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Tulsa, Oklahoma 74136-6378

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fax 866.534.4559

WWW.HZMUD.COM

Customer Information

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

Geologist: Emerson Palmer
Noble Energy Inc.

Mud Logging Details

Logger: Nikki Graber & Peter Brown

Log Interval: 2500' MD to 6950' MD

Start Date: May 27, 2013

Release Date: May 31, 2013

Well Information

Well Name: Wells Ranch USX
AA23-63HN

Location: 24-6N-63W
856' FSL, 89' FWL

County: Weld
State: Colorado

Drilling Rig: H&P 343

Total Depth: 10086' MD

TD Date: May 31, 2013

Formation: Niobrara C Chalk

KB Elevation: 4860'

GR Elevation: 4836'

API Number: 05-123-36884

ROCK TYPES

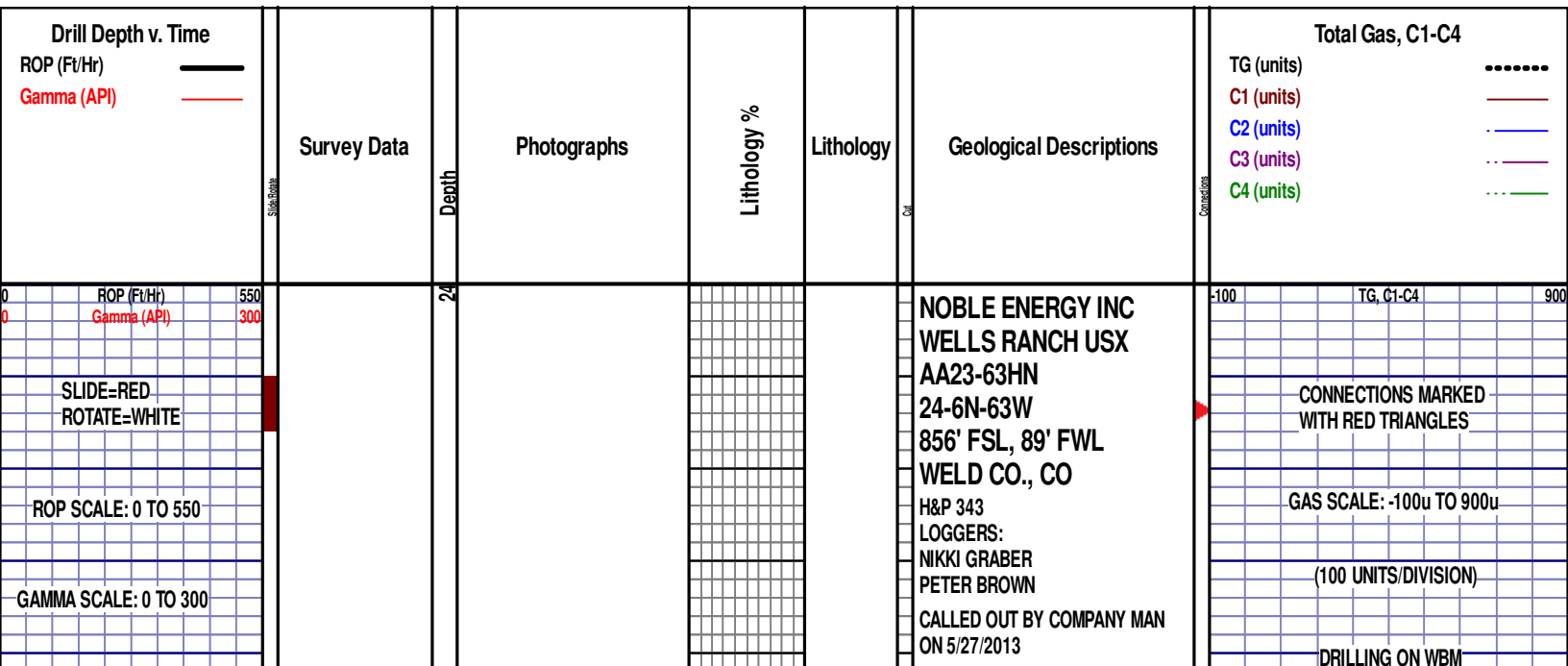
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 Bent
 Brec
 Cht
 Clyst
 Coal
 Congl

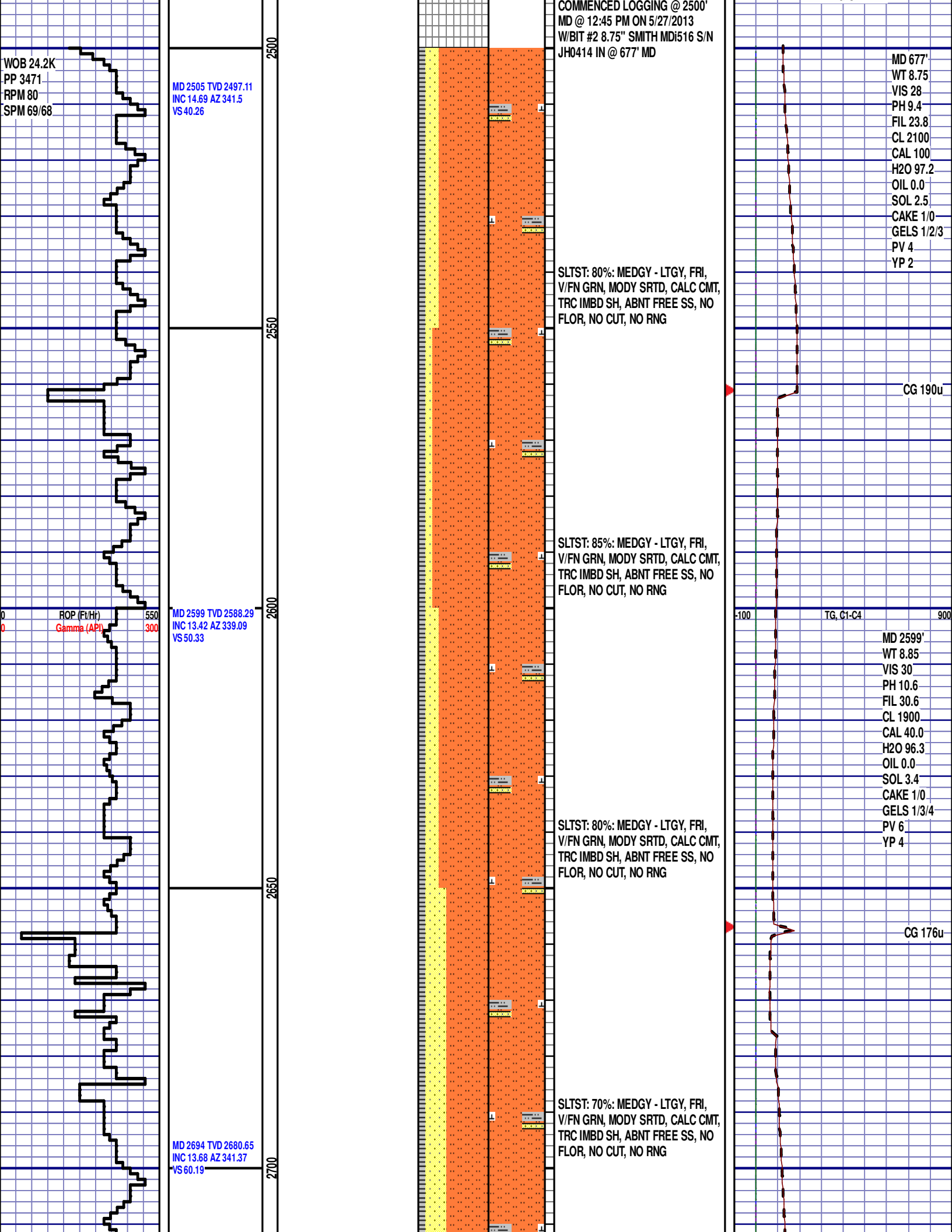
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 Gyp
 Igne
 Chk
 Lmst
 Meta
 Mrlst

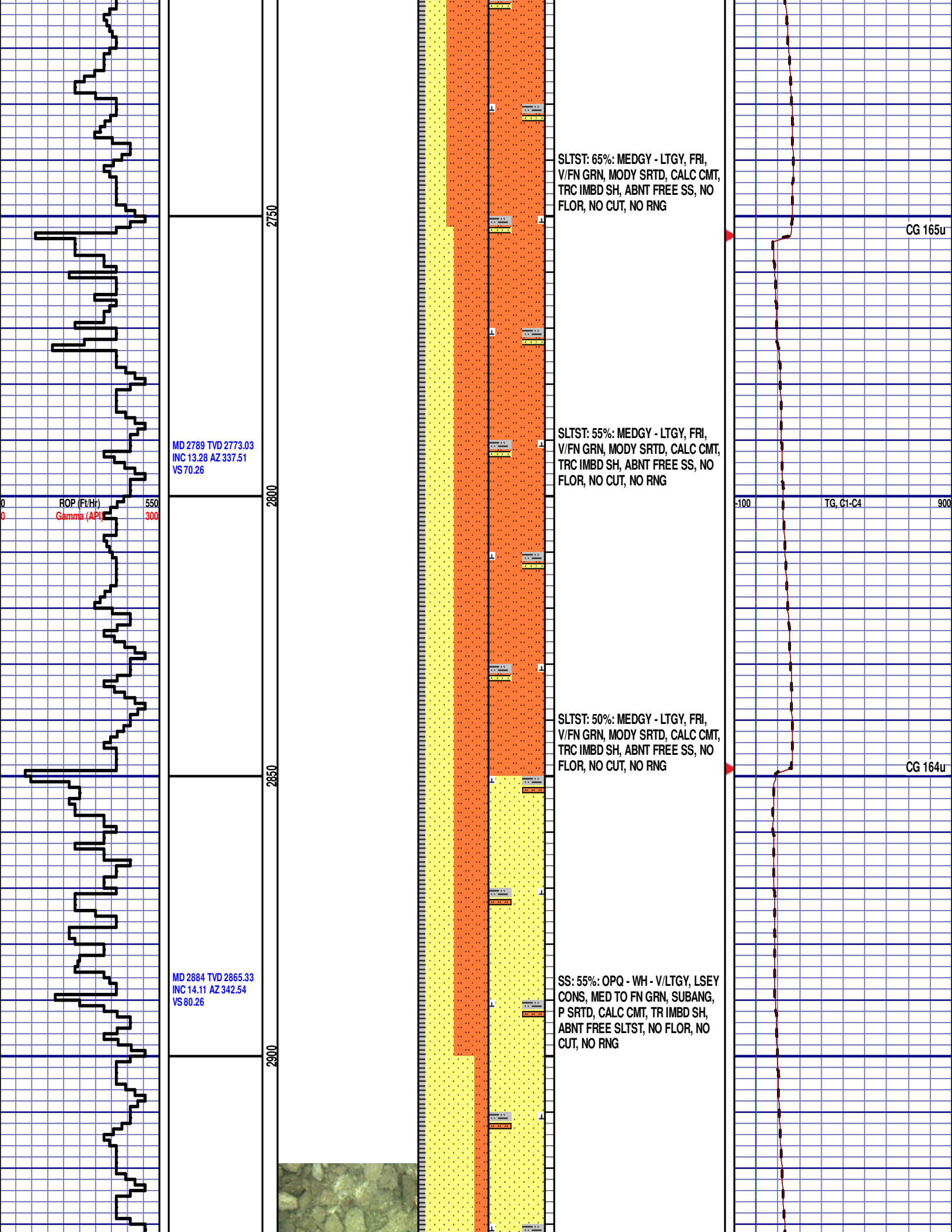
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 Shale
 Shcol
 Siltysh
 Sltst
 Ss
 Till

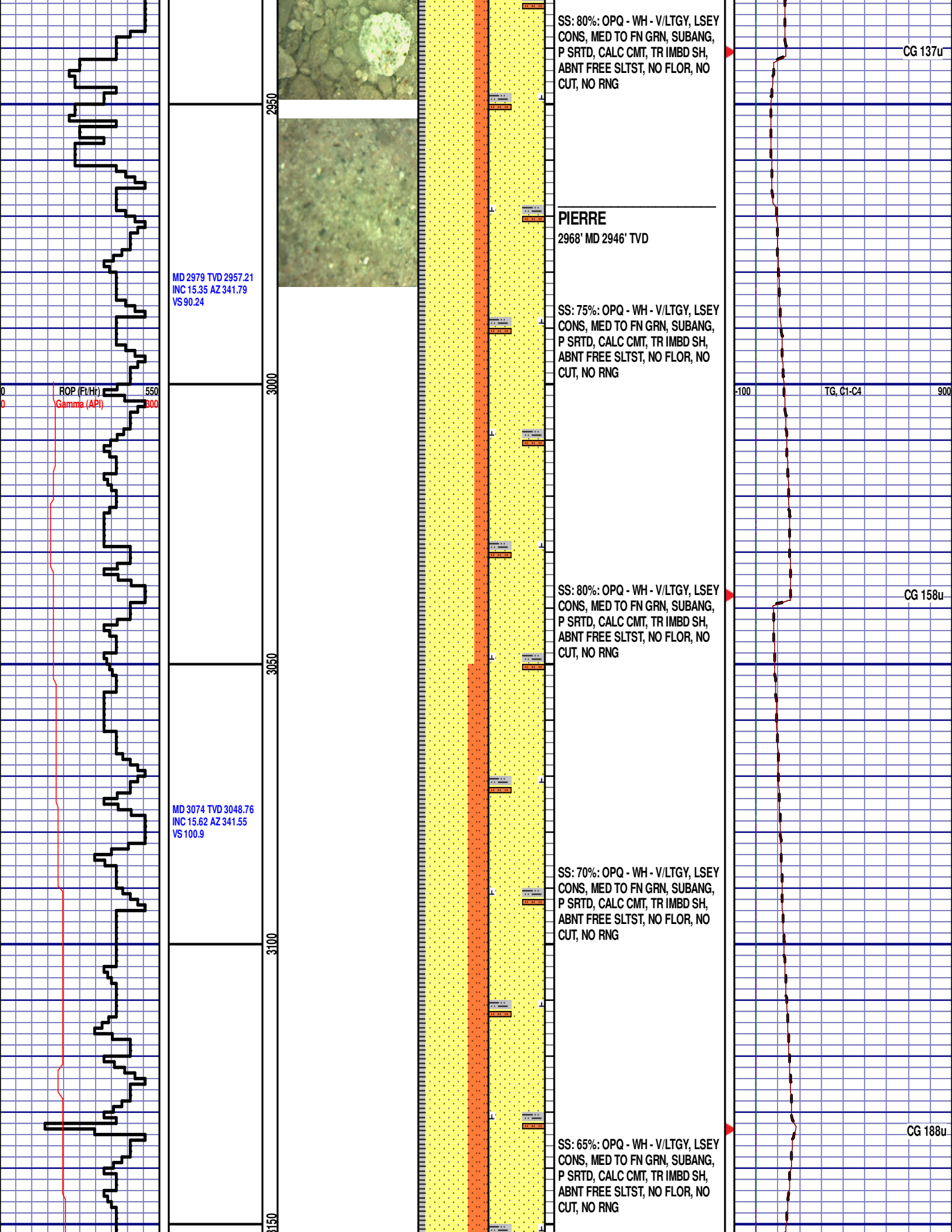
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 oshly gw
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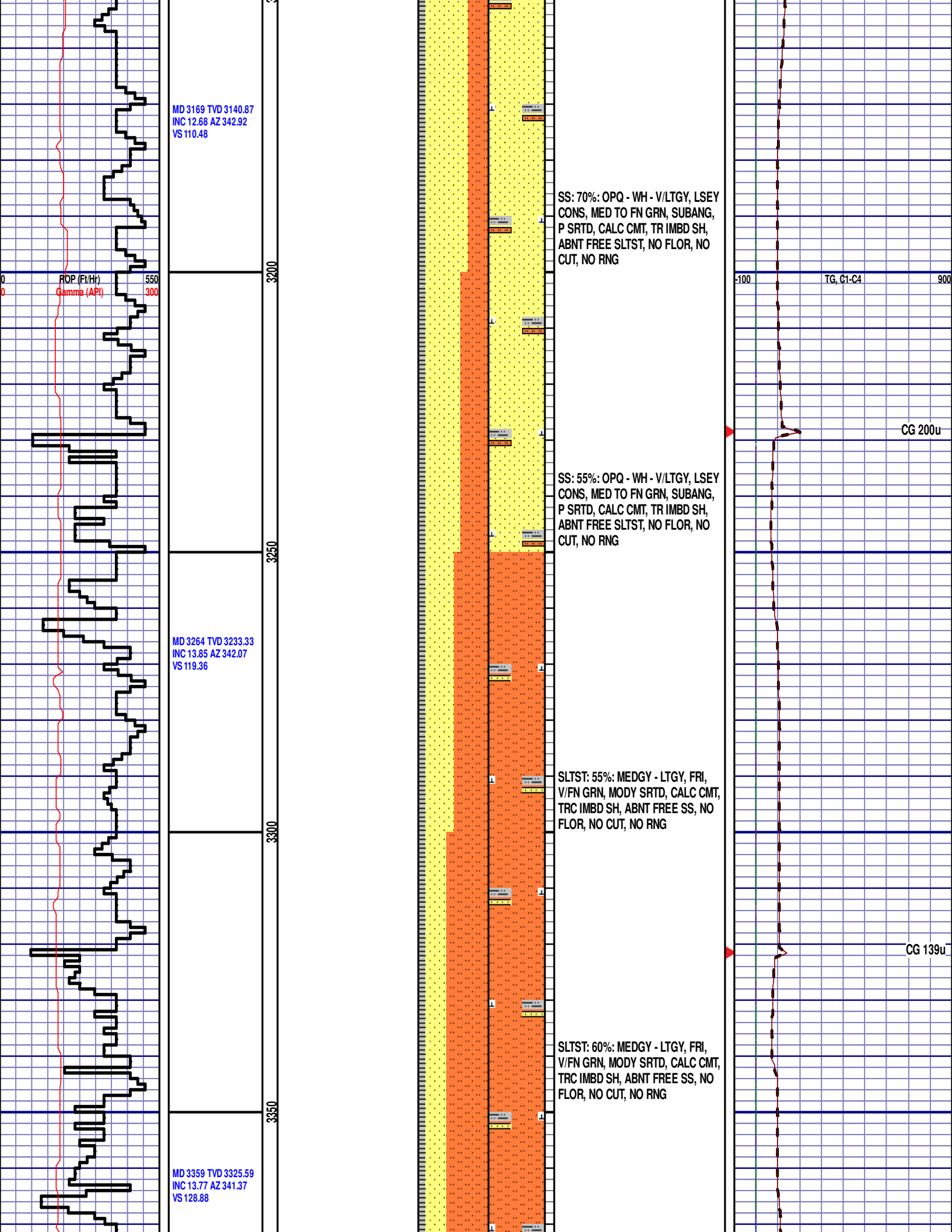
hvycrbsh
 NO SMPL
 Lsdetrst
 sltst
 sdy sh
 Cement











MD 3169 TVD 3140.87
INC 12.68 AZ 342.92
VS 110.48

ROP (Ft/Hr)
Gamma (API)

SS: 70%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

-100 TG, C1-C4 900

CG 200u

SS: 55%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

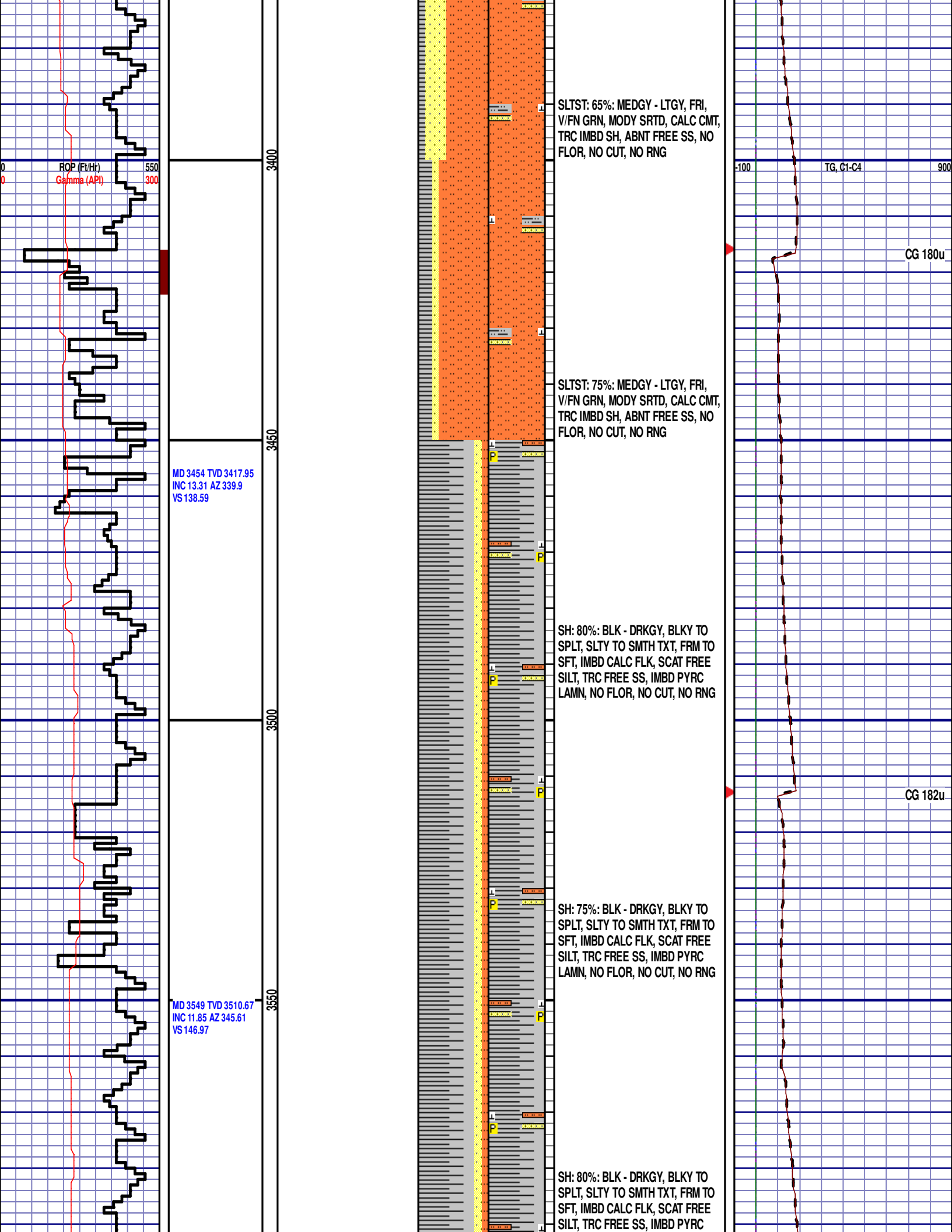
MD 3264 TVD 3233.33
INC 13.85 AZ 342.07
VS 119.36

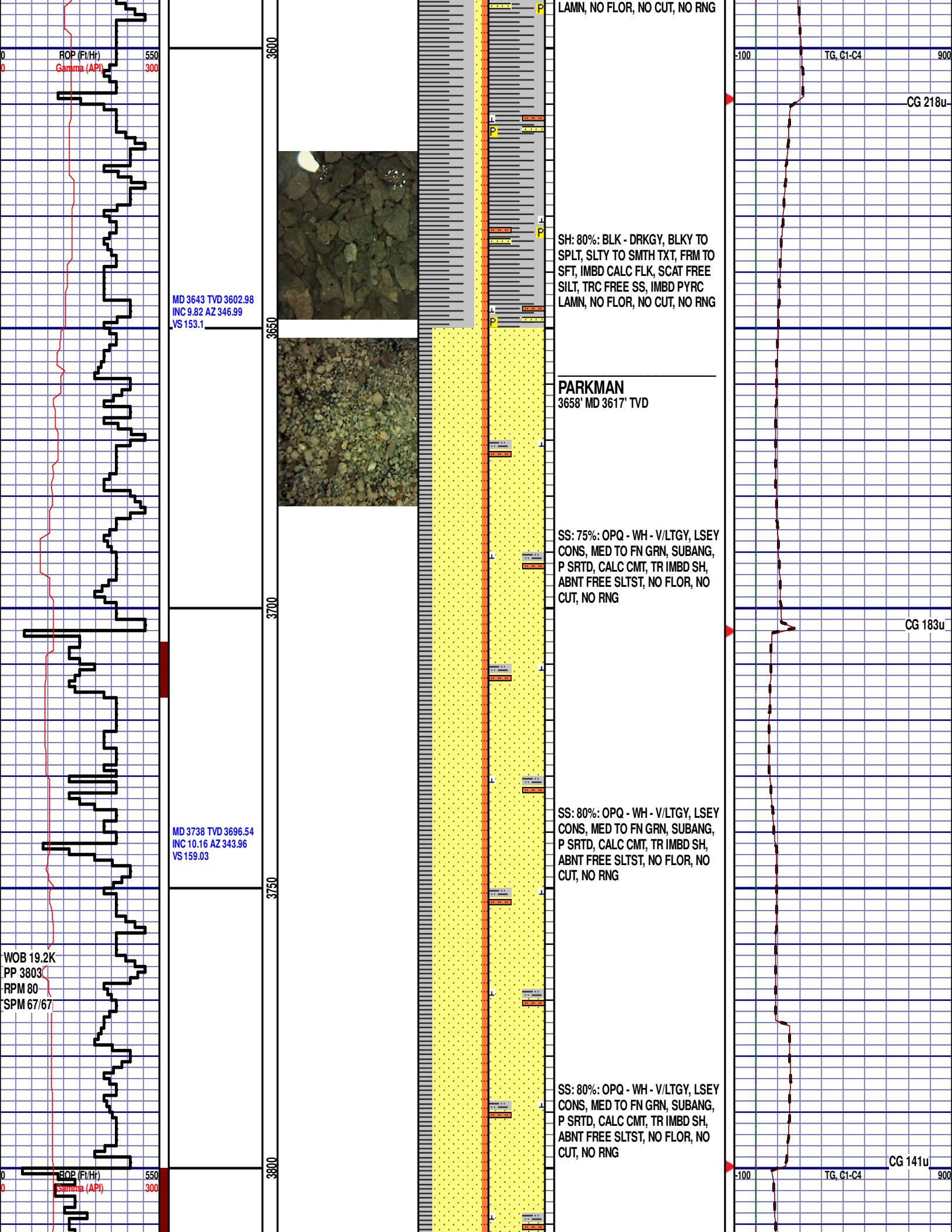
SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TRC IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

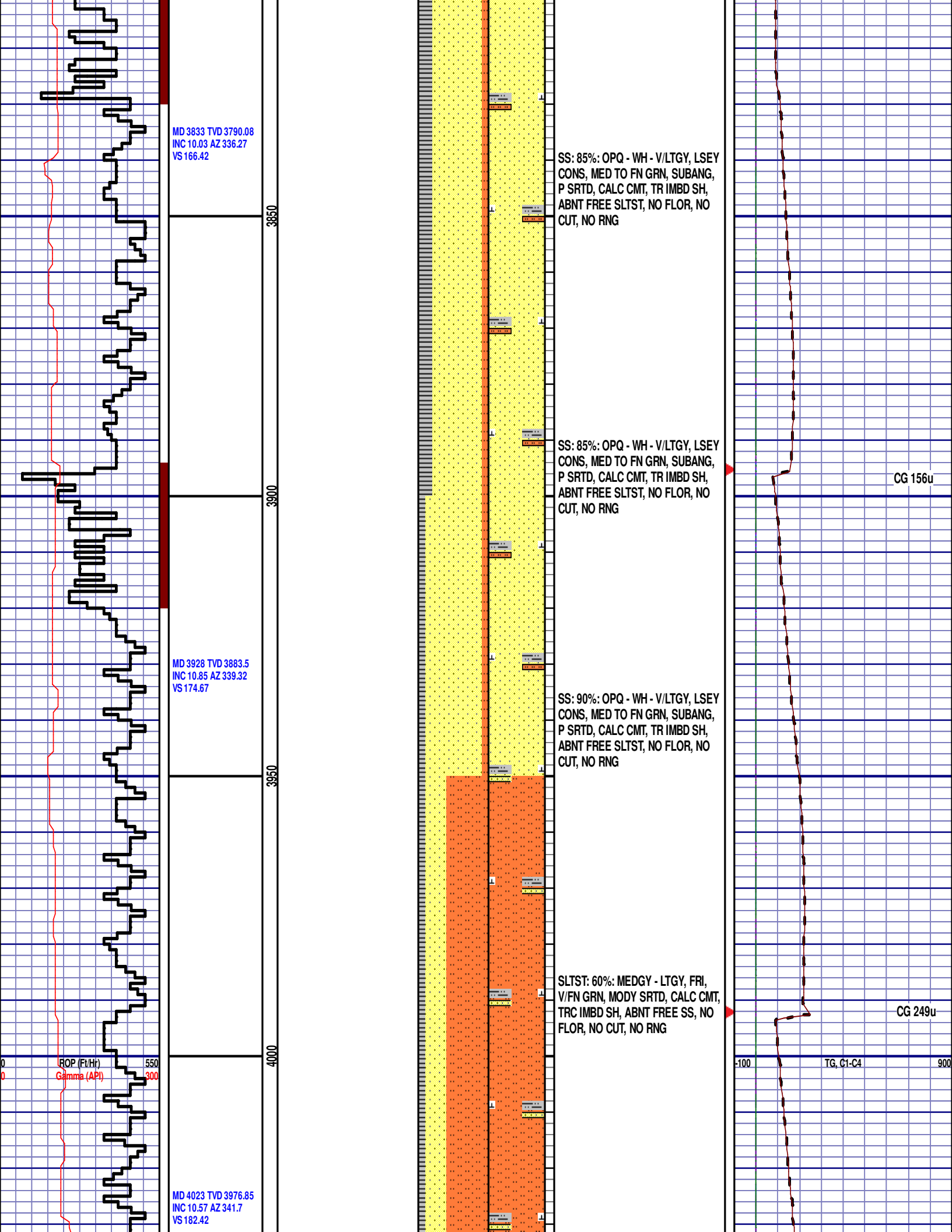
CG 139u

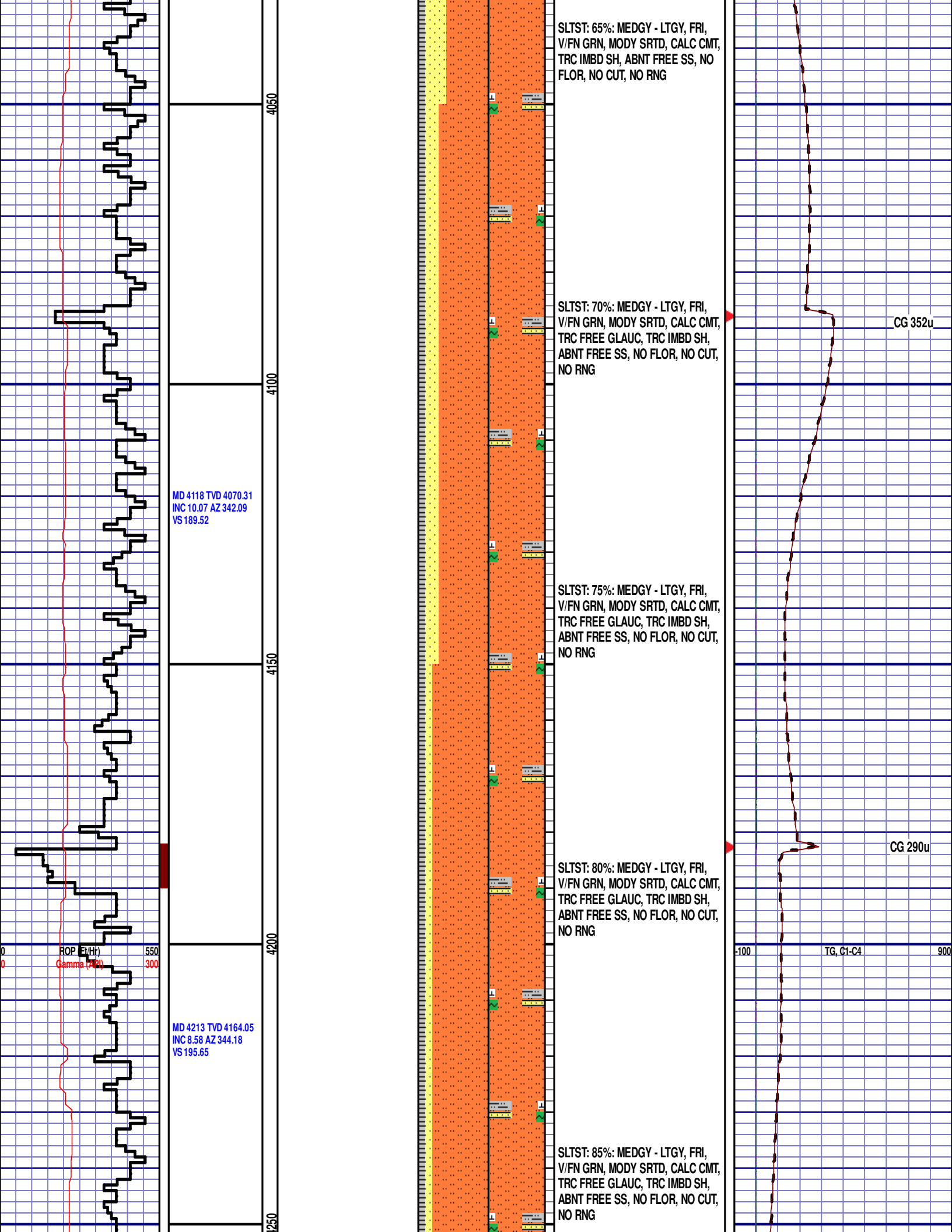
SLTST: 60%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TRC IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

MD 3359 TVD 3325.59
INC 13.77 AZ 341.37
VS 128.88









SLTST: 65%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TRC IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

SLTST: 70%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TRC FREE GLAUC, TRC IMBD SH,
ABNT FREE SS, NO FLOR, NO CUT,
NO RNG

SLTST: 75%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TRC FREE GLAUC, TRC IMBD SH,
ABNT FREE SS, NO FLOR, NO CUT,
NO RNG

SLTST: 80%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TRC FREE GLAUC, TRC IMBD SH,
ABNT FREE SS, NO FLOR, NO CUT,
NO RNG

SLTST: 85%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TRC FREE GLAUC, TRC IMBD SH,
ABNT FREE SS, NO FLOR, NO CUT,
NO RNG

MD 4118 TVD 4070.31
INC 10.07 AZ 342.09
VS 189.52

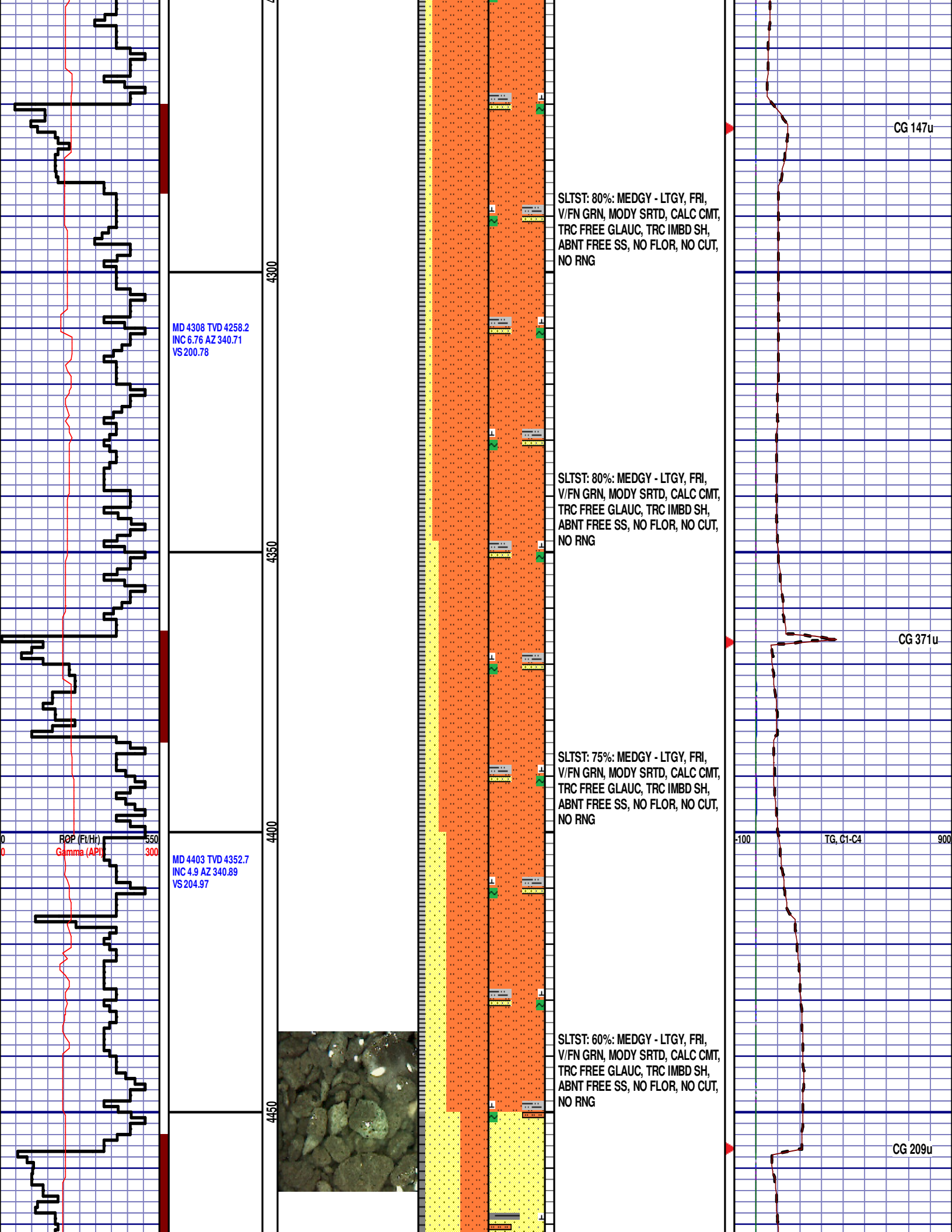
MD 4213 TVD 4164.05
INC 8.58 AZ 344.18
VS 195.65

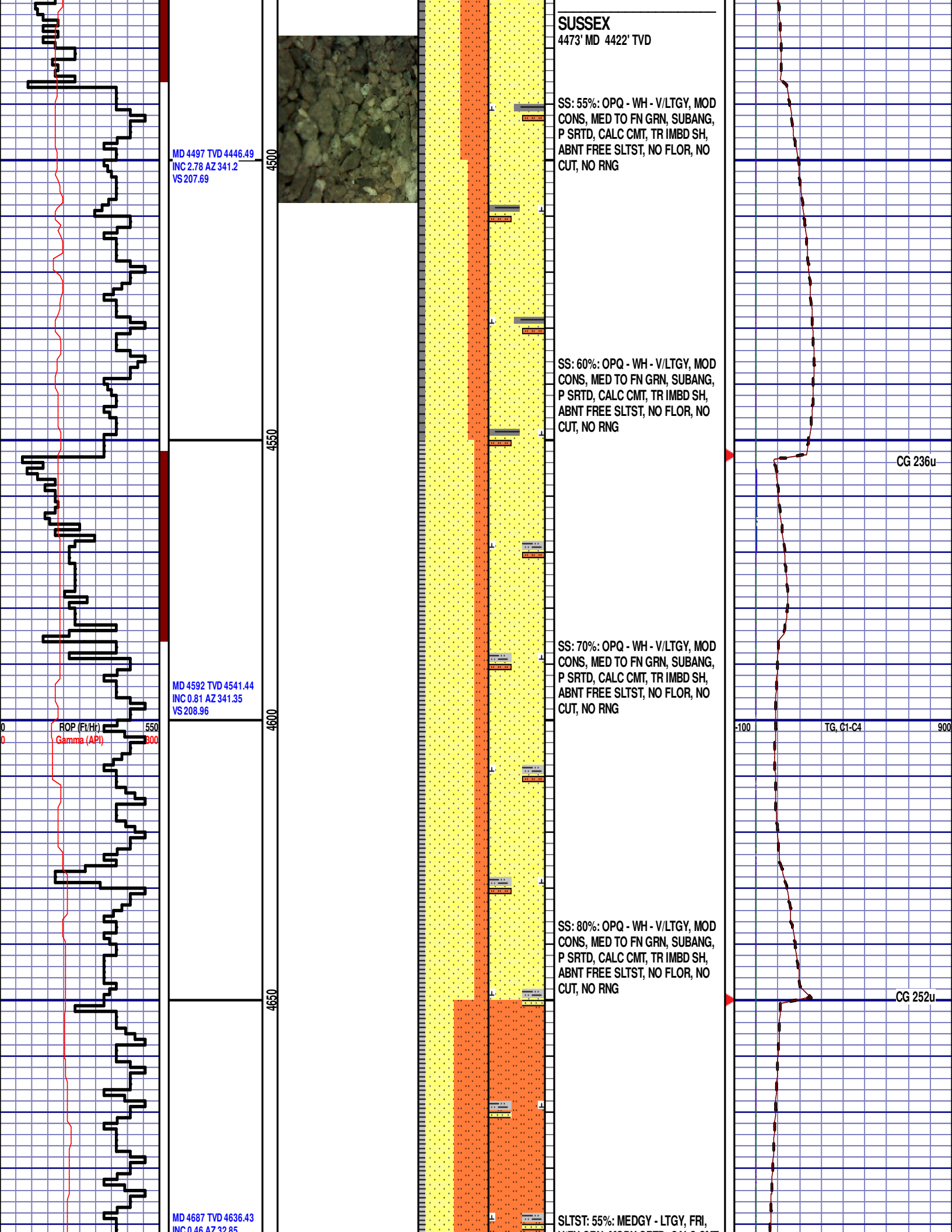
ROP (ft/hr)
Gamma (API)

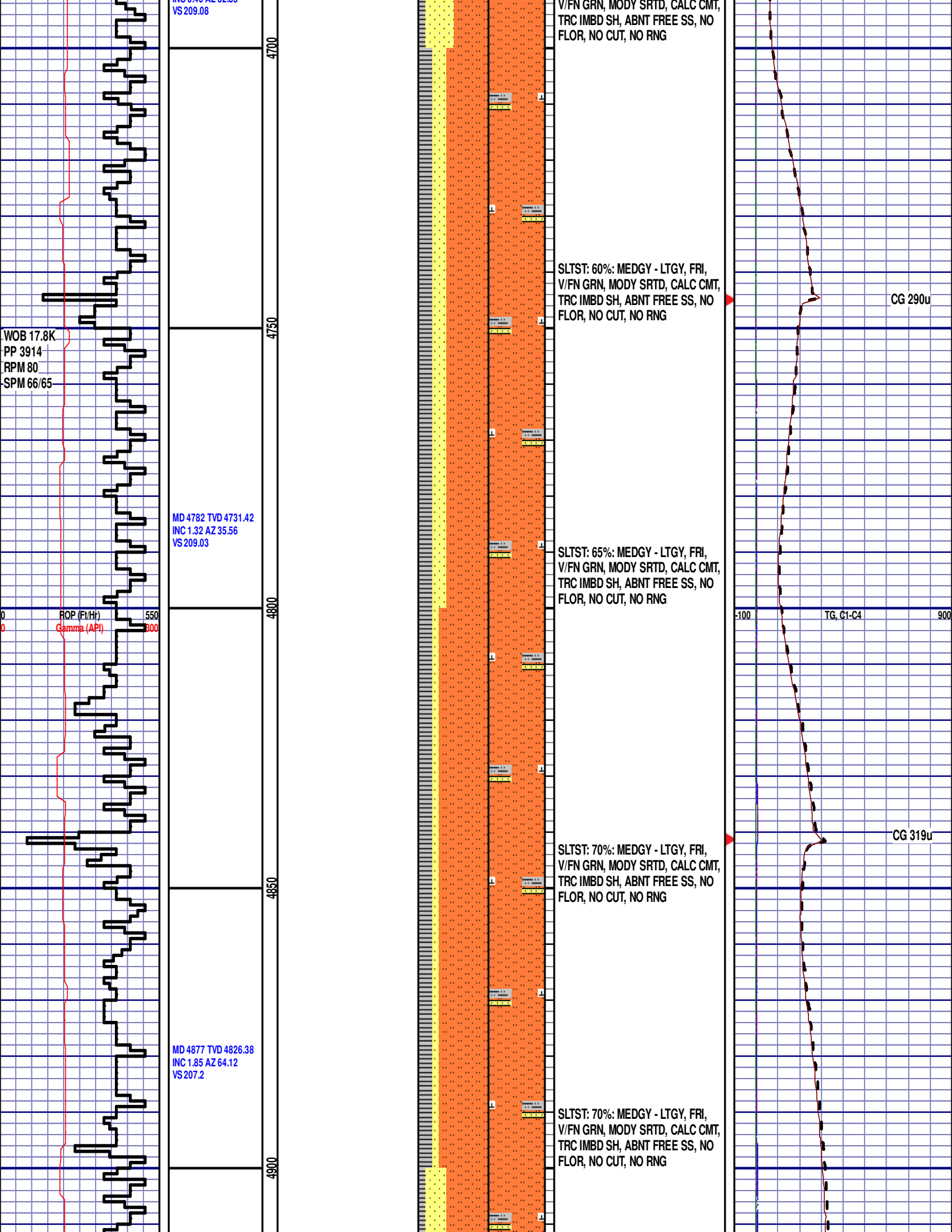
CG 352u

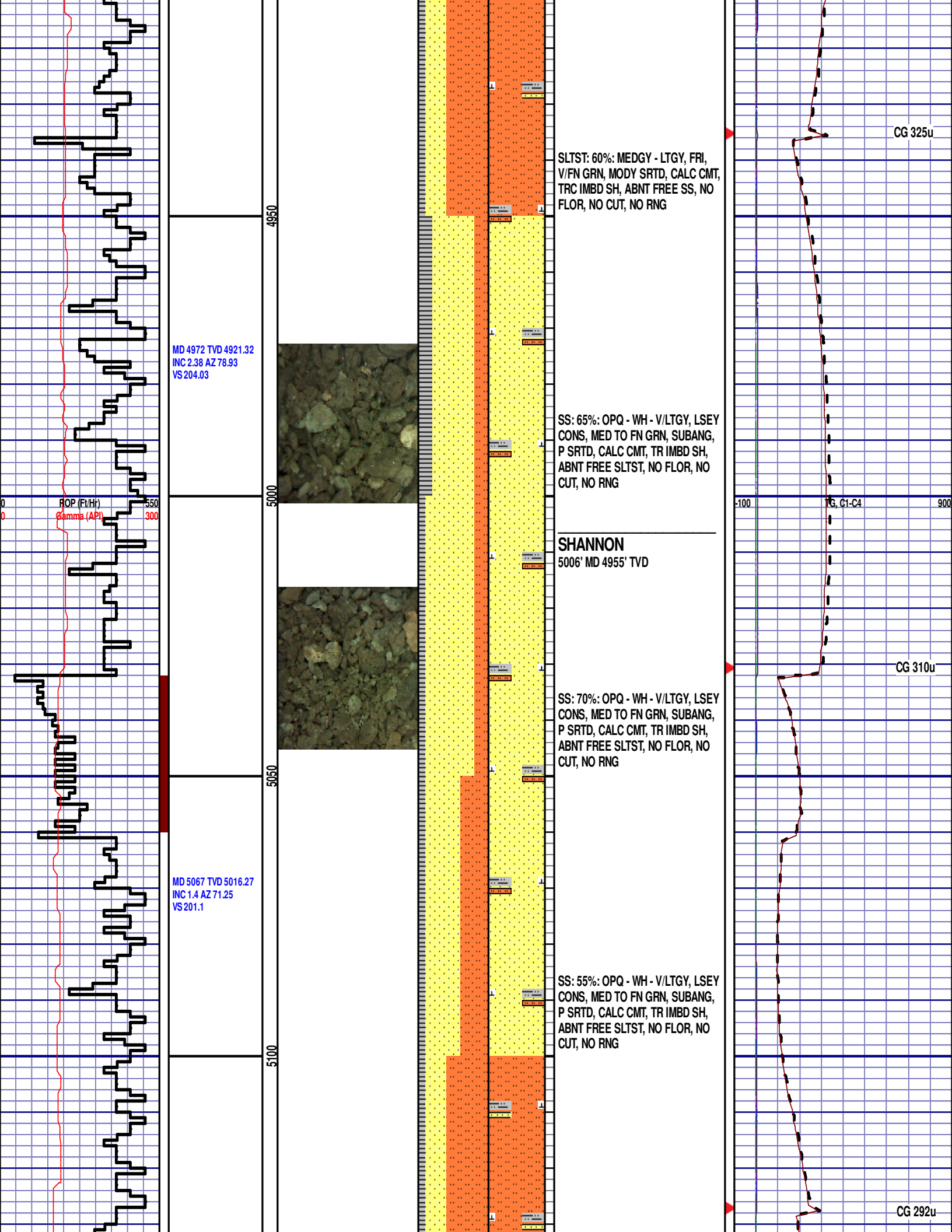
CG 290u

TG, C1-C4









MD 4972 TVD 4921.32
INC 2.38 AZ 78.93
VS 204.03

SLTST: 60%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TRC IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

SS: 65%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

SHANNON
5006' MD 4955' TVD

SS: 70%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

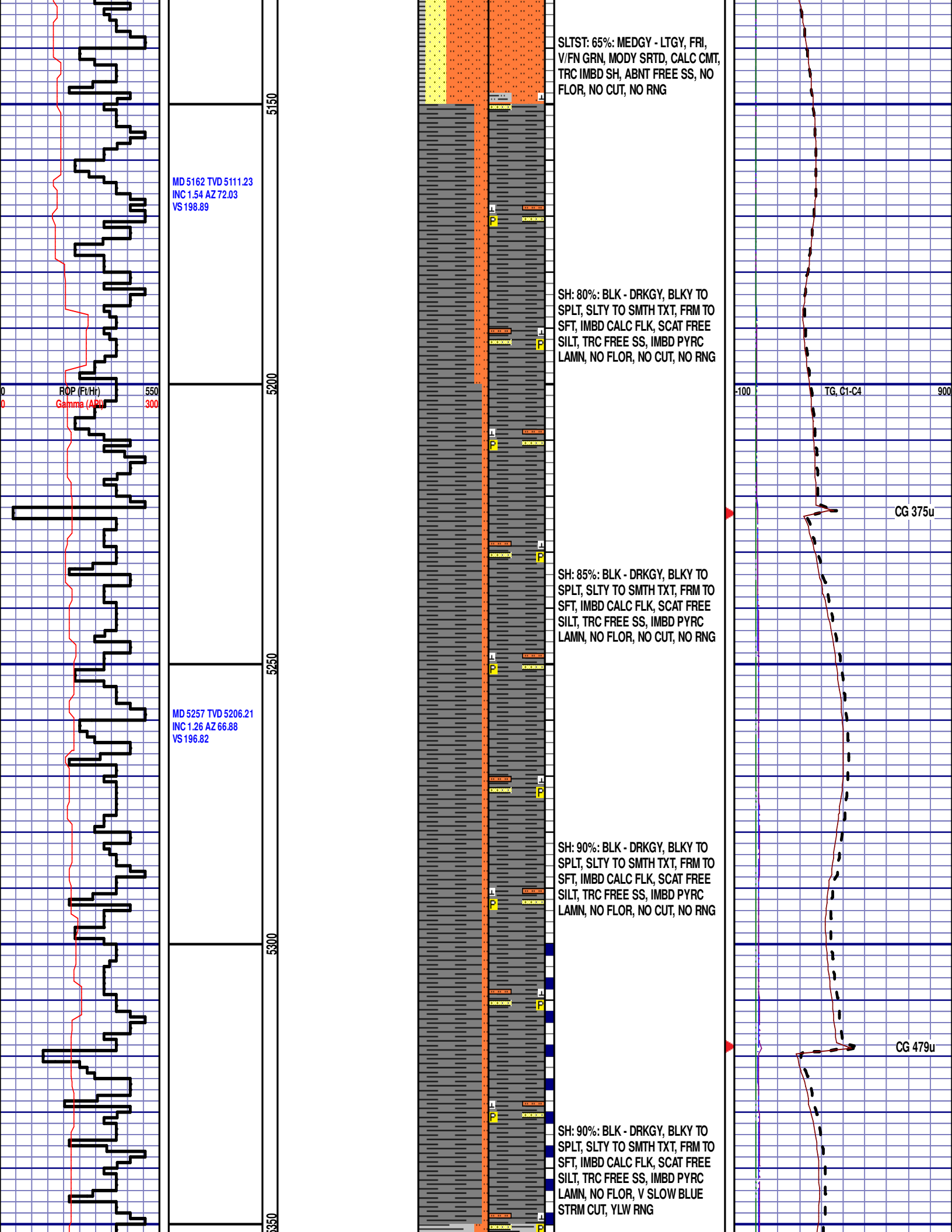
MD 5067 TVD 5016.27
INC 1.4 AZ 71.25
VS 201.1

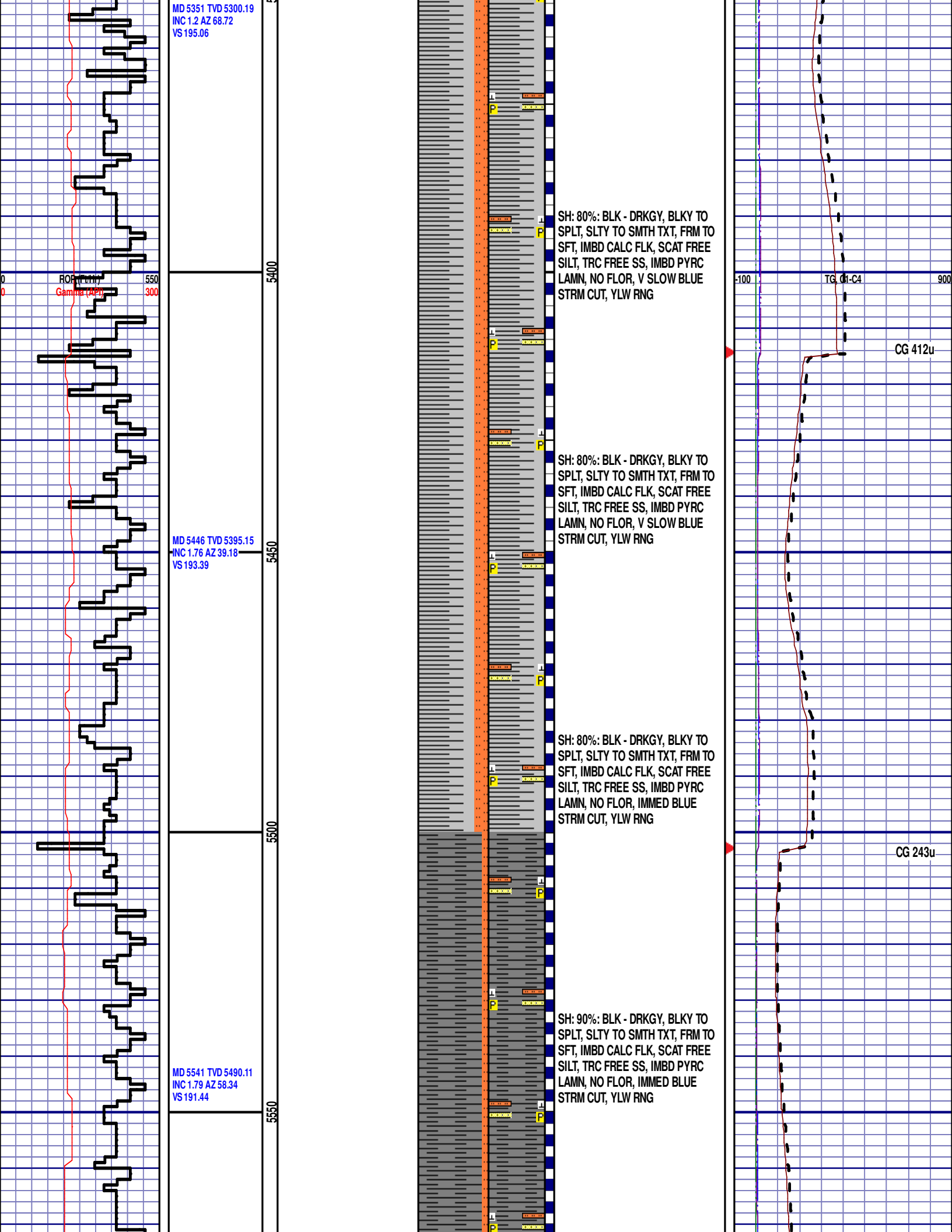
SS: 55%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

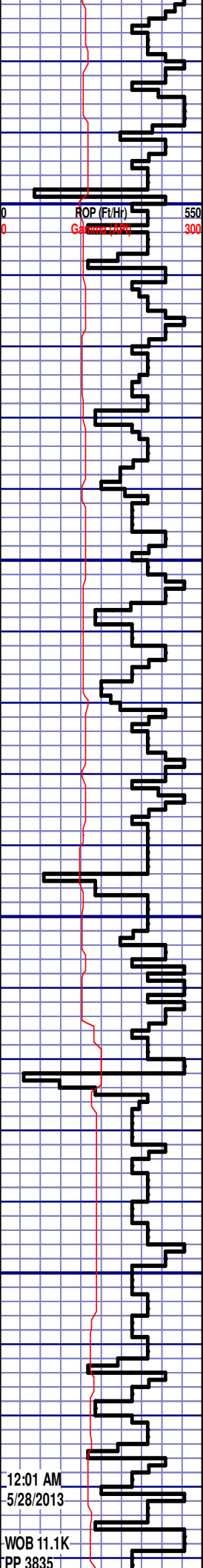
CG 325u

CG 310u

CG 292u







MD 5635 TVD 5584.06
INC 1.85 AZ 47.2
VS 189.3

MD 5730 TVD 5679.03
INC 1.08 AZ 55.84
VS 187.63

12:01 AM
5/28/2013

WOB 11.1K
PP 3835

5600

5650

5700

5750

SH: 90%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, TRC FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 90%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, TRC FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 90%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, TRC FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 90%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, TRC FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

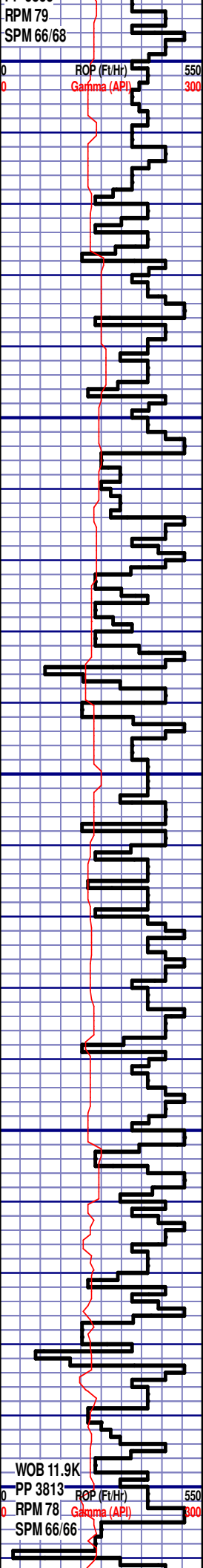
SH: 90%: BLK - DRKGY, BLKY TO

CG 182u

TG, C1-C4

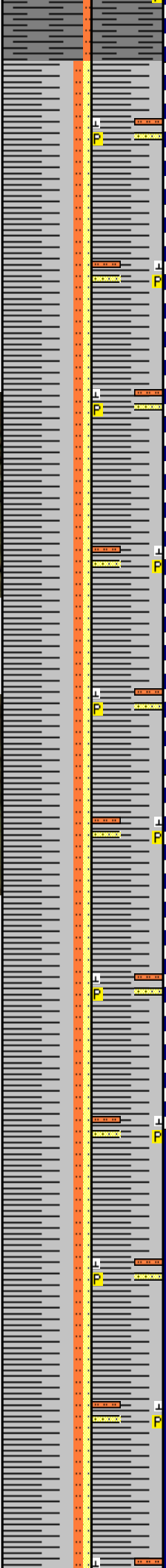
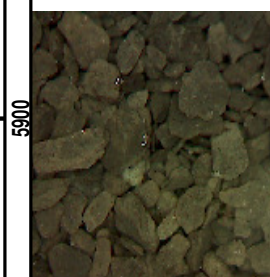
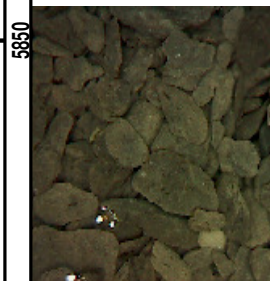
CG 339u

CG 278u



MD 5825 TVD 5774.01
INC 1.18 AZ 75.87
VS 186.04

MD 5920 TVD 5869
INC 0.47 AZ 58.28
VS 184.82



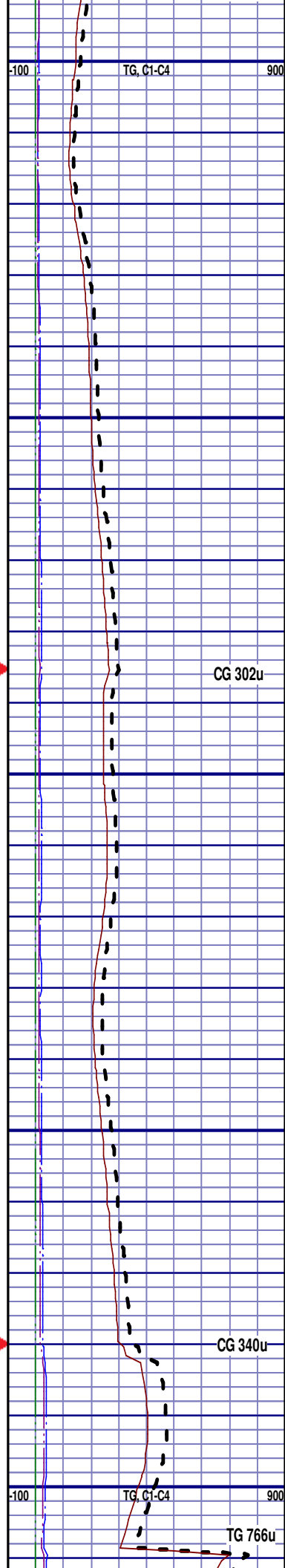
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, TRC FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

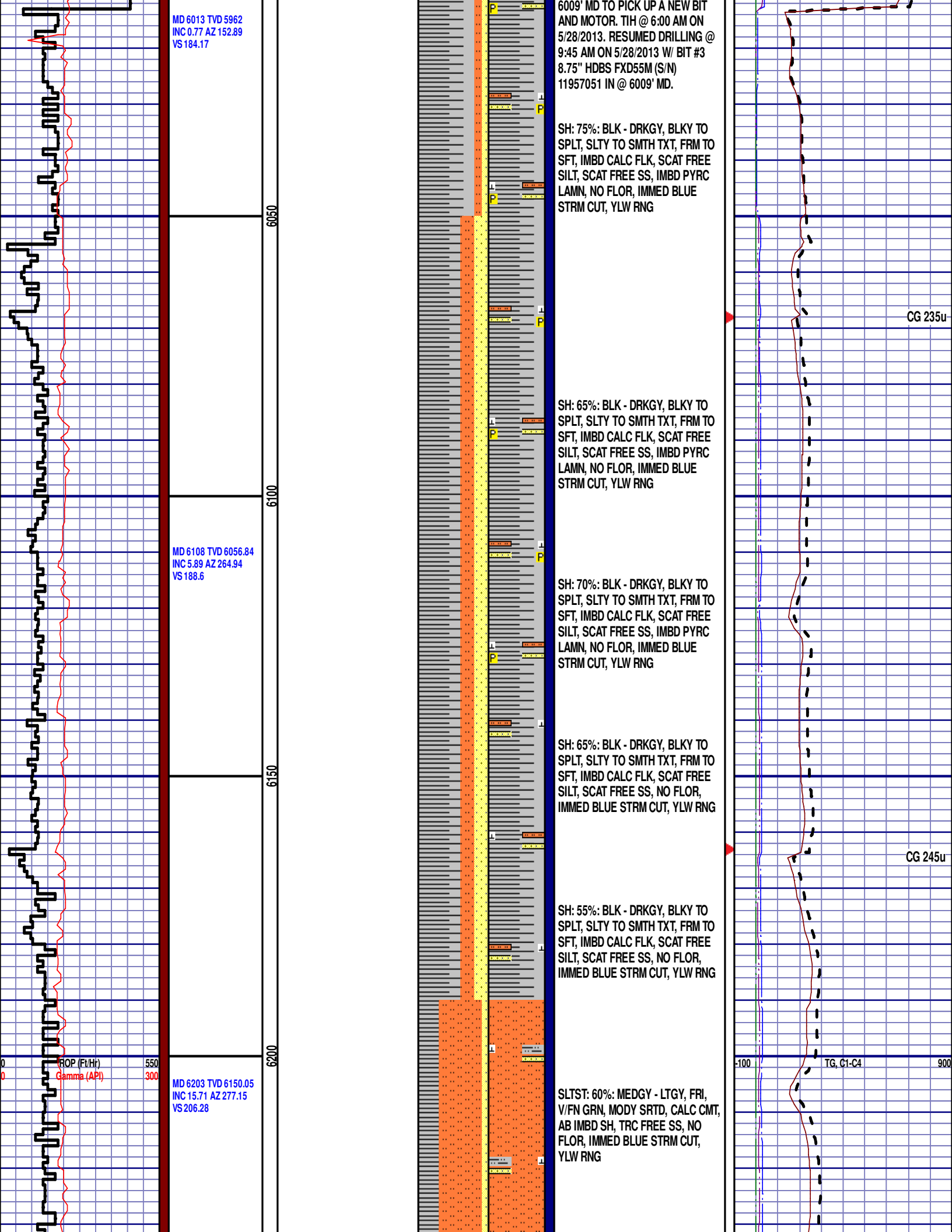
SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, TRC FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

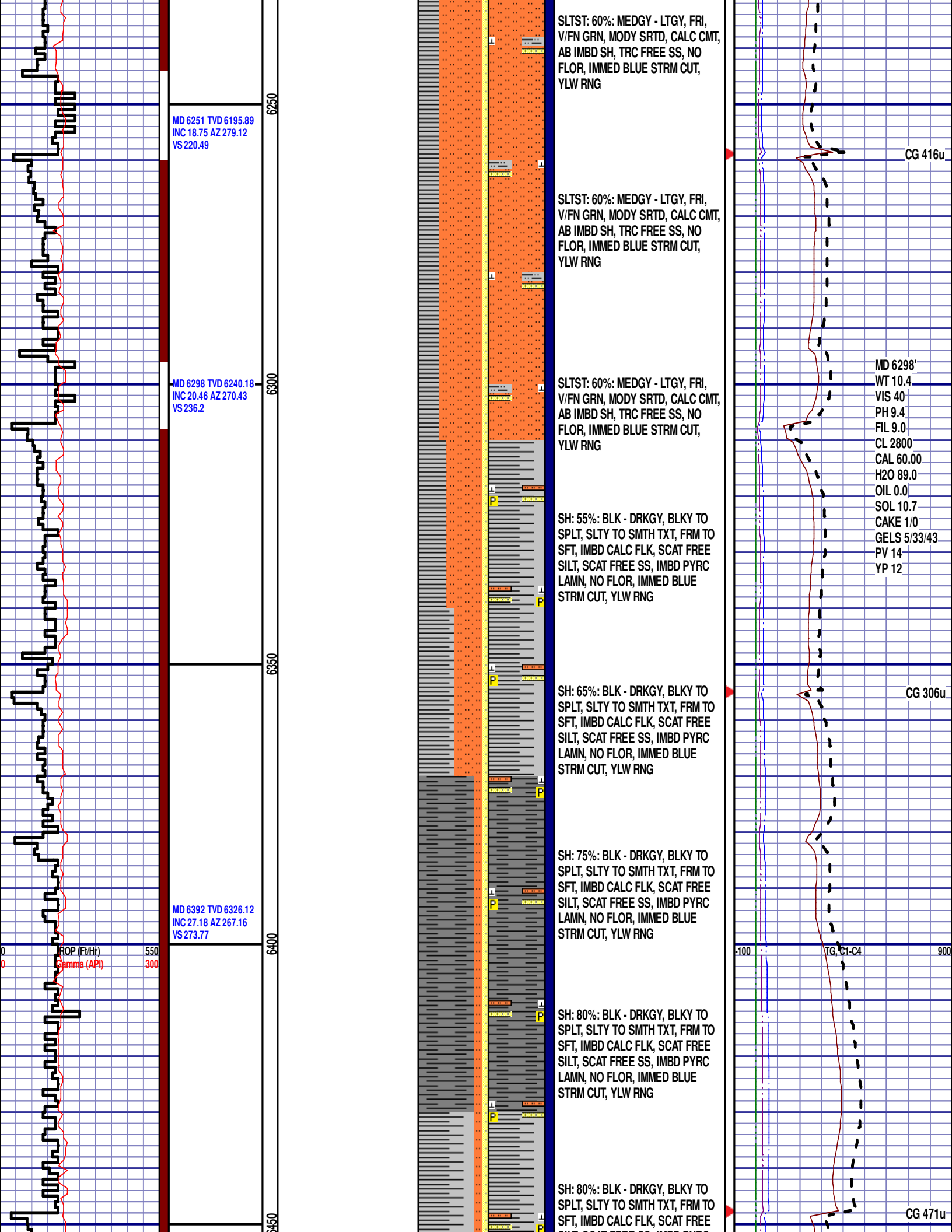
TEEPEE BUTTES
5882' MD 5834' TVD

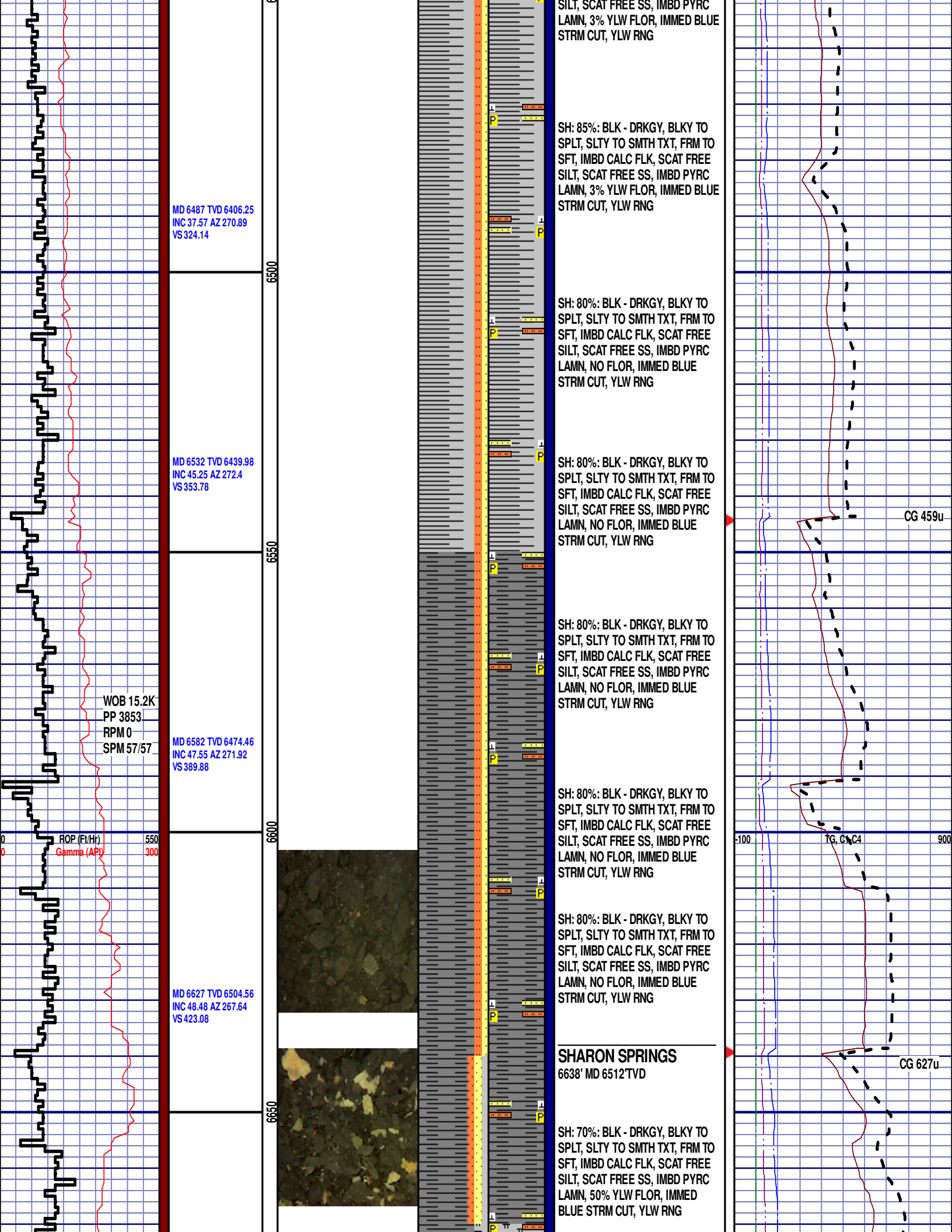
SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, TRC FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, TRC FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG









MD 6487 TVD 6406.25
INC 37.57 AZ 270.89
VS 324.14

MD 6532 TVD 6439.98
INC 45.25 AZ 272.4
VS 353.78

WOB 15.2K
PP 3853
RPM 0
SPM 57/57

MD 6582 TVD 6474.46
INC 47.55 AZ 271.92
VS 389.88

ROP (Ft/Hr)
Gamma (API)

MD 6627 TVD 6504.56
INC 48.48 AZ 267.64
VS 423.08

SH: 85%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, SCAT FREE SS, IMBD PYRC
LAMN, 3% YLW FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, SCAT FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, SCAT FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, SCAT FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, SCAT FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, SCAT FREE SS, IMBD PYRC
LAMN, NO FLOR, IMMED BLUE
STRM CUT, YLW RNG

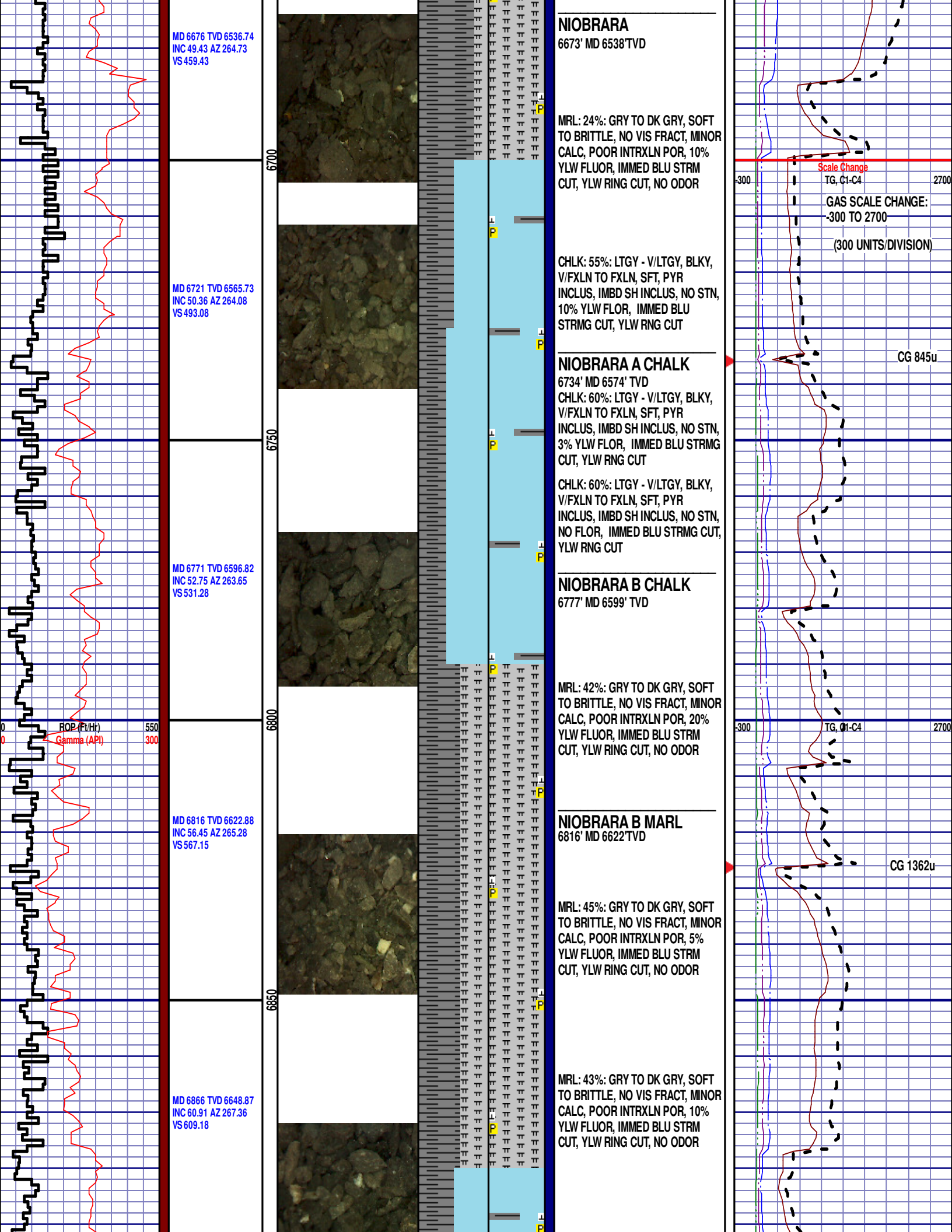
SHARON SPRINGS
6638' MD 6512'TVD

SH: 70%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD CALC FLK, SCAT FREE
SILT, SCAT FREE SS, IMBD PYRC
LAMN, 50% YLW FLOR, IMMED
BLUE STRM CUT, YLW RNG

CG 459u

TG, C&C4

CG 627u



NIOBRARA
6673' MD 6538'TVD

MRL: 24%: GRY TO DK GRY, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, POOR INTRXLN POR, 10% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR

CHLK: 55%: LTGY - V/LTGY, BLKY, V/FXLN TO FXLN, SFT, PYR INCLUS, IMBD SH INCLUS, NO STN, 10% YLW FLOR, IMMED BLU STRMG CUT, YLW RNG CUT

NIOBRARA A CHALK

6734' MD 6574' TVD
CHLK: 60%: LTGY - V/LTGY, BLKY, V/FXLN TO FXLN, SFT, PYR INCLUS, IMBD SH INCLUS, NO STN, 3% YLW FLOR, IMMED BLU STRMG CUT, YLW RNG CUT

CHLK: 60%: LTGY - V/LTGY, BLKY, V/FXLN TO FXLN, SFT, PYR INCLUS, IMBD SH INCLUS, NO STN, NO FLOR, IMMED BLU STRMG CUT, YLW RNG CUT

NIOBRARA B CHALK

6777' MD 6599' TVD

MRL: 42%: GRY TO DK GRY, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, POOR INTRXLN POR, 20% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR

NIOBRARA B MARL

6816' MD 6622'TVD

MRL: 45%: GRY TO DK GRY, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, POOR INTRXLN POR, 5% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR

MRL: 43%: GRY TO DK GRY, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, POOR INTRXLN POR, 10% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR

Scale Change
TG, C1-C4

GAS SCALE CHANGE:
-300 TO 2700

(300 UNITS/DIVISION)

CG 845u

CG 1362u

