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Customer Information

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

Geologist: Holly Duncan
Noble Energy Inc.

Mud Logging Details

Logger: Tom Wacholz &
Scott Haney

Log Interval: 2500' MD to 5490' MD

Start Date: November 22, 2014

Release Date: November 27, 2014

Well Information

Well Name: McCaffrey State LD12-75-1BHN

Location: 1-T9N-R58W
250' FSL, 2238' FEL

County: Weld
State: Colorado

Drilling Rig: H&P 343

Total Depth: 10303' MD

TD Date: November 27, 2014

Formation: Niobrara A Chalk

KB Elevation: 4656'

GR Elevation: 4632'

API Number: 05-123-39654-0000

ROCK TYPES

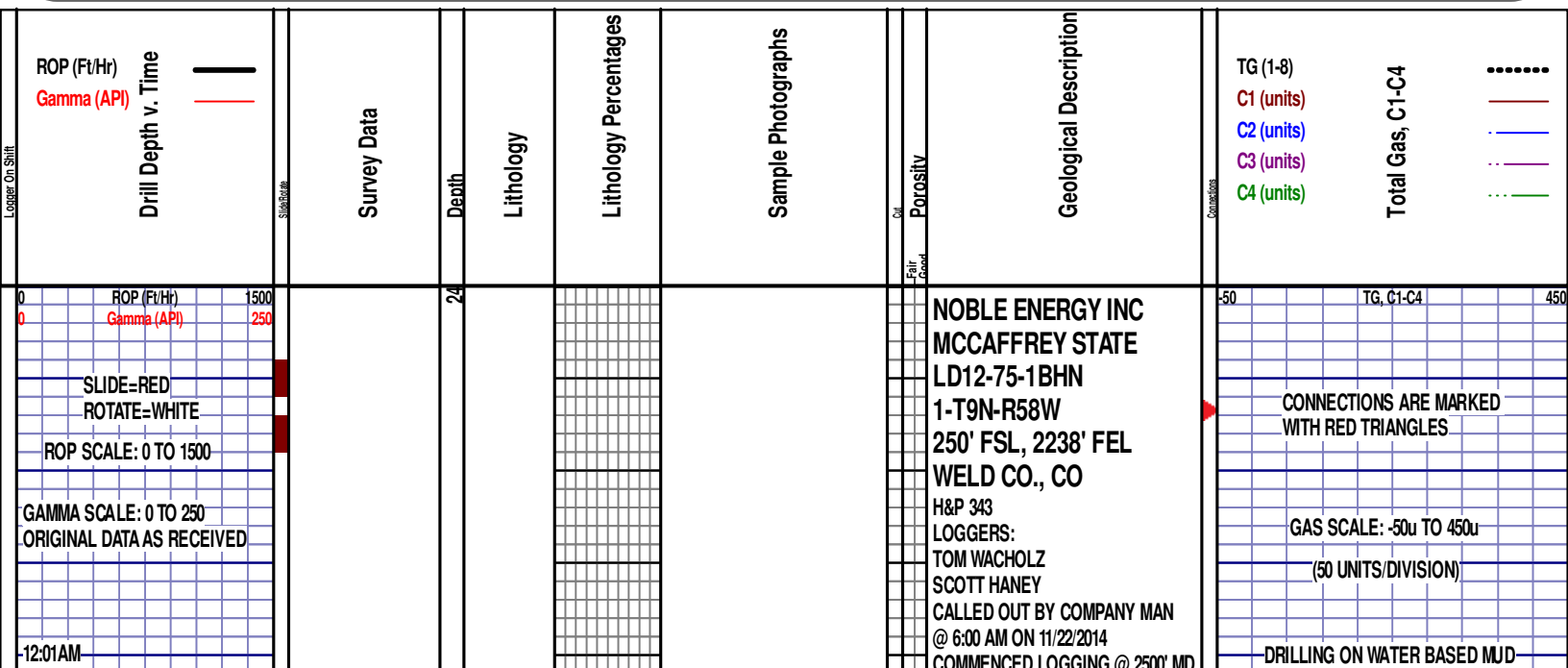
shale
Anhy
Bent
Brec
Cht
Clyst
Coal

Congl
Dol
Gyp
Igne
Lmst
Meta
Mrlist

Salt
Shale
Shcol
Shgy
Sltst
Ss
Till

gw
lmywash
ogw
olmywash
oshly gw
shly gw
sdygw

hvyrcrbsh
nosmpl
Lsdetrst
sltst
sdy sh



11/23/2014
DAY 02
0 FT/24HRS

WOB 9.2K
PP 3104
RPM 61
SPM 85/85

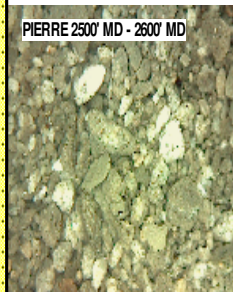
ROP (Ft/Hr)
Gamma (API)

MD 2594 TVD 2593.95
INC 0.26 AZ 48.97
VS 5.06

MD 2689 TVD 2688.95
INC 0.31 AZ 174.56
VS 5.18

2500
2550
2600
2650
2700

PIERRE 2500' MD - 2600' MD



COMMENCED LOGGING @ 2500' MD
@ 4:15 AM ON 11/23/2014 W/BIT # 2,
8.75", SMITH SDi519 (S/N) JJ7043 IN
@ 1239' MD

PIERRE

BEFORE LOGGING DEPTH

2500' MD-2600' MD: SLTST: 60% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, SANDY, IMBD
PYR, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

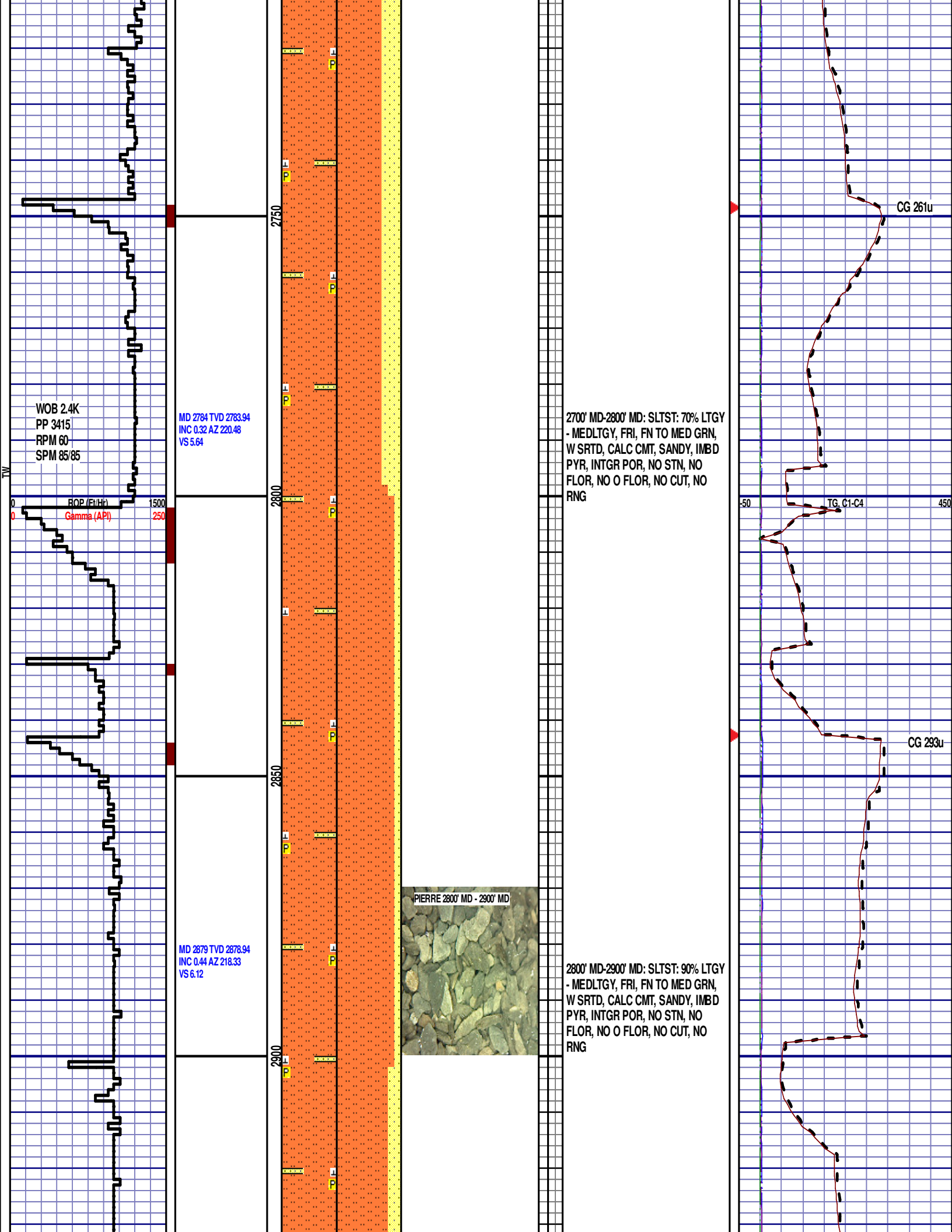
2600' MD-2700' MD: SLTST: 75% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, SANDY, IMBD
PYR, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

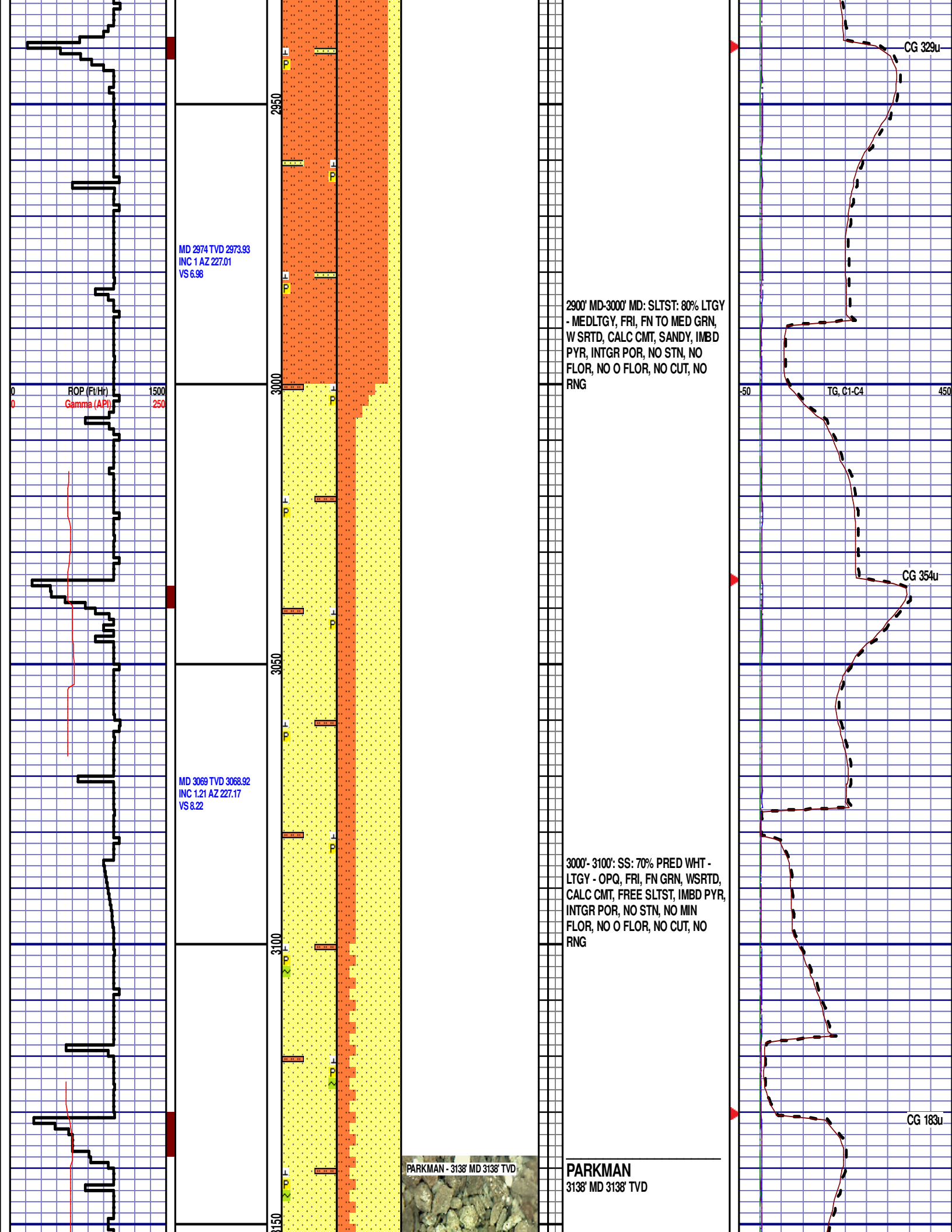
DEPTH 2432'
WT 8.65
VIS 27
PH 11.3
FIL 57.8
CL 2300
CAL 120
H2O 97.4
OIL 0.0
LGS 20.8
GEL 2/3/3
PV 2
YP 3
CK 40
SOL 2.3

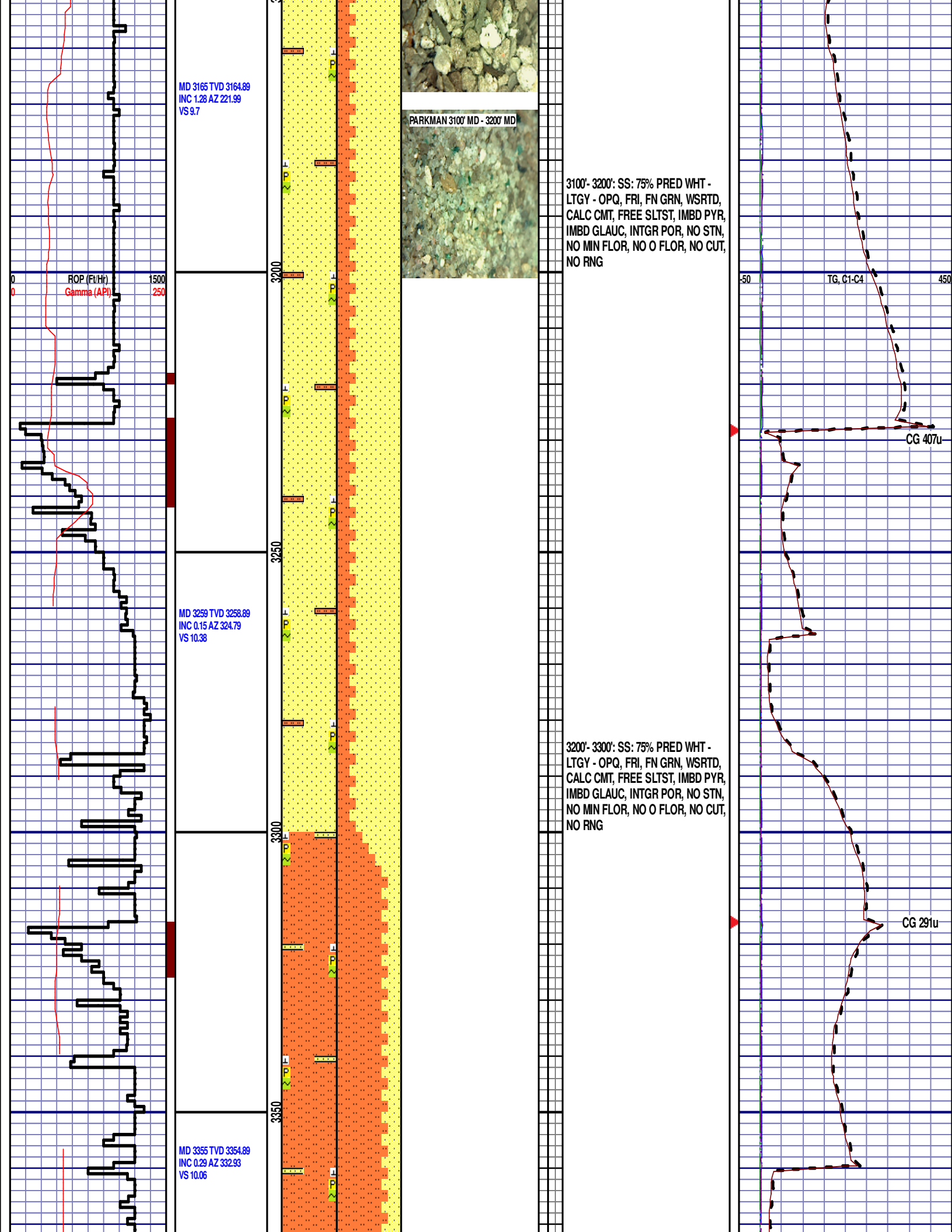
CG 326u

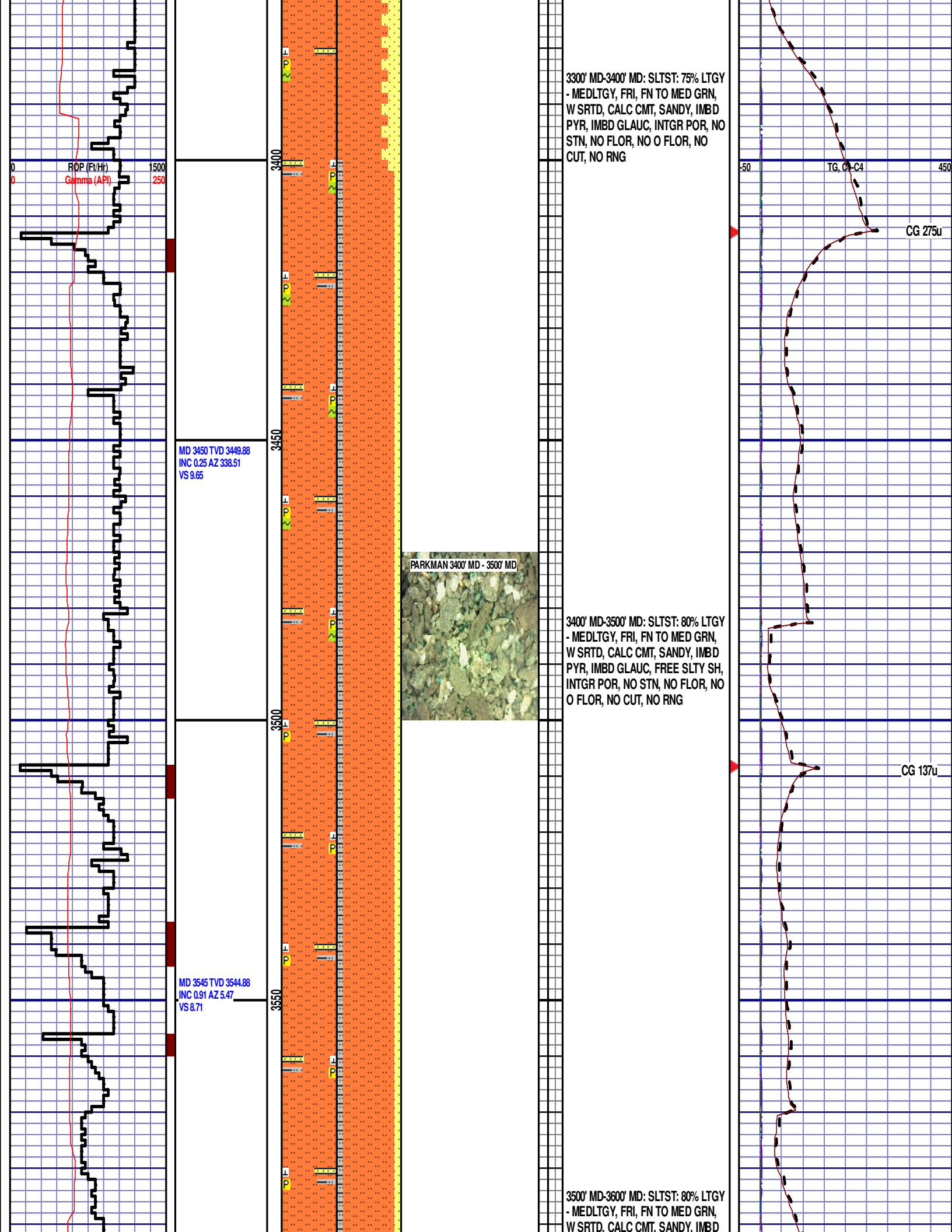
TG, C1-C4

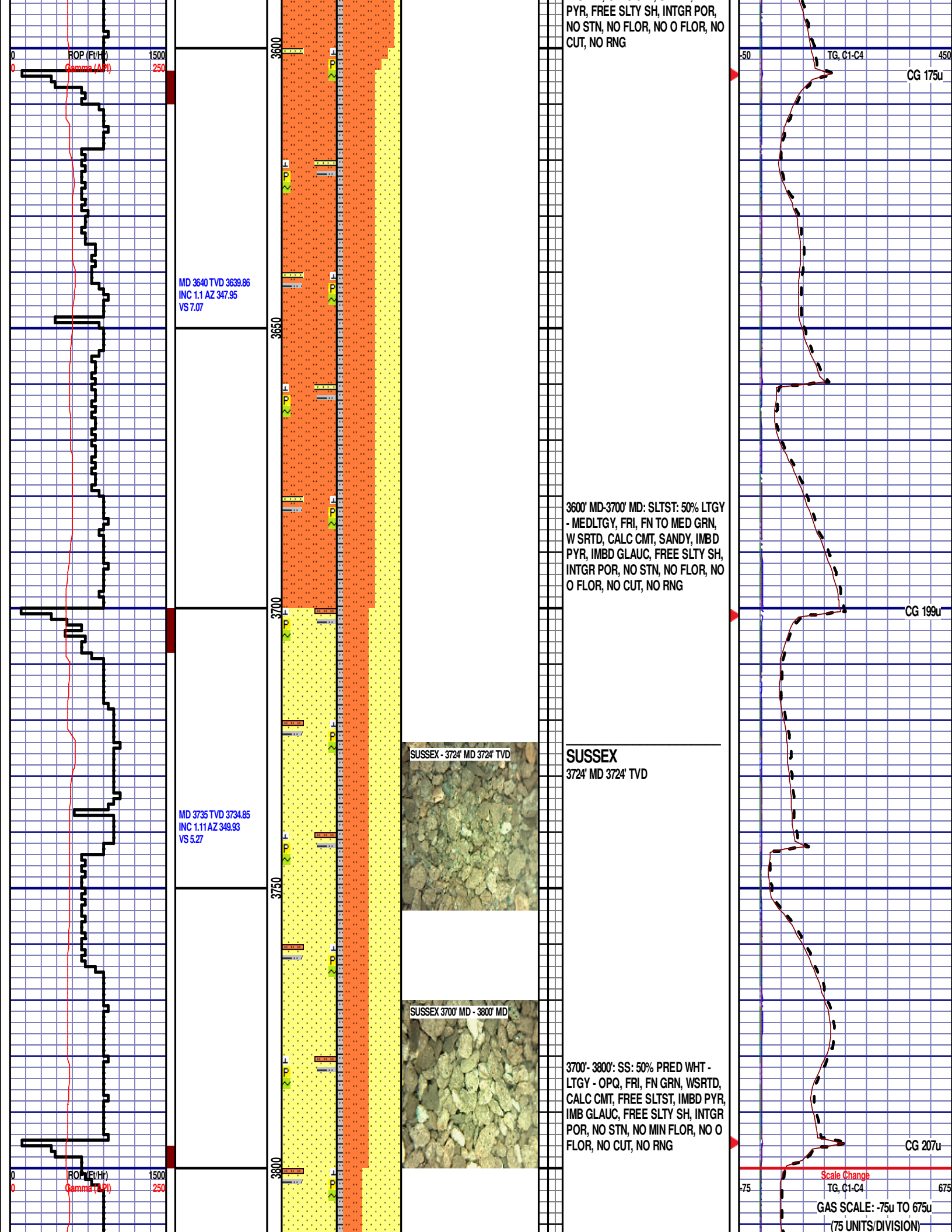
CG 340u

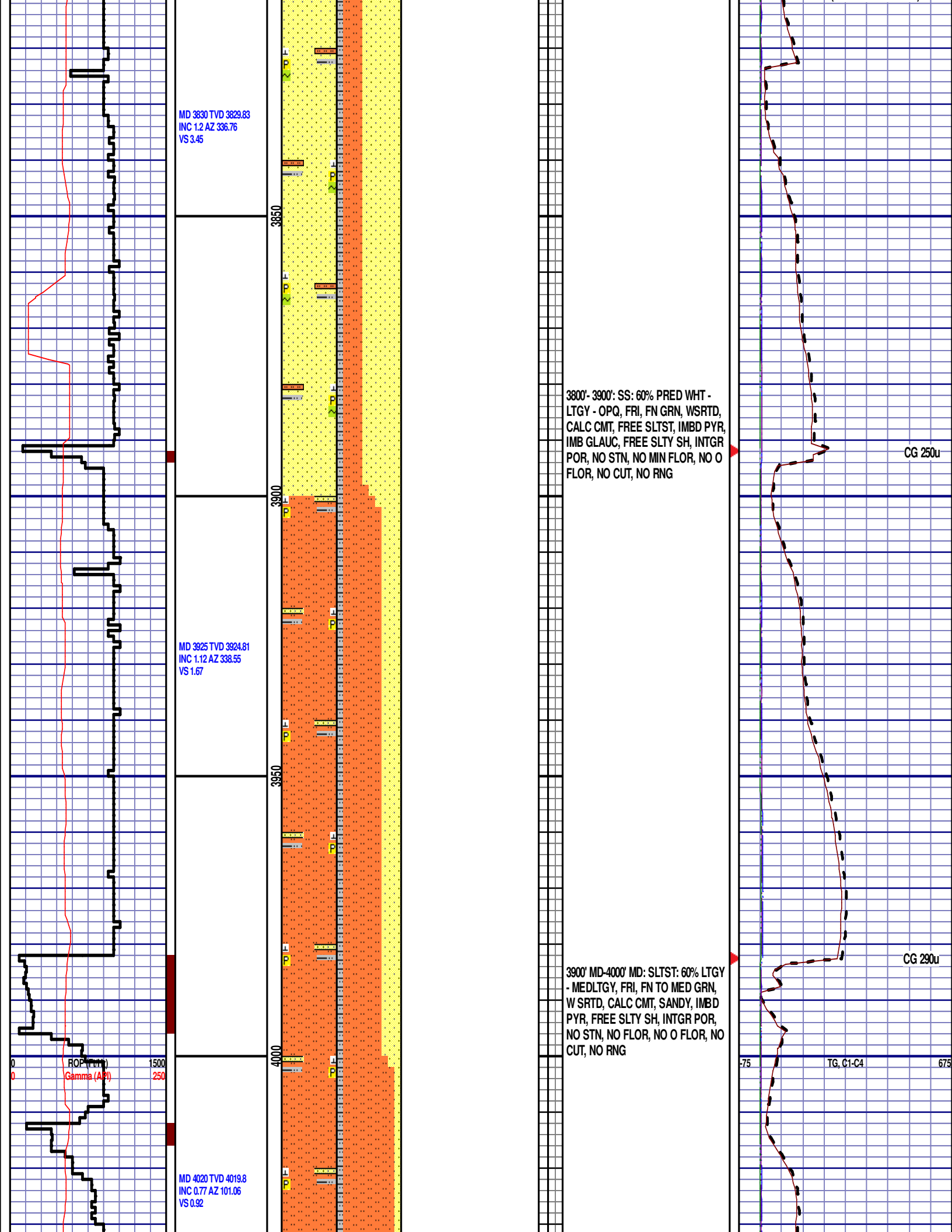


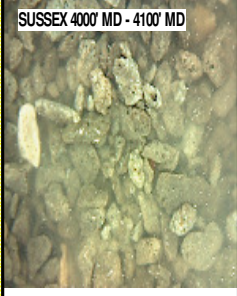
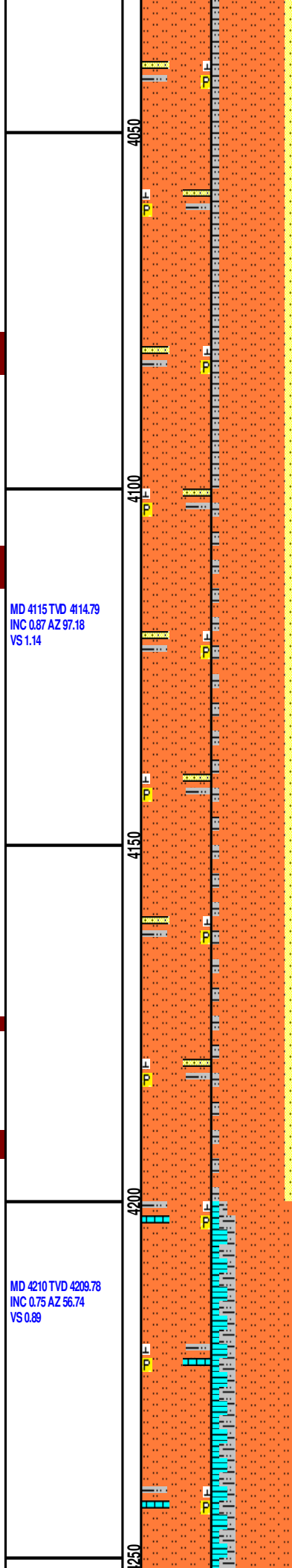
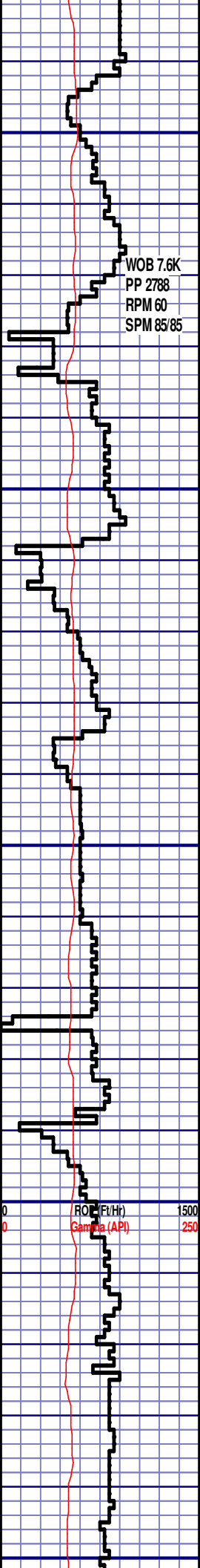










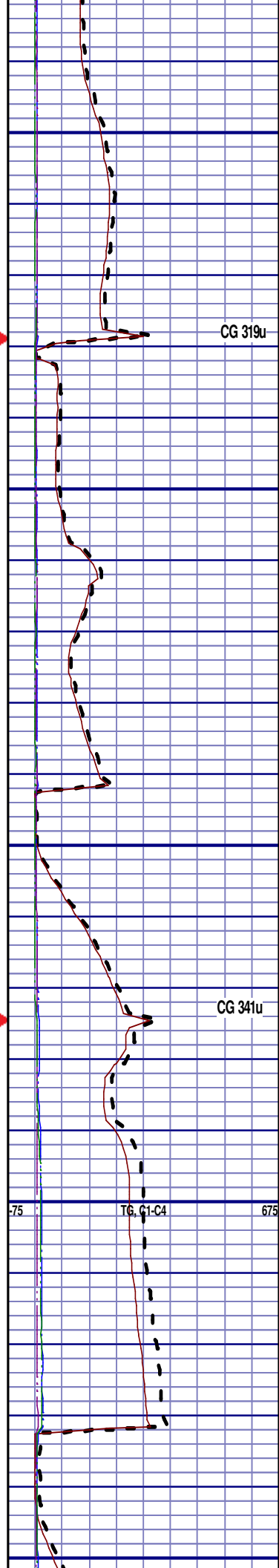


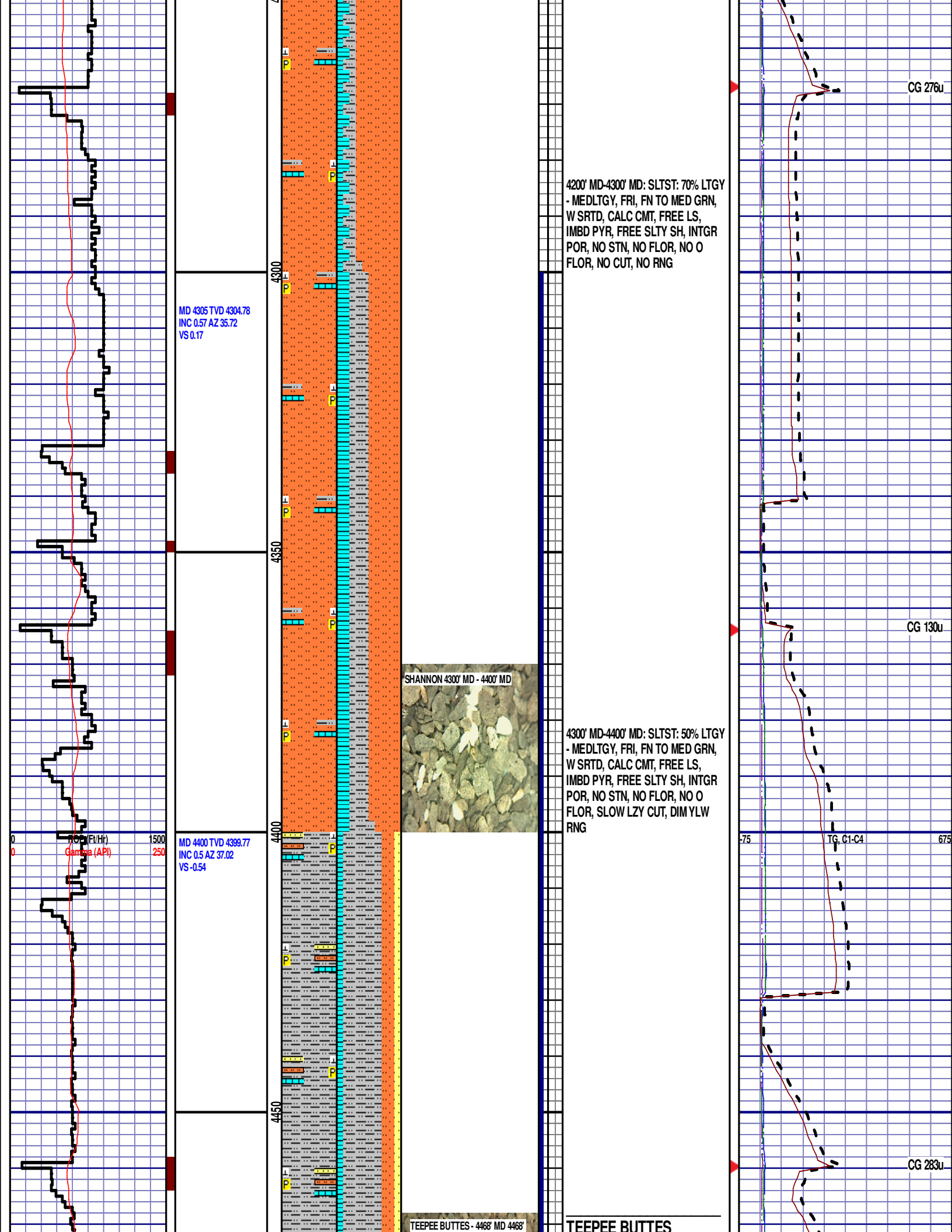
4000' MD-4100' MD: SLTST: 80% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, SANDY, IMBD
PYR, FREE SLTY SH, INTGR POR,
NO STN, NO FLOR, NO O FLOR, NO
CUT, NO RNG

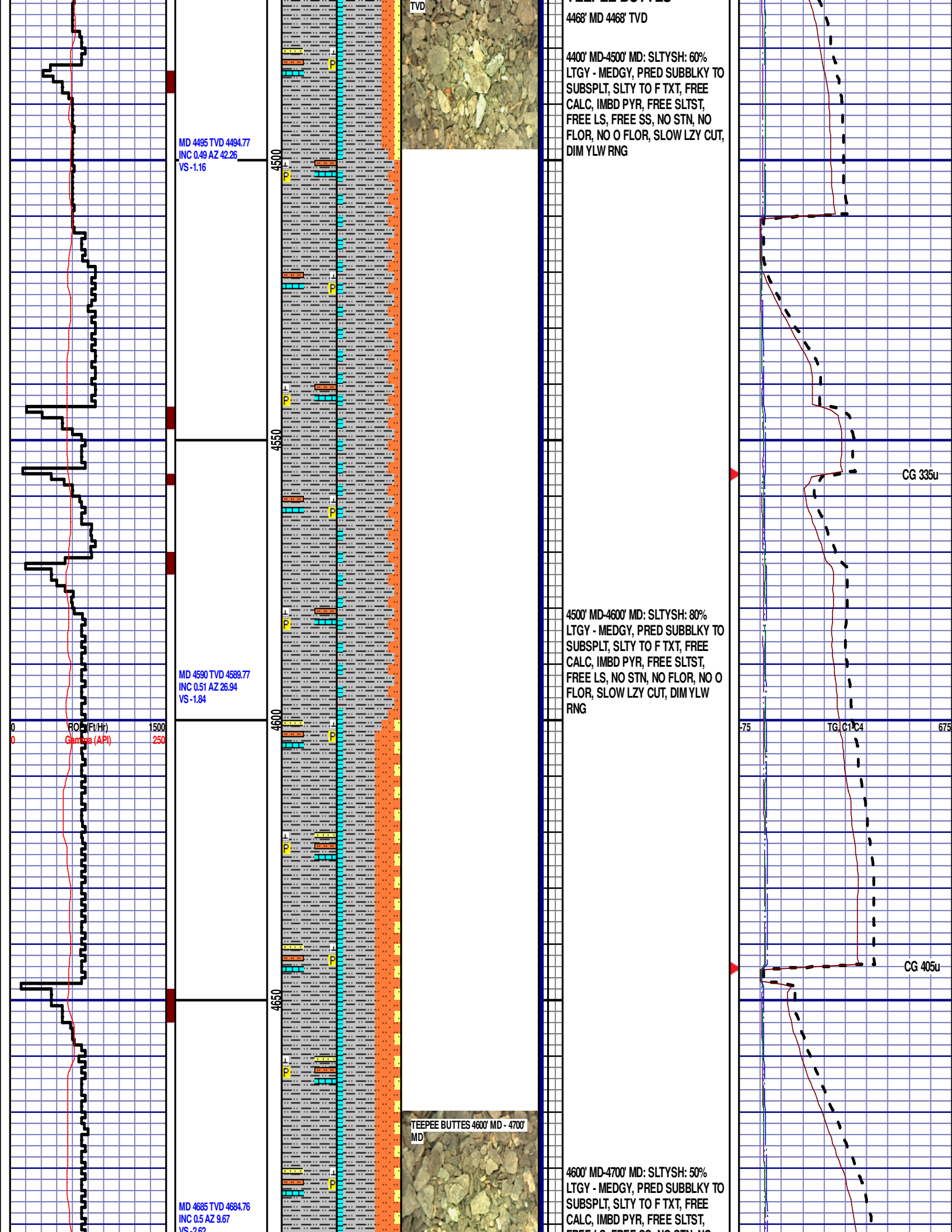


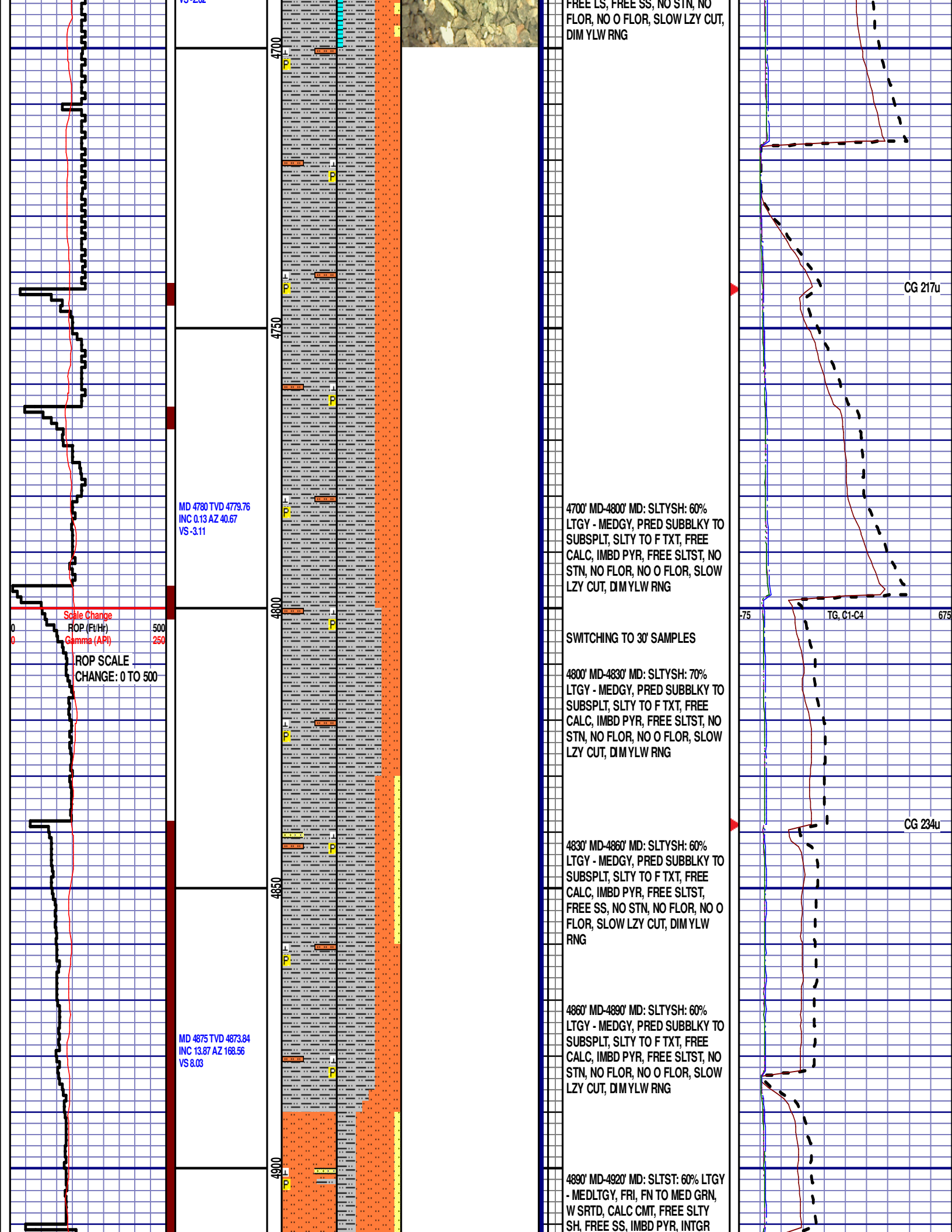
SHANNON
4156' MD 4156' TVD

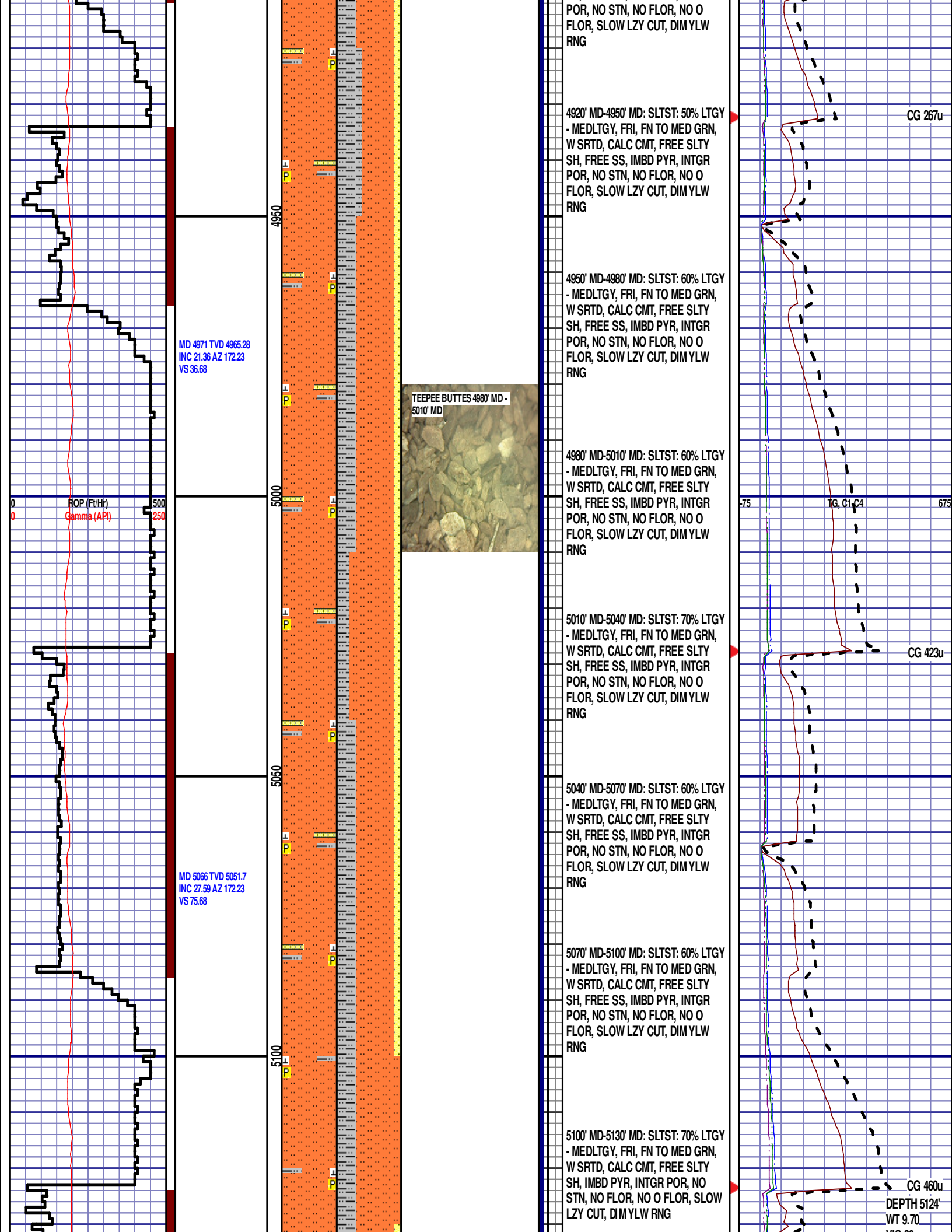
4100' MD-4200' MD: SLTST: 85% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, SANDY, IMBD
PYR, FREE SLTY SH, INTGR POR,
NO STN, NO FLOR, NO O FLOR, NO
CUT, NO RNG

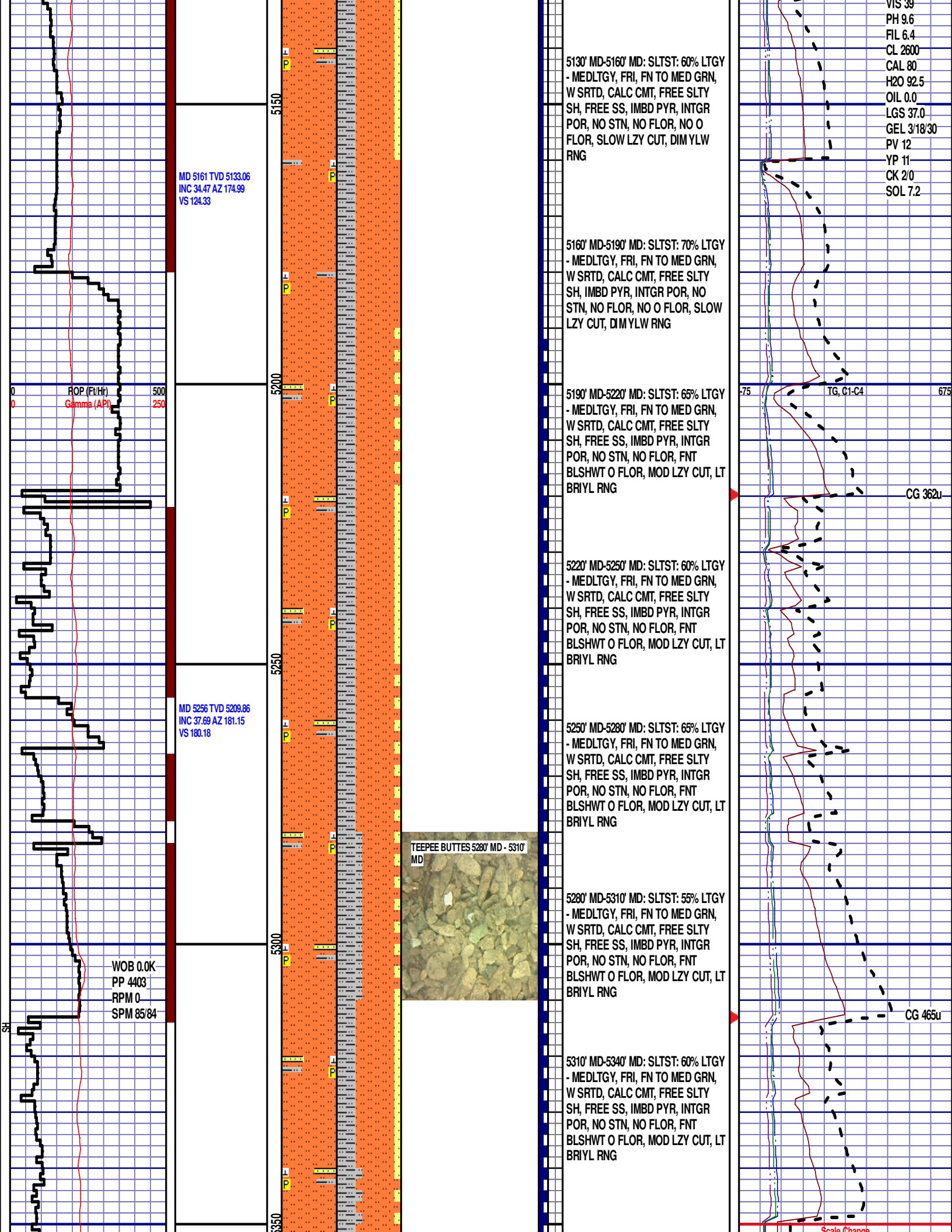










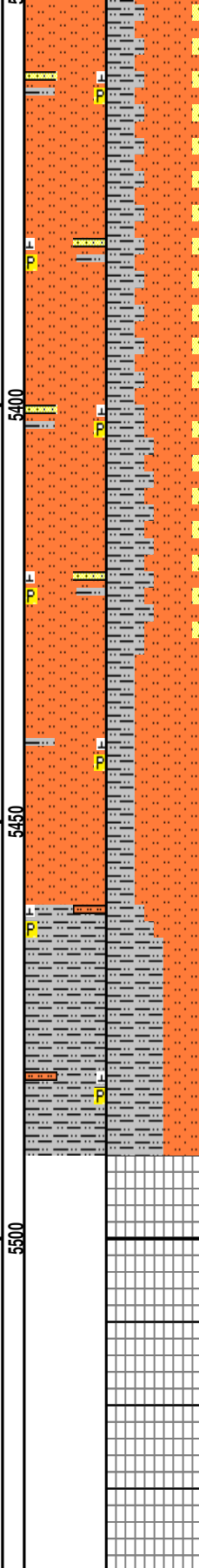


MD 5351 TVD 5281.61
INC 44.14 AZ 183.21
VS 242.3

MD 5447 TVD 5344.41
INC 54.03 AZ 182.37
VS 314.66

POP (Ft/Hr) 500
Gamma (API) 250
WOB 0.0K
PP 4424
RPM 30
SPM 85/85

WOB 4.6K
PP 4082
RPM 0
SPM 79/78



5340' MD-5370' MD: SLTST: 60% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE SLTY
SH, FREE SS, IMBD PYR, INTGR
POR, NO STN, NO FLOR, FNT
BLSHWT O FLOR, MOD LZY CUT, LT
BRIYL RNG

5370' MD-5400' MD: SLTST: 60% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE SLTY
SH, FREE SS, IMBD PYR, INTGR
POR, NO STN, NO FLOR, FNT
BLSHWT O FLOR, MOD LZY CUT, LT
BRIYL RNG

5400' MD-5430' MD: SLTST: 50% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE SLTY
SH, FREE SS, IMBD PYR, INTGR
POR, NO STN, NO FLOR, FNT
BLSHWT O FLOR, MOD LZY CUT, LT
BRIYL RNG

5430' MD-5460' MD: SLTST: 70% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE SLTY
SH, IMBD PYR, INTGR POR, NO
STN, NO FLOR, FNT BLSHWT O
FLOR, MOD LZY CUT, LT BRIYL RNG

5460' MD-5490' MD: SLTYSH: 60%
LTGY - MEDGY, PRED SUBBLKY TO
SUBSPLT, SLTY TO F TXT, FREE
CALC, IMBD PYR, FREE SLTST, NO
STN, NO FLOR, FNT BLSHWT O
FLOR, MOD LZY CUT, LT BRIYL RNG

END OF VERTICAL LOG @ 5490' MD
ON 11/23/14, CONTINUED ON
HORIZONTAL LOG

