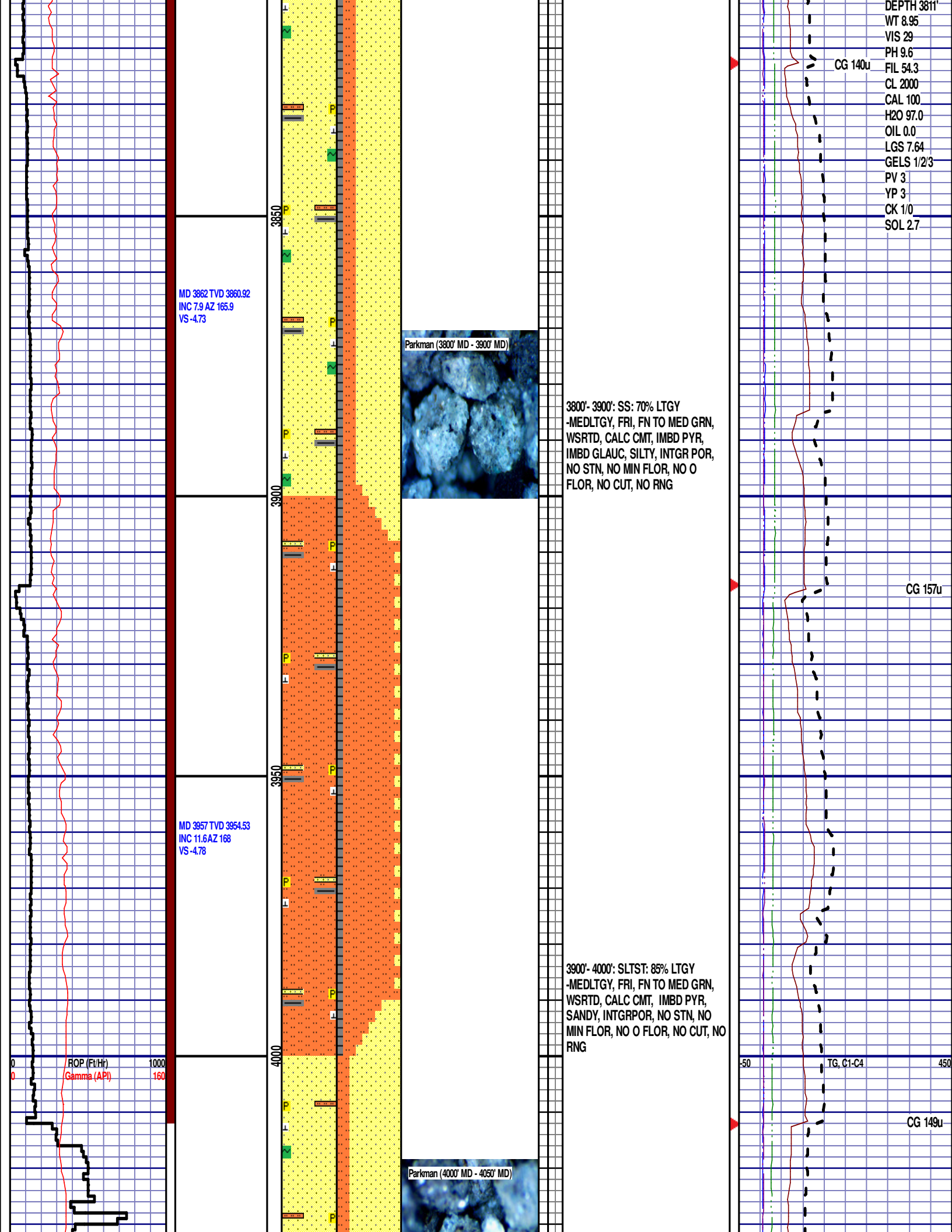


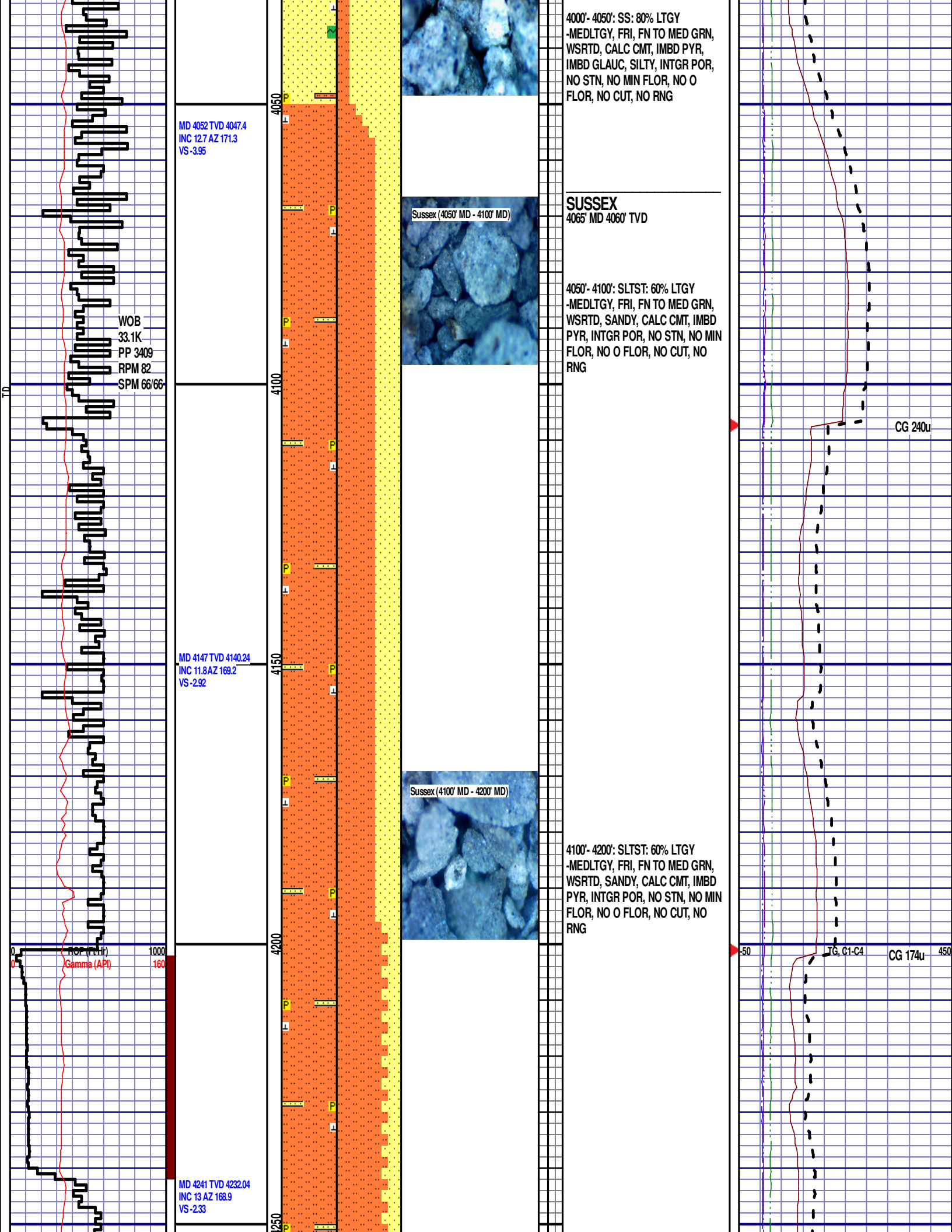
IMBD GLAUC, SILTY, INTGR POR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

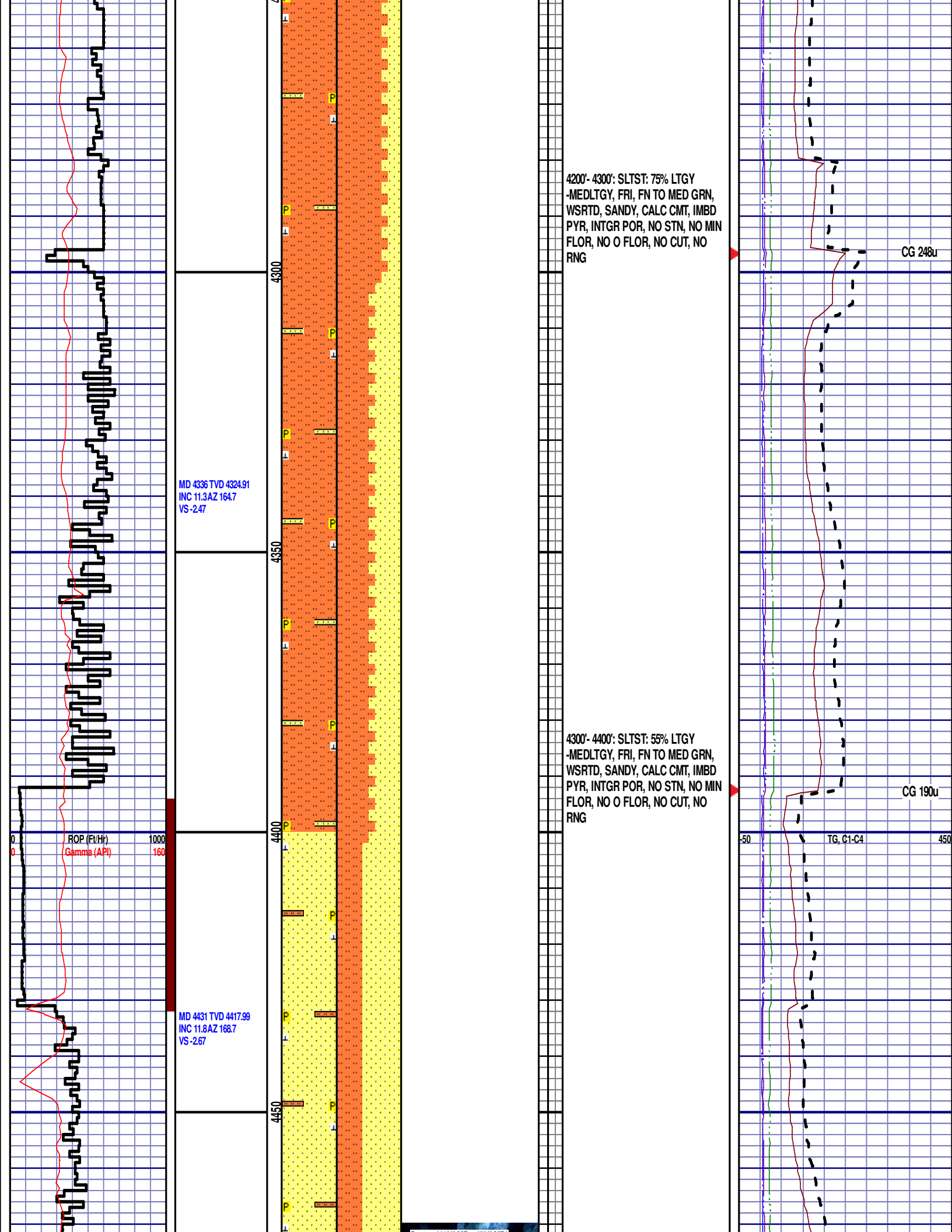
3600'- 3700': SS: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SILTY, INTGR POR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

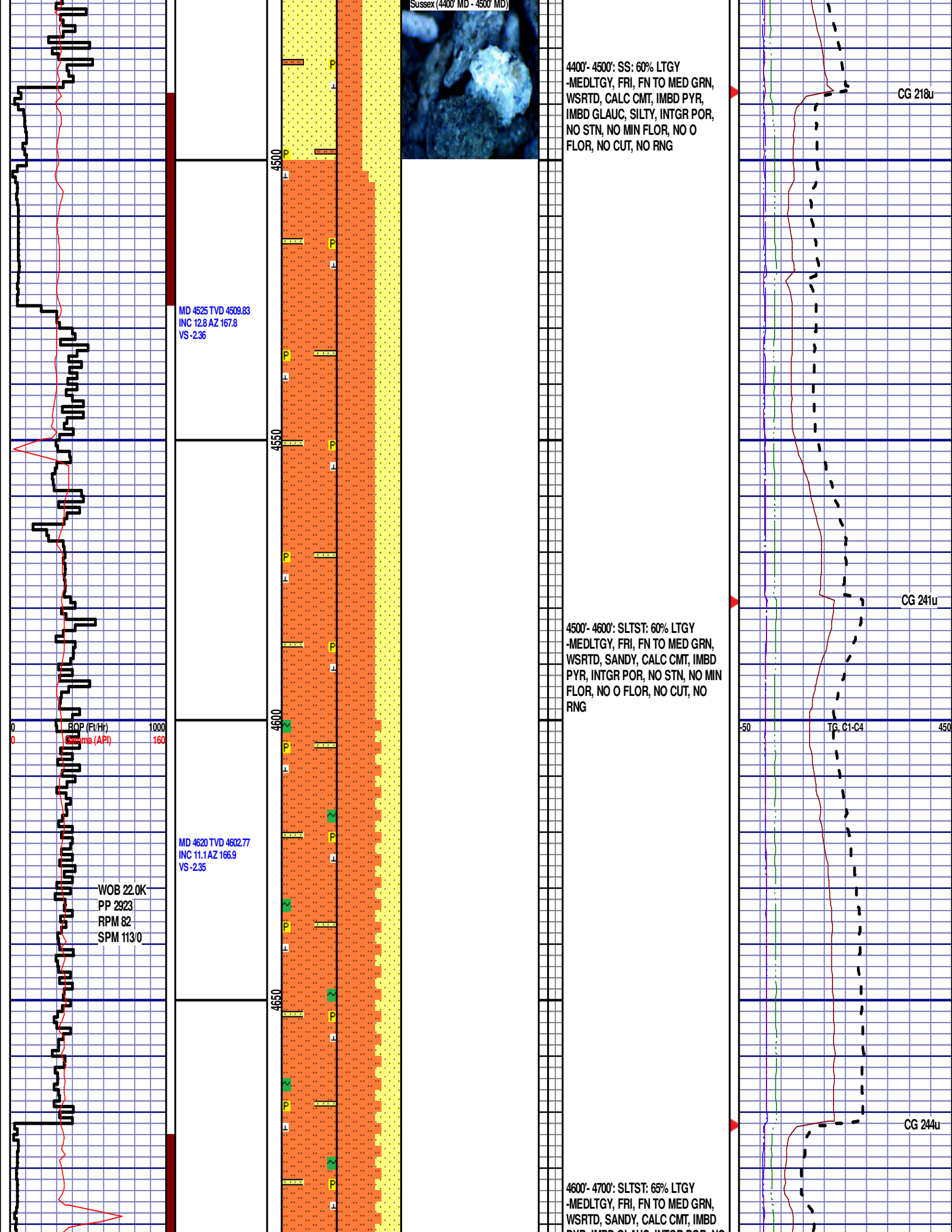
3700'- 3800': SS: 75% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SILTY, INTGR POR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

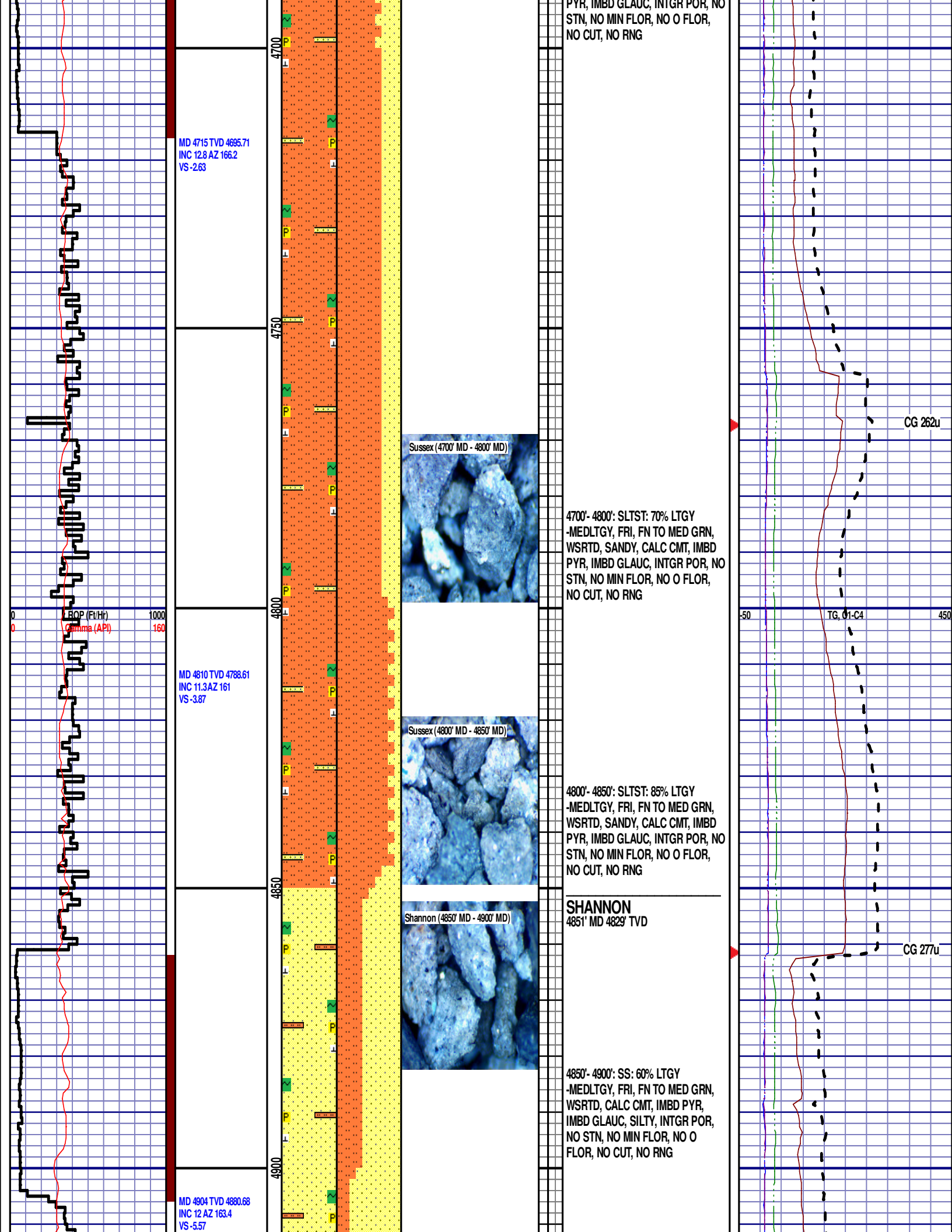


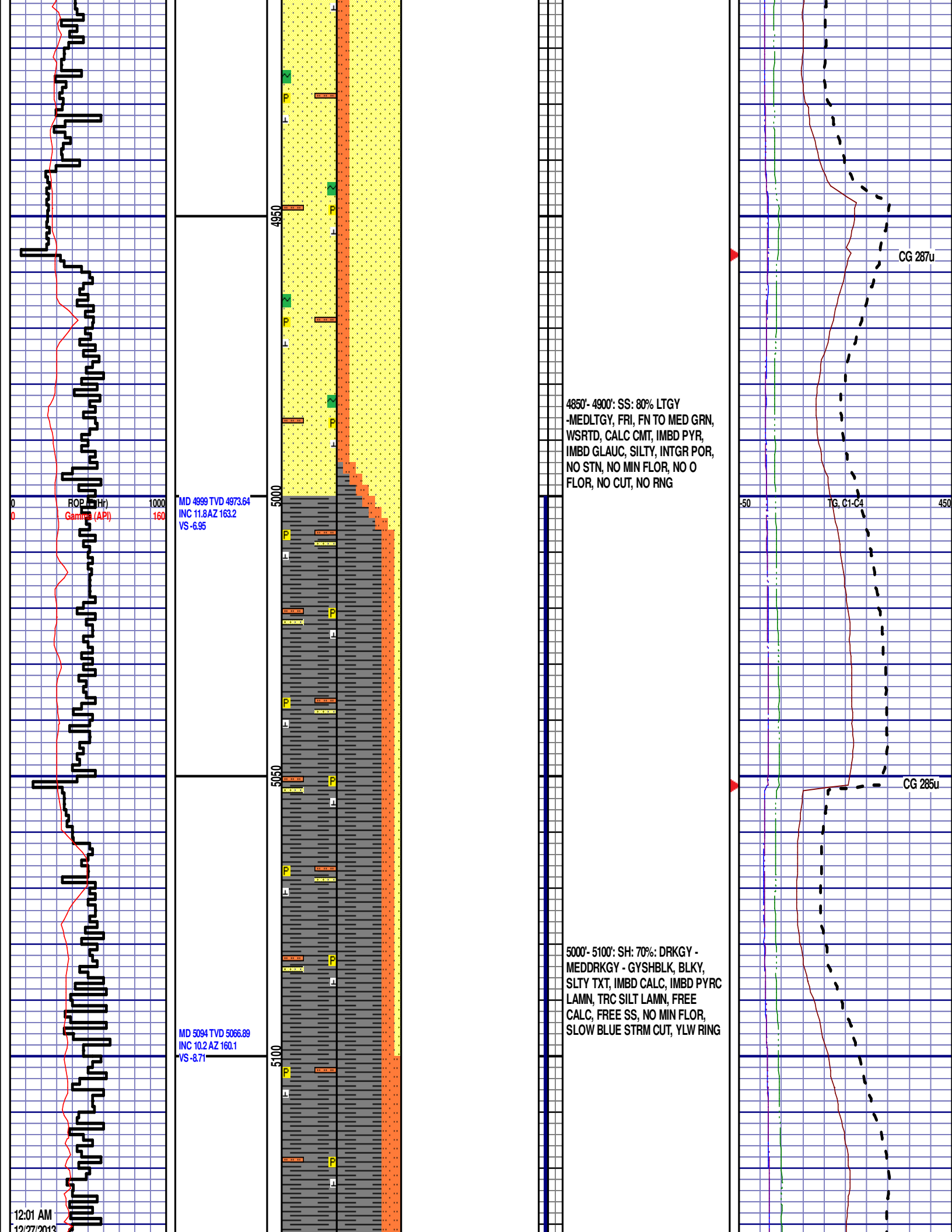












WOB 21.3K
PP 2680
RPM 0
SPM 67/66

MD 5189 TVD 5160.28
INC 10.9 AZ 165.4
VS -10.08

ROP (Ft/Hr)
Gamma (API)

MD 5284 TVD 5253.39
INC 12 AZ 166.8
VS -10.48

Shannon (5100' MD - 5200' MD)

5100'- 5200': SH: 70%: DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, IMBD CALC, IMBD PYRC
LAMN, TRC SILT LAMN, FREE
CALC, NO MIN FLOR, SLOW BLUE
STRM CUT, YLW RING

5200'- 5300': SH: 80%- DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, IMBD CALC, IMBD PYRC
LAMN, TRC SILT LAMN, FREE
CALC, NO MIN FLOR, SLOW BLUE
STRM CUT, YLW RING

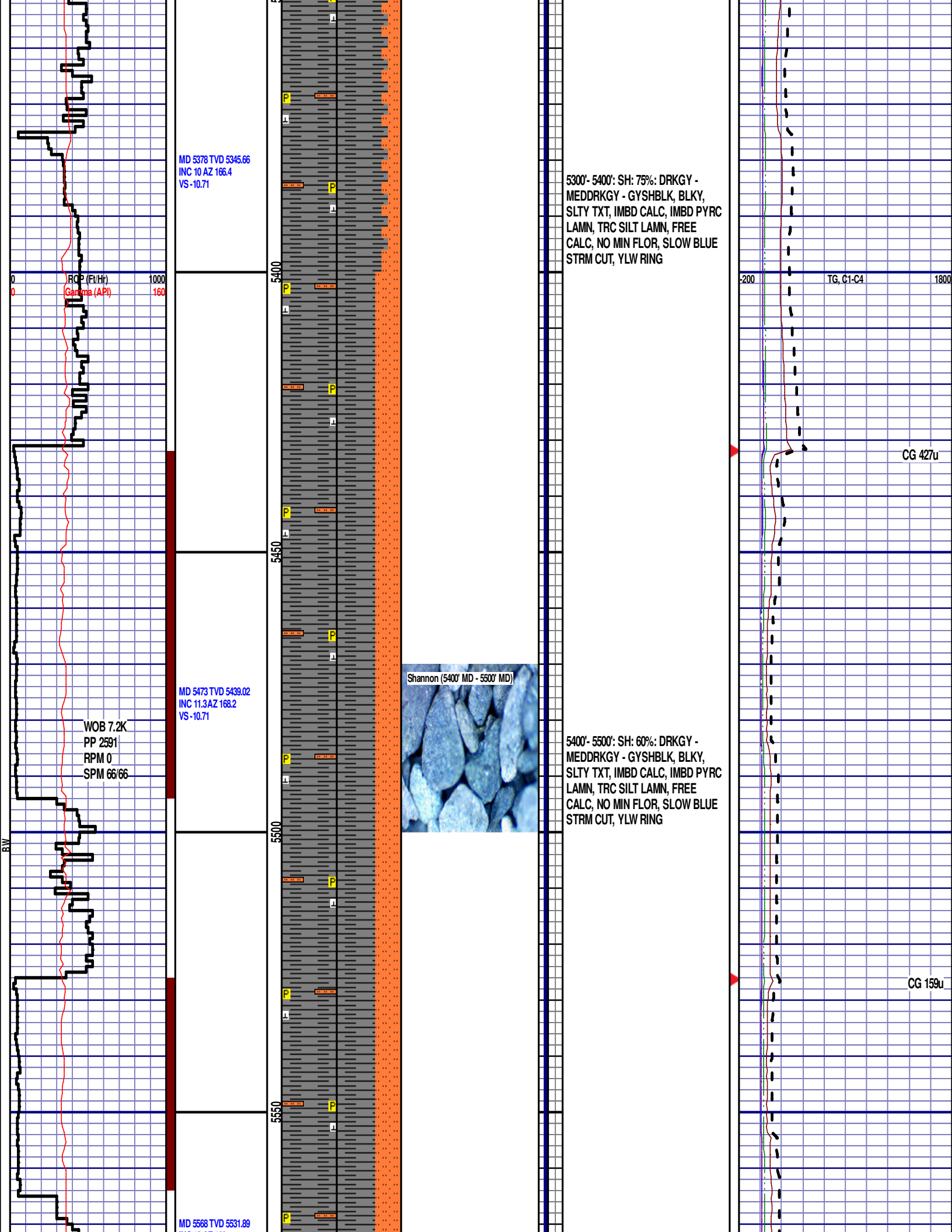
Scale Change
TG, C1-C4
GAS SCALE: -200 TO 1800
200 UNITS/DIVISION

TG, C1-C4

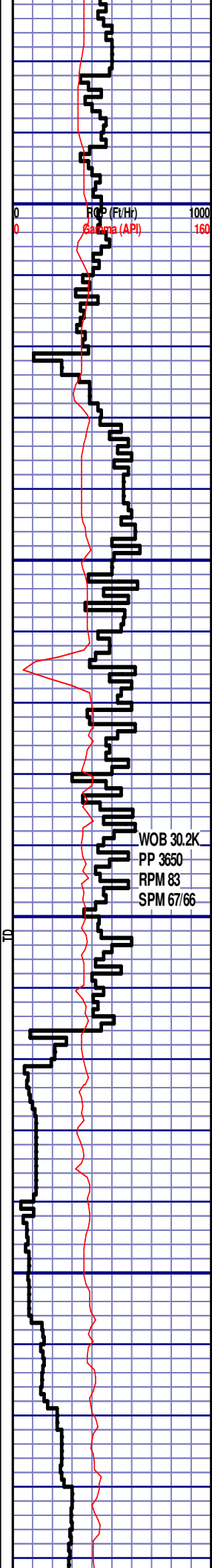
CG 365u

DEPTH 5265
WT 8.70
VIS 28
PH 8.8
FIL 52.9
CL 2100
CAL 80
H2O 97.6
OIL 0.0
LGS 13.74
GELS 1/2/3
PV 3
YP 3
CK 1/0
SOL 2.1

CG 438u



INC 13 AZ 168
VS -10.45



MD 5663 TVD 5624.94
INC 10.2 AZ 163.1
VS -10.95

WOB 30.2K
PP 3650
RPM 83
SPM 67/66

MD 5755 TVD 5715.22
INC 12 AZ 165.4
VS -11.88



5500'- 5600': SH: 60%: DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, IMBD CALC, IMBD PYRC
LAMN, TRC SILT LAMN, FREE
CALC, NO MIN FLOR, SLOW BLUE
STRM CUT, YLW RING

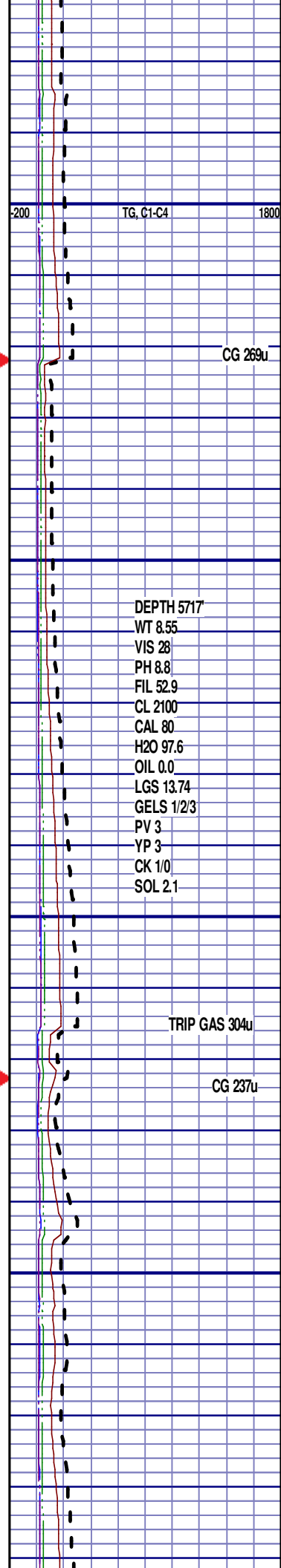
5600'- 5700': SH: 65%: DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, IMBD CALC, IMBD PYRC
LAMN, TRC SILT LAMN, FREE
CALC, NO MIN FLOR, SLOW BLUE
STRM CUT, YLW RING

TOOH @ 7:30 AM ON 12/27/2013 @
5717' MD TO PICK UP A NEW BIT
AND MOTOR. TIH @ 1:00 PM ON
12/27/2013. RESUMED DRILLING @
5:17 PM ON 12/27/2013 W/ BIT #3,
8.75", HALLIBURTON/MMD55, (S/N)
12224614 IN @ 5717' MD.

Shannon (5700' MD - 5800' MD)



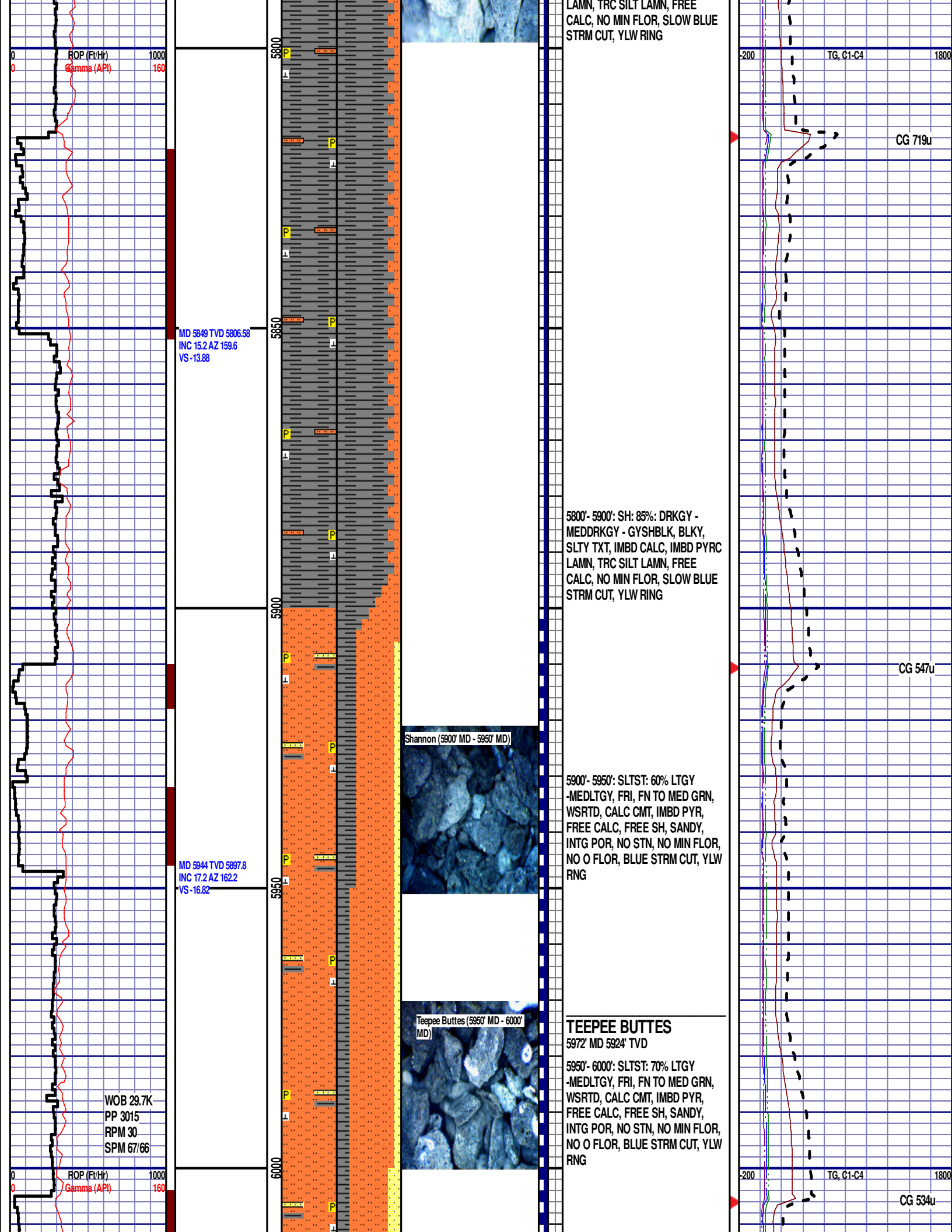
5700'- 5800': SH: 85%: DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, IMBD CALC, IMBD PYRC

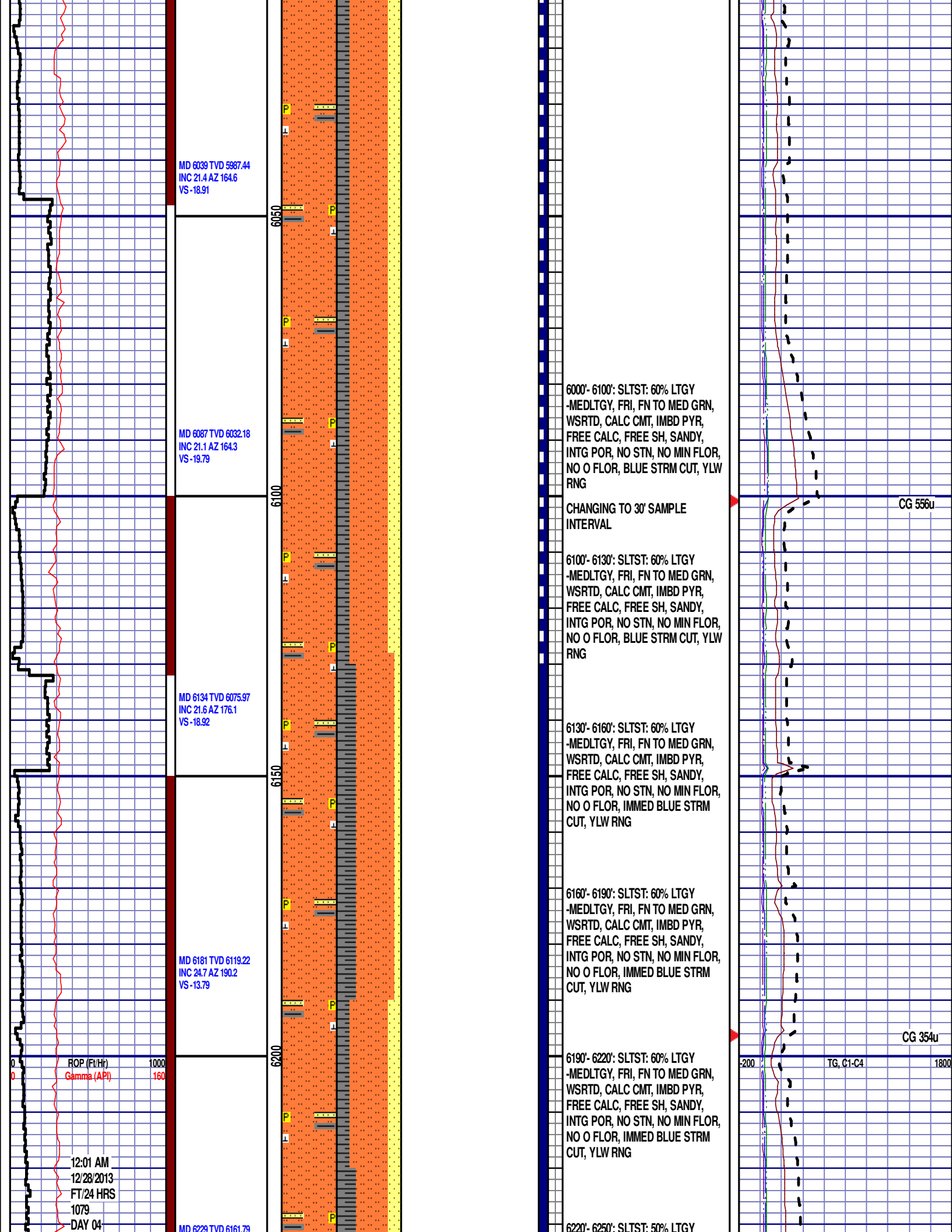


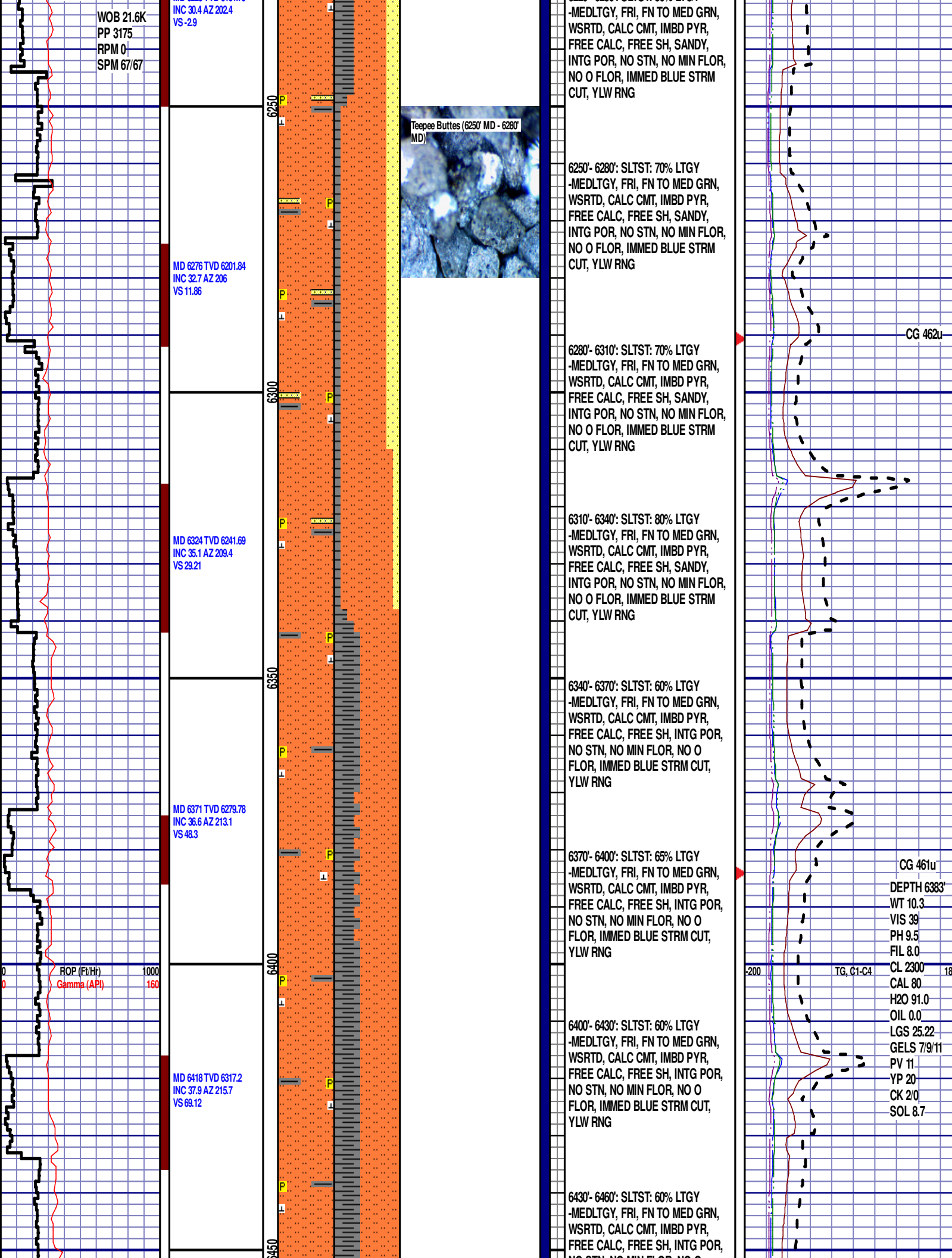
DEPTH 5717'
WT 8.55
VIS 28
PH 8.8
FIL 52.9
CL 2100
CAL 80
H2O 97.6
OIL 0.0
LGS 13.74
GELS 1/2/3
PV 3
YP 3
CK 1/0
SOL 2.1

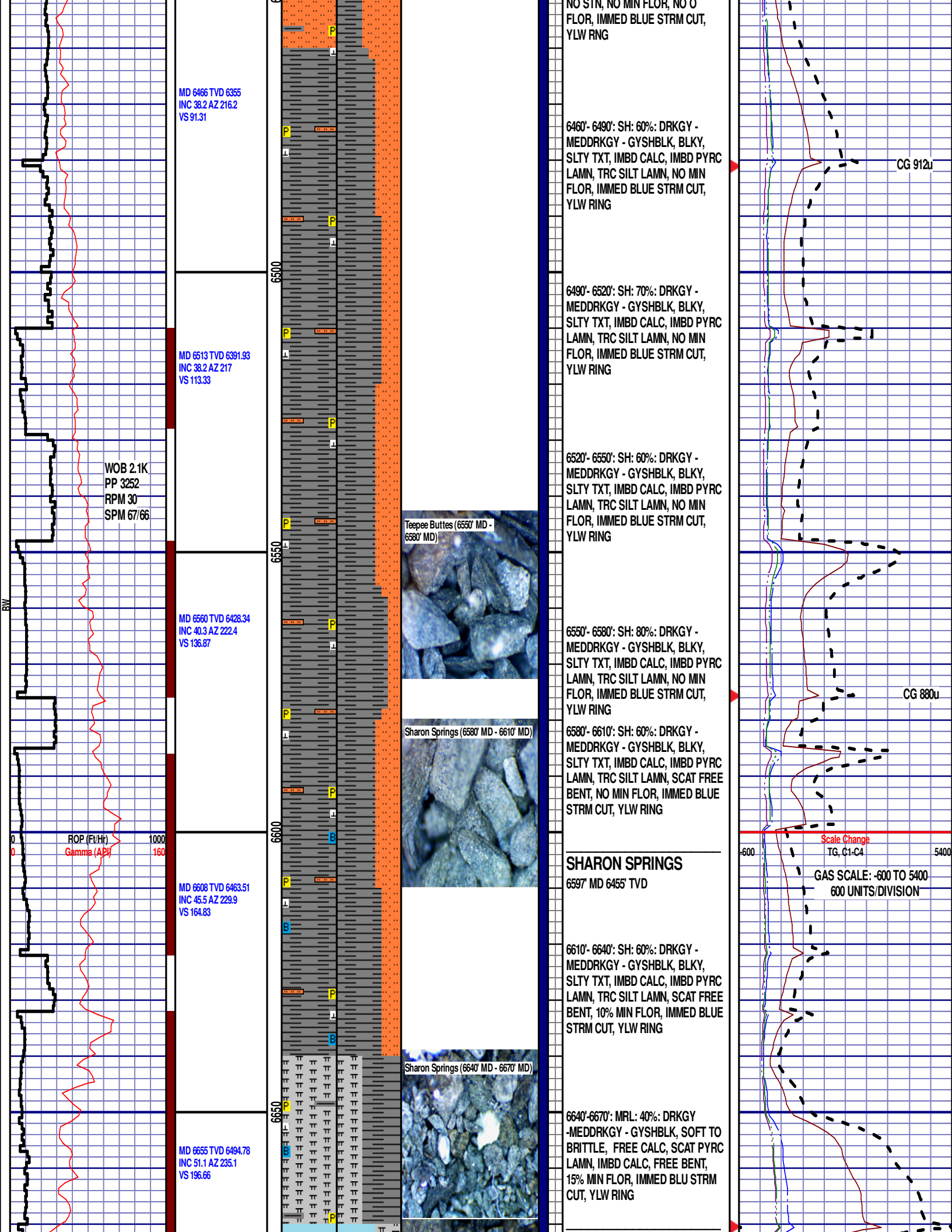
TRIP GAS 304u

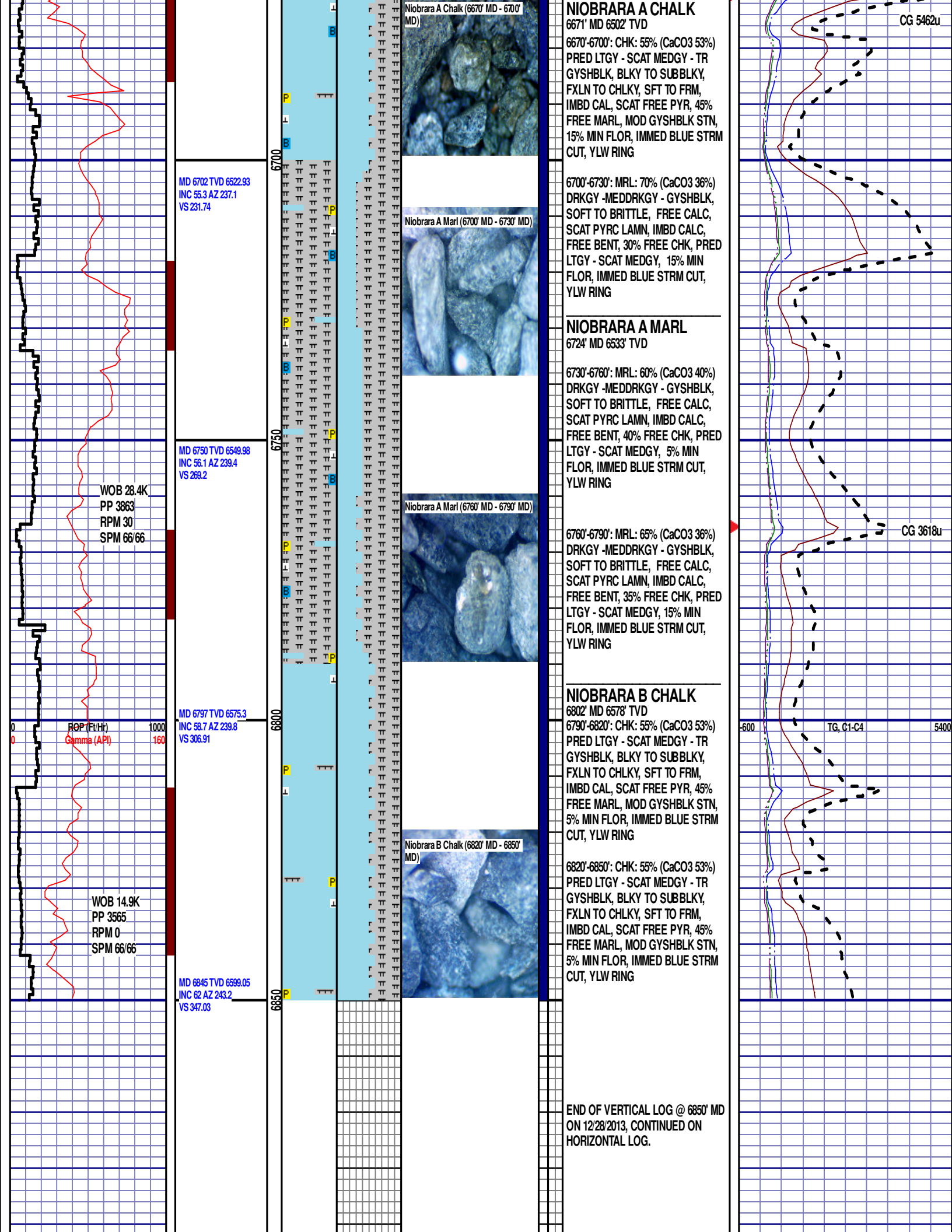
CG 237u











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