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Customer Information	Well Information
<p>Operator: Noble Energy Inc. 1625 Broadway Suite 2200 Denver, Colorado 80202</p> <p>Geologist: Renee Clackler Noble Energy Inc.</p>	<p>Well Name: 70 Ranch State BB18-675</p> <p>Location: 17-T5N-R63W 1489' FNL, 600' FEL</p> <p>County: Weld State: Colorado</p>
Mud Logging Details	
<p>Logger: Sam Stelzer & Scott Haney</p> <p>Log Interval: 2500' MD to 6730' MD</p> <p>Start Date: July 17, 2015</p> <p>Release Date: July 24, 2015</p>	<p>Drilling Rig: H&P 321</p> <p>Total Depth: 15870' MD</p> <p>TD Date: July 24, 2015</p> <p>Formation: Niobrara B</p> <p>KB Elevation: 4710'</p> <p>GR Elevation: 4680'</p> <p>API Number: 05-123-41532-0000</p>

ROCK TYPES

	Siltysh		Congl		Mrlst		Till		sdygw
	Anhy		Dol		Salt		gw		hvycrbsh
	Bent		Gyp		Shale		lmywash		nosmpl
	Brec		Igne		Shcol		ogw		Lsdetrit
	Cht		Lmst		Shgy		olmywash		sltst
	Clyst		Meta		Sltst		oshly gw		sdy sh
	Coal		Chk		Ss		shly gw		

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 1500	0 250		24					NOBLE ENERGY INC. 70 RANCH STATE BB18-675 17-T5N-R63W 1489' FNL, 600' FEL WELD CO., CO H&P 321 LOGGERS: SAM STELZER SCOTT HANEY CALLED OUT BY COMPANY MAN @ 7:00 PM ON 07/17/15. COMMENCED LOGGING @ 11:05 PM @ 2500' MD	40 360	TG, C1-C4
SLIDE=RED ROTATE=WHITE										CONNECTIONS ARE MARKED WITH RED TRIANGLES
ROP SCALE: 0 TO 1500										GAS SCALE: -40u TO 360u (40 UNITS/DIVISION)
GAMMA SCALE: 0 TO 250 (GAMMA DATA AS RECEIVED)										DRILLING ON WATER-BASED MUD

[illegible]

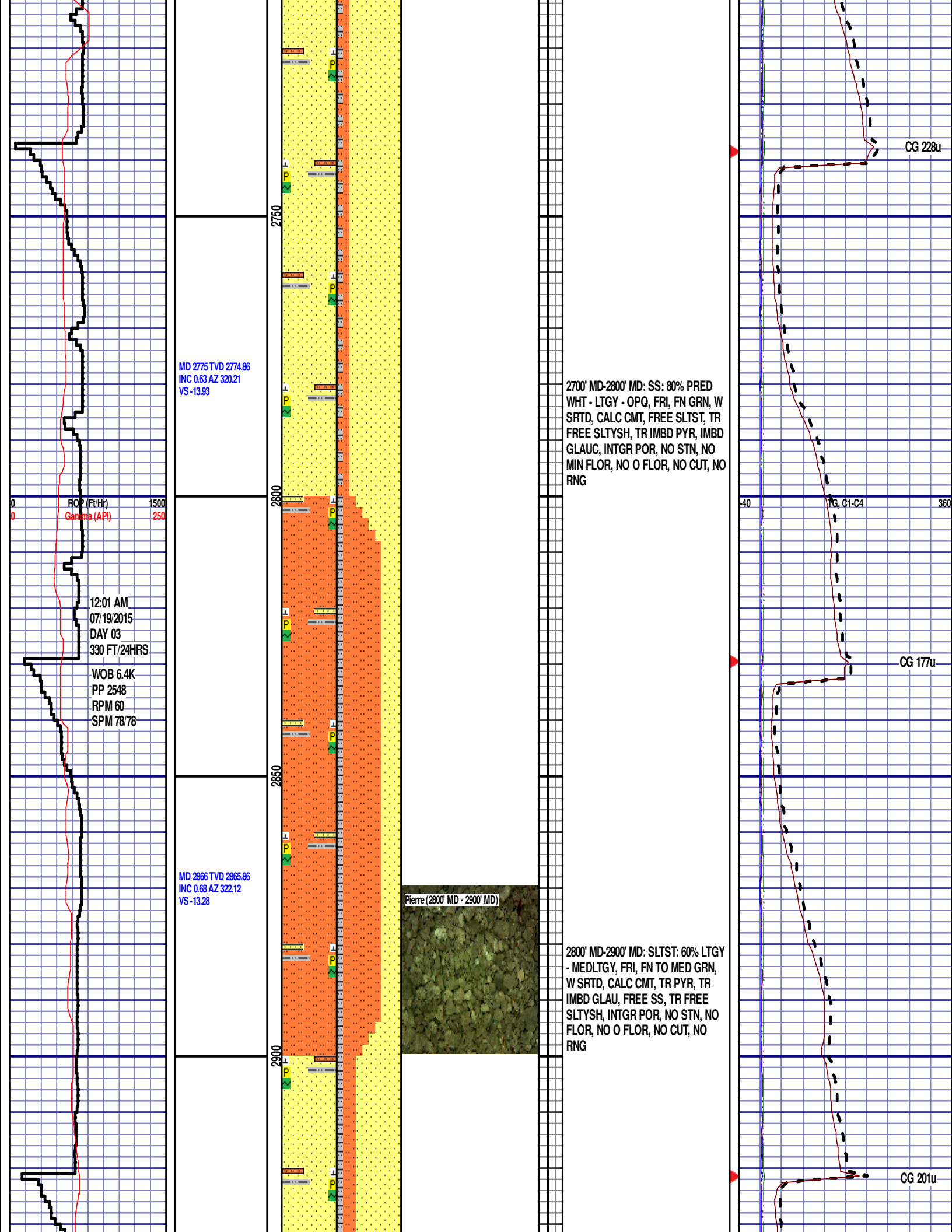
PIERRE
BEFORE LOGGING DEPTH

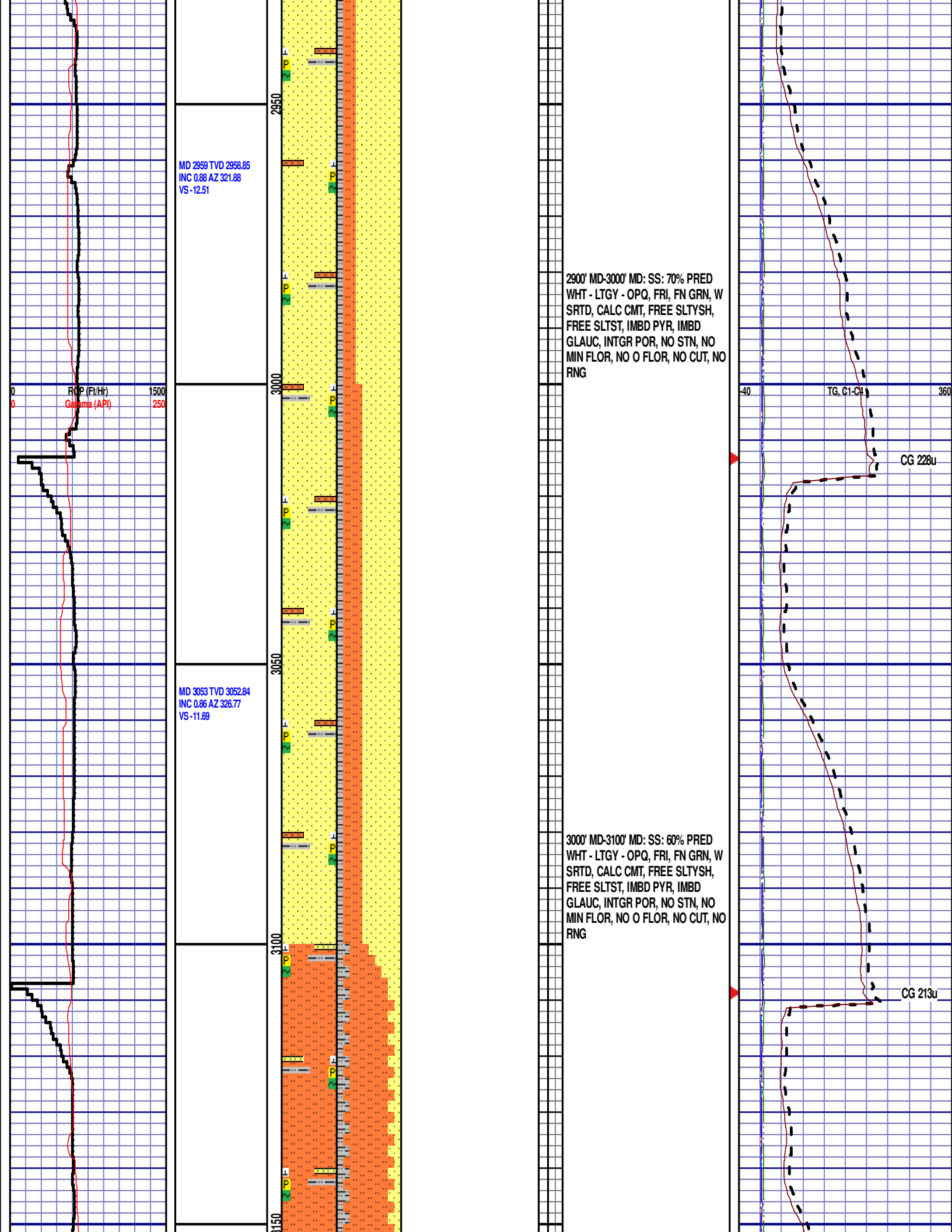
CG 183u

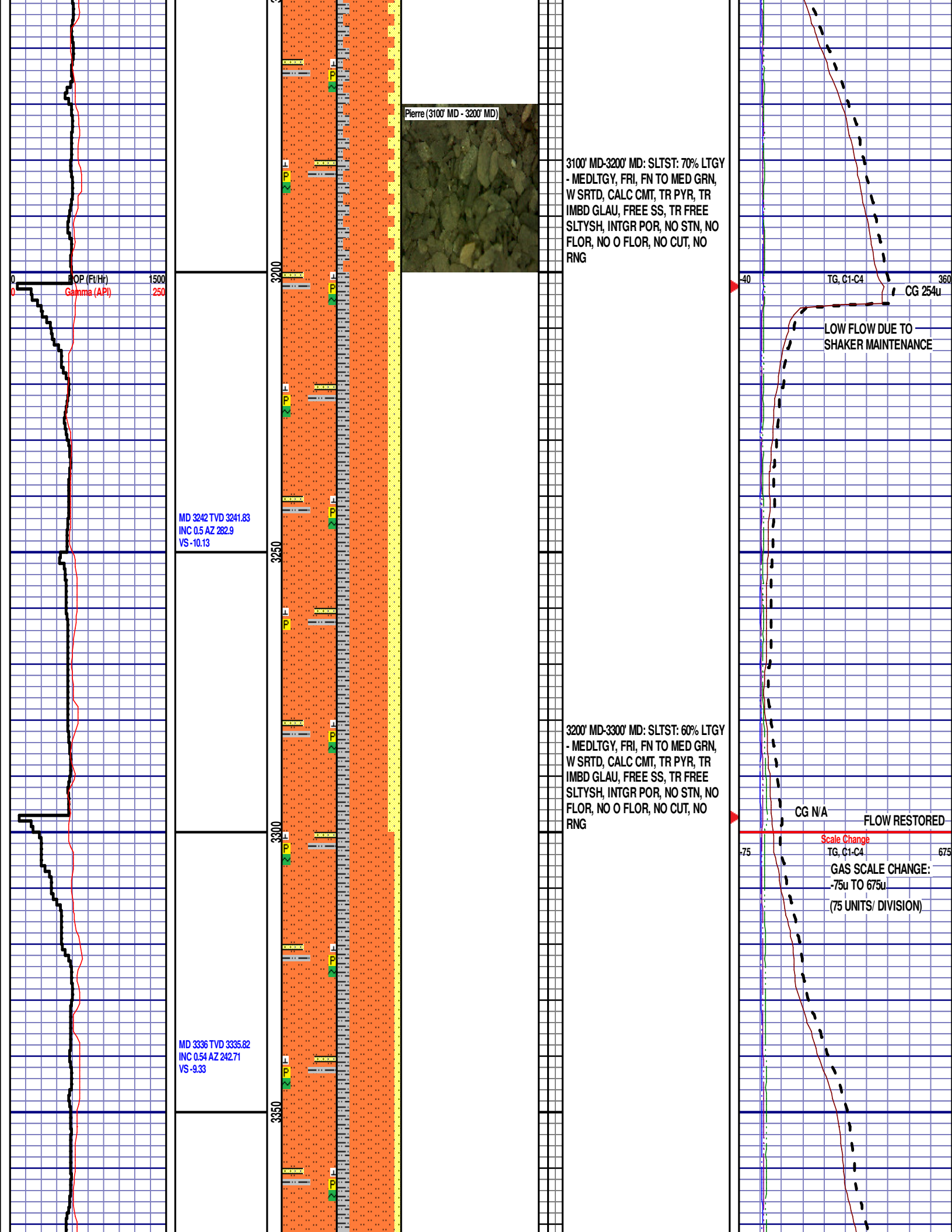
Pierre (2500' MD - 2600' MD)

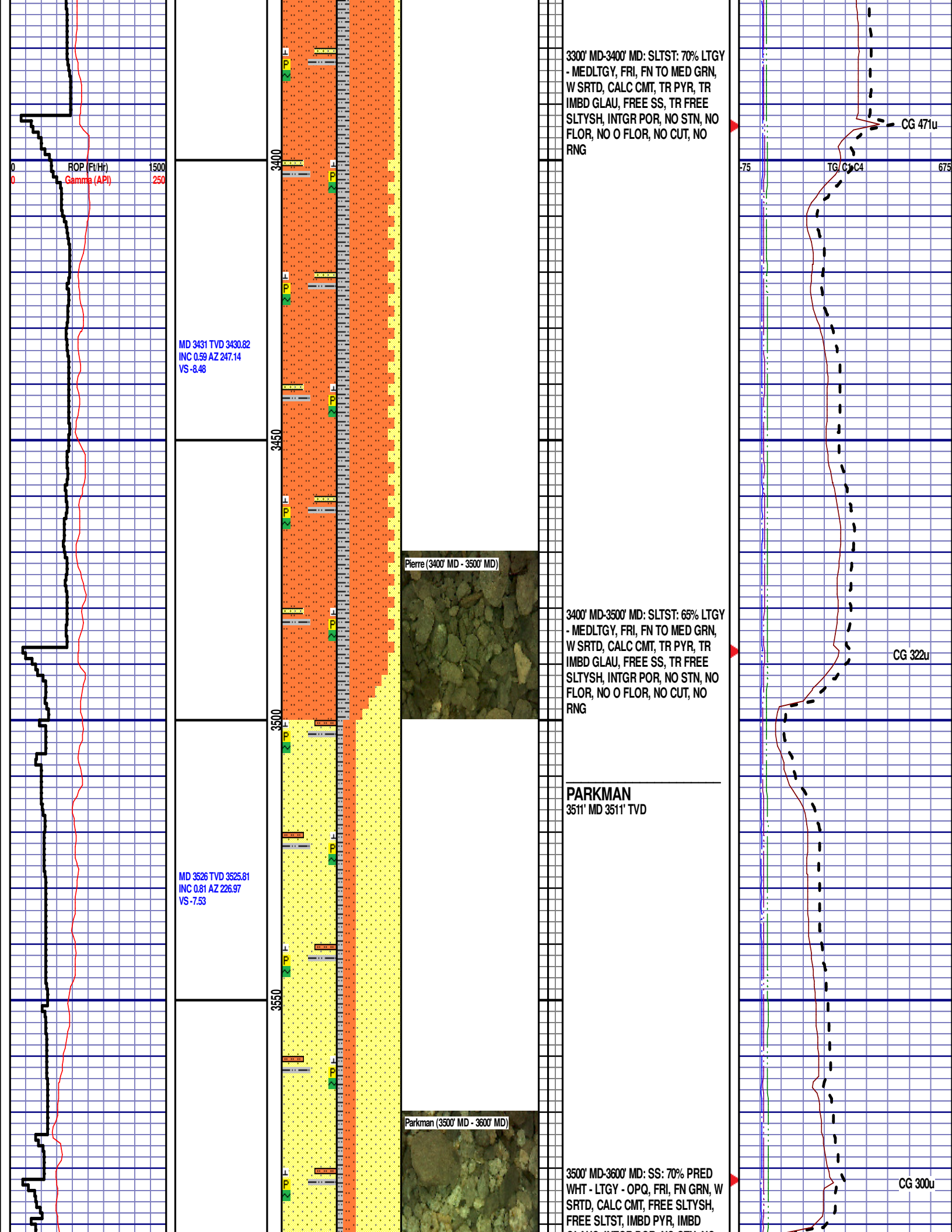
TG, C1-C4

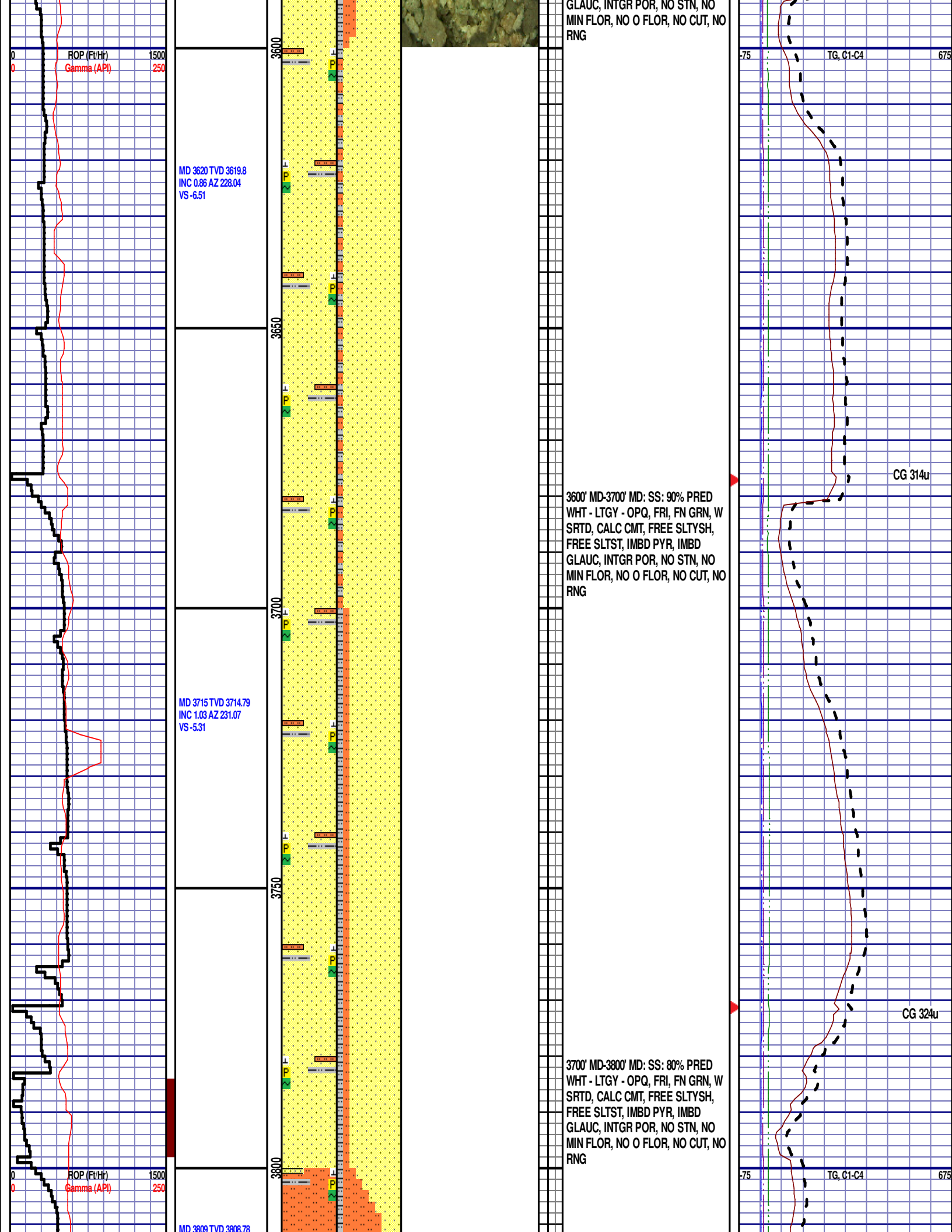
CG 182u











INC 0.7 AZ 262.69
VS-4.07

MD 3904 TVD 3903.77
INC 1.2 AZ 50.74
VS-4.27

MD 3999 TVD 3998.7
INC 3 AZ 33.3
VS-6.44

ROP (Ft/Hr)
Gamma (API)

1500
250

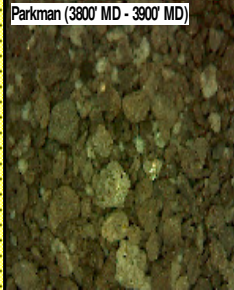
3850

3900

3950

4000

Parkman (3800' MD - 3900' MD)



3800' MD-3900' MD: SLTST: 60% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, TR PYR, TR
IMBD GLAU, FREE SS, TR FREE
SLTYSH, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

3900' MD-4000' MD: SLTST: 70% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, TR PYR, TR
IMBD GLAU, FREE SS, TR FREE
SLTYSH, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

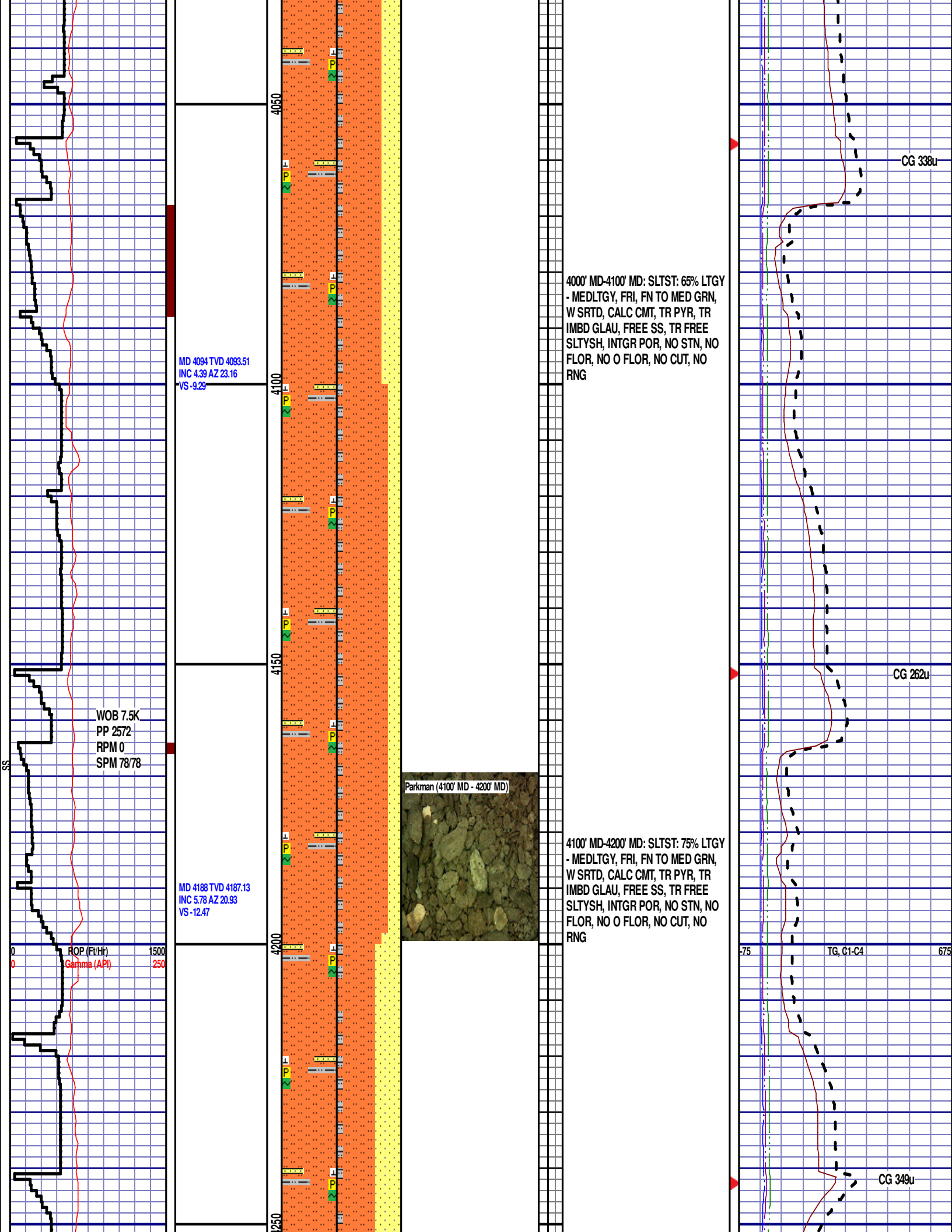
CG 339u

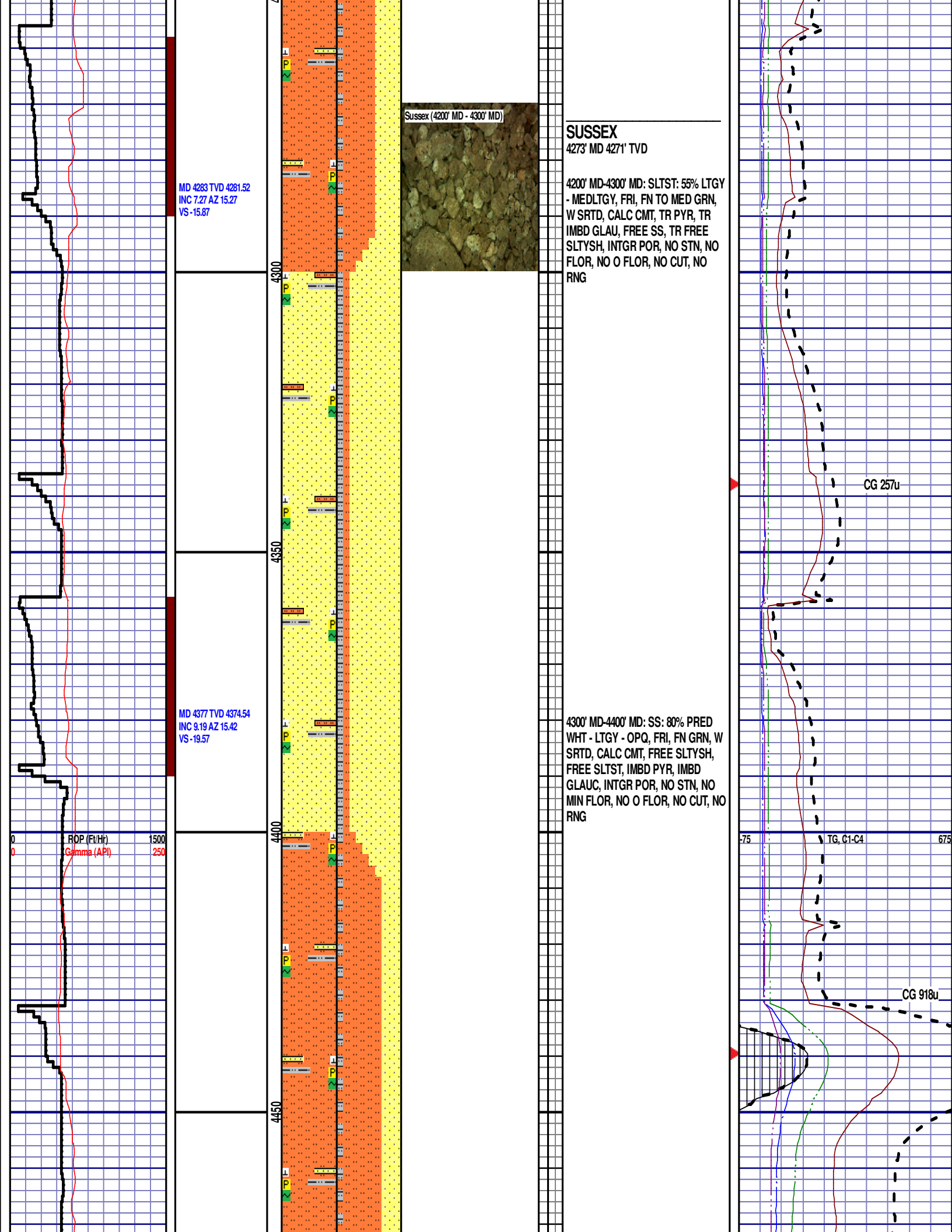
CG 400u

75

TG, C1-C4

675





MD 4472 TVD 4468.26
INC 9.66 AZ 13.84
VS -23.65

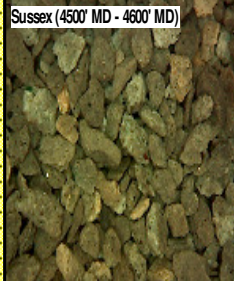
MD 4567 TVD 4562.02
INC 8.91 AZ 15.84
VS -27.71

MD 4661 TVD 4654.75
INC 9.96 AZ 24.45
VS -33.21

4400' MD-4500' MD: SLTST: 65% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, TR PYR, TR
IMBD GLAU, FREE SS, TR FREE
SLTYSH, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

4500' MD-4600' MD: SLTST: 75% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, TR IMBD PYR,
TR IMBD GLAU, FREE SS, TR FREE
SLTYSH, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

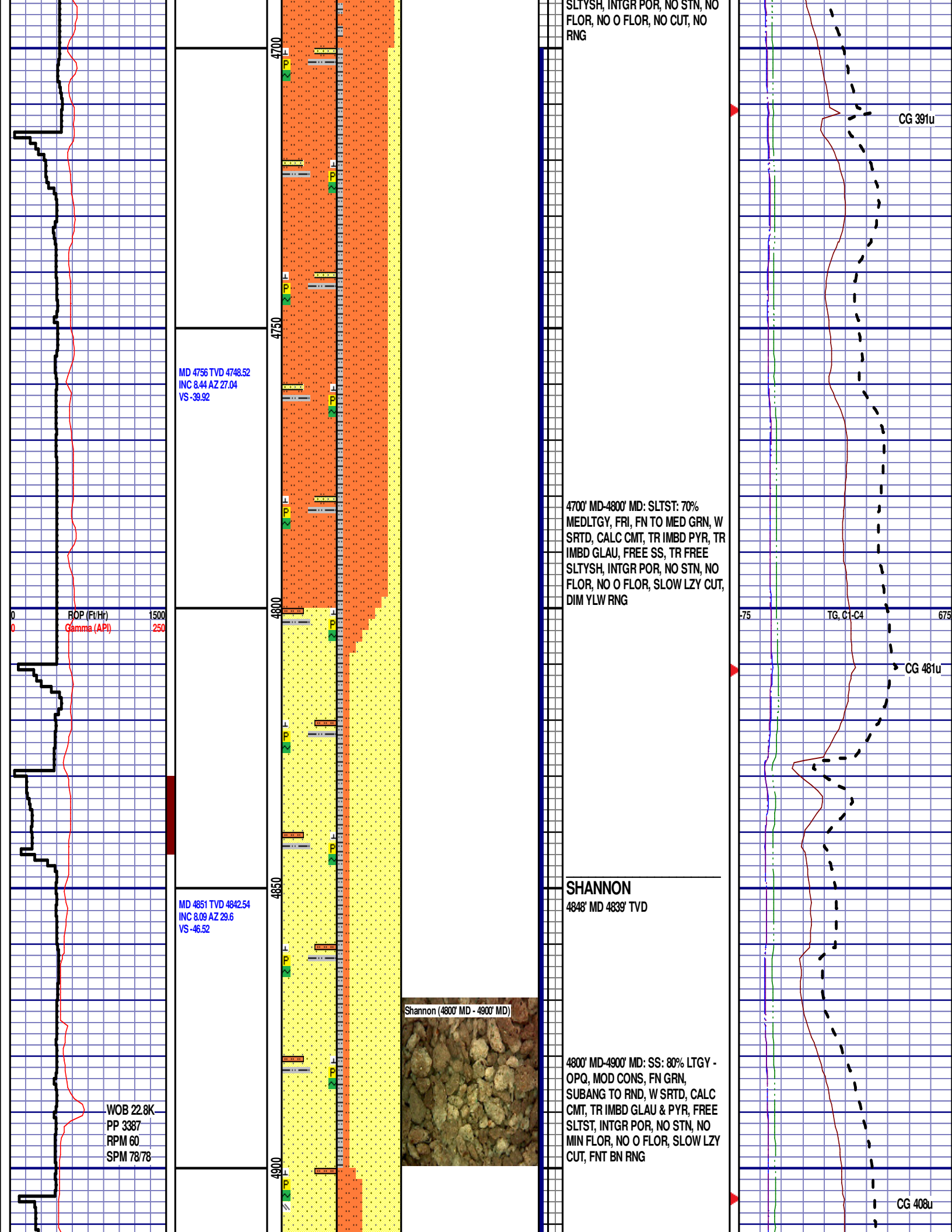
4600' MD-4700' MD: SLTST: 85% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, TR IMBD PYR,
TR IMBD GLAU, FREE SS, TR FREE

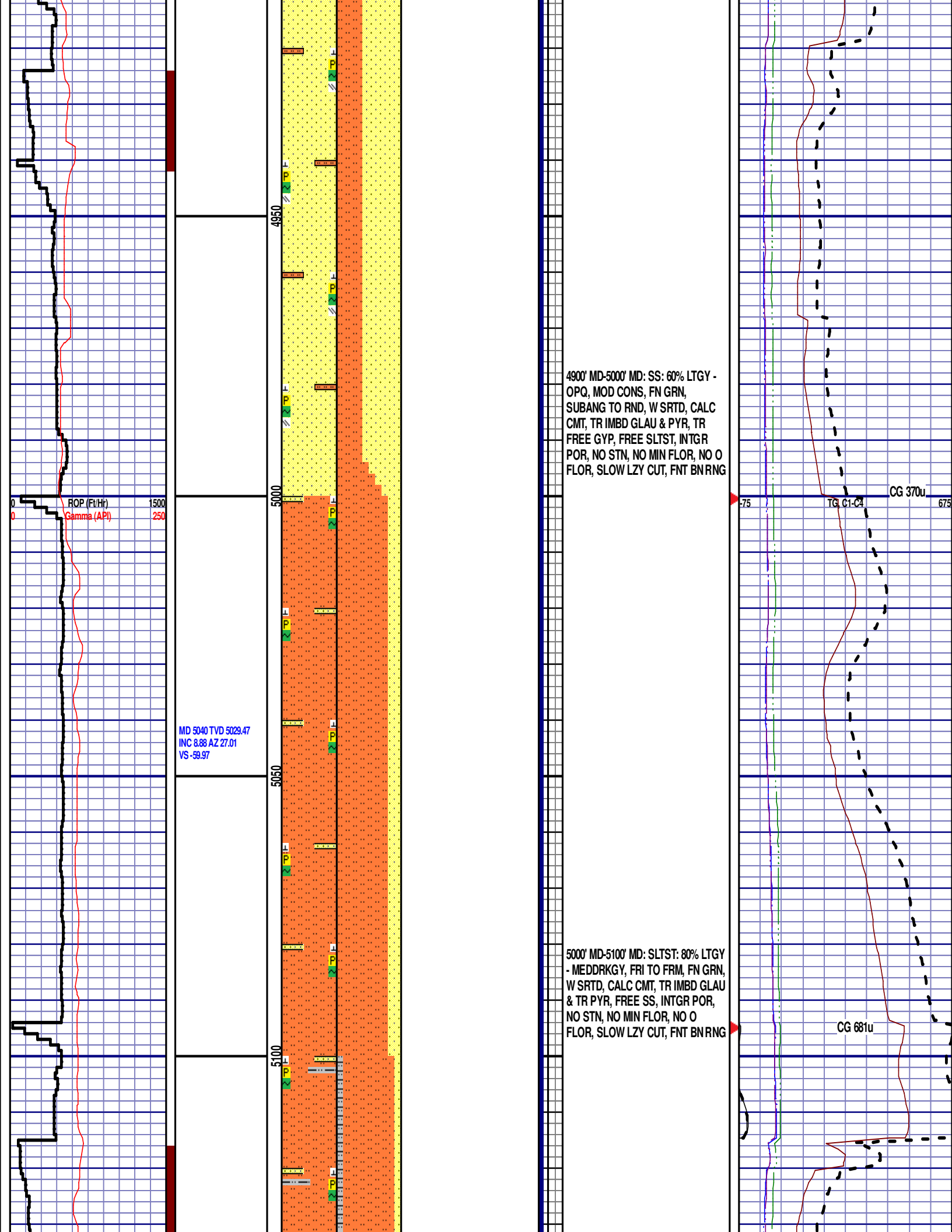


CG 456u

CG 392u

75 TG, C1-C4 675





MD 5134 TVD 5122.42
INC 8.26 AZ 17.75
VS -66.45

MD 5229 TVD 5216.47
INC 8 AZ 17.91
VS -69.7

MD 5324 TVD 5310.56
INC 7.9 AZ 22.35
VS -74.34

Shannon (5100' MD - 5200' MD)

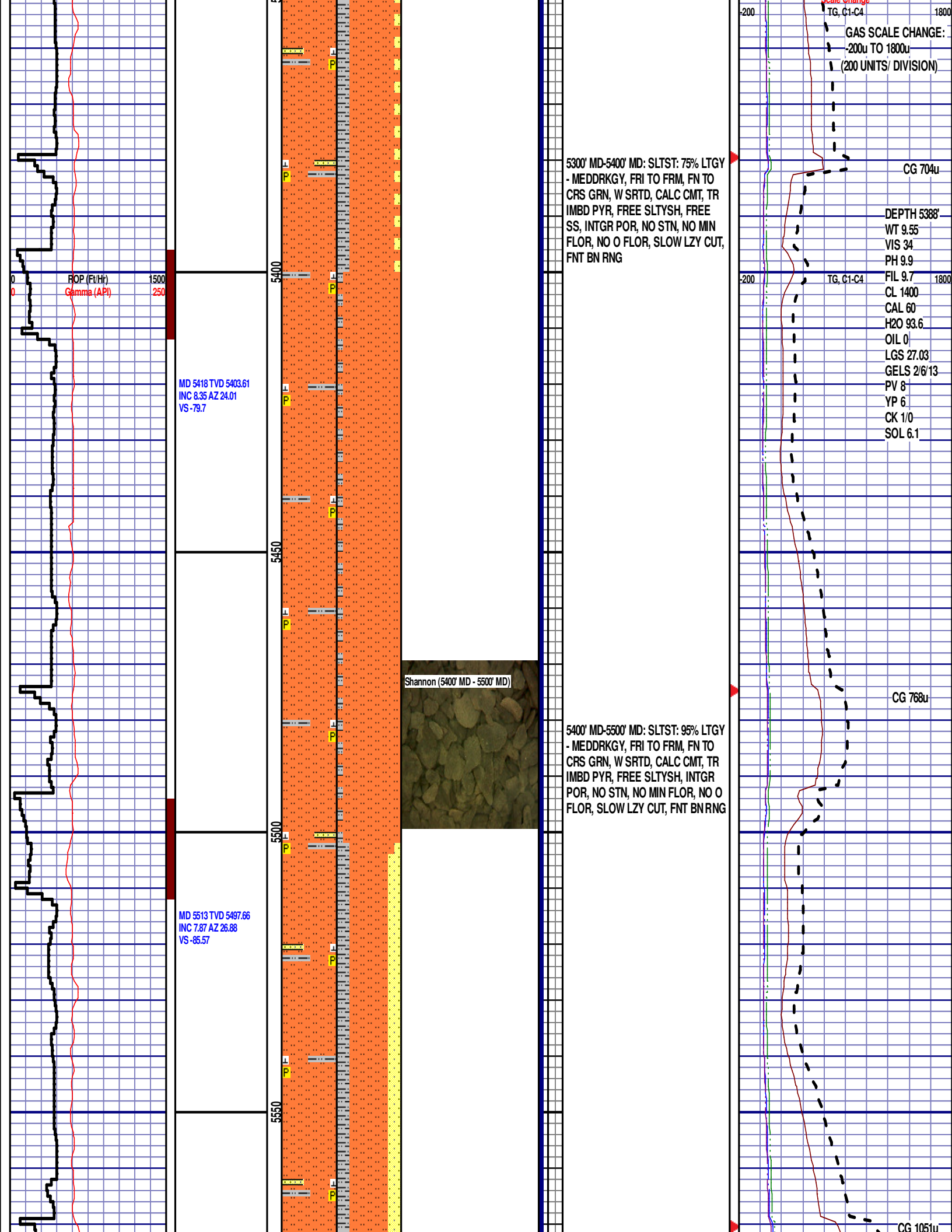
5100' MD-5200' MD: SLTST: 80% LTGY
- MEDDRKGY, FRI TO FRM, FN TO
CRS GRN, W SRTD, CALC CMT, TR
IMBD GLAU & TR PYR, FREE
SLTYSH, FREE SS, INTGR POR, NO
STN, NO MIN FLOR, NO O FLOR,
SLOW LZY CUT, FNT BN RNG

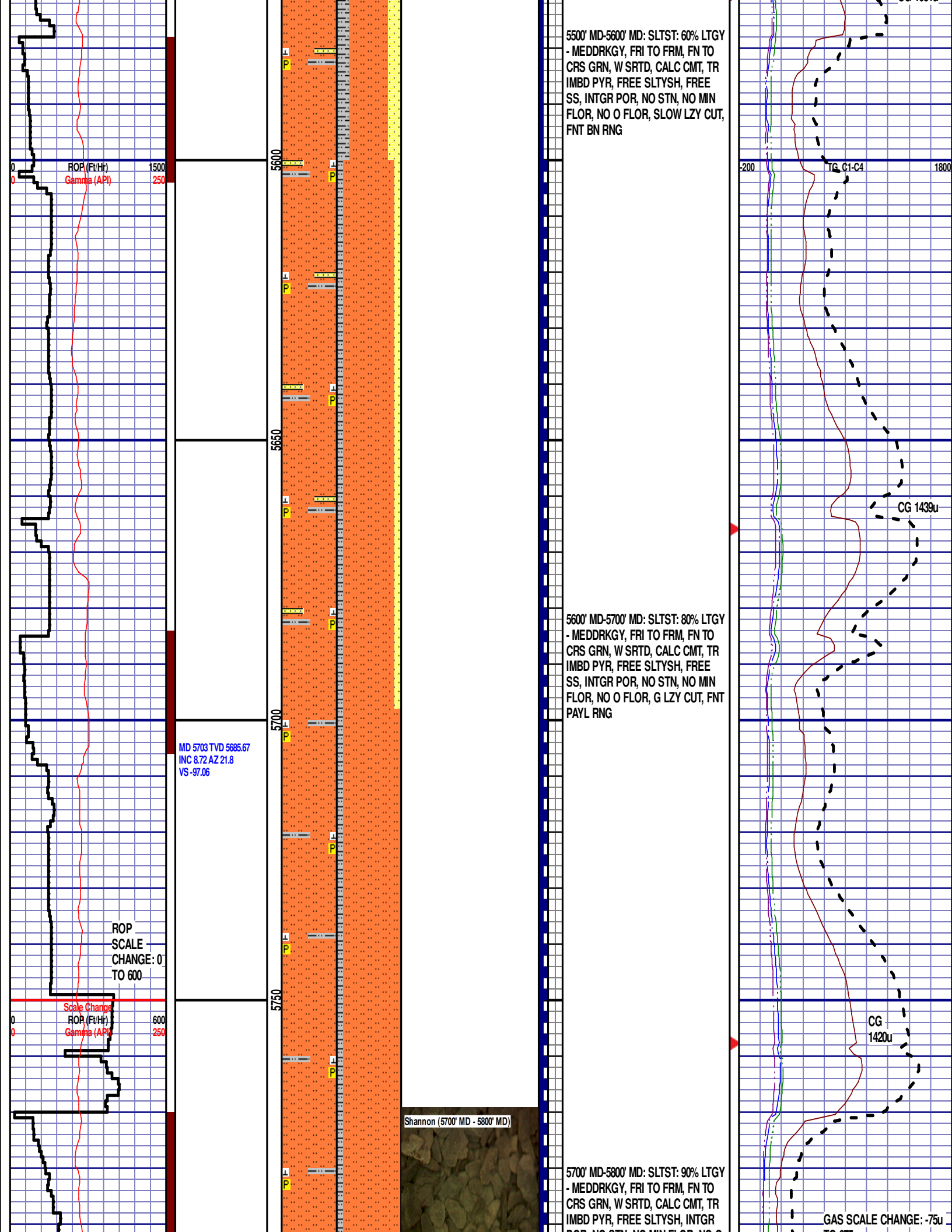
5200' MD-5300' MD: SLTST: 70% LTGY
- MEDDRKGY, FRI TO FRM, FN TO
CRS GRN, W SRTD, CALC CMT, TR
IMBD PYR, FREE SLTYSH, FREE
SS, INTGR POR, NO STN, NO MIN
FLOR, NO O FLOR, SLOW LZY CUT,
FNT BN RNG

CG 378u

CG 397u

Scale Change





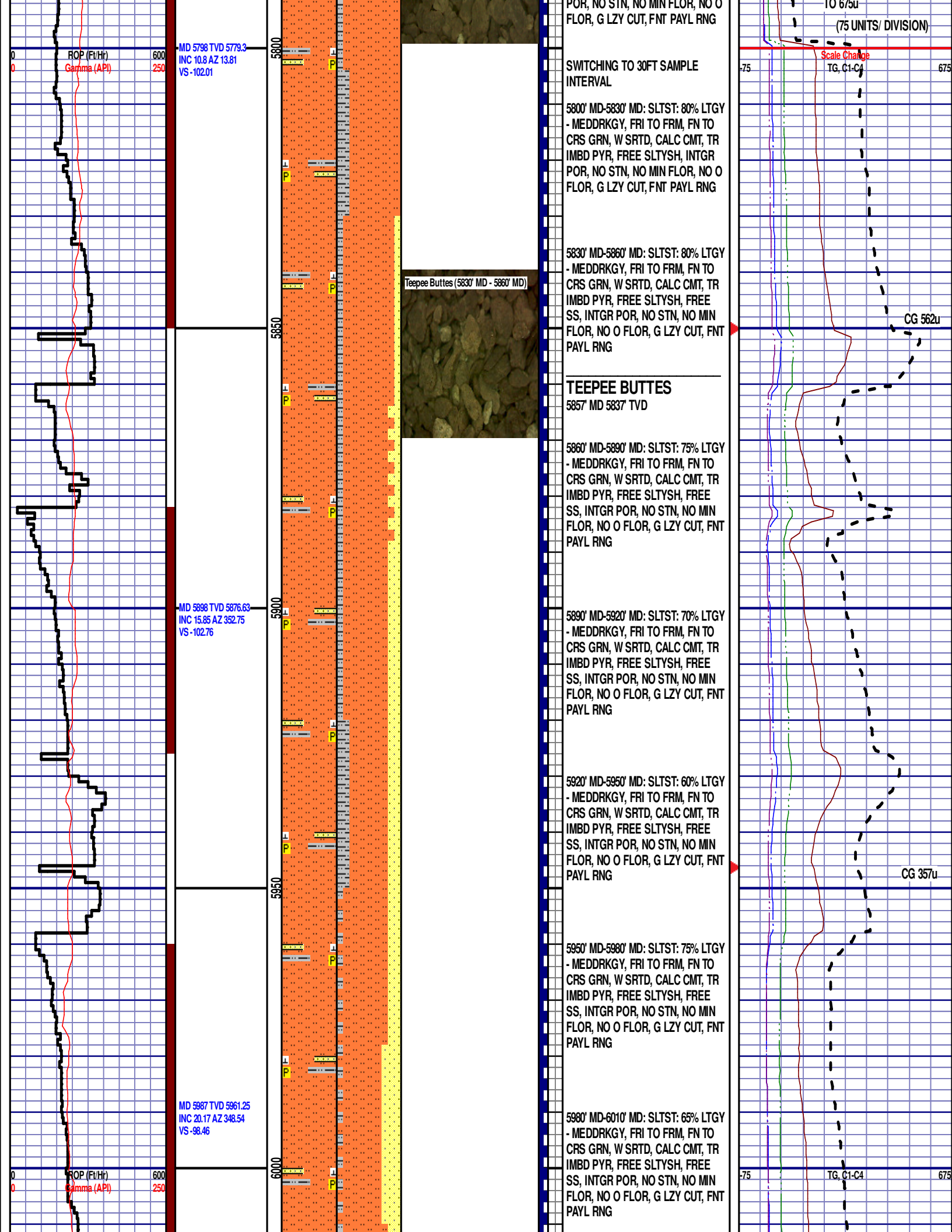
5500' MD-5600' MD: SLTST: 60% LTGY
- MEDDRKGY, FRI TO FRM, FN TO
CRS GRN, W SRTD, CALC CMT, TR
IMBD PYR, FREE SLTYSH, FREE
SS, INTGR POR, NO STN, NO MIN
FLOR, NO O FLOR, SLOW LZY CUT,
FNT BN RNG

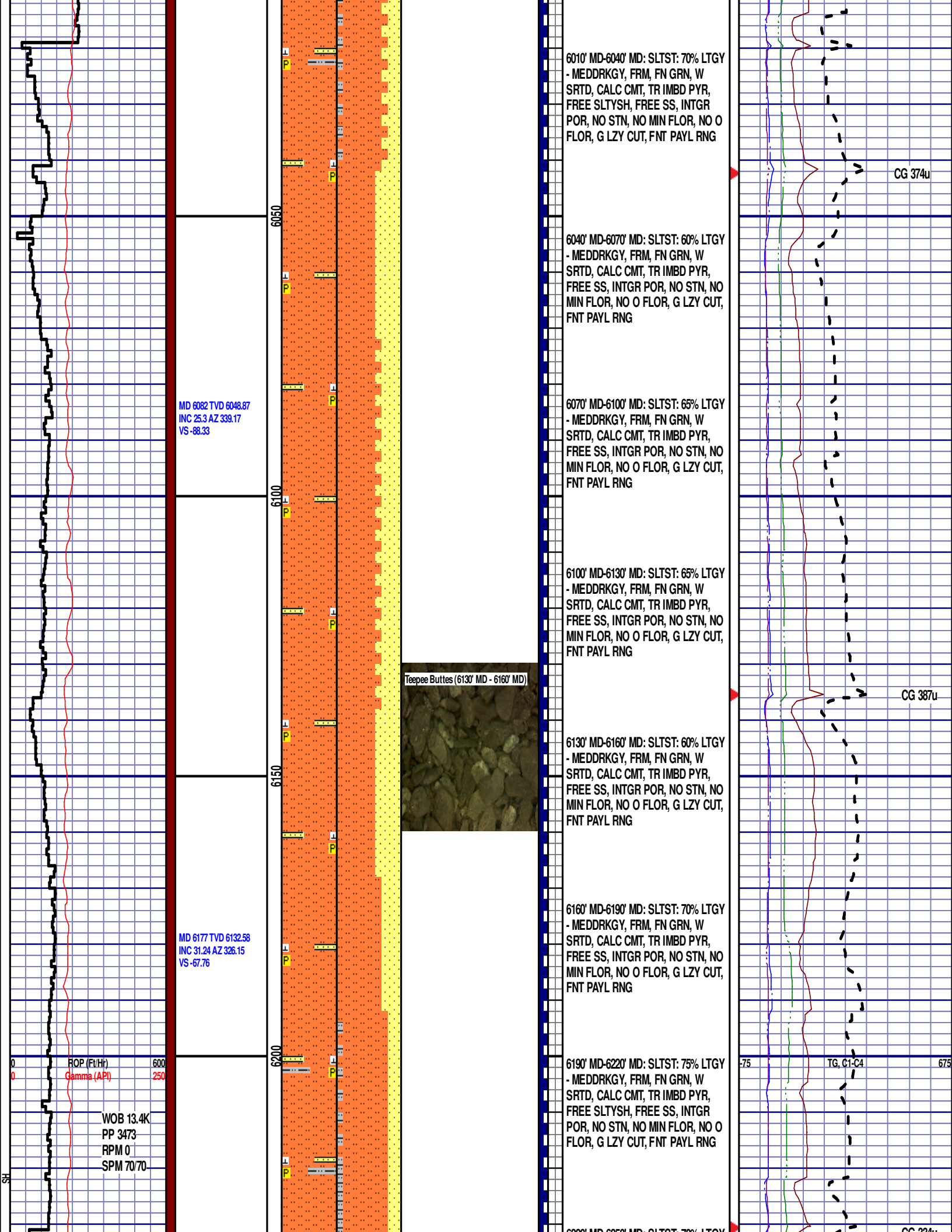
5600' MD-5700' MD: SLTST: 80% LTGY
- MEDDRKGY, FRI TO FRM, FN TO
CRS GRN, W SRTD, CALC CMT, TR
IMBD PYR, FREE SLTYSH, FREE
SS, INTGR POR, NO STN, NO MIN
FLOR, NO O FLOR, G LZY CUT, FNT
PAYL RNG

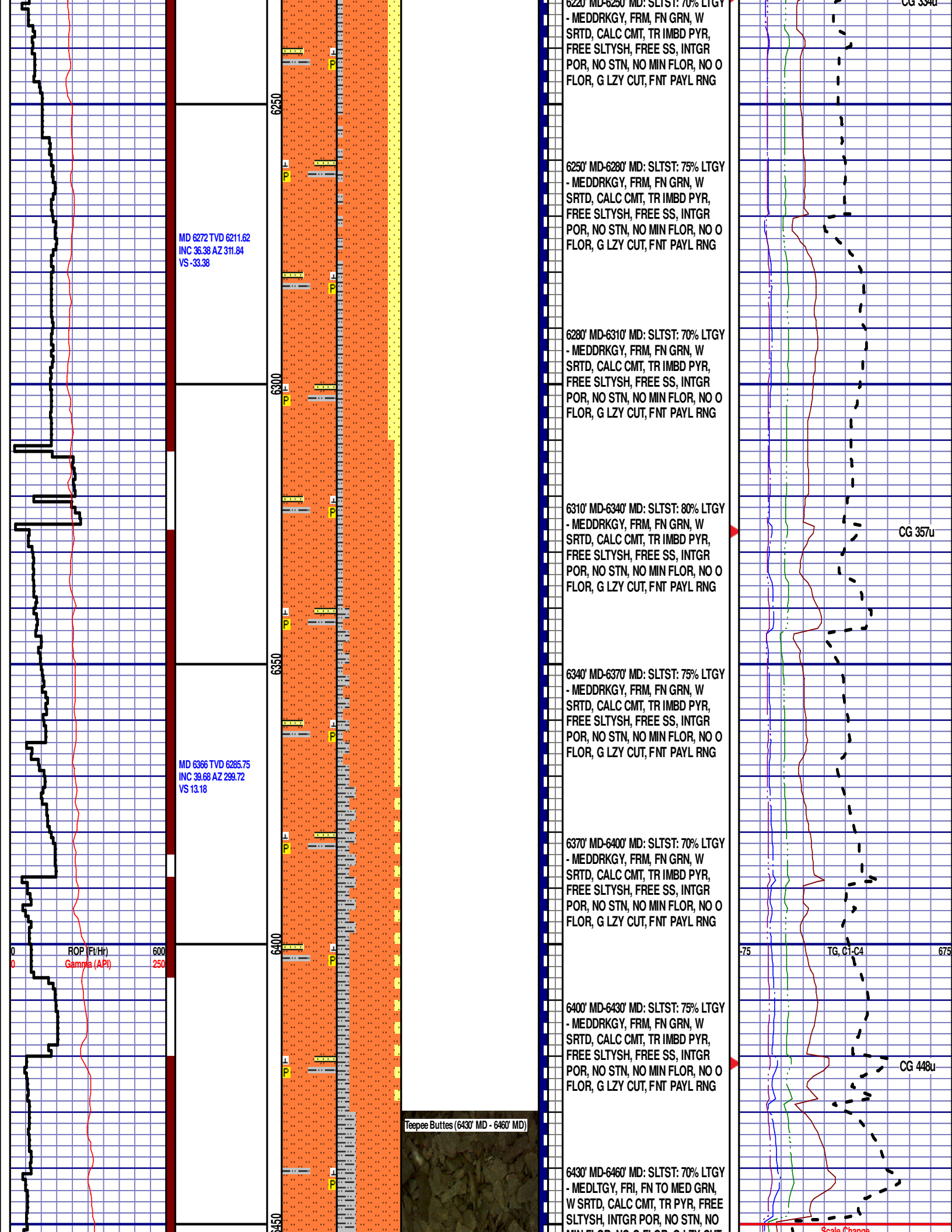
Shannon (5700' MD - 5800' MD)

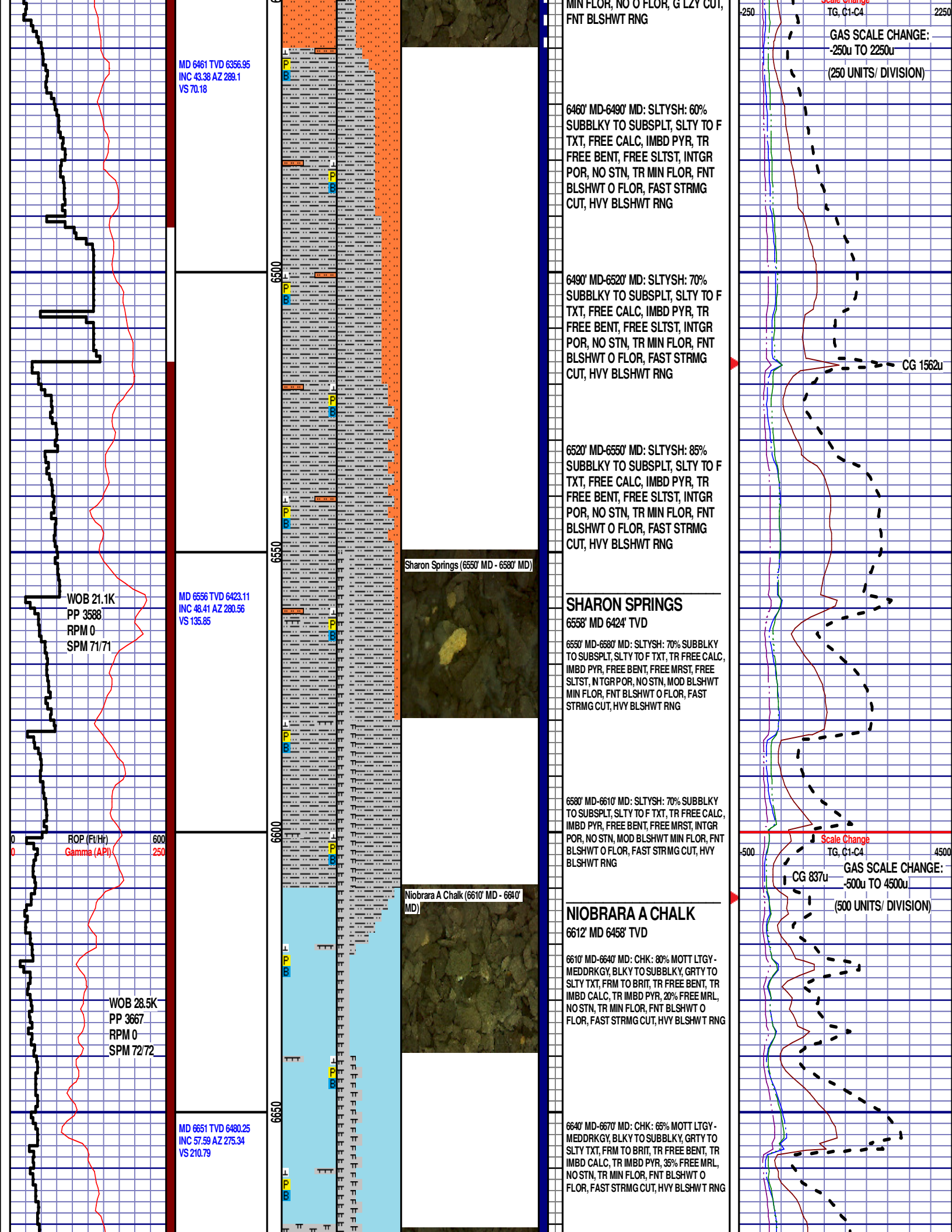
5700' MD-5800' MD: SLTST: 90% LTGY
- MEDDRKGY, FRI TO FRM, FN TO
CRS GRN, W SRTD, CALC CMT, TR
IMBD PYR, FREE SLTYSH, INTGR
POR, NO STN, NO MIN FLOR, NO O
FLOR, SLOW LZY CUT, FNT BN RNG

GAS SCALE CHANGE: -75u









12:01 AM
07/20/2015
DAY 04
3876 FT/24HRS

WOB 22.2K
PP 3488
RPM 0
SPM 72/72

6700

6750

Niobrara A Marl (6670' MD - 6700' MD)



NIOBRARA A MARL

6672' MD 6491' TVD

6670' MD-6700' MD: MRL: 65% MEDDRKGY -
MEDLTGY, B LKY TO SUBBLKY, GR TY TO
SLTY TXT, FRM TO BRIT, TR FREE CALC, TR
FREE BENT, IMBD PYR, 35% FREE CHK, NO
STN, MOD BLSHWT MIN FLOR, FNT BLSHWT
O FLOR, FAST STRMG CUT, HVY BLSHWT
RNG

6700' MD-6730' MD: MRL: 90% MEDDRKGY -
MEDLTGY, B LKY TO SUBBLKY, GR TY TO
SLTY TXT, FRM TO BRIT, TR FREE CALC, TR
FREE BENT, IMBD PYR, 10% FREE CHK, NO
STN, MOD BLSHWT MIN FLOR, FNT BLSHWT
O FLOR, FAST STRMG CUT, HVY BLSHWT
RNG

END OF VERTICAL LOG @ 6730' MD
ON 07/20/2015, CONTINUED ON
HORIZONTAL LOG

CG 1796u

